IKPÍKYAV (TO FIX AGAIN): DRAWING FROM KARUK WORLD RENEWAL TO CONTEST SETTLER DISCOURSES OF VULNERABILITY

by
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DISSERTATION ABSTRACT

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The Klamath River Basin of Northern California has historically been replete with fire-adapted ecosystems and Indigenous communities. For the Karuk Tribe, fire has been an indispensable tool for both spiritual practice and ecological stewardship. Over the last century, the Tribe's ability to burn has been severely repressed by the United States Forest Service occupation of Karuk Ancestral Territory. Only in recent decades has the federal agency come around to recognize the ecological value of fire, subsequently seeking partnerships with the very Indigenous communities it once delegitimized. This dissertation concerns itself with a critical examination of scientific and political discourses of Indigenous vulnerability. My findings reveal how the settler state employs settler colonial and racist logics to justify ongoing Indigenous dispossession. The irony is, of course, that climate change and the contemporary wildfire crisis have been produced by settler colonialism. This dissertation therefore also contests settler discourses of vulnerability by illustrating the complexity, relationality, and resilience that characterizes Karuk World Renewal, the epistemological and spiritual backbone of Karuk land management. In doing so, I make the case for the value of visual methods, and specifically illustration, in serving the nascent field of Indigenous environmental sociology.

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The River Offered Me a Stone

I sat on a large rock with my feet dangling in the Klamath River. I had driven seven hours from Springfield to Orleans, the last hour on a winding road partly paved, partly graveled, that led from California's Coastal Redwoods inland to heart of Karuk Ancestral Territory. I was tired. It was hot out, and smoke from the McCash fire filled the valley. I looked downriver, beauty everywhere. Tears filled my eyes. I asked the River to help me do good work here, to be what was needed. Amid the COVID-19 Delta outbreak and an explosive wildfire season, the Photoshop workshop I had come to teach Tribal staff hardly seemed significant, maybe even a nuisance, with so many other important things folks had to attend to. Maybe the River wouldn't hear a voice like mine. Or maybe the River wanted me out of here, knowing full well I am a settler and not even one with deep roots in this place. But then I turned my head and next to me I saw a single stone, sitting by my side, keeping me company. It was smooth and oval, fit cozily in my palm, with a gray gravelly core and a bunch of larger white flecks scattered throughout. Time had glued them together, the white flecks held in their lovely geometric pattern by the many minuscule gray particles that created the contrasting backdrop. "You are a gray particle", I told myself. And for an attention seeker like me, always looking to feed my starving ego, that was a difficult and profound lesson. To be a good gray particle, paradoxically enough, I needed to be self-assured. I needed to be able to look in the mirror and see not a troubled settler, belonging nowhere, inextricably linked to violence and destruction, but someone with the potential to heal. To heal *herself*. Because to stand with others, you must first learn to stand on your own. To engage meaningfully in relational research, you must first be in a healthy relationship with yourself. And sometimes that is the hardest thing to do.

A Story About How This Research Came to Be

Whenever I hear a scholar present their research, I often ask myself what inspired them to pursue their line of inquiry. I wish I could hear the story behind how they came to dedicate a substantial portion of their lives dedicated to a given topic. Sometimes the trajectory seems obvious, but often it is labyrinthine— a journey defined by relationships, interests, identity, and chance. For settlers like me engaged in Indigenist research, the path is seldom as legible as that of Indigenous scholars dedicating their lives to researching for and within their communities. Why do I choose to do this work, especially given the deeply troubled history of settler scholars exploiting, misrepresenting, and causing harm within Indigenous communities? The answer is a labyrinth to be sure, but no matter how lost I have gotten within, or how much self-doubt has disrupted my journey, I always end up drawn back into the light by my Indigenous collaborators and by my profound, deep-held belief that the future depends on an international resurgence of Indigenous peoples and values.

I was born in the beautiful homelands of the Washoe Tribe, known to me as Lake Tahoe, California, to a Euro-American mother whose Northern European ancestors had settled in Northern Wisconsin and to a Catalan father who had met my mother while on a trip to the United States. Later we moved back to the fatherland, and most of my formative years were spent in a small mountain town in Northern Catalunya. My first experience knowingly seeing and meeting Indigenous People in North America was when my dad took us to a pow-wow in Northern Wisconsin during a visit to my grandparents. If Euro-American children raised in the United States were undereducated about the history of settler colonialism, then I as a child raised in Catalunya was even more clueless about the violence underlying my family's presence in Indigenous territory. I can't say with certainty what Tribe was hosting the pow-wow, but if I were to guess it was the Menominee Indian Tribe of Wisconsin. Geographically it makes sense, and in my head I can hear my dad saying "Menominee" in his Catalan accent. He had a deep respect for "les tribus Indies de Nord America," a respect that no doubt had a good dose of fetishization mixed in. Perhaps being from a part of Spain that had been heavily oppressed by the Franco regime when he was a child, whose Catalan language had also been banned by the government, he felt some sort of connection. Or maybe it was just a fascination with Indigenous culture unrelated to his own political and cultural history. At any rate, when we permanently moved to Wisconsin when I was a teenager, my dad was always thrilled to meet Native folks and was proud to be a personal acquaintance of Rick Hill, former chairman of the Oneida Tribe. In time it would become clear that my dad's understanding of

contemporary Indigenous issues was limited and distorted through a settler lens, but nonetheless he instilled in me a respect for Indigenous resistance which he greatly admired.

High school in the suburbs of Green Bay, WI, taught me virtually nothing about settler colonialism, and so it wasn't until I was an undergraduate at the University of Wisconsin-Madison that I started to even contemplate the depth of the violence and ongoing conflict between Euro-Americans and Indigenous peoples. I have two people to thank for this awakening: Professor Ada Deer (Menominee) and St. Croix Ojibwa tribal historian Wanda McFaggen. Deer's course "American Indian Affairs" and her no-nonsense approach to illuminating the realities of American history and its contemporary effects on Tribes represented the planting of a seed. That seed sprouted sometime later, when I embarked on my first ever Tribal collaboration as a landscape architecture student working with the St. Croix Ojibwa on a theoretical plan intended to expand housing for Tribal elders. As part of my capstone project, I met with Wanda McFaggen to ask her a series of questions in order to gain some historical and cultural context for the design. The seed cracked wide open when I asked her one of my questions and she very sternly told me, in no uncertain terms, that as an outsider I was never to have access to that information. It was sacred knowledge that belonged to the Tribe—not to me. That moment is seared in my memory as a complete restructuring of my worldview. Wanda turned what I had been learning in Professor Deer's class into something personal. It finally dawned on me that I too was implicated in the horrific history of the United States. Wanda gave me the gift of a firm cultural boundary, a line in the sand, of realizing that people like me had done things so egregious and violent that Indigenous communities had to keep certain information from me to protect their integrity. Had she delivered it more softly, or not at all, how different would my journey have been? I am indebted to her.

Wanda was kind enough to meet with me again and helped inform my design project for the Tribe within the confines of what was acceptable for me to know and share. I created a design that honored St. Croix Ojibwa culture and lands to the best of my ability at the time. I remember being in awe of the reverence given to elders, children, and non-human species. Wild rice, maple, sturgeon, walleye, birch, sage, cedar, sweet grass, deer, tobacco, and blueberries were not only natural resources of cultural significance—they were members of the community. From the moment I was born I had always sought refuge in the non-human world. The instrumental, agentic role of plants, animals, water and land within the Ojibwa worldview resonated with me deeply. To learn that there were people whose culture conceived of the world around them with such profound affection and

respect made me happy and hopeful. Even if this worldview was not mine to have, it was clear to me that it was something that needed to be fiercely protected.

The summer after graduating, some of my UW-Madison peers and I volunteered for the St. Croix Ojibwa to help build a straw-clay home for a Tribal elder. My work with the Tribe would later pave the way for a position with the Tribal Climate Change Project at the University of Oregon three years later as I started my master's degree in Environmental Studies. At the ripe age of 27, I would finally learn the term "settler colonialism" and gain the discursive tools to verbalize the violence and political struggle enmeshed in the ongoing history of the United States. At the Tribal Climate Change Program, I was introduced to the environmental context shaping the experiences of Tribes in the Pacific Northwest. The program's coordinator, Kathy Lynn, taught me by example how to effectively and ethically serve Indigenous collaboratives as a settler scholar. It was through the Tribal Climate Change Program that I built a relationship with the Coquille Indian Tribe of coastal Oregon and developed a research project with Tribal members as part of my master's thesis. The Tribe had been increasingly using both historic and contemporary photography to document and communicate Tribal history and culture, so when I stood literally shaking in front of Tribal Council and proposed a photovoice project to gather Coquille perspectives regarding the impacts of climate change, they enthusiastically agreed. Applying decolonial, community-based participatory research principles, the Meade, Ivy, Younker, and Wheeler families and I developed a project in which each family used photography and storytelling to document and share the ways climate change may affect sacred relationships with species and places of cultural significance. The project not only revealed the value of photography in tribal climate change initiatives, it also served to remind participants of the vibrant cultural practices and traditional knowledge that thrive within Coquille families despite the violence of settler colonialism.

A year after my collaboration with Coquille families I started my doctoral degree under the mentorship of Kari Norgaard. Kari was a settler scholar with a long collaborative history with the Karuk Tribe of Northern California. Like Kathy, Kari offered me a powerful example of a settler using her strengths to amplify the work of Indigenous activists, scholars, and Tribal governments. It was through Kari that I was first brought into the Karuk DNR's Climate Change Vulnerability Assessment in 2016, and later, the Tribe's Climate Adaptation and Transportation Plans. For the Climate Change Vulnerability Assessment, I put on my ecologist hat to work with Kari and Frank Lake on a chapter assessing the impacts of federal fire management on the climate resilience of culturally vital species. Later, in the Climate Adaptation and Transportation Plans, I dusted off my

illustration skills to produce graphics for the Tribe. As you can see in Chapter IV, my graphic production, while seemingly trivial in the eyes of settler academia, has actually been one of my most valuable contributions to the Karuk DNR. This dissertation was inspired by questions that emerged for me during my work as a researcher for the Karuk DNR's climate change initiatives, and by the Karuk DNR's desire to increase graphic design capacity.

Over the years and with a lot of time to reflect on why I keep returning to this work despite cyclical bouts of self-doubt, it has become clear that my research with and for Indigenous communities is partially an act of self-preservation. First, this work gives me reason to hope in the face of a seemingly bleak future. And second, all the things that I love and give me a reason to live depend on a radical transformation of dominant socio-political systems in order to survive. Not because the things I love are vulnerable, but because the dominant systems currently destroying our world—systems largely devised by my European ancestors— are vulnerable by design and in desperate need of replacing. Socio-economic systems that depend on ever-augmenting exploitation of our planet and the subjugation of people and other species for the sake of profit are weak, unsustainable systems that disregards the basic tenets of life. By bringing capacity to Indigenous sovereignty, resurgence, and land stewardship, I not only feed my spirit but I feel fulfilled knowing I am helping rebuild resilient systems for a healthier future.

My work with and for Indigenous communities has been hard at times, and also the most transformational of my life. Hard because of the immense amount of guilt and worry that has sometimes permeated my role as a settler scholar. Hard because for a while I hated myself for being a settler, made of the same cloth as colonizers that inflicted endless pain on Indigenous communities and the Earth. Hard because my very presence here often feels at odds with Indigenous liberation. But immensely transformational because my ancestors were luckily unable to completely destroy the intricate ties between Indigenous peoples and their more-than-human communities, and the richness and power of what endures is the thread by which the world can be stitched back together. Transformational because while I am busy cursing my ancestry, many of my Indigenous collaborators and mentors embody forgiveness, healing, and camaraderie.

After 11 years working closely with Indigenous collaborators, I can finally say I am starting to feel confident in what I can and cannot offer. I know the strengths and limitations I bring to the table as a settler scholar. I am fully aware that in my partnerships I will sometimes make mistakes, and that it is my responsibility to continuously be attentive and educate myself to make these mistakes as harmless as possible. Earlier in my career my mistakes used to shake me and make me

question my worth. But over time I have come to conclude that my errors are unlikely to outweigh the importance of partaking in this work and using it to engage other settlers and settler institutions in need of transformation. Guilt can be productive to a point, but it is largely an unsustainable motivating force. It may drive you to action, but it also eats away at your soul and shrouds collaborations with negative energy. I have since learned to be motivated by my love for the world and my immense reverence for Indigenous communities who continue to resist settler colonial systems with tenacity and ingenuity. This is among the crowning achievements of this dissertation.

I. Introduction

Where Masúhsav (the Salmon River) meets Ishkêesh (the Klamath River) lies the village of Katimîin, near Á'uuyich (Sugar Loaf Mountain)—the center of the Karuk world. Since time immemorial, Karuk people have been tending to the Klamath River Basin's ecosystems along with their Hupa and Yurok tribal neighbors downstream, and Klamath and Shasta neighbors upstream. Karuk people sometimes refer to themselves as "fix-the-world-people" in reference to pikyávish, an important cluster of annual ceremonies that are also referred to as Karuk World Renewal (Kroeber and Gifford 1949). The ceremonies' Karuk name—pikyávish— stems from píkyav, which means "to fix it." A derivative of this word— ikpíkyav—means "to fix *again*." I open the title of this dissertation with i*kpíkyav* to recognize the powerful resurgence of Karuk stewardship in the Klamath River Basin in recent decades. Despite centuries of colonial violence, Karuk people continue to hold sacred relationships with their ancestral places and biotic communities. The integrity of this highly biodiverse region rests upon the ability of Karuk people to carry out the responsibilities that form part of Karuk World Renewal. According to the Karuk Tribe, pikyávish:

> …refers to the Tribe's continuing ceremonial and diurnal efforts to restore the earth and its creatures to harmonious balance. This is our inheritance, passed down from generation to generation through the teachings of the First People, the ikxaréeyav. Our oral traditions recount the formation of plants, aquatic species, land formations and other resources created and given to us to utilize and manage. These gifts are given with conditions: we understand the reciprocal responsibilities that are attached to this act of largesse, and the traditional laws given to us by the ikxaréeyav remain the basis for our management techniques, and the ceremonies that frame them.[1]

Karuk tribal member and Department of Natural Resources staff Bill Tripp (2017) explains the significance of Karuk World Renewal Ceremonies:

> [World Renewal Ceremonies] link human practices like fishing, hunting and gathering to responsibility. They also ceremonially align our culture with ecosystem process and function. In our worldview, cultural resources have a life, as do the people using them.
> Each life deserves consideration when planning projects, including fire adaptation projects.

Tripp explicitly mentions the importance of both human and non-human lives, and the fact that each life needs to be accounted for in Tribal planning. He also makes special mention of fire

[1] http://www.karuk.us/index.php/departments/natural-resources/eco-cultural-revitalization/pikyav-field-institute

adaptation projects because fire is of utmost spiritual and ecological significance in World Renewal and related practices. As Karuk spiritual leader Leaf Hillman states, "fire takes care of us and we take care of fire." The ecological reasons for—and benefits of—burning are many, including reduction of landscape pests and disease, promotion of culturally significant, fire-dependent species, reduction of understory fuel, upkeep of early seral habitats, and in the case of the Karuk, less obvious but important benefits such as the water cooling properties of fire smoke that can protect the health of salmon runs during the heat of summer (Anderson 2005, David et al. 2018, Karuk DNR 2010, Kimmerer and Lake 2001, Lake 2007, Lake et al. 2017).

For the Karuk DNR, fire management is highly illustrative of how ongoing settler colonial processes of Indigenous dispossession simultaneously restrict tribal culture, impact the ecology of places, and affect the health of Karuk people (Karuk DNR 2010, Norgaard 2014, 2019). Prior to invasion by Europeans, the burning of certain landscapes was a celebrated and calculated act that formed a vital part of both everyday practices and community-wide ceremonies such as World Renewal (Lake et al. 2017). Karuk ancestors are one among many Indigenous groups in what is contemporarily known as California that used fire as a landscape management practice (Anderson 2005). For Karuk people, fire is medicine that helps "fix it"—it helps renew reciprocal relationships with landscapes and species that form an intrinsic part of the Karuk social universe (Karuk DNR 2010, Lake, Tripp and Reed 2010, Tripp 2017). The Karuk ability burn, however, has been severely limited by settler colonialism and the myriad ways in which this social structure dispossesses Indigenous communities.

Settler colonialism is not a distant, one-time event that occurred at first contact between Indigenous peoples and Europeans, but an ongoing social structure that continuously dispossesses Indigenous peoples to the benefit of settlers and the settler state (Bacon 2018, Coulthard 2014, Glenn 2015, Norgaard 2019, Steinman 2022, Wolfe 2006). At the heart of settler colonial dispossession is *land* (Bacon 2018, Coulthard 2014, Tuck and Yang 2012). Whereas in "classic" colonialism the principal objective of colonial powers is to exploitatively extract resources and Indigenous labor in distant geographies, settler colonists seek to occupy Indigenous territories and impose their own territorial, social, political and ecological regimes on top of—or in place of—those of the original Indigenous inhabitants (Bacon 2018, Coulthard 2014, Glenn 2015, Steinman 2022, Wolfe 2006). The impositions of a settler colonial structure hinges on two mutually reinforcing processes; first, the elimination of Indigenous occupants from the land via genocide, forced removal, geographic containment and assimilation; and second, the securing of the land for

settlers via modernist commodification of land and the institution of mechanisms of standardization and surveillance that can support and police this privatization (Fenelon and Trafzer 2014, Glenn 2015).

Bacon (2018) conceptualizes settler colonialism as an *eco-social* structure that—through ever-changing, continuous processes of *eco-social disruption*—enacts what Bacon (2018) coins *colonial ecological violence*. Ecological damage, Bacon (2018) posits, is a form of settler violence upon Indigenous peoples that is essential to the functioning of settler colonialism. Among the many mechanisms of eco-social disruption are settler-imposed land management regimes, which Bacon (2018, p.5) explains "do the work of eco-social disruption without the explicitly stated intent to commit violence, yet with highly destructive results for Native communities." Bacon goes onto describe that "[b]y foreclosing the possibility of relationships with and responsibilities to ecologies, land management under settler colonialism contributes to physical, emotional, economic and cultural harms" (2018, p.5).

Karuk people initially encountered Europeans around 1840 during Jedidiah Smith's exploration party, and then more continuously starting in the 1850's when Euro-Americans came to the Klamath River Valley in search of gold. European settlers, and eventually the United States government, carried out egregious acts of violence against Karuk people in an effort to secure Karuk land and resources for incoming settler. These acts included genocide (Madley 2016, Norton 2014), forced removal of Karuk children and subsequent institutionalization into Indian boarding schools, and temporary federal termination of government-to-government relations (which were later reaffirmed in 1979). Starting in the 1890s, and as a result of California's unratified treaties (Miller 2013), the entirety of Karuk Ancestral Territory (~1.05 million acres) was placed under contested federal jurisdiction—first as Forest Reserves, and later (starting in 1905) as the United States Forest Service's Klamath and Six Rivers National Forests. Since then, the Tribe has purchased back ~1700 of those acres, yet the vast majority of Karuk Ancestral Territory is still administered by the Klamath and Six Rivers National Forests (see Figure 1). Contemporarily, the state is less prone to enact spectacular violence. Yet the repercussions of earlier violent acts and the effects of slow violence in the form of state policies that privilege settlers at the expense of Indigenous peoples continue to have serious dispossessing effects.

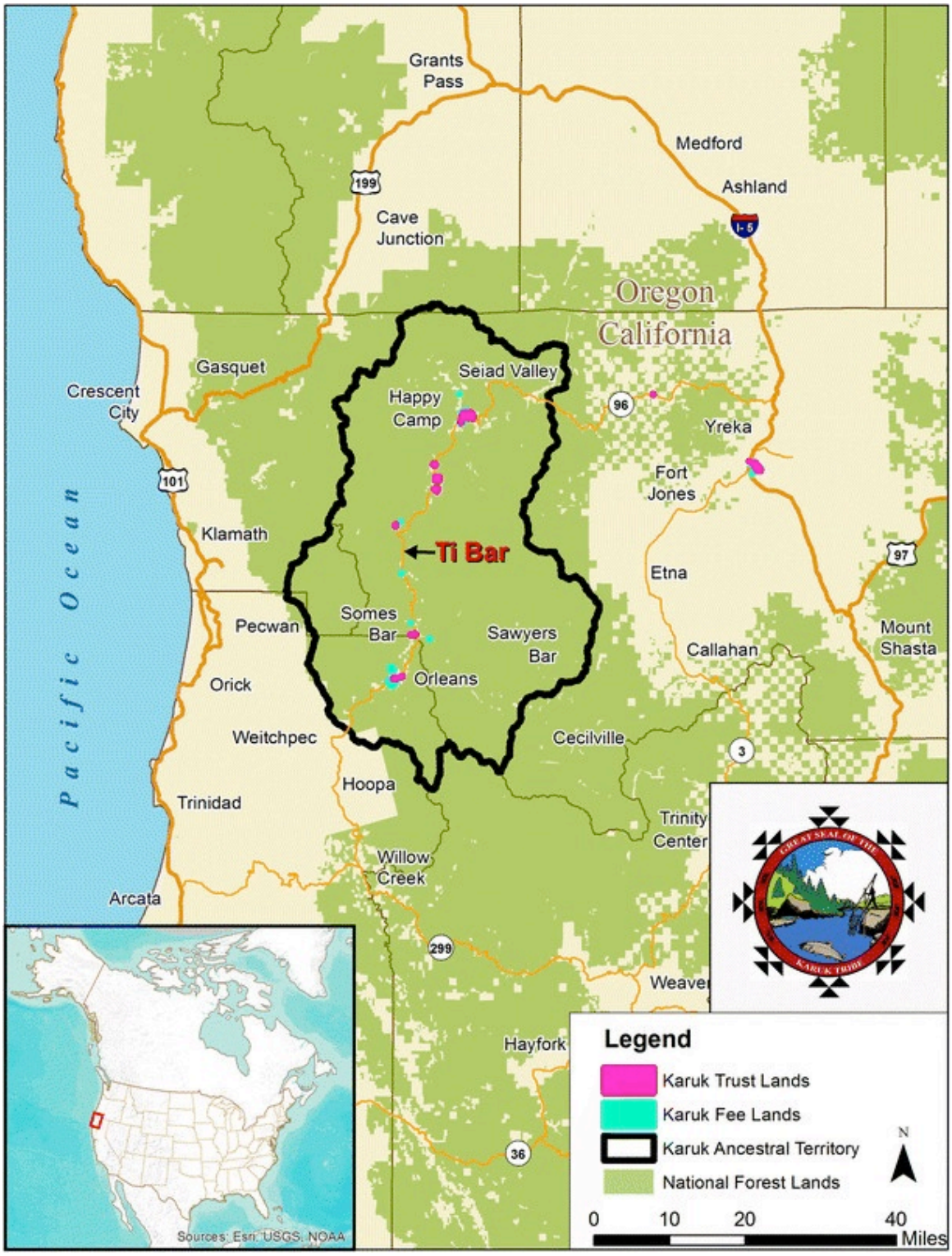

Figure 1. Map of Karuk Ancestral Territory— by Jill Beckmann for the Karuk Tribe Department of Natural Resources.

For the Karuk Tribe, the forest fire management policies of the USFS have been particularly damaging, given the fact that they affect the majority of Karuk ancestral territory. Like most state forestry programs in Europe and former European colonies, the USFS arose from a German forestry model conceived of in the European continent and later implemented widely by centralized agencies that delegitimized and criminalized local socio-ecological relationships (Scott 1998, Hudson 2011). Scott (1998) explains that in the ordered, legible forest idealized by European forestry "unauthorized disturbances— whether by fire or by local populations — were seen as implicit threats to management routines" (18). This is evident on federal lands where Indigenous use of fire has been outlawed and replaced by fire suppression. Settler scientists[2] responsible for deciding and providing justifications for specific federal land management decisions have for decades supported, or at least condoned, fire suppression-only management (Lake 2007). The Klamath River Basin has been among the numerous regions that have experienced extensive high intensity wildfires in recent years.

While cultural burning[3] typically involves fires that are lower-temperature, close to the ground, and controlled in terms of their spread, timing, and impact, today's wildfires can quickly become difficult to manage as a result of the hot, dry and highly combustible conditions caused by climate change and decades of fire suppression.

Settler scientists, policymakers and scholars tend to categorize Indigenous communities as disproportionately vulnerable to climate change impacts, claiming this vulnerability stems from Indigenous reliance on local ecosystems combined with lower participation in the capitalist economy. Simultaneously, settler scientists trained in Western academia are increasingly eager to collaborate with Tribes to address land management issues related to climate change, as is illustrated nationwide by the initiatives of the U.S. Department of Agriculture Climate Hubs, Landscape Conservation Cooperatives, and U.S. Geological Survey Climate Adaptation Science Centers. In the last two decades, and despite the numerous challenges posed by past and present violence enacted by settlers and settler institutions, the Karuk Tribe's Department of Natural Resources has emerged

[2] Shorter and TallBear (2021), and Douglas (2014) use the term "settler science" to differentiate between Indigenous knowledge systems and science on the one hand, and science that is generated by and for settler institutions and states on the other. I use this term in this dissertation because it more clearly points to the settler/Indigenous power dynamics inherent in this form of knowledge production.

[3] According to CA. State AB642, ""Cultural burn" or "cultural burning" means the intentional application of fire to land by California Native American tribes, tribal organizations, or cultural fire practitioners to achieve cultural goals or objectives, including for subsistence, ceremonial activities, biodiversity, or other benefits."

as a regional leader in land management planning and implementation. The United States Forest Service, the Nature Conservancy, The Learning Fire Network, U.C.- Berkeley, Stanford University, Cal. Poly Humboldt, and the University of Oregon are just some of the non-tribal entities that are partnering with the Karuk Tribe.

Of particular interest is the Tribe's efforts to restore traditional burning practices. In the Klamath River Basin, as in many landscapes across the West, the Forest Service's decades-long regime of fire suppression has been culturally and ecologically detrimental for fire-adapted ecosystems and communities. The absence of fire has led to a reduction in early seral habitats that are vital to many species, as well as increased forest density and fuel loads that together with a lack of natural fire breaks create highly volatile conditions (Busenberg 2004, Hessburg et al. 2005, Lake 2007, Norgaard 2014). As climate change has led to drier and hotter conditions, and as wildfire management has progressively consumed a larger percentage of the Forest Service's annual budget (Schick 2018), the severe implications of strict fire suppression have become evident even to the Forest Service itself. In recent years, the Forest Service and other non-tribal land managers and settler scientists are pursuing collaborations with Indigenous scientists and knowledge holders, presumably to find joint solutions to environmental problems, many of which have resulted from the policies and management practices of federal agencies themselves. This leads to the question: "who, or what, is vulnerable?"

In state-led climate change initiatives, vulnerability is partially calculated along racial and settler/Indigenous lines. Scholars have theorized how the social structures of settler colonialism and race are co-constitutive (Glenn 2015, McKay et al. 2020, Norgaard 2019, Pulido 2018). Bonilla-Silva (1997) defines *racialized social systems* as "societies in which economic, political, social, and ideological levels are partially structured by the placement of actors in racial categories or races" (p.469). The author explains that "[r]aces typically are identified by their phenotype, but the selection of certain human traits to designate a racial group is always socially rather than biologically based" (Bonilla-Silva 1997, p.469). The development of racial categories (the process of *racialization*) results in racial hierarchies that inform—and are informed by— racist ideologies such as white supremacy and become the "maps" by which to organize societies on a global scale (Bonilla-Silva 1997, Golash Boza 2016). The settler colonial, white supremacist racialization of Indigenous peoples—as "Indians," "redskins," "savages," etc.— serve to dispossess (and justify violence towards) Indigenous communities (Klopotek 2011, Robertson 2015, Rohrer et al. 2016, TallBear 2013).

In climate vulnerability assessment tools and reports in the United States, the social vulnerability of a given census block, neighborhood, or community is calculated in part as a function of the percentage of the population that is Black, Brown, or Indigenous. For example, the CDC's latest Social Vulnerability (SVI) Index uses four categories to calculate vulnerability scores: 1) socioeconomic status, 2) household age composition disability, 3) minority status and language, and 4) housing type and transportation. A "minority" is classified as "all persons except white, non-Hispanic." The way the SVI index for the minority status is calculated is "estimate total population – white, Non-Hispanic population" (CDC 2022, p.9). Similarly, the Environmental Protection Agency's report on *Climate Change and Social Vulnerability in the United States* identifies four socially vulnerable groups: 1) people with low-income, 2) "minorities" 3) people with no high school diploma, and 4) people aged 65 and older. The report defines minorities as "[i]ndividuals identifying as Black or African American; American Indian or Alaska Native; Asian; Native Hawaiian or Other Pacific Islander; and/or Hispanic or Latino" (EPA 2021, p.4). The agency clarifies that it is using the blanket category "minority" for the sake of consistency with other government reports. It also acknowledges that "there are important differences…in the social vulnerability of the individual communities that are included in the "minority" umbrella" (p.4). Yet no consultation with said communities is mentioned in the development of the report, nor is there an acknowledgement of the way different social structures, such as racism or settler colonialism, shape the climate change experiences of the diverse groups lumped within the monolithic "minority" category. Furthermore, Indigenous peoples are racialized and lumped into a broader category that erases Indigenous sovereignty and the ways it may shape Indigenous responses to climate change.

The fact is that while racism and settler colonialism may increase the vulnerability of people of color and Indigenous people, these power structures are rarely mentioned, let alone addressed in state-led climate change studies and initiatives. Additionally, rarely are the communities labeled "vulnerable" consulted regarding whether they actually feel vulnerable in a given context and why. Bourdieu (1985) describes the "formidable social power" that is the capacity to name, categorize, and bring to life entities which did not previously exist, a capacity over which he claims the state holds a monopoly. By constructing vulnerability to encapsulate categories such as "non-white" while simultaneously obscuring the unjust social structures in which the state is complicit, the state may simplify, or at least redefine domination in a climate change era, creating discourse with which to justify ongoing social control and exclusion.

Indigenous scholars, activists and allies are bringing into question how Indigenous vulnerability to climate change is framed in academic and policy-related discussions (Cameron 2012, Marino 2015, Whyte 2017, Wildcat 2009). Often times, vulnerability is conceptualized as inherent to Indigenous communities without examining the socio-political conditions that shape climate change experiences and preparation. As Whyte (2017) asserts, "Indigenous climate vulnerability cannot occur in the absence of the history and present practices of colonialism and capitalism in Indigenous homelands" (156). Using mainstream climate science logic, Karuk people's Indigenous identity and racial minority status make them highly vulnerable to climate change impacts. The same scientific thinking may have been employed by the US Forest Service over a century ago when they categorized Western forests as highly vulnerable to wildfire, subsequently enacting a totalizing fire suppression policy that significantly affected the structure and composition of what were in effect fire-adapted ecosystems. The fact that the Forest Service now seeks partnerships with the Karuk Tribe to mitigate the impacts of colonial forest management should give us pause and encourage us to carefully examine vulnerability discourse and its consequences.

Dissertation Goals and Outline

The paradox described above—the fact that Indigenous peoples are deemed uniquely vulnerable yet simultaneously highly sought-after collaborators in the context of climate change and fire management— inspired the research in this dissertation. I was interested in understanding how the U.S. Forest Service justified 100 years of forest mismanagement in light of the continual presence of contradictory Indigenous knowledges. I was also interested in understanding how vulnerability discourse affects the Karuk Tribe and other Indigenous communities. Finally, I was interested in learning about and celebrating Karuk World Renewal as way of knowing and doing that defies colonial assumptions and reconfigures what constitutes agency, vulnerability, and resilience. These aims are reflected in chapters II, III and IV of my dissertation, which are formatted as standalone, yet interconnected articles.

In Chapter II, titled "Under the Guise of Science: How the US Forest Service Deployed Settler Colonial and Racist Logics to Advance an Unsubstantiated Fire Suppression Agenda," I wanted to parse out how Forest Service leadership and staff justified suppression-only management in fire adapted ecosystems and communities such as those of the Klamath River Basin. I carried out a content analysis of national USFS discourse, regional USFS discourse in California, and local discourse pertaining to the Klamath and Six Rivers National Forests occupying Karuk Ancestral

Territory. At the outset, I was expecting to find that the Forest Service omitted Indigenous peoples and knowledges from their discourse and erased Indigenous presence and influence from the landscape. After all, Indigenous erasure is a central tactic of settler colonialism (Fenelon & Trafzer 2014, Wolfe 2006). What I wasn't expecting to find was widespread, explicitly racializing language aimed at discrediting Indigenous peoples and practices. Dr. Laura Pulido, one of my dissertation committee members, informed me after reading my dissertation proposal that she was going to encourage me to think about how race, not just settler colonialism, fit into the struggle over fire management in Karuk country. As I dove into my content analysis, the role of race became abundantly clear, reflecting Norgaard's (2019) assertion that in the Klamath River Basin, the social construction of race and nature occur simultaneously. In this chapter, I outline how Forest Service discourse employed settler colonial and racialized tropes such as the "Indian savage", the "vanishing Indian," and the concept of "Terra Nullius," to discredit Indigenous burning and legitimize the agency's scientifically unsubstantiated approach to fire management. This chapter is now a published article by the same title in *Environmental Sociology* (Vinyeta 2022).

In Chapter III, titled "Theorizing Vulnerability Discourse in a Changing Climate: Settler-Ascribed Vulnerability and its Role in Indigenous Dispossession," I introduce the concepts of *ascribed* and *lived vulnerability* to problematize vulnerability discourse as employed by the settler state. I define *ascribed vulnerability* as vulnerability that has been pre-determined and labeled onto individuals or groups by an outside entity who holds power in the form of recognized expertise or credibility. In contrast, *lived vulnerability* is how human and non-human individuals or groups define and address their own vulnerability based on perceived or lived experiences. Using the case of federal fire management and the Karuk Tribe along with three additional cases previously analyzed by scholars, I theorize how the settler state ascribes vulnerability to assert control over Indigenous peoples and lands, the repercussions of which often lead to lived vulnerability within Indigenous communities. The three additional cases include: 1) Federal School Policy as a Catalyst for Climate Change Vulnerability in Shishmaref (Marino 2015), 2) Differing Perceptions of Herbicide Risk in Karuk Ancestral Territory (Norgaard 2007), and 3) The Dawes Act as an Assimilatory Policy Subverted by the Nez Perce and Jicarilla Apaches (Greenwald 2002).

Finally, after outlining ways in which the settler state attempts to delegitimize and assert control over Karuk and other Indigenous communities, in chapter IV I literally illustrate the resilient and sophisticated knowledge system that continues to inform ecological stewardship in the Klamath River Basin. Heeding the call of Eve Tuck (2009) to suspend damage centered research, this chapter

is a celebration of Karuk World Renewal and the ways in which it expands mainstream sociological understandings of what constitutes "the social." Titled "Drawing from Karuk World Renewal: Illustrating More Than Human Agency and Relationality in the Klamath River Basin," this chapter also explores the value of illustration as an underutilized research methodology. It describes how my illustration work for the Karuk Tribe Department of Natural Resources has served the Tribe while also deepening my cross-cultural understanding and connection to Karuk places as a remote researcher. Finally, the chapter also describes how Karuk World Renewal principles and applications defy settler notions of vulnerability and resilience, granting full agency to the more-than-human world and framing relationships with other species as reciprocal, collaborative, and hopeful.

This dissertation is interdisciplinary for a variety of reasons. First, I am student in an interdisciplinary environmental studies program that from a curricular standpoint has allowed me to integrate various disciplines, especially sociology, geography, and communications. You can see these disciplinary frameworks, and even my undergraduate training in landscape architecture, weave together in this dissertation. Secondly, the Indigenous scholars and allies that have influenced my work are situated within, conversing between, and expanding various disciplines and fields, including American, Indigenous and ethnic studies (Greg Cajete, J. Kēhaulani Kauanui**,** Brian Klopotek, Kim TallBear, Eve Tuck, Greg Vizenor, Shawn Wilson), anthropology (Elizabeth Hoover, Tony Marks-Block, Enrique Salmón, Patrick Wolfe), communications (Ashley Cordes), geography (Emilie Cameron, Elizabeth Marino), sociology (JM Bacon, Carla Dhillon, James Fenelon, Dwanna McKay, Kari Norgaard, Erich Steinman, France Winddance Twine), education (Jo-ann Archibald, Megan Bang, Michelle Jacob), political science (Glen Coulthard), philosophy (Kyle Whyte), ecology (Robin Kimmerer, Frank Lake), and environmental studies and sciences (Sibyl Diver, Daniel Wildcat), to name a few. Some Indigenous thinkers and authors that have shaped my work, such as Winona LaDuke, Ron Reed, Leanne Simpson, and Bill Tripp, are independent scholars and thinkers not affiliated with a specific academic or research institution, yet their work remains vital.

Finally, this dissertation research is informed by decolonial and Indigenist research principles (Simspon 2014, Smith 2005, Tuck and Yang 2012, Wilson and Hughes 2019). At the heart of decolonization is, as Tuck and Yang (2012) assertively remind us, the repatriation of Indigenous lands. Decolonized research methods must therefore never stray far from the centrality of land and place for Indigenous peoples. This dissertation centers on the power of Karuk people, landscapes, and relations, as well as how they have been impacted by historic and contemporary acts of genocide and settler colonial violence. As a settler engaged in research with Indigenous communities, I take

seriously the possibility of perpetuating colonial violence through my research and consider it my responsibility to understand and put into practice decolonial research strategies presented by the Karuk Tribe, as well as other Indigenous communities, activists, and scholars. As is required of anyone carrying out research related to the Karuk Tribe, my research has been reviewed and approved by a Karuk Resource Advisory Board (KRAB). My KRAB members are Frank Lake (Karuk descendant, US Forest Service research ecologist), Kari Norgaard (settler, long-time Karuk collaborator, University of Oregon professor), Vicki Preston (Karuk, Tribal DNR staff), and Analisa Tripp (Karuk, Tribal DNR staff).

I draw inspiration and guidance from Wilson (2008), Wilson and Hughes (2019), Simpson (2014), and Tuck and McKenzie (2015) who discuss the vital importance of land and non-human species in decolonial and Indigenist research. Wilson (2008) describes knowledge as *relational*—generated in the relationship between people and landscapes, and people and non-human species. He explains that "you are answerable to all your relations when you are doing research" (56-57). In *Land as Pedagogy*, Simpson (2014) implores academics truly committed to Indigenous communities to "make a conscious decision to become a decolonizing force in the intellectual lives of Indigenous peoples by joining us in dismantling settler colonialism and actively protecting the source of our knowledge - Indigenous *land*" (p.22). Tuck and McKenzie (2015) offer a framework for critical place inquiry that seeks to decolonize conceptions of place, including the following key research objectives:

- Addressing spatialized and place-based processes of colonization and settler colonization, and working against their further erasure or neutralization through social science research
- Extending beyond considerations of the social to more deeply consider the land itself and its nonhuman inhabitants and characteristics as they determine and manifest place
- Aiming to further generative and critical politics of places through such conceptualizations/practices and via a relational ethics of accountability to people and place (19)

The frameworks and guidelines presented by these scholars guide my approach to this dissertation, which aims to center land-based relations and account for, honor and benefit the diverse biotic community of species that calls the Klamath River Basin home. It is my hope that the chapters and illustrations featured here will serve the Karuk Tribe and the landscapes and more-than-human kin they have cared for since time immemorial.

II. Under the Guise of Science: How the US Forest Service Deployed Settler Colonial and Racist Logics to Advance an Unsubstantiated Fire Suppression Agenda

An adaptation of this chapter is now published in *Environmental Sociology* (Vinyeta 2022)

Introduction

As climate change advances, a key concern for the Karuk Tribe is the presence of wildland fire—both too little, and too much of it. Prior to European-American occupation, Karuk people routinely and strategically burned landscapes in the Klamath River Basin for various spiritual and ecological reasons, a practice referred to as cultural burning. Among the many benefits of cultural burning is the reduction of larger-scale, more destructive fires (Prichard et al. 2017). That changed drastically in 1905 when 98% of Karuk Ancestral Territory—unlawfully taken by the United States government without compensation or treaty provisions—was placed under United States Forest Service jurisdiction. Originally modelled after German state forestry aimed at maximizing timber production (Scott 1998), the United Stated Forest Service brought a strict Euro-centric commitment to fire suppression to a continent fecund with fire-adapted ecosystems and communities. In Karuk Ancestral Territory, this led to the federal criminalization of cultural burning and the institution of legally enforced fire suppression, measures that have significantly altered the landscapes of the Klamath River Basin over the last 100 years (Knight et al. 2020, Lake 2007). Among the impacts is increased forest density and accumulation of forest fuels that exacerbate the risk of large-scale wildfires.

In the last decade, as evidence mounted against the Forest Service's fire suppression-only management, the Klamath and Six Rivers National Forests in Karuk Ancestral Territory have expressed interest in supporting the return of fire through partnerships with the Karuk Tribe (Harling and Tripp 2014). Unfortunately, reversing the effects of a century of federal mismanagement is difficult, especially in the context of climate change. In what is now known as California, 2020 was the most volatile fire season to date, with an unprecedented amount of area burned. This trend did not spare the Karuk Tribe; in August 2020, the Slater Fire tore through the town of Happy Camp—within Karuk Ancestral Territory and home to many Karuk residents—killing two people, burning more than 150 homes, and killing millions of culturally significant plants and animals.

Pyne (2015) has described the changing stance of the USFS as it pertains to wildfire management—from a militant enforcer of fire suppression to an agency contemplating prescribed burning. Meanwhile, Karuk Indigenous knowledge remains steadfast in its understanding that fire is a necessary and beneficial landscape element—that "fire is medicine." This chapter emerges out of the desire to examine how the USFS justified its century-long mismanagement of fire in Western forests in light of the continuous, contradicting presence of Indigenous peoples whose knowledge highlights the ecological value of burning (see Figure 2).

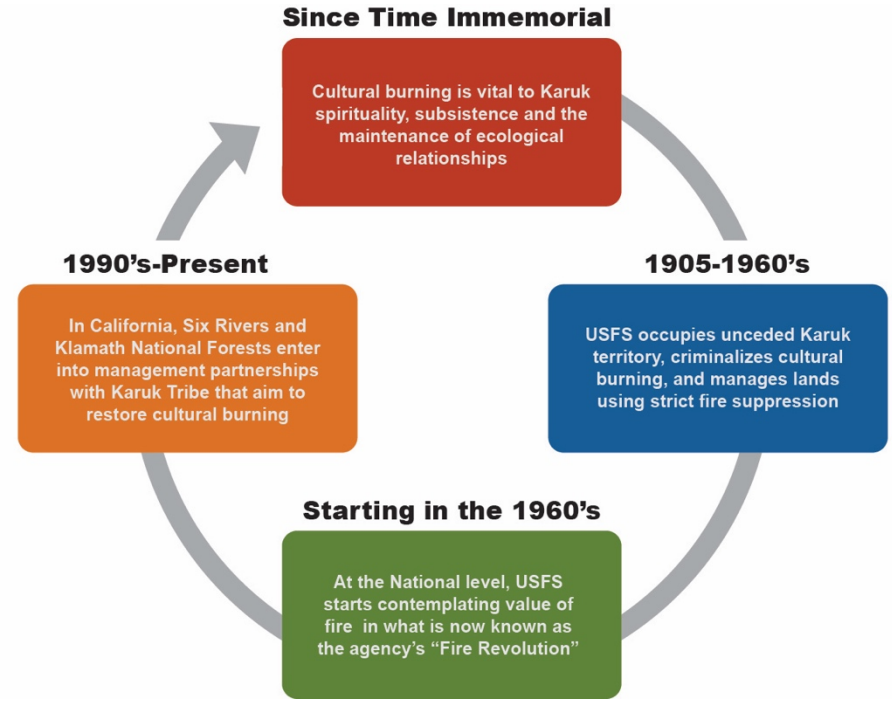

Figure 2. While Karuk Indigenous knowledge has remained steadfast in valuing fire as an essential ecosystem management tool, in the last century, the United States Forest Service has reversed its position on forest fire.

The U.S. Forest Service's legitimacy rests in part on the agency's Western scientific approach to management. Theoretically, Western science dictates that knowledge be objective and constantly scrutinized. As such, one is to expect slight revisions and sometimes even paradigmatic shifts (Kuhn 1970). Yet my analysis of the agency's changing fire management discourse affirms what other scholars have demonstrated: Western science does not operate in a value-free social vacuum. Its practitioners are social beings with preconceived notions and prejudices, socio-cultural biases, personal histories, and institutional affiliations and politics that determine how (and for whom) they

"do" science (Medin and Bang 2014). The scientific process is inseparable from the social structures that shape its funding entities, practitioners, and broader social, political, and ecological contexts.

The USFS is an institution resulting from—and in the service of—Euro-American settler colonialism. Its control over 193,000,000 acres of what was once actively stewarded by hundreds of distinct Indigenous Tribes is possible only through settler colonial violence inflicted upon Indigenous peoples, including genocide, land theft, displacement, containment within reservations, and forced cultural assimilation. In California, as in many other places across the country, the absence and presence of fire is steeped in Indigenous/settler conflict. The Forest Service's erasure of Indigenous knowledges has led to incalculable ecological and cultural consequences for Indigenous peoples especially, but also for settlers living under constant wildfire threat. Addressing the history and mechanisms of this erasure is a matter of environmental justice.

This chapter builds on the work of Lake (2007, 2017) and Norgaard (2014, 2019) who extensively examine how Karuk lifeways, settler colonialism, and federal fire suppression interact in the Klamath River Basin. My analysis here is novel in that 1) it examines the evolution of USFS fire suppression discourse over time, and 2) it focuses specifically on the relationship between state-led science and settler colonialism. Via a content analysis of USFS documents at both the national and regional levels over the last century, I expose how in the early 1900s the agency used racializing settler discourse to erase or discredit Indigenous knowledges while validating the Forest Service's presumably scientific stance on fire suppression. Midway through the 20th century, and in the broader context of the Civil Rights and American Indian Movements, the agency began to reconsider its position on fire. In the last decade, the agency has pursued collaborations with Tribes, seemingly acknowledging the value of Indigenous knowledges, all the while failing to acknowledge its own role in generating the current wildfire crisis. These findings illustrate the malleability of state-led science as well as its entanglements with colonial and racial constructs.

Background

Indigenous Knowledges, Karuk World Renewal and the Role of Fire in Karuk Lifeways

Indigenous knowledges refer to Indigenous ways of knowing that are place-based, passed intergenerationally, and dependent upon Indigenous peoples' ongoing, active, and sovereign relationships with the land, more-than-human kin, and with each other (Simpson 2004, 2014). Whyte (2017, p.157) describes the varied forms these knowledges can take, "from how ecological information is encoded in words and grammars of Indigenous languages, to protocols of mentorship

of elders and youth, to kin-based and spiritual relationships with plants and animals, to memories of environmental change used to draw lessons about how to adapt to similar changes in the future."

Since time immemorial, Karuk people have been tending to the Klamath River Basin's ecosystems along with their Hupa and Yurok neighbors downstream, and Klamath and Shasta neighbors upstream. Karuk people refer to themselves as "fix-the-world-people" in reference to *pikyávish*, arguably the Tribe's most important annual ceremony, sometimes referred to as *Karuk World Renewal* (see Kroeber and Gifford 1949). The ceremonies' Karuk name—pikyávish—stems from píkyav, which means "to fix it." According to the Karuk Tribe, pikyávish:

> …refers to the Tribe's continuing ceremonial and diurnal efforts to restore the earth and its creatures to harmonious balance. This is our inheritance, passed down from generation to generation through the teachings of the First People, the ikxaréeyav. Our oral traditions recount the formation of plants, aquatic species, land formations and other resources created and given to us to utilize and manage. These gifts are given with conditions: we understand the reciprocal responsibilities that are attached to this act of largesse, and the traditional laws given to us by the ikxaréeyav remain the basis for our management techniques, and the ceremonies that frame them.[4]

Karuk Tribal member and DNR Director Bill Tripp (2017) explains the significance of Karuk World Renewal Ceremonies:

> [World Renewal Ceremonies] link human practices like fishing, hunting and gathering to responsibility. They also ceremonially align our culture with ecosystem process and function. In our worldview, cultural resources have a life, as do the people using them.
> Each life deserves consideration when planning projects, including fire adaptation projects.

Tripp makes special mention of fire adaptation projects because fire is of utmost spiritual and socio-ecological significance in World Renewal and related practices. Former Karuk DNR Director and spiritual leader Leaf Hillman points to the very intimate and reciprocal relationship with fire, explaining that "fire takes care of us and we take care of fire." Karuk fire knowledge is place-based and time-tested, developed and refined over generations based on praxis (Lake 2007). The ecological benefits of burning are many, including reduction of landscape pests and disease; promotion of culturally significant; fire-dependent species; reduction of understory fuel; upkeep of early seral habitats; and in the case of the Karuk Tribe, less obvious but important benefits such as

[4] http://www.karuk.us/index.php/departments/natural-resources/eco-cultural-revitalization/pikyav-field-institute

the water-cooling properties of fire smoke that can protect the health of salmon runs during the heat of summer (Anderson 2005, David et al. 2018, Karuk DNR 2010, Kimmerer and Lake 2001, Lake 2007, Lake et al. 2017). For the Karuk DNR, federal fire management is highly illustrative of ongoing settler colonial processes of Indigenous dispossession that simultaneously restrict tribal culture, impact the ecology of places, and affect the health of Karuk people and their more-than-human kin (Karuk DNR 2016, Marks-Block and Tripp 2021, Norgaard 2014, 2019).

Settler Colonialism, Colonial Ecological Violence, and the Racialization of Indigenous Peoples

Settler colonialism is not a faded chapter in U.S. history but an ongoing structure that shapes every dimension of contemporary life for Indigenous peoples and settlers alike (Bacon 2018, Coulthard 2014, Glenn 2015, Jacob et al. 2020, McKay et al. 2020, Whyte 2018, Wolfe 2006). Whereas other forms of colonialism seek extraction of natural resources and enslavement of Indigenous populations to be brought back to colonizers' home territories, settler colonies seek to permanently displace Indigenous peoples from the land in order to create new territories for colonizers to permanently inhabit (Wolfe 2006). Settler acquisition and control of land is especially central to settler states (Hurwitz 2014, Tuck and Yang 2012), as is the genocide and continual erasure of Indigenous peoples (Fenelon and Trafzer 2014, Madley 2016, Norton 2014). Indigenous erasure is exemplified by the logic of *terra nullius*. As Coulthard (2014) states, "[b]ecause Indigenous societies were considered so low on the natural scale of social and cultural evolution, settler authorities felt justified in claiming North America legally vacant, or terra nullius, and sovereignty was acquired by the mere act of settlement itself" (p. 100). Literally meaning "void" "empty" or "null earth," this legal concept declared that lands inhabited by Indigenous peoples were legally vacant and open for European occupation and privatization.

Land-based power struggles are inevitably ecological in nature. Bacon (2018) conceptualizes settler colonialism as an *eco-social* structure. Through ever-changing, continuous processes of *eco-social disruption*, settler colonialism generates what Bacon coins *colonial ecological violence*. This form of violence is perpetrated by interrelated actors, including the settler state, private industry, and settler populations. It includes both "spectacular forms of violence" such as genocide and forced relocation, as well as what Nixon (2013) terms "slow violence"—less visible acts the effects of which accrue slowly over time. The settler state's enforcement of fire suppression in Karuk Ancestral Territory exemplifies a form of slow colonial ecological violence. Karuk people are policed and

threatened with incarceration for using fire, and it is only over time that the ecological and cultural implications of fire exclusion become manifest in their full magnitude. As Norgaard (2019, p. 103) explains, "[e]nvironmental decline from fire exclusions forms an extension of colonial violence to the Karuk community by simultaneously disrupting ecological and social reproduction. As such, fire exclusion continues to be a major force of land dispossession."

In the context of this research, it is also important to understand the relationship between settler colonialism, racialization and white supremacy. Scholars have theorized how the social structures of settler colonialism and race are co-constitutive (Glenn 2015, McKay et al. 2020, Norgaard 2019, Pulido 2018). Omi and Winant's (1994) theory of *racial formation* defines race not as a concrete biological or cultural fact, but one that is fluid and politically contested. Indigenous peoples are subject first and foremost to settler colonial oppression, but also to related processes of racialization that serve as further means of dispossession (Klopotek 2011, Robertson 2015, Rohrer et al. 2016, TallBear 2013)—what Norgaard (2019) describes as *racial-colonial formation*. Berkhofer (1978) outlines how hundreds of distinct Indigenous groups in North America were consolidated under the homogenous term "Indian" resulting from Columbus' erroneous geographic interpretations. He explains that "Native Americans were and are real, but the Indian was a White invention and still remains largely a White image, if not stereotype."

Among the notable images associated with "Indians" is that of the "savage," immortalized in the United States Declaration of Independence. Robertson (2015) describes how the savage narrative persists in contemporary racializations of Indigenous peoples that remain largely uncontested—what she refers to as *legitimized racism.* Another key racial narrative is that of the "vanishing Indian," in which settlers assume the inevitable disappearance of Indigenous peoples and cultures. Dunbar-Ortiz and Gilio-Whitaker (2016, p.9) explain that "[n]o myth about Native people is as pervasive, pernicious, or self-serving," and that it has been "used to advance the dubious—even nefarious—political agendas aimed at the continual seizure of Indian lands and resources." By portraying Indigenous peoples as uncivilized savages on the one hand, and as a vulnerable, disappearing race on the other, settlers and the settler state justify ongoing colonial violence.

The USFS, the Settler State, and Fire Science

As a land management agency of the settler state, the existence of the United States Forest Service is predicated on colonial ecological violence. National Forests contemporarily under USFS control are the ancestral lands of hundreds of Indigenous Tribes. The institution and expansion of USFS

jurisdiction and Indigenous land dispossession are intertwined processes. Catton (2016, p.40) explains that "[f]rom 1905 to 1909, the National Forest System increased in size by around 97 million acres, while allotment led in fairly short order to Indians' loss of around 86 million acres. The rise of conservation dovetailed with a national closeout sale on the Indians' landed heritage."

In California, the unratified treaties of 1851-52 were instrumental in dispossessing Indigenous peoples of their land. In that two-year period, eighteen Tribes signed treaties with the United States in which they were to cede title to ancestral lands in exchange for reservations set aside for Tribal use, as well as compensation for the lands ceded (Heizer 1978). The treaties needed senate ratification to have legal standing. At the time, pressure was mounting on senators to support settlers' ongoing gold rush aspirations, which would be compromised should Tribal reservations be excluded from mining. As a result, the senate did not ratify the treaties, and the eighteen Tribes in question—including the Karuk Tribe—came under U.S. sovereignty without legal claims to their ancestral lands (Miller 2013). Without any compensation or land provisions to speak of, ~1.05 million acres of Karuk Ancestral Territory were stolen and placed under United States jurisdiction, first as Federal Forest Reserves, and later as the United States Forest Service's Klamath and Six Rivers National Forests.

The establishment of the National Forests were linked to acts of overt colonial violence against Karuk people. Karuk Tribal member and DNR staff Analisa Tripp states: "…when the Forests were established is when [Karuk] people's homes were being burnt down. California Indian children…there was laws that allowed them to be enslaved. They were also being forcibly removed from their families to go to boarding schools, like my grandma" (Klamath Media 2018, 3:12). The separation of Karuk children from their families, forced assimilation and violence through boarding school education, and removal of youth from ancestral territories represented a rupture in the Indigenous knowledge systems and praxis that are vital to Karuk ecosystem management. That this knowledge continues to exist in the present day is a testament to Karuk resistance.

At the same time as Indigenous peoples and knowledge were under assault, the USFS fortified its legitimacy as a land management agency. Foucault (1980) describes the production and dissemination of knowledge as an exercise of power. The USFS derives its legitimacy from its state affiliation as well as the public assumption that the agency's decisions are guided by science. Despite its prominence as an objective knowledge system, Western science is neither value-free nor a-cultural (Haraway 1988, Levins and Lewontin 1985, Medin and Bang 2014). Scientists cannot separate their social, cultural, or political selves from their scientific selves. For Western scientists,

this often means "doing" science from a Euro- and andro-centric settler lens, given the disproportionately white and male demographics of science, technology, engineering, and mathematics (STEM) (Medin and Bang 2014). Scholars have examined the deployment of Western science to construct racial boundaries and hierarchies (Dennis 1995, TallBear 2013), and to justify domination over women (Tuana 1989) and non-humans (Haraway 1978). Scholars have also examined the role of Western science as a tool of colonialism (Dhillon 2020, Griffiths and Robin 1997, MacLeod 2000, Whit 2009). This role is multifaceted and includes the appropriation of Indigenous knowledge for colonial gains, the alignment of scientific and colonial objectives, and the misapplication of Euro-centric Western science in non-European ecological and cultural contexts.

From its inception, the USFS had strong ties with Western scientific institutions, particularly relating to the professionalization of foresters. Early professional forestry in the United States was modelled off German forestry principles that didn't align with Indigenous values (Catton 2016). Scott (1998) describes state forestry as guided not by local knowledge and experience but by abstract, standardized scientific principles that promote ecological conditions vital to capitalist production and imperial agendas. In the ordered forest idealized by European forestry "unauthorized disturbances-whether by fire or by local populations-were seen as implicit threats to management routines" (Scott 1998, p.18). The idea that fire (and, more importantly, anyone who starts fires) is the forester's enemy has driven much of the Forest Service's agenda.

Indigenous peoples throughout the United States have traditionally used fire to care for ancestral landscapes and promote culturally significant species (Anderson 2005, Kimmerer and Lake 2001, Lake et al. 2017, Marks-Block and Tripp 2021, Stewart et al. 2002). The relationship between Euro-American settler colonialism, state forestry, and fire suppression becomes explicit when Pyne (1997) explains that "much of the American West, for example, was first settled by foresters through the institutions of fire protection" (p.29). Relatedly, wealthy settlers that funded Indian-killing militias for the purposes of securing land in Northern California later used their clout as land barons to shape federal forest management, including in regard to fire suppression (Lake 2007). However, it is also important to note that the European continent was not devoid of fire conflict; in fact, it was conflict between rural peasants who routinely burned and urban officials and intellectuals who saw burning as waste that inspired extreme fire suppression ambitions among European foresters in the newly forming United States. Pyne (1997, p.30) describes:

> The collision of European forestry with indigenous landscapes sparked a public debate about appropriate fire practices and policies. The celebrated *light-burning controversy* in America had cognates in the early-burning debates that were kindled throughout the British Empire…Over and over again, they interpreted fire in political rather than environmental terms, as the graffiti of ecological vandals, as the torches of barn-burners and rural vigilantes, as the protest of a folk both sullen and *prescientific* (emphasis mine).

Pyne mentions the "light-burning controversy," a debate that shook land management in the American West in the early 20th century. This debate questioned the value of burning landscapes intentionally with low-intensity fires for a variety of ecological purposes, what the Karuk Tribe refers to as cultural burning and what is today more commonly referred to as prescribed burning. Pyne's quote also highlights a key divide constructed by Western institutions to distinguish whose knowledge is legitimate: scientific vs. "prescientific." Western scientific training is the credential under which state foresters are continuously legitimized, regardless of the scientific rigor they apply in practice. Conversely, the knowledge of those deemed "prescientific" has historically been disregarded as generally unworthy of scientific attention. Because Indigenous knowledges are produced and disseminated differently than Western science, many scientists have historically defaulted to discrediting these knowledge systems as unsubstantiated folklore (Mason et al. 2012).

Lake, Tripp, and Reed (2010) explain that in the United States, "resource management regimes are legally required to use best available science" (p.147). The lead author, who is both a Karuk descendant and a Forest Service Research Ecologist, explains that according to the Karuk Tribe, the USFS has largely failed to use the best available science in the Klamath River Basin by neglecting Indigenous knowledge that is place-specific and time-tested. The absence of landscape fire has led to a reduction in early seral habitats (ie., prairies/grasslands, oak woodlands, more open forests) that are vital to many species, as well as increased forest density and fuel loads that create highly volatile conditions, especially in the context of climate change (Busenberg 2004, Hessburg et al. 2005, Knight et al. 2020, Lake 2007). The recent fires that have raged through much of California, including in Karuk territory, illustrate the ecological, cultural, and economic consequences of erasing Indigenous peoples and knowledges. Understanding the logic behind the U.S. Forest Service's costly erasure of Indigenous knowledges is an important step toward environmental and climate justice (see Long et al. 2020).

Materials and Methods

To assess how settler constructs shaped agency discourse, I carried out a content analysis of historic and contemporary U.S. Forest Service documents, materials and webpages produced by the agency regarding fire suppression at both the federal and regional levels. In the context of policy making, Liévanos (2012) uses the concept of *state resonance* to describe the "set of action-oriented meanings, beliefs, and interests [that] are treated as reliable, valid, and credible by state actors who make policy and are thus more likely to be codified in the state's formal policies and programs" (p.485). Liévanos (2012) explains that state resonance is a key mechanism by which to legitimate one set of claims over another and eventually codify the legitimated claims into policy. In light of the role of state resonance in policy making, I chose to focus on agency discourse over strictly fire policy because agency discourse, 1) is the public manifestation of the meanings that have been legitimated by state actors, 2) synthesizes policy while simultaneously offering justifications for said policies to the public, and 3) is the principal means of communication with constituents by which the agency asserts its legitimacy.

At the federal level, the National Archives and the U.S. Forest Service website served as key resources from which to locate and extract historic documents for review and analysis. At the regional (R5) level, the Six Rivers Heritage Resource Library associated with the Six Rivers National Forest (one of two National Forests situated on Karuk Ancestral Territory) was the main source of region-specific material. I was particularly interested in literature pertaining to California, the Klamath and Six Rivers National Forests.

Federal and regional USFS documents were analyzed and coded using Atlas TI. During the initial coding I realized the context-specific importance of the terms "light-burning controversy" and "Piute forestry," which led to an expanded document search by typing those terms into Google Scholar and combing the results for relevant data. Throughout the coding process, I kept a memo outlining the timeline of historic events revolving around federal fire management and Indigenous/settler relations, as well as a memo documenting key findings, questions, and contradictions. Special attention was paid to the justifications that the USFS offered in favor of fire suppression-only policy, and whether Indigenous burning practices were accounted for and/or openly discredited. In addition to the analysis of primary data (USFS documents, materials, and webpages produced and disseminated directly by the agency), I supplemented my analysis with secondary data describing other scholars' documentation and interpretations of USFS and Karuk fire

management history. This supplementation helped me confirm, enrich, and add detail to the story emerging from my primary data.

Results

The Forest Service Racialized Light Burning

In the early 20th century, as the USFS instituted a totalizing policy of fire suppression, a hegemonic narrative accompanied the dissemination of this policy that associated fire suppression with morality. Fire suppression in Western forests was described by USFS foresters as "one of the finest accomplishments in forestry yet witnessed in the United States" (Greeley 1999, p.34). Light burning, on the other hand, represented the antithesis of the Forest Service's mission:

> For a new generation of American-trained foresters, people who worked to protect the Nation's forests from fire, the idea contradicted everything they had been taught. Indeed, they believed that fire of any kind in the forests prevented the practice of scientific forestry that they had spent years studying and perfecting. Simply put, it made no sense (Smith 2017, p.25).

Light burning was described as "most undesirable and the most mischievous" (Boerker 1912, p. 185), and was associated with vandals, social outcasts, "Indians", and greedy corporate actors (Hartzer 1981, Pyne 2015). This narrative served to inculcate the broader public with fire suppression ideology. The USFS politicized fire and fire science, focusing more on broadcasting the perceived illegitimacy and immorality of those in favor of light burning than in scientifically assessing the ecological benefits and harms of periodic burns.

In the early years of USFS fire management, it became clear that a central challenge to absolute fire suppression was going to be Indigenous burning. In the Klamath National Forest on Karuk Ancestral Territory, District Ranger Harley (1918) suggested using missionary assistance to manipulate "Indians" into ceasing their burning practices, stating:

> There is this lady here, Mrs. Watkins, who has been here over a year doing general missionary work amongst the indians....My scheme is as follows—Let the [Forest] service hire this woman to work amongst the indians on a general educational basis….[H]er duties would be to travel up and down the river between Orleans and Elliots, stopping at different indian houses, talking to them in regards to their own welfare, but the principal point to impress on them would be the fire question. This woman can do more in one season towards causing the indians to adopt our theories in regards to fire than we can do in five (as quoted in Williams 2000, p.17).

At the National level, the correlation between wildfire and "Indians" was manipulated to influence public opinion among settlers. The strategic deployment of "Piute forestry" as an alternate name for light burning illustrates the Forest Service's use of language to equate the practice with indigeneity. The term "Piute" (now more commonly spelled "Paiute") refers to three non-contiguous Indigenous groups—Northern Paiute, Southern Paiute, and Mono People—with ancestral landscapes spanning various Western states. Paiute people are among hundreds of distinct Indigenous groups that use fire to manage landscapes. In March 1920, and one month before becoming the third Chief of the USFS, William Greeley published an article titled "'Piute Forestry' or The Fallacy of Light Burning," in which he states:

> The advocates of light burning, or "Piute forestry," assert that fire should not be kept out of the pine forests…[They] claim that their scheme was practiced by the Indians in various western pine forests long before the advent of the white man, asserting that the noble redskin fired the forests regularly, not so much to facilitate his hunting or protect his dwelling as because his nature lore taught him that this was the way to prevent "big" forest fire (Greeley 1999, p.34)

Also in 1920, future renowned conservationist Aldo Leopold, then an assistant district forester for the USFS in the Southwest, published an article titled ""Piute Forestry" vs. Forest Fire Prevention," in which he states:

> This [light-burning] theory is called "Piute Forestry" for the alleged reason that the California Indians, in former days, deliberately "light-burned" the forests in order to protect them against serious fires…. The Forest Service policy of absolutely preventing forest fires insofar as humanly possible is directly threatened by the light-burning propaganda. It is up to the public and especially the users of the forests to decide whether they wish that policy continued or whether they wish to try "Piute Forestry" (Leopold 1920, p. 12-13).

While the term "Piute" initially appears to possess Indigenous specificity, the above quotes reveal its deployment as a deriding generalization homogenizing the diverse fire management practices of hundreds of distinct Indigenous groups across the U.S., morphing it into a racializing term akin to "Indian" or "redskin." "Piute Forestry" becomes racialized code for forestry that is "savage", lacking expertise, and that can be extended not just to Indigenous peoples but also to settlers who favor light burning.

Racist, anti-burning discourse was also found on documents handed out to National Forest visitors, such as on the Klamath National Forest Map of 1929. The map states that "[t]he incendiary problem…is not a fire hunt but a man hunt; not fire, but the owner of the hand that lights it, is the public's enemy" (USFS-California District 1929, p.14, emphasis mine). It then goes on to specifically associate those in favor of light burning with Indigenous practices, explaining that "many people have reached the untenable conclusion that the methods of Indian days are the best that can be devised for the present" (p.16). Regional USFS documents as late as 1949 openly deployed racist stereotypes to describe Indigenous burning in National Forests. In the Six Rivers National Forest General Integration Inspection Report written by Region 5 Foresters Cronemiller and Kern (1949), the authors describe the "Indian incendiary problem" with great urgency, with specific concerns in the Orleans Ranger District in Karuk Ancestral Territory. They equate incendiarism in the Klamath River Basin with the retaliatory acts of "the drunken Indian." Their official government report goes on to explain:

> Solving the problem of the half-drunk Indian and his retaliatory actions is a long process involving possible (a) enforcement of liquor laws in respect to Indians, and (b) long time educational programs in agriculture and forestry among the high school students. Law enforcement is, of course, essential but is a much different problem than that of the white man's conception, yet no one seems able to say what is proper punishment for an Indian. One sheriff says a rubber hose filled with buckshot is perhaps the best (Cronemiller and Kern 1949, as cited in Conners 1998).

As Conners (1998) explains, this "language typified broadly held attitudes that translated into agency practices." Racist constructs seeped into the USFS' institutional framework, justifying the agency's land management strategies and scientific pursuits.

Indigenous Peoples and Knowledges were Delegitimized or Erased

Indigenous burning had not been disregarded by all settlers. In fact, some settlers, settler scientists and settler-owned corporations were light burning advocates whose perspectives on fire aligned more closely with Indigenous peoples' practices, even if their motivations differed (Pyne 2015). Early settler support for Indigenous burning in California is reflected in the following quote:

> The debate over the suppression of fires in California's forests often divided scientists, foresters, settlers, mountaineers, and Indians. An 1899 editorial to the Forester, journal of the American Forestry Association, captures the divisiveness of the debate. "The idea that

> the Indians were better foresters than the scientific experts of the present day seems a peculiar one, but it is seriously maintained by many intelligent people" (Anonymous 1899:241, as cited in Lake 2007, p.270).

The extent of settler support for light burning is also evidenced in Greeley's essay:

> This [light burning] system is advocated by the Southern Pacific Railroad, which, because of its enormous federal grants, is one of the two or three largest timber land owners in the United States. It is supported by other large timber-owning corporations, particularly in California. Light burning has been preached in articles appearing in American Forestry and in various lumber journals. It is, in fact, a substitute offered to the people of the western states for the present system of forest protection which has hitherto made such splendid headway (Greeley 1999, p.34).

In California, civil engineer Joseph Kitts published materials in 1919 advocating for the use of light burning to reduce the risk of catastrophic fires. He pointed to the long-term use of fire among the Indigenous peoples of California as evidence that this was a valuable and time-tested land management strategy. Because they depended on healthy forests for their livelihood, Kitts concluded that Indigenous peoples had become "the most practical of foresters" (Kitts 1919: 9-10, as cited in Smith 2017, p. 26). Kitts prepared an informational pamphlet distributed by Southern Pacific Company whose land commissioner—B.A. McAllaster—was also a proponent of light burning. Southern Pacific Company owned expansive tracts of timber and it was McAllaster's belief that the Forest Service's suppression-only management would eventually lead to catastrophic fires that would devastate Westerns forests from Mexico to Canada (Smith 2017). Settlers also wrote specifically about cultural burning along the Klamath River. Ruth Kellett Roberts (1932) published an article in *California Fish and Game* titled "Conservation as Formerly Practiced by the Indians in the Klamath River Region," in which she describes the deliberate and informed use of fire and the benefits it generated for Indigenous communities.

As evidence mounted that Indigenous burning was influencing settlers' approaches to land management, the USFS explicitly discredited Indigenous peoples and anyone that replicated their practices within a broader settler-colonial project of Indigenous erasure. This was accomplished through three key settler narratives:

1. Discrediting—Savage Narrative
2. Downplaying—Vanishing Indian Narrative
3. Excluding—Terra Nullius Narrative

These narratives deployed racist tropes and often spoke of Indigenous peoples in the past tense, not as contemporary agents. In some cases, Indigenous peoples were entirely omitted from the narrative despite their importance in shaping ecosystems of cultural importance. In continuation I describe these three narratives of erasure and provide examples of how they were used.

Discrediting—Savage Narrative

One tactic was to explicitly mention and discredit Indigenous peoples and their land management practices. This tactic called upon the savage narrative to convince settlers that Indigenous peoples were unreliable sources of knowledge. Cronemiller and Kern's (1949) description of the "Indian incendiary" as a drunken individual out for revenge was one such example. Another can be found in Leopold's 1920 article, in which he states:

> It is, of course, absurd to assume that the Indians fired the forests with any idea of forest conservation in mind….the Indian fired the forests with the deliberate intent of confusing and concentrating the game so as to make hunting easier…A bunch of deer with their heads in the air waiting for a fire presented an easy mark, even to the Indian's bow and arrow, and it was this fact, and not any desire for fancied forest conservation, which caused the Indians to burn the forests (Leopold 1920, p.13).

Sometimes the messaging was more subtle, yet still effective in discrediting Indigenous knowledges while simultaneously elevating the state's supposedly scientific approach. The 1929 Klamath National Forest map explains that "[t]he existing policy of the Forest Service in fire prevention and suppression *has not been reached on the basis of guesswork*. It represents continuous and critical study of forest fires" (USFS-California District 1929, p.17-18, emphasis mine). This quote suggests that unlike Indigenous practices, USFS management is rooted in systematic and reliable scientific findings.

Downplaying—Vanishing Indian Narrative

Another tactic was to downplay the ecological role of Indigenous peoples in shaping landscapes. This tactic invoked the "Vanishing Indian" narrative, underestimating the quantity, scale, and impact of Indigenous burning, as well as the role of Indigenous peoples in future land management. In his book *American Indians and National Forests*, Catton (2016) explains:

> As much as [USFS Chief Gifford] Pinchot admired the Indians' land wisdom, he saw it as a quaint relic of the past, not as something to be seriously studied or consulted by

> contemporary land managers. It was practically axiomatic in turn-of-the-century America that Indian peoples belonged to a "vanishing race" (p.37).

In California, where Indigenous burning played a major role in shaping ecosystems throughout the state, the Forest Rangers' Catechism publicly addressed the question of Indigenous burning as follows:

> 2. Why did Indians start fires in the forest?
> Tradition says that they did so to drive out game, but no positive proof can be found that they did this as a regular custom over any large areas. *The probabilities are that Indians set very few fires*. With the coming of the white man, and the discovery of gold, fires became more numerous and spread year after year, largely unchecked (Ayres and Hutchinson 1931, p.37 emphasis mine).

Within the USFS there was the occasional ranger that understood the cultural premises and value of Indigenous burning. Russ Bower, a local settler who was the Orleans District Ranger from 1936 to 1939 worked closely with Karuk and other Indigenous peoples of the region and came to understand that Indigenous burning was not malicious nor retaliatory, but in fact an ecologically productive cultural practice. Lake (2007) explains that "after [Bower] learned of the Indians' need for burned hazel (*Corylus cornuta* Marsh. var. *californica*) for basketry material, he helped them with getting 70 acres burned near Rattlesnake ridge, southeast of Orleans" (p.275). While individuals within the agency were at times capable of taking on local projects that mitigated the impacts of national USFS policy, the agency's overarching institutional structure was still fully invested in fire suppression, making these local projects short-lived exceptions.

3. Excluding—Terra Nullius Narrative

Finally, a third tactic was to minimally mention or outright exclude Indigenous peoples from agency discourse, even in landscapes with contemporary Indigenous presence and in which Indigenous burning heavily influenced the distribution of flora and fauna. This narrative relies on the assumption that North America was a pristine wilderness devoid of human influence prior to Euro-American occupation, effectively erasing Indigenous presence and the role of Indigenous peoples in shaping ecosystems. Just one year after the inflammatory Six Rivers National Forest Report by Cronemiller and Kern (1949) described above in which the authors described the "Indian incendiary problem" with great urgency, the Prospectus for the Six Rivers National Forest (Fisher 1950) outlining the purposes and goals of the Forest doesn't mention Indigenous peoples even once. This

was despite being situated on the territories of various Indigenous communities, a fact reflected in the Forest's present-day government-to-government relationship with twelve distinct Tribes, including the Karuk Tribe, as well as four tribal communities that aren't federally recognized.[5]

USFS Scientists Compromised Fire Experiments and Concealed Research Results

Given the Forest Service's fire suppression fervor and self-proclaimed scientific superiority, one would assume that the agency was basing its anti-light burning stance on scientific data. Surprisingly, very little research was dedicated to properly investigating the benefits or harms of prescribed fire. Smith (2017) documents the history of USFS fire science from the agency's inception to the 1970s. Among the most notable aspects of this history is the dearth of research dedicated to understanding the ecological role of fire and the benefits of prescribed burning. Smith's report details a research agenda focused almost entirely on improving fire suppression techniques, often via the development of expensive technologies. Long before the agency invested any mentionable amount of time or money into researching whether fire has a detrimental impact on forest ecology, they had invested substantial resources into adapting wartime technologies to detect and suppress fires and had even experimented with weather modification techniques under Project Skyfire (Smith 2017).

At various points in USFS history—and especially following catastrophic fires—outside scientists and members of the public questioned the agency's scientific assumptions and pondered why the agency wasn't dedicating more resources to examining the value of light burning (Ogle 1920, Smith 2017, White 1920). Yet the Forest Service was slow, if not entirely resistant, to respond to these outside concerns. When they did embark on light burning research, it was often with the intention of disproving its value. Smith (2017) writes:

> Forest Service leaders showed little interest, at least initially, in conducting any authentic research to test the concept of using light burning as a way to prevent or minimize the risks of fire. Their "research" had only one objective in mind: to prove light burning was "little short of disastrous" and, according to S.B. Show, to get rid of the idea once and for all (Show 1915: 430). Moreover, advice from Native Americans, "practical foresters," and their advocates, such as the Southern Pacific Company, did not sit well with professional foresters, who were trained to bring an educated, scientific efficiency to their management of public lands (Smith 2017, p.26).

[5] https://www.fs.usda.gov/main/srnf/workingtogether/tribalrelations

The hypocrisy of the statement above lies in that the Forest Service's decisions could not be educated or scientific until the agency embarked on unadulterated research assessing the benefits of fire. Unfortunately, even when they chose to research the effects of light burning, some USFS scientists tampered with their own experiments and concealed results that didn't align with their fire suppression agenda. Pyne (2015) explains that in the Southeast, the USFS carried out demonstration plots to disprove the ecological value of light-burning, only to find the experiments failed: "Like novice students told to redo an experiment until they got the right result, the trials were repeated, and the results were kept in file cabinets. They were treated as if probably untrue, but if true, then dangerous" (p.19).

In Northern California, USFS researcher S.B. Show and his colleague E.I. Kotok conducted a study in 1919 in the Snake Lake area. Their underlying goal was to silence light burning advocates in the region. Smith (2017) explains that "the stakes were so high…that the two men actually sabotaged their own "research…[they] placed pine limbs alongside a few large fire-scarred pines to ensure that they would burn and demonstrate the danger of the technique to marketable timber" (p.28). These accounts point to forest management rooted not in science, but in the political and financial interests of an agency that had built its image as a fire suppression superpower.

The USFS Fire Revolution Aligned with Key Social Movements

The 1960s marked a turning point in the agency's stance towards prescribed fire, and eventually, in the consideration given to Indigenous knowledges. That this turning point aligns with transformational social developments such as the Civil Rights Movement and American Indian Movement is not a coincidence. As Pyne (2015, p.35) writes, "[a] fire revolution occurred when the cultural landscape of America changed and accordingly remade fire itself." Figure 3 illustrates how national and regional social movements slowly returned political power to Karuk people and reshaped fire management in the Klamath River Basin.

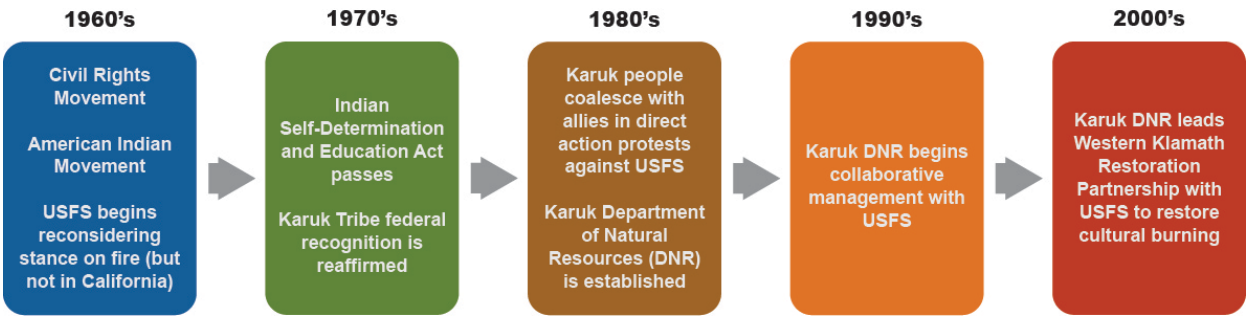

Figure 3. National and regional social movements starting in the 1960's align temporally with the evolution of national and regional USFS fire science and management.

In 1963, the proceedings for the 2nd annual Tall Timbers Fire Ecology Conference included an article by anthropologist Omer Stewart titled "Barriers to Understanding the Influence of Use of Fire by Aboriginies on Vegetation." A telling paragraph points to the role of racist constructs in shaping fire science:

> Views of peasants and country folk belonging to the same race and culture as the investigator are placed below consideration, but ancient practices and explanations of red Indians and black Negroes warrant no serious thought, even if known. Usually the white scientists refuse to learn the ways of the colored aboriginies, whether New World or Old World, because it is assumed such "children of nature" could contribute nothing to modern scientific inquiry (Stewart 1963, p.119).

Also in 1963—and 43 years after his father discredited Indigenous burning practices—Aldo Leopold's son, Aldo Starker Leopold, authored what would be known as the Leopold Report, a pivotal publication that advocated for the return of prescribed fire in National Parks. This report influenced other land management agencies, including the USFS. As Pyne (2015) explains, "[r]eclaiming fire was less a radical innovation than a restorative act, even a penitential one" (p.43). As the national conversation among scientists and land managers started to shift, some regions of the USFS started exploring the value of prescribed burning, especially in the Southeast. This change came about because of various converging forces, including a shift in national management priorities away from strictly timber and towards whole ecosystem health, the increasing magnitude and severity of wildfires, and the eventual recognition by Southern foresters that the lands they were managing needed fire to be healthy (Pyne 2015, Smith 2017). The California branch of the USFS, however, would remain the last stronghold of strict fire suppression.

Starting in the 1970s, a series of events built up political power in Karuk communities that would eventually lead to the return of fire to the Klamath River Basin. At the federal level, the Indian-Self Determination and Education Assistance Act passed in 1975, enabling Tribes to operate federal programs and opening pathways for establishing Tribal natural resources management departments. In 1978, Karuk people began seeking federal Tribal recognition, which they were officially granted in 1979. Federal recognition legally secured rights of self-governance and positioned the Tribe to interact with the United States on a government-to-government basis. It also opened up access to federal funds, benefits, and services aimed at augmenting Tribal capacity.

The mid 1980s were politically effervescent in the Klamath River Valley, with Karuk people and settler activist allies learning from each other's resistance strategies and coalescing around common causes. Diver (2016) explains that "in the mid 1980s, Karuk tribal members and their allies staged direct action protests to stop a helicopter logging sale in cultural areas on Offield Mountain, a sacred place for Karuk people" (p.538). Diver notes that it would be this "assertion of tribal authority and associated press coverage that initially compelled the Forest Service to begin consulting with the Karuk Tribe" (p.538). In 1989, the Tribe established its DNR, which decades later would receive national attention as a leader in fire management and represent an antidote to the impacts of federal fire suppression.

In 1984, the Six Rivers National Forest held a conference titled "Working with Native American Communities." This conference signalled a shift within the National Forest that would eventually lead to important collaborations with the Karuk Tribe, including Karuk Environmental Management Practices Demonstration Areas in the 1990s, and the Western Klamath Restoration Partnership in 2013, which also involves the Klamath National Forest. Both projects have as central tenets restoring Karuk land management practices and Indigenous knowledge, particularly in regard to cultural burning.

The USFS Diffuses Blame for Mismanagement and Continues to Erase Indigenous Peoples

It is now acknowledged among Western scientists that absolute fire suppression was a misguided management approach—that in fact, "light burners" had been right all along (California Fire Consortium 2013). Yet contemporary USFS discourse diffuses blame for a century of forest mismanagement and continues to erase Indigenous peoples and knowledges, even as the agency seeks Indigenous expertise and collaborates with Tribal governments to remedy the damage.

The Science and Technology subsection of the National Forest Service fire webpage erases the colonial history entangled in the agency's decades-long rejection of forest burning practices, stating:

> When we see a wildfire, our first response is to put it out. For decades, the Forest Service has done just that when it came to wildland fires. *But science has changed the way we think about wildland fire and the way we manage it* (emphasis mine).[6]

This statement suggests that it was "science" that discovered the benefits of fire, when in fact the USFS refused to scientifically assess the value of low-intensity burns while actively discrediting Indigenous burning practices. At the regional level, the webpage of the Pacific Southwest USFS Research Station (2022) includes the following statement:

> Fire is an inseparable part of most mixed-conifer forest ecosystems in the western United States. It once was the principle disturbance that shaped the structure, function, and composition of forests. Today, fire continues to influence some forests, but lack of fire and past forest management practices have changed the characteristics of many forests. Forests are increasingly vulnerable to large and severe fires that threaten ecosystems and human communities.[7]

This statement fails to mention the role of Indigenous burning in shaping North American ecosystems and omits the role of the USFS in generating the dangerous forest conditions that presently threaten many regions. That said, while the webpage's introductory statement engages in Indigenous erasure, the Research Station does have a "Fire Science" subtab dedicated to describing the important role of fire in managing Tribal cultural resources, in which they state that Indigenous knowledge pertaining to fire "is important for managers to be aware of and consider."[8]

In some cases, contemporary USFS fire discourse continues to openly deploy settler rhetoric that goes beyond Indigenous erasure. In 2021, the Klamath National Forest's webpage on fire management states:

> Since the beginning of time, fires have burned in the forest, playing a vital role in keeping the land healthy. Fire reduces dead vegetation, replenishes nutrients in the soil, stimulates new

[6] https://www.fs.usda.gov/science-technology/fire)

[7] https://www.fs.fed.us/psw/topics/fire_science/FireInCA.shtml

[8] https://www.fs.fed.us/psw/topics/fire_science/communities/cultural.shtml

> growth, and maintains biological diversity. *As civilization moved deeper into the forest, fire came to be seen as an enemy that destroyed lives, property and natural resources. As a result, the nation demanded that the Forest Service exclude fire from our environment*. Over time, it became apparent that our success had many unforeseen consequences. Without fire, our forests became overcrowded and vulnerable to attacks by insects and disease (emphasis mine).[9]

This contemporary statement invokes the savage narrative by suggesting that "civilization" arrived in the forests North America only upon the arrival of Europeans. The statement goes on to claim that it was the national population—not the Forest Service itself—that *demanded* strict fire exclusion. This contradicts the above evidence describing the agency's forceful campaign to racialize and discredit light burning in an effort to convince settlers that strict fire suppression was the only viable management option. Finally, the above statement spins the agency's management failure into "success" with "many unforeseen consequences."

Discussion

The above findings reveal the complex social relations embodied in the volatile forests of the Klamath River Basin. Fire deeply transforms landscapes; its use and control are acts of power in which "the social order dictate[s] the biotic order" (Pyne 1997, p.20). For millennia, Indigenous peoples routinely burned landscapes for spiritual and ecological reasons. The rich ecosystems that Euro-Americans encountered in what is now known as California had been thoroughly shaped by Indigenous peoples' use of fire over millennia and across generations. Cultural burning was progressively extinguished and outlawed, especially as the United States Forest Service gained jurisdiction over millions of acres of Indigenous land. The agency quickly established itself as the supreme authority in forest fire suppression, an identity that would shape its public discourse and skew its scientific pursuits.

For decades, the Forest Service claimed to base fire management decisions on science. However, historical accounts indicate otherwise; the agency's foresters were heavily influenced by the pyrophobia characteristic of European state forestry without scientifically testing the ecological benefits of fire in a North American context. Outside scientists and members of the public questioned the Forest Service's scientific assumptions. As my analysis reveals, the agency counteracted this growing dissent by embarking on a campaign to delegitimize Indigenous peoples' knowledges and fire-related practices. Any evidence suggesting that Indigenous burning was

[9] https://www.fs.usda.gov/detail/klamath/landmanagement/resourcemanagement/?cid=fsm8_049826

beneficial to forests represented a threat to an agency of the settler state whose identity was rooted in its scientific superiority and fire suppression prowess. Without scientific evidence to support its stance against prescribed burning, the Forest Service resorted to discourse that racialized, discredited, downplayed, excluded and ultimately erased Indigenous peoples in an effort to convince settlers that Indigenous land management was inconsequential. The grave repercussions of this Indigenous erasure are being felt by Indigenous peoples, settlers, and ecosystems across the Western United States as large-scale wildfires intensify each year.

The fact that two people died and over 150 families lost their homes in Happy Camp in 2020 cannot be separated from federal occupation of Karuk Ancestral Territory, the criminalization of cultural burning, and the Forest Service's faulty fire science. Settler colonialism is an ongoing and evolving social structure that continues to dispossess Indigenous peoples today. Conversely, Karuk resistance is deeply tied to honoring traditional responsibilities by returning fire to the landscape. As Karuk Tribal member and Department of Natural Resources Director Bill Tripp states: "The space we traditionally visit for solitude, prayer and carrying out cultural burning has become a space of turmoil, sorrow and trauma. That's why many Indigenous people have been fighting to use fire in the right way all our lives" (Tripp 2020).

A century after the USFS and conservation leaders like Aldo Leopold disparaged "Piute forestry" as an illogical and incompetent forest management strategy, the Karuk Tribe DNR has emerged as a national leader in fire science and management. In the last year, the Tribe's fire legacy has been highlighted in *The New York Times*,[10] *The San Francisco Chronicle*,[11] and *The Guardian*.[12] Contemporarily, the USFS might not have embarked on co-management projects with the Tribe had it not been for social movements that returned power to Indigenous communities at large, and the Karuk Tribe in particular. Social justice and ecology are deeply intertwined. In the context of this chapter, Indigenous political mobilization not only led to national policy that facilitated Karuk political sovereignty and land stewardship—it redirected the course of fire science in the Klamath River Basin. If social movements can redirect the course of fire science, then we must understand science not as a-cultural, a-political, and linear, but as very much shaped and reshaped by the institutional contexts and social power struggles in which it unfolds.

[10] https://www.nytimes.com/2020/01/24/us/native-american-controlled-burns-california-wildfires.html

[11] https://www.sfchronicle.com/california-wildfires/article/California-tribe-offered-solution-to-wildfire-15638137.php

[12] https://www.theguardian.com/us-news/2020/oct/23/karuk-tribe-california-slater-fire-insurance

As climate change advances, it exacerbates the risk of severe wildfires and other environmental hazards. Many Tribes continue to have the knowledge and skills necessary to enhance community resilience were it not for the barriers imposed by colonial institutions. Moving forward, the Forest Service can mitigate the impacts of its past forest mismanagement and embark on reparations for Indigenous peoples by securing steady funding streams for prescribed burning, decentralizing burning regulations, returning decision-making authority to Tribes, and repatriating Indigenous lands (see Marks-Block and Tripp 2021). As Karuk tribal member and Department of Natural Resources staff Analisa Tripp states "…more important than the return of fire is the return of Karuk people to their places, and to the decision-making tables about how this land is used and managed…and cared for" (Klamath Media 2018, 3:23). In Karuk Ancestral Territory, the integrity of entire ecosystems hinges on the health and sovereignty of the Karuk Tribe.

III. Theorizing Vulnerability Discourse in a Changing Climate: Settler-Ascribed Vulnerability and its Role in Indigenous Dispossession

Introduction

Indigenous peoples of North America have a long history of adaptive resilience to environmental changes great and small (Turner and Clifton 2009, Wildcat 2009). In recent centuries, Indigenous peoples have had to contend with the violent constraints imposed by a settler colonial system aimed at continually dispossessing Indigenous communities. While settlers grapple with the concept of the Anthropocene and theorize its apocalyptic qualities, Whyte (2017) clarifies that Indigenous peoples already exist in a post-apocalyptic dystopia resulting from the violence of colonialism. Climate change may be upending the lives of many settlers, but Indigenous peoples' realities were already brutally altered under settler colonialism long before contemporary climate change became significant. While it is undeniable that climate change and other forms of large-scale environmental degradation pose significant threats to Indigenous peoples and their lands, they are but a continuation of the ongoing colonial assaults upon Indigenous communities and North American ecosystems.

Western scientists and policymakers categorize Indigenous communities as disproportionately vulnerable to climate change due to the important role of local ecosystems in Indigenous cultures and subsistence practices, combined with Indigenous peoples' mixed participation in capitalist economies. Indigenous scholars and allies are questioning how Indigenous vulnerability to environmental change is framed in academic and policy discussions (Cameron 2012, Marino 2015, Reo et al. 2017, Shearer 2012, Whyte 2017, Wildcat 2009). Vulnerability is often conceptualized as inherent within Indigenous and other politically and economically marginalized communities while resilience is by default associated with white, settler status. While this partially emerges out of the desire to recognize social inequalities in the context of environmental change, climate science and policy largely fail to examine the role of settler colonialism and other systemic forms of oppression in shaping climate change capacity, let alone addressing these structures in climate adaptation or disaster planning. As Whyte (2017) asserts, "Indigenous climate vulnerability cannot occur in the absence of the history and present practices of colonialism and capitalism in Indigenous homelands" (p. 156). Furthermore, Indigenous communities or individuals labeled

"vulnerable" are seldom consulted on how they perceive or feel vulnerabilities in their actual life, nor in how to best build resilience.

Bourdieu (1985) describes the "formidable social power" that is the capacity to name, categorize, and bring to life entities which did not previously exist, a capacity over which the state holds a monopoly. This chapter concerns itself with developing the terms "ascribed vulnerability" and "lived vulnerability," and examining how the two diverge in Indigenous communities. I define *ascribed vulnerability* as vulnerability that is pre-defined and labeled onto groups by an outside entity holding power in the form of recognized expertise or institutional credibility. In contrast, *lived vulnerability* refers to how people experience and define vulnerability on-the-ground. Ascribed and lived vulnerability do not always align (Marino 2015, Hardy et al. 2017). Vulnerability is a socially constructed concept that depends on the unit of measurement, as well as one's cultural assumptions, social location, and understanding of local conditions, threats and capacity (Bone et al. 2016, Kallis 2008, O'Brien et al. 2007, Reo et al. 2017, Shearer 2012).

I first examine the distinction between ascribed and lived vulnerability as it pertains to three case studies previously examined by scholars: federal school policy as a driver for climate change vulnerability among Shishmafef's Kigiqtaamiut Iñupiat (Marino 2015), federal invasive species management and risk perception among Karuk tribal members (Norgaard 2007, Reo et al. 2017), and the Dawes Act's effects on the Nez Perce and Jicarilla Apache (Greenwald 2002). The chapter culminates with the application of these concepts to my own case study examining the justifications for federal fire suppression policy and its effects on the Karuk Tribe. I argue that by deploying settler narratives and preconceptions about Karuk people and landscapes, the United States Forest Service ascribed vulnerability onto an otherwise resilient fire-adapted community. Ascribed vulnerability disempowered Karuk people and led to decades-long mismanagement of fire-adapted ecosystems in the Klamath River Basin, ultimately producing lived vulnerability in the form of altered ecosystems and extreme fire risk. These cases illustrate how settlers and the settler state use ascribed vulnerability to justify the violent reorganization of Indigenous social and ecological systems, as well as to erase place-based and time-tested Indigenous knowledges. This analysis has important implications at a time when Indigenous vulnerability to climate change is routinely ascribed by outside scientists and policymakers in ways that that obscure power relations, absolve the state of responsibility, and place the onus of adaptation on those least responsible for climate change.

Background

Colonial Ecological Violence and Enduring Indigeneity

Settler colonialism is an ongoing socio-ecological structure that shapes every dimension of life in settler states such as the United States and Canada (Bacon 2018, Fenelon and Trafzer 2014; Glenn 2015, Jacob et al. 2020, McKay et al. 2020; Norgaard 2019, Whyte 2018, Wolfe 2006). Far from a distant event that happened long-ago during first contact between Indigenous peoples and Europeans, the structure of settler colonialism continues to privilege Euro-American values, knowledge systems and governance, and continues to inflict violence upon Indigenous communities in myriad ways. Conversely, Indigenous peoples persist and actively resist colonial violence in all its forms. Kauanui (2016) emphasizes that wherever settler colonialism exerts its force there are Indigenous peoples subverting the system and keeping Indigenous knowledge, practices and ecological relationships alive. "Enduring Indigeneity," as Kauanui (2016) refers to it, is the counterforce constantly pushing against, resisting and transforming settler colonial structures, holding within it the knowledge, power and potential to bring to life Indigenous ways of being that the settler state actively seeks to suppress. Kauanui's concept corrects the implied assumption that Indigenous communities are passive victims in the face of colonialism. In fact, settler colonialism and enduring Indigeneity are in a constant dialectic, and Indigenous peoples across history have exerted their influence and power in resisting, reshaping and decolonizing colonial institutions (Hall & Fenelon 2015, Hormel & Norgaard 2009, Jacob 2013, 2016, LaDuke 2017, Steinman 2016, Whyte 2017).

As a social structure, settler colonialism is concerned first and foremost with control over land (Tuck & Yang 2012, Wolfe 2006). Its principal purpose is to eliminate or disempower Indigenous peoples to make way for permanent European settlement. Settler colonial agendas are achieved via what Bacon (2018) describes as "colonial ecological violence," encompassing a multitude of intertwined strategies synergistically enacted by the settler state, private industry, and settler populations. This violence takes many forms, including genocide and displacement of Indigenous peoples, criminalization of Indigenous practices, deligitimation of Indigenous knowledges, and the imposition of Euro-centric land management that jeopardizes Indigenous ecologies. Another prominent feature of settler colonialism is the continual erasure of Indigenous peoples as well as settler colonialism itself (Fenelon & Trafzer 2014, Wolfe 2006). By minimizing the presence and power of Indigenous peoples, histories and governance systems and obscuring the history of colonization from the settler conscience, the structure of settler colonialism propels a

myth of rightful settler belonging and ownership. This myth normalizes and centers Euro-centric institutions across Indigenous territories and demands that Indigenous peoples and non-European settlers conform to Euro-centric ways of being and doing. Capitalism, private property, Christianity, hetero-patriarchy and Western science are just some of the institutions that become dominant and naturalized. The less the structure of settler colonialism is acknowledged, the more hegemonic these Euro-centric institutions become.

The Settler State, Western Science, and the Power of Categorization

The international dominance of Western science and assumed legitimacy of settler colonial nation-states ensures that mainstream discourse surrounding environmental risk and responsibility centers Euro-centric interests. Indigenous peoples must contend not only with the biophysical impacts of colonial ecological violence, but also with the discursive tools used by colonial powers to erase culpability and shape socio-political responses to large-scale environmental change. Bourdieu (1985) describes the capacity to name, categorize, and bring to life entities which did not previously exist as a "formidable social power." He argues that the state holds a monopoly over this capacity as a result of its *symbolic power*— its legitimacy in the eyes of the population. Through the power to create categories and define group boundaries, the state exercises *symbolic violence*, "violence which is exercised upon a social agent with his or her complicity" (Bourdieu and Wacquant, 1992, p. 167). The state's symbolic power can be further augmented when legitimized by other symbolically powerful institutions such as Western science.

Western science is understood as an objective way of knowing, yet in practice it is neither value-free nor a-cultural (Haraway 1988, Levins and Lewontin 1985, Medin and Bang 2014). As a knowledge system, it is rooted in Euro- and andro-centric interests and worldviews; not only did it originate in the European continent, contemporarily, STEM practitioners continue to be predominantly white and male (Medin and Bang 2014). Scholars have documented the relationship between Western science and colonial projects (Griffiths & Robin 1997; MacLeod 2000; Whit 2009). For one, many Western scientists acquire their credentials from colonial land grant institutions. Furthermore, the role of Western science as a tool of settler colonialism includes the scientific appropriation of Indigenous knowledge for colonial gains, the alignment of scientific and colonial objectives, and the misapplication of Euro-centric Western science in non-European ecological and cultural contexts.

In the context of large-scale environmental change—especially change precipitated by the colonial spread of capitalism and industrialization— settler states have a vested interest in controlling the narrative. The way in which settler states and Western scientists discursively frame environmental problems shapes public opinion as well as institutional responses. As climate change advances and settler states develop mitigation and adaptation strategies in conjunction with Western scientists, their discursive practices tend to reflect Euro-centric social, political, and economic interests at the expense of Indigenous peoples, lifeways and ecologies.

Discourses of Risk and Vulnerability

A discursive binary that has emerged among climate scientists and policy-makers is *vulnerable* versus *resilient*. These labels are assigned onto individuals or whole communities, human and non-human. Far from having consistent definitions, vulnerability and resilience are social constructs that can be defined in myriad ways depending on the assumptions, values and goals of the people or institutions doing the defining (Bone et al. 2016, Kallis 2008, O'Brien et al. 2007, Reo et al. 2017, Shearer 2012). Webber (2013) asserts that vulnerability "is discursively and materially *produced*" (p.2722). How settler states and Western scientific institutions define risk and vulnerability impacts entire ecosystems and human populations. For example, policymakers may consider an Indigenous community vulnerable because of low participation in the capitalist economy, whereas the same Indigenous community may define vulnerability as not having the time, knowledge, or land access to consistently care for and harvest species that are vital to culture and subsistence. These two understandings of vulnerability lead to different, often antagonistic solutions. For policy-makers, the solution may lie in assimilatory strategies that increase Indigenous participation in wage labor, thereby maintaining the social, political, and economic status quo. Conversely, for the Indigenous community, the restoration of resilience may lie in land repatriation, robust Tribal sovereignty, the protection of Indigenous knowledges, and the eco-cultural revitalization of stewardship practices—including cultural burning—all of which challenge settler systems of power.

Scholars have identified the need to critically evaluate different discursive interpretations of vulnerability in the context of climate change. O'Brien et al. (2007) offer a framework for analyzing climate change discourse to determine whether vulnerability is conceptualized as "outcome vulnerability" or "contextual vulnerability". *Outcome vulnerability* (referred to as an end-point approach) is linked to scientific framing, focuses on biophysical risks, and tends to prioritize technological adaptive measures. In contrast, *contextual vulnerability* (referred to as a starting-point

approach) focuses on how biophysical risks interact with social systems such as gender, class, race etc., and prioritizes solutions that mitigate or remove pre-existing socio-ecological barriers to adaptation. As the authors point out, "[m]ost studies do not explicitly refer to a discourse or framing; instead, this must be interpreted through the language, methods and questions that appear in texts and debates" (p.78).

Scholars have also theorized how interpretations of risk diverge between Indigenous peoples and the settler state. Norgaard (2007) uses the concepts of "abstract risk" versus "embodied risk" to differentiate between the distanced, abstracted way state agencies determine environmental risk versus the embodied way in which these risks are experienced and understood by Indigenous communities. When it comes to framing vulnerability, Indigenous communities and Tribes emphasize the linkages between environmental hazards and the socio-ecological structures of colonialism (Marino 2015, Shearer 2012, Whyte 2016, 2017). Whyte (2016) explains that state organizations describe Indigenous climate change vulnerability as "a case of bad luck" resulting from Indigenous reliance on local ecosystems and socio-economic hardships resulting from long-ago colonization. Whyte, however, sees colonialism as the root contemporary problem generating both heightened Indigenous vulnerability and climate change itself. He explains:

> This cyclical history locates colonialism at the heart of the problem of both vulnerability and climate change mitigation. There is no bad luck. Climate injustice against Indigenous peoples, then, refers to the vulnerability caused by settler and other forms of colonialism 'both' because colonial institutions facilitate carbon-intensive economic activities that produce adverse impacts while at the same time interfering with Indigenous peoples' capacity to adapt to the adverse impacts. (Whyte 2016, p.18)

When vulnerability discourse is controlled by state agents and Western scientists that are not members of—or collaborating closely with—Indigenous communities, a range of negative consequences unfold that hinder Indigenous resilience and adaptation. Firstly, settler states have a vested interest in protecting the colonial status quo and are unlikely to acknowledge—let alone address— the colonial violence that produces vulnerability within Indigenous communities. Beyond that, Indigenous vulnerability and risk may be underestimated by Western scientists and state agents unfamiliar with Indigenous lifeways and values, as in Norgaard's (2007) case study highlighted below. Conversely, overestimating Indigenous vulnerability— or underestimating the resilience and capacity of Indigenous communities to manage their own affairs and develop adaptive measures— comes with its own set of negative consequences. Marino (2015) explains that "[l]abeling certain

groups as "vulnerable" can be stigmatizing and can result in the re-creation of outdated and racist stereotypes of indigenous peoples needing the help of white outsiders. The label can imply a lack of agency and competence" (p.29). State vulnerability discourse that underestimates Indigenous peoples' knowledge and capacity serves to rationalize settler control over Indigenous affairs. Reo et al. (2017) explain:

> Vulnerability narratives can portray Indigenous nations as dependent on settler colonial nation-states and other non-Indigenous parties for relief from environmental problems, which could lead to policymakers drafting climate change or invasive species policies that interfere with Indigenous nations' aspirations of self-determination. (p.203)

Vulnerability discourse is especially prevalent in the context of climate change, yet similar discourses have historically been employed by Western states to justify political interference and control. Bankoff (2001) connects contemporary discourses of disaster vulnerability to former Western narratives of otherness and risk. These include *tropicality* discourse (in which equatorial regions are deemed dangerous and vulnerable because of Western perceptions of tropical climates and diseases), and post-Cold war development discourse (in which distinctions are made between communist and non-communist nations, as well as between the "First" and "Third World"). Bankoff explains that contemporary hazard vulnerability discourse and its discursive "tropicality" and "development" predecessors all serve "as justification for Western interference and intervention in the affairs of [the affected] regions for *our* and *their* sakes" (p.27). He describes how this discourse presents it as a "moral obligation" for Western States to "employ their good offices to 'save' these vulnerable populations from themselves and to render the regions they inhabit safer for investment and tourism" (p.27).

As nation-states and Indigenous peoples respond to climate change and other environmental crises, it is key to understand the discursive mechanisms by which states normalize Euro-centric solutions and inhibit Indigenous self-determination. Euro-American narratives of Indigenous inferiority have been promulgated throughout history as justification for genocide, land theft, displacement, and state control over Indigenous lands and peoples. The following quote, extracted from an editorial in the San Francisco Weekly National on January 13, 1859, exemplifies historic vulnerability discourse:

> The California Indian is perhaps the most inferior of all the North American races. Reared in a salubrious climate—procuring abundant food in the shape of acorns, roots, game and fish,

> without labor—inured, in fact, to no hardship—he has become a weak, degenerate creature, both physically and mentally. *He is a child* in moral restraint and mental capacity, with the animal passions, propensity and appetites…*He, therefore, needs a master*, and one too who can compel him to obey. Leave it all optional with him, and he will labor not, neither will he spin. There must be employed a sufficient white force to work the fields with him, and if necessary, inflict occasional chastisement. (as cited in Almaguer 1994, p.115, *emphasis mine*)

By ascribing vulnerability onto Indigenous peoples, settlers and the settler state justify ongoing paternalism, assimilation, and violence. While contemporary discourse may not always be this explicit, climate change and other large-scale environmental disruptions have created a discursive landscape in which vulnerability and resilience are routinely discussed, measured and assigned. Vulnerability assessments are not inherently problematic and can in fact help communities strategize and enhance their adaptive resilience, but it is vital for Indigenous peoples and governments to define their vulnerability based on Indigenous values, knowledges, and experiences. Anything less can end up producing—rather than reducing— Indigenous vulnerability.

Contrasting *Ascribed* Versus *Lived* Vulnerability

As a settler that has written both federal and Tribal reports on Indigenous climate change vulnerability, I have witnessed first-hand discrepancies between settler and Indigenous interpretations. What's more, as a settler researcher that has had the opportunity to receive feedback from Indigenous scholars and community members, I have at times ascribed vulnerability in ways that are not reflective of Indigenous experiences. In light of this, I find it necessary to advance theoretical concepts that acknowledge and dissect the power dynamics inherent in vulnerability discourse. Building onto scholarship that describes vulnerability as both materially and discursively produced (Webber 2013), as well as scholarship that distinguishes between state and Indigenous definitions of risk, vulnerability, and resilience (Marino 2015, Norgaard 2007, Reo et al. 2017, Shearer 2012, Whyte 2016, 2017), I introduce the concepts *ascribed vulnerability* and *lived vulnerability* which I further illustrate and develop in relation to the four case studies below.

Ascribed Vulnerability

Ascribed vulnerability refers to vulnerability discourse that is pre-defined and labeled onto specific communities or demographics by outside entities who hold power in the form of recognized expertise, institutional credibility, or other forms of social privilege such as class, race, and/or gender. The state and Western scientific institutions are key entities holding the symbolic power to

regularly ascribe vulnerability onto populations, communities, and ecosystems. The ascribing entities largely determine who is vulnerable and why based on scientific abstractions and cultural assumptions that don't necessarily align with the experiences, histories, values and knowledges of the people or communities in question. Those onto which vulnerability is ascribed are not consulted regarding their perspectives on what might make them vulnerable or resilient in the context of a given hazard or situation. As a result, the policies and solutions emerging from this discourse may not actually address, and may even exacerbate, the root causes producing vulnerability for the communities in question.

Lived Vulnerability

Lived vulnerability refers to how vulnerability is experienced and defined by a given person or community on the ground. This understanding of vulnerability is place- and culture-specific and rooted in embodied experiences. Lived vulnerability is understood through the lens of the people or communities at risk, who know first-hand *how* (and often and importantly, *why*) they have been—or may be— vulnerable when exposed to a given hazard. Understanding lived vulnerability is key to building long-term, effective resilience strategies. Lived vulnerability may or may not align with the risks projected by ascribed vulnerability discourse. The divergence between the two may become especially pronounced in terms of identifying the root causes of vulnerability.

Ascribing Vulnerability: What's the Harm?

Not all settler scientists and policy-makers engaged in vulnerability discourse consciously set out to perpetuate social inequalities or exacerbate lived vulnerability. In fact, some settler scientists and policy-makers focus on Indigenous vulnerability assessments and policy development at the request of Tribal governments who want Tribal needs, histories, lands, and treaties taken into account during state initiatives. However, barring highly collaborative processes with Indigenous peoples at the helm, vulnerability assessments are based on Euro-centric, Western academic abstractions that don't acknowledge—or worse yet, actively erase— the goals, values and sources of lived vulnerability within Indigenous communities. Unfortunately, *even if* the intention is benign, ascribed vulnerability discourse can lead to inadequate policies that ultimately perpetuate colonial violence onto Indigenous peoples.

The four case studies below illustrate instances in which settlers, the settler state and/or Western scientists ascribed vulnerability onto Indigenous peoples in ways that did not align with

Indigenous peoples' own conceptions of risk. These ascriptions justified state control over Indigenous affairs and lands, ultimately infringing upon Indigenous sovereignty and self-determination and thereby producing lived vulnerability within Indigenous communities. In each of these cases, Indigenous peoples have not been passive victims, but have creatively subverted or actively resisted the policies that compromise their resilience.

It is important to note that the discourse deployed by settlers does not always explicitly include the word "vulnerable" or "vulnerability." These terms have gained traction in recent decades especially regarding climate change and disaster, and while they can be found in the first case study highlighting Marino's (2015) analysis of climate change in Shishmaref, they are not explicitly present in the other three, less recent cases. Nevertheless, as Bankoff (2001) reminds us, there is a linkage between contemporary vulnerability discourse and earlier discourses of otherness and risk. While in the other three cases there isn't an explicit use of the word "vulnerable," they clearly include ascriptions of inferiority and maladaptation onto Indigenous communities, as well as state misinterpretations of Indigenous risk based on settler colonial assumptions. The resulting consequences are illuminating at a time when vulnerability discourse is becoming mainstream and when there is so much at stake for Indigenous peoples and the diverse ecosystems they have stewarded for millennia.

Case 1: Federal School Policy as a Catalyst for Climate Change Vulnerability in Shishmaref

Elizabeth Marino's (2015) book *Fierce Climate, Sacred Ground: An Ethnography of Climate Change in Shishmaref, Alaska* offers an in-depth case study of Shishmaref, an Inupiaq community located on Alaska's Sharichef Island that has garnered significant national and international media attention as it pertains to climate injustice and the prospect of climate-induced migration. The island's rapidly eroding shoreline is causing houses to collapse into the Chuckchi Sea, a phenomenon that is only likely to get worse as climate change advances. Permafrost melt is a primary driver of flooding and infrastructure damage in Shishmaref. Shore ice—which protects the island's substrates from the Chuckchi Sea—is freezing later in the year, leaving the island exposed to strong winds and waves during fall storms, speeding up erosion. State officials and Shishmaref residents have been tentatively planning the community's relocation. Because the Arctic is experiencing more rapid climatic changes that most places on Earth, and because Shishmaref represents a community that is little responsible for fossil fuel emissions yet facing climate-induced relocation, media storylines

often describe Shishmaref as the "canary in the coal mine" of climate change. This narrative often relies on vulnerability discourse that portrays community members as victims with little agency. While it is true that the people of Shishmaref will likely have to relocate their community, Marino's analysis reveals a more complex reality in which colonial constraints on Inupiaq lifeways—more so than climate change—are the real drivers of vulnerability in an otherwise resilient community.

Sarichef Island's population is 95% Alaska Native. The people of Shishmaref are specifically known as the Kigiqtaamiut Iñupiat and have inhabited the coast and river drainage on and around the island for thousands of years. Appropriately, Kigiqtaamiut translates to "people of the island." This community has held reciprocal relationships with regional species since time immemorial, especially bearded seals. Subsistence species seasonally move in and out of Shishmaref such that it ensures year-round subsistence. The Kigiqtaamiut Iñupiat see themselves as a vital part of what Marino describes as a "circle of subsistence," in which there is interdependence between land, humans, and other species. In line with the rest of the regional biotic community, the community's traditional lifeway involved patterns of high mobility around and beyond the island based on weather conditions and seasonal rounds. Traditional dwelling structures ranged from temporary icehouses and tents made of wooden poles and seal skins to more permanent sod houses, accommodating lives that moved in synchrony with coastal conditions. These were strategies informed by Iñupiat knowledge that made the community incredibly resilient to flooding and other environmental phenomena characteristic of the Arctic landscape.

Marino's analysis reveals the colonial complexities that have led a resilient and adaptable community to be deemed extremely vulnerable in the context of climate change. In fact, it was European-Americans' past ascriptions of vulnerability that have produced the precarious conditions the community finds itself in today. Shishmaref is situated within the Nome Census Area. Gold was found in Nome in 1899-1900, leading to a mass influx of Euro-American settlers. Soon after this influx came the imposition of colonial institutions. In Shishmaref, the post office was built in 1901, followed by the government school in 1906, and later a Lutheran mission in 1930.

Settlers ascribed vulnerability onto Alaska Native communities much as they had done to Tribes and Indigenous communities elsewhere in North America. Settlers posited that to survive and be viable members of society under the new colonial order, the Kigiqtaamiut Iñupiat needed to be educated and assimilated into Western systems of education and faith. Marino's analysis identifies the development of Western institutions on the island, especially the school, as the linchpin that

changed Kigiqtaamiut Iñupiat lifeways from mobile and adaptable to sedentary and vulnerable. Marino (2015) explains:

> In Shishmaref, residents point out that permanent settlement in the village is linked to the construction of the school and legislation that mandated school-age children to attend. Western infrastructure development was explicitly used by missionaries and US government leaders to promote colonial institutions and to discourage traditional infrastructure, traditional patterns of mobility, and traditional institutions (p.45).

Settlers and settler institutions used discourses of inferiority and vulnerability to coerce Indigenous peoples and other settlers to believe that immersion into Western institutions was best for Indigenous communities in the long run. Ultimately, this immersion generated actual lived vulnerabilities for the Kigiqtaamiut Iñupiat. Marino (2015) asserts:

> The Kigiqtaamiut way of life has been amazingly resilient in the face of change, particularly considering the historical tragedies of racism, colonialism, and structural violence that mark all Native American histories in this country. Today relocation options for residents are limited, and the village is vulnerable to ecological shift; but this vulnerability exists in part because of the barrage of burdens put on colonized communities (p.16).

Western institutions replaced place-based Indigenous lifeways and knowledges with generic settler knowledge and sedentary lifeways that were not only culturally irrelevant but outright dangerous in this ecological context. As climate change has advanced, the inadequacy and dangers of colonial assimilation in Shishmaref have become even more explicit. Today, the Kigiqtaamiut Iñupiat are eager to assert their agency as they face relocation. One hundred percent of the 54 families that Marino interviewed responded that if the community is relocated, the new village site should be situated within traditional subsistence territory. Otherwise, "full removal from traditional subsistence territory would lead to cultural disintegration" (Marino 2015, p.81). As Marino (2015) states:

> …relocation outside of traditional territory means merging into a preexisting urban area and abandoning completely the territory that has kept the community together and bound to an ancestral past despite and during a tumultuous century. Place, in this situation, secures sacred social-ecological relationships (p.82).

The way Kigiqtaamiut Iñupiat people conceive of vulnerability has nothing to do with access to colonial institutions—although they may value these and have every right to retain access. What is of real concern is the maintenance of traditional culture and relationships to ancestral places.

Case 2: Differing Perceptions of Herbicide Risk in Karuk Ancestral Territory

Norgaard's (2007) article examines the social factors that led to disparate interpretations of risk regarding herbicide use in forests in Northern California. I argue that it also exposes settler assumptions that lead to the misalignment between ascribed and lived vulnerability. In 1997, spotted knapweed was found growing along a river in the ancestral territory of the Karuk Tribe. Spotted knapweed is considered an invasive species and poses concern to state and federal land managers because it decreases rangeland quality. Large-scale species invasions, much like climate change, have explanations linked to the colonial spread of capitalism:

> Although humans have always moved organisms from one place to another as we travel, and participated in the shaping of so-called "natural ecosystems," the rates of human travel and trade, and hence new species introductions, have increased rapidly with the advent of free trade—the latest phase of globalization (Norgaard 2007, p.450).

The spread of spotted knapweed was also of concern to the Karuk Tribe, whose cultural obligations to species of cultural significance and whose subsistence activities thrive on the active maintenance of ecological integrity within their ancestral territory. However, when the U.S. Forest Service proposed the use of herbicides to control knapweed, the Tribe immediately and adamantly opposed the proposition. Over 98% of Karuk Ancestral Territory is currently under U.S. Forest Service jurisdiction—a result of the unratified California treaties that led to the occupation of over 1 million acres of Karuk Territory by the United States government without compensation or negotiation of treaty rights in exchange for land. Management decisions made by the U.S. Forest Service can have significant consequences for the Tribe. Whereas the Forest Service considered herbicide use in the forest a safe and effective way to control spotted knapweed, Karuk people understood herbicides as poison that has serious health implications for members of the community.

Norgaard's analysis helps us understand the discrepancy between the two perspectives. She introduces the terms *abstract risk* and *embodied risk* to distinguish between the way state agents and Karuk people perceive the risks of herbicide use. State agents base their decisions on abstract scientific literature, and importantly, on the propaganda of herbicide manufacturers. Despite touting

science-based decision-making, state agencies often let corporations influence their management decisions. As Norgaard (2007) explains:

> [T]he California Invasive Plant Pest Council—the annual conference devoted to weeds in wildland areas of the state—receives major funding from Monsanto (producers of Round-Up, one of the more commonly used herbicides on weeds). At these meetings, agency staff is exposed to information that normalizes the use of these materials (p.463).

Additionally, state agents are seldom residents of the spray zone. Furthermore, their Euro-centric assessment of risk presumes that food comes from the store, not from the forests being sprayed. In contrast, Karuk people (and especially Karuk women) interpret risk from within the spray zone, as caretakers who gather foods and traditional materials from the forest, and with the historical, embodied knowledge of what happened to their bodies (and the bodies of their unborn children) during previous chemical applications. It was in part because of these traumatic experiences of chemical exposure that the California Indian Basketweavers Association was formed in 1992. Basketweaving is a traditional skill carried out predominantly by Indigenous women, who harvest the plant materials for baskets from the forest and are therefore vulnerable to chemical exposure if spraying occurs around the time of harvest.

This case illustrates how different perceptions of what constitutes risk—as well as what are the most appropriate risk reduction strategies—can lead to very different management outcomes. State agents and Karuk people agreed spotted knapweed was a concern but disagreed on the mechanisms by which to manage knapweed populations. State agents underestimated the vulnerability of Karuk people to herbicide use because they examined risk from a settler lens and did not properly consult with the community on the ground. Instead, they based their decisions on scientific literature and corporate propaganda from a distance.

Fortunately, the Karuk Tribe, along with other California Tribes and local settler allies were able to politically mobilize to actively resists USFS herbicide spraying. Community members organized a volunteer hand-eradication effort and thought of non-chemical knapweed management strategies as a possible source of long-term employment in the region. Additionally, the Karuk Tribe leveraged their sovereign status to pass a resolution against the use of herbicides in their territory. While Karuk Ancestral Territory is legally under USFS jurisdiction, the Tribe's resolution sent a strong message to the agency. Federal agencies are mandated to consult with federally recognized Tribes anytime a management action has implications for Tribal people or territories. Had the

agency proceeded with chemical applications, the Tribe's resolution would have provided firm ground by which to enter litigation. The Tribe's resolution and political mobilization influenced federal management and increased Karuk resilience by protecting the bodies of Karuk people as well as the ecosystems they call home.

Case 3: The Dawes Act as an Assimilatory Policy Subverted by the Nez Perce and Jicarilla Apaches

Greenwald (2002) analyzes the United States government's imposition of spatial control over Indigenous peoples' lands under the guise of humanitarian assimilation efforts. The 1887 Dawes Act sought to break up communal reservation lands into individual private parcels in an effort to "civilize Indians." As Greenwald explains,"[t]raits that Euroamericans associated with savagery—such as nomadism, collective economic strategies, and tribalism—would be replaced with traits associated with civilization—sedentary agriculture, private property and individualism" (2002, p.2). The Dawes Act authorized the United States president to break up reservation lands into individual parcels to be distributed individually among members of the residing Tribe—regardless of Tribal consent—with provisions for surplus acreage to be appropriated by the government and sold to settlers. Greenwald outlines how the policy's explicit intent of assimilating Indigenous peoples failed, while its implicit agenda—the assertion of U.S. sovereignty over Indigenous territories, the transfer of land from Indigenous to non-Indigenous possession, and the reorganization of how Indigenous peoples occupied and used their lands—was highly successful.

Advocates of the Dawes Act came in many forms and had different justifications for favoring this policy. However, one prevalent narrative was out of concern for Indigenous peoples. Among the advocates for allotment policy were humanitarian reformers who referred to themselves as "Friends of the Indian." Greenwald states:

> The Dawes Act continued a long tradition of efforts by Europeans and Euroamericans to make Indians more like themselves. The rhetorical justifications for such an agenda were many: to render Indians less threatening, to ensure the salvation of their souls, and to "save" them from certain extinction in modern society (2002, p.2).

The Eurocentric notion that Indigenous uses of land were unproductive and that Indigenous peoples were helplessly bound for extinction barring settler intervention was the rhetorical engine behind the Dawes Act. By ascribing vulnerability onto Indigenous peoples, the U.S. government

justified paternalistic control over Indigenous territories, ultimately leading to the transfer of over half of all Indigenous-controlled lands to the U.S. government itself, which could then sell it to settlers. Greenwald points out that while many humanitarian Dawes Act advocates were genuinely concerned with Indigenous welfare, their interventionist strategies ended up causing more harm than good. In other words, ascribed vulnerability discourse can have negative consequences regardless of original intent.

It is important to note that Indigenous peoples were not passive victims of this legislation—in fact, some Tribes used allotment to protect their land tenure, while others actively resisted or subverted allotment policy to maintain cultural integrity. Greenwald highlights the distinct ways in which the Nez Perce and the Jicarilla Apaches approached their Dawes Act negotiations. While they approached allotment in very different ways, both Tribes managed to resist the assimilatory intent of the policy.

The Nez Perce of present-day Idaho initially resisted allotment by refusing to cooperate with federal agents. When they eventually did enter negotiations, they chose lots with ancestral significance often at the bottom of river canyons and not suitable for agriculture. Assimilation into agricultural modes of production, as the United States government had hoped, was thus thwarted. However, that left much of the reservation's arable land as "surplus" that the government could appropriate, divide and sell to settlers, which ultimately led to a significant loss of land for the Nez Perce.

In contrast, the Jicarilla Apache in what is now known as New Mexico actively sought to divide their small reservation into allotments. The Jicarilla Apache had experienced a history of displacement and were eager to secure permanent inhabitance on their small reservation, which had been established via executive order and not via a treaty. They saw the Dawes Act as a mechanism by which to acquire legal land title, and to reorganize land use based on access to the scarce water resources on their high-altitude reservation. They were able to negotiate a unique arrangement based on their Tribe's dual subsistence system of farming and grazing: each person received 2.5 acres of agricultural plot near one of the reservation's water sources, as well as a large grazing parcel elsewhere. This arrangement led to very little surplus land for the U.S. government to appropriate, and therefore little loss of their original reservation acreage. However, it led to some changes in the traditional structure of space occupancy. The Llanero and Ollero bands of the Tribe, which had historically maintained geographical separation, were now inevitably more interspersed.

If the Dawes Act didn't have a more severe assimilatory impact on these Tribes it is because of strategic approaches to negotiation with the settler state. Greenwald states:

> One of the ironies of the Dawes Act is that it allowed Indians to exercise choice despite its underlying logic of remaking all Indians in the same way…Ironically, many Indians used their allotment selections to remake themselves *as Indians* in the context of a policy that sought to destroy Indianness (p.145).

While advocates of the Dawes Act used tragic portrayals of Indigenous inferiority and vulnerability as justification for this assimilatory policy, the Nez Perce and Jicarilla Apache negotiations illustrate what these Tribes thought of as a key to their resilience: the maintenance of traditional lifeways rooted in place.

Case 4: Federal Fire Suppression in Karuk Ancestral Territory

The final case study emerges from my own research and focuses on the logics and effects of federal fire suppression in Karuk Ancestral Territory. Karuk people have been inhabiting the Klamath River Basin in what is now known as California since time immemorial and, for just as long, have been using fire as a spiritual and ecological management practice. Karuk use of fire is guided by knowledge that is place-based and time-tested, developed, refined, and passed on intergenerationally by being actively involved in the landscape. In the fire-adapted ecosystems of the Klamath River Basin, the benefits of traditional burning include reduction of landscape pests and disease, promotion of culturally significant species and early seral habitats, and reduction of understory fuels, to name a few (Anderson 2005, Kimmerer and Lake 2001, Lake 2007, Lake et al. 2017). Fire is a key tool by which Karuk people carry out their responsibilities to their more-than-human kin, promoting ecological balance and abundant annual harvests that in turn keep Karuk people healthy. The Karuk DNR Eco-Cultural Management Plan (2010) states:

> Fire affects the plants, which affect the water, which affects the fish, which affect terrestrial plants and animals, all of which the Karuk rely on for cultural perpetuity. Fire, as a gift from the Creator, is believed to be a healing agent capable of producing change to restore balance when respected, understood, and utilized in an appropriate natural/cultural context (p.5).

As has been previously described, 98% of Karuk Ancestral Territory has been under United States Forest Service jurisdiction, severely limiting Karuk peoples' ability to carry out cultural burning. From its inception, the USFS has held symbolic power because of its status as an agency of

the settler state, as well as its claim to science-based decision-making. Yet much of its original land management agenda was derived from European forestry models that were largely inadequate in fire-adapted ecosystems of the American West (Pyne 2015). Instead of using science to properly investigate the relationship between fire, Indigenous peoples, and American landscapes, the USFS defaulted to pyrophobic European state forestry principles, subsequently launching a highly successful anti-fire campaign that continues to reverberate to this day (Pyne 2015, Catton 2016). A key strategy of this campaign involved discrediting and disempowering Indigenous groups that routinely used fire. One such way to convince ambivalent settlers of the superiority of fire suppression-based management was to racialize Indigenous peoples as inferior, unreliable, and unfit land managers in need of assimilation.

As is described in detail in Chapter II, in the 1920's, USFS leadership and staff began deridingly referring to "light burning" as "Paiute forestry," contrasting it from the allegedly scientific and therefore superior fire suppression approach of the Forest Service (Greeley 1999, Leopold 1920). Paiute forestry became code for forestry that was backward and ill-informed. At the regional level, vulnerability discourse was also deployed by state agents in the Klamath and Six Rivers National Forests. In the Klamath National Forest, District Ranger Harley (1918) suggested using missionary assistance to manipulate "Indians" into ceasing their burning practices, stating:

> [The missionary's] duties would be to travel up and down the river between Orleans and Elliots, stopping at different indian houses, talking to them in regards to their own welfare, but the principal point to impress on them would be the fire question. This woman can do more in one season towards causing the indians to adopt our theories in regards to fire than we can do in five (As quoted in Williams 2000, p.17*—see Chapter II for full quote.)

Important to note above is Harley's suggestion of using Indigenous peoples' welfare as the conversational entry point by which to ultimately achieve the real goal: coercing Indigenous peoples to cease their burning practices.

In the Six Rivers National Forest, the General Integration Inspection Report written by Region 5 Foresters Cronemiller and Kern in 1949 equates Indigenous burning in the Klamath River Basin with the retaliatory acts of envious, "half-drunk" Indians (see Chapter II for quote). By deploying racial stereotypes that reduce Indigenous land management practices to drunken acts of retaliation against settlers, Cronemiller and Kern justify the erasure of Indigenous knowledge, settler control over land management, and assimilation policy to "civilize" Karuk and other Indigenous peoples of the region.

Having effectively deployed Euro-centric vulnerability discourse to discredit Indigenous peoples and other pro-fire advocates, the USFS was able to implement and maintain a totalizing fire suppression policy that kept fire out of most forests for decades. The ecological impacts have been devastating, and it is now acknowledged that in many ecological contexts, burning advocates had been right all along. One hundred years later, California finds itself in a large-scale ecological crisis stemming from the combined impacts of climate change and long-term federal fire suppression—both products of colonialism. The absence of fire has not only shifted the prevalence and distribution of fire-adapted species and ecosystems, it has also led to dangerous fuel accumulations that increase forest volatility. The year 2020 was the state's most devastating wildfire season to date, and 2021 is projected to be of equal or worse magnitude. In the Klamath River Basin, the Karuk Tribe has experienced its own share of fire-related loses—in 2020, the Slater Fire struck the town of Happy Camp, killing two people, burning more than 150 homes, and killing millions of culturally significant plants and animals. This could have been avoided if Karuk people were free to manage their ancestral forests as they once did.

As a result of the Indian-Self Determination and Education Assistance Act combined with long-term Tribal effort, the Karuk Tribe has been federally recognized since 1986, with its own DNR since 1989. In an interesting turn of events, the Tribe has emerged as a national leader in prescribed fire management, thanks to Karuk people's preservation of Indigenous knowledge against many odds. Despite their earlier campaign to discredit Indigenous burning practices, the USFS now seeks out collaborations with Tribes to restore fire in forests. The Karuk Tribe currently leads a major land management collaborative with both the Klamath and Six Rivers National Forests known as the Western Klamath Restoration Partnership. A central tenet of the collaboration is the restoration of traditional Karuk fire management (Harling and Tripp 2014).

In recent years, the Karuk Tribe's DNR has developed a Karuk Eco-Cultural Resources Management Plan (2010), and Climate Vulnerability Assessment (2016) and a Climate Adaptation Plan (2019). These documents offer glimpses into Karuk conceptions of what constitutes Tribal vulnerability and resilience. The thread weaving through every management plan and objective is the return of traditional burning regimes in the Klamath River Basin. In the Climate Vulnerability Assessment, an entire chapter (Chapter 2) is dedicated to examining the impacts of fire exclusion on patterns of fire behavior. The Tribe describes in great detail how their subsistence foods, traditional materials and community safety all depend on the return of Karuk-tended fire. Furthermore, these documents illustrate the cyclical impact of colonial violence: Federal occupation led to the

criminalization of Karuk burning practices and the institution of fire suppression, which then shifted species and ecosystem distribution and produced the volatile forest conditions of the present-day, which not only endanger Karuk people's safety, subsistence, and sovereignty, but increase the public's general fear of fire, thereby complicating the Tribe's efforts to restore cultural burning practices. As the Tribe prepares for climate change, there is a solid understanding of the way federal fire suppression has significantly augmented lived vulnerability in every dimension of Karuk life, including and importantly in regard to the exercise of Tribal sovereignty. The Karuk DRN Climate Vulnerability Assessment states:

> The exclusion of fire from the landscape creates a situation of denied access to traditional foods and spiritual practices, puts cultural identity at risk, and infringes upon political sovereignty. Attention to the relationships between management authority, traditional ecological knowledge and the use of fire becomes even more important to understand now that the instance and frequency of high severity fire is increasing with climate change (Karuk DNR 2016, p.176-177).

The Karuk Tribe continues to navigate a complex cross-jurisdictional network of state actors in an effort to return cultural fire to the landscape, protect Tribal sovereignty, knowledge, and lifeways, and ultimately have control over their adaptive capacity and climate resilience.

Discussion

The above case studies illustrate how settler discourses of Indigenous risk and vulnerability diverge from experiences and perceptions *within* Indigenous communities. Vulnerability has historically been ascribed by settlers and the settler state to justify control over Indigenous peoples, lands and affairs. Even when vulnerability is ascribed without ill intent, the consequences can still be harmful, as is illustrated in the case of the Dawes Act. These cases also illustrate how Indigenous peoples have subverted settler policies, contradicted settler categorization, and resisted assimilation through a variety of resistance strategies and practices. Simultaneously, ascribed vulnerability compromises Indigenous agency and self-determination and has historically served to justify ongoing colonial violence, producing lived vulnerability within Indigenous communities.

In an era of large-scale environmental change replete with state-led climate mitigation and adaptation initiatives, the concepts of *ascribed* versus *lived vulnerability* help further conceptualize climate and environmental injustice. Communities and demographics disproportionately affected by climate change must be at the helm of vulnerability assessments and adaptation measures to ensure

the development of community-based solutions that truly augment resilience and dismantle the systemic contributors to lived vulnerability. Ascribed vulnerability discourse often portrays vulnerable subjects against an unchangeable, naturalized, hazardous set of conditions to which they are supposedly maladapted. This discourse places the onus of adaptation onto individuals least responsible for large-scale environmental change, protecting the status quo and erasing state and corporate culpability and responsibility. In contrast, the lived experiences of people on the ground reveal the systemic processes that simultaneously disrupt ecosystems and inhibit resilience within politically marginalized communities.

As we seek pathways towards environmental justice that honor and prioritize Indigenous sovereignty, the challenge lies in the fact that most large-scale climate change initiatives are funded and driven by settler institutions. The existence of settler states hinges upon ongoing violence against Indigenous peoples, and this violence is in turn intimately linked with the degradation of ecosystems. Colonial ecological violence is among the root mechanisms by which large-scale anthropogenic environmental change takes place. Without the colonial spread of capitalism and industrialization on a global scale, climate change, deforestation, mass extinctions and large-scale ecological degradation would not be occurring at the unprecedented magnitude we are witnessing today. Indigenous peoples' resistance to colonial violence is imperative not only for Indigenous peoples' survival and wellbeing but for the preservation of much of the world's ecological integrity and security. From a planetary standpoint, Indigenous sovereignty and self-determination are key to resilience-building strategies capable of transcending the Euro-centric systems responsible for the environmental crises of our time.

IV. Drawing from Karuk World Renewal: Illustrating More Than Human Agency and Relationality in the Klamath River Basin

Introduction

As the above chapters reveal, Karuk people have contended not just with the physical violence of settler colonialism, but also the discursive violence that portrays Indigenous knowledges and practices as inferior, uninformed, and unreliable. In this final chapter, I turn the lens onto Karuk World Renewal to illustrate elements of the eco-cultural complexity that is occluded when Karuk epistemologies are marginalized, discredited or erased. Karuk World Renewal is a way of knowing and being that centers relational responsibility in the Klamath River Basin (Lake, Tripp and Reed 2010). Karuk approaches to land stewardship and climate adaptation hold important lessons for settler scholars, activists, and land managers (see Norgaard 2019). In environmental sociology, there is an urgent need to actively address the significance of racism and colonialism in creating the environmental problems of our time (Liévanos et al. 2021). Relatedly, the subdiscipline has largely neglected Indigenous epistemologies, creating important gaps in knowledge. As Norgaard and Fenelon (2021) explain in their call for an Indigenous environmental sociology,

> Despite longstanding and general public awareness that Indigenous ecologies, epistemologies, values and social arrangements look quite different from those in so-called western societies, the potential for an Indigenous environmental sociology is only recently taking hold (p.477).

The authors go on to state that "[o]ne key contribution to environmental sociology from Indigenous perspectives is attention to the presence of Indigenous ecological systems" (Norgaard and Fenelon 2021, p.479). The lack of sociological consideration regarding Indigenous ecologies became particularly visible to me as I produced a series of illustrations for the Karuk Tribe DNR over the course of several years. It was by immersing myself in the visual reproduction of Karuk ecologies that I was able to clearly visualize how Karuk World Renewal conceptually expands environmentally sociology to make space for future Indigenist research. Wilson and Hughes (2019) describe Indigenist research as "a philosophical approach to research that centres Indigenous ontology, epistemology, and axiology…or Ways of Knowing, Ways of Being, and Ways of Doing" (p.7). The authors use *Indigenist* "to label a philosophy that includes a relational and emergent understanding of reality and knowledge" in which researchers understand their place in a web of

relations to which they hold themselves accountable, and in which they understand knowledge as alive and in motion. In this chapter, I describe my efforts to fully immerse myself in the relationality of my research, holding myself accountable to the Karuk Tribe and the lands, plants, animals and waters of the Klamath River Basin, as well as to my academic community in environmental sociology. I explore the ever-evolving revelation that is living knowledge, knowledge that came alive in—and through—my illustrations. In response to Norgaard and Fenelon's (2021) call for an Indigenous environmental sociology, and with Indigenist scholarship principles in mind, I use this chapter to examine the following question: *How can visual methods, and illustration specifically, serve Indigenous approaches to environmental sociology?*

As I address this question, I pay heed to Ray, Cormier and Desmoulins' (2019) call for research "that works to challenge settler stories and delegitimize Indigenous dispossession from Lands" (p.79). Through my illustrations, I aim to vividly honor Karuk land tenure in the Klamath River Basin as well capture elements of the eco-cultural complexity, beauty, inter-species relationality and resilience of Karuk ecologies that are obscured by settler violence, Indigenous erasure, and ascriptions of vulnerability. As Jacob et al. (2021) explain:

> Even though countless forms of violence are inflicted upon Indigenous peoples and homelands, we do not want to bring a deficit lens to viewing Indigenous peoples. Within the violence, there are brilliant forms of resistance and survival of Indigenous cultures and peoples.

Relatedly, Tuck (2009) calls upon Indigenous scholars, communities and allies to "suspend damage-centered research" in favor of more nuanced frameworks that adequately capture the dialectic between the effects of colonialism on Indigenous communities and the rich and multi-faceted desires that inform Indigenous action and resistance. Indigenous communities are not "damaged" communities—they are communities impacted by settler colonial violence *and* communities in which Indigenous epistemologies, lifeways, and dreams resist, sometimes interweave with, and transform the colonial structures in their midst. Beyond that, when it comes to environmental protection, Indigenous communities are often on the front lines.
As Gómez-Barris (2017) explains "Indigenous peoples often multiply rather than reduce life possibilities, protecting land and each other at often extremely high personal and communal cost" (p.xix). This chapter is a celebration of Karuk social worlds, and a call to expand theoretical and

methodological approaches within environmental sociology to make a rightful place for Indigenous scholars and epistemologies.

In continuation, I provide the theoretical context for my analysis in two background sections. In the first, titled "Visual Methods and Indigenist Research," I review scholarship emphasizing the importance of multimodal communication, art, and visual production within Indigenous communities and connect this to Indigenist research principles. In the second background section titled "Embracing Indigenous Epistemologies in Environmental Sociology" I build upon Norgaard and Fenelon's (2021) work and survey literature describing the relationality and agency characteristic of many Indigenous social worlds, and how Indigenous epistemologies have largely been incompatible with dominant sociological frameworks. In my methods section, I describe how I created the various illustrations for the Karuk Tribe and my process for realizing their theoretical and methodological significance. In my findings, I present ten of the illustrations and describe how they serve to 1) teach about Karuk ecologies, 2) honor Karuk relationality, 3) normalize the benefits of fire and smoke, and 4) convey Karuk visions for a resilient future. Finally, in the discussion, I highlight the limitations of my role as a settler illustrator for the Karuk Tribe. I describe the photoshop workshop I organized for Karuk DNR staff in an effort to build internal capacity and emphasize the importance of visual and knowledge sovereignty.

Background

Visual Methods and Indigenist Research

If Indigenist researchers are those who center Indigenous ways of knowing, being, and doing, then we must strive to employ methods that are reflective of Indigenous ways of learning and communicating. Indigenous knowledges are taught, learned, kept, and revised largely by doing in place (Deloria and Wildcat 2001, Simpson 2014). Unlike androcentric Western academic knowledge that largely emphasizes cognitive ways of knowing, Indigenous knowledges include but also transcend cognition, recognizing the importance of "experiential understanding; sensory, emotional, and spiritual knowing; intuition; dreams; and cultural knowing" (Wilson and Hughes 2019, p. 11). In fact, "Indigenous Knowledge is alive, it has agency, it moves" (Wilson and Hughes 2019, p.9).

One way in which the animism of Indigenous knowledges is most celebrated is through story, a way of teaching, learning and communicating that is cherished by many Indigenous cultures. Archibald (2008) uses the process and principles of Indigenous storytelling to develop both a research methodology and educational curricula that she refers to as *Indigenous storywork*. Developed

with the guidance of Archibald's Stó:lō Elders as well as Coast Salish Elders, Indigenous storywork hinges on seven principles: respect, responsibility, reciprocity, reverence, holism, interrelatedness, and synergy. Tuck and McKenzie (2015) explain that Archibald's definition of Indigenous storywork "has major implications for Indigenous methods of critical place research," given that "[k]nowledge of place is held in stories" and that "[i]n their endurance, stories reinforce connections with people and places and suggest appropriate actions and relationships, including with land" (p.131-132). I witnessed examples of the importance of stories in the context of the Karuk Tribe, in which stories deeply inform the DNR's land management planning. In the Somes Bar Integrated Fire Management Project's Cultural Specialist Report, Karuk DNR Director Bill Tripp (2017) and his co-authors write:

> Stories are the primary means for passing down Traditional Ecological Knowledge, and govern its interpretation and use. They are told in winter, and require complete attention when they are told. They also function as medicine in themselves. Stories have positive, healing properties. They recite the origins of medicine, and link the people today to Ikxareyavs - the Spirit People. Everything in the world - the mountains, the trees, the animals, came from the Spirit People. Only some of them became modern-day people. The stories link people of today to the ancestral ties of duty towards the whole environment and to the practices that sustain the bonds that tie all pieces of the environment together. Karuk ceremonies are for Fixing the World - the people, the animals, the plants, and the air and water. In that sense, everything is a cultural resource. (Tripp et al. 2017, p.2)

This quote describes the vital function of stories as it pertains to traditional knowledge, as well as their vital role in sustaining kinship and responsibility between Karuk people and the other beings of the Klamath River Basin. The report then goes onto tell a story, "How Coyote Stole Fire," in which Coyote, trickster and helper of mankind, helps brings Karuk people into existence by stealing fire from the ikxareyavs, or Spirit People. The story is summarized as follows:

> Coyote wanted to steal fire, which had been lost in a bet. He collected various animals, and placed them at intervals from the river to the mountains. Frog was in the first place - closest to the river. There was forest fire in the mountains, and he stole it by diverting the children who were in charge of it, and then pretending to fall asleep by the fire, having placed oak bark between his toes. At the right moment, he ran away with a piece of burning charcoal. The ember got passed from one animal to the next as each got tired. Turtle was able to escape by rolling down from a mountaintop towards the river, and then gave it to Frog. Frog hid the fire in his mouth, dived in the river and swam to the other side, and spat the fire out under a Willow. Dogs howled as the fire rose up, and mankind came into existence (Tripp et al. 2017, p.3)

Part of this story is then represented visually by Karuk artist and DNR staff Vikki Preston (see Figure 4). In her drawing, Frog comes from the edge of the river to spit out a piece of burning ember into the roots of Willow. Karuk people, dressed in burn crew gear, walk near the river carrying fire, and along with Frog, are setting the Willow aflame. Behind them, mountains of the Klamath River Basin stand tall.

Figure 4. Illustration by Karuk artist and Department of Natural Resources staff Vikki Preston

This example from Karuk country illustrates how stories take many, interconnected shapes. An oral story becomes a written story in a land management plan, as well as a visual story in Preston's work of art. As Wilson and Hughes (2019) describe, "[s]tories are a way that Knowledge communicates and participates in relationships, which can occur whether stories are shared orally, visually, through dance, song, poetry, or sometimes, through writing them down in English" (p. 10). In a contemporary context, stories may even be generated via digital media and mobile devices. Cordes (2020) has developed a method she coins as a *digital constellatory autoethnographic mode* (DCAM) of Indigenous archaeology that employs digital data such as iPhone images, text messages, and

Snapchats to contest colonial historical narratives. She explains that "DCAM is an extension of the aural, the ocular, and the corporeal connectedness to a critical cultural researcher's ontological experience in contested (de)colonial spaces" (Cordes 2020, p.66). Visuals, be they hand-rendered art, photographs, diagrams, films, three-dimensional creations, or digital media, are therefore an important element of Indigenous storytelling.

In his book *Look to the Mountain: An Ecology of Indigenous Education*, Cajete (1994) describes science as a form of storytelling that Western educators have appropriated and stunted by neglecting Indigenous epistemologies. One of the ways in which Western education fails Indigenous students is by prioritizing written knowledge exchange (Sparks 2000). Indigenous knowledges are often passed down orally, accompanied by visual/kinetic experiences—in other words, learning by doing in the presence of elders or mentors that are offering guidance (Simpson 2014).

Hoover (2017) describes the process by which a new fish advisory guide was produced for the Akwesansne Mohawk community. The project, which was spearheaded by Tony David in his position as the Environment Division's Water Resources Program manager, aimed to still protect local families from contaminated fish, while promoting the upkeep of traditional knowledge by clearly indicating which fish can still be eaten and by sharing recipes. Hoover explains that the result was "a glossy pamphlet titled Akwesasne Family Guide to Eating Locally Caught Fish that features photos of people catching, filleting, cooking, and eating fish" (p.271). Among the features was a color-coded chart of fish species, from red to green, representing the spectrum of species that should not be eaten at all to species that can be eaten up to eight times a month. In developing this pamphlet for his community, Tony noted that in his experience "Native people are visual learners, so shying away from heavy text was a way to draw people's attention, to capture their attention and keep it" (as cited in Hoover 2017, p. 272)**.** This example illustrates the intersection between visual communication and relational Indigenous stewardship. By creating this effective, visually rich pamphlet, Tony helps his community safely continue traditional harvests and relationships with other species.

Visual communication is also highly prized in Karuk spaces, which is why I was asked to produce the illustrations that will be presented and discussed in the findings. When asked about the value of culturally relevant illustrations, Bill Tripp, Director of the Karuk DNR, states:

> It's good for intergenerational learning. I imagine just about every segment of society has somebody that doesn't really like to do the reading part of things—I never did—I have to be practicing it… I'm more visual-kinetic you know? A long time ago, you would go to this

> ridge and look for these things and see this stuff and pay attention to this. It's not exactly the same, it's not entirely something you are able to do in today's education system, you're not able to access the youth for those things, and so, having something like this as a surrogate helps because it's something they can actually look and say "hey, I've seen that on the landscape before!...and I understand what they are talking about because I have this visual of this situation and this place and what this lesson in school is about. So I can look at that through life and maybe in 30 years I can say this is what it looked like back then, this is what we did, this is what it looks like now…" In the end that's the kind of thing that will end up being valuable too. You never can tell what's going to be valuable 40 years down the road (Bill Tripp, personal communication, Sept 1, 2021)

Echoing what Bill Tripp describes, Cajete (1994) explains that an Indigenous education model must honor the process of *visioning,* which "embodies and focuses our creative power to visualize and realize new entities in communion with others and with our spirit" (p.145). He goes onto state:

> Visions always mirror what we deem sacred and intimately important to us. Also, visions relate, and act to integrate, all aspects of our lives…. It is no wonder that visions held and continue to hold such an important place in many Indian societies. The process of visioning is a basic creative response to making meaning of life. Visions are, indeed, for life's sake. (Cajete 1994, p.145)

By prioritizing the written word, colonial education systems—including higher education—neglect cultural and learning diversity among students and limit how knowledge is created and shared. This not only limits students' journeys, but the trajectory and expansiveness of knowledge at large.

Visual methods have emerged in sociology that offer scholars and students other ways of engaging with and producing knowledge. The field of visual sociology interprets social processes and patterns through the production and interpretation of visual data (Harper 2012, Spencer 2011). One example of a visual methodology is *photovoice.* First developed by sociologists Wang and Burris (1997), photovoice is a community-based participatory research process in which community members produce photographic data related to a specific social phenomenon pertaining to their lives. This method has been successfully employed especially in the fields of medical sociology and gender studies. There is also an active International Visual Sociology Association that recognizes the value of visual methods in anticolonial and antiracist research.[13] That said, while visual sociological

[13] The International Visual Sociology Association "recognize[s] outstanding anticolonial and antiracist work by researchers and activists who use visual methodologies or advance visual activism through their work" by instituting annual antiracist and anticolonial visual research awards. See https://visualsociology.org/?page_id=7210

frameworks and organizations exist and even thrive internationally, they remain marginal and underdeveloped in US sociology.

In her article "Visual sociology in a discipline of words…," Black and Indigenous sociologist France Winddance Twine describes the lack of visual training in most doctoral programs in the United States, linking this methodological gap to a culture of "academic apartheid" that "still positions 'visual' methods as less scientific, that is, less rigorous when compared to statistical methods" (Twine 2016, p.968). Twine goes onto describe the limitations of word-based scholarship when it comes to analyzing racialized and gender-based inequality, given that so much of these social phenomena unfold through visual processes. In her research examining multiracial families and identity, Twine describes how she retrofitted video data of multiracial students she interviewed to enrich her ethnographic work after she realized written words failed to communicate the complexity of their lives and embodied experiences. She concludes her article by urging North American critical race and social justice scholars to learn from their British counterparts in their embrace of visual sociological methods.

Given that vision is the primary sense by which most people experience and navigate their environment, visual methods hold strong potential for environmental sociology. That is not to exclude the experiences of people who are visually impaired, for whom other senses predominate in their daily lived experiences, and whose understanding of the environment also warrants methodological expansion within the discipline. However, it is important to recognize the centrality of visual data in most peoples' experiences of the environment in order to highlight the underutilized value of visual methods.

Gómez-Barris (2017) illuminates how visuality factors into colonial resource extraction in South America and examines visual projects that counter these colonial narratives. She explains that the Eurocentric visual theories of Foucault's panopticon and Deleuze's control society start with modernity and thus "ignore the weight of colonial seeing…render[ing] invisible the enclosure , the plantation, the ship, and the reservation, quintessential colonial spaces where power was consolidated through visual regimes" (Gómez-Barris 2017, p.6). In the work of mestiza artist Carolina Caycedo, Gómez-Barris finds a form of visual contestation to the El Quimbo Hydroelectric Project in the Yuma River in Colombia. By recording video from a fish's submerged perspective in the river, Caycedo achieves what Gómez-Barris refers to as a "fish-eye episteme" that "weaponizes digital technology to facilitate the visibility and vitality of communities that persist despite hydropower's extinguishing footprint" (p.97).

Mapping is one clear example of how visual data are generated to understand, control, and even produce places and environments. Spencer (2012) discusses the value of visual sociological methods as they pertain to representations of place. "The concept of 'place'," Spencer describes, "is one of the most complex (but perhaps least discussed) in the social sciences" (p.69). While urban sociologists have focused considerably on the role of place, sociology at large has underemphasized the social importance of landscapes that, to the settler eye, appear "wild" or unbuilt (Gieryn 2000). In fact, these are places that are replete with social interactions, power relations and culture. In describing Indigenous methods of critical place inquiry, Tuck and McKenzie (2015) highlight the Indigenous practice of *mapping place-worlds*. By putting the work of Abenaki author Lisa Brooks (2008) in conversation with Basso's (1996) description of place-making, Tuck and McKenzie highlight how Indigenous writing, storying, visioning and mapping addresses the crucial questions "what happened here?," "who was involved?" and "what was it like?." Brooks uses her land-based experiences in the company of others who share their own stories to build place-worlds in her writing. Tuck and McKenzie explain that "[t]he building of place-worlds is collective, creative, and generative" and that for both Brooks and Basso, building place-worlds "is also a revisionary act, a re-memory act, in which multiple pasts co-mingle and compete for resonance toward multiple futures" (p.133). They link this and other Indigenous methods of critical place inquiry to Vizenor's concept of *survivance*. Vizenor (1999, p.93) explains that "[s]urvivance is not just survival but also resistance, not heroic or tragic, but the tease of tradition, and my sense of survivance outwits dominance and victimry (as cited in Tuck and McKenzie (2015), p. 129).

While Brooks' world-building unfolds via the written word, other Indigenous artists, cartographers and scholars employ highly visual approaches. Some Indigenous world-building or counter-mapping approaches take highly technical and cartographic forms, while others readily blur the lines between mapping and art. These artistic representations are just as capable of disrupting settler spatialities and "mark[ing] and reestablish[ing] Indigenous geographies" (Barnd 2017, p.130). One such example is the Zuni countermapping project coordinated by Zuni farmer and Director of the A:shiwi A:wan Museum and Heritage Center, Jim Enote. Among the artists that participated in this effort was Ronnie Cachini, who developed a map of the reservation lands titled *Ho'n A:wan Dehwa:we (Our Land)*, in which he uses paint to portray places and waterways of cultural significance tied to the A:shiwi migration history. As Steinauer-Scudder (2018) describes, "*Ho'n A:wan Dehwa:we* looks nothing like a typical road atlas…It is full of color and texture and story, painted onto wide canvas." Cachini explains that "[a] conventional map takes you to places—it will tell you

how many miles and the fastest route. But the Zuni maps show these significant places that only a Zuni would know." In regards to her own experience producing one of the maps of the Grand Canyon using a Zuni winter solstice prayer as guidance, Malery Quetaki explains that "[i]t's a really great learning experience to actually visualize these prayers, to put prayer into art and into a literal map. Culturally, it allows us to reconnect to our past" (Steinauer-Scudder 2018).

With rare exceptions, visual sociology predominantly focuses on the production and/or analysis of photographs, and occasionally, video (Harper 2012, Spencer 2011). However, as the Zuni example above demonstrates, there is something generative that unfolds when we visually create places, concepts, or stories using our own illustration skills. In thinking of the role of art in Indigenous education, Cajete (1994) explains that "[a]rt, in its highest form of expression, is a kind of magic. And in this magic of creation, the artist becomes immersed within his media and the mind of creation" (p.148). In our pursuit for a more expansive and inclusive discipline, and especially in the context of Indigenous environmental sociology, exploring the role of illustration and artistic expression in our analyses and methods may be surprisingly generative. It may be through these underutilized methods that we examine old questions in new ways, visualize concepts more holistically, or reach a part of ourselves that was inaccessible by other means. As Margaret Hughes states, "…we are not brains on sticks, and the way we "come to know" involves our whole selves" (in Wilson and Hughes 2019, p.11). Art, illustration, mapping, or even a diagrammatic organization of data, no matter how elaborate or simple, whether done by an expert or novice hand, can cast light on a part of our knowing and relating that writing alone may leave in the dark.

As we explore the value of visual representations in Indigenist research, it is vital to also recognize the inaccurate and sometimes violent ways in which Indigenous peoples and their lands have historically been portrayed through the subjective lens of the colonizer. Historic photographic representations have negatively impacted Indigenous communities, even if that was not the photographer's original intent. The repercussions of early photography of Indigenous peoples and lands, for example, are still felt today (Cummings 2011, Tsinhnahjinnie and Passalacqua 2006, West 1998). The concept of *visual sovereignty*, advanced by Raheja (2011), is pertinent to both these historical colonial representations and visual approaches employed in sociological research. Visual sovereignty, or the ability to control how one's culture is represented through imagery, is being actively exercised by Indigenous photographers, filmmakers, mapmakers and artists. For settlers engaging in Indigenist research, the employment of visual methods demands that we extend a self-reflexive, decolonial lens to the process of producing and/or interpreting visual data. Without highly

collaborative processes in which our visual production is continuously informed and vetted by Indigenous collaborators, we run the risk of perpetuating colonial misrepresentations that have real material consequences for Indigenous peoples and lands.

Embracing Indigenous Epistemologies in Environmental Sociology

In 2021, sociologists Norgaard and Fenelon published an article making the case for an Indigenous environmental sociology. By and large, sociology is understood as a discipline focusing on *human* social phenomena and social structures. Despite the vital role other species play in human social systems, sociology lags behind other social sciences, such as geography and anthropology, in recognizing the socio-ecological significance of other animals, and especially plants (Carter and Charles 2018, Tovey 2003, Ergas and York 2021, York and Mancus 2013). Up until the 1990s, non-human animals were almost entirely absent from sociological analysis, a fact often attributed to the discipline's early efforts to distinguish itself from the natural sciences, and later inclination to distance itself from biological determinism (Carter and Charles 2018).

In the last three decades, sociologists have begun incorporating non-human animals into sociological inquiry, with the notable rise of animal sociology. These analyses are varied in their approaches and theoretical frameworks, from examining human/non-human play to expand sociological understandings of symbolic interactionism (Alger and Alger 1997, Jerolmack 2009, Sanders 2003), to applying Marxist frameworks to understand alienation experienced by dairy cows (Stuart, Schewe, and Gunderson 2013), to using political economic theory to understand why the rise of fossil fuels did not save the whales (York 2017). However, important gaps remain. As Norgaard and Fenelon (2021) make clear, Indigenous epistemologies and lifeways—in which non-human animals, plants, and even fire and water are often understood as agentic beings with whom Indigenous peoples hold reciprocal relationships—remain largely invisible.

Taylor and Sutton (2018) quantify the focus of sociologists incorporating non-human animals into their research from 1979-2018 and reveal that the majority of these studies (56%) focus on human interactions with captive animals, especially companion and farm animals (33% and 14% respectively). The authors find that 31% of studies addressed human-non-human interactions in the general sense without reference to specific species. Finally, 12% of the studies involved wild animals. In this last category, Cherry (2019) explains that the majority of studies focus on the exploitation of wild animals through trophy hunting or the inhumane captivity of these animals in zoos, circuses, and aquariums. In most of these studies, human/non-human relationships are framed hierarchically,

situating humans as dominant subjects and other species as objects vulnerable to continual exploitation.

While it is crucial to recognize and study the fact that non-human species experience severe exploitation, violence, and even the risk of extinction as a result of human socio-economic systems that prioritize capital gain over the living conditions of humans and non-humans alike, there are other inter-species arrangements worth studying in sociology. Settler framings of animal sociology obscure crucial types of human/non-human associations, including and especially reciprocal, kinship-based relations that many Indigenous communities have with other species. While some sociologists have examined the positive interactions between domestic animals and people, few have recognized the positive social relationships that can exist between humans and non-humans living non-captive lives. Cherry (2019) is among the exceptions, examining the relationships between human birders and the birds they interact with outdoors, explaining that by developing what she refers to as a "naturalist gaze," birders come to understand their place in ecosystems and recognize the agency of birds based on their ecological roles. Regarding the absence of sociological studies examining positive relationships between humans and wild, non-human species she states: "if we study only how people use and exploit wild animals for their own entertainment, or how people understand their own identities through experiencing nature, we miss the myriad ways that wild animals enrich humans' lives and how humans respect wild animals" (p.6). It is also important to note that settler naturalists have at times condemned Indigenous peoples' hunting and harvesting of other species. The misconception that hunting or harvesting a species automatically signifies a lack of respect or care for that species must be addressed in order to decolonize animal sociology.

Sociologists largely minimize the agency of non-human species and their vital role in shaping human social systems. However, there are some notable exceptions (eg. Cherry 2019, Ergas and York 2021, Norgaard 2019, Pellow 2016, York and Longo 2017, York and Mancus 2013). In theorizing a Critical Environmental Justice (CEJ) Studies, Pellow states that "CEJ Studies recognizes that social inequality and oppression in all forms intersect and that members of the more-than-human world are subjects of oppression *and agents of social change*" (p.225, emphasis mine). Richard York and his co-authors explicitly describe dialectical relationships between humans and non-human species, in which other animals and plants shape our lives at the same time as we shape theirs (Ergas and York 2021, York and Mancus 2013, York and Longo 2017). Ergas and York's (2021) groundbreaking article makes the case for sociological plant studies, giving plant long overdue attention within the discipline. Importantly, Ergas and York make explicit the agentic quality of

plants and recognize them as social actors, stating that "[p]lants have shaped human biological and social evolution as fundamentally as humans have shaped plant evolution" (p.6).

Indigenous epistemologies expand sociological understandings of other species as well as the ecosystem stewardship required to balance the dialectic between people and the biotic communities in which we are enmeshed. Many Indigenous knowledge systems conceptualize social systems as *more-than-human* and are shaped by reciprocal relationships with complex webs of plant and animal species, as well as elements like water and fire (Coulthard 2014, Jacob 2020, LaDuke 2017, Salmón 2000, Whyte 2013, 2017). In order to deepen and diversify sociological understandings of the environment and summon socio-ecologically sustainable futures, we must expand settler understandings of what constitutes "the social".

Weber (1964) defines sociology as "a science which attempts the interpretive understanding of social action in order thereby to arrive at a causal explanation of its course and effects" (p.80-81). By "social action" Weber explains he is referring to "all *human* behavior when and in so far as the acting individual attaches a subjective meaning to it;" in other words, behavior that takes into account the behavior of others and is "thereby oriented in its course." Human behavior, however, does not simply consider the behavior of other people, but the ecological conditions in which they live and the actions of other species. Most sociologists are not in an epistemological position to understand the motivations of other species, and yet historically have largely assumed that other species are incapable of reasoning, communication, or producing meaning. The general claim is that to attribute meaning to non-human action is to engage in anthropomorphism, but is it not just as problematic to deny meaning where meaning may exist? Despite important inroads made by environmental and animal sociologist towards recognizing the importance of ecosystems and other species, Indigenous erasure is an ongoing problem. These subdisciplines largely theorize non-human species and ecosystems in generalized, abstract ways (environmental sociology), or from settler positionalities that erase Indigenous ways of relating to the more-than-human world (animal sociology).

Much as sociologists must take their positionality into account when researching human communities and social systems, so too we must consider our positionality and limitations when examining the sociology of multi-species ecosystems. That does not mean, however, that we must abstain from these inquiries, but that we must tread with care and reflexivity, be prepared for continual revision, and engage with epistemological frameworks that center the experiences of non-humans. In their call for critical materialist sociological plant studies, Ergas and York (2021) prompt

sociologists to learn from scientists and knowledge holders that dedicate themselves to understanding the lives and social characteristics of others species. This includes researchers in the natural sciences, as well as Indigenous communities that, guided by Indigenous knowledges, practices, and spirituality, have sophisticated understandings of other species and their ecological interconnections.

The active role of non-humans in human social systems is described and theorized by many Indigenous scholars and allies working largely outside of sociology (Coulthard 2014, Deloria and Wildcat 2001, Jacob 2016, Kimmerer 2013, LaDuke 2017, Lake et al. 2010, Norgaard 2019, Salmón 2000, Simpson 2004, Whyte 2013, 2017, Wilson 2008, to name a few). Hoover (2017), whose work focuses on the experiences, resistance, and knowledge production of the Akwesansne Mohawk community as it confronts the toxic pollution of one federal and two state superfund sites, categorizes community members' experiences into three bodies: the individual body, the social body, and the body politic. She explains that "[t]he social body in Haudenosaunee communities is more inclusive than that in many Western communities. Traditional Haudenosaunee culture conceives of elements of the natural world— in addition to humans— as part of this social body" (p.25). Similarly, Enrique Salmón (2000) uses the term "kincentric ecology" to describe how his Raramuri community of the Sierra Madres of Chihuahua, Mexico, manages landscapes replete with more-than-human relatives. The Raramuri have their own term for this principle—iwigara— which refers to the interconnectedness of the entire biotic community.

Norgaard and Reed (2017) explain that decolonizing higher education requires the difficult task of dismantling the nature-culture dualism. By reinforcing these Western binaries, Jacob (2016) explains that we are unable to see the nuance in particular situations and the interconnections between everything and everyone. The nature-culture dualism is especially limiting for Indigenous epistemologies as it is incompatible with the relationality inherent in many Indigenous worldviews.

In their pursuit of decolonial and Indigenist approaches to environmental and climate justice, Indigenous scholars, activists and communities are centering the importance of relationships, including relationships with other species. Whyte (2017) uses the term *renewing relatives* to describe a process that "involves both restoring persisting relationships that are part of longstanding Indigenous heritages but also creating new relationships that support Indigenous peoples' mobilizing to address climate change" (p.158). Whyte also advances the concept of *collective continuance*, or "a community's capacity to be adaptive in ways sufficient for the livelihoods of its members to flourish into the future" (2013, p.518). He explains that collective continuance "is composed of and oriented

around the many relationships within single communities and amid neighboring communities" which importantly include ties within tribes, ties between tribes, ties within families, ties between families, and ties between species and with the land and water (p.519). Relatedly, Coulthard (2014) introduces the concept of *grounded normativity* to describe "the modalities of Indigenous land-connected practices and longstanding experiential knowledge that inform and structure our ethical engagements with the world and our relationships with human and nonhuman others over time" (p.13). Coulthard (2014) argues that it is this place-based, nondominant, nonexploitative orientation towards land and the more-than-human world that defines Indigenous resistance to the intertwined structures of settler colonialism and capitalism.

Now more than ever, it is vital to expand sociological frameworks in order to grasp the full magnitude of socio-ecological problems as well as visualize Indigenous and other forms of resistance. As Norgaard (2019, p.224) keenly puts into question: "Can climate change be a vehicle to eradicate the nature-culture dualism within sociology, thereby allowing for a fuller understanding of social dynamics and power?" In continuation I describe how visual methods, and illustration specifically, can serve Indigenist research and open up pathways for an Indigenous environmental sociology that honors more-than-human agency and relationality.

Methods

In 2016, I became a contracted researcher for the interdisciplinary team working with the Karuk Tribe DNR to develop a Karuk Climate Vulnerability Assessment. This project was then followed up by the team's development of a Karuk Climate Adaptation Plan, which began in 2018. During this process, it became evident that the team was eager to find a way to incorporate illustrations into the Adaptation Plan report. The team became aware that I used to be a landscape architect and had experience producing graphic illustrations. I started producing a few diagrams and illustrations, and as their value became evident, my new primary role became that of project illustrator. Since 2018, I have produced over twenty digital illustrations for the Tribe and for other Tribal climate projects in the Pacific Northwest and Northwestern California, ranging from depictions of how Pacific Gas and Electric (PG&E) power lines generate fire risk in Karuk landscapes, to the way transportation routes factor into climate change planning, to the techniques and benefits of Karuk cultural burning practices and tribal uses of the forest.

Most of the graphics were produced in Adobe Photoshop, and a few of the more diagrammatic ones were produced in Adobe Illustrator. The process by which I create these

illustrations has varied from graphic to graphic, but typically they are first imagined in conversations with Karuk DNR Director Bill Tripp and other DNR staff, as well as my research supervisor Kari Norgaard. I produce drafts of the illustrations discussed, after which Tribal staff review the graphics to ensure their ecological and cultural accuracy. I revise the graphics as needed until they meet Tribal standards. Early on, Kari would be in communication with Tribal staff about what the graphics should look like and what they should illustrate. Later, I began communicating directly with Tribal staff myself, hearing the vision for a graphic, producing the graphic, sending it to Tribal staff for review, receiving comments either over email or over the phone, and then revising the graphic as needed for resubmission until the illustration met Tribal staff's vision. Frank Lake, a Karuk descendant and dissertation committee member also reviewed and provided guidance to the development of some illustrations for ecological and cultural accuracy.

As part of my dissertation research, I am producing a series of illustrations for the upcoming Ikxariyatuuyship Restoration Plan (Offield Mountain, near Somes Bar, CA), some of which are included below. This process was slightly different in that in brainstorming the graphics I actually traveled to Karuk Ancestral Territory and met with Karuk DNR director Bill Tripp to go to the edge of Ikxariyatuuyship and hear his vision for the graphics. It was at the height of the McCash Fire and the landscape was extremely smoky, but we met there anyway and had a conversation not just about his vision for the graphics but about why these graphics are valuable in the first place. As I started producing these graphics and mulling over what Bill explained, I was flooded with a series of important reflections about Karuk epistemology, about Karuk landscapes, about my role as a settler scholar and about methodological depth. In the findings below, I synthesize these reflections and put them in conversation with the literature above.

Each of the graphics presented below have been included with Tribal permission and have been produced in coordination with, and with ample review by, the Karuk Tribe DNR. As a settler who resides a 6-hour car ride away from the Klamath River Basin, I am limited in my understanding of Karuk lifeways, epistemologies and landscapes. As a former landscape architect trained in design within a Western institution and raised with European aesthetic values, I cannot extract my aesthetic predilections from my illustration practice. Perhaps a Karuk person would approach these graphics in a completely different way, and that is important to recognize. For example, Vikki Preston's art displayed in Figure 4 is carried out in a very different style and incorporates a traditional Karuk "snake's nose" design, that I as a settler don't have a connection to and don't feel is culturally appropriate for me to incorporate unless I were to be explicitly asked to do so by Tribal staff.

My illustrations are not intended to be entirely artistic or entirely realistic interpretations, but somewhere in between, something visual and somewhat diagrammatic that is culturally and ecologically accurate and that effectively illustrates Karuk knowledge and lifeways, stewardship principles, and more-than-human relationships. In an ideal scenario, these graphics would be produced by someone that is Karuk and intimately aware of Karuk ecologies. In an effort to facilitate that in the future, I carried out a photoshop workshop for Karuk DNR staff in summer 2021 to begin to build internal capacity within the DNR, a process I describe in a bit more detail in my discussion section. That said, my role as illustrator for the Karuk DNR has been transformational in a way my written research had not been before, and the illustrations I have produced are valued by DNR leadership enough to maintain an ongoing reciprocal relationship with me.

Findings

Learning Karuk Ecologies in Photoshop

Long before I began illustrating for the Tribe, I had been reading and writing about the places and more-than-human species that form part of the Karuk world and had visited the Klamath River Basin on two separate occasions. For example, in 2016, I co-authored Chapter 3 of the Karuk Climate Vulnerability Assessment's, titled "Vulnerabilities of Traditional Foods and Cultural Use Species." However, it wasn't until I started illustrating Karuk ecologies that I began to better grasp the interconnections between climate, elevation, species' life-cycles and Karuk stewardship practices. As I worked on the production of these graphics and conversed with Indigenous collaborators about the specifics of each illustration, the epistemological principles of Karuk World Renewal came into sharp focus. Producing these graphics allowed me to connect with Karuk landscapes in much more meaningful ways that, as a remote researcher, I had not been able to do before.

When I first began illustrating, I was guided by conventional design principles learned in my Western landscape architecture training, which dictate that one should limit the amount of visual complexity in any given illustration. However, it soon became clear that for my Karuk collaborators, interconnections, complexity, and specificity are preferred over simplified abstractions. During revision processes, my collaborators often called for adding more details and species, not less. As I made more graphics and realized the importance of honoring the character of each species and place, my illustrations became more realistic, complex, and involved. I researched each species and learned about its life cycle, appearance at various life stages, and relationships to Karuk people.

Whereas in initial illustrations (such as Figure 5) I illustrated conifers as abstract translucent silhouettes, in more recent graphics (such as Figure 6), I illustrate site-specific species such as Douglas firs, black oaks, tanoaks, and madrones, that honor Karuk relationality and mitigate the erasure of Karuk ecologies. Also, whereas in initial renderings I drew abstracted places without referencing actual locations in the Klamath River Basin, in later renderings I used Google Earth or notes and photos I took while visiting in person to inform the illustrations.

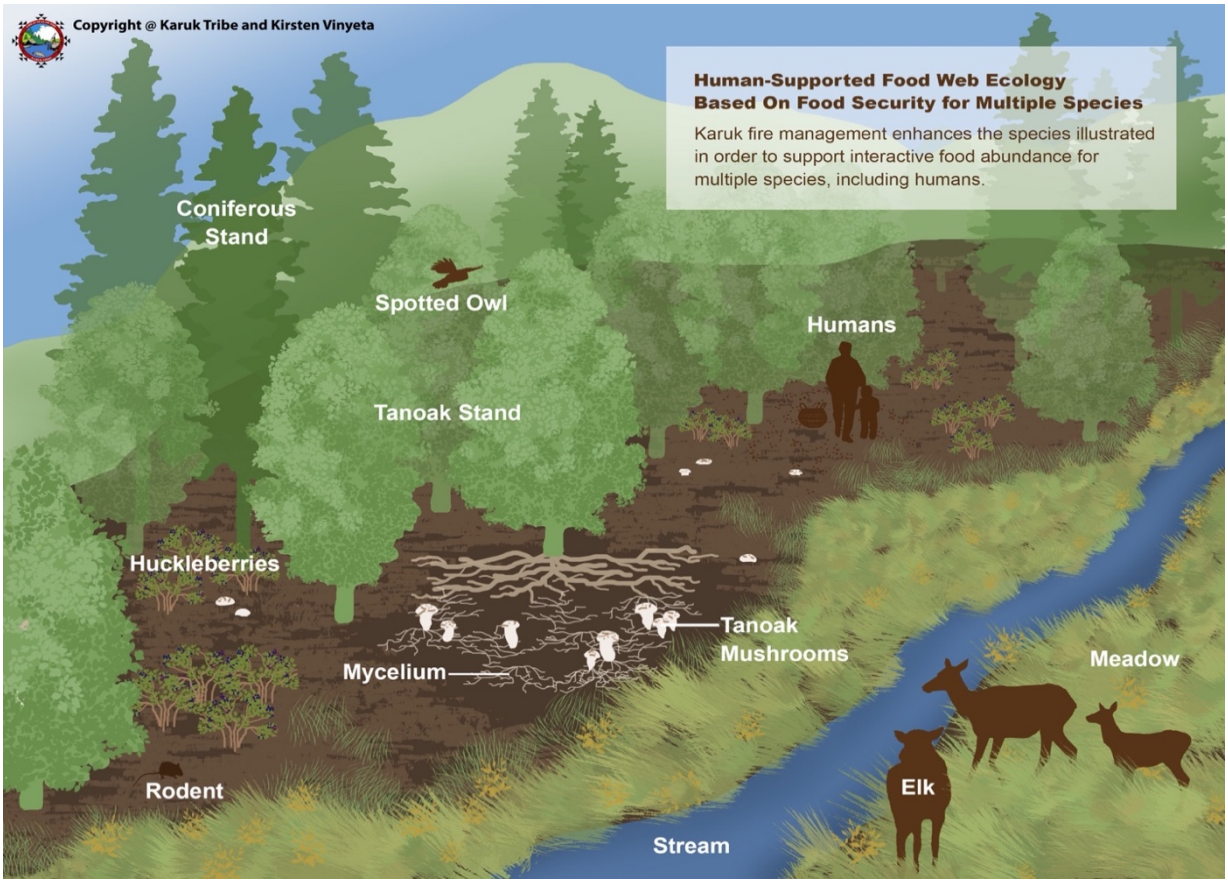

Figure 5. Karuk Climate Adaptation Plan illustration highlighting the way in which Karuk fire management generates food abundance and supports interaction between various species, including humans.

The drawings became vehicles for cross-cultural conversations regarding Karuk ecologies. As I developed the draft of a drawing, I often had clarifying questions regarding the accuracy of my depictions. The conversations that ensued using the illustrations as the starting point became significant opportunities for learning, as evidenced by the changes from drawing to drawing in the sequence of Figures 7, 8, and 9. Figure 7 represents my first attempt at setting up the scene on a hillside of Ikxariyatuuyship. During my last visit to the Klamath River Basin in September 2021, Bill

Tripp and I had driven to the edge of the Offield Mountain so he could discuss drawings I could produce for the upcoming Ikxariyatuuyship restoration plan.

I developed this first draft based on Bill's oral descriptions and long-distance pictures I took of the site. I then emailed it to Bill for review, with the following clarifying questions regarding the relationships between species:

1. I remember you mentioning white thorn and how it is one of the first things you can burn. Would there be any in this scene or is it more across the road?
2. What would be between the grasses and the manzanitas? Would they be up against one another or would there be a transition species?
3. Any other comments about the organization of the drawing thus far?

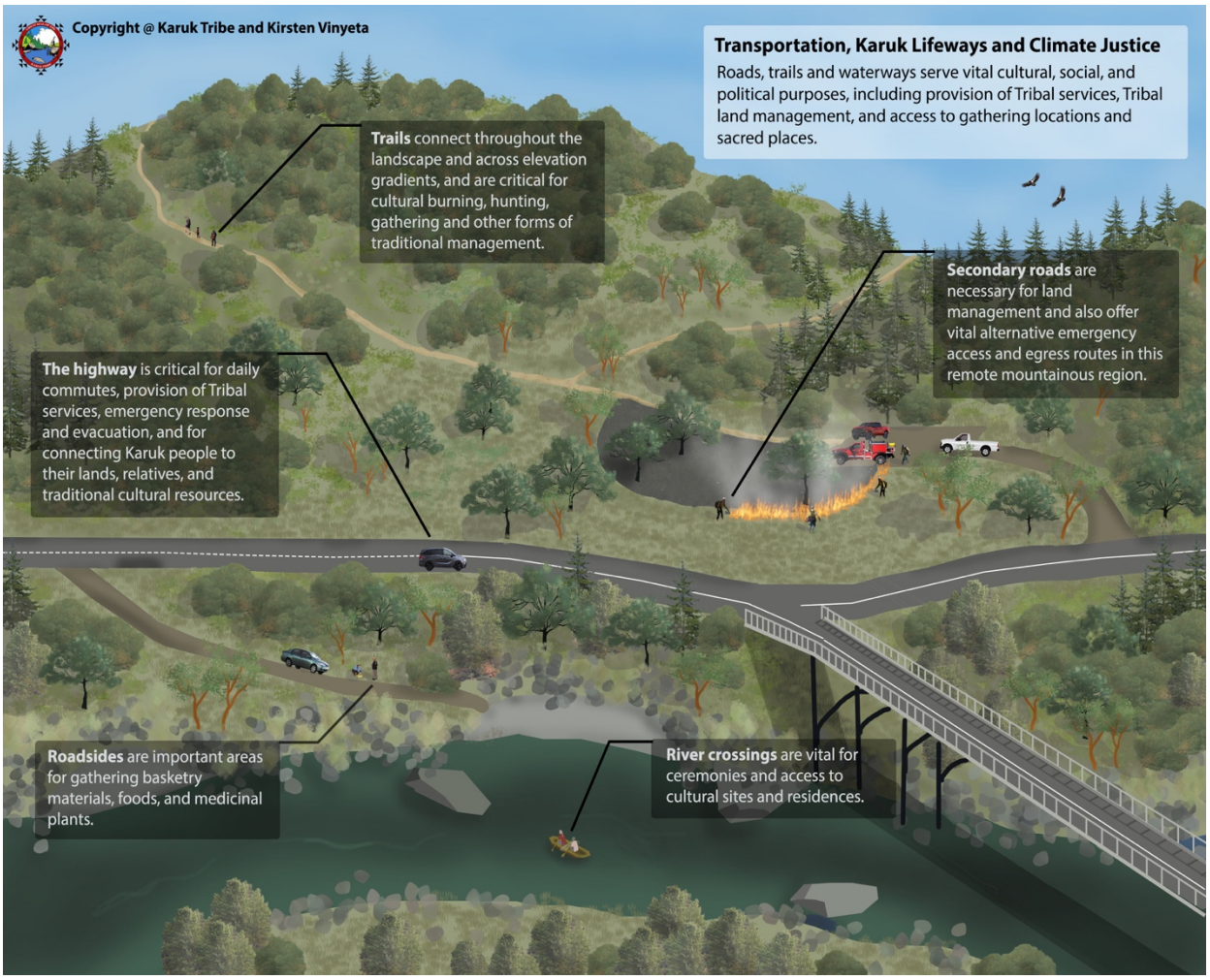

Figure 6. Karuk Climate Transportation Plan graphic illustrating the role of transportation routes in climate justice. In more recent illustrations such as this one, my renderings have become less abstract and more representative of site-specific vegetation and conditions.

Bill then responded with the following clarifications (shared with his permission):

1. Pines and black oaks and madrones would be interspersed along upper ridge
2. Few large firs would be along ridge but more of them would be in the drainage.
3. Grasses would be in between the duff circles of oak, madrone, and pine but not under fir.
4. There would be pure grass areas with narrow bands of grass in a mosaic around duff rings.
5. Whitethorn would be a product of soil type. But if this is the area I am thinking it is the whitethorn is out of the frame in the top left hand side.
6. Grass would come right up to the edge of the manzanita duff layer. But there would also probably be a few pine trees here and there around the edge to break up the grass continuity up to the edge of the manzanita.

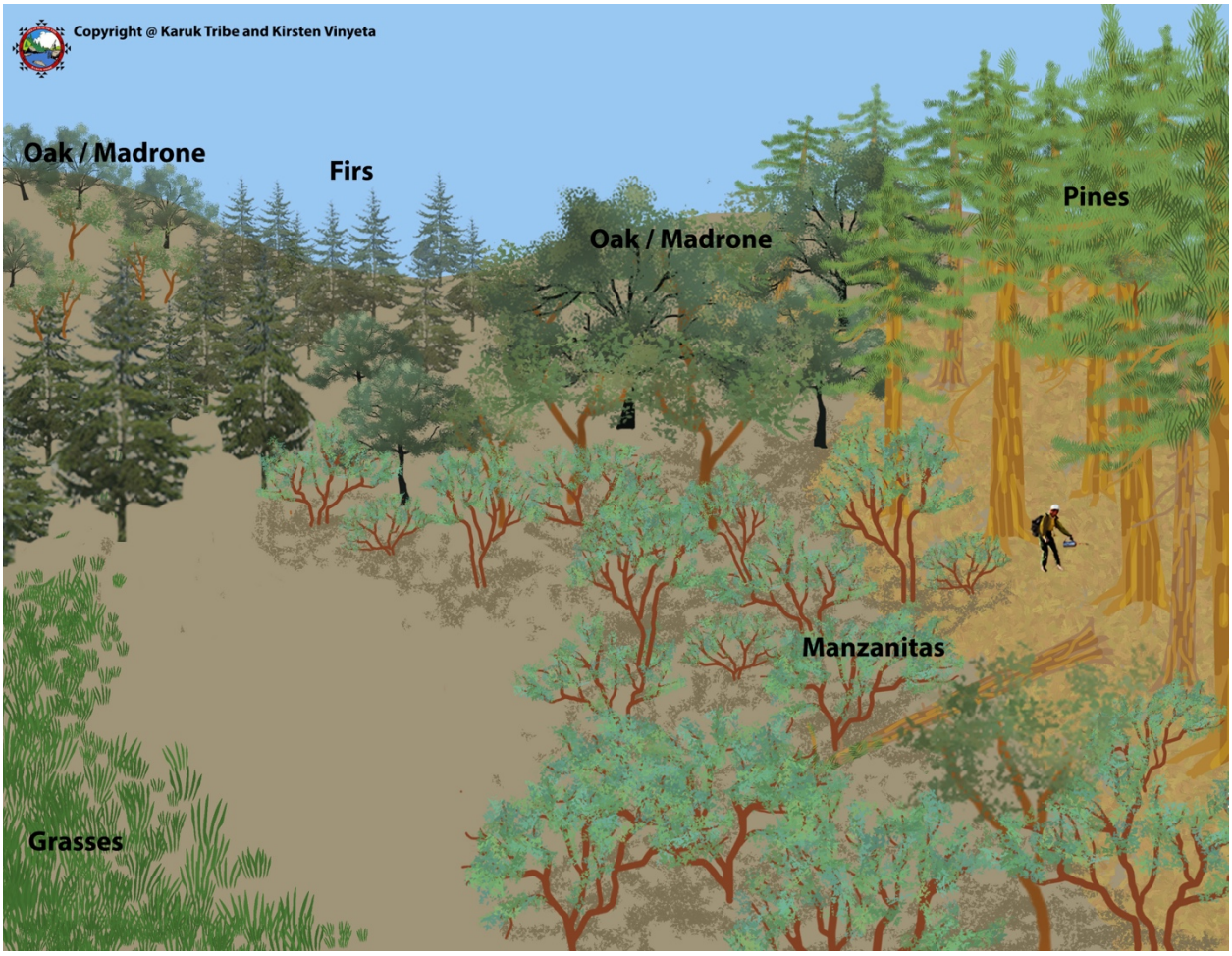

Figure 7. First draft of the first scene of the Ikxariyatuuyship burning sequence based on a roadside conversation with Bill Tripp.

The resulting drawing is Figure 8, in which I incorporated the various revisions. I then sent it back to Bill, and we had a phone conversation to increase the illustration accuracy further. In the phone conversation, Bill clarified that the oaks would actually be devoid of foliage at the time the

pine duff is burned, and that the manzanitas would be in bloom. As we discussed what animal species might be using the space, we talked about bees (which would be too small to be illustrated to scale in the scene) as well as pileated woodpeckers, which might use the site for nesting later in spring. In order to make habitat for the woodpecker in Photoshop, I added a Douglas fir snag towards the left-hand edge of the drawing. I also asked clarifying questions regarding cultural burning techniques for protecting certain trees in the burn zone. The resulting final draft of the first scene of the Ikxariyatuuyship burning sequence can be seen in Figure 9.

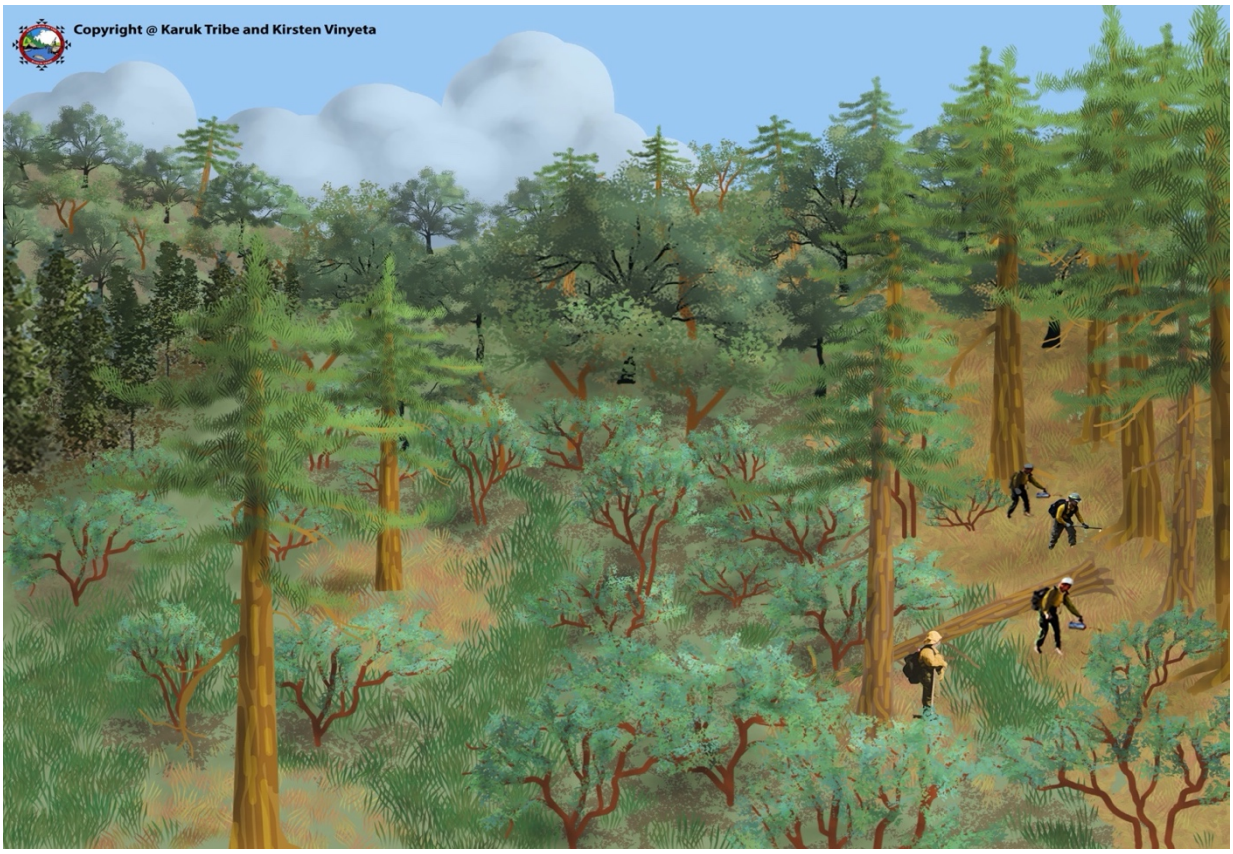

Figure 8. Second draft of the first scene of the Ikxariyatuuyship burning sequence after email exchange with Bill Tripp

In subsequent scenes in the sequence, a pair of pileated woodpeckers will be shown nesting in the snag. The evolution of this illustration and the conversations that informed the process demonstrate how graphic illustration became a site for ecological connection and learning.

One thing illustration is particularly good at representing that is often lost in written or oral descriptions is synchronicity and sequence. For those of us that are visual learners, reading or hearing a long description of the conditions and timing of burns or other management activities may

not allow us to visualize the whole picture, but an illustration allows us to quickly yet holistically grasp the synchronicity and sequence of events. It mimics what we would see on the landscape, and allows us to visualize how, for example, the pine duff may be ready to burn when the manzanita is in bloom, the grass is green, and the oaks are naked (Figure 9). Or it might help us visually stitch together how burning the meadow in June is dependent upon first burning adjacent oak leaf litter in February (Figure 10). In creating and seeing illustrations that capture the temporal, often cyclical, relationship of events in a given place, we are able to honor and more deeply understand the inner workings of Karuk World Renewal and visualize cross-species collaboration in the Klamath River Basin. These intricate and visually engaging representations of Karuk ecologies counter settler colonial erasure by brightly manifesting the place-based, sacred relations that shape the Mid Klamath River Basin.

Figure 9. Third draft of the first scene of the Ikxariyatuuyship burning sequence after phone call with Bill Tripp. The oaks are now naked, the manzanitas are in bloom, and a fir snag has been added to make way for a pileated woodpecker nest in a later scene.

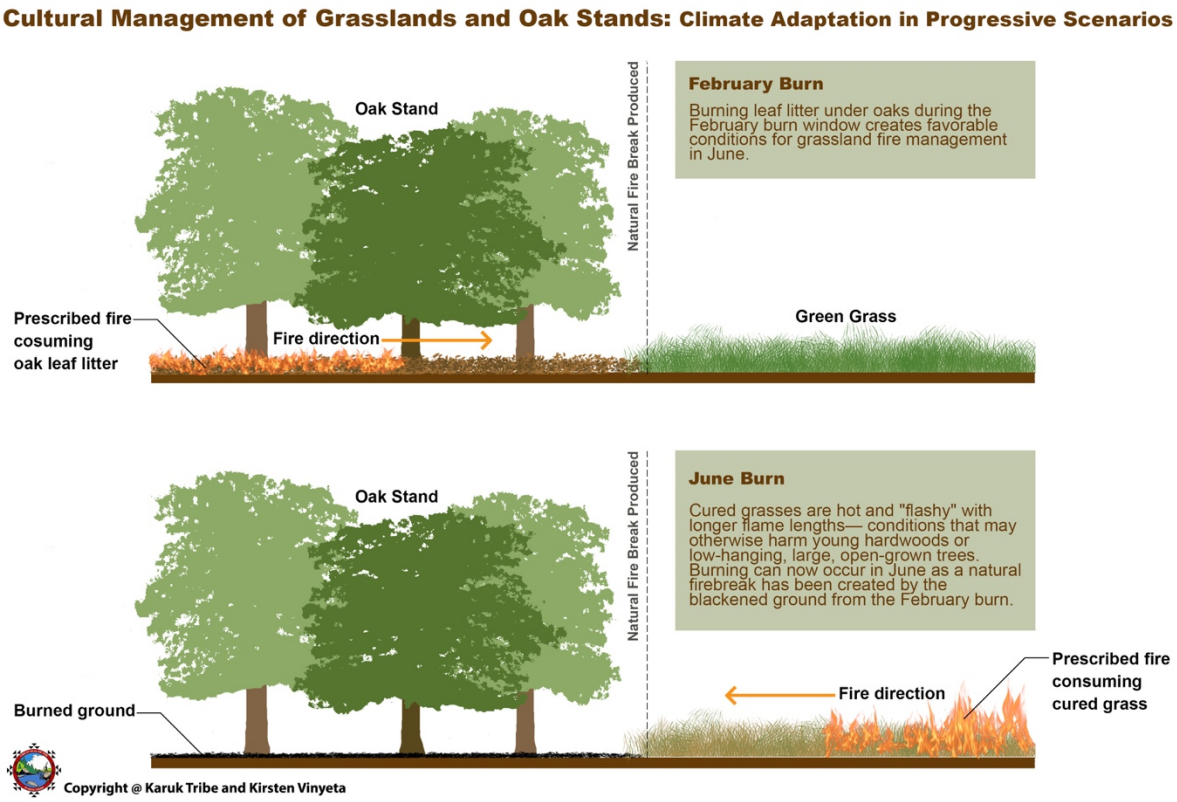

Figure 10. Graphic showing the relation between late winter burning of oak leaf litter and early summer grassland burns.

Honoring Karuk Relationality

A concept that continually emerged during the illustration process was the fact that Karuk social worlds are indisputably multi-species. It is not just that other species exist and share space with Karuk people—it is about relationships involving interaction, collaboration, and reciprocity. "The social" is therefore a set of relations unfolding ecosystem-wide, not just in town or where people are concentrated. A Karuk person may be the only human in a forest or meadow and engaging in vital social relationships with other species that shape their identity, community roles, and life choices. The nature-culture dualism is immediately dismantled as in the Karuk worldview the two are integrated. Each species possesses legitimate knowledge and holds communal responsibilities, including people. For Karuk people, a primary responsibility lies in using fire in beneficial and responsible ways that account for and honor the life cycle of other community members. Karuk stewardship, particularly through cultural burning, maintains the ecosystem structure necessary for many other species to thrive. In return, other community members offer their knowledge, labor,

fruits and materials, and sometimes their lives to Karuk people. Karuk World Renewal conceives of the world as a web of kincentric relations in which all beings have agency and responsibilities to one another.

In Figures 5 and 11, people are illustrated as one among various species that relies on and shapes the ecosystem. In Figure 5, a whole series of interrelated species are illustrated within a single scene. These various species, including Karuk people, rely on one another for sustenance and quality of life. In Figure 11, both a deer and a Karuk mother and child are enjoying the offerings of a hazelnut patch. In most of the scenes I illustrate, Karuk people are present on the landscape. In the Karuk worldview, the natural world is human, and society is nature. This is further demonstrated in the Tribe's upcoming Ikxariyatuuyship restoration plan, in which the six focal species for the plan are manzanita, California black oak, tanoak, Western pond turtle, California beaked hazel, and human. The fact that Karuk people have traditions and responsibilities rooted in the ecosystems of Ikxariyatuuyship prompted the Karuk DNR to include humans as a focal species. It is in part to remind Western land managers that the Tribe's restoration goals are not to return these ecosystems to an imaginary pre-colonial wilderness, but back into an interactive landscape—a social landscape—replete with kincentric relations and responsibilities, in which Karuk people are among the many vital species shaping the ecosystem. In conceiving of Karuk people as residents and users of the forest, the Karuk Tribe signals to federal land managers that human health—including physical, mental, and spiritual health— are among the factors that should inform land management policy and implementation.

The profound relationality inherent in Karuk World Renewal became evident during my illustration process. Species and their life cycles are understood not as standalones but in relation to one another. Symbiotic relationships are recognized, honored and incorporated into Karuk stewardship. In order to be effective stewards and carry out their responsibilities, Karuk people must understand how species relate to—and interact with—one another. For example, it was important to the Karuk DNR that I illustrate the relationship between tanoak mushrooms and tanoaks, and that I illustrate the way the mushrooms' mycelial mats interact with tanoak root systems (Figure 5). When you burn around tanoaks to prevent coniferous encroachment, you therefore also protect tanoak mushroom habitat. If the fire is low enough intensity, the mycelial mats remain unaffected and the tanoaks with which they co-exist remain unencumbered by coniferous competition.

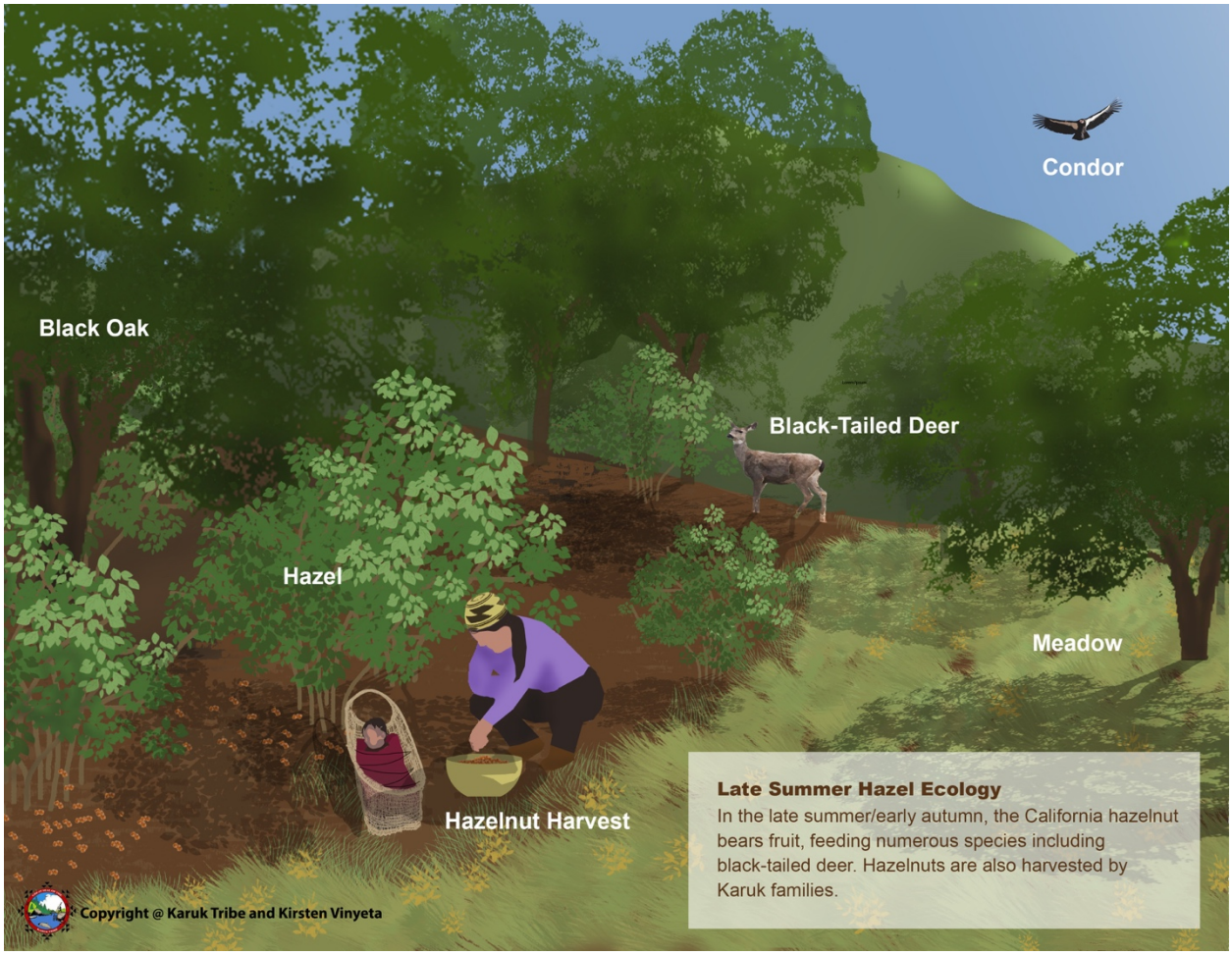

Figure 11. A Karuk woman harvests hazelnuts while her baby rests in a baby basket made of hazel sticks. In the background, a deer feeds on hazelnuts while a condor soars overhead.

It became abundantly clear that the phenological accuracy[14] of my illustrations was of utmost importance, and perhaps one of the most difficult elements to get right as a settler and long-distance collaborator. When you don't interact with a landscape on a frequent basis, you may know that a certain species blooms sometime in spring, and you certainly can look up what the species looks like on Google, but what is much harder to grasp is how species' life cycles interact with one another in a given geographic location. My lack of eco-cultural awareness became evident in the production of certain graphics. For example, my initial draft of the scene set on Ikxariyatuuyship assumed oaks are leafed out when the pine needles get burned in February (Figure 8). However, after reviewing my drawing and discussing it with me, Bill Tripp informed me that the oaks are in fact naked during this

[14] Phenology refers to the study of the timing of species' life-cycles, such as when migratory species arrive, when species leaf out, bloom, or reproduce, when they go dormant, and how these various events interact with one another.

management phase, leading me to revise the illustration for phenological accuracy (Figure 9). Similarly, in another illustration currently being reworked, I misunderstood the instructions and illustrated hazel twigs being harvested by Karuk women in late winter at the same time as the hazel is releasing pollen, but that is in fact inaccurate timing. By developing these illustrations and engaging in revisionary processes with Karuk DNR staff, I gained a much more profound and nuanced understanding of relationality in the Klamath River Basin.

The relationships and cycles of the many social actors comprising the ecological universe of the Klamath River Basin is an absolute science that requires intimate knowledge learned in place via continual and ongoing interactions. The timing of cultural burns is decided upon in a relational manner, creating intricate burn sequences that consider the combustibility and life cycle of species at different times of year. Cultural burns generally do not occur across large swaths of land but in numerous, highly specific patches that are then burned in a progressive sequence that eventually generates a varied burn mosaic across the landscape over generations and centuries. Via these mosaics, Karuk people are able to foster and maintain fire adapted ecosystems while simultaneously honoring and protecting other species during key periods in their lifecycle. Far from the unsophisticated and thoughtless burning of landscapes described by Aldo Leopold in Chapter II, this is a highly complex knowledge system that depends on extensive experience interacting with fire as well as ecological knowledge about the life cycles, needs and fire adaptability of other species. This is especially true in the context of climate change, in which Karuk World Renewal might entail adapting to rapidly changing temporal alignments.

Normalizing Beneficial Fire and Smoke through Illustrations

Climate change and federal forest mismanagement have together created a contemporary context in which most people, especially settlers, have very negative associations with forest fire. This is especially true in California, where every year explosive wildfires cause devastation in the form of loss of human and more-than-human life, evacuations, incineration of forests and grasslands, destruction of private property and poor air quality. The return of Indigenous land management practices is desperately needed, yet many settlers may feel averse to—or misunderstand—management that involves the very thing they have been deeply affected by— fire. Convincing the broader public about the value and relative safety of Karuk and other Indigenous burning practices may involve countering the media-generated catastrophic images of wildfire that Californians and folks across the country are exposed to during the height of fire season. This process has already

commenced on social media platforms like Twitter where the hashtag #goodfire is being used by Indigenous scientists and their settler allies hoping to highlight the beneficial uses of fire in ecosystem management.

In all my years using photoshop as a landscape architecture student and professional, I had never once rendered fire. It became clear when I started illustrating for the Karuk Tribe that I needed to become proficient in illustrating fire in the landscape. Using Julieanne Kost's flame rendering photoshop tutorial on YouTube[15], I learned about the "Render Flame" tool that would become a staple in my Karuk illustrations, an indication of just how important fire is to Karuk World Renewal. Another crucial task was mastering how to illustrate fire smoke under various conditions, including coming off of an actively burning fire as well as filling the valley with a smoke inversion. I used photos taken by Karuk collaborator Stormy Staats during cultural burns and wildfires in the Klamath River Basin to understand the way fire and smoke look and behave under different conditions. Much like the various species I was depicting in my illustrations, fire and smoke became agentic beings in my drawings that I began to internalize as active collaborators on the landscape.

Wildfire, especially in the context of climate change and in the absence of Indigenous land management, can cause devastating effects, a fact that is well understood by Karuk people in light of the 2020 Slater Fire that tore through the town of Happy Camp, and the large-scale fires that affect the Klamath River Basin on a nearly annual basis. And yet Karuk people, unlike most settlers, understand the many personalities of fire as existing on a spectrum, on one end of which is high-intensity, uncontrollable, catastrophic fire, and on the other end of which is fire as medicine and collaborator that brings with it a plethora of eco-cultural benefits. Fire is a spirt, an energy force that is respected, yet revered and feared based on how it behaves and is used. Settlers have not only been impacted by the very real effects of uncontrolled wildfire in their lives, but by highly effective U.S. Forest Service campaigns villainizing forest fires and anyone who starts them. The Smoky Bear campaign continues to fill the settler imaginary, capitalizing on settler sentiments towards charismatic wildlife by portraying infantilized bears, deer, and squirrels helplessly threatened by a rapidly approaching fire. In contrast, as I was illustrating the blooming manzanitas adjacent to burning pine duff, Bill Tripp described how the bees pollinating the manzanitas seem to be "in on

[15] Julieanne Kost, "How to Create Flames in Photoshop," https://www.youtube.com/watch?v=HtmwAS7-nco&t=23s

it" with the Karuk burn crew, being drawn to nest-building in the recently burned ground because they likely know the blackened earth will prevent fire from spreading at the height of nesting season.

Illustrating beneficial applications of fire on the landscape is one way to counter the catastrophic imagery most settlers associate with fire in the forest and is a key step to removing barriers inhibiting the Karuk burning practices that are essential to Karuk sovereignty. The illustrations I produced represent low-intensity, cultural applications of fire that is closely tended by Karuk burn crews. The illustrations also demonstrate the intricate practice of using landscapes' natural fire breaks— knowledge that is central to Karuk burning— as a means to direct the fire's path. The routing of fire is truly a collaborative process between Karuk practitioners, various plant species, habitats and landscape elements (see Figures 10 and 12).

Figure 12. Rendering from an aerial perspective that illustrates the vital role of wet meadows in fire management. Karuk-built features, such as handline construction lines, interact with wet meadows and even snow pockets to keep fire contained.

For example, Figure 9 illustrates the complimentary combustibility of oak leaf litter and grasses are used to limit fire spread at different times of year. When the oak leaf litter is ready to be burned,

grass is fresh and green and becomes a barrier for fire. Later in the summer when the grasses are dry and ready to burn, the blackened ground under the oaks that were burned earlier in the year become the fire's stopping point, or at least a barrier that moderates fire behavior and intensity. In Figure 12, the vital importance of wet meadows in creating natural fire breaks is illustrated. In the figure, even a snow pocket becomes a collaborator in fire management.

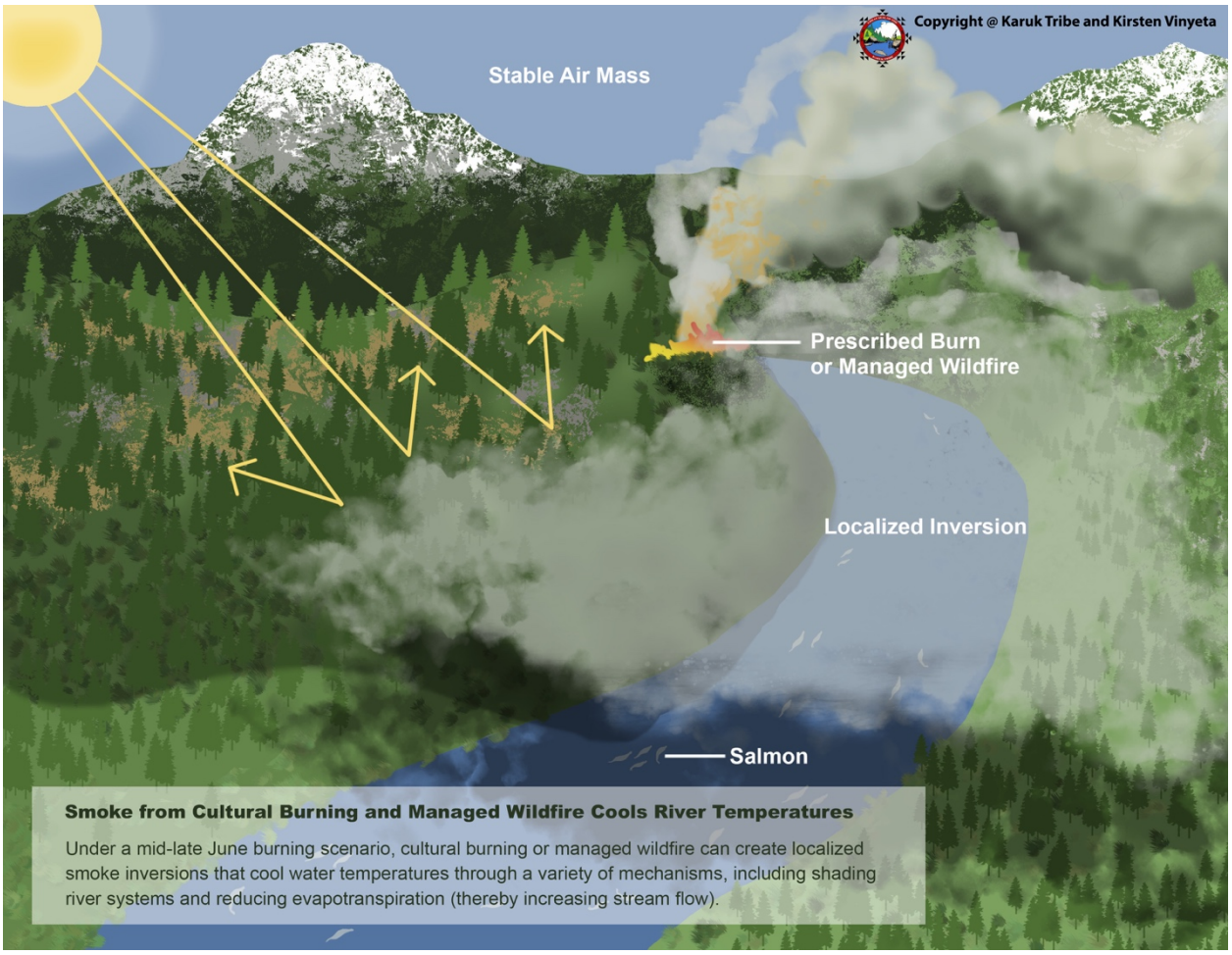

Figure 13. Challenging my rendering skills, this graphic helps visualize how smoke inversions protect salmon in the heat of summer by shading the river and its banks.

Given the vital role of fire in Karuk land stewardship practices, smoke too is seen as a natural phenomenon that, while sometimes detrimental to respiratory health, also brings benefits to the Klamath River Basin in the form of temperature control and localized fumigation of tree canopy pests (David et al. 2018). One of the most difficult scenes I was asked to illustrate was a smoke inversion filling the Klamath River Valley and protecting the river from the sun's insolation (Figure 13). Yet this was a crucial graphic intended to illustrate a piece of Karuk knowledge that instead of catastrophizing the presence of smoke, normalizes it and recognizes its benefits. The illustration is

intended to help audiences visualize how smoke inversions in the heat of summer protect the Klamath River from the sun's rays and reduce evapotranspiration by shading riverside vegetation. This phenomenon helps maintain higher and cooler water levels for salmon, a species of major significance to Indigenous peoples as well as settlers. Smoke inversions are a common and familiar enough phenomenon in the Klamath River Basin that Karuk cultural management zones actually take the role of these inversions into account (Figure 14).

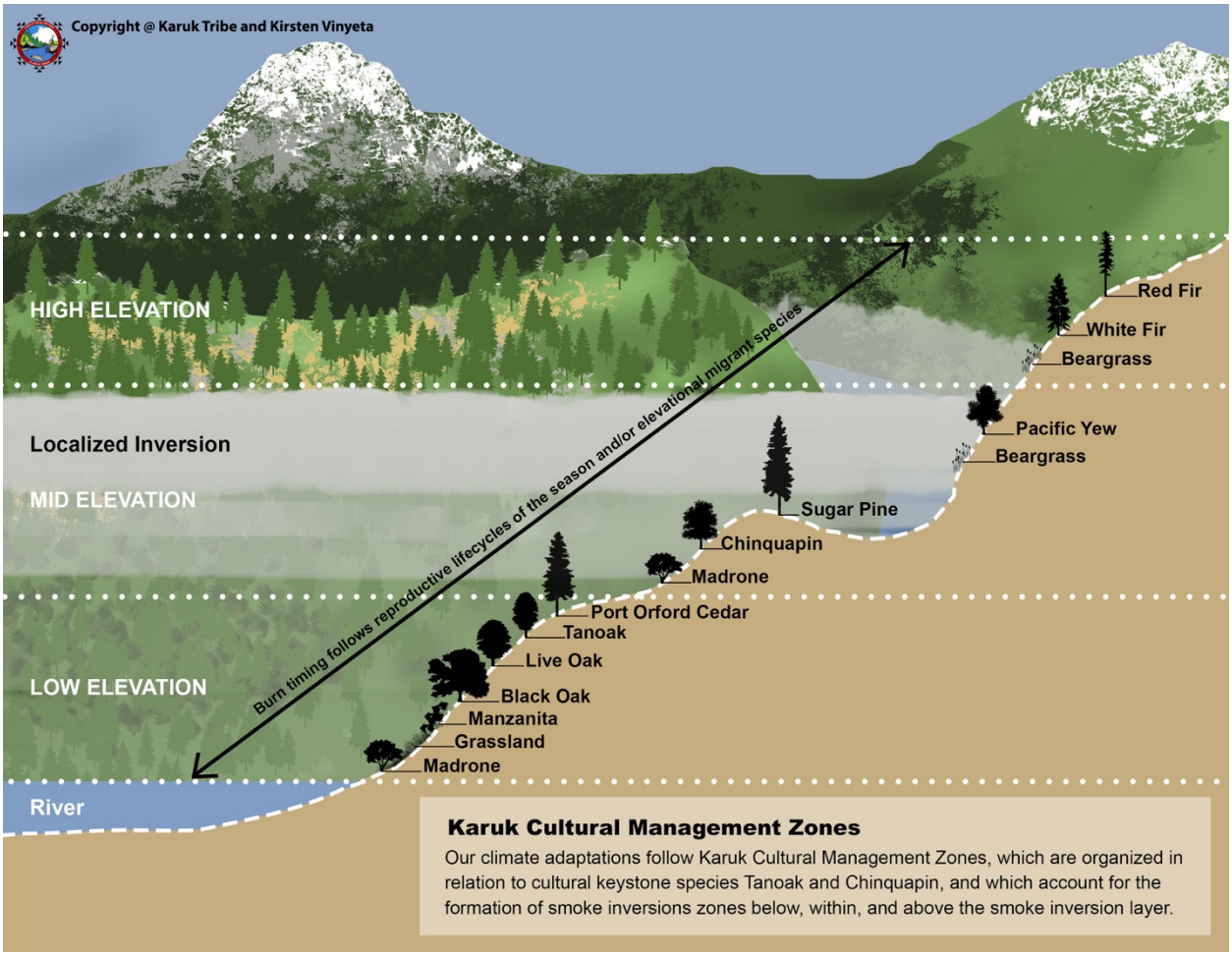

Figure 14. Smoke inversions are accounted for when defining and managing low-, mid-, and high-elevation Karuk Cultural Management Zones

The creation of graphics in which fire and smoke are portrayed not as devastating events but as beneficial landscape processes decolonizes interpretations of landscape fire and can give the broader public a more nuanced understanding. Helping people visualize the practices by which fire is kept in check during cultural burns can assist in increasing the public's trust in Indigenous stewardship

practices. In recent decades, large-scale wildfires have undoubtedly generated a lot of trauma for Indigenous and settler communities alike. A key difference is that many Indigenous communities have a long history of beneficial fire use and can therefore comprehend the opposing ends of the fire spectrum, whereas most settlers' imaginaries live entirely on the fire-averse end of the spectrum. Visually normalizing low-intensity, therapeutic fire, as well as the benefits of fire smoke begins to expand the settler imaginary and bring to the forefront the Indigenous land stewardship values that can play an important role in mitigating the wildfire crisis in California and beyond.

From the Mind's Eye to the Eye's Eye: Illustrating Karuk Visions for a Resilient Future

The actions we take in the present are often shaped not just by the past, but by the possibilities we imagine for the future. As Tripp and Cajete (1994) emphasize, visioning is an important part of contesting settler colonial impositions and mobilizing towards Indigenous futures. These illustrations visually represent the ongoing, defiant, active practice of Karuk World Renewal in the Klamath River Basin. They are visual assertions of sovereignty and land tenure, and capture the knowledge, intimacy, and effectiveness of Karuk stewardship. Karuk land management objectives are less about returning landscape conditions to an idealized pre-colonial past as they are about securing a future in which Karuk people can continue to maintain rich relationships with—and uphold their responsibilities towards— the intricate web of relations that make up their biotic community. This requires vision, and a constant dialectical relationship between Karuk people and other species in which the presence, actions and life cycles of other beings shape Karuk practices and vice-versa. Other species therefore have agency in a multitude of ways, shaping Karuk responsibilities by asserting their own identities, needs, and relationships.

The way Karuk DNR staff spoke of other beings and centered them in their climate adaptation plans shaped the way I approached my illustrations. The species of the Klamath River basin are not helpless, inferior creatures that require human paternalism, but wise beings who hold valuable lessons and that each have their set of responsibilities within the ecosystem. If Karuk people fail in upholding their responsibilities and, as a result, other species decline or disappear, it is not because those species are vulnerable or weak, but because Karuk people have failed to carry out their reciprocal stewardship. The price to pay is the loss of reciprocal relationships with species that embody knowledge and are integral members of the community. Unlike colonial discourses of vulnerability that increasingly demand that those least responsible for climate change take it upon themselves to adapt to the unsustainable practices and impacts of capitalism and colonialism, Karuk

World Renewal puts the onus of adaptation on the most—not least—responsible, and therefore inherently bends towards justice. With this in mind, Karuk land management practices are adapting to a changing climate so that Karuk people can continue to maintain healthy, viable habitats for their more than human kin despite changing conditions. This is an especially difficult task given that Karuk and other Indigenous peoples must not just contend with a changing climate, but with a whole gamut of colonial impacts that affect their extensive web of relations and their ability to, as Whyte might refer to it, "renew relatives."

While most of the illustrations capture events and management activities that have been overtly, and sometimes covertly taking place as a result of colonial criminalization, in some cases the illustrations are a defiant act of visioning and resistance, of summoning Karuk futurities in which colonial impacts have been mitigated or overcome. Such is the case in Figure 11, created in 2020, in which I was asked to include a California condor flying in the sky. Prior to European settlement, condors used to reside in the Pacific Northwest and formed an important part of the relational web of species that shape the identity of Indigenous peoples in the Klamath River Basin. A historical condor rockery was noted to occur on Shelton butte, opposite of the confluence of Bluff Creek into the Klamath River on the edge of Karuk and Yurok Territories (Kroeber 1976). As European settlers occupied more territory and their hunting and land management practices became ubiquitous, condors were brought to near extinction by the combined factors of Spanish coloniality, the impact of State and Federal fire exclusion on open habitats that sustained carrion-feeding wildlife, and lead poisoning and DDT exposure (Nabhan and Martinez 2012, Parks 2021). The Yurok Tribe downstream from the Karuk Tribe has been actively involved in condor restoration efforts via the Yurok Condor Restoration Program.[16] The return of the condor to the Klamath River Basin after a century-long absence would be much more than a long-awaited ecological milestone. As condor biologist and Yurok Wildlife Department Director Tiana Williams-Clausen describes, "[r]eturning condor to Yurok ancestral territory is really bringing a member of our community, our family, home" (Aldern 2020).

In asking me to include the condor in the illustration, the Karuk Tribe DNR was summoning this relative home, visualizing the success of their downstream neighbors' Yurok Condor Restoration Program, and foreshadowing the healing of a colonial wound. And on May 3, 2022—two years after the Karuk Tribe DNR asked me to include a condor in Figure 11 and

[16] https://www.yuroktribe.org/yurok-condor-restoration-program

fourteen years after the Yurok Tribe first mobilized towards a condor restoration effort—the Yurok Tribe did indeed release condors into the Klamath River Basin. The first birds released were two males—named Poy'-we-son and Nes-kwe-chokw'. On May 25, the only female in the release cohort was freed into the skies. Tiana Williams-Clausen chose to name her Ney-gem' 'Ne-chween-kah, meaning "she carries out prayers." A fourth bird, a male, is set to be released in the near future.

These illustrations represent Vizenor's concept of survivance in action—not just survival, but *resistance* that outwits dominance and victimry. These graphics assert Karuk land tenure, the welcomed return of Karuk fire in all its magnitude, and the restoration of Karuk webs of kinship that have been impacted by colonialism. Like photography, illustration can capture the beauty and complexity of what is there. But unlike photography, illustration can more readily transcend what currently exists to imagine, envision, and *summon*, a longed-for future. Illustration can therefore serve the act of visioning that Cajete (1994) considers central to Indigenous education. The folks at the Karuk DNR know a resilient, healthy, sovereign future is possible—that it is actually on the way—and these illustrations bring what is in the mind's eye to the eye's eye for all to see.

Discussion

In our pursuit of methods that facilitate disciplinary expansion and Indigenist research, visual methods—and illustration specifically—hold underutilized potential. As my findings reveal, illustration as both method and data can assist environmental scholars in capturing representations of place, embodied experiences, and species assemblages that are essential to our understanding of environmental inequity, colonial violence, and environmental degradation. By employing methods that recognize the primary sense by which most people perceive and interact with their environments, sociologists can more readily connect their research to human and more-than-human communities on the ground.

Indigenist research principles transcend solely cognitive processes of knowledge production in order to honor the body-mind-soul journey that is learning, relating, and teaching. Using methods that allow our creative, spiritual, and emotional selves to be actively engaged is a means by which to access parts of ourselves often suppressed in settler academic spaces. These parts of ourselves that have largely been silenced may be capable of expanding academic conversations and broadening our understanding of the interplay between power and the environment. In the nascent field of Indigenous environmental sociology, methods that readily capture the relational, holistic, embodied

nature of Indigenous epistemologies may offer rigorous and culturally appropriate means by which to do research.

In creating these illustrations for the Karuk Tribe, my limitations as a settler scholar and illustrator became clear. I did not have the cultural knowledge nor the local wherewithal to be aware of the phenological overlaps that make up Karuk webs of relations. Having never been on a burn crew or carried out any form of prescribed fire—let alone Karuk cultural burning—there were many details regarding burning practices with which I was unfamiliar. In addition, as discussed in my findings, my Western landscape architecture training prioritized simplified abstractions over the specific, an aesthetic tendency that countered the goals and preferences of my Karuk collaborators. These various misalignments point to the fact that under ideal conditions, Indigenist illustrations should be carried out by Indigenous artists and knowledge holders who are more immediately aware of—and sensitive to—the design heritage of their communities, and who are much more likely to be familiar with the cultural practices and ecosystems in question.

In an effort to build digital illustration capacity within the Karuk Tribe, in summer 2021 I proposed and organized a Photoshop workshop for Karuk DNR staff, allies and Karuk community members interested in developing their landscape illustration skills. Using dissertation fellowship funds, I coordinated with Bari Talley, Panamnik Library & Computer Center manager, to purchase and install Adobe Suite licenses for the Computer Centers well as a handful of licenses for the Karuk DNR. Unfortunately, the McCash Fire was in full swing at the time of the workshop, and three of the eight participants were unable to attend as a result of the fire's impact. For those that did attend, however, the two-day workshop was a useful opportunity to learn basic landscape, fire and smoke illustration techniques. The irony was not lost on us as we illustrated cultural burns while the fires of colonialism ravaged forests just miles north of the library. Despite the thick smoke filling the valley, and the COVID-19 delta variant in full swing, we shared knowledge, stories, and laughter while world-building in Photoshop.

Any visual representation of Indigenous peoples or practices carried out by settlers should only be done in close collaboration with Indigenous partners and with full consent and review by the communities in question. The graphics I produce for the Karuk DNR are first and foremost property of the Tribe, and until I have an explicit conversation regarding copyright, I never use the imagery without Tribal permission. In the future, it is my hope that the capacity to produce illustrations for the Karuk DNR will come from within the Tribe itself. Until then, it will be a

privilege to continue connecting with Karuk land managers, epistemologies and landscapes through the act of illustrating.

In these visual representations of Karuk World Renewal, we witness a present and future characterized by a rich web of relations renewed again and again through the exercise of sovereign Karuk stewardship—stewardship uninhibited by the constraints of colonial law and politics. These illustrations demonstrate that climate resilience is not an impossible goal—it is already alive and well in the Klamath River Basin barring impediments from the settler state. While the settler state deploys settler discourses of vulnerability, Karuk people are hard at work building resilience in the Klamath River Basin in collaboration with allies and their more than-human-kin. Only time will tell whether dominant social systems will catch up to Indigenous knowledges and conceive of ways of knowing, doing, and being that protect and enhance life on Earth.

V. Conclusion

As I wrap up this dissertation in June 2022, new developments are emerging that illustrate the ongoing significance and evolving context of the research presented within. On January 2022, the United States Forest Service published a Wildfire Crisis Implementation Plan in which the agency recognizes the value of Indigenous knowledges in shaping federal fire science, stating:

> Decisions about priority areas for fuels treatment and the design of fuels treatments will be grounded in the best available science, including science that incorporates traditional and Indigenous ecological knowledge and recognizes the value of projects based on traditional knowledge in consultation with local Tribes. (USFS 2022, p.3)

This recognition follows an earlier development in November of 2021, in which the White House Office of Science and Technology Policy and the Council on Environmental Quality jointly released a memorandum that commits to elevating Indigenous Traditional Ecological Knowledge in federal decision-making.[17]

Also of note is the powerful rise of the Landback movement and the ways in which it is unsettling Euro-American land tenure. According to the NDN Collective, "Landback is a movement that has existed for generations with a long legacy of organizing and sacrifice to get Indigenous Lands back into Indigenous hands."[18] The very first line of the movement's manifesto explains that Landback is a "a relationship with Mother Earth that is symbiotic and just, where we have reclaimed stewardship."[19] The manifesto also expresses the desire for political organizing and sovereignty, for the collective liberation of all oppressed peoples, and for the acknowledgement that "only when Mother Earth is well, can we, her children, be well. It is our belonging to the land - because - we are the land."

In Karuk country, recently introduced legislation proposes to return 1031 acres of federal lands to the Karuk Tribe. In November 2021, California State Representative Jared Huffman (CA-02) introduced a bill Huffman refers to as the "Katimiîn and Ameekyáaraam Sacred Lands Act," in which the historical village and ceremonial site of Katimiîn and the ceremonial site of Ameekyáaraam would be transferred from the contested jurisdiction of the Forest Service into trust

[17] https://www.whitehouse.gov/wp-content/uploads/2021/11/111521-OSTP-CEQ-ITEK-Memo.pdf

[18] https://landback.org

[19] https://landback.org/manifesto/

for the Karuk Tribe.[20] While this legislation has not yet passed, and while 1031 acres is but a minimal fraction of Karuk Ancestral Territory, developments such as these signal a shifting political landscape in which the devolution of Indigenous lands is in fact possible and underway.

Despite the positive developments outlined above, challenges remain. On March 1, 2022, two California congressmen, Tom McClintock (CA-04) and Doug LaMalfa (CA-01), introduced legislation directing the U.S. Forest Service to immediately suppress wildfires within the National Forest System. In a statement supporting the legislation, McClintock said:

> This 'let burn' policy of federal land managers began in 1972, during the height of the radical environmental movement. Essentially, it holds that 'fire is our friend.' It stems from the premise that fire is nature's way of cleaning up forests, and that active suppression of fires leads to a build-up of excess fuels. As we have tragically witnessed firsthand, it is dangerous nonsense to 'monitor' incipient fires in today's forest tinderbox. The U.S. Forest Service was formed to remove excess growth before it can burn and to preserve our forests in a healthy condition from generation to generation. It's time they did (LaMalfa 2022).

This discourse sounds eerily reminiscent of the historic discourse of the Forest Service highlighted in Chapter II. Such legislation could have repercussions for the Karuk and other Tribes working to restore cultural burning practices. There is a fine line between recognizing the severity of California's current wildfire situation and perpetuating the sentiment that all fire is catastrophic. For the Karuk Tribe, fire is medicine that shapes spiritual and ecological practices. It is the long-term absence of fire that has contributed to the volatile conditions of Western forests in the context of climate change. Educating the public about cultural and prescribed burning as tools for reducing—not exacerbating—the climate and wildfire crises is crucial at this moment in time.

It is imperative that we recognize both the climate and wildfire crises as products of settler colonialism. Only by understanding the myriad ways in which dominant social structures are vulnerable and unsustainable can we mobilize towards building new systems that prioritize eco-social health. On April 4, 2022, The International Panel of Climate Change (IPCC) released its sixth assessment report. For the first time in its 30-year history, the IPCC report explicitly mentions colonialism as a factor that generates climate vulnerability:

[20] https://huffman.house.gov/media-center/press-releases/huffman-introduces-bill-to-restore-sacred-land-to-karuk-tribe

> Vulnerability of ecosystems and people to climate change differs substantially among and within regions (*very high confidence*), driven by patterns of intersecting socioeconomic development, unsustainable ocean and land use, inequity, marginalization, historical and *ongoing patterns of inequity such as colonialism*, and governance (*high confidence*) (IPCC 2022, p.11).

By naming colonialism as an "ongoing pattern of inequity," the Panel recognizes the structural, contemporary, and continual nature of colonialism and identifies it as a force inhibiting resilience on an international scale. Tom McClintock and Doug LaMalfa's proposed legislation is an example of a colonial policy that could inhibit resilience within the Klamath River Basin by creating further barriers for Karuk burning. Settler colonialism continues to impose itself upon Karuk sovereignty and self-determination in ways that compromise Karuk resilience to climate change. I hope that this dissertation has encouraged readers to reconsider how we frame vulnerability, and to contemplate the possibility that what is truly vulnerable is any life-denying social system that relies on the subjugation, exploitation, and death of people and ecosystems.

Given that Indigenist research should first and foremost be relational, Wilson and Hughes (2019) explain that "[a] measure of whether our research is credible is whether or not it has strengthened relationships, moved toward relatedness, or contributed to the process of harmonization…" (p.15). Speaking for myself only, I can say that this dissertation, and especially my work illustrating for the Tribe, has not only strengthened my relationship with Karuk collaborators, but has also deepened my connection with—and understanding of—Karuk Ancestral Territory.

Early in my doctoral work, my dissertation committee member Dr. Michelle Jacob asked me if I found my work healing, a question that left me speechless. At the time, I was approaching my work with Tribal collaborators as an all-out war against not just settler colonialism, but all settlers, including and especially myself. Nobody had asked me to take this on, of course, I had assigned this task onto myself to repent for mine and my ancestors' sins. Over the course of this dissertation, and after 11 years working alongside Indigenous collaborators, I can finally say I find my work healing. This was brought vividly to my attention while in Karuk Ancestral Territory, on the same trip during which the River offered me a stone. While in my cabin one evening, I was browsing through various chapters in Wilson and Hughes' (2019) book *Research and reconciliation: unsettling ways of knowing through Indigenous relationships*. I was drawn to the title of the book's very last chapter, "Kinship as Research Methodology: Travels to Truth and Reconciliation," by Kim Anderson and Rene Meshake. To my surprise, the Indigenous authors described reconciliation as experienced while traveling to Catalunya, my paternal homelands in Northeastern Spain where my first language and greatest childhood

memories reside. Tears streamed down my face as I read the following passage from Kim as she described the culminating memory from her trip:

> There are lessons here about how I'm still young on the trail to reconciliation and forgiveness. But there is healing, too. During the break after my tearful, silent presentation, one of the community activists comes up to me and Joan, who is now by my side. He stands in front of us, an elderly Catalan man who has lived through war, totalitarian regimes, and exile. He tells us in Catalan that he has a present ["tinc un regal"]. He tells me I am strong ["ets forta"]. And then he carefully hands over two folded Catalan flags. One for me, and one for Rene. As he does this, he offers one more word, in English: "Forgiveness." I take the precious gift and thank him—and then I thank the old man spirit, the land, and the territories that have brought me to this place of Bonendamowin [forgiveness]—or at least to the border of it." (p.248-249)

What an absolute serendipitous gift that last chapter was as I cracked open in the Klamath River Basin. During that trip, I got to speak with Karuk community members, allies and staff about what home means. I got to give Bill Tripp chocolate-covered hazelnuts in exchange for his time and expertise. I got to world-build in Photoshop with Karuk staff, community members and allies. And I got to sit with the madrones and the manzanitas, stick my feet in the River, watch a bear wander the River's edge, all of us inhaling the heavy smoke of the McCash fire, but hoping for, or perhaps summoning with utmost determination, brighter days ahead.

Despite past and present challenges linked to colonial violence, the Karuk Tribe continues to steward their homelands in the Klamath River Basin and lead the nation in transformative fire management practices. When I hear the reverence with which Karuk DNR Director Bill Tripp talks about púfpuuf (Giant Pacific Salamander), bumble bees, or even acorn weevils capable of destroying vital Karuk crops, I am made beautifully aware of the relationality and reciprocity that constitutes Karuk World Renewal. This is an epistemology and ontology built to nurture, relate to, and sustain the Earth long-term. It is a fiercely resilient and adaptive way of knowing and being. Amidst an ever-changing world, Karuk people are committed to *ikpíkyav*, to fixing again. And again. And again. May the colonial barriers crumble so Karuk resilience can shine on like embers in the night.

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