THE TRIBAL CLIMATE PERSPECTIVE: TWO CASE STUDIES OF TRIBAL CLIMATE CHANGE ADAPTATION PLANS

by

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Climate change is taking affect all over the world, and Indigenous communities are not only on the frontlines of its impacts, but they are also at the frontlines of creating change and acting to adapt to it. History, culture, Traditional Ecological Knowledges, and more gives Indigenous communities a unique perspective to approach climate adaptation planning work. There is a growing network of professionals, scientists, planners, academics, tribal and non-tribal people working together to establish climate change planning in Tribal communities around the world and across the United States. With this as a backdrop, this Thesis looks closely at two specific Tribal communities and their climate adaptation plan strategies and documents, the Karuk Tribe and the Confederated Tribes of the Umatilla Indian Reservation to answer the question; What lessons can be learned from Tribal climate adaptation planning in the context of their unique communities, culture, and history? It explores three main topics as indicators of uniqueness: Cultural Aspects, Tribal Rights and Sovereignty, and Community Engagement. The findings have many lessons for both Tribal and non-Tribal entities for their own climate planning initiatives such as valuing the knowledge that community can bring, maintaining partnerships with multiple entities, building capacity and celebrating existing actions, and leading with cultural considerations.

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Introduction

Drought, food insecurity, changing weather patterns, melting sea ice, and other climate-related impacts are being felt across the world. Climate change is especially threatening to indigenous communities because it threatens ways of life, culture, economic resources, land rights, and future growth. Indigenous peoples of the world are already feeling these impacts and are on the frontlines of climate change due to the fact that they are often in a close relationship to the land continuing traditional activities in the places that they live. In consequence, Indigenous people are often leaders of climate action, and this is evidenced in this thesis.

The impacts that climate change brings are exacerbated by the persisting inequalities and repercussions of colonialism. Indigenous peoples have endured countless injustices, displacement, genocide, forced assimilation, and more. Generational trauma persists today, and Indigenous people are still fighting for their rights as the first peoples of their lands. The land, spirituality, language, culture, and trauma are all interconnected. Paternalistic policies of the U.S. government on some tribal communities have made it illegal for some Tribal people to practice their cultural activities on their ancestral homelands. Traditional planning has proven that it does not address the needs of Tribal people, and it can even be a perpetrator of colonial oppression as described by Itchoak (Itchoak, 2017). However there has been movement of Indigenous people planning for their own communities, many federally recognized tribes have their own governments that operate many programs. Climate Change has been described as an opportunity for Tribes to gain more recognition of their cultural

management practices, assert sovereignty, get funding, and more (Cleaves, 2014; Nilsson, 2008).

Today, there is a large network of scholars, professionals, activists, and citizens, both tribal and non-tribal who are working together towards climate action in tribal communities. Some such networks include organizations such as the Affiliated Tribes of Northwest Indians, the Institute for Tribal Environmental Professionals, the PNW Tribal Climate Change Project, and Rising Voices Center for Indigenous and Earth Sciences for example. Various resources have come out of the conversation as well, to aid tribal communities in developing their own climate adaptation actions and plans.

Part of the intent of this thesis is to bring to light the work that Indigenous and Tribal people have and continue to do to improve their lands and ecosystems despite the barriers that have been put on them in doing so throughout history to now. Indigenous people should rightfully be the ones who are at the center of stewarding and managing the land of their ancestors. This thesis is indicative of the importance of Indigenously led action and management in the face of climate change.

I have selected two Tribes whose Climate Adaptation Plan Documents have been particularly intriguing and inspiring to me, these are those of the Karuk Tribe, and the Confederated Tribes of the Umatilla Indians. These case studies seek to provide examples of how Tribal people are attempting to center their peoples and culture in the creation of climate adaptation plans. I seek not to determine if they have been successful or not, instead, I seek to document how these tribes are strategically including their communities' values into the plans. Therefore, the over-arching research question that guides this research is: What lessons can be learned from Tribal climate

adaptation planning in the context of their unique communities, culture, and history? Within this broad question, I chose to focus on three specific issues: Tribal Rights and Sovereignty, Cultural Aspects, and Community Engagement. I undertook this project through an exploratory approach that used qualitative document review, case studies, and interviews.

To begin this Thesis, the Literature Review covers the connection between climate change and Tribal communities, the theory of Indigenous planning, what has occurred in Tribal communities so far to plan for climate change, and an overview of the three main topics as mentioned above. I will then describe the methods used to further explore the two climate adaptation plan studies. Then, I provide "Tribal Profiles" to introduce the two Tribes whose climate adaptation plans I have chosen to examine. I will then go into the findings and analysis portion, starting with the Confederated Tribes of the Umatilla Indian Reservation's Climate Adaptation Plan (CAP), and then the Karuk Tribes Climate Adaptation Plan (CAP). The next chapter covers both climate adaptation plans together to bring out the similarities and differences between them. The conclusion will bring these elements together and discuss implications and future research directions.

Literature Review

Introduction

Climate Change is multi-dimensional. It's often said that its effects won't discriminate between the privileged or less privileged, social groups, or anything else. This is true to the extent that unusual weather events will occur anywhere, at any time, and without regard to what is in the way, however, as can be seen with the unique concerns that indigenous communities may have for the effects of climate change in the areas that they live, there are vulnerabilities that some groups of people have, and some may not. Climate effects like Increased weather unpredictability, storms, drought, high-severity wildfire, and rising sea levels have compounding effects with other stressors on the environment by human use. They will affect not only our built systems but our social systems as well. It will affect not only our physical health but our mental health. Furthermore, much of its consequences are still unknown, and planning for the unknown is a challenge in itself. However, Indigenous peoples are placed in a unique position in our situation moving into the future. Indigenous peoples have stewarded their land since time immemorial, they have lived through climate changes before, and they have Traditional Ecological Knowledges that have been passed down for centuries.

Recently, the theory of Indigenous planning has emerged as planning done for indigenous communities, usually by indigenous planners that center the indigenous community and their unique worldviews and values. In the face of climate change, Indigenous and Tribal peoples are at the frontlines to feel the impacts of change, and they have emerged at the frontlines of taking action to combat and adapt to it. Based on several studies, there are at least 38 Tribal climate change plans and documents that

have been created across the United States, many of which have been developed by the Tribes (Itchoak, 2017; Miles, 2018; Sanders, 2021; *Tribal Climate Change Project*, n.d.; Tripp & Norgaard, 2016). There are growing networks of tribal members, leaders, and environmental professionals working to see the resilience of Indigenous and Tribal peoples across the Nation and the world. Their relationship to the land gives Indigenous communities a valuable perspective on climate change planning, and as they face the effects of climate change, their plans for adaptation and mitigation must be culturally based and relevant to their needs.

Climate Change Planning

It is known that the earth's climate has experienced many changes, but in the last several decades scientists have determined that human activities are now affecting climate change to change at a faster, unprecedented, and possibly detrimental rate (Treut et al., 2007). The National Research Council notes that temperatures have risen nearly 2°F over the past 50 years. The impacts are already being felt across the world, with increased frequency and intensity of heat waves, sea-level rise, the disappearance of sea ice, and more detrimental changes to the environments in which we live (National Research Council, 2010).

Recently, the focus on climate change has shifted from asking if the climate is changing, to how we are going to be able to prevent and deal with the changing climate, or as Bierbaum (2013) puts it, “Can society manage the unavoidable changes and avoid the unmanageable?” Planners are planning for climate change through both mitigation and adaptation.

Climate Mitigation is focused on the prevention aspect of planning for climate change, to slow the rate of climate change and reduce its impacts. The International Panel on Climate Change's Fifth Assessment Report (2014) defines mitigation as "A human intervention to reduce the sources or enhance the *sinks* of greenhouse gases (GHGs)." This may include measures that control emissions of carbon monoxide, nitrogen oxides, and other pollutants that affect the ozone, affecting the climate (IPCC, 2014)

Adaptation focuses on risk management of potential effects of climate change, based on measured vulnerabilities of ecosystems and communities (National Research Council, 2010). The Tribal Climate Adaptation Guidebook defines adaptation planning as "the process by which an entity identifies and assesses the vulnerability of key concerns and planning areas that are likely to be affected by changing climate conditions; develops adaptation goals and actions to reduce the vulnerability and increase resilience…" (Dalton et al., 2018). Most adaptation strategies strive for the preparation and resilience of their communities in the face of climate change. Resilience is defined by the IPPC as, "The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for *adaptation*, learning and *transformation*" (IPCC, 2014, pg 5). Both climate change adaptation and mitigation are needed to address climate change.

Bierbabaum et. al. (2013) examine climate change mitigation and adaptation efforts at multiple levels; Federal, regional, state, tribal, local, as well as corporate, and

nongovernmental sectors. Their main findings are that adaptation planning is occurring at all of these levels in some way, and that barriers to implementation included a lack of funding, legal issues and the difficulty of predicting climate challenges. They also found that collaborative processes that included stakeholder engagement and sharing of best practices had a positive impact on the planning progress. The title of their report, "more than before, but less than needed" suggests their final conclusion that there is still much more to be done for cities, states, and regions to be adaptive to climate change (Bierbaum et al., 2013). These findings are consistent with the challenges that are experienced by Indigenous and Tribal Communities. A discussion on the specific vulnerabilities, impacts, and concerns of Indigenous and Tribal communities will be addressed later in this literature review.

Social and Cultural Dimensions of Planning

Some planning scholars have identified a shortcoming of social and cultural aspects being addressed by the conventional climate change planning practices and literature. Adger et. al. (2013) define culture as the symbols that express meaning for people, such as beliefs, rituals, art and stories that create collective outlooks and behaviors, and from which strategies to respond to problems are devised and implemented. Adger et. al. (2009) propose that "the systematic undervaluation of involuntary loss of places and cultures disguises real, experienced but subjective limits to adaptation." They acknowledge how interactions with landscapes and the physical environment are often part of the order and structure of societies, and therefore, changes in the physical environment will influence the stability of social structures. "Based on our review, we suggest that an adaptable society is characterized by awareness of

diverse values, appreciation and understanding of specific and variable vulnerabilities to impacts, and acceptance of some loss through change (Adger et. al., 2009). They go on to explain how the ability to adapt will be deeply affected by the treatment of vulnerable people and places.

In a later paper, *Cultural dimensions of Climate Change*, Adger et. al. (2013) explore how cultural dimensions of lives, livelihoods, identity, community cohesion and sense of place are threatened and affected by climate change, and how they affect how communities react to and adapt to climate change risks. They conclude that the challenge in addressing culturally important aspects of climate change lies in involving diverse communities at an appropriate scale to develop adaptation policies. They emphasize that climate adaptation planning must connect "with what matters to individuals and communities" (Adger et al., 2013, pg 116).

Lynn et. al. (2011) synthesized the literature of social vulnerability in climate change, looking at aspects of a population's location, environments, cultural, political and economic components, etc. They explained how some populations may be disproportionally affected by climate change, and concurrently may not have the capacity to prepare for and respond to climate change adequately. The main point being that existing inequities will be exacerbated by the effects of climate change. The IPCC defines vulnerability as "the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including variability and extremes… Vulnerability is a function of the character, magnitude and rate of climate change and variation to which the system is exposed" (IPCC, 2014).

The term “Climate Justice” is frequently used to address the social and ethical dimensions of climate change as a result of existing inequalities, prejudices, and environmental location. The Environmental Justice and Climate Change Initiative (EJCC) defines climate justice as “the fair treatment of all people and freedom from discrimination with the creation of policies and projects that address climate change and the systems that create climate change and perpetuate discrimination (EJCC 2009 as cited in Lynn et al., 2011).

Many of these ideas are reflected in the subsequent literature that is specific to Indigenous peoples and Tribes.

Indigenous Planning

Indigenous planning theory has emerged to define the practice of Indigenous peoples planning for their own communities with their own values and priorities in mind. Although perhaps not in the modern sense of the term “planning,” Indigenous societies have planned and managed their communities and environments since time immemorial. Matunga (2013) says that the central tenets of Indigenous planning are kinship and place-based, “It is a form of planning whose roots and traditions are grounded in specific Indigenous people’s experiences linked to specific places, lands, and resources… within, for, and by the particular Indigenous community for the place they call theirs.” (Jojola, 2013, pg 5). He describes Indigenous Planning as a process that must include: *The People, Their Place, Their Knowledge, Their Values and Worldviews, and Their Decisions* (Matunga 2013). He also describes five critical aims of indigenous planning which are “Improved environmental quality and quantity, political autonomy and advocacy, social cohesion and well-being, economic growth and

distribution, cultural protection and enhancement" (Matunga 2013). Indigenous planning is not static, but will be built upon and changed, throughout time and to best serve particular Indigenous communities (Matunga 2013).

Ted Jojola is also frequently cited for his theory of Indigenous planning. Jojola views climate change through what he calls the "Seven Generations Model" ((Jojola et al., 2013; pg. 22) The Seven Generations Model places you as the middle generation, with great-grandparents, grandparents, parents coming before you and children, grandchildren, and great-grandchildren coming after. He says,

> "Values, such as the right-of-inheritance and collective responsibility, serve to lay the foundation for the transfer of meanings and cultural practices. It is everybody's responsibility to make sure that those generations that preceded or follow him or her continue to maintain the community's worldview. This process is at the heart of sustainability" (Jojola et al., 2013; pg. 458).

The Seven Generations model calls upon a right of inheritance worldview, linking generations with each other, this is critical in the time of climate change.

Matunga identifies a "Resurgence Tradition" of planning, in which Indigenous Planners respond to local Indigenous people's protests pertaining to loss of land, resources, and environmental degradation. Similarly, Jeff Corntassel (2012) describes a "peoplehood model" as a way of viewing resurgence, "If one thinks of peoplehood as the interlocking features of language, homeland, ceremonial cycles, and sacred living histories, a disruption to any one of these practices threatens all aspects of everyday life." Also, in line with the "Resurgence Tradition," Lane and Hibbard (2005) note

Indigenous planning to be, or have a similar aim to transformative planning, which strives to break down and transform structures of oppression.

In 1995, a group of students under the Community Fellows Program in the Department of Urban Studies and Planning at MIT formed five basic principles of Indigenous Planning. They are:

1. People thrive in community.
2. Ordinary people have all the answers.
3. People have a basic right to determine their own future.
4. Oppression continues to be a force that devastates people; and
5. The people are beautiful, already.

That same year, the Indigenous Planning Network was created in 1995 (Jojola, 2000), instituting the emergence of the practice of Indigenous planning as a named and practiced action and profession.

Climate Change Impacts on Indigenous and Tribal Communities

A vast amount of literature identifies Indigenous and Tribal communities to expect disproportionate impacts of climate change, especially because of their connection to the physical environment through traditional and cultural practices and the threat that it places on their livelihood and wellbeing (IPCC, 2014; Nilsson, 2008; Norton-Smith, Lynn, Chief, Cozzetto, Donatuto, Redsteer, et al., 2016).

The *Fourth National Climate Assessment's* section on Tribes and Indigenous peoples identified three key messages regarding Tribes and Indigenous peoples and climate change. The first is "Indigenous Livelihoods and Economies at Risk", addressing the threat that climate change has on agriculture, hunting and gathering,

fishing, forestry, energy, recreation, tourism, infrastructure and their self-determined right to manage natural resources. The second is “Physical, Mental, and Indigenous Values-Based Health at Risk,” addressing how the health of Indigenous peoples is related to the interconnected social and ecological systems that may be disrupted by climate. There is particular attention paid to the threat of climate change to culturally, spiritually, and ceremonially important sites and traditional practices as they are important to Indigenous cultural heritages, identities and health. The third key message was “Adaptation Disaster Management, Displacement, and Community-Led Relocations” concerning the limitation to their adaptive capacity to climate change, such as barriers to programs, funding, etc. Federal, state, and local governments are called upon to alleviate these institutional barriers. Discussion on both Tribal efforts to adaptation planning and the government-to-government relationship between Tribes and the U.S. will be discussed in subsequent sections of this literature review.

As mentioned in the previous section, Indigenous and Tribal communities are socially vulnerable to climate change impacts, and multiple authors emphasize how climate change has the potential to magnify existing issues such as marginalization and lack of inclusion in policy-making processes at multiple levels (Nilsson, 2008). However, Norton et. al. (2016) points out that the illustration of the severe and disproportionate impacts of climate change on Indigenous peoples can perpetuate racial stereotypes and “needing the help of white outsiders" (Marino 2015:29 as cited in Norton-Smith et al., 2016)). Indigenous people have been leading efforts in climate change actions at multiple levels. Itchoack (2017) argues that in the face of threats of

climate change to Indigenous environments and sovereignty, now is a critical time to resist racism and oppression and embrace Indigenous Planning.

This reflects more positive points in the literature, where it is said that action on climate change by Indigenous peoples can empower Indigenous communities. When they take climate action, it provides opportunities to assert sovereignty, participate in decision-making, and gain recognition for traditional knowledge. For instance, Cleaves (2014) says "At the same time, it [climate change] is influencing global, national, and local markets for timber and non-timber products and may create business prospects for products from tribal forests and woodlands, including carbon sequestration, and renewable energy" (Cleaves et. Al; 59). Nilsson (2008) also addresses the expression of optimism by some Indigenous groups in adapting to climate change. She explains that in the demand for renewable energy, Indigenous lands could be an important source and that initiatives to combat climate change could open funding for Indigenous peoples to participate in the development of adaptation initiatives (Nilsson, 2008).

Tribal Climate Adaptation Planning

Indigenous and Tribal peoples have always been active in their relationship with their ecosystems and environments. They have experienced, survived, and adapted to environmental change before, so their participation and leadership in the adaptation to climate change comes as no surprise.

Resources for Tribes to conduct climate adaptation planning

In recent years there have been a substantial number of efforts by Tribes to assess their vulnerability to climate change and develop their own adaptation plans.

There are also a growing number of support resources for Tribes that are interested in planning for climate change in their own communities.

One such resource is the *Tribal Climate Change Adaptation Guidebook.* The guidebook was created in 2018 by the Oregon Climate Change Research Institute and Adaptation International to give guidance to Tribes in developing and implementing appropriate adaptation planning initiatives for Tribes. It has five key sections that are presented in a graphic that resembles a version of a traditional medicine wheel, representing the holistic approach to climate change adaptation for Tribal communities. The sections are: (1) Center the Tribes Adaptation Effort, (2) Identify Concerns + gather Information, (3) Assess Vulnerability, and (5) Implement + Monitor Action (Dalton et al., 2018). They followed "community-driven climate resilience planning" which they define as "the process by which residents of vulnerable and impacted communities define for themselves the complex climate challenges they face, and the climate solutions most relevant to their unique assets and threats" (Dalton et. Al., 2018, pg. . 36). They also define Indigenous resilience in the context of climate change as "…protecting, preserving, and enhancing tribal resources, cultural and traditional knowledge and practices, identity, and sovereignty in the face of climate and other changes" (Dalton et al., 2018, pg. 116).

The *Guidebook* utilized the *Guidelines for Considering Traditional Knowledges in Climate Change* that was created by the Climate and Traditional Knowledges Workgroup which was made up of fifteen Tribal members and leaders. and professionals of Environmental organizations. This lengthy document focuses on the protocols and considerations that must be made when working with Traditional

Knowledges and Knowledge holders. It intended to increase the understanding of TKs in climate initiatives, provide guidance to working with them, and support the interactions between tribal and non-tribal collaborators to be mutually beneficial (Climate and Traditional Knowledges Workgroup, 2014).

Another such resource is the Tribal Climate Adaptation Menu, produced by tribal, academic, intertribal and government entities with the primary objective to be of use to indigenous communities in creating climate adaptation plans with tribal and traditional values incorporated. It also welcomes use by non-tribal persons to bridge communication barriers for those interested in indigenous approaches to climate change adaptation (Tribal Adaptation Menu Team, 2018). It outlines many actions under 14 strategies, including such strategies as "Consider cultural practices and seek spiritual guidance", "Support tribal engagement in the environment", "Maintain and enhance community and structural diversity", "Design and modify infrastructure and access to match future conditions and needs" and others (Tribal Adaptation Menu Team, 2018). It was based mainly on Anishinaabe culture but provides considerations many Tribes can relate to.

In addition to these resources for Tribal communities, there have been some past academic papers on existing tribal climate assessments and climate adaptation plans.

Past Reviews

Gordon Miles (2018) conducted a quantitative review of the 36 tribal climate adaptation plans available at the time. His analysis led to conclusions surrounding the depth of plans, the capacity of Tribes and the usage of traditional knowledges, especially in reference to the contribution of external partners. For the most part,

traditional knowledge use is not necessarily inhibited by having an external party lead the plan, and they were comparable in content and analysis to those lead by Tribes. Furthermore, they found that external partner and sectoral contribution was crucial for the plans' depth, but that capacity barriers of tribes were not detrimental to their ability to create an adaptation plan.

Roben Itchoak (2017) also did a review, she looked at just six tribal climate adaptation plans, looking for if the plan-making process aligned with tribal worldviews, values and goals, and if their strategies were realistic. Like Miles, Itchoak found that external partners added to the depth and quality of the plans. Additionally, she stressed that it was imperative to know and present the tribal values of the community as they are understood by the community in the plan and utilize these values in the creation of the adaptation strategies. She ends the thesis with the claim that, "By integrating Indigenous planning methods and frameworks with western Planning Methods, planners can support tribe's development out of oppression, and into communities that better reflect their worldviews, values, and preferred lifestyles" (Itchoak, 2017, pg 107).

Throughout the resources and the literature, several themes arise about what is important to intentionally include in the creation and implementation of Climate adaptation plans for Tribal communities; these include but are not limited to; cultural revitalization as a means of climate adaptation action, the involvement of the community in the creation of the adaptation plan, and the strengthening of Tribal rights and sovereignty through the plan and adaptation activities. These three topics are the core themes that I found to be indicative of how the climate adaptation plans I chose answered by the overarching question of "What lessons can be learned from Tribal

climate adaptation planning in the context of their unique communities, culture, and history?"

These core themes will help me to answer the research question, I will go into depth about what each of these themes mean in the subsequent sections.

Cultural Revitalization and Traditional Knowledge

After the previous discussion of impacts on Tribal and Indigenous communities, it's clear that climate change poses a great threat to the cultural practices and lifeways of Tribal communities. For many Tribal communities, the revitalization of Tribal cultures is especially important to emphasize in climate adaptattion plans because of the history of cultural suppression through a variety of policies by European settlers. Furthermore, traditional and cultural land management practices are informed by the intimate knowledge of ecological processes that Tribes have, and thus they can contribute greatly to the movement of climate adaptation. For a more detailed description of the specific histories of the Karuk Tribe and the Confederated Tribes of The Umatilla Indian Reservation, see Appendix C.

For instance, for the Karuk Tribe, fire is a central part of their origin stories and knowledge systems and is an integral part of their ecosystem management (Sarna-Wojcicki et. al., 2019). White settlers did not understand the role of fires in the ecosystem, so they implemented policies of fire suppression at all costs, and the Karuk people continued to practice cultural burning at the risk of their own peril as settlers would go so far as to shoot and kill anyone who did so (Norgaard, 2014). More recently, however, practices such as cultural burns are being recognized by U.S. policymakers as useful and traditional knowledges are becoming desirable, but the trend

comes with its own ethical implications. These will be discussed, and the effects of colonization persist. In short, cultural revitalization in adaptation planning consists of re-instating cultural practices and tribal values in adaptation efforts, caring for and protecting culturally important resources, and the use of traditional knowledges to inform adaptation efforts.

The concepts of relationships and responsibilities are notable in the literature surrounding Indigenous planning and Tribal climate adaptation as a baseline value in eco-cultural management. The Dibaginjigaadeg Anishinaabe Ezhitwaad Tribal Climate Adaptation Menu states; "Relationships are the interwoven bonds that form the framework of place with in which we exist" (Tribal Adaptation Menu Team, 2018, pg. 8). It explains that through returning to elders for guidance in the revitalization of traditions, language and ceremony, the path to healing will begin. Additionally, it highlights that in contrast to western notions that "restrict the value of respect to human interactions," in many indigenous communities, respect goes beyond human-to-human relationships. It is imperative to create adaptation efforts through a framework of revitalizing human-to-non-human relationships. Its 3rd and 4th strategies, "Support tribal engagement in the environment," and "Sustain fundamental ecological and cultural functions" the menu outlines some ways to maintain and revitalize traditional relationships through actions such as using cultural fire stewardship (as specific to Anishinaabe culture in this case), creating educational, language revitalization, and youth programs and using cultural approaches to harvesting and caretaking (Tribal Adaptation Menu Team, 2018).

Bill Tripp (2014), Director of the Department of Natural Resources of the Karuk Tribe, states that the spiritual and cultural connections that exist in Indian Country are "relative to a dynamic bio-cultural relationship to, and responsibility for the lands, resources, processes, and functions based on balanced social, ecologic, and economic factors" (Tripp, 2014, pg. 14). To illustrate the lack of attention paid to the relationships and connections in the ecosystem in conventional environmental management, he then pulls from the example of the [highly controversial and spotlighted] decision to expand the critical habitat designation of the northern spotted owl. The focus on a single species ignores the connections and relationships to other ecosystem phenomena, for instance, the acorn crop that the owl feeds upon, and the patch dynamic needs of deer and elk to maintain a habitat that provides the owls with access to prey and protection of predators (Tripp, 2014).

Kyle Whyte (2013) uses the phrase, "collective continuance" to describe "a community's capacity to be adaptive in ways sufficient for the livelihoods of its members to flourish into the future" (Whyte, 2013, pg. 518) Collective continuance has to do with the relationships within communities and with other communities. Whyte explains that in relationships, one has responsibilities to those relationships, referring to the reciprocal attitudes and behavior expected by and of the parties in the relationship (K. P. Whyte, 2013). He says it is, "a concern with maintaining the capacity to be adaptive with respect to relational responsibilities, or all those relationships and their corresponding responsibilities that facilitate the flourishing of tribal livelihoods" (Whyte, 2013, pg. 519).

Jeff Corntassel (2012) also discusses the role of restoring relationships as a means of Indigenous resurgence. He criticizes the replacement of kinship relationships with market transactions in Western institutions that have developed as a result of colonization for making Indigenous homelands and waterways vulnerable to exploitation. He concludes that by honoring practicing and honoring sustainable relationships, Indigenous peoples refute the resource extraction-based economy and can revitalize local indigenous economies as responsibility-based communities (Corntassel, 2012). These relationships refer to relationships with people, and relationships to the environment and the species that live within them with us.

With a similar perspective, Lyons et. al. (2020) look at the protection of cultural sites and resources as a priority for Tribal communities in the face of climate change as a means of decolonization. Their approach to climate adaptation planning was based off of 'protecting what's left'. They discuss how the losses of cultural resources, place-based identity and self-determination, and orientation are entrenched in the ongoing lack of recognition and inclusion of traditional owners. Their case studies found that "protecting what is left" after colonization and mistreatment allows a reframing of climate planning to express the continuing presence of Indigenous people on their traditional lands and enables traditional owners to re-affirm connection to place and practices that their identities (Lyons et al., 2020).

Traditional Knowledge and Traditional Ecological Knowledge.

A large part of the discussion about Tribal and Indigenous cultural revitalization in the creation of environmental policy and climate change adaptation plans is focused on what is called Traditional Knowledge and Traditional Ecological Knowledge. The

Tribal Climate Adaptation guidebook describes Traditional Knowledge (TK) as, "complex and multifaceted Indigenous knowledge systems encompassing many aspects of traditional practices and cultural information" (Dalton et al., 2018). Traditional Ecological Knowledge is the same concept but are Traditional Knowledges that have to do with ecology, ecosystems, or the environment. Some examples of cultural practices that use Traditional Knowledges as listed by the Guidebook are storytelling, seasonality, phenology, identification of cultural items, traditions, and genealogy (Dalton et al., 2018). When speaking about TKs, it is important to note that all tribes and knowledge holders may define and manifest them differently. Other definitions of TEK include the role of generation-to-generation inheritance of TEK through oral histories, stories, ceremonies, and land management practices, it's cumulation over time, the importance of relationships of living beings in the environment, and the inseparability of it with Indigenous culture (Berkes, 2012; Dalton et al., 2018; Nilsson, 2008; Norton-Smith, Lynn, Chief, Cozzetto, Donatuto, Redsteer, et al., 2016).

Centering and using Traditional Ecological Knowledge is an important part of planning for Tribal communities for a myriad of reasons. Vinyeta and Lynn (2013) identify that Traditional Ecological Knowledges can be instrumental in assessing the impacts of climate change and to find strategies for adaptation. Norton-Smith et al (2016) say that TKs are fundamental to understanding climate change through an Indigenous perspective, and to resilience and adaptation to it. Berkes (2012) uses the term "conceptual pluralism" to explain how TKs expand the range of approaches that can be taken in problem solving in Tribal communities.

TKs are gaining attention at the policy level for their usefulness in research, education, and implementation of environmental planning, among other fields with non-indigenous researchers and planners. For example, Vinyeta and Lynn (Vinyeta & Lynn, 2013), identify the acknowledgment of TEK in the Intergovernmental Panel on Climate Change's fourth national assessment as an indicator of the momentum that TEK is having in climate research and planning. Other entities that are acknowledging, using, and funding TEK include the United Nations, the National Science Foundation, the Fourth National Climate Assessment, and nonprofits, regional collaboratives, and governments (Vinyeta & Lynn, 2013).

However, with this momentum towards valuing TKs in policy making, the protection of TKs by the original knowledge holders is crucial for Tribal communities. TKs are closely associated with Indigenous identities, and the disclosure of the information that they hold can put cultural preservation at risk. There is also the matter of using western science and Traditional Knowledge together. Lyons et al. (2020) point out that TKs are often thought of as lesser-than knowledges by western institutions. The difficulty in linking Indigenous stories about climate or weather patterns and climate adaptation for example, "high levels of awareness of climate impacts are not associated with effective planning action" (Lyons et al., 2020). Nevertheless, there are ongoing discussions on how to appropriately integrate western science and TKs, and on how to appropriately work with TKs in planning for climate change adaptation. One resource previously mentioned, *The Guidelines for Considering Traditional Knowledges in Climate Change Initiatives*, focuses on the principles of "Cause no Harm" and "Free, Prior, and Informed Consent" when working with TKs (Climate and Traditional

Knowledges Workgroup, 2014). The Tribal Climate Adaptation Menu also emphasizes the protocols to use when asking to include TEK in research or planning initiatives, through approaching Elders and Traditional Knowledge holders in respectful ways, and having thorough communication, review and allowing the knowledge holders to finalize any information to be disseminated in projects. This brings us to another common and important consideration to the planning of climate adaptation efforts that involve Tribal communities, community engagement.

Community Engagement

Community engagement has come up frequently as an important step in the creation and implementation of climate change adaptation in Tribal communities. In its simplest form, community engagement is defined by the Tribal Adaptation Guidebook as "the facilitation of purposeful reflection and discussion among tribal community members about topics of common concern and decision-making" (Dalton et al., 2018). This idea ties back to the key points of Indigenous Planning that have to do with social cohesion. Matunga (2013) describes a commitment to the group and improving the well-being of the community to be paramount. Community Engagement is a large part of both the Tribal Climate Adaptation Guidebook and the Tribal Climate Adaptation Menu. In fact, the first step included in the Guidebook is "Center the Tribe's Adaptation Effort," which includes multiple strategies to do so. For example, having a conversation with Elders and Traditional knowledge holders about the inclusion or nature of inclusion of traditional knowledges in climate adaptation plans and involving community members in creating a vision for the climate adaptation initiatives being developed. Again, part of the reason for the focus on community engagement in the

literature on planning for Tribal communities has come from the reality that Indigenous and Tribal peoples have been ignored and silenced largely in matters of environmental policy and development on traditional homelands since the arrival of European Settlers onto Indigenous homelands.

Tribal Rights and Sovereignty

That brings us to the unignorable and already apparent issue throughout the literature on planning climate adaptation in Tribal communities and this literature review; Tribal rights and sovereignty. Norton et. al. (2016) describe Tribal sovereignty as "the right of federally recognized tribes to govern themselves, define membership, protect cultural resources, control economic activity, and manage tribal land and resources" (Norton-Smith et al., 2016, pg. 5). Other definitions don't define sovereignty as having to be federally recognized, Lane and Hibbard (2005) describe it as the interlocking matters of "how to maintain or regain control over resources, especially land; maintain particular sets of social relations and more or less distinct cultural orders; and have some measure of political autonomy" (Lane & Hibbard, 2005, pg. 173).

Related to the concept of Sovereignty, is that of self-determination. One definition established by the United Nations Declaration on the Rights of Indigenous Peoples, describes it as the ability of Indigenous peoples to have free determinations of their political status, the right to pursue their economic, social and cultural development, autonomy in matters relating to their internal and local affairs, and the "right to maintain and strengthen their distinct political, legal, economic, social and cultural institutions" (United Nations General Assembly 2007, as cited in (K. P. Whyte,

2013). The U.S. federal government endorsed the UNDRIP in 2010 (Gruenig et al., 2015).

In the United States, 574 tribes are federally recognized, and thus have recognized sovereignty (U.S. Department of the Interior). Many of these tribes have treaties with the U.S. government. Treaties are legally binding agreements that are established between sovereign governments. The "treaty-making era" lasted from 1778 to 1871, during which the U.S. government negotiated, signed, and ratified nearly 400 treaties (*Tribal Climate Change Project*, n.d.). Whyte (2013) points out that when treaties were signed, the U.S. government understood them to put limitations on Indigenous peoples, while Indigenous peoples often understood them as "establishing different kinds of relationships that were more evolving and subject to renewal" (Whyte, 2013).

Treaties often gave Tribes the right to hunt, fish, and to harvest and gather traditional resources according to their ceded territories (Gruenig et al., 2015). Climate change threatens treaty rights by threatening the health of culturally important species, and their habitats may move out of Tribal boundaries or disappear altogether (Norton-Smith, Lynn, Chief, Cozzetto, Donatuto, Redsteer, et al., 2016). When the United States ratified treaties with tribes, it agreed to honor its commitments to protect these rights, entering into what is often called a "trust relationship" or "trust responsibility" with Tribes to uphold the treaties (Gruenig et al., 2015). There are too many examples in which this promise has not been upheld, but it becomes all the more important in the face of climate change.

Whyte (2013) argues that cultural self-determination is closely related to political self-determination. It is threatened by climate change with decreased accessibility to traditional foods (decreasing food sovereignty), climate related relocations, and the burden of having to build climate change into existing laws and policies such as treaties and land claims agreements that have already been structurally inflexible to Indigenous governance and authority to adjust to environmental conditions (K. P. Whyte, 2013). In this light, he says that settler states have a responsibility to support the strengthening of Indigenous sovereignty and climate adaptation efforts (K. P. Whyte, 2013). He proposes a "justice framework" with which policy makers, scientists, and professionals must situate justice within the systems of responsibilities that matter to tribes, from interspecies relations to government-to-government partnerships (K. P. Whyte, 2013). They must work to challenge the political obstructions that may limit tribal adaptation, just as Jojola and Matunga (2013) establish in their key ideas of Indigenous Planning. Whyte's ideas are also echoed by Corntassel, who argues that we should move from talking about rights, to talking about responsibilities to better address meaningful restoration of Indigenous homelands and the protection of sacred relationships to sustain community's cultural continuity (Corntassel, 2012).

Many climate adaptation efforts by Tribes consider the strengthening of their Tribal sovereignty, and some have explicitly embedded it in their plans and explicitly explain how their plans intend to address the issue. Co-management is often described in environmental management with multiple actors, in which there is a sharing of power between them, often the government and local users, or with other sovereigns in this

care. They work together to protect, converse, enhance and restore species and resources (Berkes, 2012). This idea comes up in many resources for tribes, Tribal Climate Adaptation Menu item 3.6, for example suggests to "Participate in local and landscape-level management decisions with partner agencies" (Tribal Adaptation Menu Team, 2018).

Conclusion

Much of the literature on Indigenous peoples and Tribes in planning in general and in climate planning seeks to reject the idea that Indigenous peoples are passive bystanders but are instead active participants in the management and planning of their environments and in planning for climate change adaptation. Climate change has specific impacts on Indigenous communities that must be addressed with Indigenous management and culture considered. The movement towards climate action has the potential to provide opportunities for indigenous communities to participate in policy making and planning and strengthen their sovereignty. A running theme in the literature and resources for Tribes in creating their own climate adaptation plans is that each Tribal community is unique, with their own histories, epistemologies, values and priorities, and thus no one prescribed formula to developing a plan will work. Indigenous planning theory reflects on this, with the stipulation that planning in indigenous communities should be done ideally by indigenous planners, with the worldviews and values of their communities in mind.

The three overall topics of; cultural revitalization, tribal rights and sovereignty, and community engagement as described will be the basis of the research and climate adaptation analysis. Cultural Revitalization is the return to and strengthening of

practicing traditional cultural practices, ceremonies, traditional land management activities, etc. Historically, many cultural practices were hindered through oppressive policies. Climate change further threatens culturally significant resources and the ability of Tribal communities to practice their traditional cultural practices. On the other hand, through planning for climate change, Tribes can reinvigorate cultural practices, care for and protect culturally important resources, and use traditional ecological knowledge to revitalize traditional relationships and cultural practices. In the U.S, Tribal Sovereignty is known as the right of Tribes to govern themselves, define themselves, protect their cultural resources (including natural resources and traditional knowledge), manage their land, control their own economic activity, and more. Some federally recognized Tribes also have treaty rights that the Federal government must uphold, they are often related to reservation locations the protection of rights to practice traditional activities. Social cohesion, consensus-based decision making, and community involvement is vital to Indigenous planning according to Hirini Matunga (2013). It is important in many Tribal communities to listen to Elders and involve them in the process, especially when it comes to learning about revitalizing cultural practices. Community engagement is especially important to tribes in the context of colonial history, where consultation of Tribes by the U.S. government has been much too little (Itchoak, 2017; Jojola, 2000).

My thesis will examine two Tribes to understand how they have developed climate adaptation plans with their specific Tribes in mind against the backdrop of the existing resources and growing discussion of tribal climate change adaptation.

Research Questions

The overarching question that has inspired this research is: **What lessons can be learned from Tribal climate adaptation planning in the context of their unique communities, culture, and history?**

To further explore the aspects of what makes these plans unique, I also developed several sub-questions based on my preliminary research. They are:

1. **How do these plans represent Tribal culture and community priorities?**

- How does their climate planning address Indigenous rights and sovereignty? How does this plan initiate cultural revitalization? Why is integrating Tribal culture and traditional knowledge in climate planning important?

2. **What process or strategy did the Tribes use to identify cultural values and priorities for the plan?**

- What concerns does this plan address? How was the process in line with existing Tribal Climate Change Resources? What did the Tribes learn from their process? How did the Tribes provide protections for Traditional Knowledge?

Methods

This research was conducted through a variety of methods to best examine the research question; How are these Tribal climate adaptation plans unique to the Tribal communities they are serving? This included research and synthesis of historical sources, the utilization of digital text analysis, a close read of the two climate adaptation documents, the utilization of interviews with tribal staff members, and a close look at both plans in relation to each other. This section will explain how each of these methods was utilized. It will also briefly touch on the indigenous research methods I learned about during the beginning of my research. Finally, I will discuss some limitations of this research.

Review of the history of Tribal sovereignty and policy

To understand how the plans are unique to their own tribal communities, it is critical to understand their unique histories. I looked specifically for examples of how the Tribes have had their sovereignty and cultural practices threatened throughout history, and how they have pushed against barriers and asserted tribal sovereignty throughout history until now in the face of climate change. Due to the breadth of what this could entail, this research can be seen briefly in the Tribal Profiles section of this thesis and a more in-depth discussion can be found in Appendix C.

Document Review/Analysis

Document analysis was an integral part of my research methodology because it tackled both of my sub-questions, particularly #1. How do these plans represent Tribal culture and community priorities, and the second question to the extent that the

documents speak on it, 2. What process or strategy did the Tribes use to identify cultural values and priorities for the plan? These plans are a useful source of information to better understand how tribal communities are preparing and planning for climate change with their unique communities in mind

As noted in the literature review, three main themes emerged as indicative of points where the climate adaptation plans may show uniqueness in relation to planning for their own communities. These are;

- Cultural Revitalization/Aspects through CC adaptation initiatives: Traditional Ecological Knowledge, Traditional Management Practices.
- The strengthening of Tribal Rights and Sovereignty through CC adaptation; Interjurisdictional coordination.
- Process - Community Engagement

These themes guided my review and analysis of the climate adaptation plan documents. I also reviewed other relevant Tribal planning documents that have fed into the adaptation plan documents. I conducted this analysis using both digital content analysis and non-digital content analysis techniques.

First, I did a close read of the two-climate adaptation plans themselves, manually highlighting sections and actions that pertain to the three themes. The context that was noted in the literature review to define each of the main themes was used to identify actions that represented them. For example, the indigenous planning theory of Matunga and Jojola was utilized to find many relevant action examples. Once relevant actions were highlighted, I inferred some common themes between them and that can be seen in the tables in the Content Analysis Chapter of this thesis. I also discuss how the plans are

reflective of the different resources that are available to tribes in conducting climate change adaptation.

Then, using a digital test analysis software, Voyant tools, I conducted a digital analysis on a corpus of planning documents from each Tribe. The analysis was based on a list of key words that can be seen in Appendix A. To prepare the documents for use with Voyant Tools, I used Abby FineReader to convert them into txt files and prepare them for analysis.

Voyant tools provides a visual representation of key word frequencies. This was useful in seeing what key themes emerge from the corpus' of planning documents, and to see what key themes change over time. This is helpful to understand how all the Tribe's documents have addressed the three key themes, and how they have culminated into the climate adaptation plan documents. It showed what kind of content is within the planning document and it may reveal some differences or similarities in topics of the Two tribes throughout their planning documents. The main tool of the text analysis software showed term frequencies throughout the chosen documents, showing bar graphs for each of the key words that I searched for. I was able to see these differences in frequency between documents in the same corpus and then make inferences about how they relate to the Climate Adaptation Plan itself to better understand the context of the plans and answer my research questions. The text analysis software was also able to show what words correlate the most with my chosen key words, which in some cases revealed more about how those words were used in the documents.

These are the documents that were used in the text analysis software:

CTUIR documents:

1. Agricultural Management Plan (2016) AMP
2. CAP “Final Draft” (2021) CAP
3. Climate Vulnerability Assessment (2015) CVA
4. Comprehensive Plan (2018) CP
5. Hazard Mitigation Plan
6. Hazard Mitigation Plan (2016) HMP
7. Umatilla Forest Management Plan (2021) UFMP
8. Umatilla River Vision (2011) URV
9. Umatilla Upland Vision (2019) UUV

Karuk Documents

1. Climate Transportation Adaptation Plan (2022) CTAP
2. Climate Vulnerability Assessment (2016) CVA
3. DNR Strategic Plan for Organizational Development (2015) DNR SP
4. Eco-Cultural Resources Management Plan (2010) ECRMP
5. Hazard Mitigation Plan (2015) HMP
6. Climate Adaptation Plan (2019) CAP
7. Klamath Basin Food System Assessment (2016) KBFSA
8. Western Klamath Restoration Partnership (2014) WKRP

Interviews

The third part of my methods was based on interviews to develop a broader picture of the approach that the Tribes took to input the values and priorities for their specific Tribal communities. This was needed to better answer the second question; what process did the Tribes use to identify cultural values and priorities for the plan?

Some key questions that were asked are; What methods did they use for participation. What strategies did they use to incorporate traditional knowledge? How did participants view the plans as advocating for Tribal rights and sovereignty? What protections do they have in place for TKs in the plans? Do they feel they met their goals with the plan? What were the challenges? What did they learn? What key priorities may I have missed? See Appendix B for a complete list of the questions as provided to the IRB.

I was able to interview 4 staff members from the Confederated Tribes of the Umatilla Reservation, and 2 staff members from the Karuk Tribe. The interviews were recorded on my smartphone through an app that automatically transcribed them. I also took handwritten notes. To review and analyze the interviews, I wrote down key messages from each and found common themes. With the key words list I had created in mind, I then highlighted the most important quotes, color-coding them to refer to my three main themes. Then, I used quotes as needed throughout the Climate Adaptation Plan Content Analysis chapter of this thesis.

Comparison Analysis

Since I am reviewing the two climate adaptation plans, a discussion on the differences and similarities between them will be useful to answer the question of how they are each unique to their own communities. The idea with this comparison is to explore their reasoning as it is specific to their conditions, such as their economic capacity, their access to resources, their cultural values, their traditional knowledge protections, etc. I will discuss on how other Tribes can learn from the experience of these Tribes in developing their climate adaptation plans.

Indigenous Methodologies

To prepare for doing this kind of research that concerns indigenous peoples, I took a class on Indigenous Research Methodologies, to try and do it in the best way that I could. The materials from the class included authors such as Linda Tuhiwai Smith (2012), and Margaret Kovach (2009). I was not able to take every piece of advice I learned, such as not coming to the research with pre-determined questions or being flexible on time due to my academic constraints. However, the most important method I took was to approach the research with open curiosity and to collaborate and listen to my contacts at the Tribes I wanted to use in my study. I made it clear that I was willing to change my research direction if there was an issue with it, or in order to create something that was more helpful for the Tribes. Secondly, it was important for me to do interviews with the tribal staff members so that I could hear from their perspectives and open the floor for them to teach me what they thought was important. I made sure to build relationships with participants, and I made sure that they got the opportunity to review what their contributions were in the Thesis document.

Limitations

There are many limitations to this research, especially because of the high level of judgement by the researcher that was needed to determine what was important to include and for analytical purposes. For instance, what was important about the Tribal Histories to include in the Historical Policy review portion. A notable limitation is therefore my own limitation of knowledge for the specific Tribes I have studied. Furthermore, the three main topics and what was included in them for the non-digital

content analysis were subjectively picked out as indicators about how the plans could have shown uniqueness in planning for their communities.

Considering the "digital-analysis" portion of this research, there were some limitations based on the tools that I was able to use and the documents that I chose to include. The two tribes did not have the exact same kind of planning documents, and when they did, they were not formatted or developed in the same ways. There may have been important planning documents that were missed in the analysis if they were not readily available online. The original tool that was going to be used to efficiently compare between the main topics was not working, so instead the number of key words used had to be minimized and multiple graphs had to be used.

As far as limitations to my interviews goes, because of the small number of participants interviewed for this thesis, and limitations of their own personal experiences, interview data is not indicative of all planning perspectives.

Tribal Profiles

Plan A: Confederated Tribes of The Umatilla Indian Reservation

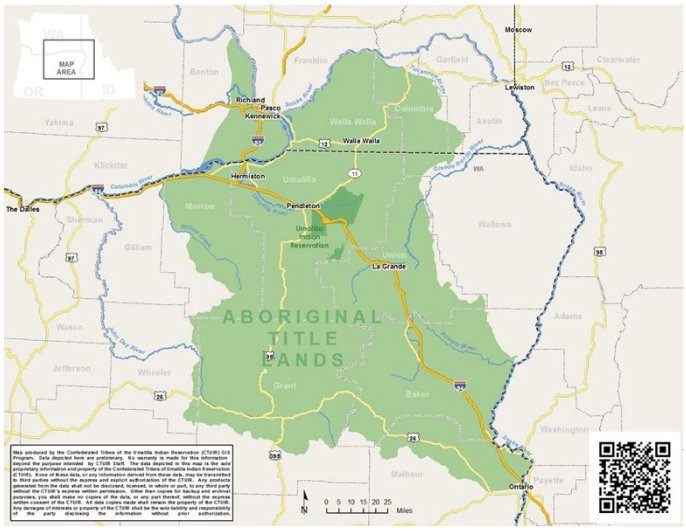


Figure 1 Confederated Tribes of the Umatilla Reservation

OVERVIEW

The Confederated Tribes of the Umatilla Indian Reservation include the Cayuse, Walla Walla, and Umatilla Tribes (CTUIR). Their "traditional use area" spanned as far as lands in today's Washington, Idaho, Montana, Oregon, and California states. Lands ceded in the Treaty of 1855 comprise of about 6.4 million acres in Washington and Oregon, where Tribal members have rights to hunt, fish, and gather foods and medicines in all usual and accustomed places. Today's Reservation is 172,882 acres, of which 52% is in Indian land ownership and 48% non-Indian land ownership. Tribal membership sits at about 3,060. Their economy is generated mainly by the Wildhorse Resort and Casino, the technological support company, Cayuse Technologies, Mission Mar, Arrowhead Truckstop, and other shops. Tourism is also a contributor to the Tribal economy (*CTUIR - About*, n.d.; Sanders, 2021).

GOVERNANCE

The CTUIR is a federally recognized sovereign nation, it practices it's right to self-governance and self-determination. The Tribal Government is composed of three distinct branches; the 9 member Board of Trustees operates routine services, the Tribal

Court oversees legal decision making, and they are both held accountable by the General Council.

PLANNING PURPOSE AND PROCESS

The "CTUIR Climate Adaptation Plan" is currently being created to prepare current and future generations to take action and reduce harm from the climate crisis. It's three goals are; 1. Center Indigenous knowledge and environmental justice in climate crisis planning, 2. Identify, develop and support interdisciplinary strategies to mitigate impacts from short term variability and long term climatic shifts, and 3. Celebrate existing CTUIR adaptation strategies.

In 2015, the CTUIR completed the CTUIR Climate Change Vulnerability Assessment. Then, in 2018 climate outreach began for the beginning of the adaptation plan through multiple community events. Committees and commissions of the CTUIR reviewed drafts of the CAP throughout the process. In 2020, a CAP webinar series was conducted over several months to replace the in-person meetings that were planned to inform and engage the CTUIR community. In 2021 another webinar series of listening sessions was hosted to review each chapter of the cap and provide opportunity for comments of CTUIR staff and community.

BRIEF HISTORICAL EVENTS TIMELINE

Pre-Colonization, the Tribes of the Walla Walla, Umatilla, and Cayuse were travelling peoples, sharing hunting sites, trails, and village encampments along important places on the Columbia river basin and its tributaries (Jennifer, 2006)

1855: The Walla Walla Treaty of 1855 is signed, later ratified in 1859 (Jennifer, 2006).

1871: The Reservation lands were surveyed at only 230,000 acres (Jennifer, 2006). Reservation life was detrimental to the way of life that the Cayuse, Umatilla and Walla Walla were used to.

1891: The BIA abolished traditional tribal chieftaincies and used other assimilation tactics, because they were considered public authorities in conflict with the federal authorities (Pond & Hester, 2006 as cited in Jennifer, 2006).

1908: Winters v U.S. held that tribes had a federally reserved water right to satisfy the principle purposes for which the reservation was created (Quaempts et al., 2018).

1934: The CTUIR voted to reject the Indian Reorganization Act because of the implications it had on giving up their old ways of leadership and the continuing oversight that the BIA would have over tribal government decisions (Pond & Hester, 2006).

1949: The Confederated Tribes' voted to approve a constitution and by-laws for the Tribe's.

1950s: Multiple lawsuits affirmed Tribal members rights to practice treaty rights such as hunting and fishing on and off reservation lands, and to get compensation for taken lands.

1976: Judge Belloni ordered the four Tribes to create a Columbia River Fish Management Plan, this led to the development of the Columbia River Inter-Tribal Fisheries Enforcement (CRITFIC).

1982: The CTUIR BOT formed the Department of natural Resources.

Today: Modern tribal members in leadership feel a responsibility to uphold the promises of the Treaty of 1855 and ensure that the vision that their ancestors had for the future of their children is materialized. Since the 80s and 90s the CTUIR has developed many departments and programs to manage their lands and their tribal members with a breadth of services.

Plan B: The Karuk Tribe

Figure 2 Karuk Tribe Aboriginal Territory

OVERVIEW

The Karuk Tribe's ancestral territory covers about 1.38 million acres near the border of the modern states of California and Oregon. A small amount of tribal trust lands are scattered throughout the aboriginal territory, making up only over one square mile. The Tribe does not have a reservation, as their treaties were not ratified by Congress. Today, the Tribe has 914 acres of Trust land and 882 acres of Fee land in the communities of Orleans, Happy Camp, and Yreka which are of considerable distance apart from each other. The tribe has approximately 4,000 enrolled Tribal members. A majority of lands in the traditional lands is under the jurisdiction of the U.S. Forest Service.

GOVERNANCE

The Karuk Tribe has been federally recognized and practices self-governance. It has three council districts of Orleans, Happy Camp, and Yreka. It has a Tribal Council of nine members. It also has several committees and commissions.

PLANNING PURPOSE AND PROCESS

The "Karuk Climate Adaptation Plan" has been developed following the Karuk Climate vulnerability Assessment that was completed in 2016. The purpose was not stated.

Although, the plan centralizes a focus on fire and pays attention to restoring human responsibilities and traditional ecological knowledge, and it emphasizes collaboration, public education and policy advocacy.

The processes was not stated, but

BRIEF HISTORICAL TIMELINE

1851-1852: The California state government used sponsored genocide policies through militias to exterminate Native peoples, Karuk tribal members fled to the mountains (Norgaard, 2019).
1850-1852: The California government negotiated treaties with the Karuk Tribe and others, but never ratified them (Norgaard, 2019).
1911: The Weeks Act provided financial aid to protect timberlands from fire, and in 1935 the "10 am policy" stipulated that fires needed to be controlled by 10 am the following morning of a fire (Diver et al., 2010).
1953: The Termination Act terminated the relationship with and federal recognition of the Karuk Tribe.
1970s: Fish Wars. Court rulings had determined that states are not authorized to regulate Indian fishing rights, and the BIA briefly opened the lower Klamath to Indian gillnet fishing in 1977. Protest and conflict ensued between Indian and non-Indian fishers. So with public pressure against Indian fishing, in 1978 a moratorium on Indian commercial fishing was placed (Diver et al., 2010).
1972: World Renewal Ceremonies are revived at Clear Creek " (Diver, 2016a).
1978: The Karuk Tribe began efforts to gain federal recognition, BIA staff determines that the tribes 'sub-entities' reside in three communities in Happy Camp, Orleans, and Siskiyou.
1986: The Karuk Tribes gained federal recognition (reinstated after termination) with rights and standing before the U.S. (Diver et al., 2010).
1989: The Tribe developed their Department of Natural Resources.
2001: The Mid-Klamath Restoration Council is created as a chapter of the California Fire Safe Council.
2009: An Eco-Cultural Resource Management plan was developed.
2022: PacifiCorp agreed to dam removal and, the Klamath dams are projected to be removed in the year 2023 or 2024 (Flaccus, 2022; Knight, 2021).

Climate Adaptation Plan Analysis

To begin, it is important to note that a finding within itself of this analysis is that the three main topics that the analysis is based off are inherently interconnected. Cultural revitalization is a part of the exercise of tribal rights, and through the revitalization of their cultural activities, practices, and ceremonies, they are also asserting sovereignty. Similarly, community engagement is connected to both cultural revitalization and tribal sovereignty because the tribal members of the community will be those who are doing cultural practices and who are the constituents of these plans.

CTUIR Climate Adaptation Plan (CAP)

Cultural Aspects (Revitalization)

As an introduction, the plan begins with "Setting the First Foods Table for Climate Resilience." This introduction starts with the reminder that Indigenous peoples have survived catastrophic events before, with reference to the torrential Missoula floods 15,000 years ago and the Mount Mazama volcano eruption over 7,000 years ago. The Indigenous people of the Colombia Plateau were witnesses to these events and were resilient to them. This reminder sets the scene for prioritizing cultural revitalization of Tribal land management in climate adaptation for the CTUIR because Tribes have had the experience of living through massive change and challenges to the environment since time immemorial. This was also mentioned in the interviews that were conducted, "People think that there was no kind of impact or interaction between humans in the landscape and there was, I think we were actively managing it I think we continue to do that. And that'll…help us with…whatever comes with climate change."

From the beginning, the CTUIR CAP references the inclusion of culture and cultural revitalization in its use of the First Foods approach. The First Foods concept stems from the CTUIR creation story where the Creator prepared the world for Man and Woman, and the First Foods stood one by one to promise their bodies so that the people would live. “In return, the promised to honor the First Foods, remember and celebrate them, and be their voice and caretakers.” (Sanders, 2021, pg. 15). This view of the First Foods approach as a materialization of the original promise throughout the CAP is important because it puts the historical and current barriers to Tribal people’s ability to practice traditional land management and cultural activities in a new perspective. As shown in figure 3, the term “First Foods” has occurrences in all the chosen CTUIR planning documents, showing how prevalent it is throughout the work of the CTUIR.

The plan reiterates that climate changes are compounded with pre-existing barriers for Tribal members to practice their cultural activities. For example, their window for harvest and hunting is becoming increasingly shorter because of changing species behaviors in response to changing temperatures and precipitation patterns, and wildfire smoke from high-severity fires. Wildfire smoke can cause worsening health issues for tribal members who persist to harvest during smoke events. Furthermore, due to historical disadvantages by U.S. Governmental treatment, chronic respiratory conditions exist at higher rates in Tribal communities. If these conditions persist and adaptations are not taken, the ability of Tribal members to keep their first foods promise

is under threat.

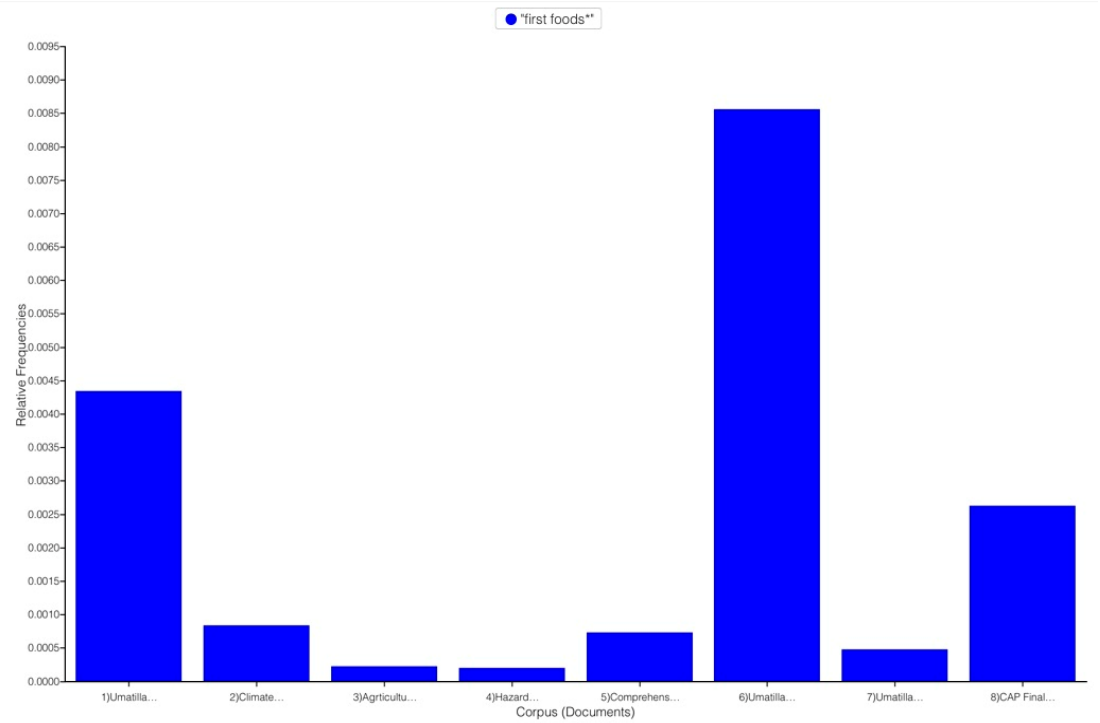


Figure 3: First Foods Key Words Graph

The ability to be on the land and practice traditional activities is also connected with the mental health of Tribal members. The simple ability to be on the land is a part of Tribal identity, as seen in this quote that appeared in the plan,

> "Without the rivers and the salmon and the land, we are not Cayuse or Umatilla or Walla Walla people. Without the rivers and the salmon, we become different people. Salmon, the rivers, the land, and all things related are so central to our culture that we honor and pay respect to these things each year in age-old ceremonies (Tovey et al, 2006)."

Furthermore, the plan also makes the connection between physical health and the ability to go out and gather foods. In interviews, Cheryl Shippentower explained this, ""it's impacted our health not even with climate change, but [just] not having access to those, we have a high rate of diabetes and obesity. And I think, to maintain it… just the physical part of that will make us healthy" (Shippentower, 2022).

Although there is not a single chapter dedicated to cultural revitalization, the CTUIR CAP references the return of cultural activities to the land and the use of Traditional ecological knowledge throughout the plan.

Specific Adaptation Actions Examples:

Table 1: CTUIR Cultural Aspects Action Examples

	Adaptation Action	Significance for Cultural Aspects
First Foods Related Actions	"Anticipate Habitat Shift and Migration" (Chapter 3b)	With monitoring and observance of the habitat shifts of First Foods, cultural practitioners will better be able to adapt to these changes.
	"Develop Food Systems knowledge Training program/certification" … "I. Develop expanded First Food identification and processing curriculum" (Chapter 3 f)	Trainings will help more tribal members to practice cultural practices and activities.
	"Develop Indigenous Food Systems Resilience Indicators for Tribal Policy" (Chapter 3f) "Organize another "rez Kitchen tour" or other First Foods Culinary event" **(**Chapter 3f) ""First Foods Resilience Storytelling Grants and Competitions" (Chapter 3d)	The plan seeks to support cultural revitalization of First Foods while connecting the community and supporting economic development through opportunities for tourism.
	"Create Opportunities to Gather, Learn, and Share Stories together"… iii. Support opportunities for healing connections with First Foods land, Community, and Culture" (Chapter 3d)	Opportunities included First Food excursions, camps, and K12 engagement.
	"Advocate for cultural and prescribed burn strategies in state, national, and international land management policy" (Chapter 3b)… Coordinate with other forest management agencies…to prioritize pre- scribed burning activities over fire suppression" (Chapter 3b)	Cultural burning is huge for cultural revitalization, as well as for high-severity wildfire risk.
Tribal	"Support opportunities for Healing Connections with First Foods, Land, Community, and Culture"…	Tribal language revitalization is cultural revitalization.

	"Support and expand cultural revival activities that center tribal language learning" (Chapter 3d)	
	"Expand prioritization of Indigenous knowledge for water management with municipalities and counties" (Chapter 3a)	Explicitly prioritizing indigenous knowledge when working with other municipalities is prioritizing cultural knowledge in planning and therefore it is cultural revitalization.
Other Actions	"Continue to Monitor and Engage with Hanford Nuclear Reservation…iv Engage with Cultural Site protection" (Chapter 3e) … "Advocate for cultural leave implementation at schools and other institutions that employ or educate tribal members around the region"	Here the plan explains the opportunities to create new "coyote stories," revitalizing the use of story as a cultural way of understanding situations.

Some adaptations that are related to First Foods are clearly intended to directly support the preservation and survival of First Foods in the face of climate change, through measuring possible changes in habitat and migration, facilitating migration, developing indicators, etc. The actions of revitalizing traditional fire regimes and cultural burning are also more directly in support of First Foods and cultural resources. In interviews, Caleb Minthorn brought the point that the plan addresses cultural revitalization through its focus on prescribed fire, "if we don't apply prescribed fire onto the lands that are over fueled, that existing wildfires that we've been witnessing over the past five or six years will overtake these lands as it is" (Minthorn, 2022). These actions will support cultural practitioners to be able to continue cultural practices with First Foods. However, other adaptation actions are more related to bringing knowledge back to more tribal members, and to connecting the tribal community to share stories and

knowledge around First Foods. In interviews, Wenix Red Elk connected the ability to go out and do cultural practices to the ability to monitor and learn more about those species for planning purposes,

> "So there's not a lot of research a lot of study on what those foods are doing. So going out with the culture [practices] we're also able to really be able to watch the food resource and to be able to start understanding that better, how we can protect it better and how we can help it better, and then also teach our kids" (Red Elk, 2022)

This shows that part of cultural revitalization is revitalizing tribal connectedness and restoring knowledge that has been challenged by colonial history and barriers to the ability to practice cultural activities.

This need is further shown by the mention of traditional and indigenous knowledges in several adaptation actions. In Interviews, Cheryl Shippentower reiterated a large part of the plan which was that it combines TEK and scientific knowledge to find the best avenues for climate adaptation, "…That's a part of our first mission is to combine those two [TEK and Science]…I think if we continue to do that, that'll help us maintain those [cultural practices and first foods] so that future generations can still gather these resources" (Shippentower, 2022). In the digital text analysis, the chosen key words referring to Traditional Knowledges occurred 35 times. This will be elaborated on in the community engagement section (see appendix D for more graphs).

Even in sections of the CAP that are more technical such as the chapter on Built Systems, TEK and the importance of cultural activities is present and centered. In the beginning of that chapter, there is a quote that talks about how Elders share their memories and stories that they have on the landscape as they are driven past, "Embedded in these many stories are place names, meanings, and traditional uses, as

well as Coyote stories, which get passed on. While technology used to move across the land may have changed, Tribal people's ties to the landscape have not (Karson Engum and Conner, 2015)."

Even the chapter entitled "Chapter 3f Economy and Community" references historical conditions of trade and commerce routes that existed before European contact, and as such the climate adaptations related to economics and community reflect the intent of the plan to continue cultural practices and relationships that existed then. In this light, the actions that relate to the economy are also part of cultural revitalization. The fact that these chapters that may seem more disconnected with culture do relate with culture shows how important it is for the CTUIR community In interviews, Kate Ely brought up how the CTUIR worldview of *tamanwit* also provides a reason to have these things interconnected, "Everything is connected, you cannot talk about any one thing without having everything else included—air, water, religion, house, economy, clothing, art, music, dance, food, etc.,... Every little creature matters in the chain of life and the food web." (Ely, 2022). This quote is talking about "ecosystem services" or different aspects in the environment but she and multiple other interview participants also reflected on how it relates to the connections between the different programs of the CTUIR's Department of Natural Resources.

Another large issue in relation to cultural revitalization is the revitalization of Tribal language which is mentioned in multiple actions and strategies throughout the plan. At first, language might not seem like it would be an important part of climate adaptation, but it is a significant component of cultural revitalization. Re-learning the tribal language goes hand in hand with re-learning and prioritizing traditional and

cultural activities that have to do with First Foods and land management. Interview participants had several responses to why the language is important to include in the climate adaptation plan;

> "they're [oral practices] important because the traditional knowledge might be layered within those stories on how we fought climate change two or 300 years ago, this isn't the first time it's happening. So that's, that's why the languages are important. Our people they'd seen this happen, they'd seen droughts, they'd seen wildfires" (Caleb Minthorn, 2022).
>
> "language is our culture and understand that language gives you a better understanding. There's some things that you can't translate from language into English. And so there's all these like, names of plants, you know, it's just our places, it's all connected…"…"There's all these teaching that goes along with those. With those foods, you know, there's songs when you're at their gathering and there's songs when you bring that food back to the longhouse that were just sung by the women" (Shippentower, 2022).
>
> "So you know, the significance of the language at least for in that example is very much it tells them our wisdom that you got out of the way of the floods. You didn't try changing the river or the flow of water. You got out of its way. You welcome to people you are prepared to welcome them and house them to accommodate the river because that's where we get our fish and our salmon. That's where all of the critters like beavers live. So I mean that's, I guess is an example of the significance of the language and language revitalization." (Huesties-Wolf, 2022).
>
> One interesting action in the table above is about the Hanford Nuclear

Reservation site. A huge concern with that site is that, as it is a usual and accustomed area, Tribal members would have the right to fish hunt, and gather there, but it is simply unsafe to do so due to the contamination. In the recently in progress injury assessment done by the NRDA team, Althea Huesties-Wolf in interviews explained, "Yes, they've been cleaned up. But are the cleanup levels suitable for see charter members to ever go back and gather fish have ceremony? Hunts?" (Huesties-Wolf, 2022). Another critical element that is brought up with the issue of the Hanford site is the idea of creating a

new “coyote story,” Althea explained that the coyote stories that have come before are tied to place and have stood the test of time, “So the coyote story would serve as a warning to not enter that area. That would last across the span of time through the story that is this legend” (Huesties-Wolf, 2022).

The CTUIR communities’ specific needs and values are catered to by the emphasis of cultural aspects throughout the plan. Cultural practices are supported and advocated for in several ways. One way are the actions that directly support the survival of First Foods in the face of climate change. Then, there are the actions that support tribal members sharing knowledge and that focus on using TEK. The simple act of going back onto the land opens more opportunities to revitalize culture, as Caleb Minthorn said in his interview, “And by us returning to the land, [and uncovering lands overburdened by fuel] we unlock lost languages, we unlock lost stories. We find artifacts from people that were here before us” (Minthorn, 2022).

The use of the word “revitalization” was questioned in some Interviews because cultural activities have continued throughout history by the Tribal people at the CTUIR, “They practice their culture all the time so I haven’t seen any change or increase in cultural activities But sharing or opportunities to see culture in action [For non-tribal members] have increased” (Ely, 2022). The climate adaptation plan recognizes this with its chapter on CTUIR resilience, and multiple actions are based on supporting existing ways that tribal members practice their culture. The difference of the use of the word “revitalization” that was found through the text analysis between the CTUIR corpus and the Karuk corpus will be discussed.

One point that came up during interviews was the importance of having tribal members working in the Tribal government, “it's simple in that if you don't have tribal members doing the work, at some point, the cultural significance starts to drop off and wane off or will start to disappear” (Caleb Minthorn, 2022). This is connected to the small action step that is mentioned once in the plan about proposing cultural leave for schools and other institutions that employ tribal members. Huesties-Wolf backed up the necessity for this, saying, “And so one of the things that's going to come out is proposal to look at not only the happiness because climate change has a huge impact on people's happiness… There's a lot of employees who would like to do more to be less of a burden on the environment, but they're working constantly” (Huesties-Wolf, 2022)

Tribal Rights and Sovereignty

The CTUIR CAP has a whole chapter dedicated to Tribal Treaty Rights and Tribal Sovereignty, Chapter 3f. The chapter says, “Protection of the rights of Indigenous People have more power to conserve and steward their homelands to preserve biodiversity, perpetuate resilient land management practices, and practice reciprocity to First Foods and lands that have brought prosperity since time immemorial.” The climate impact concerns that the chapter lays out are; “1. Potential increase in conflict over water and land resource management, 2. Potential in collective continuance for Tribes and First Foods, and Opportunities for Tribes to be State Federal, and Intentional leaders on Climate Adaptation” .

Although there was one chapter dedicated to Treaty Rights and Sovereignty, the issue is addressed throughout the plan. One of the main themes of the plan was to be in communication, coordination, and collaboration with other entities that have

jurisdiction over ceded lands, and others that have powers that are relevant to climate adaptation. Interviewees also revealed that changes have happened in the context of greater recognition of Tribes by outside entities, “There was a time When the tribes weren't at the table for discussions of Water, fish resources and such, and slowly but surely it's tribes have been at the table since the 90s” (Ely, 2022).

Specific Adaptation Actions:

Table 2: CTUIR Tribal Rights and Sovereignty Action examples

	Adaptation Action	Significance for Tribal Rights and Sovereignty
First Foods and Fire Related Actions	"Engage in Policy and Agency Land Management Discussion"s… "Advocate for Proactive Wildfire Management within State/Federal Agencies"… "Support and Expand Opportunities for Treaty Rights Exercise"… (Chapter 3b)	First Foods access is important both for asserting sovereignty by the CTUIR working with other land management agencies, and for the ability of tribal members to practice their treaty protected rights.
	"Proactively address wildfire risk"… "Support and expansion of prescribed and cultural burning"… "Coordinate with other forest management agencies (Bureau of Indian Affairs Fire Operations, Oregon Department of Forestry and US Forest Service, etc) to prioritize prescribed burning activities over fire suppression"	The CTUIR must coordinate with other forest agencies to assert its tribal rights to prioritize prescribed burning. Sovereignty will be practiced if these agencies allow and support prescribed burning.
	"Expand Opportunities for CTUIR First Foods Mission in shaping regional priorities"… "Build capacity through documenting and outreach to potential and current partners" (Chapter 3f)	First Foods Mission reaching regional land management will be a assertion of tribal sovereignty over the region where the CTUIRs homelands reside.
	"Continue to Revitalize Cultural First Foods Harvest, Processing, and Connection"… Develop Employment frameworks for First foods Procurement by Tribal Harvesters"… "Nixyaawiii Community Financial Services (NCFS) Food Sovereignty loans"	Food sovereignty is an important part of sovereignty addressed here.

Education related actions	"Continue to educate non-native people and agencies about rights that tribal members have to fish, hunt, gather, graze, and administer water in the region" (Chapter 3b)	The education of non-native people on the tribal rights is important so that they understand why tribal members practice their rights on traditional lands.
	"Facilitate proactive health risk management workshops and readiness kits"… Expand knowledge and understanding of treaty rights and wilderness safety" (Chapter 3f)	The education of tribal members is also a priority so that they understand their treaty rights and can practice their cultural activities in the most informed way.
	"Youth Engagement with Tribal Sovereignty"… (Chapter 3e)	The plan places importance on educating its youth on sovereignty so that future generations will know its importance.
Sovereignty/Federal Policy mechanisms related actions	"Pursue and develop CTUIR capability to enact 638 contracting of available programs" "Policy advances like 638 contracting for tribal food assistance programs" (Chapter 3f)	
	Support and Expand to advocate for and exercise tribal sovereignty"… "Proactively develop cultural and policy support for expanding sovereignty mechanisms"… "Expand Efforts to proactively address burgeoning conflicts collaboratively" "Establish "land back" pathways for reparations to be collected"…	(Chapter 3e) "Land back" pathways are significant, as returning land that had been historically stolen under the Treaty of 1855 is huge for the assertion of sovereignty especially in relation to land management issues such as climate change.
	"Support and Expand CTUIR Monitoring of Air, Water, and Soils to Maintain Treatment as State (TAS) Status"	The connection between the tribe doing its own monitoring is a piece of tribal sovereignty, as they are in charge of their own data collection. The "Treatment of State" Status is a framework to exercise sovereignty with.

The CTUIR also has the advantage of being a self-governing tribe with a Treaty, as was mentioned in the Interviews, “Because as Native American tribes we are able to use those arguments in order to obtain funding and deploy research projects based on the fact alone that we are sovereign, and that we have sensitive populations within our borders” (Minthorn, 2022). Like other Tribal nations, the CTUIR is a nation within a nation, and as such, it has direct relations U.S. government, the State governments in which their traditional homelands reside, and regional, county, and city governments and land management entities. The necessity of collaboration with outside entities is apparent throughout the document in action steps and strategies that encourage the CTUIR’s participation in larger regional discussions with other entities, and those that highlight collaboration and coordination. This consideration of how the CTUIR must speak with many different entities was also apparent in the interviews, “We have experience working with all levels have all levels of government… we've worked with the state of Oregon, the state of Washington, and the state of Idaho. But ultimately, we are… contractors or we're just a branch of the EPA. In that they allowed us to adopt certain authorities” (Minthorn, 2022). Althea Huesties-Wolf reflected about the complexity even just in here area of work with the Hanford site, “There's all of these regulatory entities that you could take one step in one direction at Hanford and a different there's a different regulator, compared to the step there, to where you're standing, so it's so complex” (Huesties-Wolf, 2022). As reflected by all of the staff members interviewed, Cheryl Shippentower went further to say that “It’s [Tribal rights and sovereignty] something that's just inherent with our goals [as a] Tribe and it carries over into the management plan. And to adaptation plan” (Shippentower, 2022).

The strategy/action of bringing the First Foods mission to shape regional priorities is a great example of how the CTUIR CAP highlights the necessity of including Tribal perspectives in discussion with other entities. These strategies also reflect the increasing desire of other entities to learn more from tribes about their traditional knowledges and management practices, as Kate Ely suggested in interviews,

> "The CTUIR CAP highlights tribal input and the First Foods model to shape and develop action strategies. This is an approach for the region. Federal and State agencies recognize the value of tribal approaches in natural resources management and request CTUIR collaboration in regional research grant applications using the First Foods model to integrate farming and grazing practices with environmental protection. There is a lot we can learn from each other" (Ely, 2022).

It is obvious here that the First Foods framework as a priority throughout the plan is also an important part of maintaining Tribal Rights and Sovereignty because through getting out on the land and working towards maintaining First Foods within their ceded territory, the CTUIR is asserting their Sovereignty. Adaptations for First Foods span many different action types that are relevant for Tribal Rights and Sovereignty. First Foods are not confined to the reservation boundaries, and that will become even more true if habitat shift predictions come true. Interviews reinforced that this was an important reason for continuing to strengthen sovereignty in the face of climate change, "And so we want to be able maintain those treaty rights have access to those areas, and…be able to move to those areas and continue to gather our foods" (Shippentower, 2022).

The document continues to reiterate that cultural burning is incredibly important for undoing the damage done from fire suppression on traditional lands, but that history continues with hesitancy from other agencies to turn away from fire suppression. The

CTUIR CAP continually has adaptation actions that seek to improve coordination and communication with not just other agencies but with non-tribal citizens as well.

The concept of food sovereignty is mentioned once in the action about creating food sovereignty loans to provide financial assistance to food producers for small businesses for tribal members. Food sovereignty is about the right to healthy and culturally appropriate foods that are cultivated through their own methods. This was another economic related action within the chapter on human health and happiness, showing the connectedness that sovereignty has in several aspects of the plan.

Once again, I found that education actions played a significant role in the CAP, with many educational strategy and action steps pertaining to the topic of Tribal Rights and Sovereignty. As mentioned above, the education of non-tribal people about tribal rights and sovereignty was prevalent. To practice tribal rights, Tribal members may be going to lands near non-tribal people, who must be knowledgeable about what they are doing to prevent tensions. Also important to note is that there are a large amount of non-tribal people living on the reservation lands as well. The simple act of being present on the land and doing cultural practices was also brought up in interviews, “I've heard people say maintain that presence so that people know that this is where we've always been and always gathered our resources” (Shippentower, 2022).

The focus on education for Tribal members to know their rights as Tribal people was also present. Being prepared for things when practicing cultural activities was brought up with the idea of “risk management kits,” for example shows the intention of preparing Tribal members with their best knowledge to practice their treaty-given rights safely. Additionally, the CAP shows that youth are considered in climate adaptation

planning and tribal rights and sovereignty. This also touches on Indigenous planning theory of Jojola and Mantunga of the seven generations model, and bringing in multiple generations, which is especially important in climate adaptation work as it is planning for future effects.

A few interviewees mentioned that there is difficulty in sharing jurisdiction with other entities, saying for example, “our own staff have trouble accessing it for regular monitoring” (Huesties-Wolf, 2022), and in reference to a certain difference in understanding of land, “You need those lands to be like that. For us, it is the communities [environments] where those First Foods grow. [It’s difficult] because we have people trying to manage areas that they don't totally understand” (Red Elk, 2022). Several actions address these concerns in advocating for strengthening relationships with outside partners, bringing the First Foods framework to regional discussions, educating the public about tribal rights, and working to maintain “treatment of state” status.

This was also apparent in the digital text analysis, throughout all the chosen planning documents. From the chosen key words, “coordination” was the most common word, with “partnership” following. The words that most consistently appeared throughout the documents were “consultation” and “collaboration.” This shows again that partnerships with outside entities is important in all planning documents, which continued in the CAP. Also notable was the word “intergovernmental” which was used 22 times, with most of them in the climate vulnerability assessment and the climate adaptation plan. The word “participation” was also notable, with 42 occurrences.

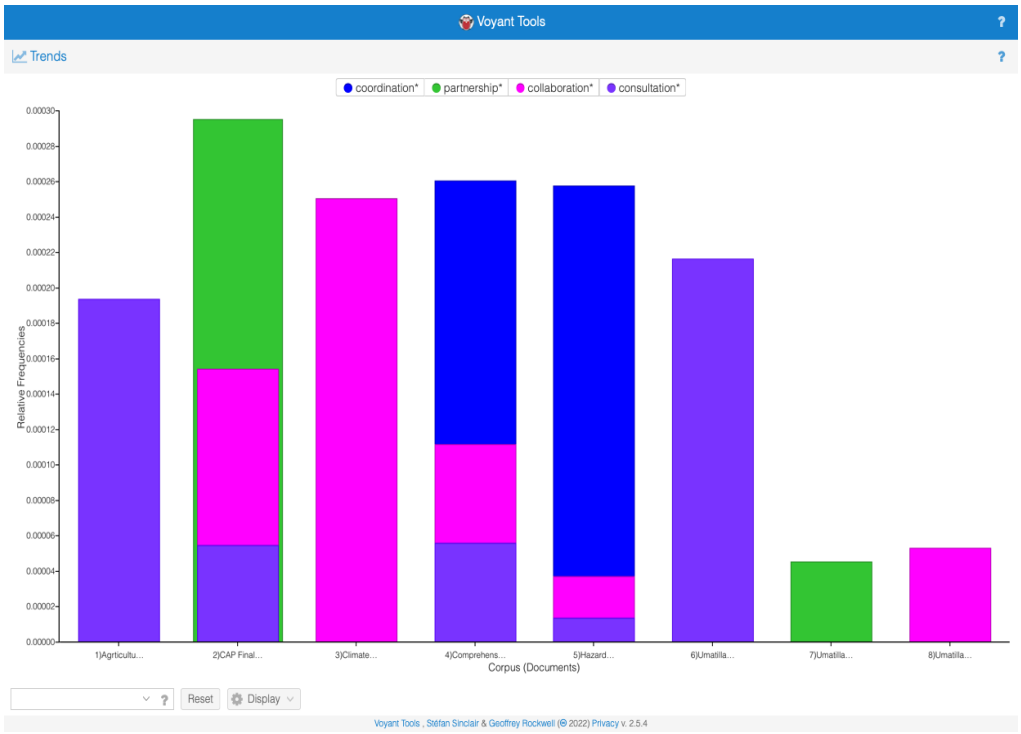


Figure 4 CTUIR Partnership Key Words

Some actions/strategies highlighted specific avenues through policy and other mechanisms through which to assert sovereignty. For example, 638 Contracting was mentioned, which recognize the rights of sovereign nations to govern their own affairs, and 638 contracts are awarded to tribes that have shown their capability to administer their own programs. The CTUIR already has a number of these contracts active in the DNR's activities, for example. The CTUIR CAP also mentions "land back" at least once, which is also a unique concern for tribes because with more land under their title, sovereignty is expanded. In his interview, Caleb Minthorn emphasized that Native Americans are at the frontlines of climate change and will be the ones to start addressing it then saying, "and in the year 2022, we actually are purchasing some more land back…that's what I mean by returning to certain parts of lands that were locked

away, whether it was private land or state or federal land… that doesn't matter" (Minthorn, 2022).

Community Engagement

Overall Result:

There are two ways to look at community engagement when reviewing the climate adaptation plans. First, there is the community engagement that was used in the process of creating the CTUIR CAP, in which community members were consulted for their input on the planning document from start to finish. Then, there are actions within the plan that plan for future events of community engagement in several different subtopics that are relevant to climate adaptation.

The CTUIR plan chapter 4 was entitled "Community Engagement" and it gave a good overview of how the planners of the Climate Adaptation Plan engaged with members of the community for the purposes of developing the plan itself. The original community engagement plan involved participatory planning over community shared meals, etc., but unfortunately, the Covid-19 pandemic hit before these could take place and the community engagement piece was momentarily de-railed. However, eventually they were replaced with virtual climate adaptation plan webinars, which although lacked the same kind of warmth and connectivity that in-place meetings could have had, had benefits as well. They were able to be longer and cover more material, and recordings allowed easy sharing and preservation of the material covered. In interviews, Cheryl Shippentower expressed her appreciated of the level of community engagement in the plan, "This was done differently where the community was brought in initially from the from day one… that made this plan more comprehensive because the

community was involved right away" (Shippentower, 2022). Althea Huesties-Wolf touched on this in her interview as well, "I mean, Colleen did massive outreach… There were posters, social media reminders, to participate, participate, participate…So, everyone always knew when the next CAP [webinar] was going to be" (Huesites-Wolf, 2022).

The initial webinar series consisted of 10 events, going through each chapter and section of the climate adaptation plan as it stood at the time. These webinars were uploaded to YouTube and to the CTUIR CAP website for the viewing of community members who were not able to attend live. Following that webinar series, another was conducted for "listening sessions" to gauge the communities and the departments, committees, and commissions of the CTUIR self-governance structure after some changes had been made to the plan since the first set of webinars.

Other chapters of the plan showed evidence of the intent to keep community engagement going in all the different avenues of climate adaptation that the plan laid out. For example, chapter 3d was entitled "Human Health and Happiness," which included not only physical health but also mental health. Community connectivity, and education on health assessment and awareness were prevalent in this chapter. Chapter 5 "Celebrating CTUIR Resilience" told more of the community engagement that has been done within different areas of the CTUIR leading up to this point and the climate adaptation plan. For instance, DNR First Foods excursions that have provided tribal members with the opportunity to do cultural learning through traveling to new locations and learning new Foods with knowledgeable community members.

Specific Adaptation Actions:

Table 3: CTUIR Community Engagement Action Examples

	Adaptation Action	Significance for Community Engagement
Documentation Related Actions:	"Organize and implement resource assessments and feasibility studies for community-identified preferred energy options" (Chapter 3e)	Studies for community-identifies preferred energy options shows that the values and opinions of the community are of importance in climate adaptation steps moving forward from the plan.
	"Facilitated Migration Mapping and Implementation"..."Conduct community planning and listening sessions around facilitated migration" (Chapter 3b)	The intention to conduct community listening sessions shows that the plan holds great value in the knowledge and expertise of community members in regard to noticing migration in important species for example.
	"Expand Organizational Cooperation on Health Needs of Tribal Community"… "Develop Community Science Reporting Tools, Education, and Protocol" (Chapter 3d)	Reporting tools are another way to engage the community in documentation of things to consider for climate adaptation.
	"Create Opportunities to Gather, Learn and Share Stories together"… " Facilitate a Community-led Climate Shifted Revision of Seasonal Round"… "Continue to work with Seniors Center, Elders, and Education Opportunities -- Conduct and compile knowledge keeper interviews" (Chapter 3d) "Participate and organize tribally-led research projects into First Foods nutrition and properties, as guided by knowledge keepers, tribal youth and elders, and the tribal community and supported by outside partners" (Chapter 3d)	Tribally led research projects with knowledge keepers addresses community engagement together with tribal sovereignty through mentioning partnering with outside partners and connects cultural revitalization with first foods focused action.

Education related actions:	"Expand awareness and skills associated with water and air borne illnesses" (Chapter 3b)	Increasing awareness of safety around water and air is important to have a healthier and prepared community in the face of climate change.
	"Youth Engagement with Tribal Sovereignty"…"Build Renewable Energy Solidarity with Impacted Communities." (Chapter 3e)	"Renewable energy solidarity" speaks to the presence of community engagement with both tribal and non-tribal members, and to the importance of building relationships with others to "alleviate potential tensions and foster mutual understanding."
	"Facilitate proactive health risk management workshops and readiness kits"… "Expand knowledge and understanding of treaty rights and wilderness safety" (Chapter 3f)	Treaty rights and Wilderness safety knowledge is incredibly important for cultural practioners.
	"Pursue funding opportunities that build scientific knowledge of First Foods relationships to land and people" (Chapter 3d)	Building knowledge of relationships.
	Regional Collaboration and Engagement"… Outreach and Engagement"… "Education and Empowerment" (Chapter 3a	This is another example of the value that the plan puts on community engagement. Continuing the theme of education as a tool.
Community connection	"Strengthen local supply chain sourcing and regional connections" (Chapter 3b)	The community kitchen touches upon preparedness as it creates shared space for connection as well as back up kitchen accessibility. It might also back up the idea of first foods, which would be prepared there.
	"Conduct community kitchen feasibility assessment to assess infrastructure and capacity needs to construct and operate a certified commercial kitchen access to the tribal community" (Chapter 3b)	

	"Expand First Foods mutual aid frameworks for tribal community to provide cultural and nutritional assistance to each other"	Mutual aid frameworks are essential in preparing for climate change, and the focus on nutrition and First Foods is a unique aspect for the tribal community.
Other:::	"Expand community capacity for built systems management… Continue to update CTUIR Hazard Mitigation Plan with community engagement on emergency response needs as these change" (Chapter 3b)	Community capacity is an important part of keeping the community in mind with climate adaptation, and this action explicitly calls for ongoing community engagement specifically with hazard mitigation which goes hand in hand with climate adaptation.

Many of the actions that were focused on engaging CTUIR community members were about documenting, monitoring, and recording their preferences for future action, their knowledge of observed changes in climate and important species, and opportunities to share together. The inclusion of these actions across the document was indicative of the high value that the creators of the CAP put on not only engaging the community in future actions, but in the knowledge that they could bring to better inform future actions. For instance, there was the action step of creating more community science reporting tools that are easily accessible for community members to report what they have seen. Another action step that showed this was about giving the community the reigns in leading a climate shifted version of the seasonal round that guides when to do traditional practices. This action of giving the community leadership in how they observe change shows that the community is the most knowledgeable on these topics, and that they able to plan and adapt for themselves.

The attitude that the community members, tribal members, cultural practitioners, "citizen scientists" and elders have extremely valuable knowledge and input to give for

planning professionals and the Tribal governments affairs was also a very prevalent theme in the interviews.

> "most elders and seniors, they know what climate change is… They've seen it before. I have clients that told me about droughts before I was born... they hold the traditional knowledge on restoring environmental and environmentally affected lands waters and or forests." (Minthorn, 2022).
>
> "I still think that that input should become from the tribal [people] because they'll be the ones most impacted. They're the ones that have the knowledge of the landscape and resources" (Cheryl, Interview, 2022).
>
> "the presentation was done by staff (in reference to the CAP webinars), and then you had tribal members come in and provide input as well. So I think that the community input was huge for this and I think that's the best way to do it" (Cheryl, Interview, 2022).
>
> "I think part of that [cultural] experience is weaved into every tribal member who works from tribe. That is we all have our different niches in our community. And like some people, hunters, fishermen, weavers they have their expertise." (Wolf, 2022)
>
> "We had both the technical component and then we had the community component with the values of the tribal members factored in, so it is a great combination, tribal members added their input" (Ely, 2022)
>
> "So, the other thing we looked at was, what are the ones that are most important that the knowledge is leaving quickly. Who can we reach out to and who can we work with to secure that as best we can before those teachers pass?" (Red Elk, 2022).

Education is again a significant part of the actions and strategies outlined in the CTUIR CAP. Mainly, for the health and wellbeing of community members as they go about their daily activities in a changing world, and especially regarding the practice of cultural activities. One action is also touching on building more knowledge, particularly scientific knowledge around First Foods to support the traditional knowledge that the community already has. Kate Ely, Umatilla Basin Hydrologist, explained in interviews how she shows a groundwater simulator to inform community members in water management and surface water-groundwater connection,, "[I say] let's look at some

changes in our climate and what that does to water resources, and people are really astounded" (Ely, 2022).

Some strategies on the topic of community engagement touched on the concept of community connection and cohesion. With better connection between community members, practice of tribal rights and revitalization of cultural activities will be strengthened. The examples pulled out tie into the concept of First Foods that guides the entire document, and they also connect with the focus on the health of the tribal community. A community kitchen provides connection between community members and backup systems for unpredictable events. Similarly, the development of mutual aid frameworks for nutritional health also touches on emergency preparedness as well as the intent to better the physical health of community members.

One interesting point made in the chapter on built systems and energy provided evidence of how different perspectives of community members were considered in the CTUIR CAP. That was the action strategy to implement feasibility studies on community identifies preferred energy options. It discussed how Power from hydroelectric generating stations is debatably referred to as "renewable" in many conversations about energy, however tribes are not united in viewing this energy source as favorable. Many of these operations block river flow either partially or entirely, and create daunting passage barriers for migratory fish like salmon and lamprey. Decision-making around large-scale hydroelectric facilities must be considered in an evolving and ongoing way by tribal leadership, but there are other opportunities for hydroelectric energy generation that does not include river-blocking infrastructure to accomplish,

though no resource assessments have been conducted for these energy sources on the UIR.

The digital text analysis revealed different terms that were used in different planning documents of the CTUIR tribe (See figure 5). The Climate vulnerability assessment had the most occurrences of the term “Traditional ecological knowledge”, and the CTUIR CAP had occurrences of all the chosen key words except for “traditional knowledge”. Not every document had mention of the chosen community engagement and traditional knowledge key terms, but it was significant that the CAP was the only document that had the term “community engagement”. This indicates an increased effort to include community engagement in future actions as related to climate change in the CTUIR’s work.

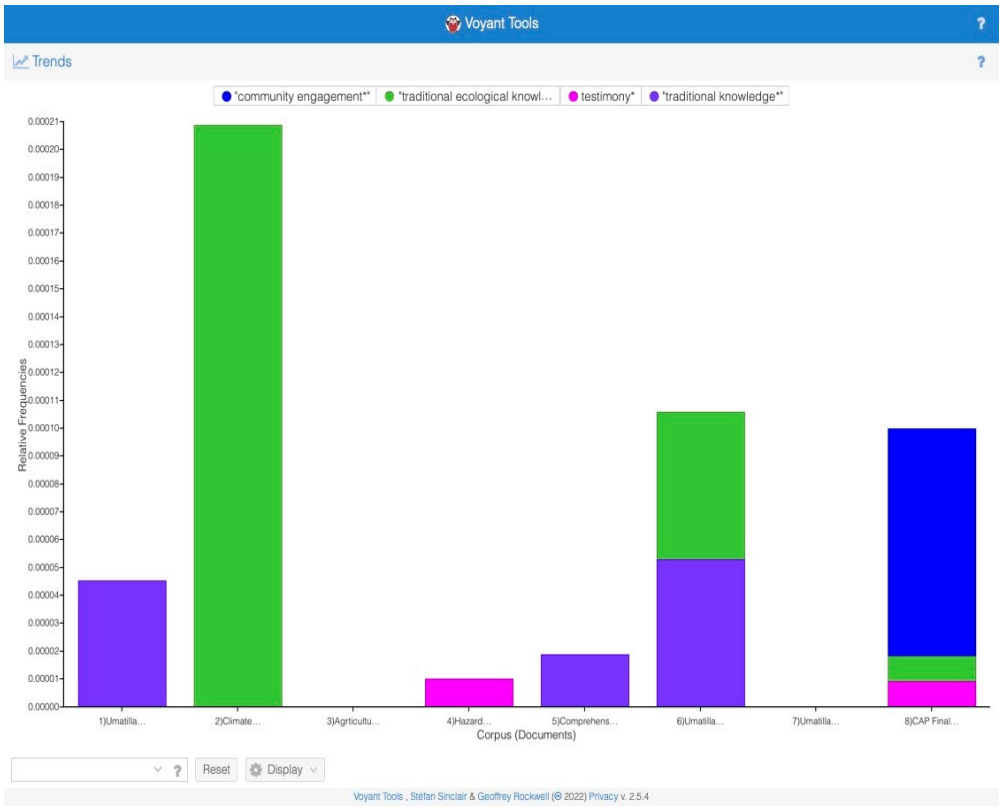


Figure 5: CTUIR Community Engagement and Traditional Knowledge words

Karuk Climate Adaptation Plan (CAP)

Cultural Revitalization

Overall Result:

Cultural Revitalization was a huge part of the adaptation strategy of the Karuk climate adaptation plan (CAP). A unique focal point of the plan and its climate concerns and actions were the “cultural indicator species” that were present throughout the document. They symbolized cultural revitalization as they were all species of plants and animals that were significant for Karuk culture as food sources, sources of regalia, characters in traditional stories, and more. These were used throughout the document

and explained in depth as to how they were culturally important, their vulnerabilities to climate change, and how they indicated ecological health in each chapter.

The plan lays out 22 focal species as cultural indicators in seven habitat zones as an extension of those that were in the previous Karuk Vulnerability Assessment. They are presented with their Karuk language names and represent the ways that traditional management can be revitalized as indicators for the relationships and responsibilities that humans have with them. Thus, the plan describes their strategies to vegetation zones and fire management as "culture centric" (Tripp & Norgaard, 2016, 58). At the end of each Habitat zone explanation of Climate concerns and adaptations, the cultural indicator species for that habitat zone are listed. Each of their brief descriptions throughout the planning document include their importance as a cultural indicator, and information on climate change, their life cycle, and habitat.

The plan frequently references the fact that Karuk people have been observers of the behavior of plants and animals to understand ecological dynamics, and therefore they are able to do human management with a bank of knowledge. The knowledge has been inscribed in the ceremonies and prayers that continue to this day. Like the CTUIR Climate Adaptation Plan, the Karuk plan makes a point to say that the information that guides the planning approach comes from a combination of traditional ecological knowledge and western science. See the graph of occurrences of "traditional ecological knowledge" in the community engagement section.

In conjunction with the use of the focal species cultural indicators, a central point in the Karuk Climate Adaptation Plan was the revitalization of traditional fire regimes. Every single chapter referenced the revitalization of traditional fire regimes as

important for climate adaptation. The cultural indicator species are intertwined with the revitalization of traditional fire regimes as they indicate when, how, and where to burn for each habitat and resource type.

A highlight right at the beginning of the document was the idea of "getting people back onto the landscape." Bill Tripp, the eco-cultural revitalization specialist of the Tribes is frequently cited throughout the document.

> "We need to get people back onto the landscape and learn what is going on. People need to be noticing these things for themselves, this is how we teach and learn in Karuk culture. It is based on observation and practice." - William Tripp

Fire suppression and the illegalization of Karuk cultural practices in history and presently have damaged the continuance of being able to be Karuk for Tribal members. Not to mention, some fire observation stations were built on some sacred sites in 1920s fire suppression efforts, which affected tribal land use practices especially as some traditional sites of setting fires were near these culturally significant habitat areas.

Cultural Revitalization is represented in several of the stated over-all strategies in Chapter two of the Karuk plan. The first strategy is "Restoring Human Responsibilities," where the plan explains that Karuk tribal knowledge and management can be utilized in the context of climate change… Another strategy is "Revitalize Traditional Cultural Management," where the plan explain that cultural and ecological information have been sustained in ceremonies, stories, and collective memory despite the interruption of social-ecological relationships by European settlement… The next strategy is "restoring Traditional Fire Regimes," the plan goes through some history of fire suppression under the U.S. government and speaks to the more recent trend of policy makers turning to traditional ecological knowledge and management practices.

The Karuk Tribes World Renewal Ceremonies are frequently mentioned as an example of the various rituals that align the Karuk culture with ecological processes. They include ceremonial burning techniques. With compounding stressors and climate change, the ability to do World Renewal Ceremonies are threatened, and for this reason they are emphasized throughout the plan as a central point of the importance of cultural revitalization, or continuance. Ceremonial practices ensures that there are abundant harvests, and they restore social and personal balance. Another ceremony, the First Salmon Ceremony invokes spring run and regulates harvest management. “Holistic” understanding is also emphasized as an element that is known in traditional knowledges. The Interview revealed that a lot of the Karuk Tribe’s work is simply about making it not illegal to be Karuk, “I think that's more what the tribe is pushing, is trying to make it not illegal to be Karuk, And when that's legal, other people learn that don't know (in reference to cultural activities)” (Bourque, 2022).

Specific Adaptation Actions:

Table 4: Karuk Cultural Revitalization Action Examples

	Adaptation Action	Significance for Cultural Revitalization
Restoration and expansion of cultural burning related activities	"Restore traditional cultural fire management practices" (In essentially all chapters) "Return historic cultural fire regimes: Low intensity fires benefit stream flows as they clear out brush that uptakes water, high intensity fires are needed to generate debris input" (Chapter 3 Riverine Systems) "Utilize cultural indicators for burning times, e.g huckleberry and xuntápan (tanoak acorns)." (Chapter 3 Low Elevation Forest	Restoring traditional cultural fire practices is an action present for climate adaptations for at least every habitat zone, and. Many of the cultural indicators are related because they indicate traditional burn times.
	"Traditional foods and subsistence practices" …"Gardening and other food provisioning" (Chapter 5 Emergency Management)	Returning subsistence practices also gets at the health dimension of cultural revitalization, and here as it comes from the emergency management chapter it is connected to the aim of the Karuk Tribe to increase self-sufficiency.

Cultural indicator species examples	"Pacific Giant Salamander / Púfpuuf / Dicamptodon tenebrosus" (Chapter 3 Riparian Systems)	Indicator of river,
	"Beaver / Sahpihnîich / Castor canadensis" (Chapter 3 Riparian Systems)	Beaver was mentioned as an example of good ways to interfere with the environment in tribal stories.
	"Beaver / Sahpihnîich / Castor canadensis" (Chapter 3 Riparian Systems)	Tanoak is a staple traditional food, and an important ecosystem player for other foods such as the tanoak mushroom. The most critical factor for tanoaks was stated as low intensity fire, going back to the focus on fire.
	Tanoak / Xunyêep / Lithocarpus densiflorus (Chapter 3 Riparian Systems)	Pileated woodpecker is an example of an important regalia species.
	"Pileated Woodpecker / Iktakatákaheen / Hylatomus pileatus" (Chapter 3 Riparian Systems)	Pileated woodpecker is an example of an important regalia species.
	Evergreen Huckleberry / Púrith /Vaccinium ovatum (Chapter 3 Riparian Systems)	The Evergreen huckleberry is significant as it is one of the first "socio-ecological resilience indictors" that the plan suggests to create more of.
	Black Tailed Deer / Púufich / Odocoileus hemionus (Chapter 3 Middle Elevation Forest)	Black Tailed deer are a source of utilitarian and ceremonial items. 65% of households said they hunt for Black Tailed deer.

Education related actions:	"Public education regarding ongoing relevance of Karuk TEK" (Chapter 7 Karuk Sovereignty)	Public education here seems to be for non-tribal community members, but it advocates for education about Traditional Ecological Knowledge, an important part of cultural revitalization that people who live with tribal members should know.
Others:	"Research/ monitoring of climate impacts and intervening stressors (Identify heat source/sinks to promote cooler water)" (Chapter 3 Riverine Habitats)	Research and monitoring is essential for future climate adaptation actions for the cultural indicators.
	"Increase seed and cormlet harvesting and reseed/replant in high severity areas that support different Indian potatoes (lilies, other geophytes)" … "Adaptive tribal harvesting/tending practice in sync with soil moisture and phenology/flowering-seeding" Chapter 3 Grasslands	Harvesting/tending practices are singled out in this adaptation action.
	"Develop solar and micro-hydro electrical power generation, monitor to ensure water utilized generating power is returned to the same stream"… "Use revenue to build Endowment for Ecocultural Revitalization" (Chapter 5 Emergency management)	The use of the revenue from electrical power generation to fund ecocultural revitalization shows how the Karuk plan tackles multiple aspects of climate adaptation at once, while prioritizing culture and community.

There is an abundance of adaptation actions that prioritize the return of traditional fire regimes, in response to many different climate concerns throughout the document. As a part of the World Renewal Ceremonies, August cultural burns provide an example of how prescribed fire can be beneficial to for responding to climate change. They limit fuel for future potential high-severity fires, they provide protective cooling to riverine systems with smoke cover and in turn trigger upstream salmonoid migration. Despite 100 years of fire suppression, the Karuk plan provides an optimistic perspective to the prospect of returning fire because traditional knowledge, knowledge off geologic features, topography, and remaining stands and ceremonial ignitions sits are there to support it. Fire is itself a cultural activity and ceremony, as said in the Interview with Shawn Bourque, “The Olfeild project, it's to get the fire back for the ceremony…” (Shawn Bourque, Interview).

As discussed, the cultural indicator species that are outlined throughout the plan are a unique and central aspect of the Karuk plan. Interview responses further proved this point, “Focus species I think has been the key to the whole plan. And what has come out and is being used by other things…beyond the climate adaption plan.” (Shawn Borque, Interviews). They are deeply connected to the culture of the Karuk Tribe, “Most of those [cultural indicator species] have stories about them. Like there's some important travel story about most of those. That's why there were in there, but also just because it's Holistic Management.” The fact that the Karuk names of these focal species are stated is significant, “A Karuk name tells you a lot about what it is, you know. Like where you'd find it, like just different aspects of managing it. That aren't in the [name given by] whatever person found the here and named it” (Shawn Bourque, Interview).

This connects back to the use of language as important part of revitalization that is connected to the climate adaptation strategy. As seen in Figure 6, the focal species/cultural indicators appear a few times with various terms in other Karuk planning documents, but they occur the most in the Karuk climate adaptation plan. However, they will be used increasingly more now that they had such a central part in the Karuk CAP according to Bourque (see Appendix C for more word frequencies).

One example cultural indicator listed is an important species for the World renewal Ceremonies, the Black Tailed deer. It is a part of the Deerskin Dance, which connects it also to salmon migration, woodpecker habitat, and others. The *púufich* is an important traditional food source, as over 65% of Karuk households reported hunting for it for food in the 2005 food assessment. The whole body of the deer is used for traditional functions. High-severity fire damages their habitats by reducing protective cover, etc, but cultural burning is beneficial for their management in conjunction with

other species, guiding them away from plants for instance.

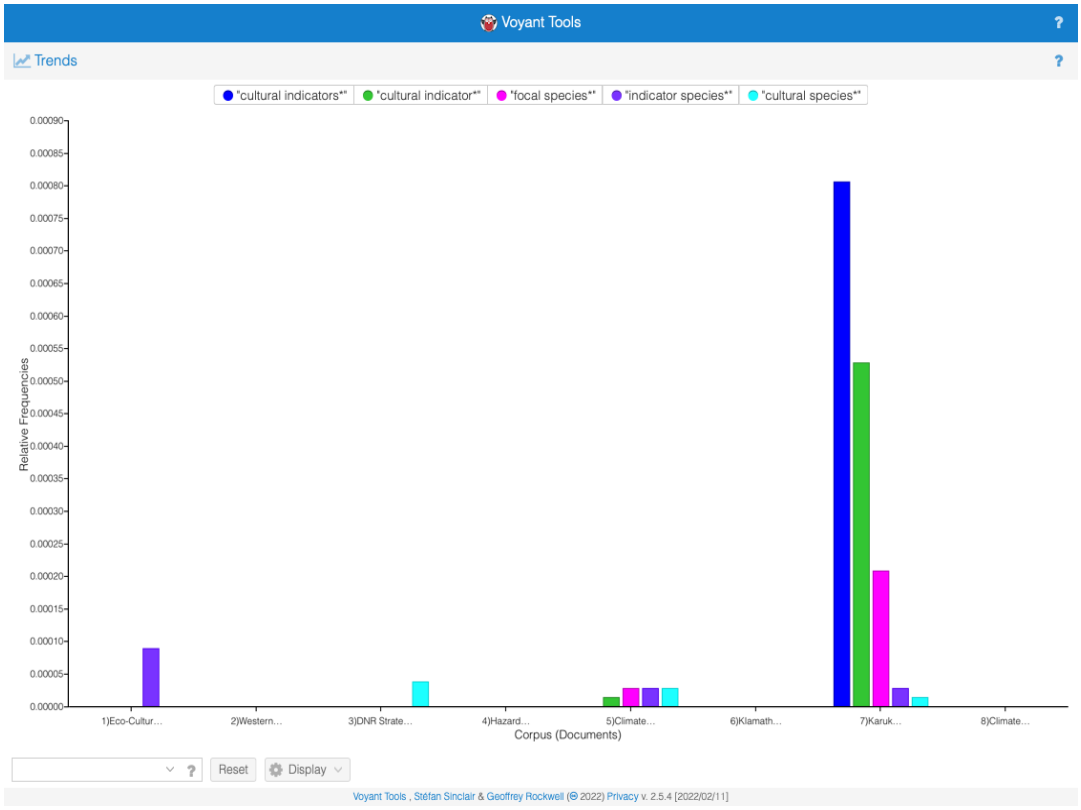


Figure 6 Karuk Cultural Indicator words

The Evergreen Huckleberry is another interesting example of a cultural indicator species to note because of its definition as a socio-ecological resilience indicator as well. It is an important Karuk food source, especially for its nutritional and health benefits. The concept of the socio-ecological resilience indicator means that there is also an element of food security to think about with it, for both human and animals in the sense that the plan attributes to it. Additionally, it mentions the idea of sustainable harvest to define it. The plan states that there is still more research to do, but that the concept of socio-ecological resilience indicators will continue to develop and be used.

Throughout the plan there was mention of educational adaptation actions just as there were in the CTUIR CAP. Although, many of them seemed to be more focused on

the general public. The one highlighted in Table 4 is specifically regarding education about Traditional Ecological Knowledge, for example. This is significant as an important part of seeking to build understanding with the community who live with Tribal members, and for future understanding of TEK in non-tribal projects. For instance, in the Interview with Shawn Bourque, he said "...Well with the Tribes *Pikyav* curriculum in the classrooms they do every week, it doesn't matter [if it is] for tribal or non-tribal [kids], everybody really gets it. My daughter is nontribal, and she gets it all those [lessons] and is a big advocate at this point" (Bourque, 2022).

Other traditional practices are mentioned as able to contribute to adaptation as well, such as shifting harvesting times for to change with soil moisture, and replanting to support culturally important species in high-severity areas. And other adaptations show the interconnection of different goals that are apparent in the Karuk CAP, such as the use of the revenue from electrical power generation to fund ecocultural revitalization shows how the Karuk plan tackles multiple aspects of climate adaptation at once, while prioritizing culture and community.

Tribal Rights and Sovereignty

Overall Result:

Two overall strategies as mentioned in Chapter 2 of the Karuk Climate Adaptation Plan are related to Tribal Rights and Sovereignty. First, the plan outlines the strategy to "Expand Tribal management authority, sovereignty, and program capacities." With this strategy, the plan outlines the importance of Tribal management and sovereignty, and it includes a few mechanisms through which it can be practiced such as 638 authority, Good Neighbor Authority, and the Indian Energy Act. The next

strategy is “Strengthen partnerships and increase interjurisdictional coordination” showing that coordination with other entities is an important part of climate adaptation for the Karuk tribe, and it provides the example of their involvement in the continuing Western Klamath Restoration Partnership as model for collaborative land and fire management planning and implementation between tribal, federal, local, and NGO partners. Other strategies mentioned in this chapter that could be related to tribal rights and sovereignty were, “Advocate for Policy Change”, “Increase self-sufficiency, system redundancies, and backup systems”, and Expand Research Capacities”

In the beginning of the plan, the view of climate change as a strategic opportunity is explicit. It states that it is not just an opportunity to retain cultural practices and return traditional management practices to the landscape, but for enhanced collaboration amongst land managers. This shows that climate change brings an opportunity for the Karuk Tribe to exercise sovereignty. The plan even states that tribes are “uniquely positioned to lead the way,” and that the Forest Service’s management plan’s goals can be best achieved through Karuk tribal management.

Each chapter had a section about “Intervening Stressors to [chapter topic] from Non-Tribal Management, indicating that interacting with non-tribal management is significant to adaptation strategies. So, for example, there are instances where culturally important species are being harvested at concerning rates by outsiders with the example of tanoak mushrooms. There are also concerns with intervention into culturally important areas by ignorant managers. The incident that the plan pointed out saw firefighters come through with a bulldozer to build a fire line, but this was in the line of where cultural artifacts lay, “In this way, the legacies of Karuk food and fire

stewardship are erased from the land, and replaced by the "safety" needs of the dominant society…" – Frank Lake ((Norgaard et al., 2022)135).

Chapter 6 of the Karuk Climate Adaptation Plan is "Climate Adaptations for Tribal Program Capacity". This is part increasing tribal sovereignty through increasing capacity for tribal programs to do their work. The tribe has nearly twenty departments, programs, and services in their three service districts of Happy Camp, Orleans, and Yreka. The Tribe employs about 231 staff and has an annual budget of about $37 million, it governs its tribal trust lands, fee lands, and the rights and interests of tribal members and descendants. Climate change is already impacting Tribal capacity.

Just as in the CTUIR CAP, there is a whole chapter dedicated to Tribal rights and Sovereignty itself, "Chapter Seven: Adaptations for Karuk Tribal Sovereignty and Management Authority" in the Karuk CAP. It identifies challenges to Sovereignty and Management authority as "changing ecological conditions, rapidly shifting policy terrain, agency emergency management mode, and other actions taken by other agencies in response to climate change." The revitalization of use of cultural indicators, the continuance of traditional ecological knowledge production and culture through presence of Karuk people on the land, use of new and existing Tribal authorities, and more are cited as adaptations for Karuk sovereignty and Management authority. It points out that the Tribe operates within complicated jurisdictional terrain, sharing responsibility with a slew of agencies including the EPA, USFWS, BIS, NRCS, USFS, California Department of Forestry and Fire Protection (CALFRIRE), the State Water board, and the California Department of Fish and Wildlife. As shown in the previous section about the history of tribal sovereignty and policy, these agencies have

historically misunderstood, contested, and/or ignored Karuk Tribal sovereignty and this continues to this day in many respects.

A large part of Karuk ancestral territory is now located in the National Forest System of the U.S. federal government. The plan points out that the Karuk Tribe has never relinquished custody of these lands, but the lack of recognized ownership has of course impacted the Tribe's ability to manage the land with the care for traditional foods and cultural use species.

The Karuk Climate Adaptation plan clearly seeks to remedy misunderstandings that exist with other agencies that have jurisdiction within Karuk aboriginal territory and assert sovereignty through its climate adaptation actions.

Specific Adaptation Actions:

Table 5: Karuk Tribal Rights and Sovereignty Action Examples

	Adaptation Action	Significance for Tribal Rights and Sovereignty
Management and Coordination related actions:	"Expand tribal management authority/program capacity to enable cultural burning and managed wildfire as acute emergency responses." (Chapter 3 Riverine Climate Adaptations)	Cultural burning continues to be a focus point of the plan, and the ability to practice cultural burning is a huge issue of tribal rights and sovereignty.
	"Increase jurisdictional coordination for eradication and reduction of pathogens and invasive species including emergency measures" (Chapter 3 Riverine Climate Adaptations) "Engage in policy and collaboration regarding ocean conditions" "Interagency coordination and research regarding strategic use of prescribed fire (see Karuk SOD plan)" (Chapter 3 Low Elevation Forests)	Interagency coordination is critical for the ability of the Karuk Tribe to be able to be co-managers on the lands of their ancestral homeland, especially for the fact that they do not have a reservation or rights confirmed by a treaty.
	"Strengthen ties with Humboldt County regarding Hazard Mitigation planning, maintain current ties with Siskiyou Co." (Chapter 4)	The fact that the plan points out specifically which entities it needs to strengthen ties with is important as It shows exactly where Tribal sovereignty must be practiced.
	"Be prepared for emerging opportunities by participation in policy formation, communication and collaboration with federal and state partners" (Chapter 7 Karuk Sovereignty)	Participation in policy formation, communication, and collaboration is repeatedly mentioned for the strengthening of Tribal rights and Sovereignty for the Karuk Tribe to be recognized by other entities into the future as climate change takes place.
	"Involvement in statewide and national policy development, e.g. Forest Plan Revision Process" (Chapter 7 Karuk Sovereignty)	The Forest Plan Revision Process is a specific example of where Karuk management should be recognized according to this plan.

	"Develop in depth plans together with CalTrans, USFS, Humboldt and Siskiyou counties"… "Increase partnerships, outreach and advocacy" (Chapter 5)	
Education related actions:	"Public education and outreach regarding impacts to Fisher during firefighting and post fire activities and Fisher, agency coordination" (Chapter 3 Middle Elevation Forest)	Public education specific to certain species.
Internally related actions:	"Work with DNR water quality and other to advocate for dam removal, reduction in agricultural inputs from upper basin, other water quality" (Chapter 5 Emergency Management)	Internal coordination will be increasingly important for climate adaptation, as there should be optimum preparation for future events.
	"Advance planning, backup infrastructure for remote work" (Chapter 6 Capacity)	Interesting that this was before the pandemic.
	"Increased staffing, proactive planning, invasive species eradication, participate in prescribed/cultural burning activities, increased jurisdictional recognition" (Chapter 6 Capacity)	Staffing increases are nee89ij8uded just to improve capacity to adapt to climate change.
	"Outline climate related threats to food security in the interest of utilizing new 638 compacting authority via 2018 Farm Bill" (Chapter 6 Capacity)	The use of legal measures to gain or defend tribal rights and sovereignty.

	"Integrate or separate program functions as necessary" (Chapter 6 Capacity) "Coordinate with other programs to advocate for return to traditional fire regimes. Increase staffing, agency coordination and proactive measures. Legal measures, collaboration with Universities and other research partners" (Chapter 6 Capacity) "Coordinate with health program to develop proactive measures. Monitor for indicators of impending fish die off events. Coordinate notifications and follow up monitoring efforts with integrated wildland fire and fuels program, water quality program and food security program staffs" (Chapter 6 Capacity) "Strategic assessment of available tribal authorities, expanded utilization of authorities" (Chapter 7 Karuk Sovereignty) "Consider development of new Air Quality Program or Program on Climate Adaptation" (Chapter 7 Karuk Sovereignty)	The plan advocates for a specific program to be developed to better tackle climate adaptation or air quality directly.

Many adaptation actions were specifically tied to Tribal Rights and Sovereignty because they discussed expanding Tribal management, increasing communication, coordination, and collaboration with other entities that have jurisdiction on the Karuk ancestral territory. In some cases, the action steps specifically pointed out the entities that need to consult with the Karuk tribe for certain management activities related to climate adaptation, such as with USFS CalTrans, Humboldt, and Siskiyou counties.

These counties are where the Karuk service districts are, but this just goes to show the amount of entities that the Karuk Tribe must communicate with in order to practice its sovereignty. The interview with Shawn Bourque further showed this point, where there have been different experiences with different agencies,

> "It's really different with different agencies even within the forest service like the six rivers [Forest Service] is way more into it and accommodating than say Klamath National Forest [Service] is where the slater fire happened in Happy Camp and they just straight up didn't even take money from the tribe to do fuels reductions, just on principle. The fire happened and burned down half the town because they just didn't want to work with the Tribe." (Bourque, 2022).

Just as in the CTUIR corpus, the Karuk corpus shows that out of the chosen key words regarding partnership, "coordination" was the most common, although in this case this term is likely also in regard to internal tribal government coordination, as will be discussed. The word "partnership" may also be skewed because of the Wester Klamath Restoration Partnership. However, mostly all the words were relatively consistent between the planning documents, again showing that this is important throughout the work that the Tribe does.

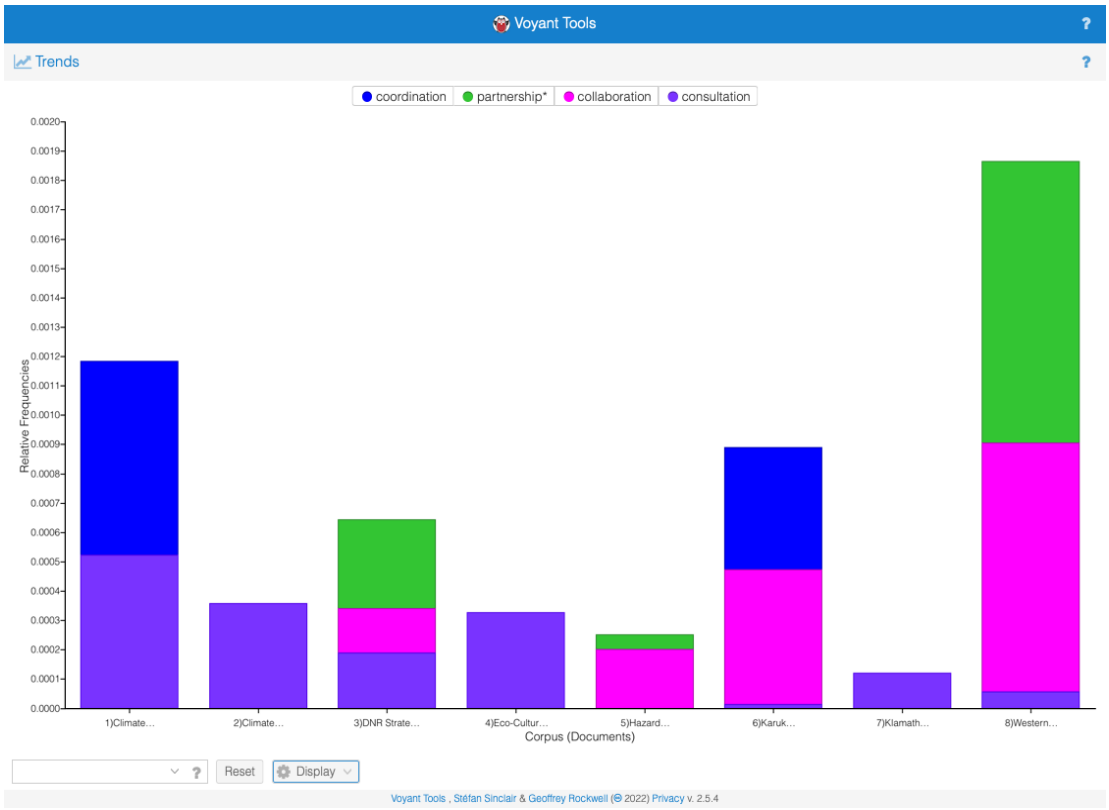


Figure 7: Karuk Partnership Key Words

The Karuk CAP has several action steps that have to do with increasing participation of the Karuk Tribe in regional policy making as a way to engage in climate adaptation in the future and to assert their Sovereignty with other entities. The Forest Plan Revision Process is a specific example of where Karuk management should be recognized according to the CAP. It provides quotes from the Federal Policy and Management Act of 1976, the 2018 Indian Energy Act, and the Federal Power act to reinforce and prove that Tribal consultation is required. Just as the CTUIR plan did, it brings out 638 contracting as a further mechanism to practice sovereignty, such as with the expansion of 638 authority for Tribal Forest Protection Act activities. There are several other programs and acts that it provides to show how the Karuk Tribe is taking advantage of these policies for their sovereignty. As with other parts of the plan, public

education action steps pertained to tribal rights and sovereignty often. In the interview with Shawn Bourque, in the absence of rights backed by a Treaty or having an established land base like a reservation, “Media and Publicity has really helped the most, you know, getting all this stuff done, because like the Karuk Tribe is the leader often but… no reservation, no “real” power.” (Bourque, 2022).

Another large part throughout the plan that can be related to Tribal rights and sovereignty were actions and strategies that were focused on improving internal coordination and the increase of tribal capacity both in chapter 6 and elsewhere. Clearly, the Karuk Tribe recognizes some of its gaps that need to be improved in preparation for the activities it will need to do in the face of climate change. This includes increasing staffing to be able to do the work needed in areas such as protective planning, invasive species eradication, etc. Coordination between departments like transportation, fire, and health means that there will be better services for the community when climate changes make impacts. There was also an action stated in several areas to develop new programs like a new air quality program and a direct climate adaptation program.

Community Engagement

One of the strategies outlines in Chapter 2 of the Karuk Climate Adaptation plan addresses community engagement specifically, “Continue community engagement and public education.” Therefore, just as in the CTUIR climate adaptation plan, the community engagement piece of the Karuk plan has a significant amount of education action steps. This is education both for Tribal members and non-tribal members of the community. It places an emphasis on the example of fear by the general public

surrounding fire because of the limited understanding about fire adapted landscapes and tribal management methods. It also points out that in some of the more remote communities in Happy Camp and Orleans, the Tribe is a leading employer, first responder, and health provider for tribal and non-tribal community members alike.

An emphasis throughout the plan was that Karuk people need to be intimately involved with revitalizing ecological knowledge practices. The plan emphasis the need for a return of the Karuk people on the landscape and to practice their cultural and traditional activities based on both mental health and physical health.

It speaks upon a level of collective "community stress" that is the result of the general awareness that Karuk people are denied access to conduct their cultural activities. The plan connects this experience to the phycological theory that requirements for wellbeing include control, commitment, support, meaning and normativity, etc. to how the Karuk people have historically been unable to carry out their cultural activities in their ancestral territory causes and compounds the effects of hunger, poverty, environmental decline, threats to identity, role stress, and the ongoing sense of genocide. So, by planning with the goal of returning Karuk people to the landscape and restoring their ability to carry out cultural activities, the Karuk Climate Adaptation Plan is focused on improving the mental health of its community.

This goal is also connected to physical health. Physical health impacts of climate change include heat stress, asthma, food and water contamination, and diet related diseases. The last point has been explicitly connected to the reduced access to traditional foods that tribal people have faced as well.

Specific Adaptation Actions:

Table 6: Karuk Community Engagement Action Examples

	Adaptation Action	Significance for Community Engagement
Documentation related actions:	"New cultural knowledge and practices keyed into increased availability of post-burn useable species in high severity areas." (Chapter 3 Low Elevation Forests)	The action step of gaining new cultural knowledge will necessitate consulting with knowledgeable tribal members. This shows the value the Karuk plan has on traditional knowledge and on its community members.
Education related actions:	"Public Education and prevention of new invasives and to reduce the spread of existing populations" (Chapter 3 Riverine Climate Adaptations) "Expand public education regarding heat stress" (Chapter 4) "Public Education regarding emergency evacuation routes" (Chapter 5)	Public education on how to recognize and deal with invasive species, heat stress, emergency evacuation routes and other things is essential in preparing the community to participate in adapting to climate change.
Program related actions:	"Community Programs, expand access to cultural and spiritual activities Increase opportunities for community engagement" (Chapter 4)	Expanding access to cultural and spiritual activities is a huge part of the revitalization of culture.
	"Coordinate with DNR regarding activities to support species restoration and revitalization of traditional management" (Chapter 4)	Traditional management revitalization is clearly cultural revitalization, and the restoration of important species goes hand in hand.

	"Expand emergency food programs" "Expand food and water backup systems in each community and individual household" (Chapter 4)	Emergency management with increased community preparation individually is important for the Karuk community.
Other:	"Expand communication backup systems and redundancies"… Increase external communication potential with radio repeater on Horse Mountain… "Increase internal communication potential with radios in all vehicles, develop radio traffic monitoring, logging and responding protocols" (Chapter 5 Emergency Management)	Expanding communication capabilities for emergency situations is essential for preparedness at the community level for potential events caused by climate change.
	"Increased time off, especially before and after fire season more explicit recognition of mental health impacts, specialist support" (Chapter 6 Capacity)	Time off for mental health reasons around fire events is supportive of the Karuk community specifically for multiple reasons.
	"Continue longstanding traditional practice of adaptive management, support cultural practitioners, youth mentoring and youth-elder interactions" (Chapter 7 Karuk Sovereignty)	Recognizing the longstanding traditional practice of adaptive management is important for the sovereignty chapter of the Karuk CAP. This adaptation also gets at the importance of multi-generational connection and involvement in climate adaptation.

Similarly to the CTUIR CAP, the Karuk Climate Adaptation frequently turns to its tribal members who are cultural practitioners or who are just living in ancestral territory with observations for building of the knowledge and information that is important for management and planning for climate change. In the example in the table, the plan shows that there is always knowledge being developed, and that this will be

critical to document for ensuring that the best and most informed management actions will be done. In the Interviews with Karuk Staff, the importance given to cultural practitioners and community members was apparent in an example with the research plots that are being used "we have got lots of cultural practitioners to come out with us and looking at see what they have to say those that's been our main like data… it is so much more deep than what we get from taking all the temperature data" (Bourque, 2022). He also mentioned a "citizen scientist" tool that has been developed to record people's experiences with changes with the focal species. However, here too as the tool is online and place based, there is the element of having to protect the knowledge, "…it doesn't show exact locations…because we don't want people to know where people's spots are to gather…That's how we're trying to engage folks as well" (Bourque,2022).

There were also a lot of public education adaptation actions mentioned throughout the plan. Public education on how to recognize and deal with invasive species, heat stress, emergency evacuation routes and other things is essential in preparing the community to participate in adapting to climate change.

As seen above with the focus on tribal capacity to assert sovereignty, many of the program related actions were for programs that affected or engaged the community in some way. Access to practice spiritual and cultural activities was stressed as important throughout the document. In textual analysis, the term "tribal management" occurred 102 times, "cultural burning" 140 times, and "cultural practices" 37 times throughout the Karuk planning document corpus (see Appendix C for graph). Traditional management revitalization is clearly cultural revitalization, and the restoration of important species goes hand in hand. Emergency management with

increased community preparation individually is important for the Karuk community. There is also an element of intergenerational learning, connection and engagement in the action step that pertains to youth-elder interactions and mentorships. This reflects the emphasis on community connection that was also seen in the CTUIR plan. In interviews with Karuk Tribe staff, the intergenerational learning piece was also emphasized "with the Pikyav Field Institute, the main thing is intergenerational learning… We've taken them [K through 12 students] out in the field and field trips, [to] look at the fire stuff… and we try to bring elders in too for that connection." (Bourque, 2022).

Expanding communication capabilities for emergency situations is essential for preparedness at the community level for potential events caused by climate change. Time off for mental health reasons around fire events is supportive of the Karuk community specifically for multiple reasons. Recognizing the longstanding traditional practice of adaptive management is important for the sovereignty chapter of the Karuk CAP. This adaptation also gets at the importance of multi-generational connection and involvement in climate adaptation.

Comparison to Tribal Climate Adaptation Guides

There are many ways that the two tribal climate adaptation plans studied reflect and are in line with the resource that has been mentioned in the literature review, the Tribal Climate Adaptation Guidebook. For instance, in choosing an approach, both of the studied climate adaptation plans are examples of Comprehensive approaches as described in the guide on page 17 (Dalton et al., 2018). And the CTUIR also took the

"Existing Planning Efforts" approach by highlighting what has already been done by various CTUIR departments that address climate change.

Another point of interest is the section of the guidebook, "1.3 Developing a vision." The CTUIR has their First Foods vision already, and the two previous planning documents, the "Umatilla River Vision" and the "Umatilla Uplands Vision" provide visions for the environments that the CTUIR lives on, furthermore, there are three clearly identified goals of the plan at the beginning of the CAP document. The Karuk Tribe was actually featured in this section of the guidebook because of their vision included in the Eco-Cultural Resources Management Plan.

In another section, "1.6 Tribal Community Engagement, the CTUIR was featured for their Climate Vulnerability Assessments attention to First Foods, and how they are specifically looking at how climate change will affect the foods that play a critical role in the Tribe's community and culture. Another key guidance in the Guide was about sharing and storytelling along the way, and both Tribes utilized videos and webinars to share to and involve the community.

These are just a few examples, but, in general, just the overall process that tribes are encouraged to use in the guidebooks is followed by the two plans studied here, and they provide in depth examples of how some tribes processes can play out in developing a climate adaptation plan.

Comparison of both Karuk and CTUIR Climate Adaptation Plans

This research focused on two tribal communities: the Confederated Tribes of the Umatilla Indian Reservation, and the Karuk Tribe of California. Since this research asks the overall research question; What lessons can be learned from Tribal climate adaptation planning in the context of their unique communities, culture, and history? It is useful to discuss the similarities and differences between these two tribal communities that have arisen based on this research. This comparison is done with the recognition that there are significant differences in size, treaty existence, culture, and context and history. However, by examining these differences or similarities and connecting them to how the Tribe's climate adaptation planning plays out, we can begin to reveal implications that could be useful for other tribal and non-tribal entities to do their own climate planning work for their own communities' history, size, etc. As this research shows, the two Tribal communities share a lot of their basic values and overall strategies for climate adaptation despite these surface differences.

Table 7: Overall Differences/Similarities

	Karuk Tribe (*Karuk Tribe*, n.d.)	CTUIR (*CTUIR - About*, n.d.)
Government staff	~231 employees	~500 employees
Operating budget	~$37 million	~$97 million (in 2003)
Tribal membership	~3751 enrolled members	~over 3,100 tribal members
Land ownership	1000+ acres in trust land, Three "service districts" of Yreka, Orleans, and Happy Camp	172,000 acres in reservation land
Gov structure?	"The governmental structure includes nearly twenty departments, programs, and services organized into three service districts" (Tripp & Norgaard, 2016)(Karuk CAP)	

The treaties signed between Tribal Nations and the United States Government provided a legal foundation to remove tribal people from their lands and created a "trust relationship" between the two nations. Treaties also protected rights and access to land, and for the CTUIR, the representatives of the Tribes pushed for protection of their rights to fish, hunt, gather, etc. in usual and accustomed places on the land that was ceded in the Walla Walla Treaty of 1855. They also reserved land for a Reservation for

their people to live on, which was originally 510,000 acres but over the years has been reduced to only 172,888 acres, checkerboarded with ownership by Indians and non-Indians. Meanwhile, the Karuk tribe had drafted two treaties in the treaty-making period, but neither was ratified by the U.S. Senate. This was because the ancestral territory of the Karuk Tribe sat on potential gold sites and agricultural potential.

The advantage of treaty protected land does give the CTUIR some more authority over land management and the protection of the rights to practice cultural activities and management. That is not to say that both tribes weren't significantly impacted by land loss and the decline of accessibility to traditional resources and traditional land management. However, this might explain some differences in the planning approaches of the two Tribal communities.

For instance, the digital content analysis revealed the vast difference in the word "revitalization," the Karuk used the word while the CTUIR did not. Interviews gave insight to this point. Cheryl Shippentower, Umatilla Basin Hydrologist of the CTUIR reflected, "I don't know that its revitalization, I wouldn't say that at all because they've been practicing culture and lead practices all the time" (Shippentower, 2022). Caleb Minthorn similarly reflected on the long process of obtaining and preparing land for tribal management once land has been bought or given back to the Tribes. On the other hand, Shawn Bourque of the Karuk Tribe government reflected on the difficulty of getting fire back on the land that is not in Karuk ownership, "I think the main problem is access to be able to do it legally. You know, I think a lot of people know how to do this stuff here but its not legal" … "We're trying to push it more on that [land that the Tribe does have] because the Forest Service can't really get involved, because the Tribe

has bought land so we've done some of those [cultural] burns without permits" (Bourque, 2022). So it's really that history of fire suppression and lack of access to land that has brought about the word revitalization, not that the culture has been completely lost. Other terms were used differently between the two Tribes and their planning documents as revealed in the

Its compelling that on the Umatilla Indian Reservation, there are an additional 300 Indians who are members of other tribes, and 1,500 non-Indians living on the reservation. The CTUIR government is based on the Reservation, governing its affairs. On the other hand, the Karuk Tribe's members primarily live in three towns of Orleans, Happy Camp, and Yreka. These are the "service districts" that the Karuk Tribe oversees, but they are significantly dispersed across the landscape. This adds challenges for the Tribe that are not as present for the CTUIR. Both tribes also of course have tribal members who do not live on the Reservation of service districts of the Tribes that they also consider.

The two tribal communities have relatively similar tribal membership, but the size, budget, and capacity of their governments differ significantly. Arguably, this can be traced to the advantage that the CTUIR does have with treaty protected rights and resources. The Karuk Tribe on the other hand only gained federal recognition in 1978.

Cultural Revitalization

Table 8: Cultural Aspects Comparison

Cultural Aspects		
Karuk Tribe	**Confederated Tribes of the Umatilla Indian Reservation**	**Findings**
• Structure: No stand-along chapter on culture	• Structure: No stand-alone chapter on culture.	• First foods framework and Focal species are similar, although different models that climate and natural resources management are based off of. • Both have educational frameworks to involve community members with cultural activities.
• Focal Species/Cultural Indicator Species	• First Foods Framework/Mission	
• Restoration of traditional fire regimes and cultural burning as a focal point.	• Restoration of traditional fire regimes and cultural burning/prescribed fire.	
• No active tribally funded language program, but uses Karuk language in plan.	• Active language program, adaptations to further support tribal language learning.	
• Adaptations to support "Eco-cultural revitalization"	• Use of TEK (in combination with scientific knowledge)	
• Pikyav field institute.	• First Foods excursions.	
• Structure: No stand-alone chapter on culture		

Culture is emphasized throughout both the CTUIR climate adaptation plan and the Karuk Tribe Climate Adaptation plan. Most notably, they are both structured around a culturally-focused model for the protection and enhancement of culturally important natural resources. The CTUIR CAP follows a "First Foods Framework" in line with the

First Foods Mission that the Natural Resources Department (and others) of the CTUIR works with. This framework/mission explicitly connects the cultural resources of "First Foods" with planning for climate change. The "First Foods" are based off a creation story of the Tribes and reflects the responsibility the tribal people have for protecting the first foods who will sustain them in turn. The CTUIR also works under the concept of "tamanwit," which describes interconnectedness between living things and the reciprocal relationships between them.

In a very similar way, the Karuk Climate Adaptation Plan is centered around "focal species", or "cultural indicators", which like the First Foods, are species that have cultural importance for the Karuk Tribe. The focal species go beyond food and include species that are important for regalia or ceremonial purposes, and each one has tribal stories and attached to them. These species are used as indicators for the health of each habitat zone that the CAP lays out. The Karuk government also operates under a concept of "pikyav", which means "to repair" or "to fix," referencing that one can fix the world through fishing, returning fire to the landscape, implementing tribal programs, creating policies, and working to repair and restore the systems of the Klamath basin and its people, etc (Norgaard, 2019).

The Karuk Tribe also has a central focus throughout the plan on the revitalization of traditional fire regimes. The return of fire on the landscape is an adaptation action that is present in the CTUIR CAP as well, although it is not in almost every chapter as it is in the Karuk plan. Both tribal communities had experience with fire suppression throughout history, although the lack of reservation lands to be able to

manage could be a factor in the difference of focus between the Karuk Tribe and the CTUIR.

Through these basic frameworks that guide the climate adaptation plans, both Tribes are centering their communities' cultures explicitly not only to uphold the culture in planning efforts, but because their cultures are inherently in relationship with their environments, and they have cultural management practices and traditional ecological knowledges that are helpful in climate adaptation.

There are also similarities in the actions that the tribes have taken or intend to take regarding enhancing cultural activities. For example, both Tribes have had had research done on food, or "food assessments," and both seem to intend to do more through their adaptation actions. Interestingly, one adaptation action the CTUIR CAP expressed an action to create indicator species just as the Karuk Tribe has done as a key point in their plan.

Both Tribal communities also had big emphasis on education throughout the plan as an overall adaptation action, and many adaptations were related to cultural continuity and revitalization. The CTUIR has several methods of educating about culture and cultural activities. For example, through the CTUIR DNR and Cultural Resources Protection Program, there have been multiple opportunities for First Foods education. First Foods excursions for example provide hands-on cultural learning opportunities for tribal members to travel to new locations on the land and learn from knowledgeable community members. The Karuk CAP has adaptations that seek to support more cultural activities in a similar manner. Additionally, the Karuk Tribe have their Píkyav Field Institute, which aims to expand Tribal capacity, build upon partnerships with

academic institutions, include traditional and western scientific knowledge to inform co-management, build upon pilot programs to educate tribal and non-tribal youth, and more (*Píkyav Field Institute*, n.d.).

The CTUIR has an active language program that supports the revitalization of the Umatilla, Walla Walla and Weylíletpuu languages. It offers a language immersion program at the Nixyaawiii Community School, community classes, and hosts language events. The CTUIR CAP's adaptation actions support the language program in many actions. The Karuk tribe does not have a tribally funded language program, although language learning happened through youth-elder mentorships, according to the Interview with Shawn Bourque. The Karuk CAP has multiple adaptations that aim to support educational opportunities and youth mentorships and youth-elder engagement. As evidenced by the Interviews, cultural activities are very much alive in both the Tribal communities, and the climate adaptation plans both address this and advocate for the enhancement of culturally related management practices in the face of climate change.

Community Engagement

Table 9: Community Engagement Comparison

Community Engagement		
Karuk Tribe	**Confederated Tribes of the Umatilla Indian Reservation**	**Findings**
• Structure: No stand-alone chapter on Community Engagement	• Structure: Yes stand-alone chapter on Community Engagement.	• Documenting/ valuing having community members share their knowledge is key. • Education on climate changes, emergency preparedness, etc. for community members is highlighted for both. • Communication and connection action items were more about technical communication systems for Karuk and cultural cohesion for CTUIR…
• Adaptations for communication systems for emergency preparedness.	• Adaptations that propose feasibility studies for discerning community opinion (preferred energy option).	
• Adaptations on Consulting with knowledgeable tribal members (cultural practitioners, etc) documenting "new cultural knowledge"	• Adaptations for strengthening community connection and cohesion.	
• Connection between ability to practice cultural traditions and health (mental & physical is highlighted	• Adaptations on consulting with Tribal members, documenting, monitoring.	
• Education: "Public education" – to learn about TEK, climate affects, emergency evacuation, invasive species management, etc.	• Connection between ability to practice cultural traditions and health (mental & physical is highlighted.	
	• Education: climate & compounding effects, health, wilderness safety.	
	• Education: climate & compounding effects, health, wilderness safety.	

The CTUIR CAP had a much more in-depth written review of the community engagement actions that were taken for the development of the plan in the writing of the plan itself than the Karuk CAP. However, both had many adaptation actions that pertained to involving and engaging the communities, both tribal and non-tribal. Both plans made it obvious that the expertise, knowledge, and opinions of the communities are valued for the documentation of climate changes, and for future adaptation actions. For instance, the Karuk plan mentions "new cultural knowledge," suggesting an involvement of community to find it, and Interviews revealed the importance of cultural practitioners in many management actions and research (Bourque, 2022). The CTUIR has many adaptation actions that support the inclusion of Tribal members in documenting changes that they have seen on the landscape, and the building knowledge that can influence adaptation actions. The CTUIR CAP webinars also revealed the inclusion of Tribal members in providing knowledge, with the inclusion of cultural practitioners in presentations, such as the "fisherman scientist," Bud Herrera, in the third CAP webinar. Both Tribes also have or are developing reporting tools for Tribal members to easily access and upload their observations (Sanders 2021, Bourque 2022).

Interviews also revealed a high regard for the protection of Traditional Knowledges. Staff members from both Tribes spoke about how there is a lot of research done by the tribes that stays internal, and that when academics do get council approval to publish things, the names of culturally important places and other sensitive knowledge topics are made sure to be removed. Althea Huesties-Wolf frequently recalled her own experiences as a Tribal member who practices cultural activities to emphasize the importance of listening to cultural practitioners,

> "Personally, as the gatherer, I believe, gatherers, fishermen and hunters are excellent sources of data because they are out there and they see these sites, hunting, fishing, gathered sites every year, and they know changes. And in conversations, whether it's formal or informal, if they want to submit it as a comment or they want I just stopped the staff person who works in that area and just fill them in on the change have are the concern they can do that." (Huesties-Wolf, 2022).

The two-climate adaptation plans also had adaptation actions that addressed education as a tool to support their communities in the face of climate change. The Karuk plan frequently used the term "public education" to refer to education actions that supported the enhancement of knowledge for non-tribal community members on topic such as treaty rights, cultural practices, etc. The CTUIR plan also addressed the education of non-tribal members on these topics in attempt at defusing possible tensions, when tribal members practice traditional practices on the ceded lands for instance. Both plans used education as an adaptation to ensure that the community is knowledgeable about climate changes, how to recognize invasive plants, evacuation plans, individual mitigation actions, and more in order to be prepared for climate change. The CTUIR CAP highlighted community connection and cohesion as well, with adaptations such as developing a community kitchen, and supporting more community sharing events. Although this was less apparent in the adaptation actions of the Karuk CAP, the actions that support intergenerational learning as mentioned above reflect it as well.

Tribal Rights and Sovereignty

Table 10: Tribal Rights and Sovereignty Comparison

Tribal Rights and Sovereignty

Karuk Tribe	Confederated Tribes of the Umatilla Indian Reservation	Findings
• Structure: Yes stand-alone chapter on Rights and Sovereignty	• Structure: Yes stand-alone chapter on Rights and Sovereignty	• Both had a whole chapter for rights and sovereignty, highlighting the ability to practice cultural traditions on the land. • Increasing participation in regional, state, and national levels of policy making and climate adaptation are apparent in both. • Karuk also had a chapter on tribal capacity, while CTUIR had a chapter on "Celebrating CTUIR resilience".
• History is frequently cited and considered	• History is frequently cited and considered	
• Ability to do cultural practices is rights and sovereignty	• Ability to do cultural practices is rights and sovereignty, adaptations reflect this.	
• Other agencies are starting to be interested in Karuk knowledge, & adaptations to be involved in statewide, and national policy, engage in policy and maintaining relationships with other gov entities. (e.g. Forest Plan Revision Process)	• Other agencies are starting to be interested in CTUIR knowledge, adaptation to expand opportunities to include First Foods in shaping regional policies.	
• Many adaptations to increase internal capacity and coordination.	• Chapter on celebrating what the CTUIR has already done along with adaptations to increase internal coordination.	
	• CAP process brought many departments together.	

The Karuk Tribe and the Confederated Tribes of the Umatilla reservation both have multiple agencies, entities, and governments that they must communicate and have relationships with in order to fully realize their authorities, management, self-governance and sovereignty. This topic is so significant that both Tribes had individual chapters to address it. Many adaptations in both explicitly point out what entities to strengthen relationships with. The need to build on these relationships is shown to be especially important because of the recent increase of interest by these entities in the Traditional Knowledge that tribes hold. The Karuk CAP even provides adaptation actions that address participation in national discussions on climate change.

Both CAPs frequently reference tribal history, from the pre-colonial way of life that has been lost or that has survived, treaty-making, the infringement on ancestral lands, dams constructed on sacred sites, etc. One quote in the CTUIR CAP explains why this is seen throughout the plans well, “The past shadows every act and thought for my people today; it circumscribes our dreams and, to a large degree, has limited our future. Thus today for us, past history is living history.” ~Maudie C. Antoine, CTUIR BOT Chairwoman, 1955” (Sanders, 2021).

The Karuk plan emphasizes the adaptation action of increasing the Tribes capacity through a chapter dedicated to it. Although it does not have a stand-alone capacity chapter, the CTUIR plan does also have some adaptation actions that address increasing internal coordination and communication between departments. Interview participants reflected on how the CAP planning process itself increased communication and collaboration between different departments of the Tribal governments. The significant difference between the size of the tribal government and their budgets may

explain why the Karuk plan has a chapter dedicated to increasing tribal capacity and the CTUIR plan does not. This could be connected to the lack of treaty backed rights and reservation as compared to the CTUIR as well. However, the CTUIR also dedicated a chapter to showcase what the Confederated Tribes have already done that can be seen as beginning climate adaptation planning.

Lessons learned part of Interviews

Each interview participant was asked if they had any lessons learned from their experience as a part of the climate adaptation planning process that could be shared with others, especially in tribal communities, doing their own climate planning work. Almost universally, themes of going to back to the Tribal community and knowledge keepers from the begging was emphasized as a critical part of starting to go about planning work;

> "I think it [the planning experience] at least showed you can't just try to solve climate change on [just] a government level. It's something a community has to be invested in.. we all have a niche that makes our community whole" (Huesties-Wolf, 2022)
>
> "Quadruple the amount of time of education and outreach and community engagement. And then bring it together with initial concept. And then share that and be flexible with modifications. And, again, double the amount of time in that process that you are then able to reach certain group of people. And then prepare your document and share as Colleen has done with the community." (Ely, 2022).
>
> "input should come from the tribal community because they'll be the ones most impacted. They're the ones that have the knowledge of the landscape and resources." (Shupeentower, 2022).
>
> "I would look into the oral history first. I would go to the elders, ask them what they know of what we lost and what they don't remember. And then from there, you can, you know, you can start referencing other other tribes work that might be similar" … "my advice would just be to go back to the elders because they're the ones that they're going to hold that traditional knowledge" (Minthorn, 2022)

They also emphasized different ways to include cultural aspects in the planning process:

> "It's simple in that if you don't have tribal members doing the work, at some point, the the cultural significance starts to drop off and wane off or will start to disappear" (Minthorn, 2022).
>
> "And they're [oral histories] important because the traditional knowledge might be layered within those stories on how we fought climate change two or 300 years ago, this isn't the first time it's happening. So that's, that's why the languages are important. Our people they'd seen this happen, they'd seen droughts, they'd seen wildfires" (Minthorn, 2022).
>
> "I think that keeping it more traditional than looking at how you are going make money in the capitalist system, is the best way to move forward for tribes" (Bourque, 2022).
>
> "So the coyote story would serve as a warning to not enter that area [the Hanford nuclear waste site]. That would last across the span of time through the story that this legend" (Huesties-Wolf, 2022).
>
> "have high school education outreach as well get to the high school students and see if we steal an hour from the science teacher and do some education outreach with the tribal perspective in mind" (Ely, 2022).

Along with this, there was an emphasis on keeping traditional knowledges protected, and making sure that community members are comfortable to share:

> "I mean, we have lots of conversations only some of its public… there's a whole bunch of stuff from my research I've been a part of that's just internal… we do share with the Karuk people and everything, but we don't share with the world." (Bourque, 2022).
>
> "We don't like to share you know, locations of where these foods are. When we do these oral histories, it's not shared with the public is just shared with tribal members" (Shippentower, 2022).

One participant also mentioned the fact that they are not only planning to improve their own community, but to make changes for the better of all and the surrounding community:

“If we advance the first foods and bring them back to life, that's going to produce more robust economic activity…we never say that that they're ours to keep and ours to hide forever, or we're trying to do is bring them back. So that way everybody can enjoy that” (Minthorn, 2022).

Conclusion

This research revealed that there are many ways and lenses in which one can look at Climate Adaptation in Tribal Communities. It confirmed and built upon past reviews of climate adaptation plans for tribal communities that already showed the importance of creating plans from a tribal perspective and that include the tribal world views. The research was inspired by the abundance of networks, theory, and resources for tribes embarking on climate change, especially the fact that each of these resources point out that each tribal community needs to have their own planning process to fully respond to their unique histories, community knowledge, values, and priorities. These two deep dive case studies provide examples of how Native American Tribes have developed climate adaptation plans that consider the histories, cultural values, and priorities of the communities for which they were made.

Preliminary research for this Thesis found that three key topics were indicative of priorities for Tribal communities: Cultural revitalization (or continuance/aspects), Tribal Rights and Sovereignty, and Community Engagement. These three main topics guided the rest of the research, examining exactly how each of the two case studies addressed them. However, there are many more topics that could be examined to reveal how the climate adaptation plans were unique to their communities, not to mention the depth that could be done with each of those topics.

Although these three main topics were used to examine the climate adaptation planning strategies of the two Tribal cases separately, the findings showed that they are all very interconnected, and discussing one for long enough will eventually lead to another. This further represents the idea of ‘holistic management’ that both Tribal

communities were shown to value. Cultural aspects run throughout both climate adaptation plans as basic frameworks for their climate planning (e.g. First Foods and Cultural Indicators). Education actions for community were shown to be important for multiple levels, from tribal and non-tribal, personal safety, individual actions, cultural activities, intergenerational learning, etc. Strengthening and maintaining partnerships with other entities such as U.S. government agencies, Universities, and regional organizations was shown to be important, just as much as creating new partnerships and participation opportunities. Internal capacity building and celebration of existing actions were highlighted in the climate adaptations plans. And, both plans clearly valued the knowledge of their communities for current and future actions on climate adaptation.

There are many different avenues of future research for this topic. For one, the utilization and protection of TEK in internal Tribal activities and in external partnerships with non-tribal entities could be further researched in a case-by-case basis such as this. There could also be more research simply on how partnerships with other entities are established and maintained, especially with the context of Tribal histories, cultures, and values in mind. This research focused on relatively new climate adaptation documents. The Karuk Climate Adaptation Plan was completed in 2019, and the CTUIR Climate Adaptation Plan is still in its final draft stages. Both claim to be "living documents" that will be changed as knowledge and climate shifts become reality. Because of the freshness of these documents, this research focused more on the content of the plans, and it touched upon the planning process. However, climate adaptation planning is not static, after all it is only a plan, but true adaptation will only come from actions. Therefore, it will be valuable for future research to examine how

climate adaptation planning plays out post-plan creation. Another potential avenue for future research is looking further into the capacity of Tribes and what they can do in climate adaptation while working on increasing internal capacity. This was begun a bit in the review by Gordon Miles (2018), but it could be done in a way more like mine with deeper cases studies. I would also be interested in seeing this research specifically on how the communities' values and cultures for whom climate adaption plans are for are integrated in non-tribal plans as well.

In addition to being valuable for other tribes in embarking on climate adaptation plans, I believe this research is valuable to understand how Tribes are developing their own climate adaptation plans for their own communities. So that in using things like Traditional Ecological Knowledge for the planning efforts of non-tribal entities there is an understanding of how they are implemented in the Tribal context. I hope this thesis can be a basis to understand this for non-tribal entities. And I hope that it will provide in-depth examples of how two Tribal communities have created climate adaptation plans with their communities' values and priorities in mind for other Tribes that are embarking on climate change adaptation.

Appendix A: Textual Analysis Buckets & Key Words

Cultural Revitalization

Key Words/Phrases:

Cultural Revitalization, Revitalization, Fishing, Fishing rights, Dip-netting, Gillnet fishing, Tribal fisherman, Gathering, Gathering rights, harvesting, Subsistence, Hunting, Medicinal plants, Cultural resources, Cultural practices, cultural identity, Traditional relationships, responsibilities, Religious, Ceremonial spiritual

Traditional Knowledge/Traditional Ecological Knowledge

Key Words/Phrases:

Traditional Ecological Knowledge, Traditional Knowledge, Indigenous knowledge, Citizen Scientists, Tamánwit, Pikyav, Habitat relationships, Plant populations, associations, Ecological relationships

Traditional Management

Key Words/Phrases:

Traditional Fire Regimes, fire, fire management, traditional fire management, cultural burning, Burning**,** Future generations, Seven generations, generations, children, grandchildren**,** Cultural indicators

Types of management: Burning, Fishing, Hunting, Gathering, Harvesting, Medicinal plants

Tribal Rights and Sovereignty

Key Words/Phrases:

Collaboration, Aboriginal use area, Traditional use area, Intergovernmental Collaboration, Self-determination, Consultation, Trust responsibility, Government-to-

government, Tribal-federal policies, tribal-federal relationship, Intergovernmental, Inter-tribal, Coordination, Jurisdictional coordination. Agencies/Entities: Forest Service, Oregon State, California State, Washington State. Other Tribes: Yurok, Hoopa, Nez Perce, Klamath, Grande Ronder, Yakima.

Historical Policy and Management

Key Words/Phrases:

"Usual and accustomed places" , Ceded lands, Assimilate, Assimilation, Boarding Schools, Termination, colonialism, Federal recognition, Resistance

Community Engagement

Key Words/Phrases:

Testimony, Citizen scientist, Fisherman scientist, Tribal Elders, Community Members, The community, Use of quotation marks Climate Concerns and Actions: Air quality, air, clean air, pollution, emissions, Climate, Climate Change, Increased Temperatures, weather conditions, Climate displacement, Energy, clean energy, sustainable energy, Broadband, internet, cell service, Infrastructure, transportation, Health, mental health, human health, diet, welfare, traditional foods

Appendix B: Interview Questions

Interview Script

I am gathering information about the Tribal perspective and leadership in climate adaptation planning for their communities. I've identified your Tribe as one of three Tribes I am studying to better understand the mechanisms and processes that Tribes use to create climate adaptation plans.

Is it okay to record this interview so that I can capture your responses accurately?

Your participation is voluntary, but the information shared will be helpful for other Tribes that are interested in beginning their own climate adaptation planning.

The first half of the interview will consist of questions to clarify and better understand some topics of interest I have identified based on the climate adaptation documents themselves. The second half of the interview is about delving into the process that was undertaken to develop the plan, specifically in regards to community engagement.

Interview Questions

Part 1: Elaboration of content analysis

Tribal Rights and Sovereignty

1. How would you say the climate adaptation plan addresses Tribal Rights and Sovereignty?
2. How did the role of other organizations and governments (e.g. USFS, DEQ, regional collaboratives) influence the climate adaptation plan?

Cultural Revitalization

1. How would you say this plan addresses a revitalization of Tribal traditions and culture?

2. (Why) is cultural revitalization an important aspect of the plan?
3. Was traditional knowledge a part of this process?
    a. Were protections for Traditional Knowledge put in place?
    b. How did you protect traditional knowledge?
    c. Describe to me the process of incorporating traditional knowledge into this plan. What challenges did you encounter?

Community Engagement

1. How has the community been involved in the creation of the climate adaptation plan?
2. How were different perspectives incorporated into this document?
3. How were planning participants identified? How were community members informed of the creation of the plan?

Part 2: Process

1. What was your role in the planning process?
2. What do you think motivated your tribe to undertake the process of creating a climate adaptation plan?
3. Could you give me a roadmap of the process from your perspective?
4. What was the purpose and goal of the plan?
5. How were the planning needs identified?
    a. How does this plan meet those needs?
    b. Were there additional needs revealed during this planning process? How were they addressed?
6. How did the plan goals align with the Tribe's goals?

    a. How is this plan connected with other projects, plans, and policies that the Tribe has done in the past?

7. How were tribal goals and values identified?
8. How were tribal goals and values incorporated in the plan?
    a. Has the plan been effective at identifying and representing the Tribe's needs?
9. Are there critical actions that were not included in the plan?
10. Do you feel that this plan includes aspects that a non-tribal plan would not? What are they?
11. How do you think the plan caters to the Tribes community specifically?
12. Who developed the planning process?
    a. Were non-tribal entities involved in the planning process?
    b. How were other planning participants identified?
13. Did you utilize tools made for Tribes in climate planning initiatives? (e.g. Tribal Climate Adaptation Guidebook, Tribal Climate Change Menu, Guidelines for Considering Traditional Knowledges in Climate Change Initiatives, Climate Change Principles)

Lessons learned

1. What were the lessons learned?
    a. What challenges did you encounter in the planning process overall?
    b. What would you say were the successes of the process?
2. What would you have changed about the planning process if given the opportunity? If you had to update the plan what would you do differently?

3. What are the best planning processes for aligning and incorporating Tribal values, goals, and priorities into plans? (what worked well?)
4. What advice would you give to another Tribal community embarking on the process of creating a climate adaptation plan or taking climate actions?

Part 3: Community Engagement History

1. What was the level of community engagement for the climate vulnerability assessments?
2. How were the responses of the community to the climate vulnerability assessment taken into account for the creation of the climate adaptation plan?
3. What other plans and policies have you been a part of?
4. How did you engage the community in these projects?
5. What have you learned about the concerns of the community?

Concluding questions

1. Is there anything else you would like to discuss?
2. Is there anything else you want to know about this study?

Appendix C: Historical Context

The Confederated Tribes of the Umatilla Indian Reservation and the Karuk Tribe have a lot in common as Native American Tribes that have rich histories of living with the land and practicing traditional management practices on the it, as well their experiences as survivors of European intrusion, disease, genocide, and the multitude of offensives that came with them. However, they each also have their own histories and experiences as Tribes. In this section I will explain some of the most important events in their histories in relation to Tribal Sovereignty and Policies of the U.S. Federal government, States, and the Tribal governments themselves. These histories are important to consider today as the Tribes embark on their climate adaptation strategies as Sovereign governments.

The Tribes of the Walla Walla, Umatilla, and Cayuse were travelling peoples, sharing hunting sites, trails, and village encampments along important places on the Columbia river basin and its tributaries.

Oral traditions and stories had and have a significant role in the worldview of Tribes across the country. Their stories are geographically associated with sites and places throughout their homeland. The animism of place is central to the worldview of the Plateau tribes, places, like animals and plants, are recognized to have a spirit and therefore must be treated with respect (Morning Owl et al., 2015).

The Tribes of the Walla Walla, Cayuse, and Umatilla lived under *Tamánwit*, referred to as "our Indian Law" as translated from Sahaptin (Jennifer, 2006)… It is the lifestyle the Tribes lived by. "In the stories of our people, *Tamánwit,* is an ideology by which all things of the earth were placed by the Creator for a purpose." It is a reference to the

creation story of the people and the land, and the promise that was made when the Creator decreed that the people take care of the land through harvesting, sharing, and consuming the first foods, and managing the landscape. The land would in turn take care of them. In the tradition, each food spoke one by one in order, to make the promise to the people (Jennifer, 2006). The Karuk tribe's oral tradition has a very similar part in their story of creation (Norgaard, 2019). The philosophy of reciprocity and responsibility between the people and the land and its plants animals is prevalent across many Tribal communities. Genna Beaucage of the Nnishnaabeg Nation put it this way, ". We have no such thing as capital. We have relatives. We have clans. . . . My ancestors -didn't accumulate capital, they accumulated networks of meaningful, deep, fluid, intimate collective and individual relationships of trust. In times of hardship we did not rely to any -great degree on accumulated capital or individualism but on the strength of our relationships with others. - . . ." (Norgaard, 2019).

Tribes all over the world recognize the earth as their mother, belonging to all of us, to be cherished, respected, and taken care of just as she takes care of us. As Maudie C. Antoine described at the 1955 1855 Treaty Centennial, "That one man That one man could claim a piece of the earth for himself, to hold against all others, was as unthinkable in Indian philosophy as it is to you and I - that one may keep a piece of the sky above us, the sky that in this present day conception is the one thing man must share in common (Jennifer, 2006).

It was in this way that both the Tribes of the CTUIR and Karuk lived and managed their homelands. Both practiced cultural burning, to enhance the quality of their forests and keep travel routs open. Smoke was beneficial, cooling river

temperature and decreasing evapotranspiration by plants and increasing river flow, so that then salmon could begin their upstream migration (Norgaard, 2019). A philosophy held by the Karuk Tribe that is guiding for research collaboration today is “pikyav” translating to “to repair,” and pikyávish refers to the world renewal ceremony that is practiced every summer. Through this, the Karuk tribe is working to repair and restore social and ecological systems in the Klamath Basin (Norgaard, 2019).

These philosophies have shaped the ways that the Tribes lived pre-colonization, and they continue to be guiding in the activities in the Tribal Governments’ activities to this day. Native Americans are set apart from other racialized minorities in this country because of their indigeneity and nationhood.

reservations, termination, restoration,

The Confederated Tribes of The Umatilla Reservation

The Treaty of 1855

The U.S. government’s justification for making treaties to get Indians off their valuable homelands and on to reservations was that the inevitable wave of white settlement was going to become increasingly dangerous for Native Americans unless they had a designated place to live. By the time the Treaty of 1855 began, the Cayuse, Umatilla, and Walla Walla tribes had heard of what was happening in the East, and some of them at the Treaty council knew how to read and write in English already (Jennifer, 2006). The proceedings were negotiated on behalf of the U.S. government by Isaac I. Stevens and Joel Palmer, superintendents for the Washington territory and the Oregon Territory, respectively. Although the initial treaty was intended only to make two treaties and reservations, one with the Yakima, and one with the Nez Perce, the Umatilla, Walla

Walla and Cayuse chiefs managed to convince General palmer to create a third reservation (Jennifer, 2006). It was signed by at least thirty six headmen of the Cayuse, Umatilla, and Walla Walla Tribes.

The values of the Tribes were not left unspoken at the Treat Council, there were multiple accounts of ancestors talking about how important the land was their people, and that the children needed to be considered because they needed a place to live. *Tamánwit* was emphasized, as the Tribal leadership tried to explain what the land meant to them, and that selling it was abhorrent to think of (Jennifer, 2006).

The Treaty of 1855 described the boundaries of the future Umatilla Indian Reservation, with 512,000 acres on the map to be the residency of the Tribes. The U.S. government, on the other hand, acquired 6.4 million acres of tribal lands to be distributed to Euro-American settlers (Umatilla River Vision). The Treaty also described promises to develop schools, mills, farms, and other developments, but the U.S. Government failed to follow through with most of them. It was ratified by the senate on March 8, 1859, a month after Oregon became the thirty third state in the United States (Jennifer, 2006).

Lands

The Umatilla Indian Reservation today is only a fraction of the original reservation size in the Treaty of 1855. The confederated tribes endured a series of further cessations of their supposedly treaty protected lands. The reservation lands were not surveyed until 16 years after the Treaty of 1855, and then it was surveyed to exclude an entire 230,000 acres area on the eastern bound of the original Treaty boundaries. In 1885 the Umatilla Allotment Act dimished the reservation by 120,000 acres, giving allotments to individual Indian families and opening the reservation to white settlement

(Jennifer 2006). Many descriptions of the boundaries of the reservation are still contested based on different interpretations (Jennifer et. Al, 2006). In 1939, 14,000 acres were restored to Tribal ownership of lands that had not been sold during the Umatilla Allotment act (Jennifer et. al., 2006).

Reservation life was detrimental to the way of life that the Cayuse, Umatilla, and Walla Walla tribes were used to. They were asked to pack up and move from their original land use area of millions of acres where they could roam freely to only a few thousands of acres on the Reservation (Hunn, 2005).

Many tribal members felt despair and grief at their situation, and this continues to this day. The Bureau of Indian Affairs made efforts to ban traditions of the Confederated Tribes, for example in 1891 it abolished traditional tribal chieftaincies because they were considered public authorities in conflict with the federal authorities (Pond & Hester, 2006). The federal government tried to assimilate them in many other ways too, discouraging tribal ceremonies, sending children to boarding schools, etc. Despite efforts to assimilate the Tribes, Tribal members kept up traditions as much as they could. “Traditional roles were still practiced but in new contexts, such as at the Pendleton Round-Up, where serenading often took place in the village” (Pond & Hester, 2006).

Although the Treaty of 1855 stipulated that the Tribes had the right to continue their traditional practices such as hunting, fishing, and gathering in their “usual and accustomed places” … the Tribes had to keep standing up for these rights through multiple court cases. Early on, Tribal water rights were reaffirmed by the Supreme court in *U.S. v Winans,* which established that tribes had sovereignty and reserved water

rights to continue their traditional way of life as laid out in the treaty negotiations, and the U.S. has the trust responsibility to uphold these rights. Then in 1908, *Winters v. U.S.* once again held that tribes has a federally reserved water right to satisfy the principle purposes for which the reservation was created (Quaempts et al., 2018a). These rights would yet again be questioned in the coming years.

Modern Governance

In 1934, Congress passed the Indian Reorganization Act (IRA) to create tribal governments and provided a template for constitutions and tribal societies. The CTUIR tribal referendum voted to reject the IRA because of the implications it had on giving up their old ways of leadership and the continuing oversight that the BIA would have over tribal government decisions (Pond & Hester, 2006). However, the Confederated Tribes' voted to approve a constitution and by-laws for the Tribe's drafted by Charles Luce in 1949, and it was approved by Secretary William E. Warns on December 7, 1949 (Luce & Johnson, 2006). The Constitution and By-Laws created a 9-member Board of Trustees (BOT) to carry out tribal governmental activities. A General Council retained authority to elect the BOT, amend the constitution, to remove BOT members, to schedule meetings, and determine who would enroll as a tribal member (Luce, & Johnson, 2006). Now organized, the CTUIR government embarked on projects to assert their sovereignty and protect and enhance the rights of tribal members.

Court Cases for Treaty Rights and Sovereignty

The 1950s saw important cases in federal court to establish and protect tribal treaty rights. In 1955 the BOT asked the tribal attorney to make a treaty right to hunt and fish on the reservation when Oregon's hunting and fishing seasons were closed.

Public Law 280 asserted that the State of Oregon had authority to regulate on-reservation hunting and trapping by tribal members, so the Confederated Tribes filed a suit against the State of Oregon to get a declaration that the state had no authority over on-reservation hunting and trapping by tribal members. The U.S. District court of Oregon ruled in favor of the Tribes, both on the Umatilla Indian Reservation and on the Klamath reservation as they filed the same claims (Luce & Johnson, 2006). In 1959 Oregon game wardens arrested tribal members fishing for Salmon on Catherine Creek, a site that was off the reservation (Luce & Johnson, 2006). The Game Commission interpreted the treaty right to fish at all usual and accustomed places as no greater than any citizens rights, rendering the Treaty fishing rights meaningless, so Tribes filed another case. In the end, the ruling was in favor of the Tribes, and the outcome set a precedent that the state could only regulate tribal fishing if it was "necessary for conservation" of the fish, and the states measures did not meet that standard at the time.

In 1953 the Indian Claims Commission act passed, giving Tribes the opportunity to clear up any more outstanding legal claims against the federal government. Through this, the CTUIR filed two major claims. The first was in light of the destruction of the incredibly culturally important Celilo fishery on the Columbia River, seeking compensation for the damage done by the creation of the Dalles Dam in 1957. The first issue with this was proving that the Confederated Tribes used the Celilo fishery as a "usual and accustomed station", complicated by the fact that is was far from their originally occupied territories, the fact that they had many other fishing spots and the assertion by the Yakama Tribe had exclusive treaty rights to fish as Celilo. Eventually, this was proven, and the settlement gave a total of $4.6 million in compensation to the

Tribes. It was paid out in per-capita payments. The second suit was seeking compensation for the 1859 taking of tribal lands for irrigation dams on the lower Umatilla River and for the erroneous survey of the UIR's boundaries (Luce & Johnson, 2006). It included claims for the taking of lands ceded by the Treaty of 1855 (Claim 1), and lands in Grant (Claim 2), Malheur (Claim 3), and Baker (Claim 3) Counties. In 1965, Claims 1 and 4 were settled, but with the requirement that claims 2 and 3 be surrendered, the settlement was for $2,450,000 which was also made out in per-capita payments.

The 1970s and 80s were significant regarding legislation. The Clean Water Act and the Endangered Species Act are passed. The Indian Civil Rights Act of 1968 applied Due Process and Equal Protection for tribes, with many provisions of the U.S. Bill of Rights. In 1975, the Indian Self-determination and Education Assistance Act authorized tribes to take over BIA and Indian Health Service federal programs (Johnson, 2006).

In 1966 another tribal fishing court case, *U.S. v Oregon* went through Oregon federal court after tribal fishers catch went down 13 percent after the destruction of the Celilo Falls Fishery. Four Columbia River tribes joined, the CTUIR, Nez Perce, Warm Springs, and Yakama tribes. In 1969, Judge Belloni reaffirmed the tribes' right to fish in their usual and accustomed areas, with a right to harvest a fair share and that the state could only regulate them for salmon conservation (Tovey, 2006). In 1974 in Washington, U.S. District Court Judge George Boldt reaffirmed tribes' rights and said that they have a right to harvest 50% of the available harvest (Tovey, 2006).. In 1976, Judge Belloni ordered the four Tribes to create a Columbia River Fish Management

Plan, this led to the development of the Columbia River Inter-Tribal Fisheries Enforcement (CRITFIC) department, made up of the four tribes. The begging of tribes, states, and federal agencies collaboration to rebuild salmon on the Columbia River was marked when the Bonneville Power Administration provided $100,000 for salmon projects for CRITFIC. CRITFIC remains an important entity for intertribal discussion and representation to protect treaty reserved fishing rights (Tovey, 2006). The CTUIR also established a Fish and Wildlife code to govern activities such as salmon harvest seasons for Tribal members, and the first Fish and Wildlife Committee was created in 1978. The Northwest Power Act of 1980 was the first act to require all fish management actions to work with the Tribes, and gave the Northwest Power Planning Council responsibility to rebuild naturally spawning habitat above the Bonneville Dam.

In 1982 the BOT formed the Department of Natural Resources with the original mission to "…protect, enhance, and restore the natural and cultural heritage of the CTUIR by ensuring the long- term health, availability, wise-use, and production of the tribe's natural and cultural resources in a manner consistent with Tribal values and scientifically sound resource management" (CTUIR 2005:2).

First Foods Framework

"The end goal of the First Foods-focused management strategy is the sustainable stewardship of natural systems in CTUIR tribal lands, using the long-term production and harvesting of the full First Foods order by the tribe as a primary benchmark for success." "The First Foods-focused mission highlights direct linkages between the ecological health of the Umatilla River and the health and well-being of Umatilla tribal

members. Degradation of the river, water quality, and associated ecological processes results in the loss of traditional tribal foods." (Jones et al., 2011).

Modern tribal members in leadership feel a responsibility to uphold the promises of the Treaty of 1855 and ensure that the vision that their ancestors had for the future of their children is materialized.

The Karuk Tribe

In 1850, the California Government passed an Act for the Government and Protection of Indians, which codified a caste system and indenture, it allowed any white person to apply to remove Indians from lands that he has claimed (Diver et al., 2010). In the years of 1851 and 1852, the State of California encouraged the extermination of Native peoples sponsored by a bounty of $0.25 to $1 per Indian scalp, this contributed to the quick decrease in population that the Karuk Tribe experiences, from about 2,700 people in 1850 to 800 by 1880 (Norgaard, 2019). The Karuk people lived further inland than the coastal Tribes, and many fled to the mountains to hide, their deep knowledge of the land helped them to survive the outright genocide (Norgaard, 2019).

Treaty Making

In the years of 1851 to 1852, the U.S. government negotiated 18 treaties with Tribes in the recently founded state of California for the reservation of about 7.5 million acres of land for Native use (Norgaard, 2019). However, because of the mining and agricultural interests in the lands proposed, the California state government would do everything they could to stop them. None of the 18 California tribes got ratification for the treaties. The Karuk and the other tribes did not get any protections, lands, or rights that they had tried to reserve in the treaties (Norgaard, 2014). Although, some

reservations were made, such as the Klamath River Reservation in 1855, and the Hoopa Valley Indian Reservation in 1864, they contained none of the Karuk aboriginal territory, but Karuk members were included to go to the Hoopa reservation. Many continued to hide in the mountains to avoid being forcibly removed to the reservation (Norgaard, 2019).

As of 2016, the Karuk tribe own about 901 acres of trust lands, and 777 acres of fee lands (Norgaard, 2019). The vast majority of the lands that Karuk recognize as their ancestral territory are under the management of the U.S. Forest service (Norgaard, 2019). Some allotments were given to Karuk members in "fee title", but in the 1920s, many could not make a living on their small allotments, therefore were not able to pay taxes, and were forced to sell their property (Norgaard, 2019).

Fire Suppression

The forests in Karuk ancestral territory were deemed valuable for timber production by the California government, it began to enact large-scale land management for forestry in 1876, and went into the hands of the U.S. Forest Service since its creation in 1905 (Norgaard, 2019). Since the begging of federal management of the area, fire was viewed as only a destructive force to be avoided and controlled at all costs, an act entitled the Act for the Government and Protection of Indians in 1850 specified that anyone who set prairie on fire or refused to put it out immediately would be subject to fine or punishment (Norgaard, 2019). In 1911 the Weeks Act provided financial aid to protect timberlands from fire, and in 1935 the "10 am policy" stipulated that fires needed to be controlled by 10 am the following morning of a fire (Diver et al., 2010). Karuk people tried to explain their practices and the ecological need for fire and

continued to use fire despite the danger they faced in doing so, “for many years following white settlement in their territory, Karuk people were simply shot for engaging in cultural practices such as setting fires (personal communication)” (Norgaard, 2014). The species that had initially helped with fire resistance in the Karuk territory, such as grasses, manzanita, and sugar pines have since been invaded by Douglas fir and brush species (Norgaard, 2019). The environment and the Tribal people were affected in many ways. Without access to their food, material resources, and medicinal plants, the people of the Karuk tribe found themselves struggling to maintain social and cultural bonds (Norgaard, 2019).

Fish Wars

Flash forward to the 1970s, the federal government denies the Karuk people to continue their traditional fishing practices (Diver et al., 2010). Although, the state department of Fish and Game does allow dip-netting at Ishi Pishi falls, it was considered illegal until this point even though the site was culturally important (Diver et al., 2010). Court rulings had determined that states are not authorized to regulate Indian fishing rights, and the BIA briefly opened the lower Klamath to Indian gillnet fishing in 1977. Protest and conflict ensued between Indian and non-Indian fishers. So with public pressure against Indian fishing, in 1978 a moratorium on Indian commercial fishing was placed (Diver et al., 2010).

In 1972, World Renewal Ceremonies are revived at Clear Creek. “Despite a history of displacement, many Karuk tribal members have maintained a strong connection to their homelands…. Karuk Peoples have also maintained a longstanding tradition of gathering at established cultural sites to practice World Renewal Ceremonies. Karuk World

Renewal Philosophy obligates its followers to take on stewardship responsibility for natural resources, an important mandate for tribal land managers (Karuk DNR 2011; Kroeber and Gifford 1949; Lake et al. 2010" (Diver, 2016a).

Federal Recognition and Tribal Governance

In 1978, the Karuk Tribe began efforts to gain federal recognition, BIA staff determines that the tribes 'sub-entities' reside in three communities in Happy Camp, Orleans, and Siskiyou. In 1986 the Karuk Tribes gained federal recognition, with rights and standing before the U.S. government (Diver et al., 2010). Then, the Karuk tribe developed a constitution, and it has a nine-member Tribal Council, and numerous tribal departments (*Karuk Tribe*, n.d.). The Tribes mission statement is to "promote the general welfare of all Karuk People, to establish equality and justice for our Tribe, to restore and preserve Tribal traditions, customs, language and ancestral rights, and to secure to ourselves and our descendants the power to exercise the inherent rights of self-governance" (*Karuk Tribe*, n.d.).

The Tribe developed their department of Natural Resources in 1989 with a vision defined as "one that is adaptive, holistic, and sustainable for people and place. Ecosystem management should take care of the land, addresses people's needs, use resources wisely, and practice ecologically balanced stewardship." In the 1990s, the Karuk Tribe and the Forest Service started the Ti Bar Demonstrating project in the Klamath National Forest, with the aims to demonstrate "culturally appropriate" management techniques and to develop a process for undertaking joint management projects, it included prescribed burning. Unfortunately Forest Service leadership change in 2000 led to an abandonment of the project (Diver, 2016a). Other collaborative

projects with the Forest Service are done, such as road decommissions and tribal monitors on forest fires (Diver et al., 2010). In 1998 a Ishi Pishi/Ukonon ecosystem analysis plan emphasizes the self-determination of the Karuk Tribe. In 2001, the Mid-Klamath Restoration Council is created as a chapter of the California Fire Safe Council, working to reinstate historic fire regimes (Diver et al., 2010). The Mid-Klamath Watershed Council is formed in 2006. In 2009 an Eco-Cultural Resource Management plan was developed to assist in making the DNR vision a reality (Karuk Tribe of California, 2009). In a similar fashion to the "First Foods Framework" of the CTUIR, Karuk management works with the central component of traditional foods as "cultural use species".

One recent important issue for the Karuk tribe is the campaign for the removal of the lower Klamath river dams. In 1918, the California Oregon Power Company built the first of three hydroelectric dams on the Klamath River with no additions of pish passages, blocking more than 300 miles of salmon and steelhead habitat in the upper Klamath. The Iron Gate dam was completed in 1962 and blocked access to 120 km of Klamath River habitat and tributaries. Trinity and Lewiston Dams were built on the upper trinity tributary of the Klamath River.

Current Klamath River fall chinook productivity is less than 8 percent of its historical productivity. They have contributed to the denial of access to salmon and steelhead for more than 80 years. In 2002 over 68,000 fish died because of warm water and low flows as created by poor management by the Upper Klamath Irrigation Project and the dams cause of water quality degradation. The Karuk Tribe has worked hard to campaign for the removal of the four Klamath dams with others, including the Yurok tribe. Finally, in

November 2022, PacifiCorp agreed to dam removal and, the Klamath dams are projected to be removed in the year 2023 or 2024 (Flaccus, 2022; Knight, 2021). Other things: 1983 Injunction on areal spraying on public lands in karuk territory, recent fire bills ?, 2004 “Effect of an Altered Diet on the Karuk people” 2016 Klamath Basin Food System Assesment, shared jurisdiction with CALFIRE, knowledge sovereignty

Conclusion

What I have written here is by no means a full history of the Tribes, but I hope I have sufficiently explained the most significant events that affected Tribal Sovereignty and policies that have influenced the abilities and priorities of the tribal governments

Appendix D: Digital Content Analysis Graphs

This is the order that the documents appear in the graphs;

CTUIR documents:

10. Agricultural Management Plan (2016) AMP
11. CAP “Final Draft” (2021) CAP
12. Climate Vulnerability Assessment (2015) CVA
13. Comprehensive Plan (2018) CP
14. Hazard Mitigation Plan
15. Hazard Mitigation Plan (2016) HMP
16. Umatilla Forest Management Plan (2021) UFMP
17. Umatilla River Vision (2011) URV
18. Umatilla Upland Vision (2019) UUV

Karuk Documents

9. Climate Transportation Adaptation Plan (2022) CTAP
10. Climate Vulnerability Assesment (2016) CVA
11. DNR Strategic Plan for Organizational Development (2015) DNR SP
12. Eco-Cultural Resources Management Plan (2010) ECRMP
13. Hazard Mitigation Plan (2015) HMP
14. Climate Adaptation Plan (2019) CAP
15. Klamath Basin Food System Assessment (2016) KBFSA
16. Western Klamath Restoration Partnership (2014) WKRP

“Cultural Revitalization” Key Terms

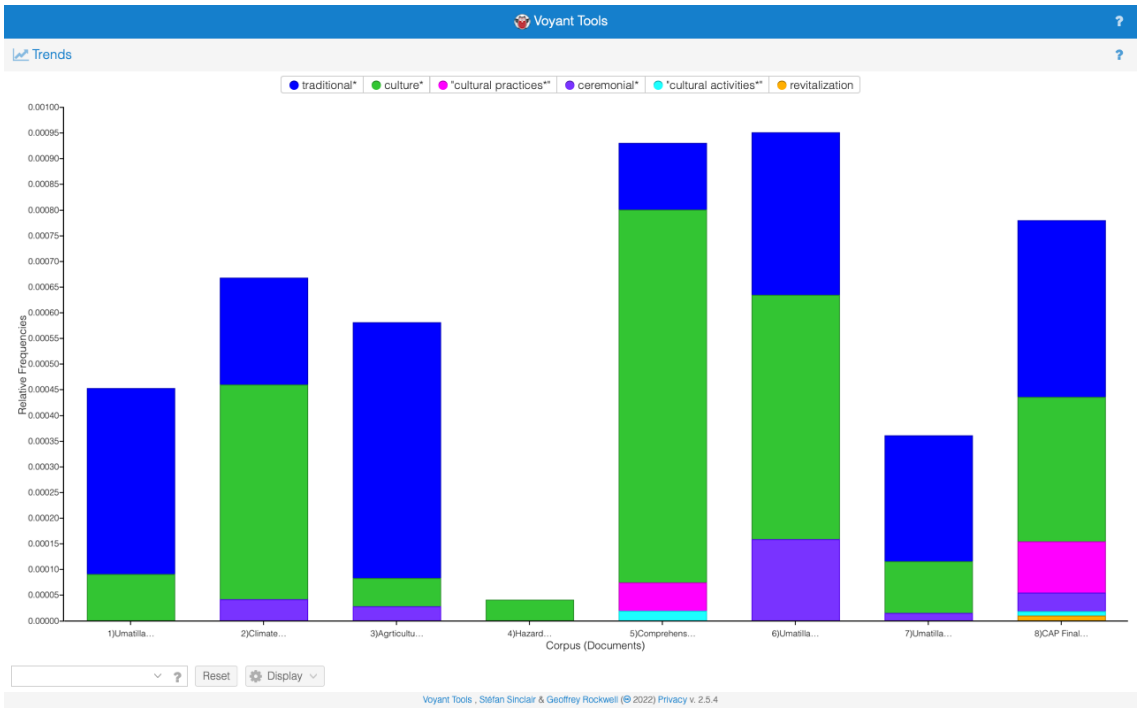


Figure 8: CTUIR Cultural Revitalization Trends

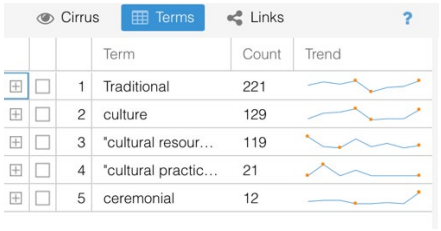


Figure 9: CTUIR Cultural Revitalization Terms

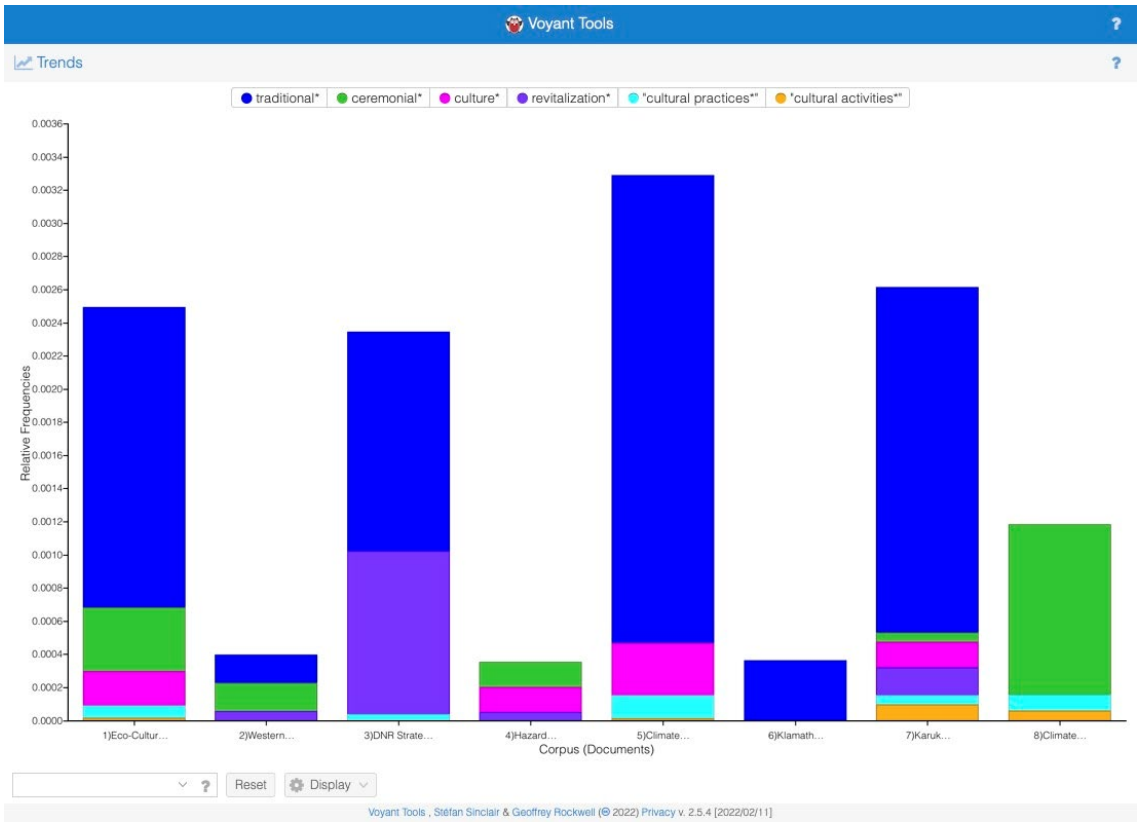
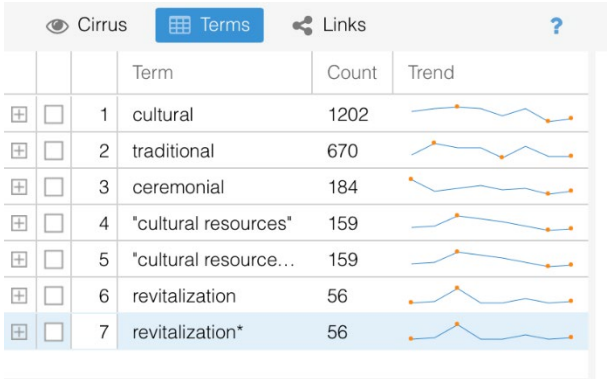


Figure 10: Karuk “Cultural Revitalization” Trends



	Term	Count	Trend
1	cultural	1202	
2	traditional	670	
3	ceremonial	184	
4	"cultural resources"	159	
5	"cultural resource…	159	
6	revitalization	56	
7	revitalization*	56	

Figure 11: Karuk “Cultural Revitalization Terms”

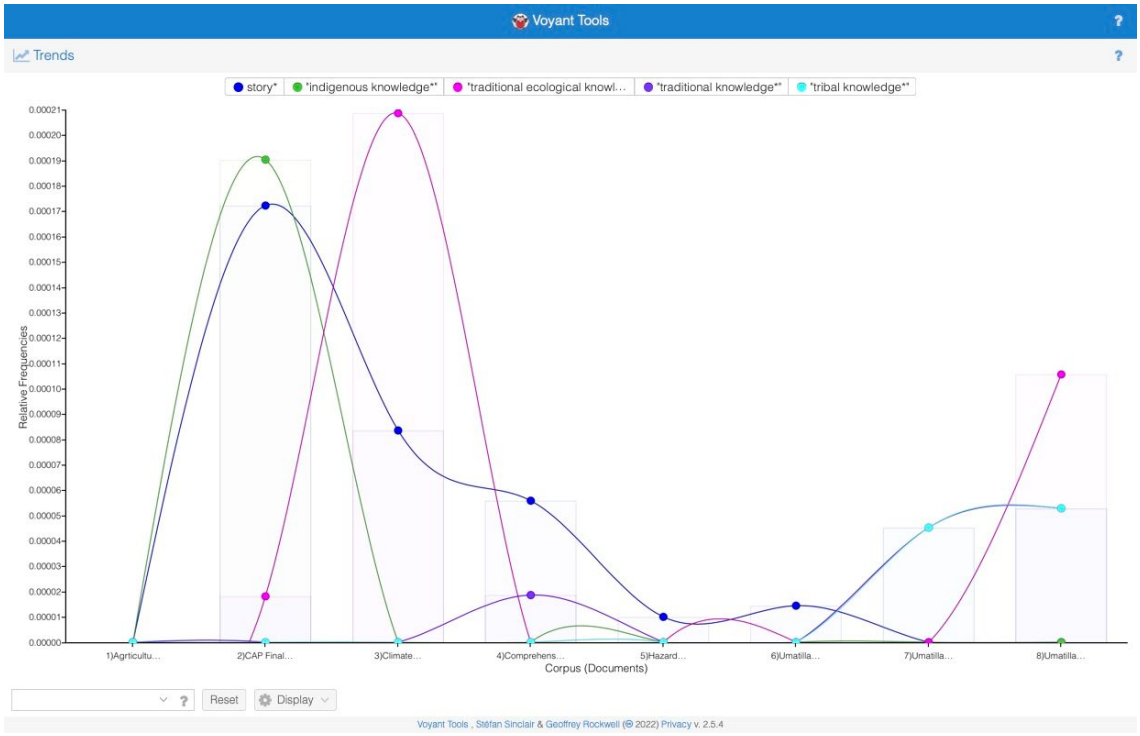


Figure 12: CTUIR “Traditional Knowledge” Trends

	Term	Count	Trend
1	"traditional kno…	3	
2	"traditional eco…	9	
3	story*	28	
4	"indigenous kn…	21	
5	"tribal knowled…	2	

Figure 13: CTUIR “Traditional Knowledge” Terms

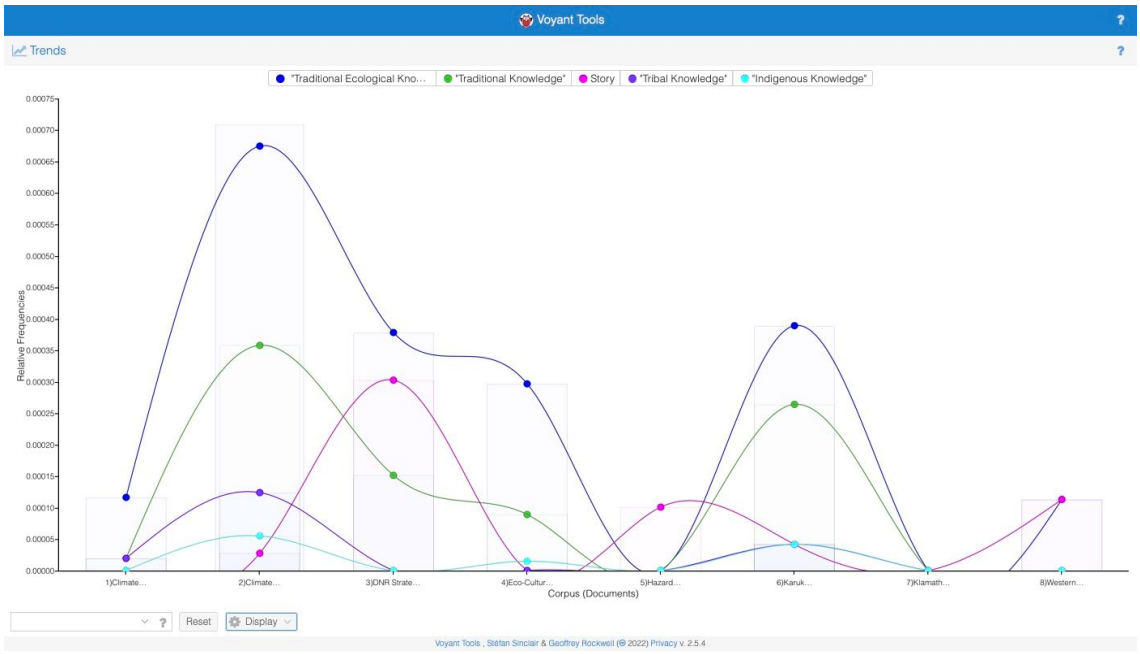


Figure 14: Karuk “Traditional Knowledge” Trends

			Term	Count	Trend
⊞	☑	1	"Indigenous Knowledge"	8	
⊞	☑	2	"Traditional Ecological…	115	
⊞	☑	3	"Traditional Knowledge"	56	
⊞	☑	4	Storytelling	0	
⊞	☑	5	story	17	
⊞	☑	6	"Tribal Knowledge*"	13	

Figure 15: Karuk “Traditional Knowledge Terms

Traditional Management terms

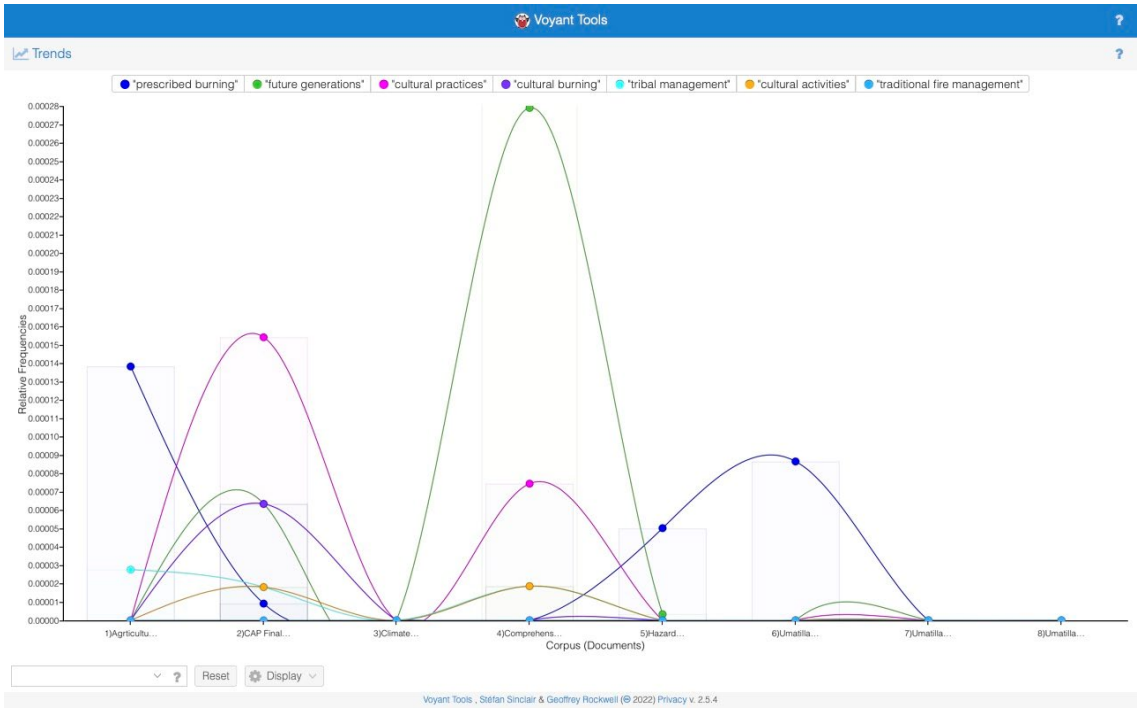


Figure 16: CTUIR "Traditional Management" Trends

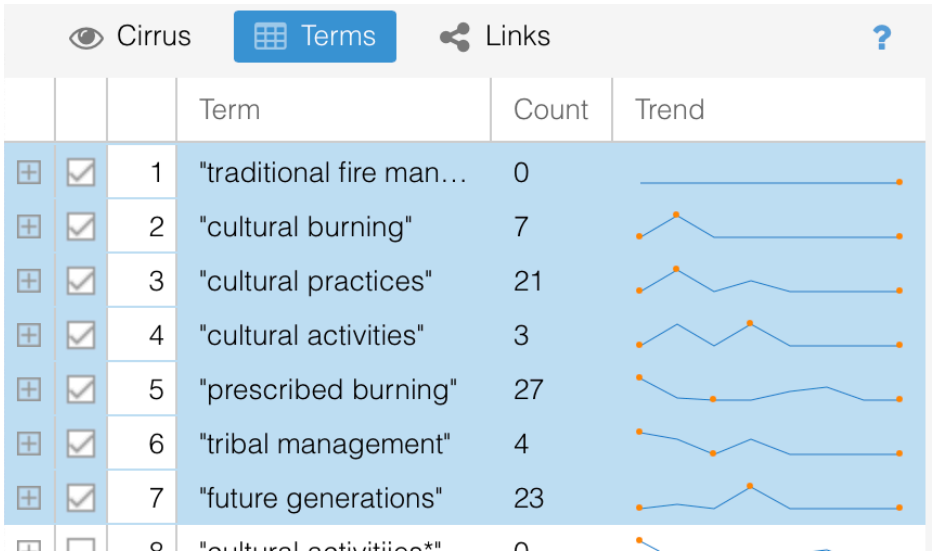


Figure 17: CTUIR "Traditional Management Terms

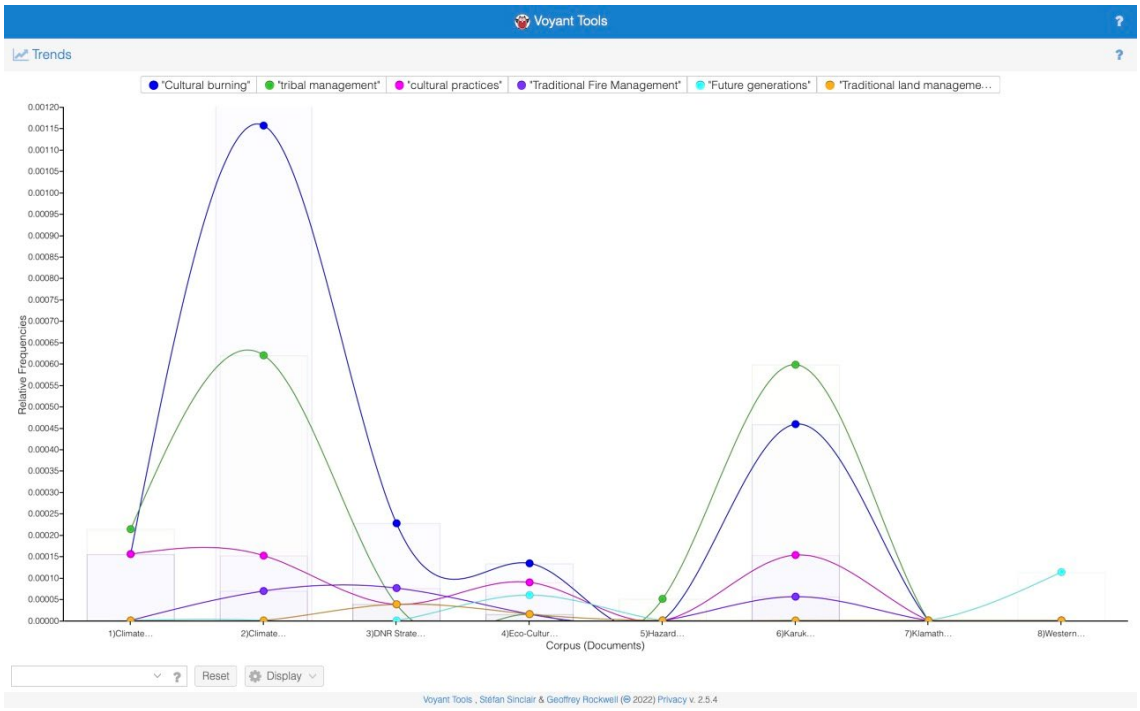


Figure 18: Karuk "Traditional Management" Trends

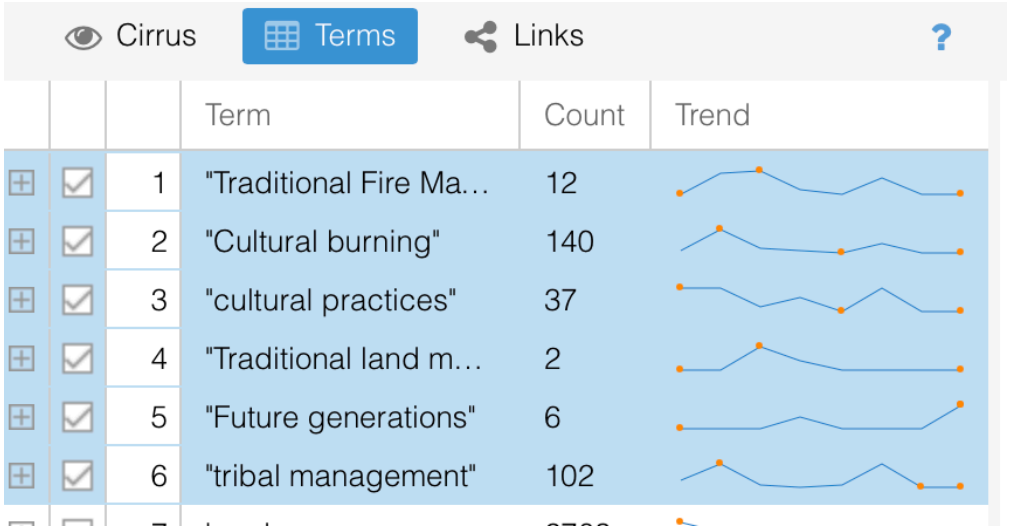


Figure 19: Karuk "Traditional Management" Terms

Specific types of management:

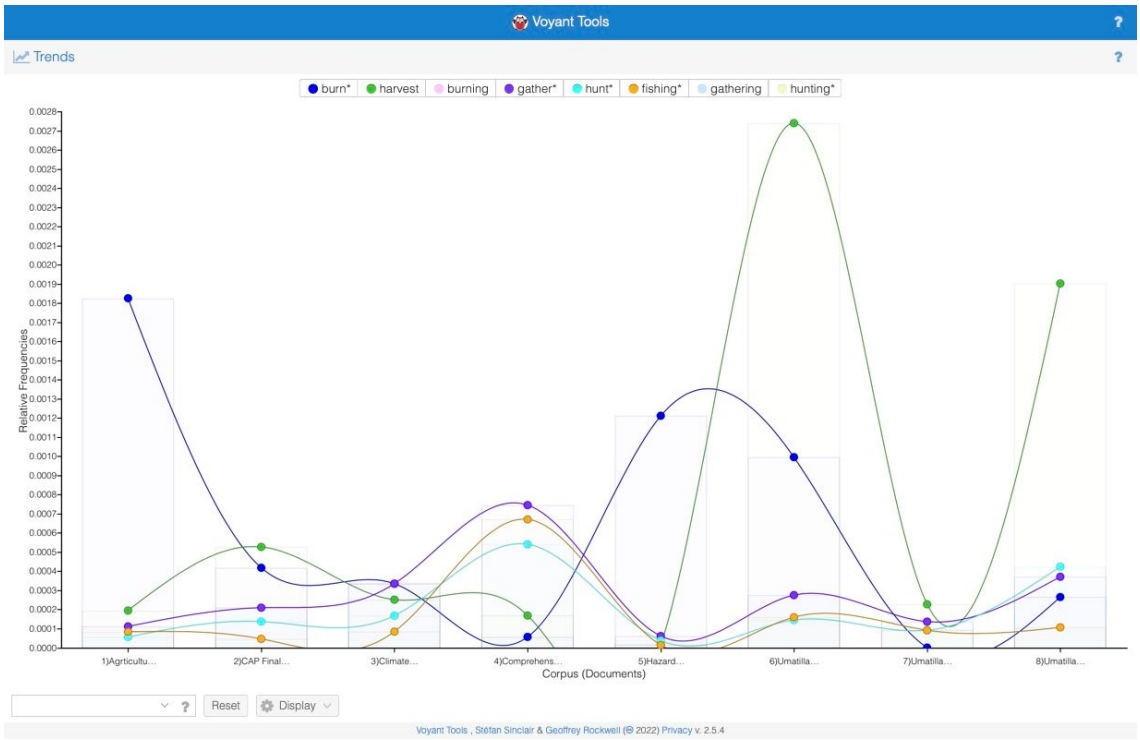


Figure 20: CTUIR "Cultural Practices" Trends

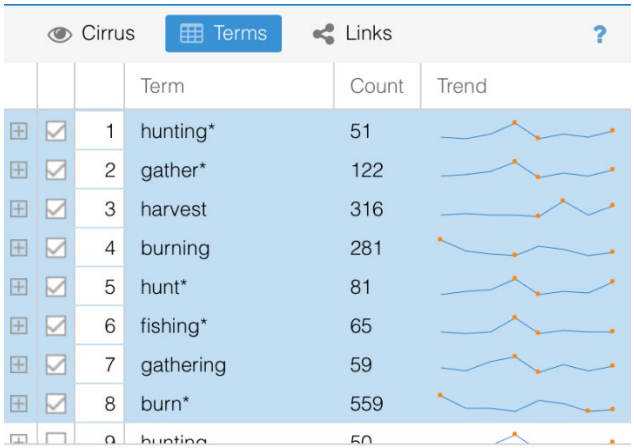


Figure 21: CTUIR "Cultual Practices" terms

Karuk

Figure 22: Karuk “Cultural Practices” Trends

			Term	Count	Trend
⊞	☐	1	burn*	1082	
⊞	☐	2	burning	524	
⊞	☐	3	gathering*	124	
⊞	☐	4	gathering	120	
⊞	☐	5	hunt*	114	
⊞	☐	6	harvest	106	
⊞	☐	7	fishing*	95	
⊞	☐	8	hunting	95	
⊞	☐	9	gather	17	

Figure 23: Karuk “Cuultual Pracitces” Terms

Tribal Rights and Sovereignty

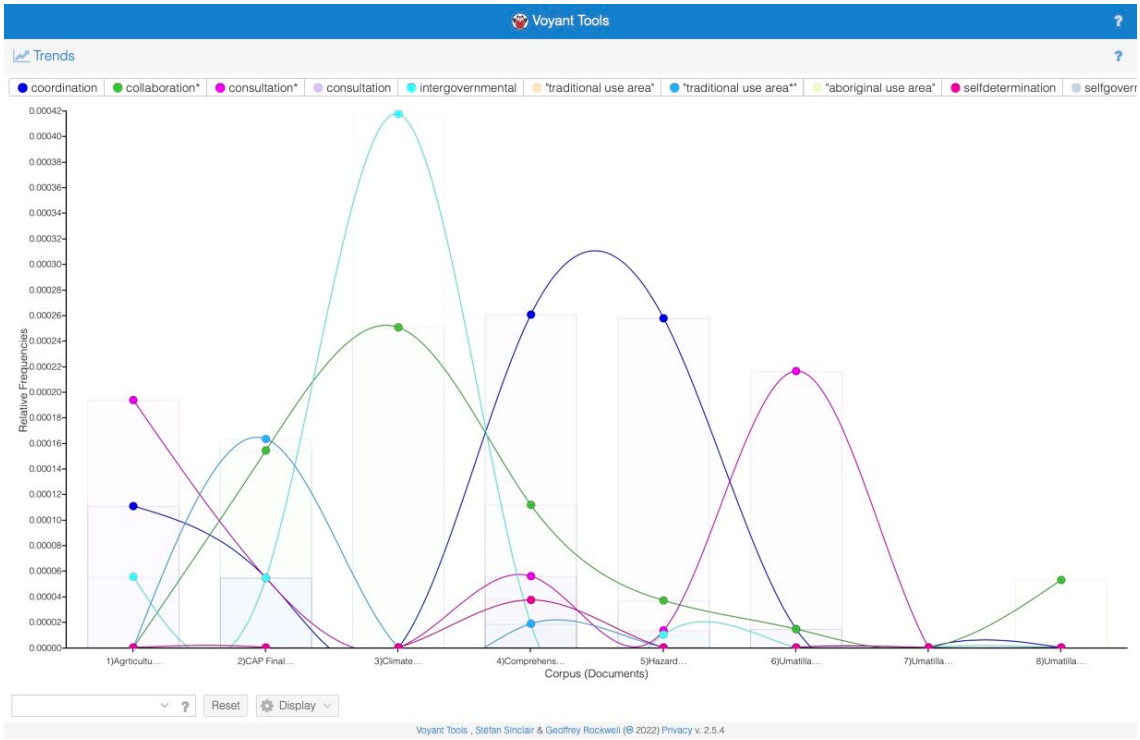
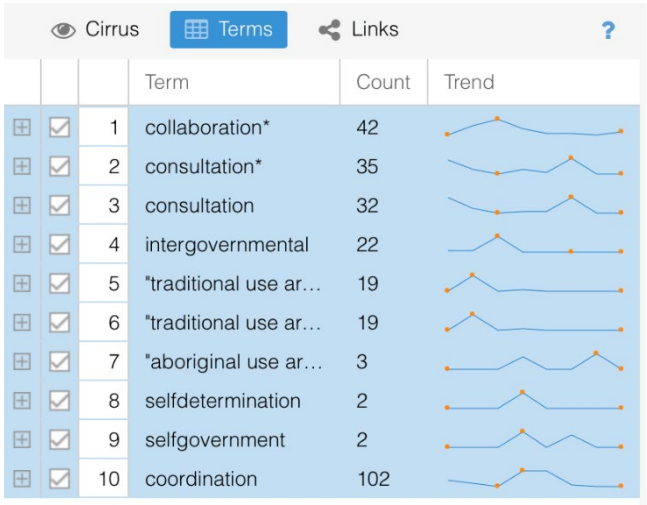


Figure 24: CTUIR "Tribal Rights and Soveriegnty" Trends



	Term	Count	Trend
1	collaboration*	42	
2	consultation*	35	
3	consultation	32	
4	intergovernmental	22	
5	"traditional use ar…	19	
6	"traditional use ar…	19	
7	"aboriginal use ar…	3	
8	selfdetermination	2	
9	selfgovernment	2	
10	coordination	102	

Figure 25: CTUIR "Tribal Rights and Soveriegnty" Terms

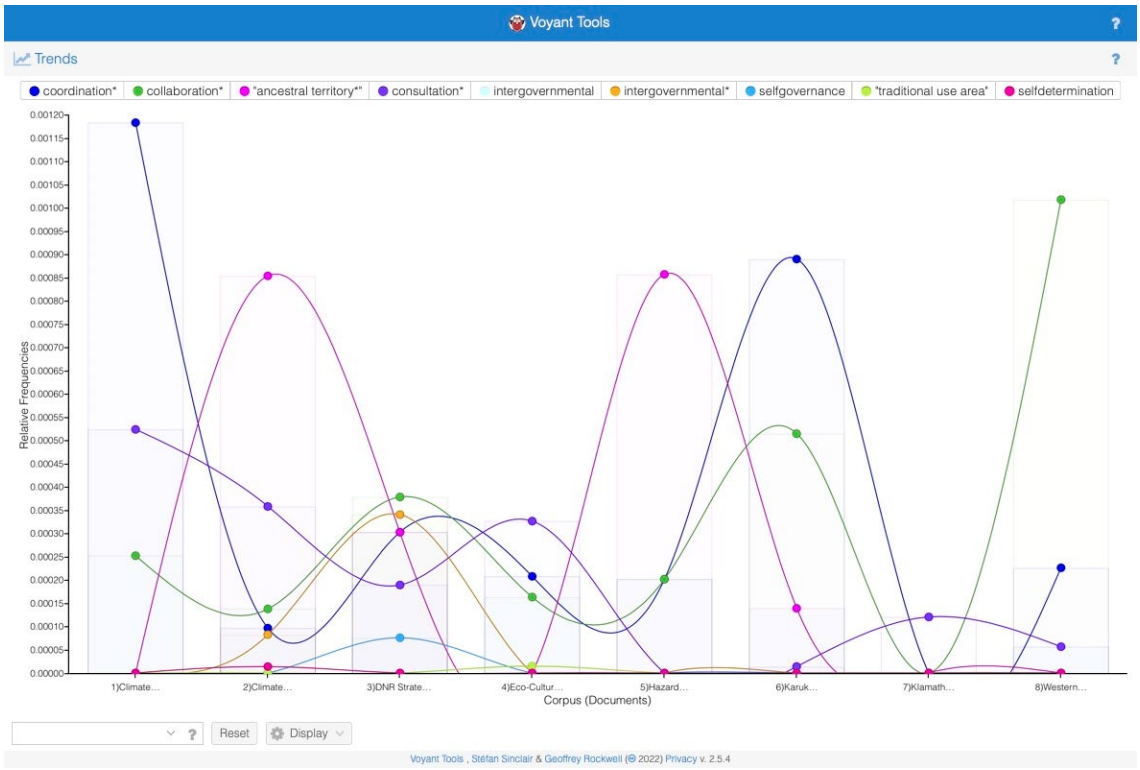
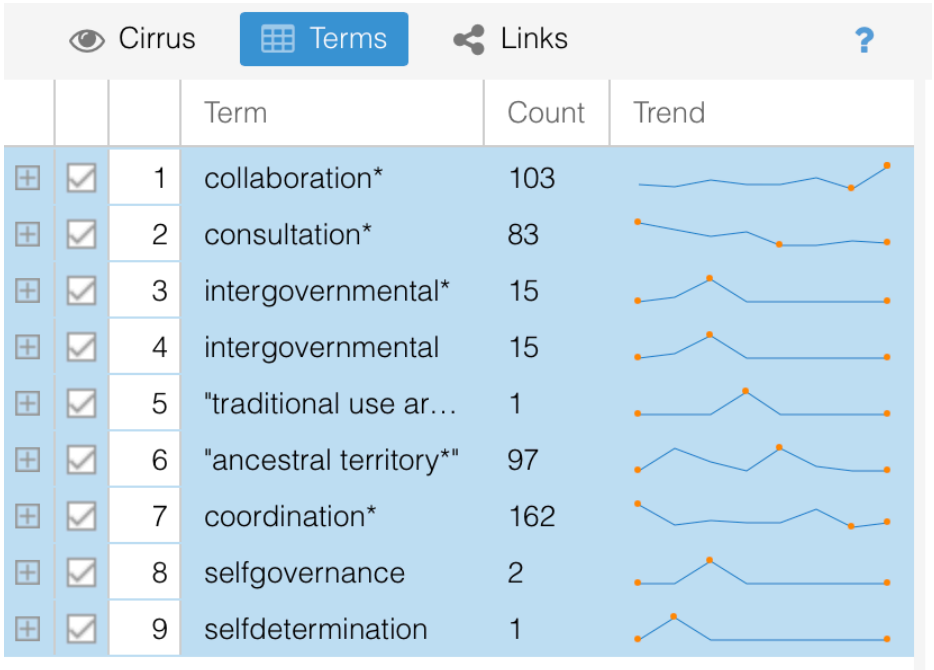


Figure 26: Karuk "Tribal Rights and Soveriegnty" Trends



	Term	Count	Trend
1	collaboration*	103	
2	consultation*	83	
3	intergovernmental*	15	
4	intergovernmental	15	
5	"traditional use ar…	1	
6	"ancestral territory*"	97	
7	coordination*	162	
8	selfgovernance	2	
9	selfdetermination	1	

Figure 27: Karuk "Tribal Rights and Sovereignty" Terms

Historical policy and management

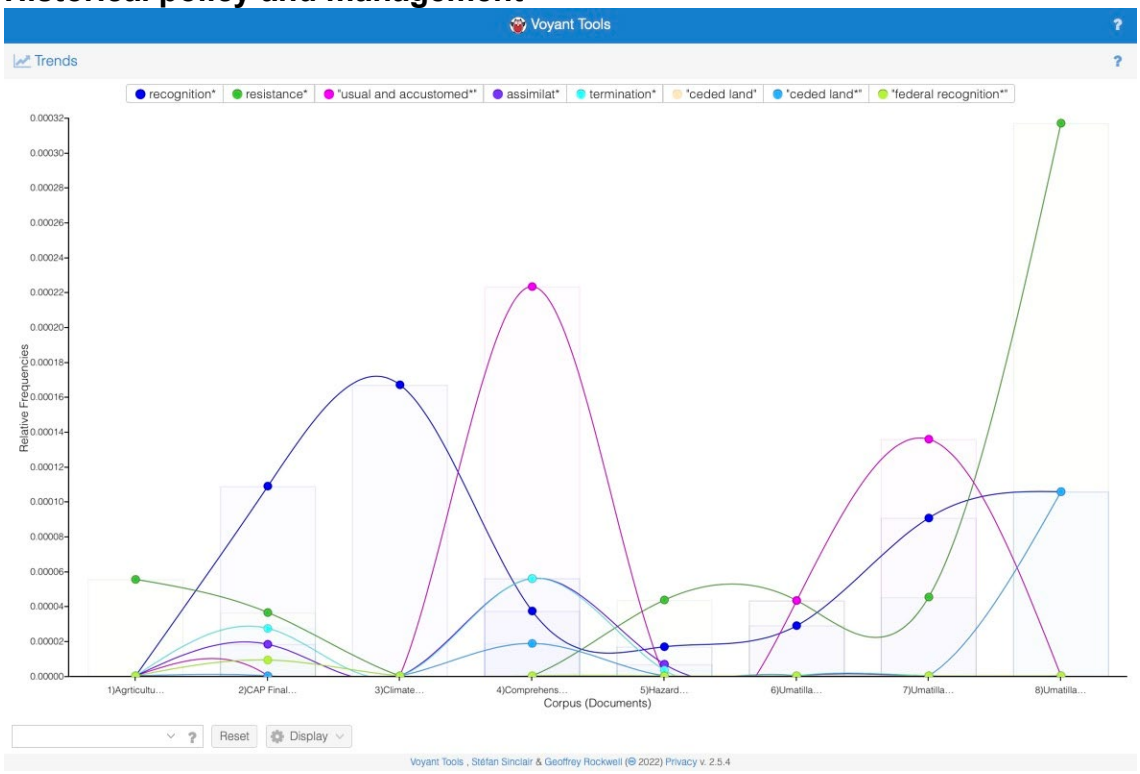


Figure 28: CTUIR "Historical Policy and Management" Trends

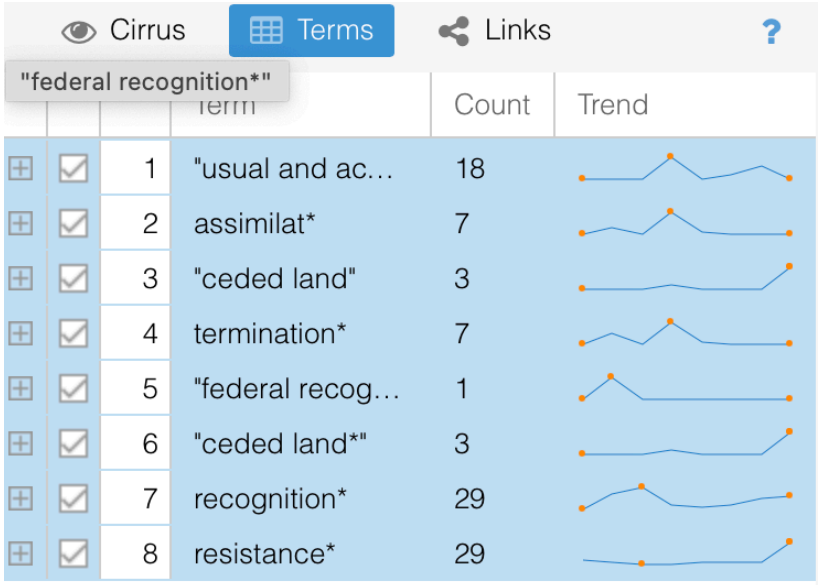


Figure 29: CTUIR "Historical Policy and Management" Terms

Bibliography

2021_CLIMATE_CHANGE_ADAPTATION_FRAMEWORKandBlueprint.pdf. (n.d.). Retrieved May 13, 2021, from https://www.oregon.gov/lcd/CL/Documents/2021_CLIMATE_CHANGE_ADAPTATION_FRAMEWORKandBlueprint.pdf

Adger, W. N., Barnett, J., Brown, K., Marshall, N., & O'Brien, K. (2013). Cultural dimensions of climate change impacts and adaptation. *Nature Climate Change*, *3*(2), 112–117. https://doi.org/10.1038/nclimate1666

Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., Naess, L. O., Wolf, J., & Wreford, A. (2009). Are there social limits to adaptation to climate change? *Climatic Change*, *93*(3–4), 335–354. https://doi.org/10.1007/s10584-008-9520-z

Alkon, A. H., & Norgaard, K. M. (2009). Breaking the Food Chains: An Investigation of Food Justice Activism*. *Sociological Inquiry*, *79*(3), 289–305. https://doi.org/10.1111/j.1475-682X.2009.00291.x

Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management*, *90*(5), 1692–1702. https://doi.org/10.1016/j.jenvman.2008.12.001

Berkes, F. (2012). *Sacred Ecology*. Routledge. http://ebookcentral.proquest.com/lib/uoregon/detail.action?docID=957004

Bierbaum, R., Smith, J. B., Lee, A., Blair, M., Carter, L., Chapin, F. S., Fleming, P., Ruffo, S., Stults, M., McNeeley, S., Wasley, E., & Verduzco, L. (2013). A comprehensive review of climate adaptation in the United States: More than before, but less than needed. *Mitigation and Adaptation Strategies for Global Change*, *18*(3), 361–406. https://doi.org/10.1007/s11027-012-9423-1

Clark, S. A., Miller, A., & Hankins, D. L. (2021, March 9). Good Fire. *Karuk Climate Change Projects*. https://karuktribeclimatechangeprojects.com/good-fire/

Cleaves, D. (2014). *Climate Change Brings Risks and Opportunities to Tribes and Their Forests by By David Cleaves, Climate Change Advisor to the Chief, U.S. Forest Service and Adrian Leighton, Chair, Natural Resources Department, Salish Kootenai College, Pablo, Montana—Google Search*. https://www.google.com/search?q=Climate+Change+Brings+Risks+and+Opportunities+to+Tribes+and+Their+Forests+by+By+David+Cleaves,+Climate+Change+Advisor+to+the+Chief,+U.S.+Forest+Service+and+Adrian+Leighton,+Chair,+Natural+Resources+Department,+Salish+Kootenai+College,+Pablo,+Montana&rlz=1C5CHFA_enUS843US843&sxsrf=APq-WBuXVMNGqQpysegC8ueHnqoqxmGjeQ:1651122275727&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiVxebl_bX3AhUdJzQIHTEEBj8Q_AUoAnoECAEQBA&biw=860&bih=764&dpr=2#imgrc=zpB3zyXBGfyEYM

Climate and Traditional Knowledges Workgroup. (2014). *Climate and Traditional Knowledges Workgroup (CTKW). 2015. Guidelines for Considering Traditional Knowledges (TKs) in Climate Change Initiatives.*

Climate Change Vulnerability and Adaptation in the Blue Mountains Region Forest Pacific Northwest General Technical Report March Service Research Station PNW-GTR-939 2017. (n.d.). Retrieved June 30, 2021, from https://www.fs.fed.us/pnw/pubs/pnw_gtr939.pdf

Comprehensive Economic Development Strategy for the Confederated Tribes of the Umatilla Indian Reservation. (n.d.). Retrieved June 30, 2021, from https://ctuir.org/media/1smb1zr4/ctuir-ceds-2017-21-final-draft_0.pdf

Confederated Tribes of the Umatilla Indian Reservation. (2010). *Forest Management Plan An Ecological Approach to Forest Management*. Bureau of Indian Affairs. https://ctuir.org/media/s5vb3mkh/forest-management-plan_7_09_10.pdf

Corntassel, J. (2012). *Re-envisioning resurgence: Indigenous pathways to decolonization and sustainable self-determination*. https://dspace.library.uvic.ca/handle/1828/12471

CSKTClimatePlan.pdf. (n.d.). Retrieved July 5, 2021, from https://csktribes.org/CSKTClimatePlan.pdf

CTUIR - About. (n.d.). Retrieved June 1, 2022, from https://ctuir.org/about/

CTUIR - Fisheries. (n.d.). Retrieved April 7, 2022, from https://ctuir.org/departments/natural-resources/fisheries/

CTUIR DNR Umatilla River Vision 100108.pdf. (2011). Retrieved June 30, 2021, from http://www.ykfp.org/par10/html/CTUIR%20DNR%20Umatilla%20River%20Vision%20100108.pdf

Dalton, M., Chrishold Hatfeild, S., & Petersen, A. "Sascha." (2018). *Tribal Climate Adaptation Guidebook*. https://oregonstate.app.box.com/s/wu3mczk5ognbf2pb74jdmlgn59266oo8

Department of Land Conservation. (2021). *2021 STATE AGENCY CLIMATE CHANGE ADAPTATION FRAMEWORK*. https://www.oregon.gov/lcd/CL/Documents/2021_CLIMATE_CHANGE_ADAPTATION_FRAMEWORKandBlueprint.pdf

Diver, S. (2016b). Co-management as a Catalyst: Pathways to Post-colonial Forestry in the Klamath Basin, California. *Human Ecology*, *44*(5), 533–546.

Diver, S., Liu, L., Canchela, N., Tannenbaum, S. R., Silberblatt, R., & Reed, R. (2010). *Karuk Lands Management Historical Timeline | The Karuk Lands Management Historical Timeline is an educational resource for learning about the history of lands management on Karuk Aboriginal Territory in the mid-Klamath watershed, Northern California.* https://karuktimeline.wordpress.com/

ECRMP_6-15-10_doc.pdf. (n.d.-b). Retrieved September 17, 2021, from https://www.karuk.us/images/docs/dnr/ECRMP_6-15-10_doc.pdf

Endress, B. A., Quaempts, E. J., & Steinmetz, S. (n.d.-a). *First Foods Upland Vision*. 32.

Final-karuk-climate-assessment1.pdf. (2016). https://karuktribeclimatechangeprojects.files.wordpress.com/2016/11/final-karuk-climate-assessment1.pdf

Flaccus, G. (2022). *Major hurdle cleared in plan to demolish 4 Klamath River dams*. Opb. https://www.opb.org/article/2022/02/26/major-hurdle-cleared-in-plan-to-demolish-4-klamath-river-dams/

Gruenig, B., Lynn, K., Voggesser, G., & Whyte, K. P. (2015, September). *Tribal-Climate-Change-Principles_2015-148jghk.pdf*. https://cpb-us-e1.wpmucdn.com/blogs.uoregon.edu/dist/c/389/files/2010/11/Tribal-Climate-Change-Principles_2015-148jghk.pdf

Halofsky, J., & Peterson, D. L. (Eds.). (2017). *Climate Change Vulnerability and Adaptation in the Blue Mountains Region*. https://www.fs.fed.us/pnw/pubs/pnw_gtr939.pdf

Harling, W., & Tripp, Bill. (2014). *Western Klamath Restoration Partnership: A Plan for Restoring Fire Adapted Landscapes*. 57.

Huang, T.-Y., Pérez-Cardona, J. R., Zhao, F., Sutherland, J. W., & Paranthaman, M. P. (2021a). Life Cycle Assessment and Techno-Economic Assessment of Lithium Recovery from Geothermal Brine. *ACS Sustainable Chemistry & Engineering*, *9*(19), 6551–6560. https://doi.org/10.1021/acssuschemeng.0c08733

Huang, T.-Y., Pérez-Cardona, J. R., Zhao, F., Sutherland, J. W., & Paranthaman, M. P. (2021b). Life Cycle Assessment and Techno-Economic Assessment of Lithium Recovery from Geothermal Brine. *ACS Sustainable Chemistry & Engineering*, *9*(19), 6551–6560. https://doi.org/10.1021/acssuschemeng.0c08733

IPCC. (2014). *AR5 Synthesis Report: Climate Change 2014 — IPCC*. https://www.ipcc.ch/report/ar5/syr/

Itchoak, R. (2017). *Planning in Tribal Communities: An Evaluation of Climate Adaptation Planning Processes*. https://scholarsbank.uoregon.edu/xmlui/handle/1794/23019

Jantarasami, L., Novak, R., Delgado, R., Narducci, C., Marino, E., McNeeley, S., Raymond-Yakoubian, J., Singletary, L., & Powys Whyte, K. (2018). *Chapter 15: Tribal and Indigenous Communities. Impacts, Risks, and Adaptation in the United States: The Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program. https://doi.org/10.7930/NCA4.2018.CH15

Jennifer, K. (2006). *Wiyaxayxt / Wiyaakaa'awn / As Days Go By: Our History, Our Land, Our People--The Cayuse, Umatilla, and Walla Walla*. University of Washington Press. http://ebookcentral.proquest.com/lib/uoregon/detail.action?docID=3444598

Jojola, T. (2000). *Indigenous Planning and Community Development*. 15.

Jojola, T., Walker, R., & Natcher, D. (2013). *Reclaiming Indigenous Planning: Reclaiming Indigenous Planning*. McGill-Queen's University Press. http://ebookcentral.proquest.com/lib/uoregon/detail.action?docID=3332617

Jones, K. L., Poole, G. C., Quaempts, E. J., O'Daniel, S., & Beechie, T. (2011). *Ctuir-dnr-umatilla-river-vision-v2-051811.pdf*. https://ctuir.org/media/25chgmwn/ctuir-dnr-umatilla-river-vision-v2-051811.pdf

Karuk Climate Transportation Adaptation Plan. (2022, March 22). *Karuk Climate Change Projects*. https://karuktribeclimatechangeprojects.com/transportation/

Karuk DNR_Strategic Plan_FINAL_12172015.pdf. (n.d.). Retrieved July 23, 2021, from https://www.karuk.us/images/docs/dnr/Karuk%20DNR_Strategic%20Plan_FINAL_12172015.pdf

Karuk Tribe. (n.d.). Retrieved June 1, 2022, from https://www.karuk.us/

Karuk Tribe Climate Vulnerability Assessment Assessing Vulnerabilities From the Increased Frequency of High Severity Fire. (2016). https://karuktribeclimatechangeprojects.files.wordpress.com/2016/11/final-karuk-climate-assessment1.pdf

Karuk Tribe Department of Natural Resources. (2010). *Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan*. https://www.karuk.us/index.php/departments/natural-resources/dnr/132-dnr-ecrmp

Knight, C. (2021, May 3). Klamath Dam Removal | Moments That Write History #10. *California Trout*. https://caltrout.org/50th/klamath-dam-removal

Kovach, M. (2009). *Indigenous methodologies: Characteristics, conversations and contexts*. University of Toronto Press.

Lane, M. B., & Hibbard, M. (2005). *Doing It for Themselves: Transformative Planning by Indigenous Peoples*. https://journals.sagepub.com/doi/10.1177/0739456X05278983

Lynn, K., MacKendrick, K., & Donoghue, E. M. (2011). *Social vulnerability and climate change: Synthesis of literature* (PNW-GTR-838; p. PNW-GTR-838). U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. https://doi.org/10.2737/PNW-GTR-838

Lyons, I., Hill, R., Deshong, S., Mooney, G., & Turpin, G. (2020). Protecting what is left after colonisation: Embedding climate adaptation planning in traditional owner narratives. *Geographical Research*, *58*(1), 34–48. https://doi.org/10.1111/1745-5871.12385

Miles, G. (2018). *Climate Planning with Multiple Knowledge Systems: The Case of Tribal Adaptation Plans* [Ohio University]. https://etd.ohiolink.edu/apexprod/rws_olink/r/1501/10?p10_etd_subid=164775&clear=10/

Morning Owl, E. T., Cash Cash, P., Engum, J. K., Haug, D. B., Conner, R., Rigsby, B., Chess, J. M., & Minthorn, M. J. (2015). *Čáw pawá láakni = They are not forgotten: Sahaptian place names atlas of the Cayuse, Umatilla, and Walla Walla* (E. S. Hunn, Ed.). Tamástslikt Cultural Institute ; Ecotrust.

National Research Council. (2010). *Adapting to the Impacts of Climate Change*. The National Academies Press. https://doi.org/10.17226/12783

Nilsson, C. (2008). CLIMATE CHANGE FROM AN INDIGENOUS PERSPECTIVE. *Indigenous Affairs*, *1–2*, 8.

Norgaard, K. M. (n.d.-a). *Karuk Traditional Ecological Knowledge and the Need for Knowledge Sovereignty*. 62.

Norgaard, K. M. (2014). *Karuk Traditional Ecological Knowledge and the Need for Knowledge Sovereignty*. 62.

Norgaard, K. M. (2016). *Retaining Knowledge Sovereignty*. https://karuktribeclimatechangeprojects.com/retaining-knowledge-sovereignty/

Norgaard, K. M. (2019). *Salmon and Acorns Feed Our People: Colonialism, Nature, and Social Action*. Rutgers University Press. http://ebookcentral.proquest.com/lib/uoregon/detail.action?docID=5899520

Norgaard, K. M., & Hormel, L. M. (2009). *Bring the Salmon Home! Karuk Challenges to Capitalist Incorporation*. https://scholarsbank.uoregon.edu/xmlui/handle/1794/18939

Norgaard, K. M., Watts-Tobin, A., & Rickwalt, M. (2022). *Karuk Climate Transportation Adaptation Plan Final*. https://karuktribeclimatechangeprojects.files.wordpress.com/2022/03/karuk-climate-transportation-adaptation-plan-final-2022-1.pdf

Norton-Smith, K., Lynn, K., Chief, K., Cozzetto, K., Donatuto, J., Hiza Redsteer, M., Kruger, L. E., Maldonado, J., Viles, C., & Whyte, K. P. (2016). *Climate change and indigenous peoples: A synthesis of current impacts and experiences* (PNW-GTR-944; p. PNW-GTR-944). U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. https://doi.org/10.2737/PNW-GTR-944

Norton-Smith, K., Lynn, K., Chief, K., Cozzetto, K., Donatuto, J., Redsteer, M. H., Kruger, L. E., Maldonado, J., Viles, C., & Whyte, K. P. (2016). Climate change and indigenous peoples: A synthesis of current impacts and experiences. *Gen. Tech. Rep. PNW-GTR-944. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 136 p.*, *944*. https://doi.org/10.2737/PNW-GTR-944

(PDF) Aligning environmental management with ecosystem resilience: A First Foods example from the Confederated Tribes of the Umatilla Indian Reservation, Oregon, USA. (n.d.). Retrieved July 17, 2021, from https://www.researchgate.net/publication/325327637_Aligning_environmental_management_with_ecosystem_resilience_A_First_Foods_example_from_the_Confederated_Tribes_of_the_Umatilla_Indian_Reservation_Oregon_USA

Pe'ícháachuqeli, C. (n.d.-b). *(When our Hearts are Happy)*. 15.

Pikyav Field Institute. (n.d.). Retrieved May 17, 2022, from https://www.karuk.us/index.php/departments/natural-resources/eco-cultural-revitalization/pikyav-field-institute

Quaempts, E., Jones, K., O'Daniel, S., Beechie, T., & Poole, G. (2018b). Aligning environmental management with ecosystem resilience: A First Foods example from the Confederated Tribes of the Umatilla Indian Reservation, Oregon, USA. *Ecology and Society*, *23*. https://doi.org/10.5751/ES-10080-230229 *Reduced-size_final-karuk-climate-adaptation-plan.pdf*. (n.d.). Retrieved April 18, 2021, from https://karuktribeclimatechangeprojects.files.wordpress.com/2019/10/reduced-size_final-karuk-climate-adaptation-plan.pdf

Reed, R., & Norgaard, K. M. (2010). *Salmon Feeds Our People: Challenging Dams on the Klamath River*. 10.

Sanders, C. (2021). *CTUIR Climate Adaptation Plan Final Draft*. Confederated Tribes of the Umatill Indian Reservation.

Sarna-Wojcicki, D., Sowerwine, J., & Hillman, L. (2019). *Decentring Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin*. *12*(1), 26.

Smith, L. T. (2012). *Decolonizing methodologies: Research and indigenous peoples* (Second edition). Zed Books.

Treut, H. L., Somerville, R., Cubasch, U., Ding, Y., Mauritzen, C., Mokssit, A., Peterson, T., Prather, M., Allen, M., Auer, I., Biercamp, J., Covey, C., Fleming, J. R., García-Herrera, R., Gleckler, P., Haigh, J., Hegerl, G. C., Isaksen, K., Jones, J., … Prather, M. (2007). *Historical Overview of Climate Change Science*. 36.

Tribal Adaptation Menu Team. (2018). *Dibaginjigaadeg Anishinaabe Ezhitwaad: A Tribal Climate Adaptation Menu*. 52.

Tribal Climate Change Project. (n.d.). Retrieved May 29, 2022, from https://tribalclimate.uoregon.edu/

Tripp, B. (2014). *Understanding the Indian Connection to Land and Place*. Evergreen Magazine.

Tripp, B., & Norgaard, K. M. (2016). *Karuk Climate Adaptation Plan*. https://karuktribeclimatechangeprojects.files.wordpress.com/2019/10/reduced-size_final-karuk-climate-adaptation-plan.pdf

Tucker, S. C. (n.d.). *Background information for the Klamath River DAM REMOVAL Campaign*. 4.

Vinyeta, K., & Lynn, K. (2013). Exploring the role of traditional ecological knowledge in climate change initiatives. *Gen. Tech. Rep. PNW-GTR-879. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 37 p.*, *879*. https://doi.org/10.2737/PNW-GTR-879

Vinyeta, K., Powys Whyte, K., & Lynn, K. (2015). *Climate change through an intersectional lens: Gendered vulnerability and resilience in indigenous communities in the United States* (PNW-GTR-923; p. PNW-GTR-923). U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. https://doi.org/10.2737/PNW-GTR-923

Whyte, K. (2016). *Indigenous Peoples, Climate Change Loss and Damage, and the Responsibility of Settler States* (SSRN Scholarly Paper ID 2770085). Social Science Research Network. https://doi.org/10.2139/ssrn.2770085

Whyte, K. (2020). Too late for indigenous climate justice: Ecological and relational tipping points. *WIREs Climate Change*, *11*(1). https://doi.org/10.1002/wcc.603

Whyte, K. P. (2013). Justice forward: Tribes, climate adaptation and responsibility. *Climatic Change*, *120*(3), 517–530. https://doi.org/10.1007/s10584-013-0743-2

Williams, T., & Hardison, P. (2013). Culture, law, risk and governance: Contexts of traditional knowledge in climate change adaptation. *Climatic Change*, *120*(3), 531–544. https://doi.org/10.1007/s10584-013-0850-0