Claim, Reclaim, Unclaim: Foregrounding Place-Based Solidarities in the Eco-Cultural Revitalization of a Post-Mining Landscape on the Klamath River

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Abstract

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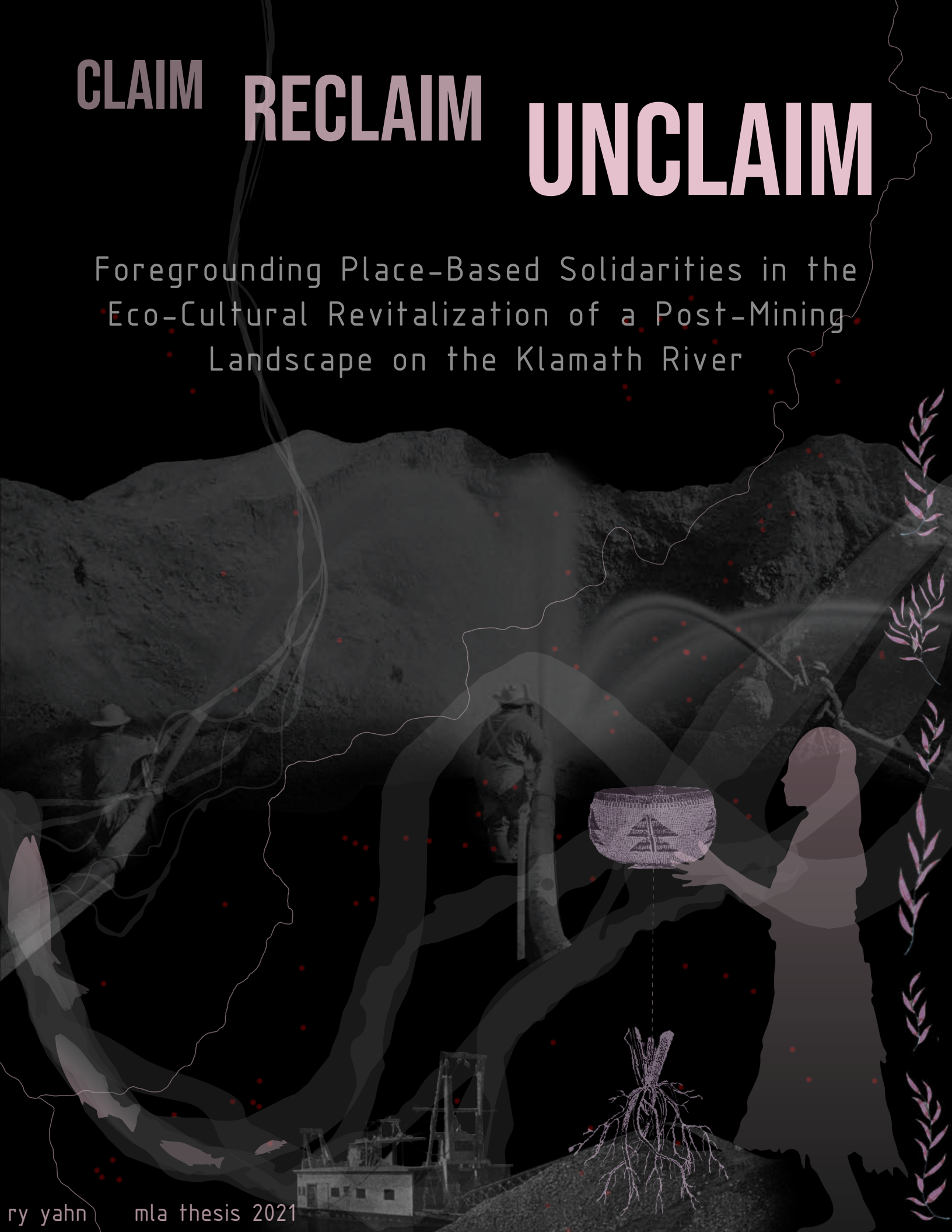
Post-mining landscapes (PMLs) such as Tishánik, located on the Mid-Klamath River in Karuk Aboriginal Territory, are sites of historic and ongoing settler colonial violence. While PMLs are emblematic of extractive relationships to land and a logic of elimination, they are also sites of enduring indigeneity and resurgence. Mining activities on Karuk lands have led to a massive reshuffling of matter that has reconfigured human and more-than human relationships, threatening Karuk ways of life. Through "claiming," miners converted more-than-human relations into resources and waste. Resources were mobilized to distant places, serving as raw material to fuel empire, expansion, and globalization. Vast quantities of disjointed material, understood as waste, were left behind at PMLs. Severed from their relations and out of place, these materials now impede Karuk eco-cultural practices and threaten all forms of life. While current approaches to "reclaiming" PMLs grapple with the ecological impacts of these forms of waste, I argue that reclamation generally serves to reproduce settler colonialism. As an alternative, I present an "unclaiming" framework that seeks to disrupt settler colonial structures in landscape architecture practice by foregrounding place-based solidarities in the eco-cultural revitalization of PMLs. I employ a material flow approach at Tishánik in an effort to resituate two disruptive and out of place materials that were impacted by historic mining back into the web of relations to support Karuk eco-cultural practices. By centering resurgence and co-production, "unclaiming" endeavors towards alternative, non-settler futurities through the generation of vital emergent knowledges that result from reciprocal and nonhierarchical place-based practices.

CLAIM RECLAIM UNCLAIM

Foregrounding Place-Based Solidarities in the Eco-Cultural Revitalization of a Post-Mining Landscape on the Klamath River



ry yahn mla thesis 2021

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GLOSSARY

Hügelkultur horticultural technique using compostable biomass (e.g. wood) to create mound for planting

Ikxareyavs Spirit People that all human and non-human relations descended from in Karuk stories

LA landscape architecture

Píkyav "fix-it," Karuk ethic of repair & renewal

Pikyávish Karuk "Fix the World" / World Renewal Ceremony

PML post-mining landscape

TEK traditional ecological knowledge

Tishánik ancestral Karuk village site and sacred World Renewal Ceremony site; also a PML and the focal site in this thesis

USFS United States Forest Service

NOTE: All images are my own unless other source is noted.

INTRODUCTION

ORIENTATION

On January 24, 1848, James Marshall struck gold near Sutter's Mill in Nisenan territory, initiating the first modern gold rush.[1] This gold rush now serves as a foundational story for many Californians, who proudly weave this heritage into the fabric of their everyday lives and identities (e.g. the San Francisco 49-ers, "The Golden State," the State Seal). Indeed, many contemporary metropolises across the U.S. were junctions and transaction points during the gold rush era, which led to their physical and population growth and economic and infrastructural connections to the larger world.[2] Materials extracted through mining were the raw materials that fueled expansion, empire, colonialism, and globalization. While these catalytic transnational processes of extraction and wealth concentration served to enrich some settler-capitalists, their redistributive powers were cataclysmic for the Indigenous caretakers of the land in ways that reverberate into the present.[3] While the heavy environmental costs of mining are generally acknowledged, few Americans are aware of the violence and dispossession that the same forces unleashed upon Indigenous peoples. This is especially true of the California Gold Rush, which initiated an enduring era of genocide and brutality on the California Indians—including the Karuk—in an effort to take their land and labor for extractive purposes.[4]

This thesis explores opportunities for disrupting settler colonial structures in landscape architecture (LA) practice by foregrounding place-based solidarities in the eco-cultural revitalization of post-mining landscapes (PMLs). I engage with these structures through my work with the Karuk community in the mid-Klamath basin at Tishánik, a Karuk ceremonial and village site that has endured overlapping eras of mining (Figure 1). Following calls to "unsettle"[5] and "undesign"[6] in pursuit of decolonization, the approach presented in this thesis aims to "unclaim" PMLs. The goal of unclaiming is a direct response to the "claiming" of land for mining that involves the conversion of land and life into the colonial ideological construct of property, dispossessing those who are Indigenous to the land and in deep relation to it. A mine claim involves the legal stratification of surface materials (vegetation) from subsurface materials (rocks, minerals), and results in the reshuffling of matter as certain materials deemed resources are extracted and others are left out of place and designated as waste.[7] Once the mining processes have been carried out and this land becomes a PML, the process of "reclaiming" may begin, where the negative impacts of mining are mitigated, and new purposes for the land are pursued. However, reclamation, as I will demonstrate, is often performed as a continuation of settler colonial processes that promotes capitalist and expansionist settler futurities[8] and continues to treat land as a resource to extract wealth and power from. This thesis presents "unclaiming" as an alternative approach, instead aiming to reinstate resources and waste into the place-specific network of relations that have been severed through mining. Unclaiming is a decolonizing process that centers nonhierarchical relationality and Indigenous resurgence through place-based solidarities. It entails an underlying commitment to returning land to the management of its ancestral caretakers and working towards Indigenous futurities[9] for collective survival.

APPROACH

I come to this project with an awareness of and a desire to engage with my identity and the associated privileges I hold as a white settler on stolen land, especially as a landscape architect whose primary occupation is working with and on the land. I write this from Seattle, Washington, on the unceded ancestral lands of the Duwamish, Suquamish, Muckleshoot, Tulalip, and Puyallup Nations. I am originally from Denver, Colorado, ancestral homelands of the Cheyanne and Arapaho Nations. My interest in mining can be traced back to my youth, which was spent hiking and backpacking in the Rocky Mountains. I loved escaping the city to the quietude of the forests and alpine wilderness, and the pine beetle damage, forest fires, and old mine infrastructure were all normalized parts of the landscape to me. However, I began to realize these forms of destruction were consequences of ongoing settler colonial activities, and that the network of towns and infrastructures that oriented me in this vast stretch of wilderness was almost entirely a vestige of a mining past. Every small mountain town I passed through had interpretive signage explaining its rich mining history with an air of nostalgia and celebration; towns were commodifying their extractive history to further extract money from tourists. I began to wonder how this influenced the future of these lands.

With this in mind, I chose Leadville, Colorado as a site for one of my landscape architecture studios, a small mining town 10,000 feet above sea level that once vied for the status of state capital. I uncovered the unspoken history of dispossession and broken treaties that accompanied this mining activity. Mapping the loss of Ute land in the Colorado mountains on a timeline alongside mining discoveries, I saw how closely dispossession of land was correlated with the discovery of minerals and the encroachment by settlers. Upon finding silver and gold in the mountains, white settlers violently invaded Ute land that had been guaranteed by government treaties. Although these settlers were in violation of federal land agreements, they were soon rewarded as land cessions were strongarmed or simply declared without agreement, and settlers were compensated either directly or indirectly for dispossessing the Indigenous people from their lands. Today, these same lands now harbor the toxic legacies of its mining past with myriad consequences ranging from acid mine drainage spills that release heavy metals into live-sustaining waterways[10], to forest fires that result from the logging and fire suppression that accompanied mining activities[11].

The unclaiming approach to PMLs I present here is part of a new wave in LA that is prompting the discipline to deal more directly with the role of design and planning in Indigenous dispossession, as well as redlining, "slow violence"[12], and other forms of environmental injustice. I was inspired to explore PMLs in my thesis because mainstream LA approaches to reclaiming PMLs do not acknowledge the histories and implications of the ways in which mining facilitated the encroachment onto and stealing of Indigenous land by white settlers. Rather than addressing the ongoing settler colonial legacies of PMLs, LA mine reclamation literature was predominantly focused on ecology, aesthetics, and balancing the interests between environmentalists and historic preservationists who want to keep the visible legacy of mining intact as an expression of heritage. Rarely was it mentioned that these PMLs are sacred ancestral

lands of diverse Indigenous nations who were violently dispossessed of their land when precious minerals were found on them but continue to fight for these lands today.

I believe it is important to make these connections between land, extraction, and dispossession, because how designers conceptualize the source of current injustices directly influences how we go about addressing them, and therefore in part determines the future of these lands. *Not knowing* or *thinking about* the violent processes that led to non-Indigenous presence on stolen land is a privilege, and not being aware of how one is implicated in these structures of domination risks reification of these structures, even with the best intentions. Being aware of these structures of injustice, I feel a responsibility to work to dismantle them and challenge institutions that uphold them. By identifying ongoing structures of domination and how I, and my profession, are implicated, I began to work towards accountability in my life and design work. It is not enough to be aware of and criticize these structures, which can lead to a damage-based approach. Rather, recognizing that power, place, and practice are coproduced[13], settlers should work towards disruptive and transformative change by decentering themselves through place-based solidarities that support localized struggles for Indigenous resurgence[14]. These solidarities are enacted through relationships and practices that engage with the literal stolen lands we live upon and their particularities of place and people, foregrounding Indigenous sovereignty with the goal of creating transformative alternatives to the colonial present we live in.[15] This involves centering the revitalization of Indigenous knowledges, languages, ceremonial life, and systems of ethics, all of which are intricately tied to land in a place-based way.[16]

I have begun in this process in my work by foregrounding place-based solidarities in the Karuk-led eco-cultural revitalization Tishánik. Tishánik is a PML on the Mid-Klamath River in Karuk Aboriginal Territory that has endured multiple eras of mining, the social and ecological impacts of which reverberate into the present-day (Figure 1.1). Tishánik is part of the Mid-Klamath River corridor, which includes the major tributaries of the Salmon, Trinity, and Scott rivers. These rivers bear many of the same marks of extraction. In 1978, Tishánik was designated to be part of the 9,000-acre cultural landscape of the Panámnik World Renewal Ceremonial District, and in 2015, the Tribe bought the property from a reluctant landowner. The diverse ecosystem at Tishánik once supported a thriving Karuk village, serving as an important population and economic hub where culturally important activities such as gathering, fishing, hunting, cultural burns, and ceremonies were carried out. Through these activities, the Karuk enacted their kinship responsibilities to the more-than-human world, embodying a philosophy of *píkyav*, which means "to repair" or "to fix."

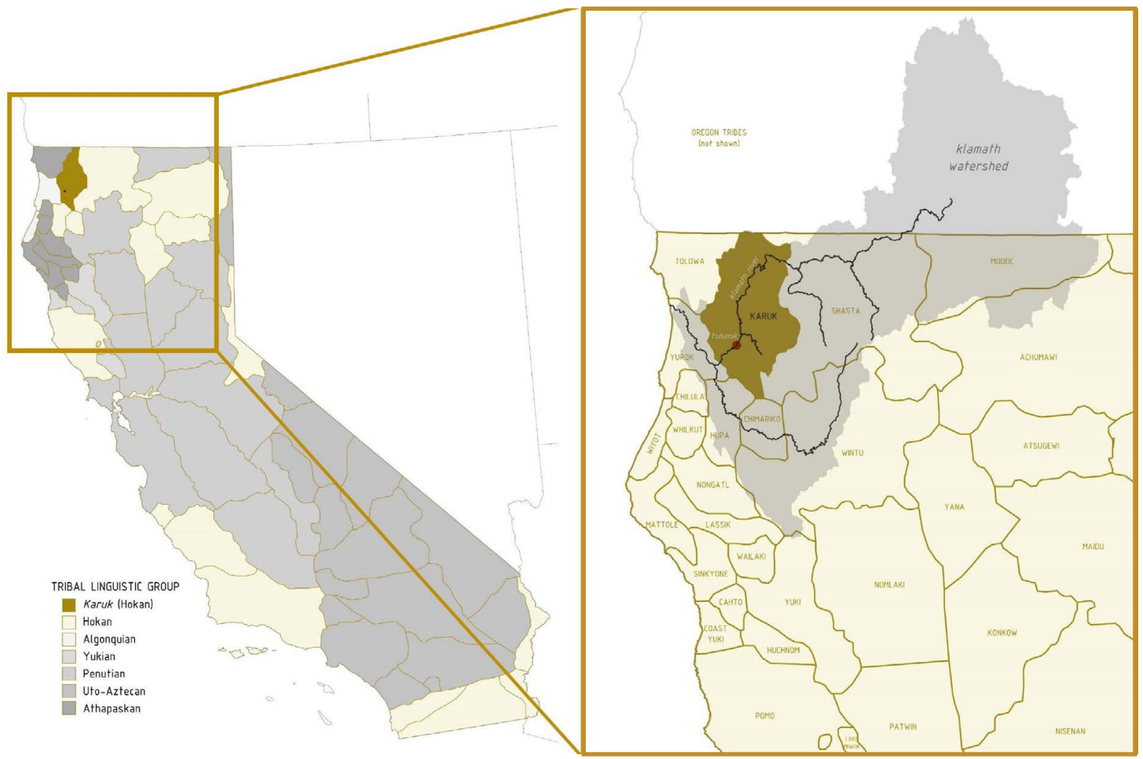


Figure 1.1 Context map showing traditional Karuk territory & Klamath watershed

However, this longstanding and reciprocal relationship with the land was violently disrupted in the mid-nineteenth century by miners in search of gold. The initial influx of individual prospectors panning for gold in the river carried out genocidal practices to claim their stake on the land. An era of company-owned hydraulic mining operations followed, diverting streams into giant hydraulic cannons that sluiced away entire hills and river terraces into the river. Finally, an era of heavy dredge mining followed as dredges owned by far-off capitalists overturned miles of riverbed, converting dynamic floodplains into static and towering rock piles. These earth-moving activities disturbed culturally and ecologically important geomorphological, hydrological, and vegetation profiles of Tishánik. Long-term ecological impacts compound the trauma of an era of outright genocide—murder campaigns against whole Karuk villages carried out by state-sanctioned vigilantes, and miner's everyday sexual violence against young Native wives.[17] However, the Karuk always returned to re-occupy Tishánik village and re-establish their ceremonial practices.

Today, the disturbances caused by mining, in addition to the destructive effects of logging, overfishing, industrial agriculture, and dams, have made it difficult for the Karuk to fulfill their responsibilities to their fish, animal, and plant relations. However, the Tribe has continually fought against these forces to assert their presence and protect their homelands through diverse means of resistance that continue into the present.
One key struggle in this fight is the decades-long campaign to remove four Klamath River dams that block salmon runs, raise water temperatures, and breed toxic algae (Figure 1.2). The imminent removal of these hydroelectric dams has generated research opportunities and funding streams that have paved the way for a multidisciplinary group of collaborators to come together and plan for the eco-cultural restoration of Tishánik. This multi-year project that centers Karuk knowledges and practices is co-led by Karuk cultural practitioners Lisa Morehead Hillman and Leaf Hillman and University of Washington professor Dr. Cleo Woelfle-Erskine.

As part of this larger project, my thesis is concerned with revealing the layered histories of mining and resistance at Tishánik to envision the ongoing transformation of this site into a place of revitalization and renewal for the Karuk. I first visited Tishánik in March 2021 with two fellow Master of Landscape Architecture thesis student collaborators (whose theses focus on geomorphology and the use of fire in prairie management), one PhD graduate student, and Dr. Woelfle-Erskine. Prior to our arrival, we had participated in several zoom meetings with Leaf Hillman and Lisa Morehead Hillman around our general interests, and they helped guide the trajectory of our research by contextualizing it within Tishánik. We had also engaged in archival research in the form of maps and documents, GIS analysis, reading publications by Karuk and non-Karuk collaborators about projects and histories in the Klamath River Basin, and restoration approach research. We brought with us large, printed maps with historical information and Digital Elevation

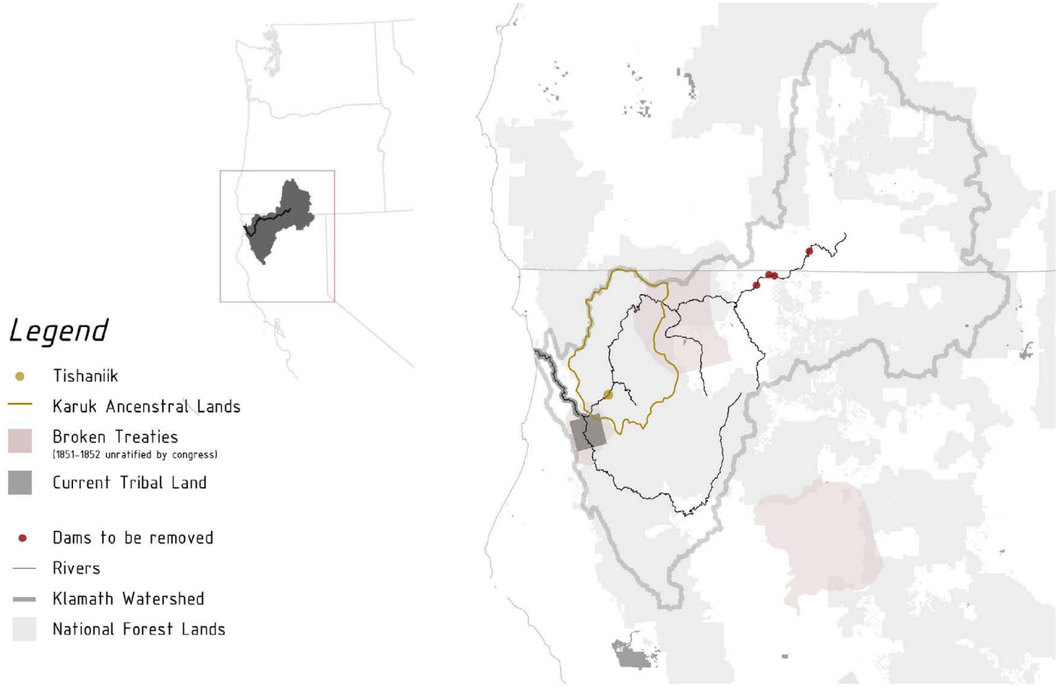


Figure 1.2 Context map showing dam removals and land ownership

Figure 1.3 Activities from the visit to Tishánik

Models (DEM) data that could be used to generate ideas and knowledge. The map I made was created from a map that had previously been created by the Karuk Department of Natural Resources, which overlaid historic river alignment and place names from a hand drawn Sander's Map, created by P.F. Young in the early 1900s on behalf of the California Mining & Dredging Syndicate, onto a contemporary aerial. I also added data points indicating sites in the Mineral Resources Data System.

During our one-week visit, we were introduced to Tishánik by Leaf and Lisa. The first day, we sat at Camp and Leaf shared with us the history of the Karuk and Tishánik, telling us of the overlapping eras of mining, violence, and resistance. Afterwards, we immediately took out the maps we brought and started recording some of the spatial dimensions of the history that had just been related. Throughout our visit, it served as a repository for location-specific knowledge of past and current conditions, as well as opportunities (Figure 1.3, top left). Lisa and Leaf then guided us through Tishánik, explaining which areas had been recently burned and introducing us to different plants, demonstrating harvesting and basketmaking techniques (Figure 13, bottom right).

The next day, Leaf took me and one of my collaborators on a small tour of locations in the Orleans area that had been impacted by mining, providing context and history for each one. Following this, we toured two restoration sites in the area led by the Salmon River Restoration Council. These restoration sites addressed similar legacies of mining that are faced at Tishánik. Strategies such as apex log jams and hügelkultur sparked ideas for our own work at Tishánik. Furthermore, we learned about the political barriers to restoring National Forest lands due to both active mining claims and the desire to preserve historic mining sites. At our small cottage, we used a makeshift camera set up to digitize historical mining records from the Orleans Bar Gold Mining Syndicate that operated at Tishánik in the early twentieth century (Figure 1.3, top right). Our subsequent days at Tishánik were spent conducting plant surveys, documenting GPS data points, establishing test plots (Figure 1.3, bottom right), and collecting drone imagery. These activities and perspectives informed the design work carried out by my collaborators and I following our return to Seattle.

I write this thesis in a moment of pause and reflection, but certainly not at the end of this project. In July 2021, my collaborators will return to Tishánik and present our design proposals and research to the Karuk community during a workshop. This will be an opportunity to generate new ideas, spark memory, and iterate to further the co-design process. My work on this project is a slow undertaking, requiring long term accountability and deep listening, and the timeline of a year-long master's thesis is limiting. This is a larger issue within the discipline of landscape architecture, in which client-firm agreements only allot a certain amount of time for site analysis, design, and construction, with little to no follow-up during post-occupancy. Throughout this process, consent and consultation are rarely carried out with the ancestral caretakers of the land, instead prioritizing client desires, economic development, or narrow ecological or social goals. If consent and consultation are carried out, it's often in a limited capacity that serves performative functions and fails to disrupt any power dynamics, and goals are ultimately aligned with settler-based agency and client interests. These approaches are ultimately an extension of settler colonialism and the same destructive patterns that mining typifies.

Mindful of these settler colonial legacies and the ongoing harm they do, I propose an alternative methodology that is critical of the implicit assumptions and goals that govern conventional approaches to reclaiming PMLs. Instead, the unclaiming approach I put forth endeavors to work towards decolonization through place-based solidarities that center Indigenous sovereignty. Figure 1.4 visualizes how I understand the interconnections between different concepts

of this project. The rock tailings represent all of the related structures, processes, and impacts of settler colonialism and racial capitalism, summed up by the idea of 'claiming.' This system allows for continued extraction to take place and threatens the future of life on earth. Growing from the tailings, the willow roots illustrate an assertion of life and future. Willow is a key species in riparian ecosystems in Karuk territory, and is an important basketry plant that is dependent on regular burns for growth. To be useful for basketry, willow roots must grow straight, which happens in sandbars along the river's edge; since the mining and dam era, such habitats have become scarcer. To restore willow roots and the basket weaving practices they sustain, both flood and fire must be restored to Klamath floodplains. I imagine the willow roots to represent actions that disrupt, dismantle, and repurpose the tailings as they grow. The growth of these roots represents aspects of 'reclaiming' that are centered on recovery and repair.

Finally, a traditional Karuk basket sits at the center, emerging from the willow roots, representing the importance of centering Indigenous sovereignty

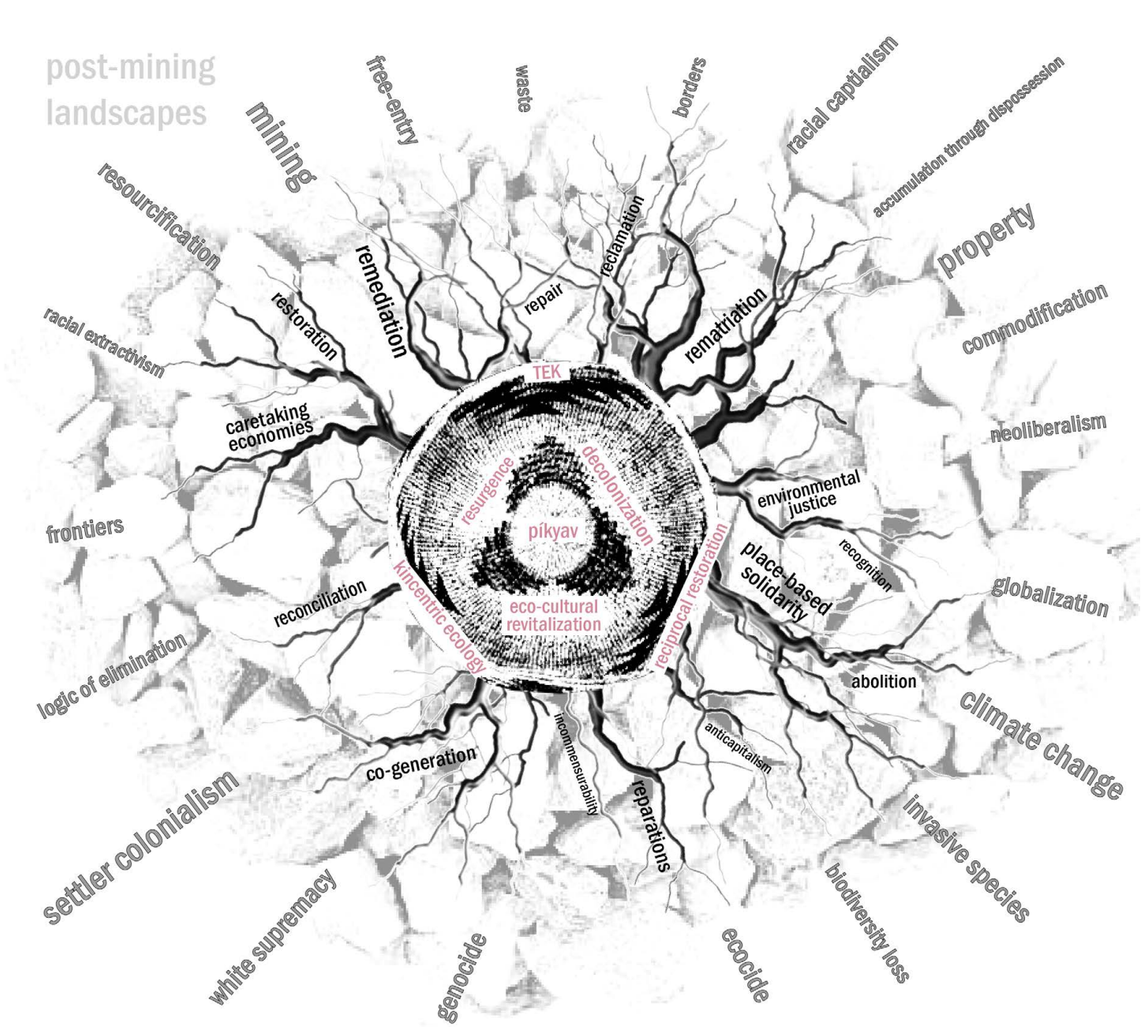
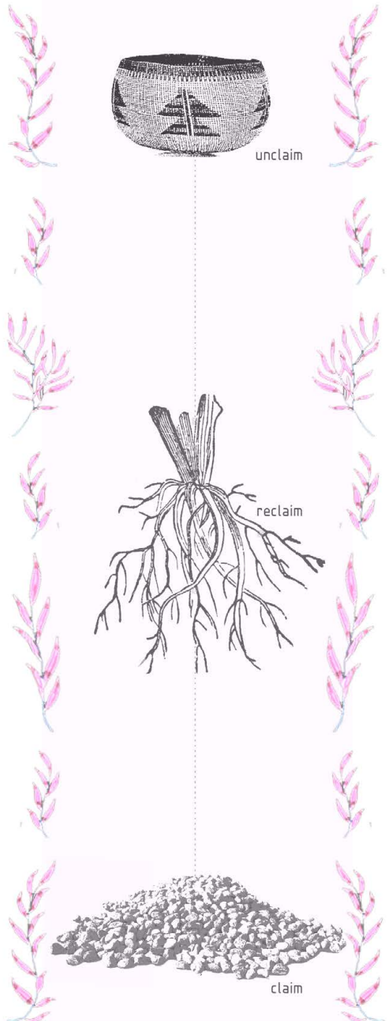


Figure 1.4 Conceptual framework for this project

and resurgence through 'unclaiming' PMLs. When willow harvesting season arrives, Karuk basket weavers and their families continually check willow sticks, sharing information with each other as different plants in different places become harvestable. Kids, husbands, and even visiting students such as myself are invited to harvest the willow sticks with the weavers, as well as care for the willow patches by coppicing and burning them. Materials are dried and processed, and from there, basket weavers create intricately designed baskets augmented with hazel and grape root, and several fern species. These baskets are both an important



cultural symbol and part of Karuk life through their use as hats, baby carriers, fish traps, and containers for harvested food. Baskets' continued creation depends on the ability to grow the materials it is made of, which requires cultural management of the landscape. The basket represents all of these embodied relations, which are key to eco-cultural revitalization, world-making, sovereignty, and the Karuk ethic and practice of *píkyav* (to-fix-it).

This thesis argues that landscape architects engaged in PML reclamation must grapple with the social, political, and historical dimensions of the land they work upon and center Indigenous sovereignty through place-based solidarities to avoid reifying ideologies grounded in extraction, capitalism, hierarchy, and settler colonialism that led to the creation of PMLs. I first introduce the concept of settler colonialism and demonstrate how mining has served to accelerate its processes, and then describe how its qualities manifest in PMLs. In Chapter 2, I locate the ontological differences in the relationship between humans and land as a major source of tension between western and Indigenous worldviews and practices and explore their spatial implications. I demonstrate how Indigenous ontologies establish non-hierarchical relations and are based on intergenerational knowledge and practices that have co-evolved since time immemorial, facilitating place-based stewardship and renewal. On the other hand, I highlight how Western worldviews facilitate the commodification of land through extractive activities such as mining. In Chapters 3 and 4, I use a material flow approach to explore the alteration of Tishánik during eras of hydraulic and dredge mining, tracing how mining facilitated the transformation of plants and rocks from relations into resources and waste. Specifically, I investigate black locust and mine tailings, which now not only hinder ecological function and cultural practices, but also serve as violent symbols of the mining histories of Tishánik. Next, I problematize current approaches to mine reclamation and site design that serve to uphold settler colonialism and offer potential pathways for decolonization by presenting alternative ways of engaging with land and co-generating knowledge that challenge dominant narratives and power structures. Using an unclaiming approach, I develop four principles that guide my design work at

Tishánik. These are (1) **use the past to formulate a vision of the future**, (2) **design for a caretaking economy**, (3) **honor the agency and personhood of all beings in a spirit of reciprocity**, and (4) **center eco-cultural revitalization, emergent knowledge co-generation, and intergenerational knowledge transfer in a spirit of *píkyav***. Finally, I apply these ideas to my design work, exploring how black locust and mine tailings might be transformed from waste to relations through eco-cultural restoration activities at Tishánik. Re-situating these materials back into the network of relations supports collective healing and resurgence, ultimately working towards transformative and liberatory futures that support collective survival.[18]

MINING & SETTLER COLONIALISM

From the nineteenth century onward, mining has served to accelerate the violent processes of settler colonialism that remain embedded in the American landscape today, which can be seen at Tishánik.[19] Settler colonialism is an ongoing process and structure of invasion that seeks to dispossess Indigenous peoples of their lands through various forms of elimination with the intention of replacing them.[20] This form of conquest involves converting Indigenous lands into the ideological constructs of property, claims, and resources through the act of extraction, which "removes all of the relationships that give whatever is being extracted meaning."[21] Figure 1.6 is a counter-map that reveals the relationship between mining and the invasion of America, showing a pattern of gold rush, Indigenous land cession, and then statehood. Gold rushes facilitated the conversion of Indigenous lands into empire as the United States spread its territorial reach westward (Figure 1.5). At Tishánik, the complex relationships between sacred landforms, plants, and animals that were maintained through Karuk ceremonies and cultural practices were violently disrupted through various forms of mining and the genocide precipitated by the search for gold.

However, the settler colonial project is incomplete, as evidenced by the enduring indigeneity of the Karuk and other Indigenous peoples.[22] As Secwépemc scholar George Manuel states, "there was never a time since the beginning of colonial conquest when Indian people were not resisting."[23] This is especially true for the Karuk, whose resistance can be easily traced from gold rush California to present times. During the genocidal gold rush era, any form of resistance was met with exponentially increased violence by settlers, serving as justification for "war," which was thinly veiled genocide.[24] This was the case during the Red Cap War, when the refusal of several Karuk villages to disarm led to an organized genocidal killing campaign in the region.[25] However, despite enduring over a century and a half of settler colonial eliminatory tactics in the form of genocide, destruction of their land base through extractive activities, and exclusion from their land through private property regimes and National Forest establishment, the Karuk have continually returned, rebuilt, and re-established their connection to the land.[26]

Settler privileges are institutionalized through ongoing processes that continually assign political meanings and organize material structures.[27] Steinman (2016) summarizes the dimensions of settler colonial power that uphold these privileges, synthesized in Table 1.[28] I elaborate on these dimensions of power in relation to mining activities and settler colonialism in Karuk territory, and later reference them in relation to LA and PML reclamation practices, and ultimately, avenues of decolonization. While settler colonial studies delineate specific logics of domination, it does not provide an alternative vision, and risks depicting settler colonialism as inevitable and totalizing, rather than contingent and contested.[29] As Veracini (2010) has voiced, there is a deficit in narratives in settler colonial studies around decolonizing settler colonialism.[30] Indigenous analyses of Indigenous-settler relations and accompanying political thought, however, contain "transformative visions" for alternative futures that are informed by ontologies outside of Western thought.[31] Thus, following Kanaka Maoli scholar J. Kēhaulani Kauanui, I center Indigeneity as an essential counterpart analytic of settler colonial analytics.[32]

The first dimension is the **denial that settler colonialism exists.** While the mining past of towns and cities may be acknowledged and celebrated, the realities of settler colonialism and dispossession of Indigenous lands are largely left unspoken. This contemporary denial has pervaded through history, as can be demonstrated through the statement of one settler who had been in Orleans since 1852 in the early stages of the Gold Rush: "without hydraulic mining there would be nothing up here."[33] This sentiment embraces mining as the origin and reason for existence of the town while erasing any other presence on the land predating mining.

Today, settlers continue to deny the violent origins of their presence on Indigenous lands. For instance, during a meeting organized by local Orleans residents aiming to "Decolonize the River" by educating settlers on the harms of ongoing settler colonialism, one older male settler left because he said it felt like the facilitators were "trying to cut off" his genitals.[34] Settlers' **refusal to confront the violence foundational to American history is the second dimension.** The Klamath area was one of **the most extreme sites of foundational violence during the gold rush era.** Benjamin Madley, author of An Americ*an Genocide: The United States and the California Indian Catastrophe, describes the "state-sponsored killing machine"*[35] in California that worked to eliminate Indigenous peoples during the gold rush era.[36] In 1851 and 1852, the state of California spent $1 million each year to fund militias and vigilantes to murder California Indians, and in 1856 there was a bounty issued for Indian scalps.[37]

This gold rush and the genocide it precipitated led to a massive change in population, as settlers literally destroyed to replace (Figure 1.7).[38] Before the Gold Rush, there were ten California Indians for every settler.[39] By the end of 1849 there were two settlers for every California Indian, and the population difference continued to grow (Figure 3). As settlers poured into Karuk lands in search of gold, they burned villages and massacred large numbers of Karuk peoples. Seventy percent of the Karuk population had been killed by the 1880s, and many survivors had been forcibly moved to Hoopa Valley Reservation or fled into the mountains.[40] All

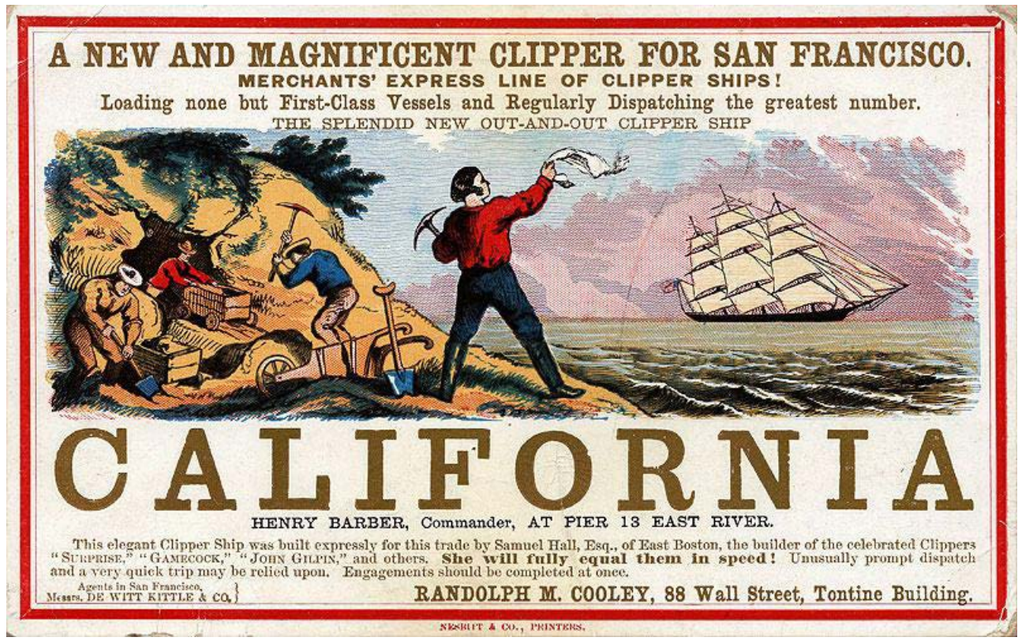
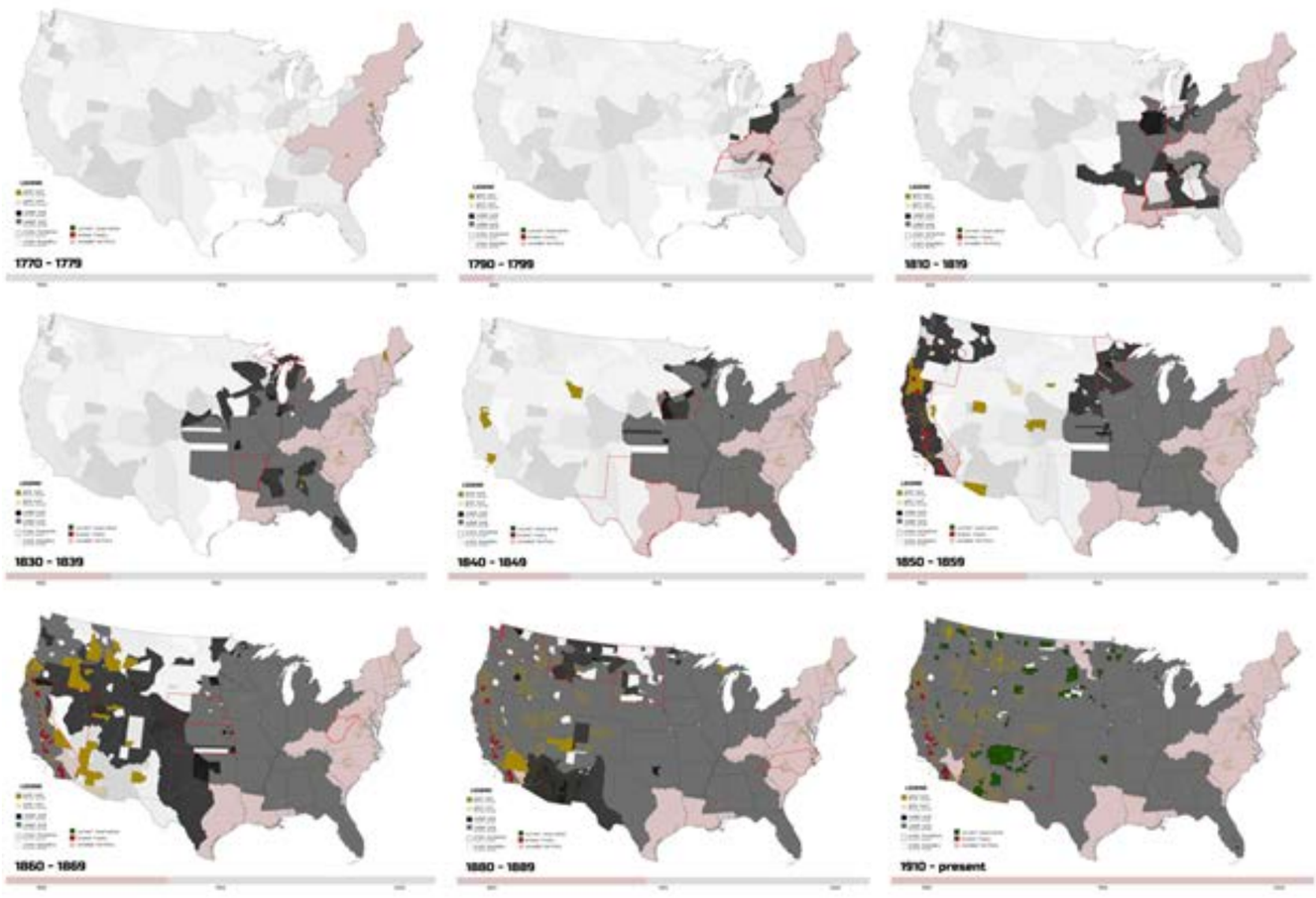


Figure 1.5 California Gold Rush propaganda (UC Berkeley / OAC)



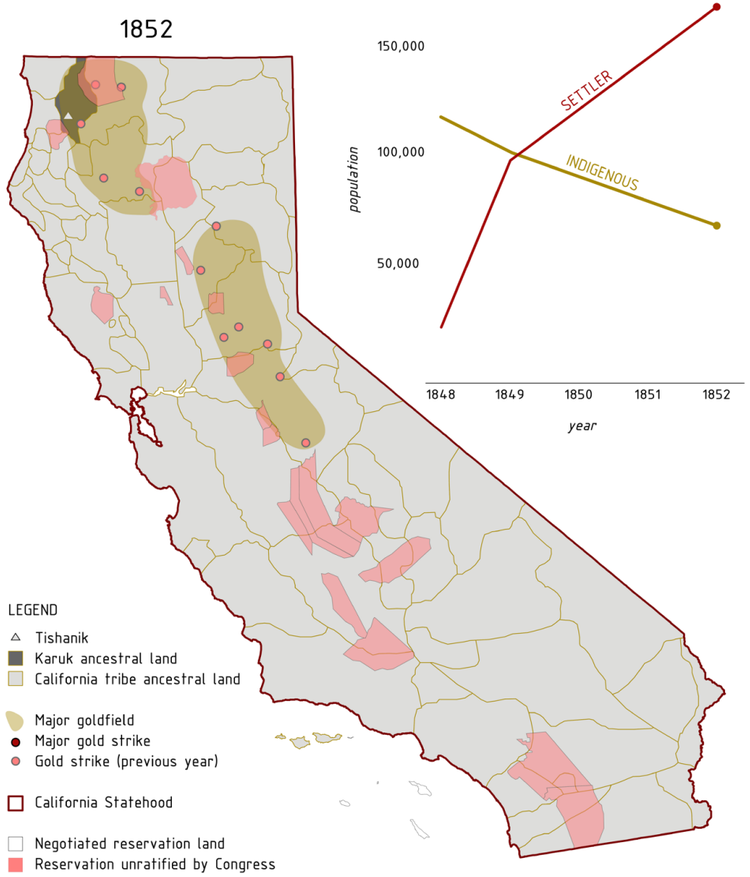


Figure 1.6 (left) Gold Rushes in the invasion of the US

Figure 1.7 (right) Gold Rushes in the invasion of California

of this took place in spite of a treaty signed in 1851 between the Karuk and treaty commissioners. This was but one 18 treaties that were negotiated with over one hundred California Tribes (including the Karuk Tribe) between 1851 and 1852, who surrendered 92.5% of their land base in exchange for nineteen reservations that totaled less than 8 million acres.[41] However, both the California Senate and the U.S. Senate repudiated all 18 treaties, in large part because they might constrict the search for gold, and subsequently placed all documents relating to the treaties under an "injunction of secrecy" that stayed in effect until 1905.[42] The breaking of these treaties was "a deceitful crime of vast proportions" that left the Karuk and other California Indians vulnerable to the state-sanctioned extermination that followed.[43] This was further exacerbated when Congress passed the 1855 Bounty Land Act, which expanded incentives to encourage murdering California Indians on land that had previously been negotiated as reservations for the same tribes they were targeting.[44] This history of deceit and genocide is buried and reframed as a history of American pioneering and exceptionalism, which serves as the basis of identity for many settlers today.

A third dimension of settler colonialism is the **ideological justifications for dispossessing Indigenous bodies from land.** Examples of this include the Doctrine of Discovery, Manifest Destiny, and *terra nullius, all of which reinforce the naturalization of settler authority. The Doctrine of Discovery can be traced as the legal justification for the U.S. settler state. It stems back over five hundred years to a set of papal bulls that declared that non-Christian territories did not belong to anyone until claimed by a Christian Monarch. This doctrine was subsequently cited to legitimize the nascent United States government in the 1823 U.S. Supreme Court Case Johnson v. M'Intosh.*[45] As a United Nations study (2014) on the impacts of the Doctrine of Discovery summarizes,

"in all its manifestations, "discovery" has been used as a framework for justification to dehumanize, exploit, enslave and subjugate indigenous peoples and dispossess them of their most basic rights, laws, spirituality, worldviews and governance and their land and resources. Ultimately it is the very foundation of genocide."[46]

Another dimension is the **settler control of population economy** for the purposes of creating and sustaining settler demographics. Mining is implicated in this dimension through informal and indirect material techniques, by decimating Indigenous land bases, which are sources of food, culture, and life. As settlers came pouring into California looking for gold, they caused traditional food supplies to go into rapid decline, driving off and overhunting game, grazing livestock on rich meadow ecosystems, and obliterating whole landforms and everything that lived on them through hydraulic mining.[47] Mining and ongoing extractive activities have negatively impacted Karuk health and culture.[48] These legacies continue on today through the degradation of Karuk lands and waters, and depletion of eco-cultural

resources. Today, only 0.0007% of Karuk homelands remain in Karuk hands.[49] Most of this land is now designated National Forest, and exclusionary policies and restrictions on traditional cultural practices have made it so "it is a criminal act to be a Karuk Indian in the twenty first century."[50]

Cultural appropriation co-opts indigenous knowledges and traditions for settler use. Hurwitz and Bourque (2018) describe how settlers who call themselves hippies and "Back to the Lander's" have built an identity partially based on being "stewards of the land."[51] Many of these settlers consider themselves to be protectors of the land because they have fought against extractive activities. However, with limited land available on Karuk territory due to the large percentage held by the United States Forest Service (USFS), these settlers take what's left of these lands in the form of private property, further displacing Karuk people from their own land.

Finally, settler colonialism works by **denying and working to eliminate possible alternatives in the past, present, and future.** Mining activities can be understood to lay claim to the future by altering landscapes to the point of becoming hostile and toxic to life. Their barren and raw state serve as reminders of the harms of extraction and exploitation, an archive of trauma. Unangan scholar Eve Tuck and environmental scholar Marcia Mackenzie (2014) explain the notion of futurity, distinguishing it from the notion of future because "futurity includes how current practices shape and make possible the future."[52] As I will show, settler-led PML reclamation strategies are often rooted in settler futurities, reproducing the extractive, expansionist, and capitalist ideologies that underpin mining and settler colonialism, including remaking life and land into property.[53] Settler futurities, grounded in elimination, foreclose other futurities. However, Indigenous-led eco-cultural revitalizations offer visions of non-settler futurities that recalibrate human relationships to land to "recover Indigenous land and life, and shape a new structure and future for all life."[54] At Tishánik, this involves recovering traditional management practices such as fire to care for plants important for basketry and other cultural practices, and restoring agency to the land through

Table 1 Dimensions of settler colonialism. Adapted from Steinman (2016) & Veacini (2010)

	CLAIM MINING	RECLAIM PML RECLAMATION	 LANDSCAPE ARCHITECTURE	UNCLAIM REVITALIZATION & RESURGENCE
Denial of the existence of settler colonialism and the settler colonial nature of society	Narrative of wilderness, frontier The unacknowledged processes of settler colonialism that led to the establishment of mining cities and towns	Erase traces of Indigenous past, move towards "pristine wilderness" Absence of relationships with Indian nations in national mythologies Narrative of settler independence, democracy, exceptionalism	Not acknowledging or prioritizing Indigenous histories Adoption of sustainability values without identifying complicit roots of colonialism	Assertions of Indigenous conceptions of natural world Acknowledge place names Acknowledge past, uncover and confront complicity in structures Scholarly and grassroots challenges to ubiquitous denial of US colonialism
Foundational settler violence and its concealment and diminishment	Genocide State-sanctioned and federal military Autonomous settlers	Minimizing representation of settler violence in national narratives Celebrating mines as heritage	Minimizing representation of settler violence in national narratives	Exposure of settler violence Healing activities, landscapes & ceremonies Transforming waste and symbols of violence into materials that support eco-cultural activities
Ideological justifications for indigenous dispossession and naturalizing settler authority	Doctrine of Discovery Lockean principles labor & land *Terra nullius* Manifest destiny Valuation of gold over life	Representing Indigeneity in the past, settlers as dynamic and defining the future Representing mining as identity and heritage Extolling environmental stewardship of mining projects	Site as property Not acknowledging Indigenous histories in design Universal design frameworks framed as "right" and apolitical	Challenge Western ontologies around land Critiques of Western epistemologies & methodologies Tribal IRB control of research on ancestral land Asserting Native modernity and dynamism
Settler control of population economy	Destruction of land base & eco-cultural resources for Indigenous lifeways Denial of access to habitats via relocation Breakup of collective tribal lands Prohibitions on Native language and ceremonies	Continued holding land as private and federal land, exclusive or open to extraction	Designing for Western use of land that precludes Indigenous eco-cultural practices	Protection and reaquisition of territories and eco-cultural resources Native language retention and transmission Unsettling; save the man, kill the settler Eco-cultural revitalization that foregrounds the continuation and generation of Indigenous knowledges and practices
Cultural appropriation		Applying TEK without sovereignty and land management	Applying TEK without sovereignty and land management	TEK not separate from culture; centering Indigenous land management in its application
Denial and elimination of possible alternatives in the past, present, and future	Damaging landscapes beyond the point of immediate repair, reducing habitat for eco-cultural resources Climate change & toxic landscapes in need of perpetual care	Rejection of indigenous land claims	Designing land as property and resource Not consulting and centering Indigenous stewards of the land in design	Place-based solidarities centering Indigenous sovereignty in design Disrupting settler norms to facilitate creation of decolonized relationships and interactions Co-generating knowledge through the coexistence of Western and Native science

nonhierarchical relationality.

Tishánik is an important site of resistance, resurgence, and intergenerational knowledge transfer, where alternatives to extractive settler futurities are practiced and passed on. Despite assertions of ownership and governance by the settler state through private property regimes and institutions that claim Karuk lands as their own, asserting rules and regulations that criminalize traditional activities, the Karuk continue to assert their sovereignty and carry out their responsibilities to the land.

POST-MINING LANDSCAPES

Tishánik is a post-mining landscape (PML) (Figure 1.8). PMLs are "landscapes of extremes" where the legacies of settler colonialism and racial extractivism are on full display.[55] According to the Center of the American West, no other industry has shaped the Western United States as profoundly as mining.[56] PMLs are the originary sites where the capitalist distinction between "waste" and "value" is made and enacted on more-than-human kin and relations. Thus, PMLs are sites where relational networks between more-than-humans and humans are disrupted as relations become commodified resources. This disruption severs interconnected life forms and balanced processes, as matter is disembodied, reshuffled, and made unwhole.

After a claim is made and this delineation is made, miners separate resource from waste by sorting and rearranging matter. "Resources" are funneled into the global economy, the benefits of which are concentrated to a small minority. The value placed on gold is an ideological fabrication, as is the demarcation of "waste." Historian and activist Roxanne Dunbar-Oritz (2014) remarks on the bizarre unquestionable value given to gold, despite its relative uselessness.[57] She explains,

"Investors, monarchies, and parliamentarians devised methods to control the processes of wealth accumulation and the power that came with it, but the ideology behind gold fever mobilized settlers to cross the Atlantic to an unknown fate. Subjugating entire societies and civilizations, enslaving whole countries, and slaughtering people village by village did not seem too high a price to pay, nor did it appear inhumane. The systems of colonization were modern and rational, but its ideological basis was madness."[58]

The extraction of gold, which, despite romantic notions of the pioneering prospector who panned the river for gold, quickly shifted to industrial methods that only benefited those with the capital and assets to invest in large-scale extraction technology. As Historian Andrew Isenberg (2018) remarks, "industrial mining did not extract wealth from the nonhuman natural environment so much as it merely rearranged the distribution of natural wealth: benefiting the investors ... who passed along the costs of their enterprises to the environment itself and to less powerful or less fortunate members of society."[59] In other words, it is only profitable because of discounted environmental costs. Gold is the ultimate example of the commodification of nature in a process of accumulation through dispossession[60], extraction through degradation. Ultimately, Isenberg concludes gold added "nothing whatsoever to the real wealth of the world."[61]

Instead, PMLs are where these discounted environmental costs are paid. PMLs become repositories for that deemed as "waste;" Geographers Caitlynn Beckett and Arn Keeling (2019) asserting that PMLS "are fundamentally defined by waste."[62] Geographer Lindsey Dillon (2014) defines waste as "the by-product of production, the remainder of what is useful; the opposite of value."[63] In other words, waste is something that is always formed in relation to something else of value. Geographers Vinay

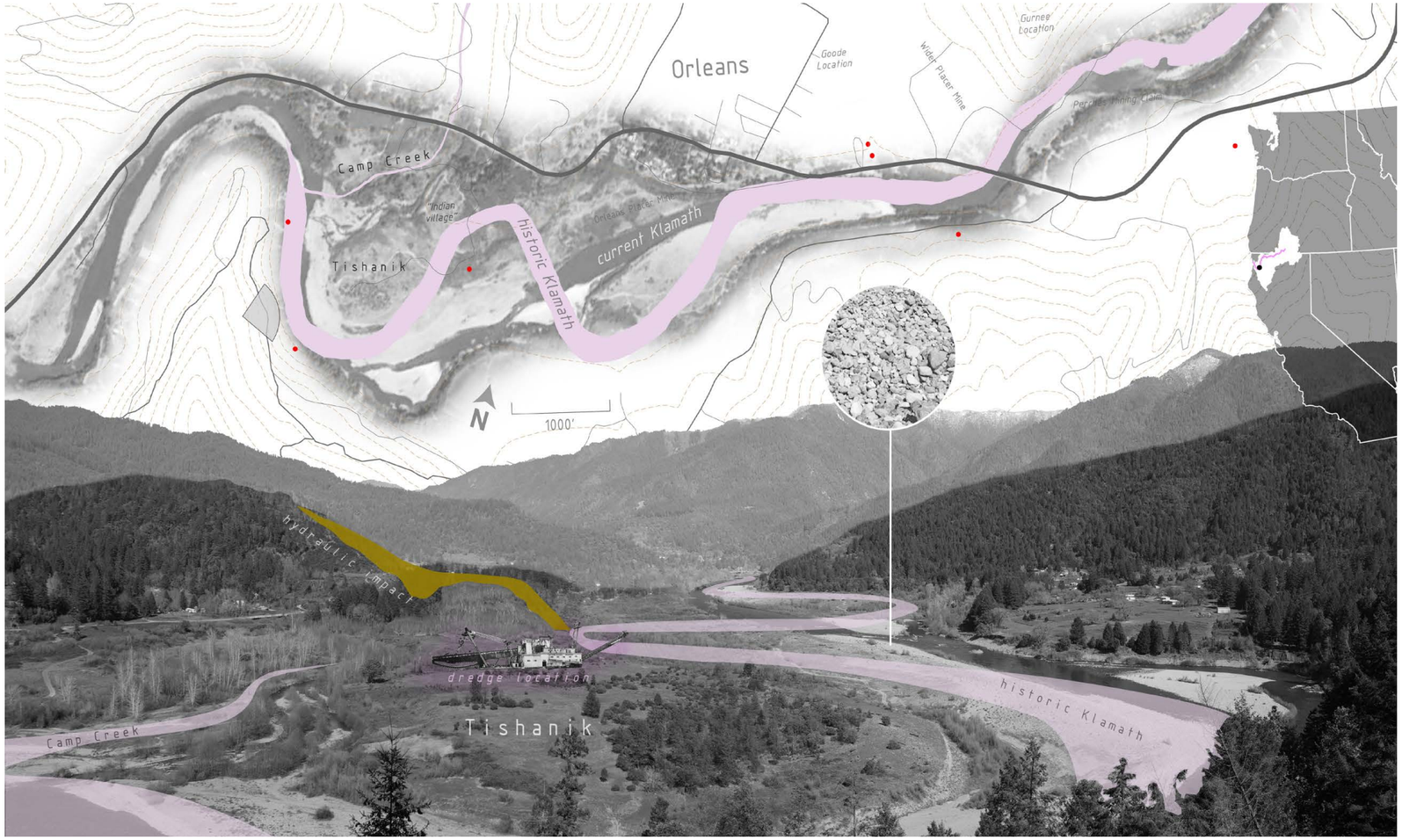


Figure 1.8 Mining impacts at Tishánik

Gidwani and Rajyashree Reddy (2011) further place the idea of "waste" into a historical and political context by asserting that it is "the political other of capitalist 'value,' repeated with difference as part of capital's spatial histories of surplus accumulation."[64] Drawing from literature around settler colonialism, Indigenous studies, and waste formation, I understand "waste" as the obligate counterpart of "resource" that emerges from the commodification of relations through colonialist and capitalist activities. Mining is one of many extractive techniques that produces waste and resources. However, it is remarkable in the extremely high value placed on the "resources" extracted and the toxic and barren nature of the "waste" it leaves behind. In other words, mining produces an extremely low "waste" to "resource" ratio. It is also among the least "renewable" extractive practices that commodifies more-than-human relations.

Waste created from mining currently represents one of the world's largest waste streams. It takes the form of overburden (soil and vegetation removed), waste rock (rocks with lower ore content than deemed economically viable), tailings (materials leftover from the separation of desired minerals from the ore), open pits, and abandoned communities and infrastructures.[65] In these wastes, elements and compounds once bound and hardened in the earth can become exposed to the biosphere and dispersed into the ecosystem, leaching into waterways and bioaccumulating in vegetation and animals, posing severe health and ecosystem hazards.[66] Erosion, tailings impoundment failures, leaching, and acid mine drainage (AMD) all become vehicles for delivering these contaminants to communities and ecosystems far outside the boundary of the mine.

PMLs, especially abandoned PMLs, pose a huge hazard to communities. One study by The U.S. Bureau of Mines estimates that approximately forty percent, or 12,000 miles, of waterways in the Western U.S. are contaminated by metals from AMD, in addition to 180,000 acres of lakes and reservoirs.[67] A 2019 investigation into 43 abandoned hard rock mines under federal oversight found that these sites collectively discharge 20 million gallons of polluted wastewater containing lead, arsenic, zinc, and copper into ground and surface water each day.[68] Federal officials have expressed fears that at least six of these sites pose a risk of a blowout similar to the 2015 Gold King Mine Spill (Figure 1.9). This disastrous event released about thee million gallons of AMD carrying toxic metals into the San Juan River, impacting the Ute and Navajo tribes who use this water for agricultural and cultural uses (Figure 1.10).[69] Other tribal lands in California, Nevada, Montana, South Dakota, and Colorado have also been impacted by releases of contaminated waters from abandoned gold mines.[70]

Spatial analysis by Lewis, Hoover, and MacKenzie (2017) demonstrated that more than 600,000 Native Americans live within 10 km of an abandoned mine, mostly gold mines (Figure 1.11).[71] This disproportionate proximity to toxic sites is the legacy of historic and ongoing policies that dispossessed Indigenous peoples of ancestral lands, and violations of treaty negotiated rights that facilitated mining activities on Indigenous land. The impacts of these activities have led to direct health impacts, as well as indirect impacts around cultural practices associated with land. These impacts amount to what Rob Nixon (2011) calls "slow violence," which can be felt on the timescale of generations to come as the cumulative effects build in communities.[72]

To understand why so few PMLs have been restored, it is key to understand the complex regulatory context for remediation. The first federal regulatory mechanism for mine reclamation was the Surface Mining Control and Reclamation Act (SMCRA).[73] One of its main priorities was to protect the "integrity of the nation's water," prioritizing restoring pre-mining topographic conditions.[74] However, SMCRA only applies to coal mines, and there is no comprehensive regulatory mechanism for other types of mining that dominate the West.[75] This means that most mines in the West are not eligible for federal funding.

Instead, each state has passed its own regulatory legislation around various mining activities. Abandoned mines are addressed by federal and state entities since there is often no one who can be held liable for them. As a result, taxpayers

Figure 1.9 Gold King Mine waste water spill 2015 (Geoff Liesik / The Deseret News via AP)

Figure 1.10 Gold King Mine spill water in Animas River (Durango Herald)

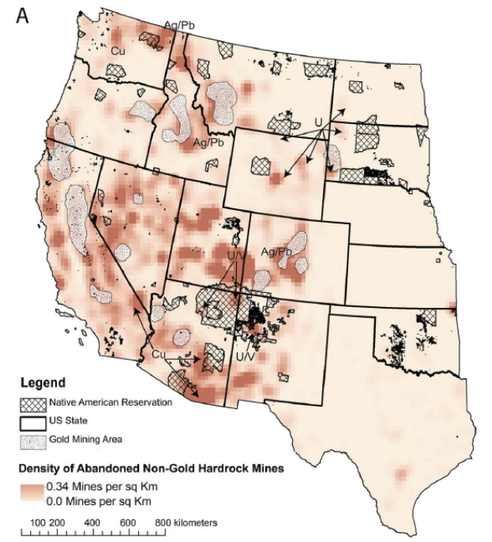


Figure 1.11 Abandoned hardrock mines near Reservations (Lewis, Hoover, MacKenzie, 2017)

bear the brunt of these remediation costs, which often exceed any profit ever derived. New mines require mine operators to post a bond, or proof of financial assurance, that ensures that funds will exist to reclaim the mine even if the company goes bankrupt.[76] However, to encourage mining companies to open new operations, states will often require bonds that are not sufficient to cover full remediation costs.[77] Because of this, funding from bond forfeiture does not usually cover the costs of reclamation.[78] For instance, when the Pegasus Gold Mining Company declared bankruptcy, they left 30 unreclaimed mines in their wake that lacked funds for remediation.[79] On the other hand, non-government parties who might be interested in contributing to remediation efforts are often deterred because of punitive liability policies.

All in all, the regulatory climate around mine reclamation today heavily favors mine operators and transfers much of the costs to the public. This means that toxic abandoned PMLs are not only a part of the past but also the future. The next chapter will explore the conflicting ontologies around land that have led to the creation of PMLs.

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[9] McKenzie and Tuck, *Place in Research : Theory, Methodology, and Methods*.
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LAND & MINING

THE IMPORTANCE OF LAND

This chapter explores the dichotomous worldviews of land that are held by settlers and Indigenous peoples, focusing on Karuk epistemologies, and the implications of these worldviews. Settler understandings of land are at the source of destructive mining activities, and continue to manifest through the treatment of PMLs today. As inter-tribal organizer and author Dennis Martinez (2003) explains, "fiercely held beliefs about the place of humans in nature also inspire political agendas, the success or failure of which hold ominous consequences for both our wild lands and the native peoples who call them home ... [and] manifest themselves in the future direction of ecological restoration."[1]

The issue of land is especially important for landscape architects to unpack, as land is our primary occupation, and we are especially implicated in enacting these ideologies by designing landscapes, and therefore designing the future. Our work is never apolitical; as Rod Barnett (2016) points out in his piece *Designing Indian Country, "landscape architects are ... in everything they do, contributing to the political landscapes that all things dwell within."*[2] Landscape architects should critically interrogate what normative views of land are held and what power structures and activities are upheld by carrying out those worldviews. Widening our understanding of what land means and the implications of those understandings can make space for emergent and more just design approaches, and is an important part of decolonizing the practice.

STORY FOR RECIPROCITY

For Indigenous cultures, land is not simply some important material object.[3] Instead, land is understood in relational terms that encompass both the human and nonhuman world, from the stones of the earth to the stars in the skies, connecting water and matter on their never-ending journey across the world and through human, plant, and animal bodies.[4] This locates humans "as an inseparable part of an expansive system of interdependent relations covering the land and animals, past and future generations, as well as other people and communities."[5] In this way,

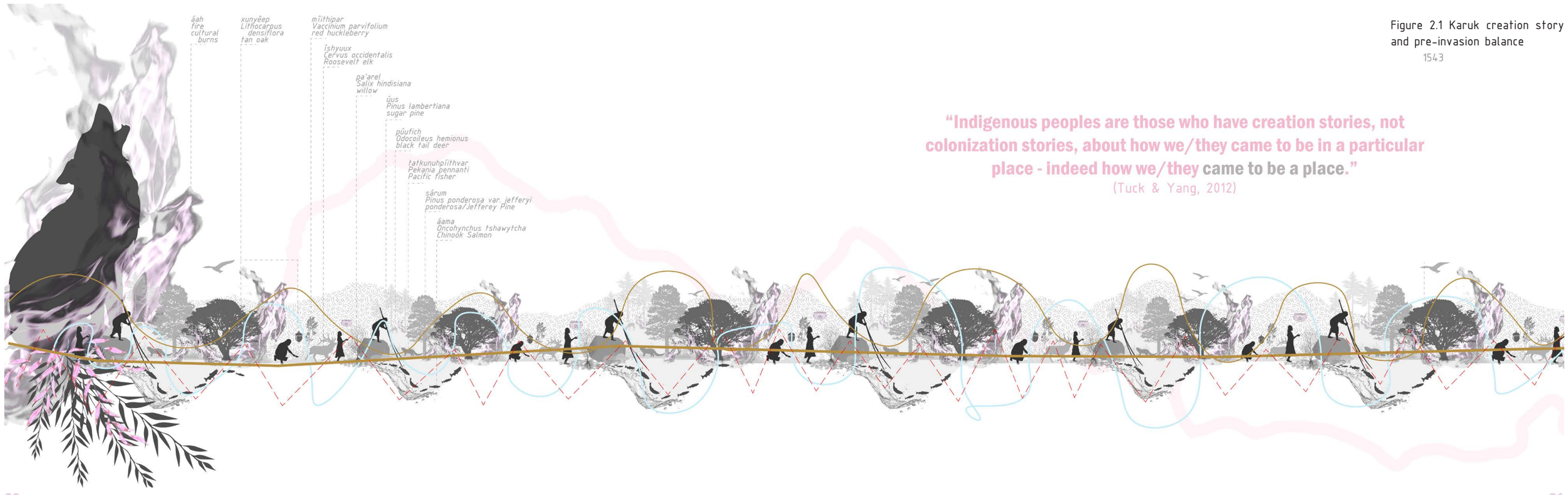


Figure 2.1 Karuk creation story and pre-invasion balance
1543

"Indigenous peoples are those who have creation stories, not colonization stories, about how we/they came to be in a particular place - indeed how we/they came to be a place."
(Tuck & Yang, 2012)

"all resources are unified"[6] in a nonhierarchical network of interconnected beings. Furthermore, land is understood as a "living, agentic force and source of stories"[7] which provides accumulated, intergenerational knowledge of how to relate to others and the world.[8] Stories represent a way of passing on Traditional Ecological Knowledge (TEK), which can be understood as "knowledge gained from attending to the land over generations."[9] This knowledge is then "inscribed in ceremonies and prayers" and to be enacted and shared.[10] Athabascan scholar Dian Million (2014) states simply, "story is Indigenous theory."[11]

While settler scholarship inserts migration narratives and anthropological histories onto Indigenous peoples, Native peoples articulate their creation in their own terms. Anthropological and linguistic evidence has identified the ancestral Karuk as the first inhabitants of the Northwest Coast region of California, with sites dating back to 10,000 B.P.[12] On the other hand, the Karuk people assert their presence in the Klamath River Basin since time immemorial.[13] Karuk creation stories trace their origin back to the Spirit People, or *Ikxareyavs*, the original beings of the world. The story tells of how Coyote, an archetype symbolizing trickery, change, and resourcefulness, stole fire from the Spirit People, initiating a cascade of events that connect fire, plants, animals, and humankind (Figure 2.1).[14] The Spirit People were transformed into animals, trees, rocks, and people, thus establishing "familial bonds [which] persist to this day."[15] Fire is importantly understood as "a central component of that duty of care for the whole world, which is inherited from their common ancestry as Spirit People."[16]

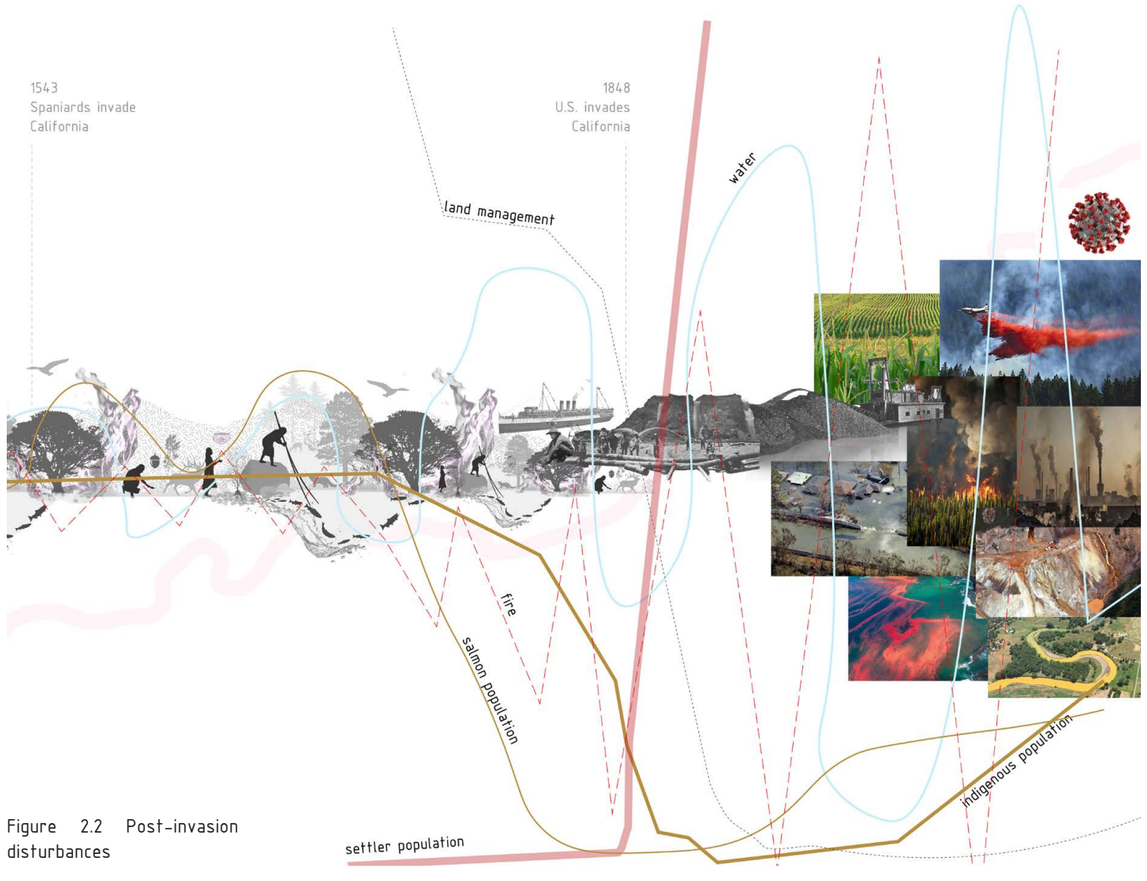


Figure 2.2 Post-invasion disturbances

These foundational stories create a culture of kinship, responsibility, and reciprocity. They demonstrate not only that every entity has a spirit, but also the inseparability of these spirits, as all emerge from a common source. Thus, all beings are understood through kinship relationships. Along with these kinship relationships come responsibilities and obligations, which are met through reciprocity on the part of the nonhuman world, ensuring the long-term mutual survival and wellbeing of all.[17] Ceremony is an important part of carrying out these "ancestral ties of duty"[18] that are revealed through story. In particular, Tishánik is the site of the Karuk Pikyávish ("Fix the World") Ceremony that ensures abundant harvests and balance.[19] As Karuk ceremonial leader Leaf Hillman explains,

"The rocks and the trees and the water and the air, the responsibility that I have, those are real relations. We have not forgotten that we are related and that we have responsibility. And at the same time, we give thanks to those other spirit people for helping to subsist us, and reminding them that we haven't forgot that we owe them something too. So the renewal is renewing the bonds that exist."[20]

Instead of seeing land as a nonhierarchical interdependent network of kinship relations, Western culture holds an anthropocentric worldview where "non-human actors are seen as standing in reserve for human consumption."[21] For someone entrenched in dominant settler colonial culture, the word 'land' most likely evokes ideas of an inanimate patchwork of dirt, soil, and the plants on top of it. It is distinctly separate from humans, and can be divided, owned, sold, claimed, commodified, and extracted for human use. Land does not have agency, but rather is treated as an inert stage upon which domination over racialized bodies, animals, and plants is carried out. As opposed to understandings of land that are rooted in responsibility and reciprocity, Western ideas of ownership have little to do with duty, instead centering on rights of exclusion and individual property claims.[22]

STORY FOR DISPOSSESSION & EXPLOITATION

These constructions of land are central to justifying the violent practices of settler colonialism. As Tiffany Lethabo King, Jenell Navarro, and Andrea Smith (2020) write, "colonization is not simply about stolen land, but about the creation of something called land that can then be stolen."[23] This redefinition of land facilitates a hierarchical and extractive relationship between humans and non-humans, which is typified by the activity of mining. During the mining process, a single resource is ascribed inordinate value and is subsequently extracted and dismembered from its network of relations. Everything leftover after this resource is extracted is considered "waste," reshuffled and thrown out of relation by the disruptive activities entailed by mining. These practices enrich a privileged few at the expense of the many, throwing into disarray complex networks of relations that sustain life on earth (Figure 2.2).

Extraction-oriented practices contrasted with Indigenous land management practices, which altered the landscape considerably, but in ways not legible to white settlers. Upon encountering the Americas in 1492, European invaders found a highly humanized landscape with far-reaching and complex political and trade economies.[24] As Roxanne Dunbar-Oritz summarizes (2014):

"Indigenous peoples had occupied and shaped every part of the Americas, established extensive trade networks and roads, and were sustaining their populations by adapting to specific natural environments, but they also adapted nature to suit human ends."[25]

Dennis Martinez (2003) furthermore describes Indigenous peoples as "keystone players in

ecosystem dynamics" who would, through their "intimate co-evolution and co-adaptation with plants and animals," intervene in natural processes just enough to nudge them towards a mutually beneficial trajectory.[26] Ongoing management practices rooted in stewardship and kinship, and developed through a nuanced understanding of ecological dynamics, produced "an ecological kaleidoscope" of "the world's largest gardens and grazing lands."[27]

Karuk management practices, especially fire, enhanced the presence of ecocultural resources such as game, basketry materials, acorns, and berries.[28] One observer in 1868 noted that "no country in the world was as well supplied by Nature, with food for man, as California, when first discovered by the Spaniards."[29] Karuk enjoyed the benefits of a diet high in many nutrients, the staples of which were salmon (*áama / Oncohynchus tshawytcha & ishyâat / O. kisutch), Tan Oak (xunyêep / Lithocarpus densiflora) acorns, and Manzanita (fath'úruhsa / Archtostaphylos patula & fáath / A. manzanita), and berries (Noorgard 2004 health effects).*[30] Other plants such as willow (*pa'arel / Salix hindisiana) and hazelnut (athithxuntápan / Corylus cornuta), which are used in basketry, are enhanced by cultural burns.*[31] Thus, resources were kept in ample supply through management practices such as burning, coppicing, harvesting, and transplanting.[32] These practices ultimately served to "protect the balance of nature" by "enhancing positives and minimizing negatives."[33]

During our visit to Tishánik, I saw firsthand the clear impact that cultural burns on the landscape, creating areas that had accessible ecocultural resources. Karuk practitioners had even established a burn regime at Tishánik that effectively cleared target areas of invasive Himalayan Blackberry. Our visit was in the middle of March, coinciding with willow and grape root harvesting season. Lisa showed us how willow (*pa'arel / Salix hindisiana) and grape root (aay / Vitis californica) are harvested, and then demonstrated how the two tones can be woven together to create beautiful patterns on a basket. Contrary to so-called "protected" areas under federal jurisdiction which are either used to exclude or extract, these lands under tribal management were alive with Karuk people who would come from far and near to harvest ecocultural resources.*

To justify the dispossession of such complex and deep ties to land and its resourcification, European invaders established their own stories around land and people. Such "ideological justifications" included myths, maps, and laws.[34] These stories are still at play, forming the "structure"[35] of ongoing settler colonialism. Many of these are related to land; as Norgaard et al. (2018) point out, "it is often through controlling such relationships with the environment that race is constructed and wealth is moved from one racial category to another."[36] The California Gold Rush is a prime example of this, as settlers swarmed into an already occupied territory to extract something of perceived value, all the while murdering the original occupants and obliterating their sacred source of livelihood.

Although the Karuk had complex management practices that kept ecocultural resources in rich supply, even helping the first unprepared settlers in the area survive, settlers subsequently justified their violent dispossession over land through Lockean labor theory.[37] Locke's theory "legitimated the appropriation of the American wilderness as a right, and even as an imperative, under natural law."[38] Locke asserted that God's gift of land demanded labor to be expended upon it for it to

Figure 2.3 Manifest Destiny (John Gast / US Library of Congress)

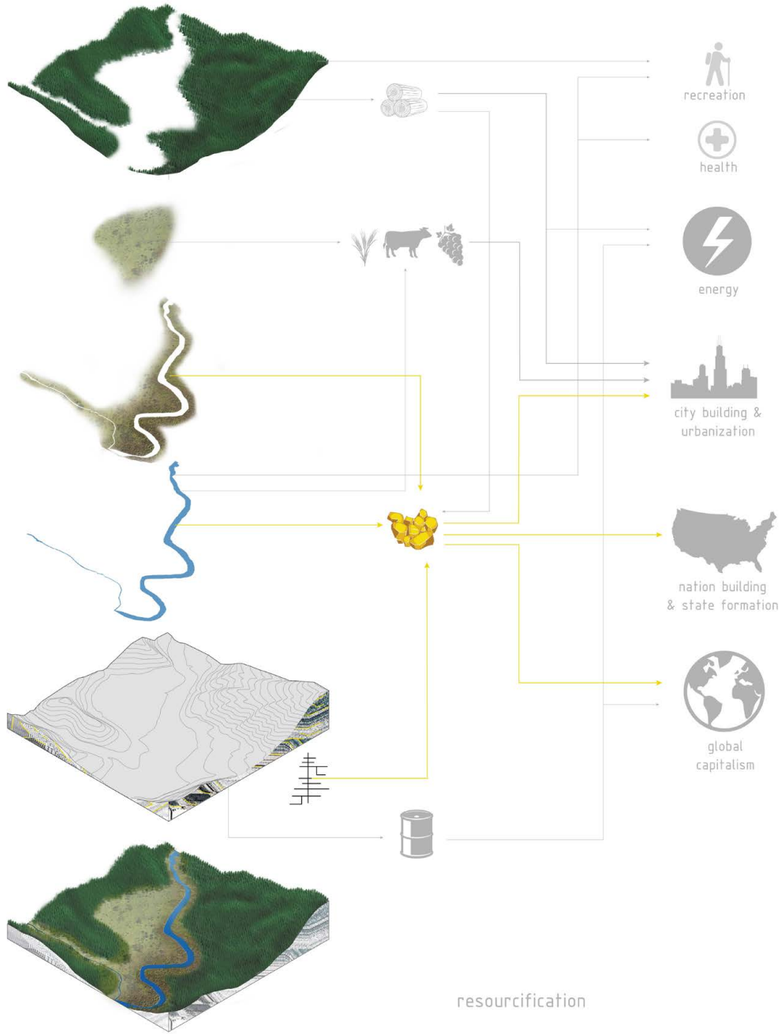


Figure 2.4 The resourcification of the American West

accrue benefits and value. Ideas of production inform narratives of progress, justifying ongoing dispossession. While Indigenous peoples hold place as having the greatest meaning, Western societies derive meaning through historical and developmental terms.[39] Historian Kent Curtis points out the important cultural purpose the iconographic prospector serves in advancing this narrative of progress.[40] The California state seal sanctifies this moment of discovery, showing a prospector alongside the word "Eureka!" Gold mining serves as an exemplary model of the free-labor ideology that envisions the world as a repository of riches awaiting development, and in which those who work the hardest reap the greatest reward.[41]

An ideology of Manifest Destiny underpinned policies in the nineteenth century by the nascent federal government that offered generous gifts of land stolen from Indigenous peoples to settlers (Figure 2.3). These policies, such as the Preemption Act of 1841 and the Homestead Act of 1862, were meant to motivate settlers and industry to expand westward to lay claim to and "improve" the land so the United States could reach its supposedly preordained shape.[42] These policies hinged on the conversion of land into the legal imaginary of property, facilitated through supposedly mimetic representations of land through maps, surveys, and titles. In reality, these forms of representation served to erase Indigenous presence, histories, and relationships on land to render it empty, as well as to obscure the impact of disruptive activities such as mining, logging, and damming, on larger ecological systems.[43]

Gold rushes served as a major driver of settler colonialism in the West. The discovery of gold initiated mass invasions of Indigenous lands through violent processes of elimination and resource extraction.[44] The importance of mineral extraction for nation-building was made into law in 1872 through The Mining Law of 1872 legally separated surface rights above ground from subsurface rights below ground (i.e. minerals), opening all lands 'owned' by the U.S. to exploration and purchase through the act of claiming (Figure 2.4).[45] This law, still intact today, prioritized use of land for extraction above all other uses. Mining claims dismember, separate, and sever the connection between lifeforms in complex relations. It was through mining claims that the sacred lands of Tishánik were converted into something that could be bought and sold, rendering Karuk presence on their ancestral ceremonial lands illegitimate in the eyes of the settler state.

On top of rendering Karuk people illegal on their homeland and incentivizing extraction on their lands, state and federal legislators passed laws criminalizing Karuk traditional practices. Legislators separated Karuk children from their families and sent them to boarding schools as an attack on intergenerational knowledge transfer. Miners, loggers, and industrial capitalists destroyed the material basis for cultural practices through destructive mining and logging activities. Because of these and other forms of attack, the practice of ceremonies was, for a time, halted at Tishánik.[46] Fire suppression policies by the United States Forest Service (USFS) further inhibited the practice of Karuk culture, while also altering ecosystem dynamics in a way that promoted more catastrophic wildfires.[47] Since the 1970s, the federal government has also attempted to curtail the rights of the Karuk to engage in traditional fishing practices.[48] Today, as Leaf Hillman describes, it is still "a criminal act to practice a traditional lifestyle and maintain traditional cultural practices necessary to manage important food resources."[49]

The following two chapters tell the story of two eras of mining by tracing two materials at Tishánik that were thrown out of balance to become designated as "waste" during these eras. First, I trace hydraulic mining impacts by examining the invasive plant Black locust. Hydraulic mining activities obliterated sacred landforms and plant communities at Tishánik, ultimately leading to the establishment of Black locust, an invasive plant that now obstructs the growth of eco-cultural resources and is associated with the wounds of mining. Next, I follow the transformation of dredge tailings during the era of dredge mining. In this era, the Tishánik floodplain was turned upside-down by a massive floating dredge that searched for gold. This disrupted a dynamic floodplain where a free-flowing river once wandered freely, pinning it instead to the opposite bank, where it is quickly eroding land. Like Black locust, the tailings have also disrupted plant communities and inhibited the harvest of eco-cultural plants. Following an analysis of how the "claiming" process led to the severing of relations to create these forms of "waste" that hinder eco-cultural practices, I continue the material flow approach to envision processes of "unclaiming." The unclaiming endeavors to recast these materials into the network of human and more-than-human relations and ultimately support eco-cultural revitalization.

NOTES

[1] Martinez, "Protected Areas, Indigenous Peoples, and The Western Idea of Nature," 249.
[2] Barnett, "Designing Indian Country," n.p.
[3] Coulthard, *Red Skin, White Masks : Rejecting the Colonial Politics of Recognition*.
[4] Coulthard.
[5] Coulthard, 63.
[6] Tripp, Watts-Tobin, and Dyer, "Cultural Resources Specialist Report Prepared for the Somes Bar Integrated Fire Management Project," 2.
[7] Harrison, "'We Need New Stories,'" 16.
[8] Coulthard, *Red Skin, White Masks : Rejecting the Colonial Politics of Recognition*.
[9] Karuk Tribe, "Karuk Climate Adaptation Plan."
[10] Karuk Tribe, 44.
[11] *Theorizing Native Studies*, 35.
[12] Salter, "A Context Statement Concerning the Effect of Iron Gate Dam on Traditional Resource Uses and Cultural Patterns of the Karuk People Within the Klamath River Corridor."
[13] Tripp, Watts-Tobin, and Dyer, "Cultural Resources Specialist Report Prepared for the Somes Bar Integrated Fire Management Project."
[14] Tripp, Watts-Tobin, and Dyer.
[15] Tripp, Watts-Tobin, and Dyer, 3.
[16] Tripp, Watts-Tobin, and Dyer, 3.
[17] Coulthard, *Red Skin, White Masks : Rejecting the Colonial Politics of Recognition*.
[18] Tripp, Watts-Tobin, and Dyer, "Cultural Resources Specialist Report Prepared for the Somes Bar Integrated Fire Management Project," 2.
[19] Karuk Tribe, "Karuk Climate Adaptation Plan."
[20] Leaf Hillman quoted in Karuk Tribe, 52.
[21] Pasternak, "Property in Three Registers," 16.
[22] Pasternak, "Property in Three Registers"; Harris, "Whiteness as Property."
[23] King, Navarro, and Smith, *Otherwise Worlds: Against Settler Colonialism and Anti-Blackness*, 16.
[24] Denevan, "The Pristine Myth."
[25] Dunbar-Ortiz, *An Indigenous Peoples' History of the United States*, 27.
[26] Martinez, "Protected Areas, Indigenous Peoples, and The Western Idea of Nature," 248–49.
[27] Dunbar-Ortiz, *An Indigenous Peoples' History of the United States*, 28.
[28] Marks-Block, Lake, and Curran, "Effects of Understory Fire Management Treatments on California Hazelnut, an Ecocultural Resource of the Karuk and Yurok Indians in the Pacific Northwest."
[29] Norgaard, "Karuk Traditional Ecological Knowledge and the Need for Knowledge Sovereignty: Social, Cultural and Economic Impacts of Denied Access to Traditional Management," 15.
[30] Norgaard, "The Effects of Altered Diet on the Health of the Karuk People: A Preliminary Report."
[31] Marks-Block, Lake, and Curran, "Effects of Understory Fire Management Treatments on California Hazelnut, an Ecocultural Resource of the Karuk and Yurok Indians in the Pacific Northwest."
[32] Marks-Block, Lake, and Curran.
[33] Tripp, Watts-Tobin, and Dyer, "Cultural Resources Specialist Report Prepared for the Somes Bar Integrated Fire Management Project," 3–4.
[34] Preston, "Racial Extractivism and White Settler Colonialism"; Steinman, "Settler Colonial Power and the American Indian Sovereignty Movement."
[35] Wolfe, "Settler Colonialism and the Elimination of the Native."
[36] Norgaard, Reed, and Bacon, "How Environmental Decline Restructures Indigenous Gender Practices," 100.
[37] Salter, "A Context Statement Concerning the Effect of Iron Gate Dam on Traditional Resource Uses and Cultural Patterns of the Karuk People Within the Klamath River Corridor."
[38] Harris, "Whiteness as Property," 1727.
[39] Coulthard, *Red Skin, White Masks : Rejecting the Colonial Politics of Recognition*.
[40] Benjamin Mountford and Stephen Tuffnell, *A Global History of Gold Rushes*.
[41] Benjamin Mountford and Stephen Tuffnell.
[42] Dunbar-Ortiz, *An Indigenous Peoples' History of the United States*.
[43] Harrison, "'We Need New Stories.'"
[44] Benjamin Mountford and Stephen Tuffnell, *A Global History of Gold Rushes*; Madley, *An American Genocide: The United States and the California Indian Catastrophe, 1846-1873*.
[45] Leshy, *The Mining Law: A Study in Perpetual Motion*; Hoogeveen, "Sub-Surface Property, Free-Entry Mineral Staking and Settler Colonialism in Canada."
[46] Hillman, Personal Communication.
[47] Karuk Tribe, "Karuk Climate Adaptation Plan."
[48] Hormel and Norgaard, "Bring the Salmon Home! Karuk Challenges to Capitalist Incorporation."
[49] Leaf Hillman quoted in Hormel and Norgaard, 354.

HYDRAULIC MINING & BLACK LOCUST

HYDRAULIC MINING

Prior to colonial invasion, the hill of Tishánik most likely supported an oak savannah. Traditional management practices, including burns and removal of younger trees, are essential to maintain the health and growth of Tan Oak, whose acorns are major food sources.[1] Fire killed insect parasites, increased harvests, and cleared space for gathering acorns. Upon the arrival of Anglo-American settlers, a series of events severely impacted these trees. Traditional management practices, including burns, were interrupted due to both the attempted elimination of Karuk people and legal bans on burning, leading to changes in species composition. Settler logging practices quickly led to deforestation and decreased stand diversity. Hydraulic mining served as both a direct and indirect driver of these changes to the landscape.

Capitalism

The introduction of hydraulic mining in Gold Rush California represented a significant shift in technology from panning, and had significant social, ecological, and economic impacts (Figure 3.1.[2] First used in 1853, its widespread adoption by 1855 led to a transition in the gold rush from the "open" phase, where gold was accessible to most people, requiring little investment in technology, to the "closed" phase that emerged once easily accessed placer gold was exhausted.[3] By this time, mining became technologically sophisticated and capital-intensive. As John Kincade said in 1871:

"Mining is no longer generally prosecuted by those having a will to work, but is conducted by the few having capital to invest. All that class of mining that was easily discovered and worked has passed away."[4]

Figure 3.1 Hydraulic mining in Gold Rush California (US Library of Congress)

Profits were transferred from individual prospectors and small cooperative groups to hierarchically organized joint-stock companies who owned the machines of hydraulic mining and employed wage laborers in their large operations.[5] This correlated with a decrease in miners' average daily earnings from $20 in 1848 to $3 in 1856, while allowing one man to do the work of six.[6] It was reported that the Orleans Bar Mining Company paid employees between $25 and $50 per month in 1899.[7] It was this reduction in labor costs that made this process profitable, despite the fact that as much as twenty percent of the gold that entered the sluice was washed away with the rest of the debris.[8]

California, being deficient in labor and capital but rich in natural resources, was especially dependent on foreign investment to procure this capital.[9] In 1968, British-owned companies produced 60% of the world's annual gold output.[10] Most of the capitalists who owned the mining companies sat in offices far away from California, profiting from speculation and investment in a boom-and-bust economy. These investors used maps, which serve as "technologies of distance"[11] to manage land and people from afar. Complex realities of place and space were distilled and simplified into "narrow fields of legibility"[12] that flattened Native lands and waterways (complex, layered, and in many relations) to lines on paper.[13] Flattening an ever-changing multidimensional space into a static, two-dimensional representation allowed land to become "objects of colonial knowledge and thus colonizable territory."[14]

This flattening and management from afar occurred in Orleans, where the hydraulic mining syndicate passed from British ownership to New York ownership in 1899 after a weather event led to its abandonment for 8 years.[15] The Orleans Bar Gold Mining Company was the largest placer mining company in Humboldt County, holding 1400 acres of patented land and investing several hundred thousand dollars.[16] It was reported to be "by and under the laws of the territory of Arizona."[17] In 1907, it again changed hands to the California Mining and Dredging Syndicate, registered under the laws of Nevada.[18] Through maps and claims, and the ideologies that underpinned them, settler colonialism in the form of mining brought destruction to the land base of the Karuk, serving to sever place-based relations.

Land

These companies employed hydraulic water cannons, known as "Giants," to turn gold-bearing hills into mud to be separated into gold and waste (Figure 3.2). These high-pressure water streams washed away everything in their path, including soil, boulders, tree stumps, small animals, and gold-bearing gravel (Figure 3.3). All of this material was collected into flumes where gold settled to the bottom and everything else was deposited at the end of the flume and deposited into the river.[19] One observer noted in 1868:

"By no other means does man so completely change the face of nature than by this process of hydraulic mining. Hills melt away and disappear under its influence. . . The desolation remains after the ground, thus washed, is abandoned, is remediless and appalling. The rounded surface of the bed rock, torn with picks and strewn with enormous boulders too large to be removed, shows here and there islands of the poorer gravel rising in vertical cliffs with red and blue stains, serving to mark the former levels, and filling the mind with astonishment at the changes, geologic in their nature and extent, which the hand of man has wrought."[20]

Figure 3.2 Hydraulic mining "Giant" in California (Salmon River Restoration Council Archive / Dobson Collection)

Figure 3.3 Steep bluffs created by hydraulic mining (Wikicommons / Denver Public Library public domain)

Figure 3.4 Steep ledge from hydraulic mining at Tishánik

Figure 3.5 Hydraulic cut through hill at Tishánik

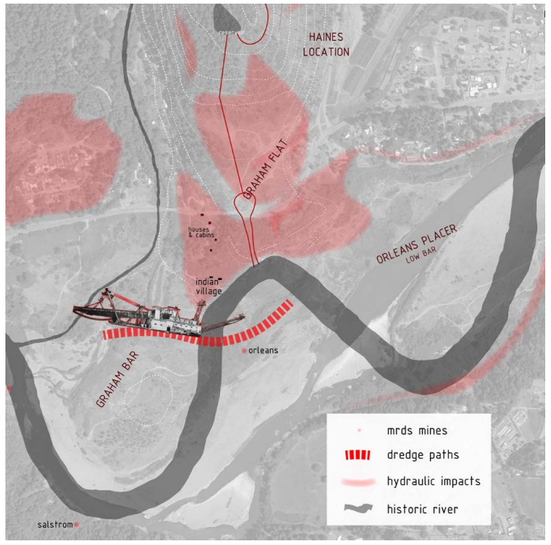


Figure 3.6 Map of hypothesized mining impacts at and around Tishánik

During our time at Tishánik, we saw how hydraulic mining interrupted the softly sloping hills adjacent to the Klamath River, leaving steep, overgrown ledges (Figure 3.4). Mining companies further disturbed the landscape through 'cuts' meant to sample the geologic profile of the earth, creating deep ravines. (Figure 3.5). The "point" at Tishánik, a sacred landform that formed in the Karuk creation story, was washed away by hydraulic mining during this era, as well.[21] In total, it is estimated that between four hydraulic mines on Orleans Bar Gold Mining Company property, nine million cubic yards of material was removed, about three times the volume of the Great Pyramid (Figure 3.6).[22] This material was washed into the Klamath River.[23]

Whole mountainsides like the hill at Tishánik would disappear to recover a relatively miniscule amount of gold, ounce for ounce. While one source claims that the average return per cubic yard of material removed in the area was $1.03 of gold[24], calculations taken from the records of the Orleans Bar Gold Mining Company indicate a return of sometimes only half a cent per yard.[25] In contrast to these relatively meager returns, the losses to the Karuk were immense, as their more-than-human relations lifeways were destroyed. However, despite settler attempts to eliminate the Karuk and dispossess them of their lands, they continually returned, and their presence is even marked on the historic map from the hydraulic mining era (Figure 3.7).

I have begun modeling the loss of land from hydraulic mining at Tishánik using drone imagery collected by my collaborator Sofi Courtney, which was then converted into a three-dimensional Rhinoceros (Rhino) model of the site by my collaborator Morgan Southall. I then traced the contours from the historic Sanders Map, and used the Rhino plugin Land Design to create a three-dimensional overlay of historic conditions (Figure 3.8)). Before our visit to Tishánik in July, I will create a physical interactive model that can be shared during the community workshop and be used to share the history of Tishánik with Karuk youth. However, because the historic map was made after hydraulic mining activities had already begun, the original landforms are probably still not accurately represented. The model can serve as a basis for community dialog that can help spark memories and stories that further inform the model in future iterations. While this might entail more accurate historic contours for the model, co-generation and iteration might also spark other forms of additional information. This might be concrete or abstract, memories of the past or visions for the future.

Law

The impacts of hydraulic mining are not limited to contour lines. Once water had transformed the earth's crust into a muddy substance and the small amounts of gold it delivered were collected, thousands of tons of 'debris' were deposited into river valleys below the mines.[26] This negatively impacted downstream farms and towns, causing flooding and creating soil that nothing could grow in. The Federal Act of 1866 and the General Mining Law of 1872 served to establish mineral claims as the priority use on federal land, and for some time, the negative impacts of mining were ignored.[27] California judges were quick to protect hydraulic miners with the legal infrastructure that had been established to protect individual miners.[28] However,

Figure 3.7 Late 1800s Sander's Map for the Orleans Mining Syndicate overlaid on 2018 NAIP imagery (Karuk GIS Department)

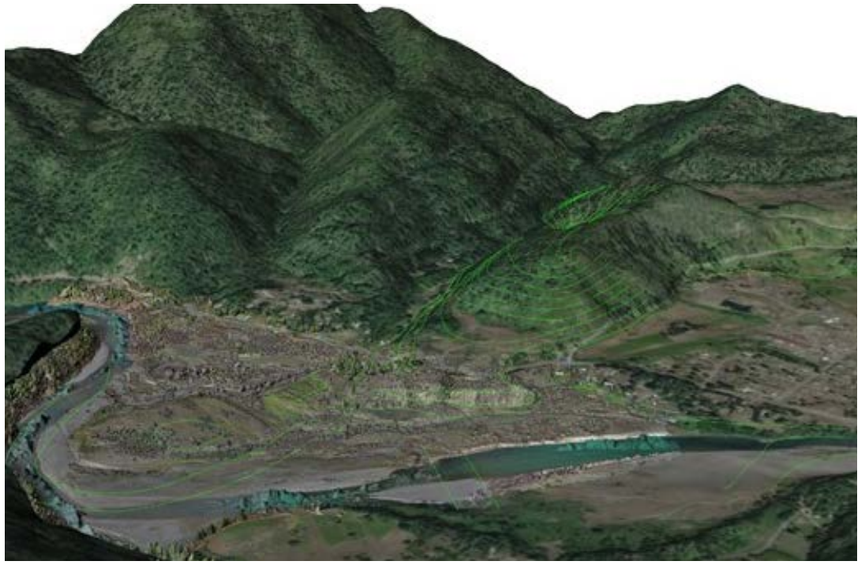


Figure 3.8 Rhino model of Tishánik with historic contours overlaid in green to visualize land loss from hydraulic mining

the legal environment shifted in the 1880s, when, due to pressure from industrial farming interests and railroad moguls, its privileges were majorly curtailed.[29]

While we were overlooking Tishánik and Camp Creek, Leaf described a legal case from the hydraulic mining era between the Orleans Bar Gold Mining Syndicate and a private landowner who owned part of Tishánik during that era.[30] I subsequently located the file at the Humboldt County Courthouse to pass on and make accessible to the Tribe. I also drew on this account to further my understanding of the impacts of hydraulic mining on Tishánik. The case, which made its way to the Supreme Court of California in 1908, set a precedent that miners were liable for the impacts of depositing mining debris into streams if it caused a diversion or damaged downstream property. This was established after the Orleans Bar Gold Mining Syndicate accidentally released a massive amount of hydraulic mining debris into Camp Creek, altering its path more than any known flood had done. Through the description of the conditions before and after the release, we can begin to reconstruct the historic conditions of Camp Creek in the future.

Water

To supply the water for this mass reshuffling of matter, huge amounts of impounded water was necessary. Since the discovery of gold, teams of miners have attempted to regularize and control the river flow through the construction of dams, reservoirs, ditches, and diversions.[31] Reservoirs that submerged valley forests held water in reserve, which was then distributed through ditches to supply the giant hoses with a steady water supply.[32] In Orleans, a twelve-mile flume was constructed to carry water from Camp Creek to the various mining claims (Figure 3.9).[33] However, no means of regularization could fully control the water, "the principal tool of placer mining," although much effort was put into attempting to do so.[34] The activities of mining companies were largely governed by seasonality, as they awaited adequate supplies of water.[35] In the off-season, companies would put their men to work building the necessary infrastructure to facilitate the conveyance of water and debris.[36] These cycles of labor can be traced in the Orleans Bar Gold Mining Company's records, which record how many workers were involved in what activities. On the other hand, early-season water events would wash out dams and destroy the preparatory work that had been done, and costs would not be recovered.[37]

Lumber

The California lumber industry took off to meet increased demand for wooden flumes and viaducts that carry the hydraulicked material (Figure 3.10). By 1870, one third of the state's accessible timber was gone.[38] This included Tan Oak, which was also valued for tanning hides into leather, hence its name. The settlers perceived Tan Oak as a commodity and a barrier to accessing auriferous gravel resting in hillsides. However, these native tree stands were important relation for the Karuks, who managed them through burns and in return received a bounty of food.[39] Through the destruction of Tan Oak ecosystems, settler colonial notions of land and resources severed these relations and in effect served to control the population economy.[40] In addition to clearing Tan Oak and other native tree species to mine and use as infrastructure, settlers also carried with them new species to plant, many of which took hold and became invasive. *Robinia pseudoacacia,* or Black locust trees, are one of these plants, and continue to impact Tishánik today.

Figure 3.9 Newspaper clipping from 1900 announcing the completion of a flume running from Camp Creek to Orleans (Humboldt Times, 1900)

MINING COMPANY HAS ITS FLUME COMPLETED.

From Joseph H. Pitt who was in town yesterday from Orleans it is learned that the Orleans Bar Gold Mining Company has its long flume and ditch completed, and will begin active operations in a short time. This flume, twelve miles in length, runs from Camp Creek to Orleans. It is five feet wide and three deep and will carry 2700 inches of water. The supply is practically inexhaustible, which will enable the company to mine almost the year round on its 1310 acre tract of mining ground, which gives promise of big returns.

Much credit is due to Superintendent P. L. Young under whose supervision the flume was constructed. The property under his management should yield its owners profitable returns.

Figure 3.10 Hydraulic mining wooden flumes (USGS / https://www.regionalsan.com/post/mercury-central-valley)

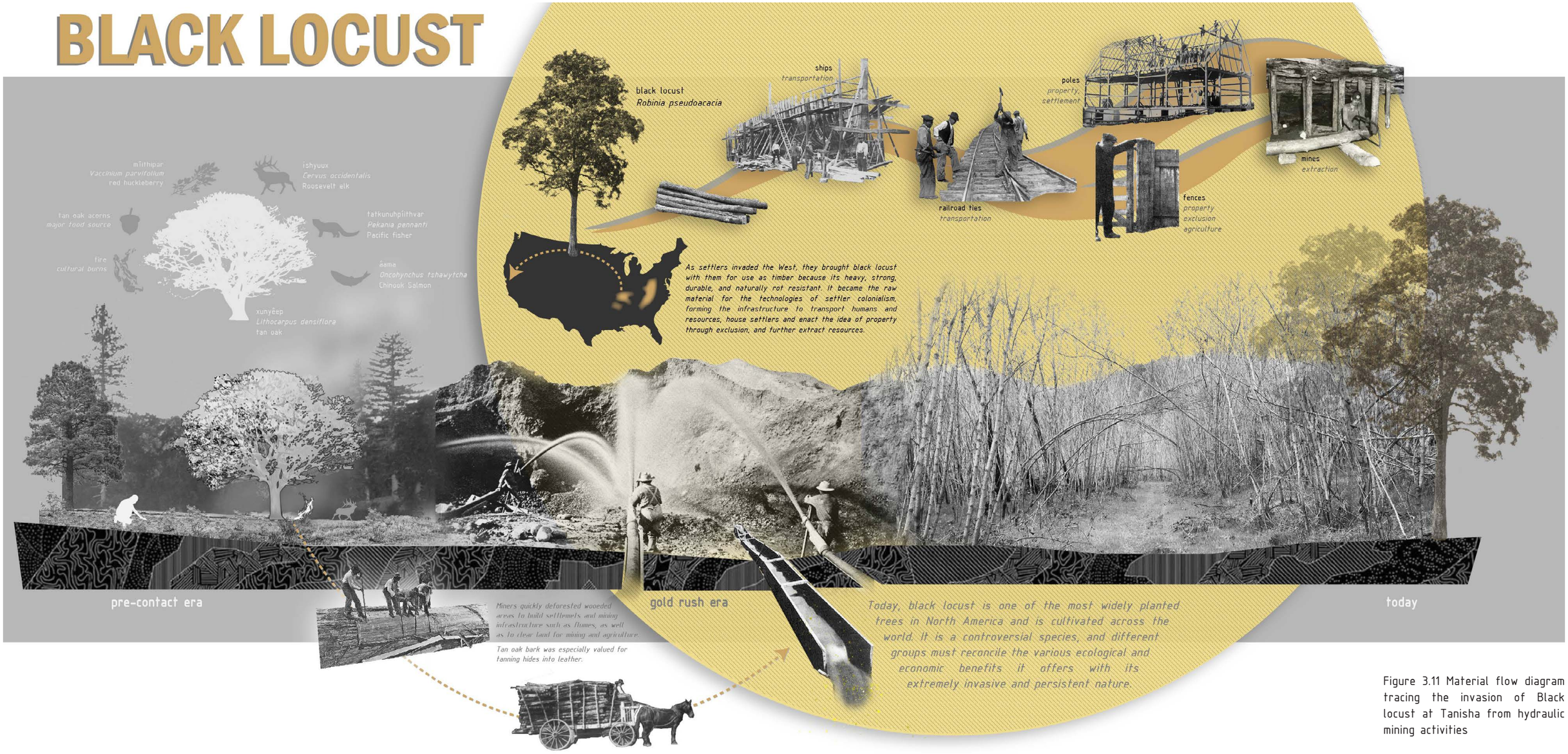


Figure 3.11 Material flow diagram tracing the invasion of Black locust at Tanisha from hydraulic mining activities

BLACK LOCUST

In the early 1900s, Black locust trees were planted across North America (Figure 3.11).[41] Native to the Appalachian Mountains and Ozark Plateau, settlers planted this deciduous tree outside of its native range for its aesthetic, economic, and ecological services.[42] Its fast growth and adaptability make it a good pioneer species, and its ability to colonize nutrient poor soils and disturbed ecosystems have led to its application for mine reclamation, reforestation, and erosion control.[43] Its durable and rot-resistant wood was valued for use as fence posts, mine timbers, poles, railroad ties, ship timber, firewood, pulp, crates, and other uses.[44] It is hypothesized to have been brought to California by gold-rush era settlers. Its timber provided raw material for the infrastructure that facilitated mining and settler colonialism. This included mine shafts and flumes, railroad tracks and ships, fences to delineate property, poles for building homes, shade in the summer, and fuel for cooking and heating fires. Furthermore, it has a long history of use for reclaiming mine sites. Studies on revegetating mine sites by planting Black locust began in the 1920s, with widespread cultivation for this purpose by the 1940s.[45]

However, the same qualities that make it a good candidate for mine reclamation make it an aggressive invader in many ecosystems. The spread of a mining-era stand of Black locust trees at Tishánik has been devastating, extinguishing and replacing many acres of native species. The Karuk community perceive Black locust as an insidious reminder of colonialism and the violent gold rush era. Black locust trees aggressively invade oak, beech-maple, and fragmented native prairie and

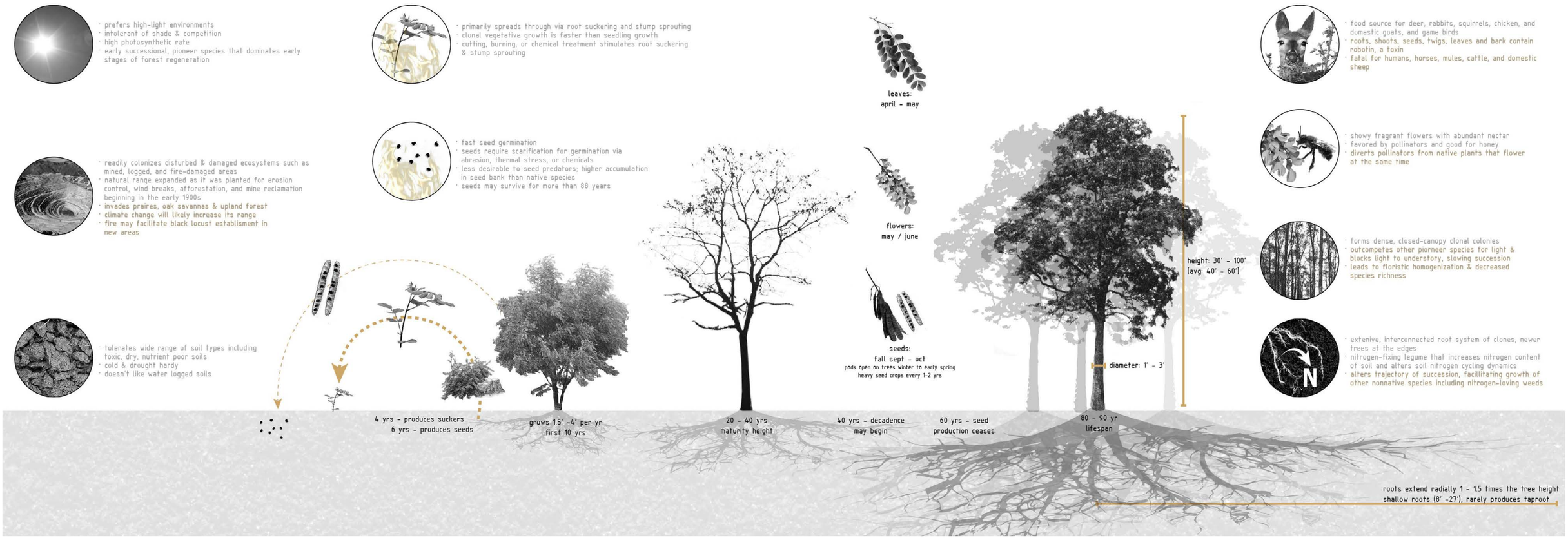
savanna ecosystems, forming dense colonies that shade out both native understory and overstory plants, leading to floristic homogenization.[46] At Tishánik, where hydraulic mining has removed much of the topsoil and native vegetation, leaving steep, exposed, bare soil in its wake, Black locust colonized easily, preventing the reestablishment of oak savanna, which today faces threats from Sudden Oak Death and climate change.[47] Black locust is also a nitrogen fixer, which, while adding nutrients to the soil, alters ecosystem structure and dynamics.[48] This is especially true in California, where many natives species grow on hillsides and thrive in thin, low-nutrient soils.[49] Furthermore, Black locust may lure pollinators away from native plants.[50]

Black locust spreads both through seed dispersal and vegetative regeneration (Figure 3.12).[51] The trees begin producing seeds by their sixth or seventh year, peaking in production between 15 and 50 years, and continuing with heavy seed production every 1-2 years until about 60 years of age.[52] Seed pods containing 4-8 seeds open on the tree in winter and early spring.[53] Seedlings can grow up to 3 feet per year.[54] Although stands have a heavy seed load, producing up to 12,000 seeds per square meter, they have a low germination rate and don't spread far due to their relatively large size.[55] The impermeable seed coat requires scarification through frost, rain, soil microbes, or chemicals, abrasion, or fire.[56]

More often, black locust reproduces vegetatively through vigorous root suckering and stump sprouting.[57] Suckers spontaneously originate from adventitious buds beginning when trees are as young as four to five years old and until they are up to 70 years of age.[58] In this way, it forms groves of clones interconnected by an extensive fibrous root system where the oldest trees are in the center, spreading up to 3-10 feet annually.[59] Seedlings are taller, grow faster, and achieve reproductive maturity earlier compared to other species of the same age.[60] Not only is Black locust extremely resistant to disturbance, but physical, chemical, and fire damage increases its suckering and sprouting activity, making it extremely difficult to control.[61] The growth rate of cut stands is about twice as fast as uncut stands, and these stands reach maturity in about half the time.[62]

Controlling Black locust can be likened to battling the Greek monster Hydra—cut one head off and two others grow back in its place. It continues to be one of the most cultivated trees in North America as different interest groups debate whether its ecosystem and economic benefits outweigh its risk as an invasive and persistent tree.[63] There is no consensus on the best way to control, and "no single technique has been identified as being entirely effective."[64] A combination of physical and chemical control is perceived as the best option, but short-term control is at odds with the long-term likelihood for resprouting several years after treatment with a seedbank that can survive as long as 80 years.[65] Many recommend simply

Figure 3.12 Black locust characteristics and life cycle



focusing on controlling the spread, one publication recommending:

"Where robinia are widely established, they can no longer be eradicated. In such areas, the aim should be to find management options that exploit the species' positive characteristics and minimises its negative impact."[66]

The hydraulic mining era thus both served to alter the sacred landforms of Tishánik, but also continues to threaten important eco-cultural resources for the Karuk through the establishment of Black locust that grew in the wake of its destruction. These trees remind our collaborators of the trauma and dispossession that this disturbance has and continues to cause. The era that followed was dredge mining, which also left a legacy of material accumulation that serves as a reminder of these traumas: dredge tailings.

NOTES

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DREDGE MINING & TAILINGS

DREDGE MINING

In 1913, the San Francisco Call reported that in Orleans, "conditions have reached a point where [hydraulic] mining no longer pays."[1] Instead, the Orleans Bar Mining & Dredging Syndicate leased a 15,000 acre belt of "virgin gravel 40 feet deep" along the Klamath river to the Oroville Light and Power company for the purposes of operating a dredge.[2] Small scale dredge mining in California had begun in the late nineteenth century after the technology was developed in New Zealand in the 1860s and the designs were brought to a San Francisco iron company for production in 1887.[3] It proved to be the most cost-effective method of mining yet, and "even development of efficient, modern heap-leaching has not succeeded in producing gold at as low an operating cost as dredging."[4] Between 1895 and 1948, California produced 12.5 million ounces of gold through bucket-line dredging, representing over half of total US bucket-line dredge production in that time period (Figure 4.1).[5]

The floating bucket-line dredge is essentially "an enormous self-contained, mobile production unit combining both mining functions and metallurgic recovery"[6] (Figure 4.2) Most auriferous gravels in California were adjacent to or set away from waterbodies, and the dredge provided an effective means of reaching this gold.[7] The dredge consists of a continuous chain of buckets on a ladder which scoops up auriferous gravel from the "chewing" end, creating a pond in front of itself on which it floats (Figure 4.3).[8] As the bucket chain circulates, excavated ore is emptied from the buckets into a processing area aboard the dredge. Conveyors separate the ore and waste, and gold is recovered through amalgamation or gravity, while the tailings are discharged from the stacker behind or

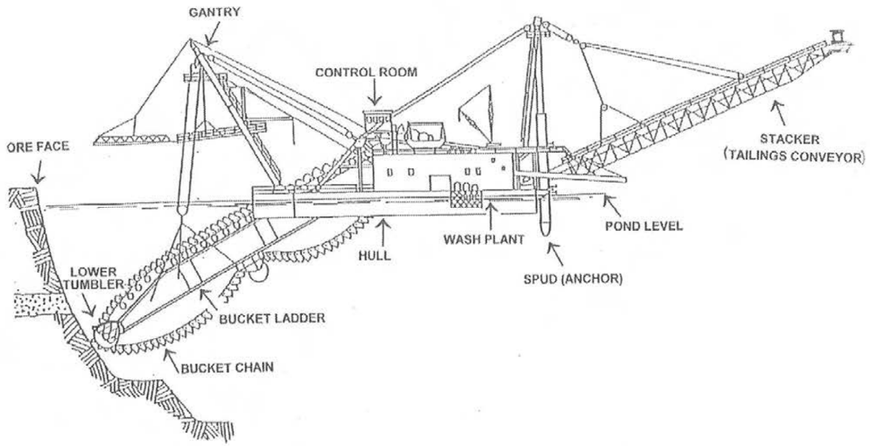

Figure 4.2 Schematic diagram of floating bucket-line dredge (Kirshenbaum, 2000)

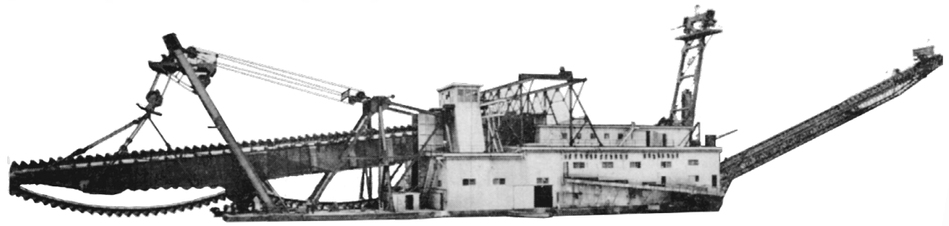

Figure 4.1 Floating bucket-line dredge (Sawin, 1949)

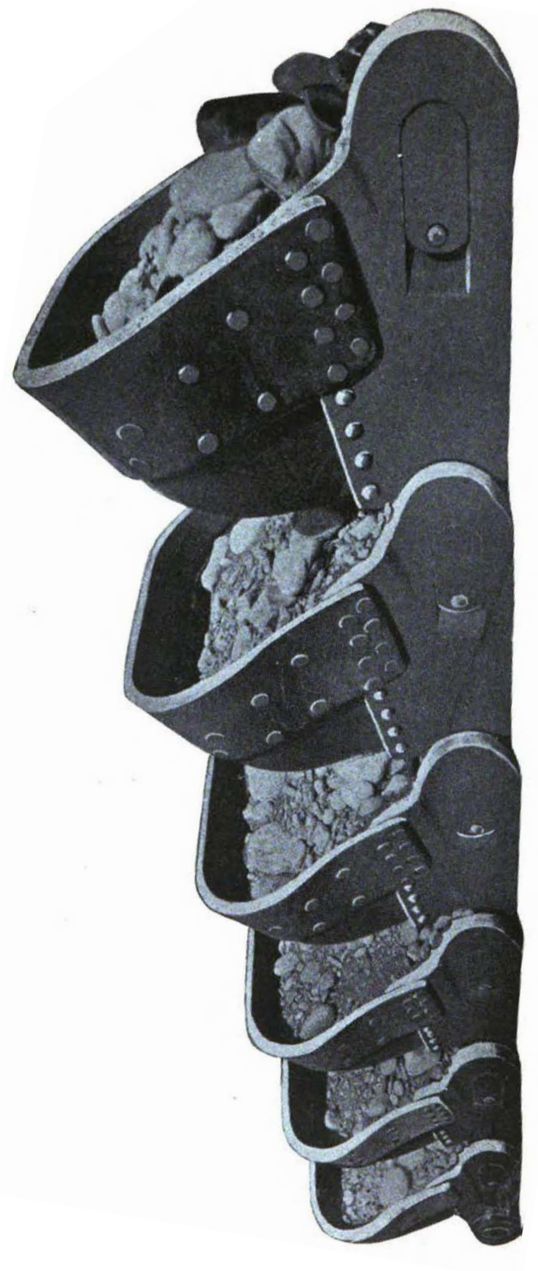

Figure 4.3 Bucket chain (Aubury et al., 1905)

alongside the dredge.[9] The overall effect can be likened to turning the river upside-down, leaving "a wasteland of boulders" in its wake (Figure 4.4).[10]

These were huge machines, up to 500 feet long, although dredges in the Klamath were typically smaller than the larger ones in the Sierras.[11] Capable of digging 30-40 feet and displacing 1,000 to 1,500 tons, they could excavate around 250,000 yards per month.[12] A good deposit returned 50 cents of gold per cubic yard excavated, and monthly yields averaged $40,000.[13] On top of being able to process massive amounts of rock matter, dredge operations only required a very small crew, which further reduced labor costs, although it represented a significant initial investment (for instance, a 1913 newspaper article about dredging in Orleans quotes a cost of $75,000 for a dredge).[14] Therefore, this mode of mining continued the trend of funneling profits to a few small beneficiaries who have the capital to invest in technology capable of significantly altering the landscape.

The profitability of dredge mining led to its dominance in the early twentieth century as hydraulic and lode mining declined.[15] By 1910, there were sixty-eight dredges operating in California by thirty-one companies.[16] However, its greatest contribution to gold production began in the late 1930s and lasted until 1942.[17] However, at the beginning of World War II, the War Production Board Order L-208 prohibited gold mining, effectively ending the dredge era.[18] U.S. dredge production saw peak in the year of 1940, most of which occurred in California.[19]

The year 1940 was also the one year that a dredge operated in Orleans, according to oral history (Figure 4.5).[20] This relatively short mining phase contrasts with the long-lasting damage it caused to the floodplain, as well as the long amount of time spent making exploratory holes to determine if it would be profitable. Borings began in 1913, when an 8,000 pound prospect drill was brought to Orleans bar using the newly built county road.[21] The dredge was intended to operate in two phases, first moving downstream in a way that would significantly alter

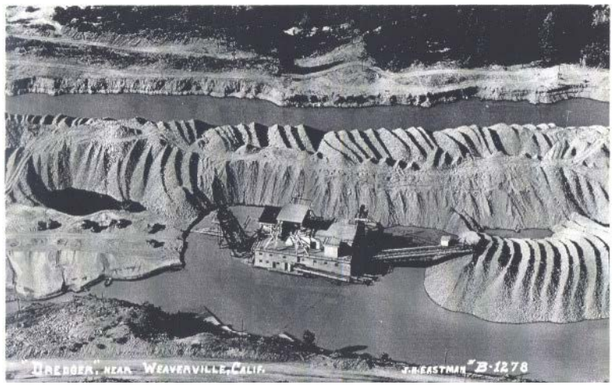

Figure 4.4 Gravel deposits from dredge mining (Trinity Council Historical Society / Agee, 2007)

the river alignment, and then reversing its course to correct the alignment.[22] However, it never completed the second phase, as the machinery was dismantled and converted into war materials at the start of WWII.[23] The remains of the dredge were left abandoned in the middle of the floodplain at Tishánik for many years (Figure 4.6). This history is still being pieced together, and its path and story will hopefully be recovered further in subsequent community gatherings with the aid of photographs and maps. The maps I have produced that reconstruct past mining activities (Figures 3.6 & 4.7) are based on assumptions given information currently available.

Figure 4.5 Dredge at Tishánik in 1947 (USGS)

TAILINGS

Despite the relatively short time that dredging took place, it had immense impacts on the floodplain. The alignment of the river channel has been dramatically shifted, and there is significant buildup of tailings that prevents inundation. During our visit to Tishánik, Sofi Courtney and I recreated a photograph from before the dredge mining era (likely early twentieth

Figure 4.6 Dredge sitting at Tishánik (Adrienne Gilkison Collection / Jeff Buchin)

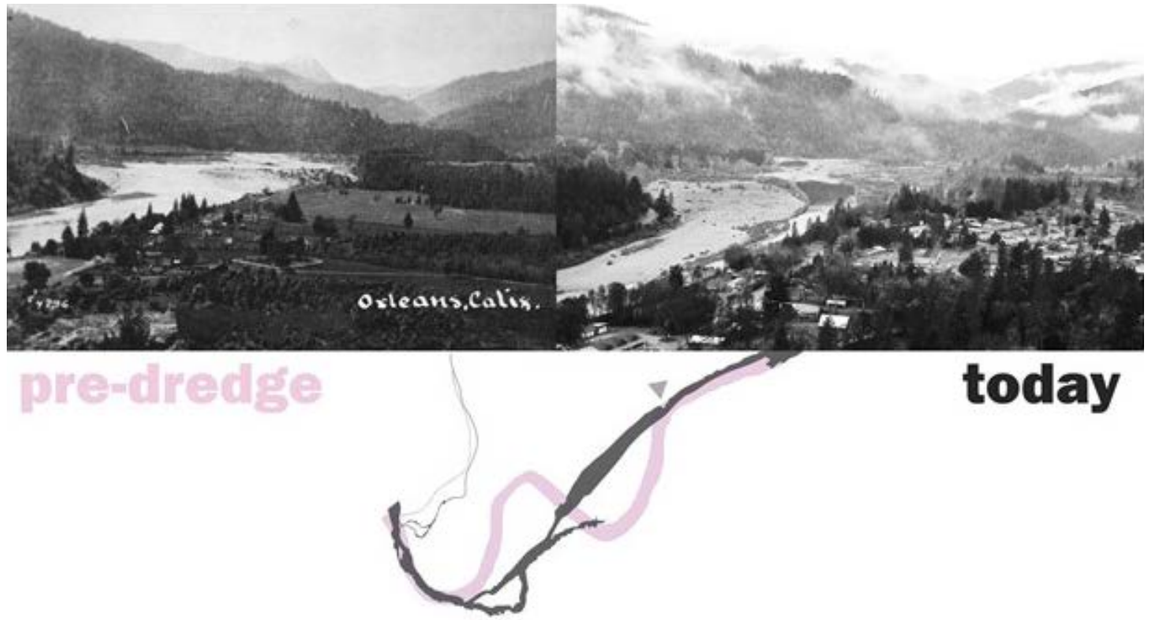

Figure 4.7 Photographic comparison of the Klamath River and Tishánik pre-dredging and today

century) to reveal these changes (Figure 4.7). Because the hill from which the original photograph was taken had been hydraulicked away, we used a drone to capture the same angle. The juxtaposition of the two photographs reveal some of the impacts that can't be captured by a two-dimensional map alone.

The dredge tailings displaced a berm of boulders into the middle of the river, which was then further altered by massive flooding events in 1955 and 1964.[24] The impacts of each of these events on the river channel can be understood better by examining maps and aerials from the years following each disturbance (Figure 4.8). A map from the late nineteenth century and an aerial from 1944 show the impact of the dredge; the northernmost fold of the river that once met the hill of Tishánik shifted significantly southward, while its southernmost fold has moved even more southward. The next aerial available is from 1998, which shows the impacts of 1955, 1964, and 1997 floods. Again, the river alignment has overall moved southward.

Oral histories and archeological evidence illustrate the increasingly severe impacts of these large floods, which are predicted to become more frequent as climate change increases rain-on-snow events.[25] Leaf Hillman explained that contemporary floods "are catastrophic because of the way the river has been altered so dramatically."[26] Another community member noted, "these floods all came after the mining started."[27] Because of the conditions set by mining activities, the flood of 1955 and 1964 had significant impacts on the floodplain and vegetation. The '55 flood scoured the riparian corridor, and to this day there is a marked reduction of mature vegetation in riparian areas.[28] One traditional fisherman recounted:

"Everything here was affected by the '55 flood. It was one way of Nature telling us that we had to change. We had to change our ways. It was devastating. Every creek, every river, everything on this river was affected. It straight guarded everything. It took the creek from being a creek to being a gutter. Now it's nothing. It's got no vegetation around it, just bare rock. The vegetation protects the water. Wherever there's trees they

late
1800s

1944

1998

2009

2015

1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020

placer mining

hydraulic mining

dredge mining

flood
of 1964

flood of 1955

Figure 4.8 Map and timeline of historic mining and flood events compared to alignment of the Klamath River over time

Figure 4.9 Undulating landscape of Tishánik

Figure 4.10 Thick blackberry stand at Tishánik

Figure 4.11 Raised unvegetated river bar at Tishánik

do a great deal for the water because they give it the proper shade. They give it the proper habitat that it needs to keep flowing . . . now there is just a straight flow of water going down the creek with no life."[29]

This lack of vegetation is notable at Tishánik, both along the Klamath River and Camp Creek. When the 100-year flood of 1964 came, there was little left to scour, and it instead "smoothed out everything."[30] Fine sediment from the surrounding hills that had been mobilized by road building and logging activities was deposited along the floodplain, including Tishánik.

The cumulative effect of dredging and successive flooding events has left Tishánik with significant buildup of small boulders and rocks in an undulating landscape with a thin layer of soil covering (Figure 4.9). It is unknown exactly how these elements have settled over time, and further studies are needed to understand the cross-sectional composition of the site. However, the presence of significant boulders across the site is likely hindering the growth of desirable species. Additionally, the river floods backwater habitats at only the highest flows, which reduces their ecological function. Willows are not being scoured regularly, and old stands attract insects and are not useful for basket weaving. Blackberries have colonized other parts of the potential inundation zone in thick, impenetrable stands (Figure 4.10).

On the south edge of the site, along the river bar, the boulders and rocks are stacked too high to be submerged by the river under normal flow (Figure 4.11). Because of this, water isn't scouring the bars and willows, and other riparian plants are unable to establish, leaving the floodplain deficient in vegetation. The lack of vegetation and small gravel has significant impacts, especially on salmon and other fish species. Subsurface (hyporheic) river flow passing through tailings gets hotter because tailings absorb heat during the day and stay hot at night.[31] Vegetation provides shade and absorbs heat without transmitting it to the passing water. Warm water temperatures threaten salmon, who are adapted to live in only a narrow range of temperatures.

Salmon traditionally accounted for 50% of energy and protein in the Karuk diet, making it the main food source alongside Tan Oak acorns.[32] By 2003, the Karuk diet consisted of only 1.1% of the salmon consumed before invasion.[33] Along with the health impacts of reduced access to traditional foods, the reduction in salmon population also

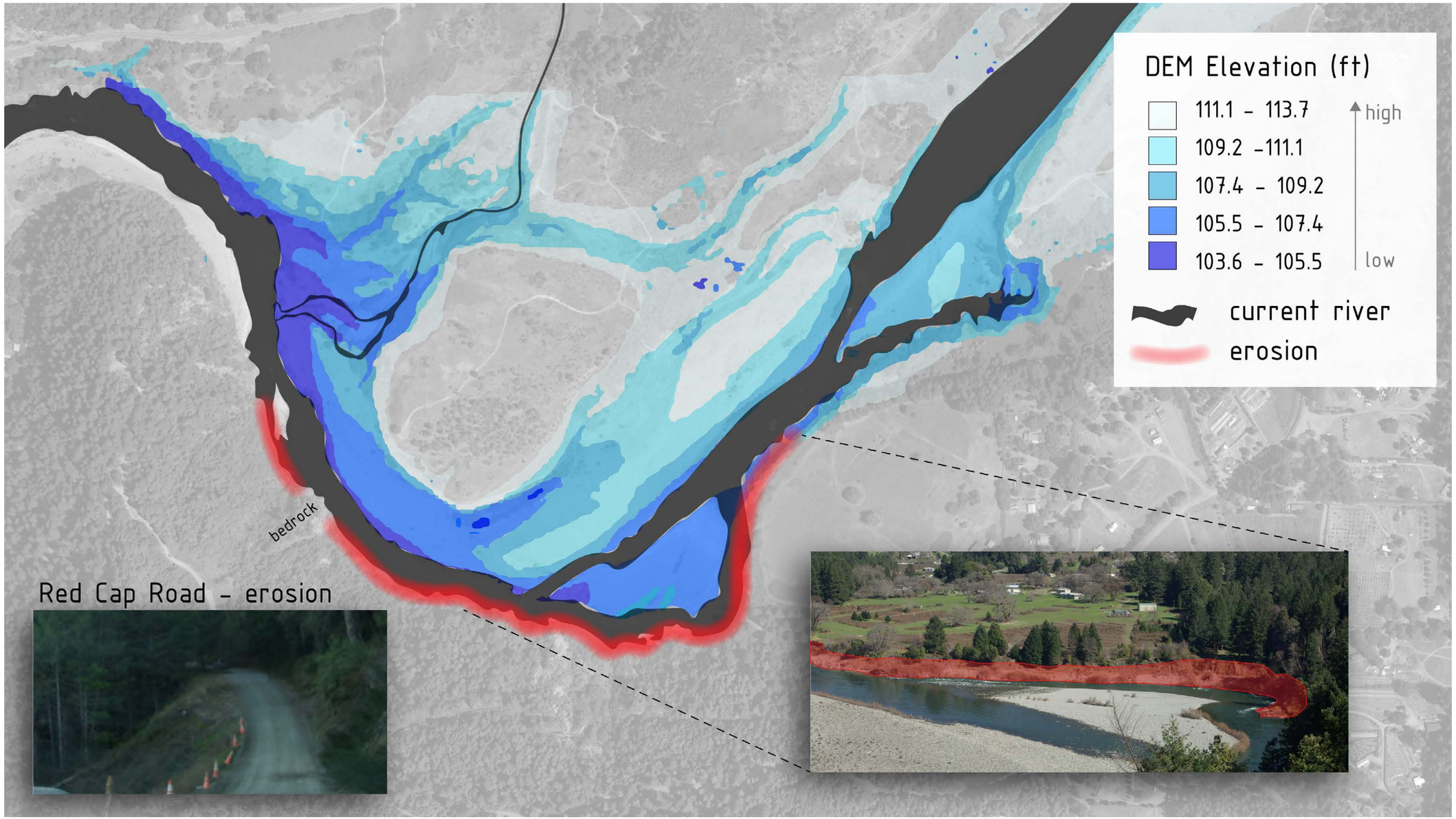

Figure 4.12 Map of impacts of dredge mining, showing the elevation profile of Tishanik and erosion of the south bank of the river

impacts cultural practitioner's ability to carry out ceremonial practices that are tied to fish migration and consumption.[34] Other contributing factors to the steep decline in salmon include overharvesting in commercial fisheries, hydroelectric dams that pollute the water and prevent migration, agricultural water diversions, levees that limit floodplain habitats, and erosion of fine sediments that clog spawning gravels. Salmon are also a keystone species, meaning their decline leads to cascading impacts onto other species, ultimately devastating ecosystems. The tailings are therefore preventing the Karuk from practicing their culture, ultimately upholding settler colonialism.

Another significant impact of the dredge mining tailings at Tishánik has been to pin the river to the south bank. Because the floodplain has essentially been turned upside down, with larger boulders now on top, the river channel is no longer able to move freely across it. The energy of the river is instead being diverted to the less solid south bank, where it is causing significant erosion. We saw firsthand the impact of this erosion as we drove on Red Cap Road, which has already collapsed on two previous occasions as a result of the force of the river, and threatens to do so again (Figure 4.12). We stood on the one small section of road that has held steady due to the bedrock that juts out of the hill, look out at the altered river alignment and recent erosion of the south bank while Leaf described to us the impact of dredging, from habitat destruction to this erosion. The south bank contains private land parcels that have experienced continual land loss over time. Red Cap Road, the only access road for around 200 households, runs along the south bank on a steep hill, and has already been wiped out twice due to erosion. A new road was built higher on the slope but risks another blowout from continued erosion. Leaf Hillman has called it an "endangered road."[35]

Like hydraulic mining and the resulting persistence of black locust, the legacies of dredge mining live on today, preventing the establishment of eco-cultural resources, threatening fish habitat, and causing erosion of land. Sacred riverbed rocks that once served as the platform upon which other relations such as the river, salmon and humans co-existed in balance were extracted in mass quantities to recover small amounts of gold. These rocks, now called "tailings" and considered waste, were overturned, placed in such a way that they now threaten the Karuk's ability to fulfil their *píkyav* responsibilities to the world. Both these tailings and the black locust can be sited in the dimensions of settler colonialism because they destroy traditional place-specific habitats necessary for cultural survival as well as deny possible futures through their persistence and magnitude.[36] The next chapters will present an "unclaiming" approach to reinstating these materials back into the network of relations that sustain Karuk eco-cultural practices and lifeways.

NOTES

[1] "Work in Mining Camps Still Going Forward: California - May Build New Dredge."
[2] "Work in Mining Camps Still Going Forward: California - May Build New Dredge."
[3] Kirshenbaum, "The Giant Gold Diggers: California's Land-Going Fleet of Dredges."
[4] Kirshenbaum, 11.
[5] Kirshenbaum, "The Giant Gold Diggers: California's Land-Going Fleet of Dredges."
[6] Kirshenbaum, 11.
[7] Kirshenbaum, "The Giant Gold Diggers: California's Land-Going Fleet of Dredges."
[8] Agee, *Steward's Fork : A Sustainable Future for the Klamath Mountains*, 133.
[9] Kirshenbaum, "The Giant Gold Diggers: California's Land-Going Fleet of Dredges."
[10] Agee, *Steward's Fork : A Sustainable Future for the Klamath Mountains*, 133.
[11] Agee, *Steward's Fork : A Sustainable Future for the Klamath Mountains*.
[12] Agee.
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[14] "Work in Mining Camps Still Going Forward: California - May Build New Dredge."
[15] Agee, *Steward's Fork : A Sustainable Future for the Klamath Mountains*.
[16] Kirshenbaum, "The Giant Gold Diggers: California's Land-Going Fleet of Dredges."
[18] Kirshenbaum.
[19] Kirshenbaum.
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[21] "Work in Mining Camps Still Going Forward: California - May Build New Dredge."
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[27] Quoted in Salter, lvii.
[28] Salter, "A Context Statement Concerning the Effect of Iron Gate Dam on Traditional Resource Uses and Cultural Patterns of the Karuk People Within the Klamath River Corridor."
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[30] Salter, xl.
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[33] Norgaard.
[34] Norgaard.
[35] Hillman, Personal Communication.
[36] Steinman, "Decolonization Not Inclusion."

UNCLAIMING PMLS

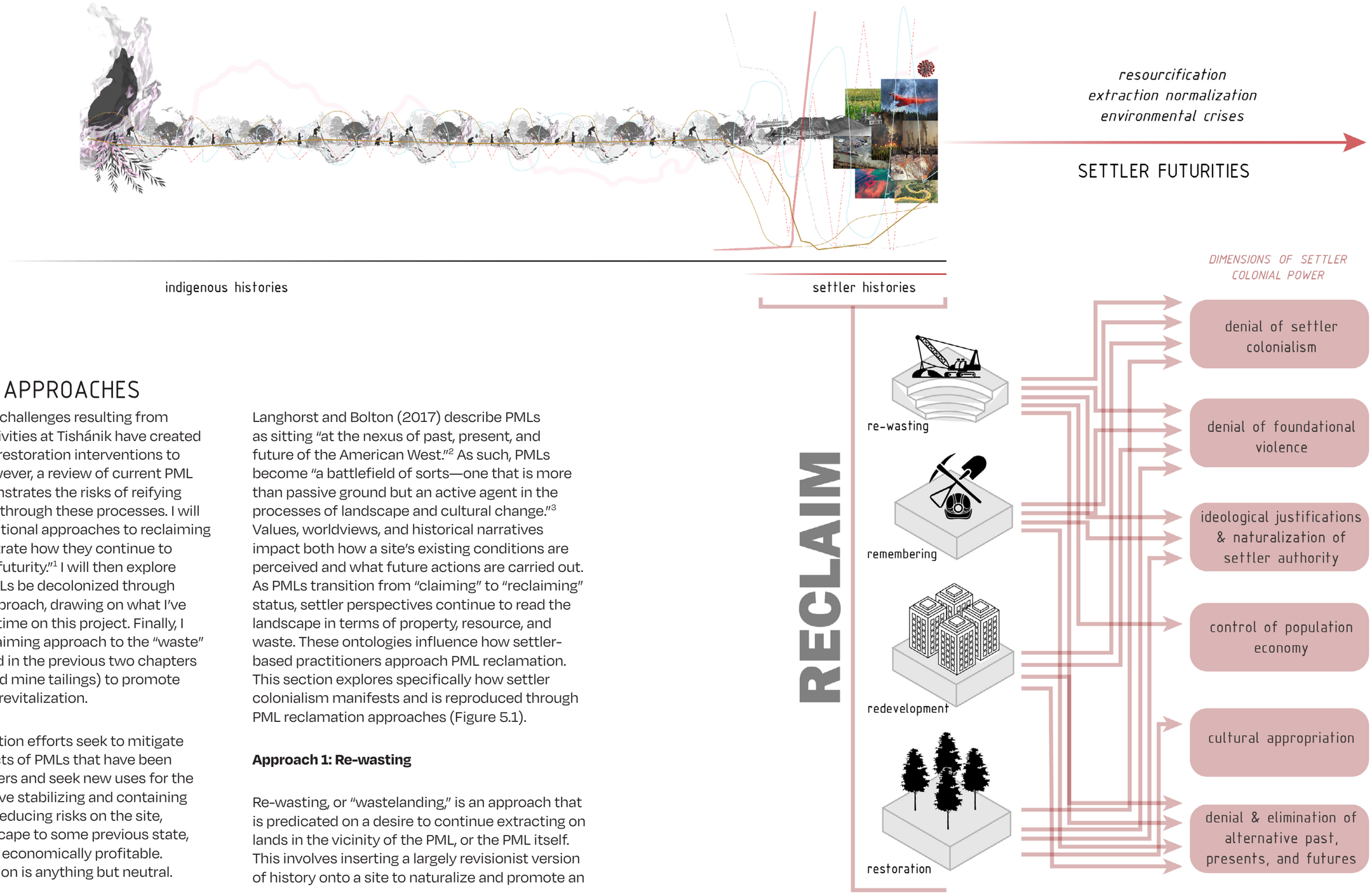

Figure 5.1
Conventional reclamation approaches and settler futurities

RECLAIMING APPROACHES

The myriad challenges resulting from historic mining activities at Tishánik have created an opportunity for restoration interventions to be introduced. However, a review of current PML reclamation demonstrates the risks of reifying settler colonialism through these processes. I will first lay out conventional approaches to reclaiming PMLs and demonstrate how they continue to reproduce "settler futurity."[1] I will then explore how reclaiming PMLs be decolonized through an "unclaiming" approach, drawing on what I've learned during my time on this project. Finally, I will apply this unclaiming approach to the "waste" products discussed in the previous two chapters (i.e. black locust and mine tailings) to promote Karuk eco-cultural revitalization.

In general, reclamation efforts seek to mitigate the negative impacts of PMLs that have been abandoned by miners and seek new uses for the site. This may involve stabilizing and containing pollution sources, reducing risks on the site, restoring the landscape to some previous state, and even making it economically profitable. However, reclamation is anything but neutral. Langhorst and Bolton (2017) describe PMLs as sitting "at the nexus of past, present, and future of the American West."[2] As such, PMLs become "a battlefield of sorts—one that is more than passive ground but an active agent in the processes of landscape and cultural change."[3] Values, worldviews, and historical narratives impact both how a site's existing conditions are perceived and what future actions are carried out. As PMLs transition from "claiming" to "reclaiming" status, settler perspectives continue to read the landscape in terms of property, resource, and waste. These ontologies influence how settler-based practitioners approach PML reclamation. This section explores specifically how settler colonialism manifests and is reproduced through PML reclamation approaches (Figure 5.1).

Approach 1: Re-wasting

Re-wasting, or "wastelanding," is an approach that is predicated on a desire to continue extracting on lands in the vicinity of the PML, or the PML itself. This involves inserting a largely revisionist version of history onto a site to naturalize and promote an

extractive industrial future. Whitson (2019) calls upon a case study in Minnesota to demonstrate how interpretive choices serve to obscure and shape public collective memory, erasing violent histories of displacement and environmental harm.[4] In this way, the landscape serves not only as a memorial that centers the white settler experience, but as "an amnesiac, contributing to a collective forgetting," ultimately upholding settler colonialism through a key dimension of power.[5] Such interpretive choices at public history sites celebrate mining heritage and deny the existence of settler colonialism. The landscape also erases the violent history of Indigenous removal, replaces past and present Indigenous uses of the land with a story of industrial resource extraction, and creates the conditions necessary for the emergence of a new industry that further threatens the rights and resources of Indigenous peoples.

Thus, re-wasting overtly contributes to settler colonialism by denying the existence of settler colonialism and its foundational violence and asserting heritage and economy as ideological justification for continued mining activities. Furthermore, by continuing to damage the land bases of Indigenous peoples, re-wasting reinscribes settler futurities, foreclosing alternative futurities. Settler futurities threaten all lifeforms, as opposed to Indigenous and other alternative futurities, which create avenues for collective survival.

Approach 2: Redevelopment & Recreation

Redevelopment aims to reclaim abandoned mine sites for some form of economic development.[6] This can take the form of new housing developments, or recreational use such as skiing or other tourist activities. Redevelopment is an attractive approach because it provides a funding source for remediation activities that is accompanied by an expectation for profit generation. However, it is a continuation of extractive ways of thinking, as profit is the driving motive. Its implementation largely reproduces settler colonialism in similar ways as re-wasting, although not always as overtly. Regardless of the types of benefits that come from redevelopment (e.g. housing or recreational activities), the benefits will likely primarily serve those who are already privileged. Land continues to be viewed in terms of property and resources and its management and use continues to people who are Indigenous to these lands and continue to hold them as sacred.

Approach 3: Remembering

Remembering celebrates the heritage of past mining activity as a sort of origin story that memorializes settler colonial pasts to justify settler colonial futures. David Harvey writes:

"production of memory in place is no more than an element in the perpetuation of a particular social order which seeks to inscribe some memories at the expense of others. Places do not come with some memories attached as if by nature but rather they are the contested terrain of competing definitions."[7]

In an effort to inscribe PMLs with memories that justify the presence of settlers on Indigenous lands, mining infrastructure is preserved, and interpretive signage is put in place to educate visitors about the mining era. Museums might be erected along with memorials and interactive activities that aim to recreate certain mining activities for visitors. PMLs thus serve as an anchor of collective memory and a source of identity and heritage for settlers.

An example of this type of PML is the Leadville Mining District in Colorado, which has an 11.6-mile recreational Mineral Belt Loop Trail that leads users from the historic mining center of town into the surrounding hills that contain historic mines with interpretive signage that largely celebrates its mining history (Figure 5.2). This is at odds with the fact that it is one of the most polluted sites in the country that experiences ongoing issues with treating contaminated water—something the area will have to grapple with in perpetuity. Furthermore, Leadville houses the National Mining Hall of Fame & Museum, which, according to their website, "holds more than 250 stories of men and women who achieved lasting greatness in mining and natural resources."[8] There is a whole room devoted to the nearby Climax mine that is currently operating to extract the largest molybdenum source in the world, and signage extolls the mine's "environmental stewardship." In this way, remembering and celebrating a settler past clears the way for continued extraction.

Figure 5.2 Mineral Belt Loop Trail in Leadville, Colorado

Remembering is a particularly explicit form of settler colonialism reproduction, as it makes a definite and plain claim to a historical narrative that denies settler colonialism, or worse, celebrates it. It encourages settlers to invest their identity into a specific historical narrative that justifies their continued presence on the landscape. By prioritizing this relatively short and extremely environmentally damaging period in history, denying any histories before mining, it promotes settler futurities and denies alternatives. The celebration of these PMLs conceals the vast ecological and social trauma that mining has caused and disconnects the narrative from the broader forces of capitalism and colonialism.

Furthermore, the prioritization of mining narratives through public pressure and the National Historic Preservation Act can prevent their ecological restoration. In Leadville, when the EPA called for the capping and removal of tailings piles that were releasing heavy toxic metals into the town, residents decried removal of an icon of the area's mining past.[9] In an act of compromise, the tailings were capped with concrete that was painted to approximate the original tailings. Another instance of local opposition entailed the Crooked River Valley Rehabilitation Project, a joint USFS and Nez Perce Tribe restoration project that aimed to restore fish habitat in a dredge-mined riparian area. The Idaho County Commission published an op-ed titled "Leave Crooked River alone: USFS proposal would destroy mining history."[10]

A final example is one that is currently unfolding on ancestral Karuk territory on the Salmon River, a tributary of the Klamath River (Figure 5.3). The Salmon River Restoration Council (SRRC) is meeting considerable opposition from the USFS in their attempts to restore dredge-mined riparian areas. The opposition partly stems from the fact that these are historical mines and could be eligible for preservation. Because this federal opposition has been such a barrier to restoration efforts, the SRRC has put grant funds towards examining all the historic mining sites in the watershed to identify those which are unique so that the others

Figure 5.3 Active mining claim on the Kelly Bar Habitat Enhancement Project site on the Salmon River

can be restored in a more streamlined process. Lisa expressed frustration with these barriers to restoration, as the mining history of a site is just a "blip" in a long history of stewarded land.[11] However, this small and particularly disturbing and violent period is prioritized for remembrance through federal agencies and policies at the expense of eco-cultural resources that support the Karuk.[12]

Approach 4: Restoration

Restoration focuses on returning the landscape to a former pre-mining condition in terms of ecological function. Restorationist William R. Jordan III describes restoration as "the attempt . . . to do . . . everything possible to heal the scars and erase the signs of disturbance and disruption . . . The aim of the Restorationist is to erase the marks of his own kind from the landscape."[13] Restoration involves identifying a real or imagined past condition of the landscape as a point of reference.[14] The focus is usually on non-human systems, seeking to undo the impacts on hydrology, create habitat, control erosion, stabilize toxic materials, re-establish vegetation, or "approximate original contours," the mandate of the SMCRA.[15]

Restoration approaches can reproduce settler colonialism in less overt ways than the preceding approaches. Because they seek to erase traces of past mining activities, they conceal foundational violence and deny the realities of settler colonial pasts. Additionally, they perpetuate the wilderness/culture binary by portraying landscapes as separate from humans, serving settler ideologies. For instance, visitors who are not familiar with the Klamath area may drive through Klamath and Six Rivers National Forests and perceive the land as an untouched "pristine wilderness." They are unaware that these lands have endured excessive mining and logging, activities that have severely altered the waterways, landforms, and plant and animal communities. Not only have these lands been disturbed to the point of uncontrollable forest fires, contaminated waters, and endangered fish populations, but the Karuk's deep relationship to the land has been violently disrupted first by miners and then by the USFS, who burned homes to evict Karuk people from their homelands into the 1980s. Like other federal land ownership structures, the USFS wanted absolute control of the land and to create the image of a "pure" wilderness.[16] At the same time, this federal land remains open to mining claims and logging activities.

These perceptions of untouched wilderness perpetuate the settler colonial myths of *terra nullius* and the "pristine wilderness," which put forth that prior to European invasion, the Americas were largely uninhabited, an "ancient, primeval, undisturbed wilderness" in which "the native people were transparent in the landscape."[17] Imagining land wild, untended, and awaiting Lockean development erases Indigenous presence, connections, and future claims to land. Today, it continues to inform many conservationist approaches, including the establishment of "public lands" such as National Parks and Forests, which have also served to dispossess Indigenous peoples from their lands.[18]

If not carried out in collaboration with tribal communities, restoration can thus serve to continually dispossess Indigenous bodies from their ancestral lands by keeping land within federal and local government possession (which often remains open for extraction) and excluding Indigenous use and management. Cultural appropriation can also occur if TEK is attempted to be applied in the restoration without Indigenous involvement and leadership, which has happened in the past as the USFS has tried to implement Karuk knowledge without Karuk involvement. As Leaf explains, "they can't just apply those concepts, because what they require is cultural practices of a land-based people."[19] Indeed, this appropriation perpetuates the idea that knowledge is a discrete and static thing that can be separated from practice and culture and implemented by settler-based practitioners and institutions. This is also something that landscape architects must grapple with as TEK increasingly gains traction and designers seek to integrate it into their designs through plant selection, holistic approaches, and design gestures.

UNCLAIMING APPROACHES

The reclamation approaches described in the previous section have the potential to reproduce settler colonialism into the future because they are predicated on the same ideologies that led to their formation. However, PMLs "present a unique opportunity for the negotiation and articulation of morals, values, histories, and physical experiences associated with mine sites."[20] An unclaiming approach seeks to disrupt the extractive, colonialist, capitalist ideologies that led to the formation of PMLs, including claiming and resourcification[21], that continue to shape these landscapes today and set the stage for settler futurities (Figure 5.2). Unclaiming involves locating these ideologies and dimensions of power responsible for the formation of PMLs and intervening. One important aspect of this intervention involves reinstate materials that have been transformed into resources and waste back into relations that support Indigenous and alternative futurities. As a settler-based designer, I ground my efforts towards this end in place-based solidarities.

Place-based solidarities entail a different approach to conventional design methodologies. Tuck and Mackenzie describe how "Indigenous conceptualizations of land are diverse, specific, and particular."[22] Different landscapes and geographies generate and demand different relational knowledges, ethics, and practices that are uniquely responsive to place.[23] The ancestral caretakers who have co-evolved in relationship with these lands hold irreplaceable and specific knowledges of these lands that extends from time immemorial to futures yet unknowable. This place-based specificity contrasts with Eurocentric universal design approaches that are taught in

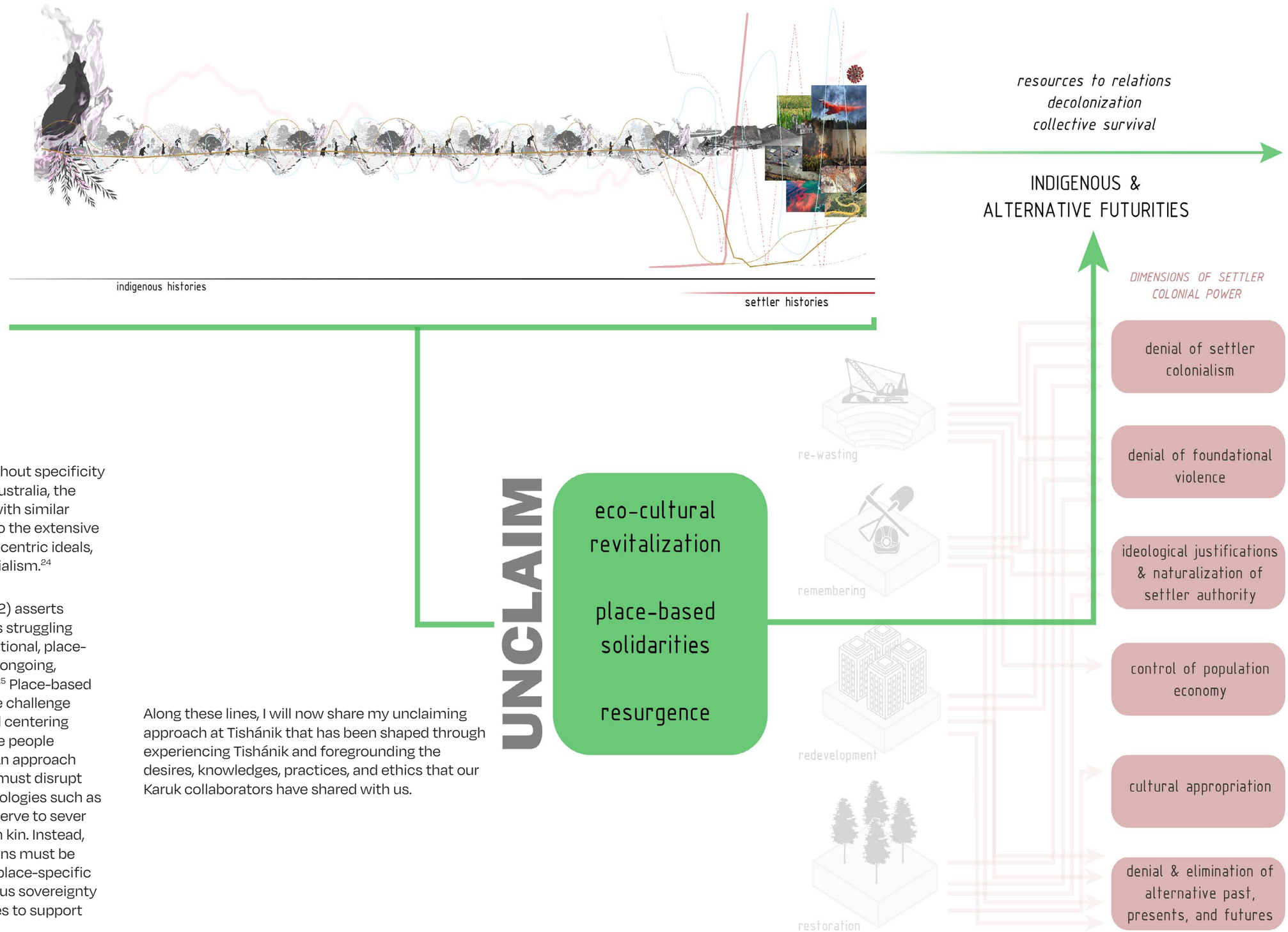

Figure 5.2 Proposed "unclaiming" approach for alternative futurities

design schools across the world without specificity to place. The fact a designer from Australia, the Americas, and Europe will emerge with similar design approaches is a testament to the extensive exportation and hegemony of Euro-centric ideals, and is ultimately a product of colonialism.[24]

Tsalagi scholar Jeff Corntassel (2012) asserts that "being Indigenous today means struggling to reclaim and regenerate one's relational, place-based existence by challenging the ongoing, destructive forces of colonization."[25] Place-based solidarities in design must therefore challenge these universal approaches, instead centering the knowledges and practices of the people whose land designers stand upon. An approach grounded in place-based solidarity must disrupt the reification of settler colonial ideologies such as property, resource, and waste that serve to sever relationality with more-than-human kin. Instead, land must be unclaimed, and relations must be restored. This process will vary in a place-specific way, but will always center Indigenous sovereignty and resurgence in localized struggles to support Indigenous futurities.

Along these lines, I will now share my unclaiming approach at Tishánik that has been shaped through experiencing Tishánik and foregrounding the desires, knowledges, practices, and ethics that our Karuk collaborators have shared with us.

UNCLAIMING AT TISHÁNIK

In an interview carried out in 2019 between collaborators Daniel Sarna-Sarna-Wojcicki and Leaf Hillman, Leaf encapsulates the significance of embedded histories and cultural revitalization at Tishánik:

You can say this site has been highly disturbed and most of the original land from there has been removed [through hydraulic mining], and there's very little of that original landform that remains. A couple of pieces of that remain, but the significance of that place has not diminished . . . It's an important place for us because it does encapsulate all of this history that people have endured and been through. That site sort of has that history embedded in it, all of those things.

But yet, we survived and came out the other side of that horrible history and sort of everything that that means, that has sort of been embedded in that landscape there today, how people feel about it today, and the importance that people associate with that place today. It really is one of those places of revitalization and renewal, literally . . .

Anyways, there's a lot of history embedded in that place. That's very important for us today. And, continuing on that path to reclaim and revitalize and re-occupy and establish that place once again as our place. . .

[The long term plan is to] continue to restore the place and to continue to . . . research on there and establish . . . places over there where we go and treat the willows. People have different uses for that place, whether it might be a place where people go set your eel baskets and the like. All of those things are all a part of that history and about renewing that history and re-establishing or continuing its significance in the lives of the people. I think, the long term goal is to reestablish and revitalize that relationship of the people to that place that has always been significant in our history, to restore and revitalize that.

This interview highlights the unique aspects of Tishánik, a sacred place of renewal and healing, which must be attended to if approached with place-based specificity. Its history, as a site of resistance and endurance, is important to address. Revealing its history counters the settler colonial impulse to diminish harmful histories, while foregrounding the resistance and resurgence that has always been a part of this history resists totalizing and damage-based narratives. Using this history to envision the future of Tishánik, eco-cultural revitalization emerges as the primary goal. Eco-cultural revitalization counters settler colonial control of the population economy through destruction of Indigenous land bases. Rather than a universal best practice approach to design intervention and plant establishment, eco-cultural resources specific to the Karuk are prioritized. The growth and care for these more-than-human relations ultimately engenders Indigenous futurities as knowledges are generated and passed onto future generations.

I highlight four principles I have centered in my unclaiming approach for Tishánik below.

1. Use the past to formulate a vision of the future

This first principle recognizes that understanding the past is integral to formulating a vision of the future. Tishánik is a layered site with a history of both trauma and renewal. In his work, *Our History is Our Future, Nick Estes* (2019) describes how "settler narratives use a linear conception of time to distance themselves from the horrific crimes committed against Indigenous peoples and land."[26] On the other hand, he explains how Indigenous understandings of time see the past and present as inseparable, so "an alternative future is also determined by our understanding of our past."[27] Indigenous scholars such as Winona LaDuke[28] and Rebecca Tsosie[29] and others[30] have drawn attention to the importance of attending to these histories and their ecological, social, and health impacts to inform the future of PMLs, centering justice and sovereignty.

Foregrounding this history is important for any outsider involved in this project, and isn't something that can be gleaned by settler-written historical accounts. Settler accounts of history seek to hide and retell these histories to justify continued settling of Indigenous lands. Countering these totalizing histories with histories of resistance paves the way for ongoing resurgence. Critical approaches to the histories of these lands reveal how the conversion of land to property and resource underlies settler logics and futures. Re-establishing relations involves understanding how these more-than-human relations were commodified and separated into resource and waste, and how that has transformed the landscape. This is why I take a material flow approach focused on materiality rather than a top-down approach that pushes design without consideration of materials. This follows Jane Hutton's (2020) calls to "think of materials not as inert products but as continuous with the land and the people that shape them."[31]

2. Design for a caretaking economy

When designing, landscape architects need to remain vigilant of where the knowledge they're implementing has originated, what stories it promotes, whose land they are on, and who the long-term stewards of that land are. Designers need to center and design with those who engage in "caretaking economies" and long-term stewardship of the land.[32] Settler colonialism attempts to erase and eliminate enduring indigeneity on land still in deep relation with its ancestral caretakers. These relationships challenge the propertization and resourcification of the land and therefore threaten settler colonial power. Place-based solidarities must center those engaged in these practices.

This contrasts with the status quo approaches in which a designer is hired for a finite contractual period under which they do a site (property) analysis and produce a design that will be implemented through construction documents that are passed onto contractors to implement, and finally to longer term contracted maintenance laborers who are meant to stay behind the scenes. Throughout this process, consent and consultation are rarely carried out with the ancestral caretakers of the land, and if they are, it's often in a limited capacity that serves performative functions and fails to disrupt any power dynamics.

Centering the ancestral caretakers of the land moves beyond consultation and consent and towards co-generation and sovereignty. This allows

alternative design approaches to emerge that are more focused on long-term sustainability, process, and care. This is especially important for PMLs, which often hold no final solution because they have been altered so significantly. These become "matters of care" that must be stewarded into perpetuity.[33] There are no settler-based institutions that are equipped for this long-term care work. However, this aligns with the worldviews and practices of Indigenous peoples.

In this project, a material flow approach means foregrounding who is doing the labor of creating a landscape and seeing this labor not as a commodity or something to be hidden, but as an opportunity for knowledge transfer and cultural revitalization. It is through the labor of working the land that culture is passed down. Leaf and Lisa and the Karuk Department of Natural Resources have created programs to employ Karuk youth at Tishánik for this purpose. This also supports the connection between TEK and cultural practices and Indigenous management, rather than appropriating TEK to undermine sovereignty.

3. Honor the agency and personhood of all beings in a spirit of reciprocity

Scholars such as Robin Wall Kimmerer (2011) have highlighted the need to shift our understanding of ecological restoration towards acts of reciprocity, where "humans exercise their care-giving responsibility for ecosystems."[34] As Western science has moved towards understanding the ways that the health of ecosystems impacts human health, it has begun adopting ideas that are rooted in TEK. Indeed, TEK holds many answers that Western science does not, and is integral to our collective survival in uncertain futures. However, this knowledge cannot be separated from the people who have generated it or their practices and belief systems. Therefore, centering reciprocity and TEK involves giving decision making power around natural resource management to Indigenous peoples. This works against the cultural appropriate dimension of settler colonialism.

This is also a challenge for settler-based designers to critically examine their understanding of "natural resources" as inert objects that exist for human use and benefit. When these resources are understood again as more-than-human relations with agency, the way we design shifts. Instead of arranging plant, hydrological, and geomorphological features in a pre-ordained fashion on a site, designers can instead understand their role as creating the conditions to allow these features to carry out their own will. This honors the wisdom and agency of the more-than-human world and breaks down the hierarchies inherent in Western views. One way this principle is practiced for the Karuk is through cultural burns, which harnesses the power of disturbance to create the conditions for more-than-human relations to find balance. On the other hand, application of herbicides for invasives such as black locust does not honor this agency or principle of reciprocity.

The material flow approach also pushes back on the traditional focus of creating a polished site design. Leaf and Lisa explained that any graphic work that presented a plan for Tishánik that was too finished or too definitive might discourage community input and knowledge co-generation. At this stage of the project, a finished site design would hinder further ideas. While my collaborators and I have begun to map various programs, or "camps," these remain fluid. There is no single one-time budget for this project or timeline. Instead, the design will unfold in more incremental phases and is always in flux, as humans and more-than-humans continually interact in a reciprocal manner to change each other. For design, this means setting the stage and conditions for different processes to play out in a way that honors the agency of more-than-human relations such as the river and the plants.

We are also designing beyond the site and pushing against the scales and boundaries normally considered. Understanding property to be a construct and tool of settler colonialism is an issue for landscape architecture because, as the editors of Scapegoat (2011) point out, property "is the literal foundation for all spatial design practices."[35] Landscape architects always begin with a space that is already bounded by property lines on a map--afterall, the editors ask, "what is a 'site' except a piece of property?"[36] Tishánik is a piece of property in the eyes of the settler state, but for the Karuk it is irreducible to lines on paper, and rather is connected to other places and processes in time and space, existing far beyond the realms of commodification. When mapped, mining, logging, and road-building projects also belie the resounding impacts of these activities in time and space. In this way, "two-dimensional maps simultaneously enable trauma and obscure it from public memory by positioning it within a narrative of innocent civic advancement."[37]

Reliance on maps can disguise the impacts of activities and connections between places through a process of "detached spectatorship."[38] For instance, the placing of dams hundreds of miles upstream from Tishánik has significantly impacted water quality and fish populations, but this is belied by a map showing them as distanced. Instead, Karuk people articulate, through story and memory, the impacts of these dams, telling something more true than what the supposedly mimetic and mathematically accurate maps show.[39]

Furthermore, governance scales such as counties, states, and even watersheds also insert settler colonial boundaries and definitions to space, which are then considered by landscape architects in designs and analysis. Our collaborators Daniel Sarna-Wojcicki, Lisa and Leaf problematize the uncritical application of watershed governance in overlooking issues of power and scale and not responding to sociocultural and ecological realities and needs of the Karuk.[40] They explore two frameworks, firesheds and foodsheds, as alternatives for collaborative natural resource management. Designers must challenge themselves to see beyond the boundaries and governance systems defined by the settler state and understand space and land in less commodified terms than those that see "resources" instead as agentic forces that exist as part of a larger, interconnected, and unbounded system. In this way, we anticipate the impacts of dam removals hundreds of miles upriver and how we can use this event as a catalyst to return agency to the river on the floodplain of Tishánik. We understand that burn regimes on site can help build knowledge and evidence for application beyond Tishánik, and seek to understand how the ecosystems at Tishánik interplay with the larger system in the context of climate change and in the pursuit of full return of traditional land to the Karuk people for stewardship.

4. Center eco-cultural revitalization, emergent knowledge co-generation, and intergenerational knowledge transfer in a spirit of píkyav

Finally, eco-cultural revitalization, emergent knowledge co-generation, and intergenerational knowledge transfer must be foregrounded in this kind of design work. Understanding that settler colonialism works partly by destroying the homelands of Indigenous peoples, both threatening survival and the practice of cultural knowledge, this principle highlights the importance of creating the material base for resurgence and revitalization to occur. Lisa Betasamosake Simpson (2016) emphasizes that "resurgence is an emergent and generative process."[41] By engaging in place-based practices, new knowledges are constantly emerging. Because of this, Simpson (2016) highlights the importance of actualizing place-based alternatives to the destructive forces of capitalism to facilitate these knowledge-producing processes. Returning land to Indigenous stewardship is therefore imperative to building the tools to survive in a world of uncertainty and radical change.

We are designing for uncertain futures. During my time at Tishánik I learned how every design or intervention is an opportunity to co-generate knowledge that is essential to collective survival in a future full of conditions we have never seen before. For example, while I was there, I helped set up several test plots designed by Sofi and Lisa to establish the impact of Karuk cultural management practices such as gathering on three key species. Climate change is ushering in a future of extremes, including floods, droughts, and increasing atmospheric and water temperatures. These conditions will have, and already have, resounding impacts on biodiversity, species distribution, and ecosystem dynamics. Novel ecosystems are already at play, presenting novel conditions and issues for which no solutions or best practices are yet available. This is an important and urgent opportunity for co-generation of knowledge through synergies between Karuk TEK and Western science models.

For instance, invasive species such as Black locust have impacted nearly every part of the world over the past few hundred years, dramatically and quickly altering ecosystem dynamics that have evolved over millennia alongside knowledge to steward these ecosystems. Landscape architects and restoration scientists work in quick bursts to remove invasive species from a site and replace them with native species. This often is done uncritically and without thought to shifting ecosystem dynamics. These invasive plants are then burned or disposed of in other ways. Nicholas Reo and Laura Ogden (2018) point out that these approaches are rooted in colonial timelines and understandings of plants as natural resources.[42] Working with Anishnaabe communities, they problematize traditional approaches, describing how Anishnaabe understand these plants as beings that assemble into nations, instead of a single-species outlook. The authors explain how the Anishnaabe understand that it is the responsibility of humans to discover the purpose of these plants, ultimately challenging the native-non-native binary of dominant discourse. Looking at the long term, there are still many questions as to how long these newcomers plan to stay and how they will settle into the network of relations. A more temporally expansive outlook pushes far beyond immediate colonial timelines. Landscape architects need to work with the ancestral caretakers of land to develop a more nuanced and long-term plan for invasive species, prioritizing eco-cultural revitalization, and working to design areas where knowledge for survival can be co-generated.

Tishánik is already a site of resurgence, eco-cultural revitalization, and *píkyav.* The Karuk have fought to protect and carry out their obligations to their plant and animal relations at Tishánik throughout ever-evolving waves of settler violence and disturbance. There are records and oral histories that show that they have continually carried out ceremonies throughout the last century and a half of invasion into the present, despite periods of interruptions.[43] This is in spite of the propertization and patenting of the site for mining, where it passed through the hands of mining companies, private property owners, and "Green Rush" marijuana growers before the tribe finally purchased it from a reluctant landowner in 2015. The site now supports intergenerational knowledge transfer, knowledge co-production, and revitalization of traditional activities rooted in reciprocity. While I was there, Karuk people from all over the area would come to harvest culturally important plants for medicinal and other uses. The site is an important focal point of renewal, where the philosophy of *pikyáv,* or 'fix it' is embodied and practiced.

Through place-based solidarities, these practices are centered both through promoting the growth and availability of eco-cultural resources and the establishing spaces where culture can be enacted. My work responds to the need to manage the growth and spread of black locust to promote the establishment of native plants that are essential in carrying out cultural practices, as well as creating paths, structures, and shaded spaces that allow for gathering and education to occur across the year. The designs that follow utilize two materials that are currently inhibiting the growth of eco-cultural species on site, black locust and mine tailings. Through the design project, I apply a material flow approach that explores possibilities for transforming them into materials that help facilitate the practice and transmission of knowledge and culture by creating gathering space or generating income that can support the Tribe, thus re-establishing them within the network of more-than-human relations.

NOTES

[1] Tuck and Yang, "Decolonization Is Not a Metaphor," 14.
[2] Langhorst and Bolton, "Reframing The Postindustrial," 160.
[3] Langhorst and Bolton, 168.
[4] Whitson, "Monumental Mines."
[5] Whitson, 50.
[6] Langhorst and Bolton, "Reframing The Postindustrial."
[7] Harvey, *Justice, Nature, and the Geography of Difference*, 309.
[8] "Mining Hall of Fame."
[9] Langhorst and Bolton, "Reframing The Postindustrial."
[10] Commission, "Leave Crooked River Alone."
[11] Morehead Hillman, Personal Communication.
[12] Morehead Hillman.
[13] Quoted in Berger, *Reclaiming the American West*, 61.
[14] Langhorst and Bolton, "Reframing The Postindustrial."
[15] Langhorst and Bolton.
[16] Martinez, "Protected Areas, Indigenous Peoples, and The Western Idea of Nature."
[17] Denevan, "The Pristine Myth," 226.
[18] Gilio-Whitaker, *As Long as Grass Grows : The Indigenous Fight for Environmental Justice from Colonization to Standing Rock*.
[19] Quoted in Norgaard, "Karuk Traditional Ecological Knowledge and the Need for Knowledge Sovereignty: Social, Cultural and Economic Impacts of Denied Access to Traditional Management," 18.
[20] Beckett and Keeling, "Rethinking Remediation," 216.
[21] Corvellec et al., "Resourcification"; Hultman et al., "A Resourcification Manifesto."
[22] McKenzie and Tuck, *Place in Research : Theory, Methodology, and Methods*, 11.
[23] McKenzie and Tuck, *Place in Research : Theory, Methodology, and Methods*.
[24] Akama, Hagen, and Whaanga-Schollum, "Problematizing Replicable Design to Practice Respectful, Reciprocal, and Relational Co-Designing with Indigenous People."
[25] Corntassel, "Re-Envisioning Resurgence: Indigenous Pathways to Decolonization and Sustainable Self-Determination," 88.
[26] Estes, *Our History Is the Future : Standing Rock versus the Dakota Access Pipeline, and the Long Tradition of Indigenous Resistance*, 14.
[27] Estes, 14.
[28] LaDuke, *Recovering the Sacred: The Power of Naming and Claiming*.
[29] Tsosie, "Indigenous Peoples and the Ethics of Remediation: Redressing the Legacy of Radioactive Contamination for Native Peoples and Native Lands."
[30] Beckett and Keeling, "Rethinking Remediation."
[31] Hutton, *Reciprocal Landscapes : Stories of Material Movements*, 5.
[32] The Red Nation, *The Red Deal: Indigenous Action to Save Our Earth*, 23.
[33] Beckett and Keeling, "Rethinking Remediation," 216.
[34] Kimmerer, "Restoration and Reciprocity: The Contributions of Traditional Ecological Knowledge," 257.
[35] Adrian Blackwell et al., "Editorial Note," 1.
[36] Adrian Blackwell et al., 1.
[37] Harrison, "'We Need New Stories,'" 13.
[38] Harrison, 13.
[39] Salter, "A Context Statement Concerning the Effect of Iron Gate Dam on Traditional Resource Uses and Cultural Patterns of the Karuk People Within the Klamath River Corridor."
[40] Sarna-Wojcicki, Sowerwine, and Hillman, "Decentering Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin."
[41] Simpson, "Indigenous Resurgence and Co-Resistance," 27.
[42] Reo and Ogden, "Anishnaabe Aki."
[43] Hillman, Interview.

RELATIONAL FLOWS

FROM RELATION TO RESOURCE; WASTE TO RELATION

Chapters 3 and 4 traced the transformation of Tishánik through two material byproducts that were produced from mining activities, black locust and mine tailings. These activities supported settler colonialism by converting more-than-human relations into resources. The following chapter continues to trace these material legacies by envisioning their re-establishment in the future, subverting this waste as relations that facilitate cultural practices and knowledge transmission. This unclaiming approach takes to heart the idea that decolonization is not a metaphor, and engages the materiality of colonialism in a transformative manner.[1] The principles and lessons outlined in Chapter 4 guide my proposed visions for these materials.

BLACK LOCUST

Black locust's threat to biodiversity, difficulty of eradication, and risk of spread through fire can be seen at Tishánik. Dense clonal stands dominate the hydraulicked hill, and its establishment has expanded following uncontrolled burns that were not caused by the tribe. Future work includes mapping fire events with the spread of black locust. My focus here is in evaluating the risks of spreading and possible management strategies moving forward. Figure 6.1 maps the current extent of black locust establishment in dark yellow, and areas of possible spread in light yellow. This is especially concerning, as black locust is likely to invade unshaded areas such as prairies and chaparral systems, and burning of adjacent areas may facilitate its establishment and spread into those areas.[2] The stand of black locust at Tishánik is adjacent to a prairie that is burned regularly.

One option is to simply let the current stand grow, avoiding disturbance, and remaining vigilant to remove new shoots. Through collaborations with Anishinaabe communities, Reo and Ogden (2018) explain that, "determining the nature of new relationships [with plant newcomers] naturally begins with looking for possible uses."[3] To this end, finding possible uses for black locust while preventing its spread could be a possible management strategy. Although fast-growing and easily spreadable, black locust is a short-lived species, with an average lifespan of 80 to 90 years.[4] While a century-long management strategy might not be feasible in the dominant paradigm of restoration that focuses on short-term solutions implemented through contracts with uncertain futures, working under a paradigm of long-term stewardship opens up opportunities for new approaches. Reconceptualizing timelines from linear short term processes under the management of settler institutions to landscapes of perpetual care and cycles of life reclaims settler futures.

Black locust timber is quite valuable, which is one reason it is one of the most cultivated tree species. It is a medium-sized tree, averaging 12-30 m in height and 30 to 60 cm in diameter, with roots that spread 1 to 1.5 times its height.[5] I propose a variety of onsite uses depending on age and trunk diameters that would require different levels of processing (Figure 6.1). Small diameter wood could be used to create tool handles, thatch fences, raised garden bed walls, terrace walls, analogue beaver dams, and wood for hügelkultur gardens. Larger diameter wood could be used to create paths, decks, permeable pavers, shade and gathering structures, fences, furniture, and engineered log jams. Its possible use for engineered log jams is especially notable given its rot resistance, which can make it more durable for long term submersion underwater. Some of these items could also be sold to generate income for the tribe.

After black locust has been removed, the soil structure and nutrient mix is likely to be much different due to nitrogen fixation and other processes. This could make re-establishment of native oak savanna plants untenable in the immediate term. One option would be to establish vegetable gardens in their place, which would thrive in the high nutrient soil. Since the establishment of these stands is on a slope, terraces could be formed, stabilizing the slope with the black locust wood and/or rock walls (to follow).

Another option is to treat the black locust trees to remove and replace them in the short term. While this approach can be risky, as disturbance frequently causes increased regeneration and spread, many of the studies that caution against this approach are conducted with a short-term perspective and an eye on limitations of immediate returns rather than long term management approaches, which remain under-researched.

The feasibility of fully eradicating Black locust is often questioned, but management publications generally reach for a combined physical and chemical approach as the most effective, depending on the type of stand and herbicide type, approach, and timing. Approaches such as basal bark treatment, cut-stump, frilling and "hack and squirt," and drill and frill can be effective, although all require follow-up treatment because of regeneration.[6] Overall, "control with herbicides is temporary, as it does not change conditions that allow infestations to occur," offering initial control but not a stand-alone or long-term solution.[7] Only herbicides that affect the tree's root system will be effective, and a single step can repopulate the entire area.[8] There are also possibilities for control through repeated cutting, but it is noted that this must be done every growing season for several years to exhaust the root system.[9]

While combined chemical treatment is offered as best practice in scientific technocratic spaces, our Karuk collaborators were generally against herbicide use, favoring a traditional burning approach that is aligned with renewal and stewardship ethics. While there is plenty of cautionary information regarding burns, there is a paucity in research around long-term burn management strategies. As Sabo (2000) explains, more "removal experiments are needed for established invaders" that involve data collection for a minimum of three to five years.[10] This represents a major opportunity for the tribe to apply a "reciprocal restoration" approach, finding synergy between TEK and western science to contribute new knowledge around black locust management in the face of uncertain futures.[11]

In black locust's native range, disturbance including fire was at play in maintaining plant communities, so it is well-adapted to burns.[12] One study suggested that black locust's expansion in Long Island was partly caused by fire, as historical fire dates matched black locust establishment dates.[13] Additionally, it is noted to alter fire regimes of other fire-adapted ecosystems such as pitch pine-scrub oak forests, due to the fact that it is less flammable than the vegetation it is replacing.[14] The litter under the dense canopy of clonal stands tends to stay damp, which also may slow surface fires.[15] Finally, black locust stands tend to lead to an understory of low-light adapted nonnative grasses and other species, which also alters fire regimes.[16]

MANAGEMENT

PHYSICAL

CHEMICAL

CULTURAL

HARVEST

MANAGEMENT PLAN

erosion control
shade out black locust
cultural burns

atúruupveen
Rubus leucodermis
blackcap raspberry

xapúxraah
Rubus leucodermis
thimbleberry

atáychúrip
Rubus vitifolius
dewberry

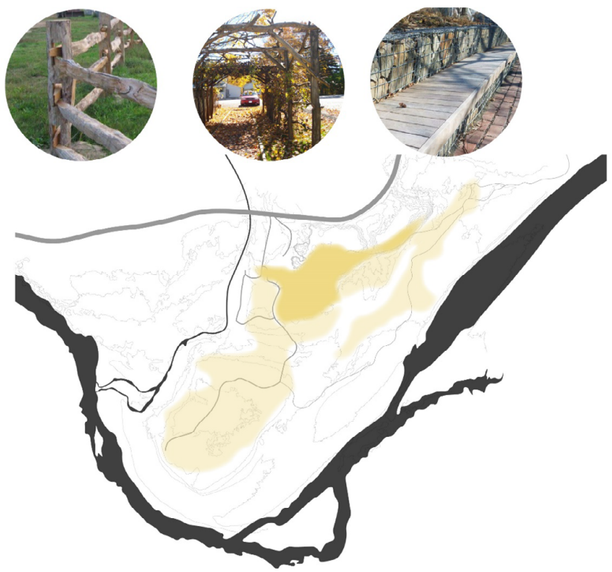

Figure 6.1 Management strategies and opportunities for Black locust at Tishánik

High-severity fire is thought to favor black locust regeneration.[17]

Current scholarship around fire and black locust management points to the need for caution around burns. Stone (2009) warns, "while fire may result in an increase in black locust in areas where black locust is already established, it may also facilitate the establishment of black locust into new areas."[18] While black locust is often top-killed during fire, prolific resprouting, seed germination, and lateral spread are likely to follow. One study at the Little Bluestem Prairie Nature Preserve in Indiana combined cutting, herbicide supplication, and prescribed burns.[19] They found that nearly half of the stumps sprouted after treatment, and sample plots in which black locust was not previously detected had a density of 2000 stems per hectare after treatment, forming "an advancing edge of black locust sprouting."[20]

Given existing knowledge around burns, the following strategies are recommended. One manager at the Albany Pine Bush Preserve recommends that "to effectively control locust sprouts, burning should occur on a strict return interval, during the late spring/early summer, under prescription parameters, and on a targeted unit," noting that this approach is not feasible for many locations given fire and smoke restrictions.[21]. Another publication recommends "bulldozing, piling, and burning of trees followed by planting of a cover crop or native species," while also noting that bulldozing, which removes all species, might not be suitable for ecologically sensitive areas or areas prone to erosion.[22] Burning after removal of mature trees and establishment of native cover for fuel could kill seedlings and help exhaust the seedbank, but seedling and sucker control through burning is generally only recommended in combination with other control methods such as herbicide.[23]

In terms of strategizing burning treatments, two vulnerabilities can be helpful to keep in mind. Although black locust is highly tolerant of a range of site conditions, "it will not grow well in competition with other trees, vines, or grasses, nor will it grow well on poorly drained, heavily textured soils."[24] For instance, one study found that after coppicing, root stumps in full sun produced suckers at a rate of 77% of the original number of stems, compared to 2% in the shade. In general, black locust is not found in dense woods unless it is the dominant tree species.[25] It thrives in disturbed places because its fast growth quickly out-competes other pioneer species for light, but it is not likely to grow if other species are already established. In fact, erosion-control black locust plantings in grassy areas have failed because of competing grasses.[26] Both grasses and *Rubus* species have been effective in limiting black locust establishment and growth, although sprouting may still occur.[27] Even when shaded, a persistent bud bank is created, allowing rapid resprouting as soon as the canopy opens.[28] Warne (2016) notes that planting larger native species stock can help outcompete black locust seedlings, but that it may be better to avoid restoration planting until black locust has been removed for several seasons because it could be difficult to distinguish between the two.[29]

There are several native grass fire-adapted species that are culturally important and could be planted following mechanical (and possibly chemical) removal of black locust to prevent its reestablishment, including ripgut grass, bear grass, slender hairgrass, and wild rye (see Figure 6.1 with Karuk names). Some of these grasses produce seeds that have traditionally been used as a food source. Alongside the removal of black locust and vigilant removal of new sprouts, the establishment of native grasses, and controlled burns, an oak savanna ecosystem might eventually be able to reestablish, contributing to the cultural revitalization of Karuk practices.

Another consideration is soil conditions. Black locust is a relatively shallow-rooted species that generally does not produce a taproot, making it vulnerable to soil conditions.[30] It does not respond well to poorly drained water-logged soils or heavy compaction. There are areas where black locust is currently at risk of spreading that could be opened up for more frequent inundation from the river (see Morgan Southall's 2021 MLA thesis, forthcoming), which would decrease the likelihood of spread. Planting native *Rubus* species such as blackcap raspberry, thimbleberry, and dewberry could further limit growth and spread.

Long term studies in these different site conditions with different burn and replanting management strategies could contribute valuable research to the sparse literature on effective black locust management. Long term strategies centered on cultural burns, reestablishing relations, finding best uses, implementing TEK, and prioritizing cultural revitalization can provide substantial benefits not only at Tishánik, but across the world, as Black locust has spread globally.

The information and suggested strategies developed here are meant to provide context and set the stage for conversations among Karuk tribal members, the caretakers of this land, to make decisions for the holistic long-term management of Tishánik. Combined with the specialized traditional knowledge that Karuk holds for managing oak stands, new restoration approaches can be tested and implemented. Ultimately, these strategies aim to convert a material that currently threatens Karuk ways of life forms that can support Karuk eco-cultural revitalization and reinstate relations on the land.

MINE TAILINGS

Mine tailings redirected the river's flow toward softer rocks on the south bank, leading to road washouts and erosion of agricultural land. A floodplain restoration approach should aim to reduce the river's energy directed at the south bank during high flows, to revegetate the river bar, and to restore the Klamath River's agency to re-occupy its floodplain. My collaborator, Morgan Southall, has begun the work of analyzing different restoration interventions that would flood side channels and floodplain terraces at high flows, and allow water to fill backwater habitats more frequently. Her approach aims to open up channels that follow existing low elevation points, some of which follow historic dredge mining paths (See Figure 4.10). This will ultimately help redirect some of the river's energy and give it more freedom to meander in an open-ended process. It will also restore ecological function to the site and provide high quality aquatic habitat. This approach follows river justice principles put forth by the co-PIs for this project, in which the river, a living, agentic being, is released from its current confines to roam freely along the floodplain and restore its relations to other species.

This approach entails a lighter touch than many dredge tailings restoration projects. Many widely-adopted approaches involve mechanical re-channelization to add meanders to an artificially straightened channel (See Oxbow Conservation Area Tailings Restoration Project, Swan River Restoration Project, Crooked River Valley Rehabilitation Project, and Trinity River Restoration Program). This is achieved in phases by diverting the river into a bypass channel, using heavy construction equipment to re-grade the channel, adding woody debris and coarse sediment, and replanting with native plant communities. Instead, the proposed approach falls more into a 'Stage 0' framework that uses low-tech interventions including structures such as beaver dam analogues, post-assisted log structures, and engineered log jams.[31] This initiates a process to restore a complex, dynamic, multi-threaded floodplain with diverse habitats, giving water and beavers the opportunity to achieve outcomes that Karuk cultural practitioners desire.

Pushing these ideas forward with a resource / waste to relations material flow framework, I examined how the immense field of tailings could be rearranged and reused to promote habitat and eco-cultural practices. While a bulldozer might be the most efficient way to remove tailings that are currently preventing inundation, other long-term approaches could be implemented through workdays and youth employment. Rocks could be used both on and offsite. The Hoopah Valley Tribe has a Road Aggregate and Ready Mix business 25 miles south of the site, to which tailings could be transported for processing. The tailings could potentially be sold to generate income or be processed into gravel and cobble to augment the river bar and create spawning beds, thereby

increasing the heterogeneity and dynamism of the river channel. This approach is being taken in the Trinity River Restoration Program in Northern California in partnership with the Yurok Tribe.

Other options include various onsite uses aimed at promoting eco-cultural revitalization. Tailings could be used to stabilize engineered log jams that encourage water to fill backwater habitats. They could also fulfill similar functions as black locust logs, in the construction of raised garden bed walls, terrace walls, gabion retaining walls and erosion control, stone paths, and gathering shelters. Finally, they could be rearranged in artistic and culturally meaningful arrangements as community participatory interventions to reestablish relations.

The potential interventions and uses of black locust and mine tailings put forth here are premised on the decolonizing design principles outlined in Chapter 4. They seek to place resources and waste back into the network of relations by finding their purpose and connecting their use to cultural practices. The various uses proposed for these materials can support the hydrological, planting, and cultural programs proposed by my collaborators Morgan Southall and Jocine Velasco (Figure 6.2). These approaches aim to align with specific Karuk goals such as re-introducing fire, minimizing pesticide use, creating employment opportunities for youth, providing opportunities for co-generating knowledge, and creating space for cultural programs to be carried out.

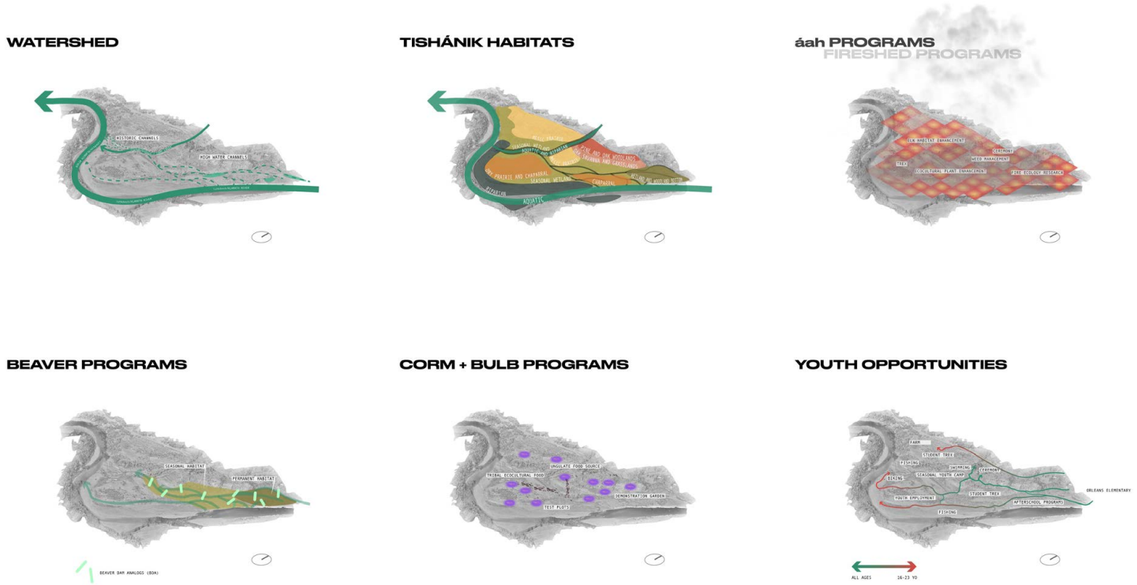

Figure 6.2 Proposed eco-cultural programs at Tishanik produced by Jocine Velasco (Velasco 2021)

NOTES

[1] Tuck and Yang, "Decolonization Is Not a Metaphor."
[2] Stone, "Robinia Pseudoacacia. In: Fire Effects Information System."
[3] Reo and Ogden, "Anishnaabe Aki," 1448.
[4] Warne, "Black Locust (Robinia Pseudoacacia L.) Best Management Practices in Ontario."
[5] Warne.
[6] Warne.
[7] Stone, "Robinia Pseudoacacia. In: Fire Effects Information System."
[8] Warne, "Black Locust (Robinia Pseudoacacia L.) Best Management Practices in Ontario."
[9] Warne.
[10] Sabo, "Robinia Pseudoacacia Invasions and Control in North America and Europe," 5.
[11] Kimmerer, "Restoration and Reciprocity: The Contributions of Traditional Ecological Knowledge."
[12] Stone, "Robinia Pseudoacacia. In: Fire Effects Information System."
[13] Stone.
[14] Stone.
[15] Stone.
[16] Stone.
[17] Stone.
[18] Stone.
[19] Stone.
[21] Stone, "Robinia Pseudoacacia. In: Fire Effects Information System."
[22] Warne, "Black Locust (Robinia Pseudoacacia L.) Best Management Practices in Ontario," 22.
[23] Warne, "Black Locust (Robinia Pseudoacacia L.) Best Management Practices in Ontario."
[24] Converse, "Element Stewardship Abstract for Robinia Pseudoacacia," 4.
[25] Stone, "Robinia Pseudoacacia. In: Fire Effects Information System."
[26] Stone.
[27] Warne, "Black Locust (Robinia Pseudoacacia L.) Best Management Practices in Ontario."
[28] Vitkova, "Black Locust (Robinia Pseudoacacia) Beloved and Despised: A Story of an Invasive Tree in Central Europe."
[29] Warne, "Black Locust (Robinia Pseudoacacia L.) Best Management Practices in Ontario."
[30] Warne.
[31] Wheaton et al., "Low-Tech Process-Based Restoration of Riverscapes: Design Manual. Version 1.0."

UNCONCLUSIONS

TAKEAWAYS

PMLs are sites of historic and ongoing violence and dispossession that are emblematic of extractive relationships to land that dominate land use today. Highlighting how mining serves to accelerate settler colonialism, I have shown how the reclamation of these sites fall into similar trappings, continuing to reproduce settler colonial structures of domination. This thesis has presented an unclaiming design approach for dismantling the various dimensions of settler colonialism in PMLs by centering the place-based, Karuk-led eco-cultural revitalization of Tishánik. My historical approach connects present environmental injustices to legitimizing narratives, policies, practices, and forms of resistance that have been constructed as separated in time and space. Through this approach, I have begun to "unsettle" the dominant understanding of time to reclaim the past and future. By drawing on diverse written accounts, oral histories and personal interviews, historical records such as written reports, court files, and news articles, as well as historical photographs and maps, this approach connects larger historical trends and forces with discrete histories of place. I identify the conversion of land from relation to resource as a major function of settler colonialism that is continually reproduced through mining, mine reclamation, and landscape architectural approaches to site design. This understanding informs my material flow approach, where the history of disruptive materials considered as waste today are traced to reveal their transformation from relations into resources. This understanding, along with the restoration principles identified, is harnessed to re-envision these materials as relations that can serve to promote eco-cultural revitalization.

By tracing the transformation of more-than-human relations into resource, and its byproducts (waste), and then by imagining their transformation back into relation, this material flow approach reveals possible pathways to decolonization. While mining activities have led to a massive reshuffling of matter that reconfigured more-than-human and human relationships, this approach aims to resituate "out of place" material back into the web of relations to restore balance. By finding the best use for materials that have been deemed invaluable or waste from extractive activities that have commodified one part of the landscape at the expense of the rest, humans can fulfil their responsibilities to the more-than-human world.[1] These uses convert the material legacies of settler colonialism that currently serve as a barrier to traditional practices (i.e. black locust preventing cultural burns and establishment of native oak and grasses; tailings preventing willow growth and threatening salmon survival), and re-envision them as assets that can contribute to eco-cultural revitalization, ultimately embodying the philosophy of *píkyav* (repair).

The eco-cultural restoration of Tishánik is an opportunity to build vital emergent knowledge through reciprocal and nonhierarchical place-based practices. Non-indigenous collaborators in the science and design fields have the opportunity to support these efforts through place-based solidarities. As my designs and material flows analyses demonstrate, landscape architects can begin to decolonize our design approaches by critically examining the sources and implications of our own approaches and working to center the knowledges and practices of the people whose lands we live and work upon. From my time working with the Karuk, I established four design principles to honor the people and more-than-human kin at Tishánik. These are (1) **understand the past is integral in formulating a vision of the future,** (2) **design for a caretaking economy,** (3) **honor the agency and personhood of all beings in a spirit of reciprocity, and** (4) **center eco-cultural revitalization, emergent knowledge co-generation, and intergenerational knowledge transfer in a spirit of *píkyav.*** These principles are all orienting towards "unclaiming" and decolonizing practice and design.

The fields of landscape architecture and design are entrenched and complicit in legacies of colonialism. Throughout their education and practice, very little reflexive work is asked of designers by settler institutions. Designers may believe themselves to be neutral while they "silently embod[y] dominant agendas and associations."[2] Designers are positioned as experts who solve problems and speak for the "other," all the while potentially unaware that they are even practicing on land that was taken through violence and coercion.[3] The very legitimization of the design profession rests on the perpetuation of "design expertise," in which the Eurocentric universal design approaches are valued as superior to other ways of knowing and seeing.[4] Problem-solving, innovation, and creativity have been a part of Indigenous cultures since time immemorial, as people co-evolved with the land around them, and are embodied in TEK. By not acknowledging these deep histories, embodied knowledges, and practices, and positioning Eurocentric design approaches and methods above all others, settler-based designers reify power dynamics and perpetuate stories of domination.

However, design can also serve as a powerful way to challenge technocratic interventions to restoration that paint themselves as ideologically neutral while silently perpetuating settler colonialism. Recognizing the power of story and how historical narratives serve to shape our world materially, design can be harnessed to stimulate collective memory towards transformative societal change.[5] The future can be reclaimed through the dismantling of colonialism's "technologies of temporality."[6] By engaging in these longer, complex, entangled histories, transformative place-based solidarity practices can emerge.[7] Landscape architects should work to pivot the field to engage in place-based solidarities throughout our education and practice.

At Tishánik, the many spatial and temporal layers reveal a long history of stewardship, a traumatic era of settler colonialism that is ongoing, and the collective continuance and resurgence of the Karuk.[8] It is important for settler collaborators to be aware of these histories to avoid reifying the structures of settler colonialism, and also to appreciate the living place-based histories of these sites to contribute to a better vision of the future through place-based solidarities.[9] This kind of solidarity centers Indigenous resurgence while actively working to understand and challenge the ongoing relationality of settler colonial power.[10]

ALTERNATIVE FUTURITIES

I agree with Hupa, Yurok, and Karuk scholar Cutcha Risling Baldy, who writes that "ultimately, the goal of any institution should be the return of land, especially land that could hold cultural, spiritual and social significance for tribes that are still rebuilding from attempted genocide, removal and termination."[11] Today, 98% of Karuk traditional territories are under the management of the USFS as the Klamath and Six Rivers National Forests.[12] This land, established as public lands following the creation of the USFS in 1905, was taken from the Karuk following an era of genocide and violence. True to the mining origins of settler presence on Karuk lands, this land remains open for extraction, and placer mining claims on federal lands line the Klamath River (Figure 7.1). These extractive futures impede restoration efforts, as the USFS is hesitant to invest in a restoration project that may be re-mined. Furthermore, the USFS impedes the restoration of the abandoned mines littered along the river corridor for historic preservation reasons.

The preservation and celebration of these PMLs then serves to embolden present-day settlers to continue extracting, claiming this mining history as their heritage, identity, and future. Organized groups of miners, such as the New 49'ers Prospecting Association, purchase claims, selling annual memberships for the right to access these claims, information around how to mine them, and a general cultural experience of mining, or, as Leaf Hillman calls it, "recreational genocide."[13] In the promotional film on the New 49'ers website, the founder boasts, "we have so much mining ground, it's kind of like the entire forest is open to you, probably very similar to what it was like when the old timers arrived here." This sentiment echoes ideas of "pristine wilderness," denying the violent dispossession that took place when miners arrived in the area to make way for continued extraction. The Karuk Tribe continue to fight these encroachments, and in the early 2000's filed a lawsuit against the USFS to stop suction mining, which threatens already endangered salmon habitat and spawning grounds.

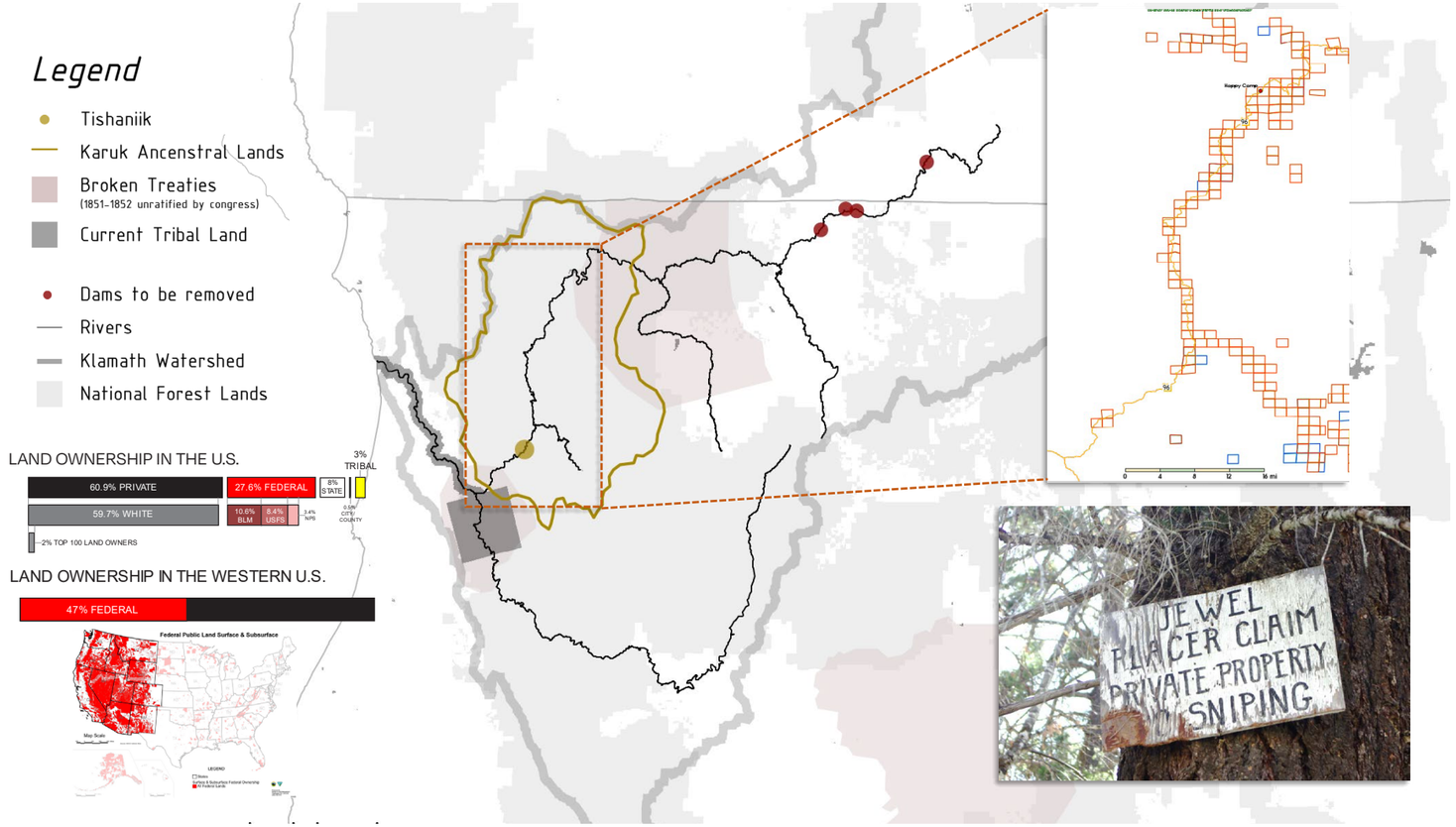

Figure 7.1 Land ownership in the Western U.S. and Klamath watershed and mining claims on the Klamath River (USGS National Atlas/ BLM; mylandmatters.org)

On a larger scale, 47% of land in the Western U.S. is owned by arms of the federal government (Figure 7.1). The laws these agencies enact serve a dual purpose: excluding the presence of the ancestral caretakers of this land and opening them up to forms of extraction. Because of the still-in-effect General Mining Law of 1872, much of this land hosts large mining companies engaged in the mining of a variety of minerals, as well as oil and gas, for nearly no cost at all. Through the treatment of PMLs, landscape architects have a role in creating a culture of permissiveness through the narratives that enable these activities to continue. PML reclamation reproduces settler colonialism by erasing traces of the ancestral stewards of the land who were displaced through mining activities, erasing the destruction of mining activities, celebrating mining histories, and continuing to use these sites as extraction.

On the other hand, rather than reclaiming PMLs for settler colonial reproduction, landscape architects and other settler-based restoration practitioners should instead work to "unclaim" these sites, challenging the disembodiment, properitization, and resourcification of lands and waters by re-establishing them into the network of nonhierarchical relations. This work must center the ancestral caretakers of the land and their knowledge through place-based solidarities that fight to end the continued extractive practices that threaten all of life on earth and instead revitalize eco-cultural practices. Through the novel ecosystems of PMLs, designers and researchers can contribute to the co-generation of emergent place-based knowledges and practices that offer modes of surviving and thriving in the face of climate change and continued ecological destruction, working to repair traumas of the past and make way for alternative non-settler futures.

NOTES

[1] Reo and Ogden, "Anishnaabe Aki."
[2] Akama, Hagen, and Whaanga-Schollum, "Problematizing Replicable Design to Practice Respectful, Reciprocal, and Relational Co-Designing with Indigenous People."
[3] Akama, Hagen, and Whaanga-Schollum.
[4] Akama, Hagen, and Whaanga-Schollum.
[5] Miraftab, "Insurgent Planning."
[6] Strakosch and Macoun, "The Vanishing Endpoint of Settler Colonialism," 41.
[7] Snelgrove, Dhamoon, and Corntassel, "Unsettling Settler Colonialism: The Discourse and Politics of Settlers, and Solidarity with Indigenous Nations."
[8] Whyte, "Critical Investigations of Resilience."
[9] Coulthard and Simpson, "Grounded Normativity / Place-Based Solidarity."
[10] Snelgrove, Dhamoon, and Corntassel, "Unsettling Settler Colonialism: The Discourse and Politics of Settlers, and Solidarity with Indigenous Nations."
[11] Risling Baldy and Tully, "Working for and toward Land Return of Goukdi'n (Jacoby Creek Forest)," 12.
[12] Hormel and Norgaard, "Bring the Salmon Home! Karuk Challenges to Capitalist Incorporation."
[13] Hillman, Personal Communication.

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