Unsettling Prairies: A Critical Reimagining of Fire Management in Cities

Jocine Velasco

A thesis

submitted in partial fulfillment of the

requirements for the degree of

Masters in Landscape Architecture

University of Washington

2021

Committee:

Ken Yocom, Chair

Cleo Woelfle-Erskine

Clarita Lefthand-Begay

Program Authorized to Offer Degree:

Landscape Architecture

University of Washington

Abstract

Unsettling Prairies: A Critical Reimagining of Fire Management in Cities

Jocine Velasco

Chair of the Supervisory Committee:

Ken Yocom

Department of Landscape Architecture

Abstract

Climate projections for 2050 expect Puget Sound regional temperatures will likely increase by 2.9-5.4 degrees Fahrenheit, temperatures more suitable for a mosaic of fire-resilient landscapes such as prairies, grasslands and oak savannas. Through fire, Indigenous people of this region have stewarded these landscapes since time immemorial. But because of settler colonialism and its legacy, these ecocultural landscapes are increasingly disappearing. This thesis argues that landscape designers must decolonize our methods by asking two questions in order to actively engage in prairie revitalization and Tribal co-generation surrounding prairie revitalization. First, how can a decolonizing design framework support the subsequent fire management of prairies in both wildland and urban areas? Second, how can a decolonizing design framework disrupt then deepen landscape architecture to support fire-dependent prairie habitat revitalization within the Pacific West? I propose the Decolonizing Design Framework (DDF) which includes five practices that can potentially integrate within existing landscape design methods (site analysis, conceptual design, participatory design, design-build and landscape management). The five practices are: (1) to honor Tribal sovereignty, 2) to respect the personhoods of all biotic life and the abiotic forms that support them, 3) to co-generate with a Tribe on shared climate adaptation goals, 4) to center long-term care of the land, and 5) to value multispecies epistemologies. I then implement and analyze the DDF in two case studies, the Camas Monitoring Project on the University of Washington – Seattle campus and the UW-Karuk Klamath Project, and present the findings through an autoethnographic method.

Keywords

prairie habitats, fire ecology, decolonial studies, climate adaptation, landscape architecture

UNSETTLING PRAIRIES

A CRITICAL REIMAGINING OF FIRE MANAGEMENT IN CITIES

JOCINE VELASCO

MLA THESIS 2021

acknowledgements

Maraming salamat/Many thanks to my thesis committee members Ken Yocom, Clarita Lefthand-Begay and Cleo Woelfle-Erskine. Ken for keeping an open mind at the direction I was taking with the Camas Monitoring Project and for supporting the expanse of my thesis scope. Thank you for processing with me after our first presentation. Clarita for the rigor, the understanding and the decolonizing mentorship (beauty above me, beauty below me). You have shown me how to be a good researcher to the communities I belong to. Salamat to Cleo for including me within the larger Klamath revitalization project and for insisting on a poetic approach to science. Maraming salamat to Lisa Hillman and Leaf Hillman for having the long-range vision and strategic insight for Tishánik and sharing them with me. Salamat to Polly Olsen for bearing witness. Thank you for not giving up on our camas meadow team and for teaching me that undoing settler colonial harm takes time. Endless thanks to my partner-in-crime Perry Hohlstein for collaborating with me on the Living Prairie Plant Display. Without your craftsmanship, the display would definitely not have turned out as beautiful as it did.

Maraming salamat to Ry Yahn and Morgan Southall for your skills as research-designers in our UW-Karuk Klamath collaboration. Thank you, Al Burgos for inspiring me to continue to take my thesis seriously because our ancestors and families are riding on it. Salamat to my reviewers Jean Ni, Alison Hirsch, Gabriel Montemayor and Rich Freitas for reminding me to fold landscape architecture methods back into the research. Thanks to the game of tennis for keeping my mental health afloat during my thesis year.

preface

All of these need to be relearned and remixed. The poetics of this endeavor seems more important than the categories of quick thinking, that lead to definitive and fixed conclusions. We understand the world better if we tremble with it. Because the world trembles in every which way. It trembles organically and geologically. It also trembles with the climates, alas, that we know. But the world also trembles through relations that we have with each other. Because the rapports between different nations, just like between individuals, are always complex, difficult and inextricable.

Édouard Glissant [1]

I decided to write my thesis in a non-traditional research format as part of my larger decolonizing design process. Landscape architecture as a field of study has given me the freedom to do, to make and to envision without relying on "definitive and fixed conclusions." Landscape architecture, at its core, is a multi-disciplinary field of study that blurs theory, science and art. It activates analysis and gives visions their material form. Because of this, I have the opportunity to pursue this thesis project through an iterative, experimental and hybridizing process as a refusal against the individual, or as the Martinique scholar Édouard Glissant once said via the writings of Fred Moten[2], to "consent not to be a single being." I am speaking for myself and my personal design process—however, within my perspective are multiple histories embedded in my lineage as part-colonized, part-colonizer and existing more than or outside of that binary.

---

1 Manthia Diawara, "One World in Relation: Édouard Glissant in Conversation with Manthia Diawara," *NKA (Brooklyn, N.Y.)* 2011, no. 28 (2011): 4–19, https://doi.org/10.1215/10757163-126663

2 The title of the Black scholar, Moten's, theoretical trilogy is called *Consent Not to Be a Single Being* in reference to the same Manthia Diawara's conversation with Édouard Glissant that I reference with the above excerpt. Fred Moten, *Black and Blur*, Moten, Fred. *Consent Not to Be a Single Being*; v. 1 (Durham: Duke University Press, 2017).

Article 5. The right of taking fish at usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the Territory, and of erecting temporary houses for the purpose of curing, together with the privilege of hunting and gathering roots and berries on open and unclaimed lands.

Treaty of Point Elliott, 1855

Figure 1.1 The Mima Mounds in the height of spring. Source: Jocine Velasco

1. introduction

Climate projections for 2050 expect Puget Sound regional temperatures will likely increase by 2.9-5.4 degrees Fahrenheit, "under a low greenhouse gas scenario."[3] Similar to the shift to a warmer and drier Puget Sound region during the early Holocene period that brought about fire-resilient landscapes such as prairies, grasslands and oak savannas, those living in this region will likely see a massive prairie habitat shift in their lifetime. A mosaic of prairies, grasslands and oak savannas may or may not proliferate in the Puget Sound (and in the larger Pacific Northwest region) in the future but this will depend on anthropogenic (human) influence. Landscape design is poised to reimagine a time when prairies can exist in this region again and with them, their subsequent stewardship through fire.

However, much of original conditions of these critical and threatened landscapes have diminished considerably since Euro-American settler colonialism and American imperialism. Article 5 of the 1855 Treaty of Point Elliott states, "The right of taking fish at usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the Territory, and of erecting temporary houses for the purpose of curing, together with the privilege of hunting and gathering roots and berries on open and unclaimed lands."[4] These "open and unclaimed lands" (existing now as federal or private lands) were the prairies, grasslands and oak savannas what is now known as the state of Washington. Fundamentally problematic, this phrase diminishes the important role of Indigenous people as long-term land managers of their ancestral lands and does not recognize the specific ties that Tribes have with "unclaimed lands." Tribes have fought for the United States court system to recognize the vague Treaty language have intentionally put them at a disadvantage. For instance, the legal interpretation between a "right" and a "privilege" is recognized by the Washington Supreme Court as both meaning the right to fish and to hunt.[5] But the fight for full recognition of Tribal rights of the management of prairie habitats have still not been won.

The loss of fire-resilient landscapes in the Puget Lowlands, Willamette Valley and Klamath Mountain Range ecoregions means the loss of Indigenous lifeways that depend on biodiversity. To regain this diversity, prairie restoration efforts in the Pacific West must contend deeply with the genocidal history that a diverse set of nations experience in the wake of settler colonialism. Indigenous nations and communities everywhere hold "80 percent of the world's biodiversity"[6] and yet the loss of their territories is ongoing and widespread. With this understanding, landscape architects must not design sustainably for "underrepresented" communities as a paltry catchall solution to address climate change. We should listen to Indigenous scholars who push back on "vulnerability narratives" because they "obscure the actions, strategies, resources, and knowledge that Indigenous groups mobilize to navigate environmental change."[7] Comparatively speaking, landscape architecture as an epistemology is relatively young whereas Indigenous-related land knowledge have survived for millennia and will—if we are lucky—usher us towards a more inclusive and diverse next millennia.

Figure 1.2 Conifer woodlands that have experienced prescribed burns. Source: Justin Haug, http://waprescribedfire.org/new-rx-fire-in-action

Figure 1.3 Conifer woodlands that have experienced fire suppression. Source: Justin Haug, http://waprescribedfire.org/new-rx-fire-in-action

Non-Native designers must recognize that what Tribal nations are facing with climate change is a particular environmental subjectivity[8] that intersects race, class and Indigeneity. The incongruency is that Indigenous-influenced land management practices (from burning to agroecology) are increasingly being used for climate adaptation but have rarely been credited as grounded in Indigenous epistemologies. Increasingly, landscape architecture projects in the Pacific West are incorporating native prairie plant palettes as a low-maintenance, drought-tolerant alternative. These designed urban prairie habitats are aesthetically pleasing, attract much-needed biodiversity and other environmental benefits in urban areas, and does not interrupt sightlines and views. Landscape

3 Guillaume S. Mauger et al., "State of Knowledge: Climate Change in Puget Sound" (Seattle: Climate Impacts Group, University of Washington, 2015).

4 This declaration is made similarly in the series of treaties generally named Stevens Treaties including the Treaty of Medicine Creek and the Quinault Treaty. Pauline R. Hillaire and Gregory P. Fields, *Rights Remembered: A Salish Grandmother Speaks on American Indian History and the Future* (Lincoln, UNITED STATES: Nebraska, 2016), http://ebookcentral.proquest.com/lib/washington/detail.action?docID=4456532.

5 Washington Department of Fish and Wildlife, "Treaty History and Interpretation," Washington Department of Fish & Wildlife, accessed June 6, 2021, https://wdfw.wa.gov/hunting/management/tribal/history.

6 "FAO - News Article: 6 Ways Indigenous Peoples Are Helping the World Achieve #ZeroHunger," accessed April 5, 2021, http://www.fao.org/indigenous-peoples/news-article/en/c/1029002/.

7 Nicholas J. Reo et al., "Invasive Species, Indigenous Stewards, and Vulnerability Discourse," *American Indian Quarterly* 41, no. 3 (2017): 201, https://doi.org/10.5250/amerindiquar.41.3.0201.

8 Allison Ford and Kari Marie Norgaard, "Whose Everyday Climate Cultures? Environmental Subjectivities and Invisibility in Climate Change Discourse," *Climatic Change* 163, no. 1 (November 2020): 43–62, https://doi.org/10.1007/s10584-019-02632-1.

INDIGENOUS FIRE PRACTITIONERS

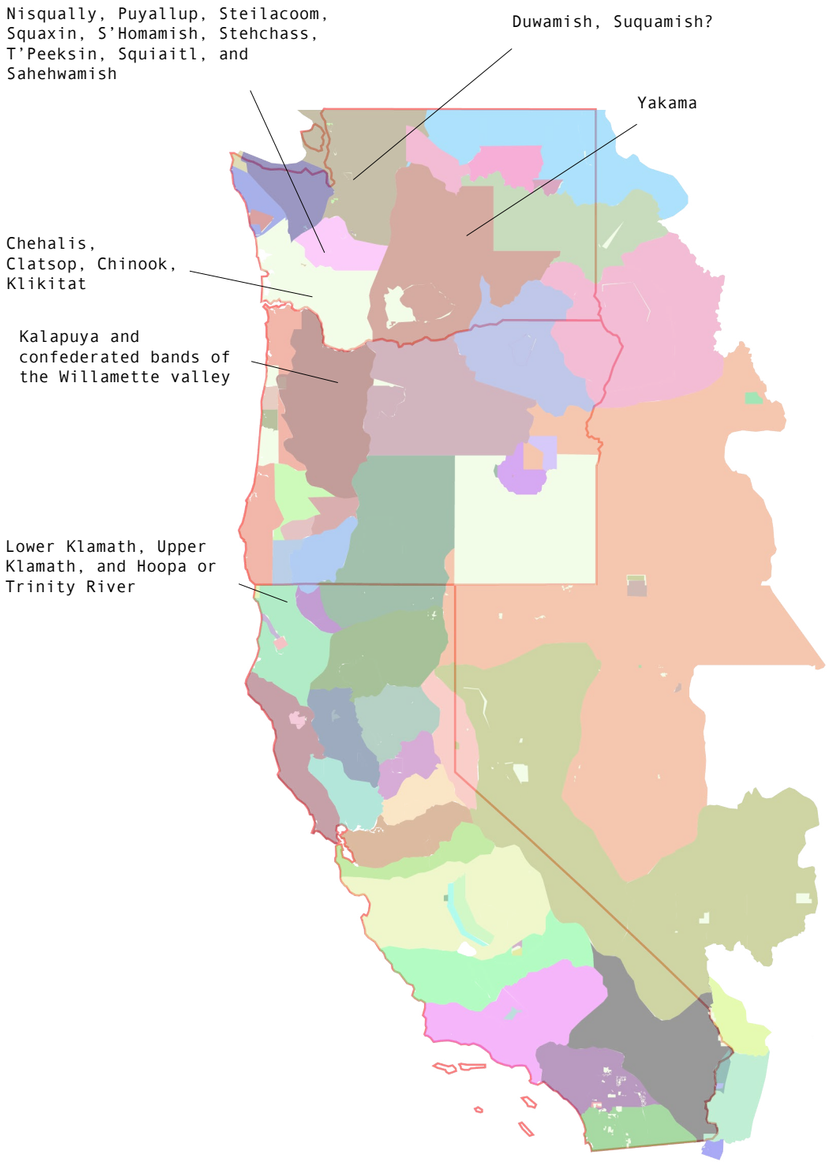


Figure 1.4 A portion of historic and current Tribes who manage prairies with fire in my scope of work.

ECOREGIONS

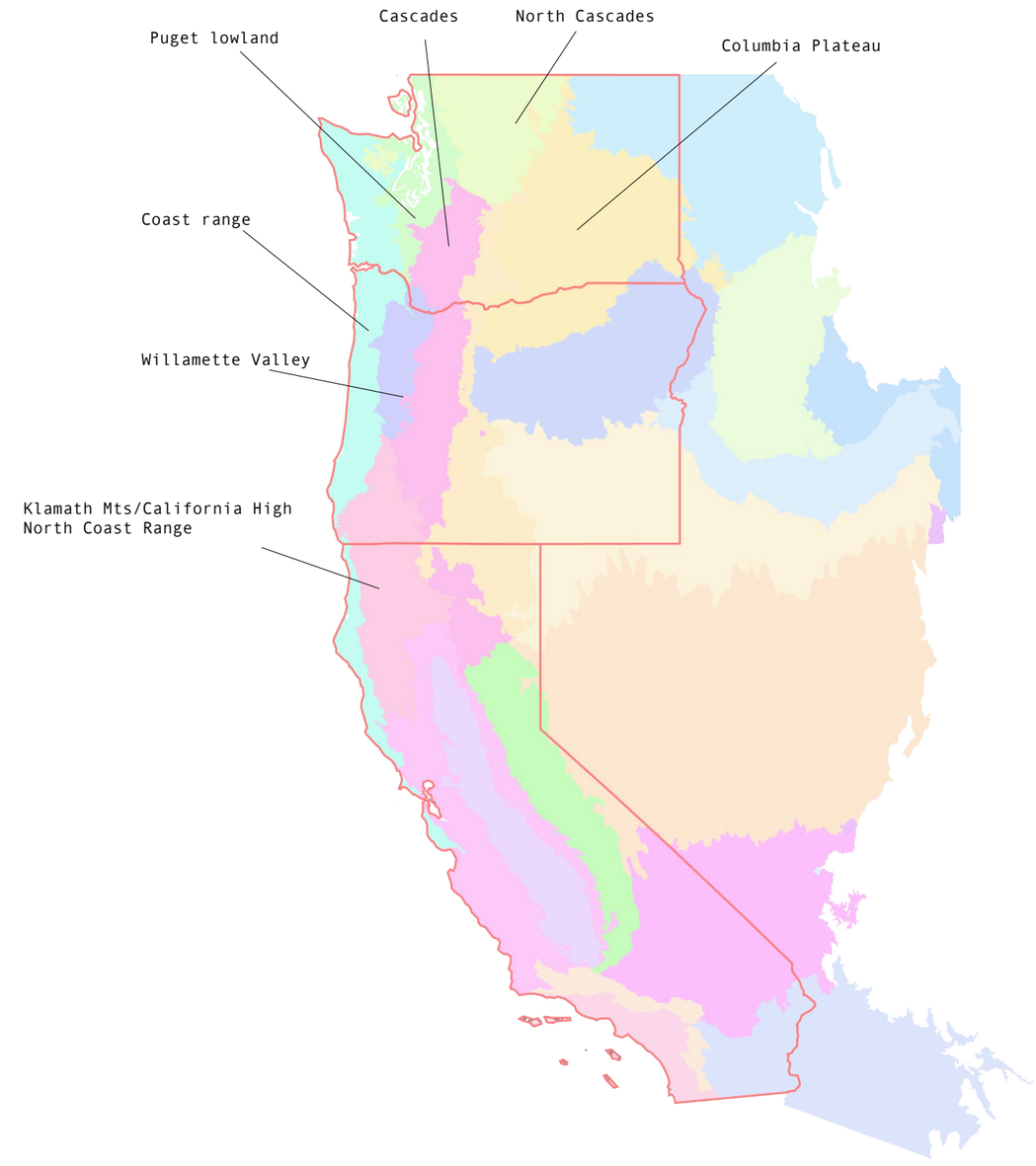


Figure 1.5 A portion of the ecoregions with historic and current prairies, grasslands and oak savannas.

design introducing historically Indigenous-stewarded prairie habitats as a climate adaptive design strategy that functions with more than ecosystem services in mind will require a more critical and robust approach. An approach built on a Decolonizing Design Framework (DDF) that grounds itself in Indigenous, decolonizing and feminist epistemological methods while critically investigating the Western landscape design methods it works within. Opting to use "decolonizing" instead of "decolonial" to describe the framework implies a process of decolonization that is ongoing rather than a finite goal.

I aim to center two research questions to analyze two prairie-related case studies: the Camas Monitoring Project on the University of Washington – Seattle campus and the UW-Karuk Klamath Project. First, *how can a decolonizing design framework support the subsequent fire management of prairies in both wildland and urban areas*? Second, *how can a decolonizing design framework disrupt then deepen landscape architecture to support fire-dependent prairie habitat revitalization within the Pacific West*? Prairie revitalization within the Pacific West and their subsequent fire management in both wildland and urban areas are shared climate adaptation goals by the stakeholders in the landscape design projects in my thesis. These questions work in tandem and respond to one another as they address complicated and entangled ecosocial histories in order to conceive what prairie counterfutures can look like.

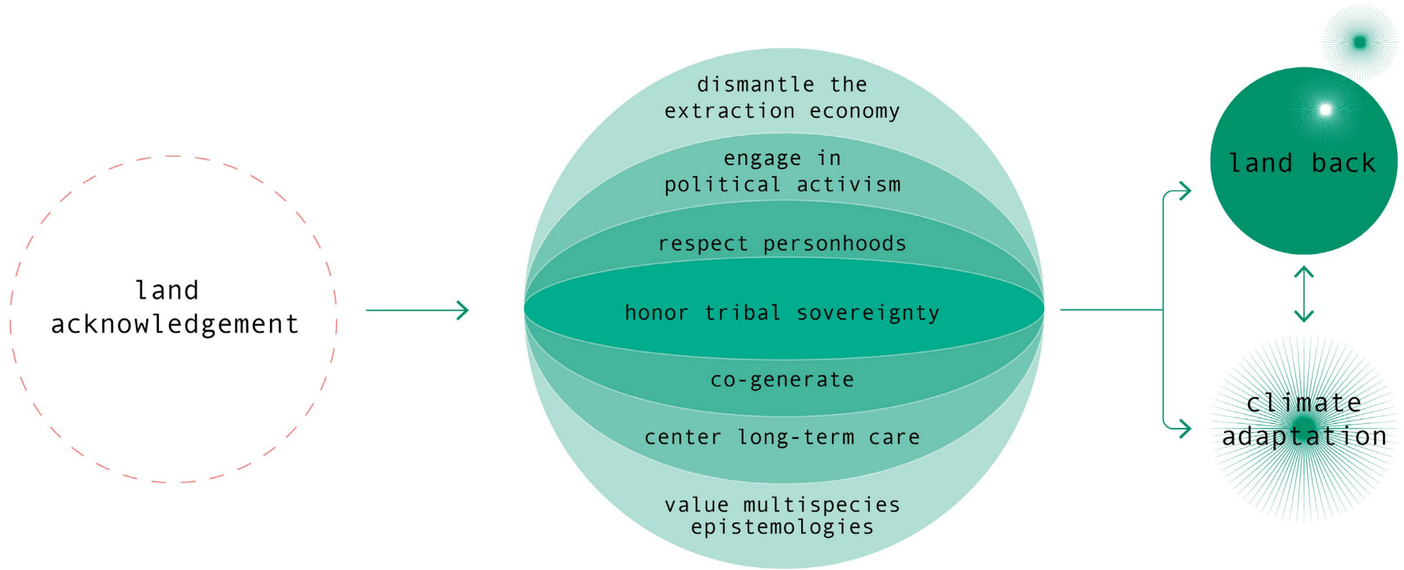


Figure 1.6 From Settler to (Settler) Accomplice - my proposed Decolonizing Design Framework (DDF).

Decolonizing Design Framework

Foundational to my proposed DDF is the argument that academia has turned decolonization into a metaphor[9], cleanly absolving settlers from the responsibility of facing the history of genocide and chattel slavery. Rather than actively engaging in ways that can honor Tribal sovereignty, performative decolonization has perpetuated settler colonial violence. To begin, I had to ask myself: whose ancestral land am I designing on? With my thesis, I wanted to learn if it is possible for me to decolonize my design-related projects by decolonizing the design process. This framework is a translatable exercise in identifying how my personal perception and politics structure the approach and priorities I bring to design. I argue that for non-Native designers, we have what Potawatomi scholar Dr. Kyle Powys Whyte calls "political responsibilities"[10] in going beyond land acknowledgement and towards explicit material support for Indigenous-led restoration projects. Because Indigenous communities hold the material knowledge and expertise to successfully address climate change, non-Native designers, planners, and restoration ecologists must ground climate adaptation efforts in their knowledge with their consent and through expressed material reciprocity. Material support can include paid consultation work, paid collaborative positions, pro bono design work and grant work, research partnerships, volunteer work events, or simply showing up with our own bodies to protest. These are just some ways to stay in solidarity with Indigenous communities on their ecocultural movements and our shared climate adaptation struggles.

Drawing from both Indigenous land back movements and climate justice as the shared visions for collective liberation and survival, I identified seven key practices for building trust with Tribal co-stakeholders surrounding research and design relating to prairie habitats and their subsequent fire management. Two of these practices, to dismantle the extraction economy and to engage in political activism, are included because I believe they are actions that I can do to stay in solidarity with Indigenous land back movements and climate justice. However, I am not actively participating in either practices within the scope of this thesis but

9 Eve Tuck and K Wayne Yang, "Decolonization Is Not a Metaphor," Decolonization: Indigeneity, Education & Society 1, no. 1 (2012): 1–40.

10 Kyle Powys Whyte, "Indigenous Women, Climate Change Impacts, and Collective Action," Hypatia 29, no. 3 (2014): 599–616, http://www.jstor.org/stable/24542019.

consider both as part of a life-long process. The five practices in the DDF that I aim to address are: 1) to honor Tribal sovereignty, 2) to respect the personhoods of all biotic life and the abiotic forms that support them, 3) to co-generate with a Tribe on shared climate adaptation goals, 4) to center long-term care of the land, and 5) to value multispecies epistemologies. By implementing this DDF, I hope to add to existing bodies of work and respond to existing approaches to design collaborations with Tribal nations.

The chapters in my thesis aim to deeply investigate my two research questions. The first chapter is a literature review that addresses both research questions by incorporating the theories of Indigenous, decolonizing, and feminist scholars to examine Western narratives surrounding historic prairie loss. The second chapter questions settler conservation and its motives by examining the Joint Base Lewis-McChord prairie restoration project and the exclusion and erasure of historic and existing Indigenous knowledge. The third chapter looks at existing landscape design methods and opens space for how a decolonizing design framework can lend itself to landscape design and adaptive restoration processes by disrupting then deepening design methods like site analysis, conceptual design, participatory design, landscape management planning, and design-build prototyping. The fourth chapter examines two case studies that engage Tribal stakeholders in prairie stewardship and prairie design respectively: 1) the Camas Monitoring Project on the University of Washington – Seattle campus and 2) the Karuk-UW Klamath Ecocultural Revitalization Project. Through autoethnographic methods, I reflect on my research questions and search for opportunities where the 5 DDF practices can integrate. Lastly, the final chapter prompts designers and non-designers alike to utilize speculative conceptual design to imagine prairie counterfutures in the Pacific West.

List of Figures

(images are my own unless indicated otherwise)

historic prairie loss

ECOLOGICAL

FIRE SUPPRESSION

CONIFER ENCROACHMENT

INVASIVE SPECIES

SPATIAL

SETTLER AGRICULTURE

TIMBER INDUSTRY

LEGAL

INTERNMENT OF INDIGENOUS PEOPLE

SETTLER CITY-MAKING

U.S. FOREST SERVICE FIRE POLICIES

STATE-MAKING

PRIVATIZATION

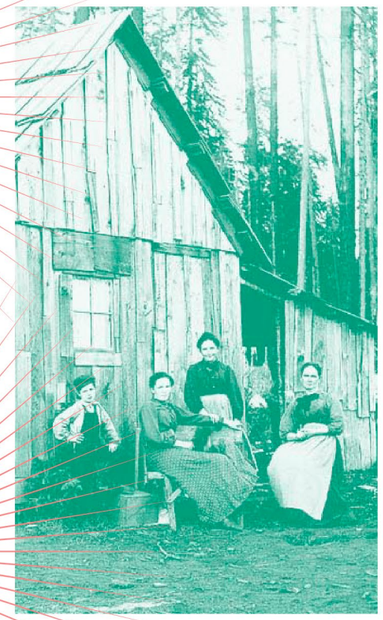
BROKEN TREATIES

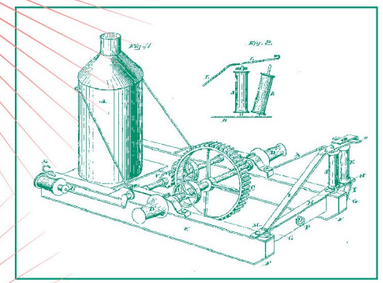
IMPERIALISM

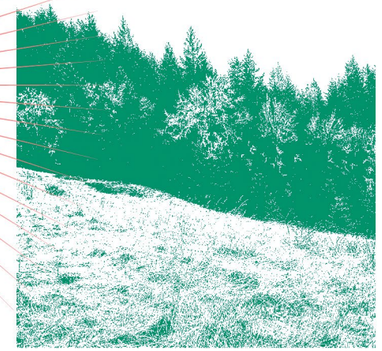
SETTLER COLONIALISM

CAPITALIST EXTRACTION

SYSTEMIC







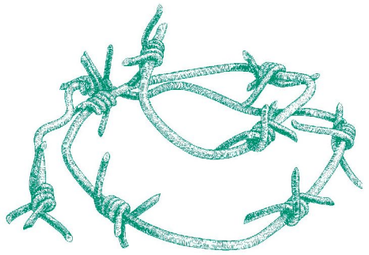


Figure 2.1 Historic prairie loss diagram.

2. defying settler territories: tribes, prairies and fires

Section 1. Historic Prairie Loss

> Indigenous people skillfully modified the fire regime to create a range of forest openings in many different stages of postfire succession, which enhanced the diversity and yield of game, berries, root crops, edible seeds, and medicinal plants. In contrast, fire was often used by the colonists with a different intent—uniformity, such as production of pastures, cropland, and plantations.
>
> Robin Wall Kimmerer and Frank Lake[11]

Human perception of fire varies across time, space, geopolitical economies and between cultures. In all the literature relating to the use of fire as land management, there is no mention of utilizing the urban landscape as a site of fire management or of fire demonstration for public education. The practice of cultural burning by Indigenous people is often cited as traditional ecological knowledge (TEK) or traditional ecological management (TEM) in the United States. However, it's also important to note that fire is a cheap, less labor-intensive agroecological practice for subsistence worldwide. Historically, settings where fire is used by Indigenous[12] and local[13] communities for subsistence purposes, the land regulating body, in many cases the dominant federal and/or state governments, have criminalized them. These actions correlate and coincides with statehood, industrialization, city-making and the separation of "wildlands" from its "urban" counterpart. Where concrete establishes property lines, fires (like floods) blur and diminish settler territorial meaning.

Publications from both Native[14] and non-Native[15] fire ecologists and scholars showcase how not all fires at the same. In general, they are divided into three categories: low-severity, mixed severity and high-severity fire regimes. Habitats like prairies, oak savannas and pine-oak woodlands that Tribes manage through smaller fires are part of a low-severity fire regime. They have less fuel loads and emit less smoke. Tribes also manage and have historically managed these habitats as frequent as twice a year every year.[16] Whereas lands like timber plantations or federal forest reserves that experienced historic fire suppression are more likely to receive high-severity fires because of their increased ignitable vegetation.[17]

Scientific publications focusing on prairie restoration has not fully connected settler colonialism to historic prairie loss. For instance, the majority of prairie research within the Puget Lowlands ecoregion acknowledge that Indigenous fire management

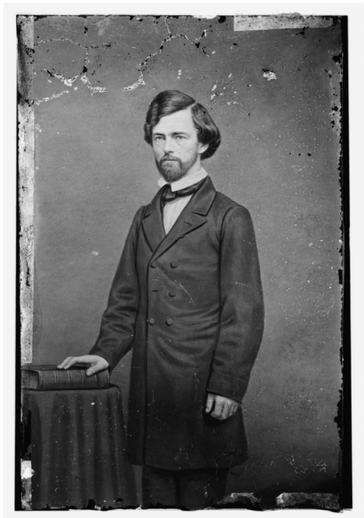


Figure 2.2 Portrait of Isaac Stevens, the governor of the Territory of Washington, who coerced many Tribes to sign his treaties. Source: Brady, Matthew. https://www.loc.gov/pictures/resource/cwpbh.02650.

supported in prairie habitat persistence but do not link the forced removal of Tribes as a main factor of prairie loss.[18] Fire, for Tribal nations such as the Upper Chehalis, Confederated Tribes of the Colville Reservation and Karuk Tribes respectively, was (and for some Tribes, still is) an integral aspect of their land management technologies. H. T. Lewis, a settler anthropologist, observed at least 70 different reasons why Tribes in so-called California practiced burning.[19] But what took Indigenous people of the Pacific West thousands of years to steward, took less than 100 years to almost completely decimate. A combination of ecological, spatial, legal and systemic factors contributed to historic prairie loss in the Pacific West. Within the southern Puget Lowland ecoregion, only 3,000 acres of the estimated 150,000 acres remain of glacial outwash prairies that contain native prairie plant species today.[20] Although evidence of anthropogenic Indigenous fire regimes is abundant, there has been a certain reluctance in

11 R.W. Kimmerer and F.K. Lake, "The Role of Indigenous Burning in Land Management," *Journal of Forestry* 99, no. 11 (November 1, 2001): 36–41, https://doi.org/10.1093/jof/99.11.36.

12 Robert T. Robert Thomas Boyd, Indians, Fire, and the Land in the Pacific Northwest, 1st ed. (Corvallis, Or.: Oregon State University Press, 1999).

13 Wolfram H. Dressler et al., "Recalibrating Burdens of Blame: Anti-Swidden Politics and Green Governance in the Philippine Uplands," Geoforum, February 2020, S0016718520300348, https://doi.org/10.1016/j.geoforum.2020.01.024.

14 Kimmerer and Lake, "The Role of Indigenous Burning in Land Management"; Daniel Sarna-Wojcicki, Jennifer Sowerwine, and Lisa Hillman, "Decentring Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin" 12, no. 1 (2019): 26; Tony Marks-Block, Frank K. Lake, and Lisa M. Curran, "Effects of Understory Fire Management Treatments on California Hazelnut, an Ecocultural Resource of the Karuk and Yurok Indians in the Pacific Northwest," Forest Ecology and Management 450 (October 2019): 117517, https://doi.org/10.1016/j.foreco.2019.117517.

15 J. Wray and M. K. Anderson, "Restoring Indian-Set Fires to Prairie Ecosystems on the Olympic Peninsula," Ecological Restoration 21, no. 4 (December 1, 2003): 296–301, https://doi.org/10.3368/er.21.4.296; Henry T. Lewis, "Patterns of Indian Burning in California: Ecology and Ethnohistory," American Anthropologist 77, no. 3 (1975): 685–86, https://doi.org/10.1525/aa.1975.77.3.02a00880; L. Storm and D. Shebitz, "Evaluating the Purpose, Extent, and Ecological Restoration Applications of Indigenous Burning Practices in Southwestern Washington," Ecological Restoration 24, no. 4 (December 1, 2006): 256–68, https://doi.org/10.3368/er.24.4.256; John D. Walstad, Steven R. Radosevich, and David V. Sandberg, Natural and Prescribed Fire in Pacific Northwest Forests (Corvallis, Or.: Oregon State University Press, 1990).

16 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"; Kimmerer and Lake, "The Role of Indigenous Burning in Land Management."

17 Walstad, Radosevich, and Sandberg, Natural and Prescribed Fire in Pacific Northwest Forests.

18 Sarah T. Hamman et al., "Fire as a Restoration Tool in Pacific Northwest Prairies and Oak Woodlands: Challenges, Successes, and Future Directions," Northwest Science 85, no. 2 (July 2011): 317–28, https://doi.org/10.3955/046.085.0218; Wray and Anderson, "Restoring Indian-Set Fires to Prairie Ecosystems on the Olympic Peninsula"; Charlotte C. Trowbridge et al., "Long-Term Effects of Prairie Restoration on Plant Community Structure and Native Population Dynamics: Long-Term Effects of Prairie Restoration," Restoration Ecology 25, no. 4 (July 2017): 559–68, https://doi.org/10.1111/rec.12468.

19 Lewis, "Patterns of Indian Burning in California."

20 Storm and Shebitz, "Evaluating the Purpose, Extent, and Ecological Restoration Applications of Indigenous Burning Practices in Southwestern Washington."

the part of public and private landowners to introduce cultural burning practices in non-reservation lands.[21]

It is important to review the legal dimensions of prairie loss by focusing on negative impacts of Euro-American state-making and city-making project from 1840s onward in the Pacific West of the United States. The series of treaties generally called Stevens Treaties that include Treaty of Point Elliott not only promised fishing rights but rights to gather and hunt in prairies. However, the sudden decrease of "open and unclaimed lands" mentioned in the Stevens Treaties came with the US's acquisition of Indigenous land. Tribes such as the Nisqually and Puyallup have fought back against treaty rights violations surrounding fishing and hunting within the Stevens treaties since the 1960s. Without the grassroots organizing and direct actions that Tribal activists like Bill Frank committed their lives to, the Boldt Case would not have gained as much ground and as much popular support.[22] From 1985 to 2001, Pacific Northwest Tribes along with the US government sought a determination by the court against the state of Washington of bearing the responsibility of restoring critical fish habitats by removing state-owned structural barriers to fish passage.[23] Prairies, grasslands and oak savannas are crucial habitats and their Indigenous management are just as crucial to recognize as part of honoring the Treaties.

Active disregard of Tribal rights as agreed upon in the Stevens Treaties, the US government greatly impacted not only salmon habitat but elk and camas habitat as well. Yeoman farmers, encouraged by the burgeoning US, converted almost all available deep-soil and wet prairies—where the camas thrive—even before the 1862 Homestead Act. Two laws that combined spatial design with settler colonialism and white supremacy over Indigenous people were the Dawes General Allotment Act of 1887 and the Land Ordinance of 1785. The Dawes Allotment Act divided parcels as a way to individuate property ownership to diminish Tribal land management structure of larger portions of land not "owned" by any one particular Indian. Tribes that did not have this ownership structure saw their power diminish significantly. This led to more parcels of land legally available for settlers.[24] Shortly after, the Land Ordinance of 1785 slashed grids on the landscape and made parcels out of prairies and savannas to be sold to settlers and settler companies. The United States Congress led by Thomas Jefferson signed into being this document.

> "Be it ordained by the United States in Congress assembled, that the territory ceded by individual states to the United States, when the same shall have been purchased of the Indian inhabitants, and laid off into states, shall be disposed of in the follow manner. It shall be divided into hundreds of ten geographical miles square, each mile containing 6,086 feet, and 4-10ths of a foot, by lines to be run and marked due north and south, and others crossing these at right angles, the first of which lines, each way, shall be at ten miles distance from one of the corners of the State within which they shall be."[25]

36	30	24	18	12	6
35	29	23	17	11	5
34	28	22	16	10	4
33	27	21	15	9	3
32	26	20	14	8	2
31	25	19	13	7	1

Figure 2.3 The grid that inspired the plat surveys for the Land Ordinance of 1785. Source: Jerome Higgins

Maōri scholar Linda Tuhiwai Smith writes, "There is a very specific spatial vocabulary of colonialism which can be assembled around three concepts: (1) the line, (2) the centre, and (3) the outside."[26] Meaning what seemed to be ordained by nature or the natural law, Manifest Destiny, was in actuality spatially constructed and justified by the White settler imaginary in favor of the settler.

Figure 2.4 Portrait of John Weeks, a US Senator who passed the 1911 Weeks Act. Source: Service, Bain News. "J.W. Weeks." Still image, 1915. https://www.loc.gov/pictures/resource/ggbain.31644.

These land surveys were delineated by walking in straight lines and charted on paper—regardless of existing human and more than human inhabitants, geographical features or ecological process. Due largely to the Western settler imaginary, these prairies were seen by Euro-American explorers, yeoman farmers, lawmakers, scientists and scholars as sites to be extracted from or dredged or ploughed, and once depleted, paved over into another kind of treeless landscape: the city. The city or the aspect (i.e. the port or the fort) of the city where it receives its power, in Tuhiwai Smith's term, is "the centre"—the colonial economic stronghold.

The counterpart of the city is the settler wildland. The burgeoning nation of the US needed to territorialize these lands as "public" lands by 1) preserving certain geographic features as pristine and 2) managing the productivity of the rest. Two federal agencies formed during the late 19th century to perform these measures were the National Park Service and the US Forest Service. The latter was originally under the same authority of the Department of Interior as the former but split off in 1905 to be taken under the wing of the Department of Agriculture. This thesis focuses more on the significant role that the US Forest Service played in fire suppression in these wildlands that negatively impacted prairie habitats and other fire-dependent ecosystems and their concurrent

21 Wray and Anderson, "Restoring Indian-Set Fires to Prairie Ecosystems on the Olympic Peninsula."

22 Charles F. Wilkinson, Messages from Frank's Landing: A Story of Salmon, Treaties, and the Indian Way (Seattle: University of Washington Press, 2000).

23 Michael C. Blumm, "Indian Treaty Fishing Rights and the Environment: Affirming the Right to Habitat Protection and Restoration," SSRN Electronic Journal, 2016, https://doi.org/10.2139/ssrn.2813894.

24 "It appears likely that the U.S. government desired to sell the land off cheaply to white settlers." Daniel McGrath, "The Model Tribal Probate Code: An Opportunity to Correct the Problems of Fractionation and the Legacy of the Dawes Act," Journal of Gender, Race and Justice, 2017, Gale Academic OneFile, http://link.gale.com/apps/doc/A492465327/AONE?sid=bookmark-AONE&xid=87c3a1ee.

25 United States Congress, "A Century of Lawmaking for a New Nation: U.S. Congressional Documents and Debates, 1774 - 1875," in Journals of the Continental Congress, vol. 27, 446, accessed April 19, 2021, http://memory.loc.gov/cgi-bin/ampage?collId=lljc&fileName=027/lljc027.db&recNum=83.

26 Linda Tuhiwai Smith, Decolonizing Methodologies: Research and Indigenous Peoples (London, United Kingdom: Zed Books, 2012), http://ebookcentral.proquest.com/lib/washington/detail.action?docID=1426837.

Figure 2.5 Timber workers on a steam donkey. Source: Clark Kinsey. https://digitalcollections.lib.washington.edu/digital/collection/clarkkinsey/id/214/rec/7.

land stewards. By defining all fires as a threat to fight against and by not delineating between different fire types, causes and intentions, the US Forest Service campaigned for total and absolute fire removal by the early 1900s.[27] Spatial and legal factors imposed by US federal and state governments worked in tandem with each other to "fight" fires. After major fires such as the 1902 Yacolt fire and the "Big Blowup of 1910" affected the newly formed states of the Pacific West, the formation of the Western Forestry and Conservation Association and the approval of the bill, Weeks Act of 1911, legitimized fire suppression as a means to protect US federal forest reserves.[28] Massive funds and human labor were poured into fire suppression to ensure that ever-increasing infrastructure and development in new American cities in the Pacific West would continue unimpeded and protected.

27 "Another key tenet of the Weeks Act created the foundation, still in use today, for cooperative agreements between the Forest Service and non-federal forests. By 1911, the public desire for fire control on forests throughout the US, regardless of ownership, called for the Forest Service to act cooperatively with state and private forest owners to provide guidance and material to help support fire prevention and suppression[...] By 1919, 23 states had entered into cooperative agreements with the Forest Service." Lincoln Bramwell, "1911 Weeks Act: The Legislation That Nationalised the US Forest Service," Journal of Energy & Natural Resources Law 30, no. 3 (2012): 325–36, https://doi.org/10.1080/02646811.2012.11435298.

28 Gerald W. Williams, "The USDA Forest Service - The First Century," Historical analysis (Washington D.C.: USDA Forest Service, April 2005).

Figure 2.6 A US Forest Service ranger in Montana, posing in the aftermath of a series of massive fires called the Big Blowup of 1910 that affected the Pacific West. Source: Forest Service Northern Region. Aftermath of the 1910 Fires. 1910. Photo. https://www.flickr.com/photos/fsnorthernregion/4930354848/.

Vital prairie and grasslands in pine-oak savannas and woodland edges could not compete with the encroachment of thick conifer forests and the absence of fire management.[29] All over the Pacific West, conifer encroachment due to fire exclusion became a justification for timber extraction and the industry was born. As described by Alisa Gallant and colleagues, the effects of logging on the habitats of fire-dependent tree species are significant.

> "Following Euro-American settlement, the natural disturbance mechanism of fire was replaced by logging. Since then, the total area logged has been much less extensive than the burned areas of the past, and has been confined to the moist Douglas-fir forest and mid- and lower-elevation forest biophysical classes. Even within these classes, the area in seedling- and sapling-aged stands may now be only about one-third of what it was before Euro-American settlement. While logging can mimic fire in terms of creating canopy openings, selectively cut stands favor dominance by fire- and pest-sensitive species, and clearcut sites are often planted with conifers within a year of harvest, eliminating the natural establishment of early seral species."[30]

29 Eamon A. Engber et al., "The Effects of Conifer Encroachment and Overstory Structure on Fuels and Fire in an Oak Woodland Landscape," Fire Ecology 7, no. 2 (August 2011): 32–50, https://doi.org/10.4996/fireecology.0702032.

30 Alisa L. Gallant et al., "Vegetation Dynamics under Fire Exclusion and Logging in a Rocky Mountain Watershed, 1856-1996," Ecological Applications 13, no. 2 (2003): 385–403, http://www.jstor.org/stable/3099906.

TIMBER PRODUCTS EXTENTS

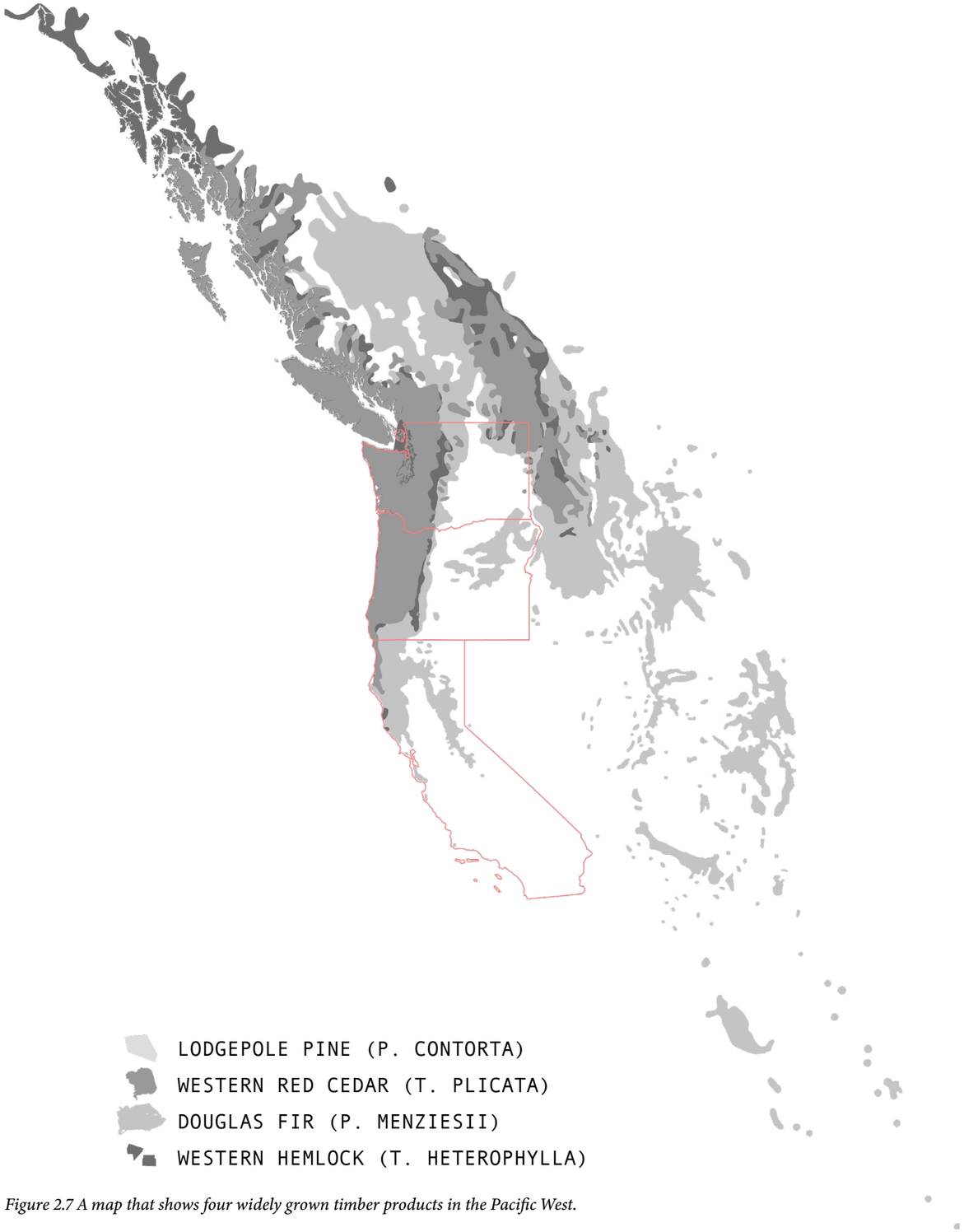


Figure 2.7 A map that shows four widely grown timber products in the Pacific West.

GARRY OAK (Q. GARRYANA) EXTENTS

Figure 2.8 A map showing the plant distribution of the Garry oak.

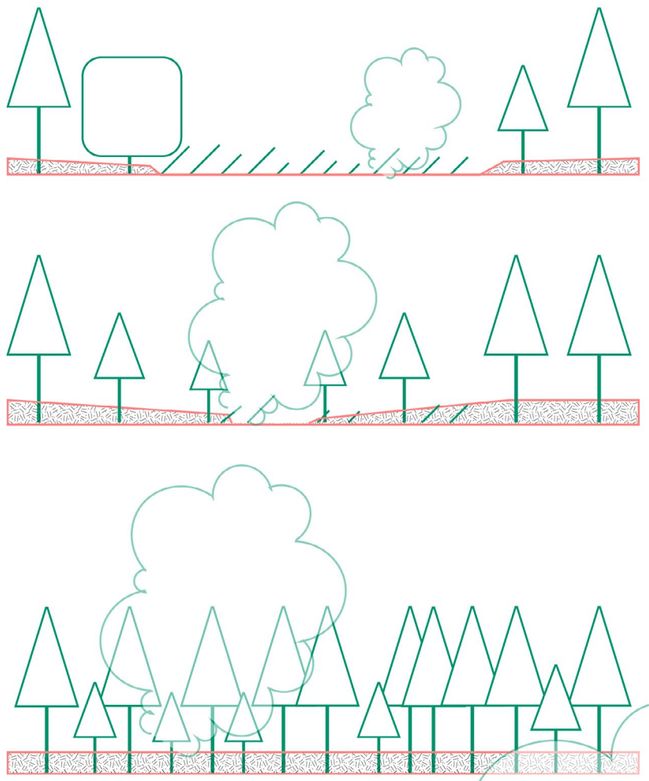
FIRE TYPES AND SMOKE

LOW-SEVERITY FIRE REGIME

PINE-OAK WOODLAND

OAK SAVANNA

PRAIRIE/GRASSLAND



LESS FUEL LOADS (IGNITABLE VEGETATION)
SMALLER SIZE, LESS CO2 EMISSIONS
MORE FREQUENT FIRE INTERVALS

MIXED-SEVERITY FIRE REGIME

CONIFER FOREST

PINE-OAK WOODLAND

HIGH-SEVERITY FIRE REGIME

CONIFER FOREST

TIMBER PLANTATION

MORE FUEL LOADS
CROWN FIRES, MORE CO2 EMISSIONS
LESS FREQUENT FIRE INTERVALS

Figure 2.9 A diagram showing the three types of fire regimes and their characteristics.

Section 2. Karuk Fire Ecological Knowledge and Climate Adaptation Planning

> Fire is medicine.
>
> Leaf Hillman, Karuk Tribe

The Karuk Tribe are one of the Indigenous fire management experts in the Pacific West. The Karuk Department of Natural Resources have also drafted a Climate Adaptation Plan that outlines the Karuk's long-range vision for ecocultural revitalization that is specific to Karuk cultures, epistemes, governance structures and worldviews. Specific to the Karuk is the holistic land governance framework that considers fire, the Klamath River and agroecology as interconnected and layered. *Decentring Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin* introduces two scalar frameworks to work in tandem with the watershed scale, the "fireshed" and the "foodshed" for ecocultural land management in Karuk Aboriginal Territory.[31] The authors, including Karuk scholars Lisa and Leaf Hillman, advocate for a decolonial framework "that builds from Indigenous perspectives on the complex spatial and temporal dynamics of water, fire, and food, and their embeddedness in place-based ecological and sociocultural relations."[32] In it, they argue that current partnerships that relate to watershed governance not only has "been critiqued for its inability to deliver material ecological results of improved aquatic habitat and water quality conditions" but has also "systemically prevented Indigenous communities from participating in watershed collaborations."[33] This decentring inspires the actionable step of holistic restoration in my proposed decolonizing framework.

Why does working with Tribal nations on restoration projects matter? How can the field of landscape architecture become a more robust and relevant profession with these types of collaboration? Landscape architecture's design process, more than any design field of study, emphasizes the need to pay attention to the linkages between social systems, ecological processes and geological history. Simultaneously, the profession at large is highly dependent on an economic-based model where clients—as paying customers—

Figure 2.10 A sign post for the Karuk Tribe Housing Authority showing the Karuk nation's insignia. Source: Karuk Tribe, https://www.karuk.us/

highly inform and ultimately determine the extent and details of design. Without decolonizing frameworks rooted in Indigenous epistemologies and land stewardship, Indigenous communities are not prioritized. Landscape architecture firms, unencumbered by stringent metrics that hold them accountable, arguably get away with claims of sustainability[34]. Similar to restoration ecology or fields of study that offer ecological services, landscape architecture can fall into Manifest Destiny[35] spatial narratives that inform power relations within the design collaboration.

> "Seeing the watershed as a unit 'mandated by nature' and devoid of any cultural or political influences, allows it to acquire an 'untouchable legitimacy' as the primary seat of environmental governance. This 'naturalises' the watershed as the optimal scale of conflict resolution, water management, and environmental governance, and accomplishes what Cohen and Bakker term an 'eco-scalar fix'. This forecloses important political choices and collective discussions about what scales and institutional arrangements are appropriate for community and place, which social, economic, and ecological processes matter most, and who has power to set priorities for ecosystem management and restoration. Watershed-centric governance can diminish the effectiveness of alternative channels of communication and social organization, and ignore difficult questions of inclusion, rights, and responsibilities implicated in alternative scalar framings."[36]

Figure 2.11 Bill Tripp, the director of the Karuk Department of Natural Resources standing in front of a prescribed burn. Source: Karuk Tribe, https://www.karuk.us/

Keeping the fireshed and foodshed as critical scales to include within watershed governance influences the landscape design I propose for the Karuk. The design intent folded within the larger Klamath restoration project is to center cultural burning practices, ethnobotanical plant reintroduction and Karuk intergenerational programming as elements that promote long-term and/or permanent land stewardship.

The Karuk Tribe is a federally recognized Tribe whose ancestral lands are located within the Mid-Klamath River Basin in the Klamath Mountain Ranges ecoregion. They practice both cultural and prescribed burning. The Tribe led and facilitated one of the first Prescribed Fire Training Exchange (TREX) programs (Klamath River TREX) within the Pacific West in their aboriginal territory and has since hosted the Klamath River TREX each year. TREX is a program that promotes diverse collaboration between stakeholders to provide a "cooperative burning model."[37] Originally started by a partnership between the Nature Conservancy and the Forest Service among other partners, it has since shifted to a steady and ongoing increase in Tribal participation and leadership.

31 Sarna-Wojcicki, Sowerwine, and Hillman, "Decentring Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin."
32 Sarna-Wojcicki, Sowerwine, and Hillman.
33 Sarna-Wojcicki, Sowerwine, and Hillman.
34 These three bodies of work include chapters that promote and explain landscape architecture's role in ecological sustainability. Joshua Zeunert, Landscape Architecture and Environmental Sustainability: Creating Positive Change through Design, Required Reading Range. Course Reader (London ; New York: Fairchild Books, 2017); Robert Holden and Jamie Liversedge, Landscape Architecture: An Introduction (London, UNITED KINGDOM: Laurence King Publishing, 2014), http://ebookcentral.proquest.com/lib/washington/detail.action?docID=1876176; Bruce Sharky, Thinking about Landscape Architecture: Principles of a Design Profession for the 21st Century, [First edition]. (New York, NY: Routledge, 2016).
35 Cleo Woelfle-Erskine, "The Watershed Body: Transgressing Frontiers in Riverine Sciences, Planning Stochastic Multispecies Worlds," Catalyst: Feminism, Theory, Technoscience 3, no. 2 (September 22, 2017).
36 Sarna-Wojcicki, Sowerwine, and Hillman, "Decentring Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin."
37 The Nature Conservancy, "Prescribed Fire Training Exchanges," Conservation Gateway, accessed April 18, 2021, http://www.conservationgateway.org/ConservationPractices/FireLandscapes/HabitatProtectionandRestoration/Training/TrainingExchanges/Pages/fire-training-exchanges.aspx?fbclid=IwAR0uEyLcjLdAakZUwcOkZo75innyeSDn0Zzz58ZfUSB3V8Q3-d4KAejFnTA.

Figure 2.12 Jason Reed, a Karuk fish biologist, sets a low-severity fire around an oak tree. Source: Kilii Yüyan, National Geographic

In comparison to the Joint Base Lewis McChord (JBLM) Sentinel Landscape Partnership mentioned in the next chapter, the Klamath River TREX cooperative burning intentionally encourages Tribal participation. Instead of an emphasis on "military readiness through endangered species recovery"[38] where management and knowledge of management practices rests solely on JBLM, the TREX program focuses on knowledge transfer of fire management practices, navigating burn permits and the ecological processes of fire. In a 2018 controlled burn event by the Karuk Tribe, Tribal participants included the Amah Mutsun Land Trust, the Dry Creek Rancheria Band of Pomo Indians, and the Susanville Indian Rancheria. Though it is not explicit, the Karuk and Yurok TREX programs honor Tribal sovereignty and land governance while teaching collaborative burning strategies that ground its knowledge in historic and contemporary Indigenous traditional ecological knowledge.

In the summer of 2020, the Slater Fire in the Klamath region devastated the town of Happy Camp where many Karuk members live and is the seat of the Tribe's Administrative Offices. With acres of forest, decades of US Forest Service fire suppression, and longer drought periods, high-severity fires are happening more frequently. Due to structural racism and the criminalization of Indigenous social and ecocultural lifeways, the cascading intergenerational effects of these high-severity fires are felt most by those Tribal members with little to no resources. The legacy of settler colonialism and anti-Native discrimination still affect how the Karuk Tribe exercise their Tribal sovereignty. Before the Slater Fire, a TREX burn was supposed to happen in Karuk Aboriginal Territory but a "Cal Fire office shut down [the] burn during the fall TREX on Karuk land, citing elevated wildfire risk."[39] That wildfire came and destroyed approximately 200 homes the following year[40]—a risk that may have been avoided had the agency approved the TREX prescribed burn the year before.

The success of the Yurok and Karuk TREX programs in the Klamath region gave headway for other regions in the Pacific West to implement these training exchange programs of their own. Between 2015 to 2019, Central Oregon, Ashland, Cascadia, and the recent addition of Northeast Washington TREX program. The Washington Prescribed Fire Council is the governing body that facilitates the TREX programs in the state of Washington. Unlike the Yurok and Karuk-led TREX in the Klamath region of northern California, the Washington programs are not Tribal-led. The Cascadia TREX received participants from the Kalispel Tribe and Yakama Nation during their 2019 burn event.[41] It is not known if there are representatives of Tribes within the larger Washington Prescribed Fire Council.

List of Figures
(images are my own unless indicated otherwise)

38 "Joint Base Lewis McChord | Sentinel Landscapes," accessed April 11, 2021, https://sentinellandscapes.org/landscapes/joint-base-lewis-mcchord/.

39 Susie Cagle, "'Fire Is Medicine': The Tribes Burning California Forests to Save Them," The Guardian, November 21, 2019, sec. US news, https://www.theguardian.com/us-news/2019/nov/21/wildfire-prescribed-burns-california-native-americans.

40 Vivian Ho, "Fire Tore through the Karuk Tribe's Homeland. Many Won't Be Able to Rebuild," The Guardian, October 23, 2020, http://www.theguardian.com/us-news/2020/oct/23/karuk-tribe-california-slater-fire-insurance.

41 Washington Department of Natural Resources, "Prescribed Fire Training Gives Firefighters Skills to Improve Forest Health, Increase Community Protection | WA - DNR," Washington Department of Natural Resources, accessed April 19, 2021, https://www.dnr.wa.gov/news/prescribed-fire-training-gives-firefighters-skills-improve-forest-health-increase-community.

2031 Tribal-led fire revitalization training programs proliferate

2050 Puget Sound temperatures rise 2.9-5.4 degrees Fahrenheit

2100 Ecocultural revitalization and mutual aid in varying scales become the norm to address crisis and healing

2021 Governor Newsom signs $536 Million Wildfire Package
2021 Senate awaits Governor Inslee's signature on $125 Million Wildfire Bill

2014 Yurok and Karuk Fire Practitioners adopt TREX

1960s-70s Nisqually and Puyallup Fish-ins
Boldt Decision tribal sovereignty victory

1911 Weeks Act

1887 Dawes General Allotment Act

1862 Homestead Act
1873 Timber Culture Act
1881 Steam Donkey invented

1854 Treaty of Medicine Creek
1855 Treaty of Point Elliott
1856 Quinault Treaty

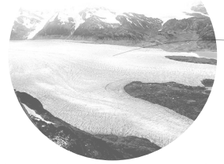
1840s Deep-soil prairies converted to agriculture by settler colonizers

Prairies, grasslands, and savannas increased in the Pacific West because of Indigenous low-severity fires

Sustainable agroecology advanced, specific to each Tribe and landscape

Village life encouraged fire management and storage of foods

Maximum warming period of 3.6 degrees F warmer than modern conditions



Early post-glacial period, cool and moist with grasses and sedges with some boreal forests

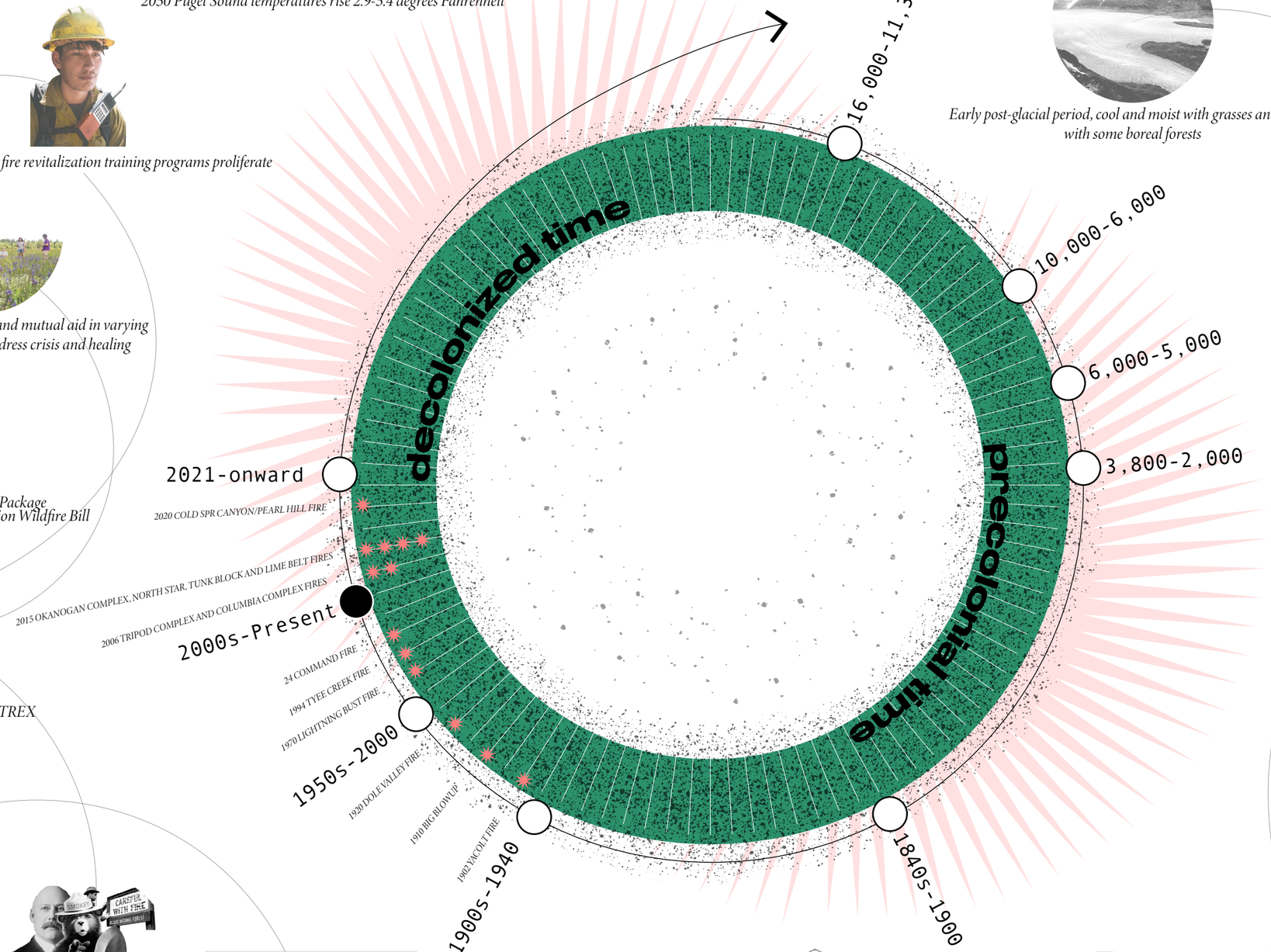


Figure 2.13 Prairie formations, prairie loss, prairie revitalization timeline.

3. from settler conservation to an ethics of care

Section 1. An Analysis of Settler Conservation and its Motives

> Space is often viewed in Western thinking as being static or divorced from time. This view generates ways of making sense of the world as a 'realm of stasis', well-defined, fixed and without politics. This is particularly relevant in relation to colonialism. The establishment of military, missionary or trading stations, the building of roads, ports and bridges, the clearing of bush and the mining of minerals all involved processes of marking, defining and controlling space.
>
> Linda Tuhiwai Smith[42]

Despite our better efforts as land-dependent professionals, without unraveling our settler relationship to space, land management, labor and without materially supporting Tribal sovereignty, non-Native landscape architects and restoration ecologists will continue to perpetuate settler colonialism even when we attempt to heal the land. The above excerpt by Tuhiwai Smith explains that the settler's perception of space is fixed and "without politics".[43] Just an hour drive from Seattle where I am situated, one of the largest prairie restoration projects in the Southern Puget Sound is located within the Department of Defense's (DoD) military complex called Joint Base Lewis-McChord (JBLM), sitting on the ancestral lands of the

Figure 3.1 A person walking the annual Leschi and Quiemuth Honor Walk. Source: https://nwtreatytribes.org/nisqually-honors-ancestors-on-joint-base-lewis-mcchord-with-walk/

Nisqually and Puyallup Tribes respectively. Approximately 7,000 acres of an endemic South Puget Sound prairie, the largest area of existing critical prairie habitat in southwestern Washington, had been converted into the joint bases' artillery impact range by the United States. Prairie ecologists discovered that the explosions from live munitions were unaffecting the fire-resilient plant communities within JBLM but voiced concerns on the range's impact on critically threatened prairie species such as the Taylor's checkerspot butterfly, mardon skipper and the Mazama pocket gopher.

This has presented a complicated issue for JBLM. Considered an impediment to continued artillery operations, the news that the

42 Tuhiwai Smith, Decolonizing Methodologies.
43 Tuhiwai Smith.

endangered Taylor's checkerspot butterfly (an endemic species in Puget Sound prairies) was found on site gave JBLM pause. In 2013, an agreement between JBLM, the DoD and the non-profit organization Center for Natural Land Management (CNLM) was created to preserve critical prairie habitat within the DoD property for endangered and threatened species. The JBLM Sentinel Landscape Partnership "brings together partners in working lands, conservation and military readiness to progress innovative conservation and community goals."[44] The US military, the wing of the federal government solely responsible for the forced removal of American Indians from their ancestral lands, are now controlling prairie restoration efforts for some of the last remaining prairie habitat historically stewarded by Indigenous people of this region.

The JBLM does not clearly state what nations and conflicts the ammunitions used for training at their firing ranges will eventually be used for.[45] This settler perception of a fixed time and space[46] ignores the historical connection of the creation of the US military, the subjugation of Indigenous nations and military grounds. In fact, during the creation of the US as a republic, an unprecedented alliance between three tribal nations (Shawnee, Delaware and Miami Indians) successfully interrupted settlers from their Manifest Destiny of tribal land seizure and settler property accumulation. Because of this major victory against the U.S., the new government led by George Washington founded the Legion of the United States—the first United States army—to systematically and violently fight against the Indian nations.[47] "And yet it would be forgotten. The first war the United States ever fought, in which the U.S. Army itself came into being, would never even be given a name."[48] What history that happens after this we know, but what is perhaps hard to connect is the direct lineage of the contemporary military institution of the DoD to the arm of the burgeoning American Empire, the Legion of the United States. In *The Militarization of Indian Country*, the Ojibwe organizer and enviromentalist Winona LaDuke mentions "the DoD owns 30 million acres of land"[49] in not only the so-called United States but in extents of US-colonized Guam and Puerto Rico as well.[50]

The dissonance of this alliance between restoration ecologists and JBLM exists within Tuhiwai Smith's "realm of stasis."[51] Where settler narratives surrounding ecological restoration considers JBLM as a space devoid of a decolonial politic that opposes persistent military violence at the expense of the prairie, grasslands and savannas and the more-than human beings that depend on these ecosystems. For instance, military personnel outside of JBLM cannot get proper clearance to access the prairies despite their military status. The near impossibility for non-military community members to access this space highly limits other ways of land stewardship and uses. Nisqually Tribal member Cynthia Iyall has mentioned that the Tribe has a "working relationship"[52] with JBLM. Exercising their Tribal sovereignty decades after the fish-ins, the Tribe has formed agreements with the joint base to perform honor walks (like the Leschi and Quiemuth Honor Walk), to undertake fire management and to gather camas at the prairies there. It is not publicly known how often and as to what extent Nisqually prairie management occurs at JBLM.[53] What is evident is that JBLM, as the main land managers of the site, will continue their munition operations. But what are the longterm effects of this? The implications of soil and groundwater contamination for prairie plants and the more-than-human beings (plants, animals, and other biotic life as well as abiotic forms like soil and water) continually exposed to toxins from ammunitions have not been thoroughly investigated on the site. Regardless, this shows the limits of restoration strategies without decolonizing frameworks grounded in repatriation.

To reduce the life of a Taylor's checkerspot butterfly into a bare[54] number (ie its population) is to sever that butterfly from its connection to the flows, processes and relationships it has with other forms of life and its quality of life within the larger ecoregion. This compartmentalization is inherent in settler colonialism and capitalism—to objectify in order to subjugate, dominate and accumulate. The destruction caused by artillery weapons at JBLM implies a centering and a primacy of military technological operations over a full-scale restoration effort for the Taylor's checkerspot butterfly that centers regeneration of all forms of life and the abiotic forms that support them. The compromise that prairie conservationists make in such instances uncouples restoration ecology from the Indigenous and feminist ethics of care in general and Tribal land stewardship more specifically.

---

44 "Joint Base Lewis McChord | Sentinel Landscapes."

45 Winona LaDuke writes, "In 1940 the army selected a 16,000 acre parcel from within [the Oregon] territory to become the Umatilla Ordnance Depot. Beginning in 1941, some 7,000 workers were hired and $35 million was spent to create a complex of military storehouses, housing and ammunition. The munitions that were stored there were used in the Korean Conflict, Vietnam, Grenada, Panama, Operation Desert Shield and Operation Desert Storm. In 1962, chemical nerve agents VX and GM and the mustard blister agent HD were sent there." Winona LaDuke, The Militarization of Indian Country (East Lansing: Makwa Enewed, 2012).

46 Tuhiwai Smith, Decolonizing Methodologies.

47 William Hogeland, Autumn of the Black Snake: The Creation of the U.S. Army and the Invasion That Opened the West, First edition. (New York: Farrar, Straus and Giroux, 2017).

48 Hogeland.

49 LaDuke, The Militarization of Indian Country.

50 "USA Department of Defense Lands - Overview," accessed April 17, 2021, https://www.arcgis.com/home/item.html?id=6b911a60a5a4465a85fd5c42668bf907.

51 Tuhiwai Smith, Decolonizing Methodologies.

52 Lindsay Trott, "Walk of Honor: Nisqually Indian Tribe Visits Land of Ancestors," Nisqually Valley News, May 9, 2013, http://www.yelmonline.com/stories/walk-of-honor-nisqually-indian-tribe-visits-land-of-ancestors,119643.

53 D. Preston, "Nisqually Honors Ancestors on Joint Base Lewis-McChord with Walk," Northwest Treaty Tribes (blog), May 1, 2019, https://nwtreatytribes.org/nisqually-honors-ancestors-on-joint-base-lewis-mcchord-with-walk/.

54 A reference to Giorgio Agamben's concept of "bare life" where life is determined solely through biological processes instead of the quality a life is lived. Giorgio Agamben, Homo Sacer: Sovereign Power and Bare Life, Homo Sacer 1 (Stanford, Calif.: Stanford University Press, 1998).

Section 2. More to Life than Biotic Life: Towards an Ethics of Care

> 'Care ethics' refers to approaches to moral life and community that are grounded in virtues, practices, and knowledges associated with appropriate caring and caretaking of self and others. In contrast to ethical theories that assume the paradigm of moral reasoning to be an isolated agent making impersonal, abstract calculations—a dominant view in Western philosophy—ethics of care highlight the affective dimensions of morality, the inevitability of dependence and interdependence, the importance of caretaking and healthy attachments in the basic fabric of human well-being, and the relational and contextual nature of any ethical question or problem.
>
> Kyle Powys Whyte and Chris Cuomo [55]

The restoration project at JBLM gives designers like me a chance to be an active stakeholder in Indigenous-related restoration projects such as prairie revitalization in the Pacific West. Being an active stakeholder disrupts the idea of an objective and passive researcher. As Whyte and Cuomo states in the quote above, Western restoration ecology assumes "the paradigm of moral reasoning to be an isolated agent making impersonal, abstract calculations."[56] This isolated agent is then paid and valued tremendously to be making these calculations. A move towards implementing care ethics within Western landscape architecture and restoration ecology would be a radical shift in which stakeholder we prioritize and what labor would be considered of value. Whether it's rearing human or plants, care practices have traditionally been undervalued. An ethics of care assumes accountability to not just the Taylor's checkerspot butterfly but to the camas that it gets its nectar from, the fire, soil and water that takes care of the camas bulbs, and the people that tend them all to grow the camas as their food source. Implementation of care ethics in restoration is nothing new to Indigenous communities—it is how Native stewards have been able to work with fire to grow food and to provide food for the animals they hunt. As Frank Lake and Robin Wall Kimmerer wrote, Indigenous "fire was used as a pragmatic tool to meet the goals of Indigenous practitioners, to increase the yield and diversity of subsistence foods. These practical goals were also coupled to a spiritual responsibility to carefully use fire to multiply life."[57] It is

Figure 3.2 Louise Wilmes gathering camas with a digging stick. Quamash Prairie, Oregon. Source: Oregon Metro

perhaps important within an ethics of care for prairie revitalization to distinguish between life-generating fire, wildfires and fires used for destruction.

Landscape designers wishing to incorporate native prairie, grassland and oak woodlands as a climate adaptation strategy would do best to decolonize their restoration practices by collaborating or at the very least, consulting with Indigenous fire practitioners. They are not only the knowledge-bearers of life-generating fires but visionary ethnobotanists, restoration ecologists and designers themselves. Like other federal, state and local agencies, Tribal nations release their own climate adaptation plans that designers should follow in order to align climate adaptation goals and strategies. Tribal land management has proven to be successful (since time immemorial) and it should be stressed that non-Native designers wanting to enact true ethics of care could

55 Kyle Powys Whyte and Chris Cuomo, "Ethics of Caring in Environmental Ethics: Indigenous and Feminist Philosophies," in The Oxford Handbook of Environmental Ethics, 1st ed., Oxford Handbooks (Oxford University Press, 2017), https://doi.org/10.1093/oxfordhb/9780199941339.013.22.

56 Whyte and Cuomo.

57 Kimmerer and Lake, "The Role of Indigenous Burning in Land Management."

Figure 3.3 Prairies in winter when most of the plants have senesced. Mima Mounds, Washington. Source: Jocine Velasco

begin (the way that non-Native scientists have done) to collectively strategize with Tribal nations whose ancestral lands designers materially benefit from. Design firms and landscape architecture programs who make the commitment to work with Tribal nations could significantly affect change and materialize climate adaptation strategies more efficiently.

In landscape scholar Joan Nassauer's Cues to Care (CTC) framework , she argues that ecological functions of designed landscapes may not be recognizable to humans unless there are cues of "human intention."[58]

> "In settled landscapes, urban or countryside, people expect to see the look of human intention. Where people intend indigenous plant communities or habitats to exist as gardens or preserves, and where the landscape communicates this intention by the way it looks, people are likely to understand that this is 'nature' and find it aesthetically pleasing. Where those same plant communities or habitats exist without obvious signs of human intention, they may be mistaken for neglected land or be readily compromised as land awaiting development. Perception of human intention may be the difference between a nature preserve and a dumping ground, or the difference between a wetland and a slough. Designing ecosystems so that people will recognize their beauty and maintain it appropriately may depend upon including design cues of human intention."[59]

But which human and what intention? The issue of her assumptions here is that there is a universal humanity that experiences and sees "nature" in the same way when it is more accurate to specify that this framework adheres more to settler-grounded perceptions and settler histories. It is the same dominant and persistent narrative that obscures varying environmental subjectivities[60] and responsibilities[61] around climate change that does not name settler colonialism nor its permutations within capitalist economic structures. As Indigenous fire practitioners, scholars and ecologists would argue, a burned prairie would be the cue that signals human intention. In fact, fire as a land management strategy has been used worldwide to clean the land of unwanted vegetation and to promote the growth of desired plant species. Post-fire landscapes, to any local community that steward with fire, are neat and orderly landscapes. In her work, Nassauer has prioritized non-Indigenous landowners and land managers for whom these landscape design elements are intended without questioning how a history of settler landownership may influence perceptions of "nature" and landscape aesthetics. Rather, it's the influence of settle landownership that entirely shapes the aesthetic hierarchies, the approval of restoration projects, the maintenance of design projects, and even the types of design cues that are valued. To disrupt and deepen this framework, designers and design scholars would need to incorporate decolonizing ethics that would inform design decisionmaking on who to design with and what to design for.

For prairie revitalization in both urban and rural landscapes, a decolonizing of Nassauer's CTC framework can enrich the "vernacular design traditions"[62] of landscape design by working with the design traditions of Tribes that steward fire-resilient landscapes. Expanding the definition of what landscape designers consider as part of a more inclusive cues to human care that combines the Indigenous and feminist concept of ethics of care, has the potential to strengthen co-design and co-generation with Tribal stakeholders while shifting public perceptions around fire-resilient landscapes. Existing landscape scholarship around Maōri-centered participatory design has shown the possibilities of non-hierarchical co-generation with iwi/Tribes in Aotearoa/New Zealand.[63] In the case of the two projects presented in my thesis, participatory design's non-hierarchical co-generation became a key component in decolonizing the landscape design methods while actively supporting landscape-related Indigenous projects.

58 Joan Iverson Nassauer, "Messy Ecosystems, Orderly Frames," Landscape Journal 14, no. 2 (1995): 161–70, https://doi.org/10.3368/lj.14.2.161; Jiayang Li and Joan Iverson Nassauer, "Cues to Care: A Systematic Analytical Review," Landscape and Urban Planning 201 (September 2020): 103821, https://doi.org/10.1016/j.landurbplan.2020.103821; Joan Iverson Nassauer, "Monitoring the Success of Metropolitan Wetland Restorations: Cultural Sustainability and Ecological Function," Wetlands 24, no. 4 (December 2004): 756–65, https://doi.org/10.1672/0277-5212(2004)024[0756:MTSOMW]2.0.CO;2.

59 Nassauer, "Messy Ecosystems, Orderly Frames."

60 Ford and Norgaard, "Whose Everyday Climate Cultures?"

61 Whyte, "Indigenous Women, Climate Change Impacts, and Collective Action."

62 Nassauer, "Messy Ecosystems, Orderly Frames."

63 Jacqueline McIntosh and Bruno Marques, "View of Designing for Culturally-Diverse Communities. The Role of Collaborative, Interdisciplinary Design-Led Research," The Journal of Public Space, Special Issue, 2, no. 3 (2017), https://www.journalpublicspace.org/index.php/jps/article/view/281/280; Bruno Marques, Greg Grabasch, and Jacqueline McIntosh, "Fostering Landscape Identity Through Participatory Design With Indigenous Cultures of Australia and Aotearoa/New Zealand," Space and Culture 24, no. 1 (June 27, 2018): 37–52, https://doi.org/10.1177/1206331218783939.

List of Figures

(images are my own unless indicated otherwise)

3.1 Preston, D. "Nisqually Honors Ancestors on Joint Base Lewis-McChord with Walk." Northwest Treaty Tribes (blog), May 1, 2019. https://nwtreatytribes.org/nisqually-honors-ancestors-on-joint-base-lewis-mcchord-with-walk/.

3.2 Louise Wilmes gathering camas with a digging stick. Quamash Prairie, Oregon. Source: Croover-Payette, Amy. "Native American Community, Metro Work Together to Provide Culturally Appropriate Access to Public Land." Metro, July 10, 2017. https://www.oregonmetro.gov/news/native-american-community-metro-work-together-provide-culturally-appropriate-access-public-land.

3.3 Prairies in winter when most of the plants have senesced. Mima Mounds, Washington. Source: Jocine Velasco

4. decolonizing existing landscape design methods

A land-based existence is a distant memory for many populations worldwide, especially those who live in densely populated areas like cities. How can people develop a place attachment in order to steward a landscape they are unfamiliar with, if stewardship is not culturally and holistically part of everyday life? Public health, public education and public perception have to be addressed when introducing fire-dependent prairie habitats in urban areas. Non-Native designers working directly with Tribes have the responsibilities of first and foremost, honoring Tribal sovereignty when working with public and private agencies that do not align with Tribes and their land management goals. There are tensions between these directions that need to be thought through that landscape designers working with Tribes can better incorporate in their design process. A decolonizing design framework that is both culturally appropriate and place-based can be one place to start.

In order to disrupt and deepen existing design process, I first had to observe which aspects of the process could benefit from a decolonizing design framework. Analyzing the landscape design process, I used for the Camas Monitoring Project and UW-Karuk Klamath River Project, I selected these landscape design methods: 1) site analysis, 2) conceptual design, 3) participatory design, 4) landscape management and 5) design-build. Site analysis and conceptual design are the initial phases within the general landscape design process. Landscape management is one of the last phases within the design process. Lastly, participatory design and design-build are two landscape design approaches.

Each landscape method is then paired with a decolonizing design framework practice that relates to it. The DDF practices are: 1) to honor Tribal sovereignty, 2) to respect the personhoods of biotic and abiotic life that exist on any given site, 3) to co-generate with a Tribe on shared climate adaptation goals, 4) to center long-term care of the land, and 5) to value multispecies epistemologies. For site analysis, the DDF practice is to honor Tribal sovereignty. For conceptual design, the aim is to respect the personhoods of biotic life and abiotic forms. One caveat is that ideally, the DDF practices should be incorporated as a whole within all landscape design methods.

Section 1. Existing Landscape Design Methods

Site analysis and conceptual design are the first and second phases of a typical landscape design project while landscape management planning is one of the last phases.[64] All three require research, site assessment and communication with clients. Site analysis requires designers to think through geomorphologic, hydrologic, ecological and social shifts that happened on the site and the shifts that would happen in the future. Site analysis trains designers to consider temporal and spatial scales. Site analysis includes research surrounding land use, property ownership, history, and field visits that include existing condition assessments, the larger spatial context, client interviews, and experiential observations. The conceptual design phase is the first draft of the design where ideas are placed in their general locations within a site plan. The designer informed by the site analysis, client feedback and inspirations, begin to sketch the general form of the site. Land management planning is usually a small aspect of one of the last phases of the design process. Technically not a responsibility, landscape architecture as a practice leaves land management to contractors or to the landowners who hire their own contractors or in-house maintenance crews. Land management planning is confined within the construction design phase when designers create planting plans and planting schedules.

The two design approaches I aim to disrupt and deepen with the Decolonizing Design Framework are participatory design and design-build. Having roots in the Scandinavian co-operative movements[65], participatory design in landscape architecture is an approach to public design projects that engages all stakeholders of a site as co-designers within the design process. This usually includes focal communities experiencing sociopolitical inequities who are often left out of larger decision-making processes that shape their surroundings and negatively impact their material conditions. The second approach, design-build, combines design and construction as design services within a single firm. However, design-build prototyping is also an iterative approach employed by individual craftspeople, gardeners, artists and other tactile workers.[66]

The Camas Monitoring Project and the UW-Karuk Klamath River Project are the two prairie-related projects where I begin to seek decolonizing opportunities in these aforementioned landscape design methods. The design methods are useful on their own but I attest that in order to materially support Indigenous land back movements and restoration efforts, a decolonizing process should take place. For my thesis, the Indigenous stakeholders in each respective projects (the Burke's Tribal Liaison, the UW Native American Advisory Board and Karuk Tribal members) largely informed the DDF practices I chose to highlight.

Section 2. Decolonizing Design Framework

The Decolonizing Design Framework (DDF) is responding to existing protocols to Tribal collaboration, research and Indigenous epistemologies created and adapted from Indigenous-led policies such as the *Indigenous Research Protection Act*.[67] For instance, the National Oceanic Atmospheric Agency's National Marine Sanctuaries has its own Tribal Cultural Landscape government-to-

64 "All landscape architects should have an understanding of landscape management, which relates to what happens to a site after the initial development work has been completed[...] In landscape architecture handover (technically 'practical completion') is a crucial—and open-ended—stage of any landscape architecture project and should be planned and costed accordingly." Holden and Liversedge, Landscape Architecture.

65 Jesper Simonsen and Toni Robertson, Routledge International Handbook of Participatory Design, Routledge International Handbooks (New York: Routledge, 2013).

66 Daniel Winterbottom, Design-Build: Integrating Craft, Service, and Research through Applied Academic and Practice Models (Milton: Taylor and Francis, 2020), https://doi.org/10.4324/9781315679372.

67 Indigenous Peoples Council on Biocolonialism, "Indigenous Research Protection Act" (Indigenous Peoples Council on Biocolonialism, n.d.), http://www.ipcb.org/publications/policy/files/irpa.html.

government approach to Tribal consultation and collaboration.[68] It can also look like the University of Washington's Memorandum of Understanding Between Northwest Regional Tribes and the University of Washington is an institution-to-Tribe agreement.[69] The Karuk Tribe and University of California Berkeley's partnership has created a set of guidelines called *Practicing Píkyav: A Guiding Policy for Collaborative Projects and Research Initiatives with the Karuk Tribe*.[70] Formalizing these collaborations with guidelines and policies ensures Tribal rights to their knowledge and their dissemination.

It is important to note that the DDF is informed by my own experience with my short time co-generating with Indigenous stakeholders for the Camas Monitoring Project and the UW-Karuk Klamath River Project. The DDF practices I selected are: 1) to honor Tribal sovereignty, 2) to respect the personhoods of biotic and abiotic life that exist on any given site, 3) to co-generate with a Tribe on shared climate adaptation goals, 4) to center long-term care of the land, and 5) to value multispecies epistemologies. The most important practice is to honor Tribal sovereignty as it is the foundation from which all other DDF practices are built upon. Honoring Tribal sovereignty as an individual non-Native designer, of course, looks different from the federal-Tribal government relationship. However, landscape architecture as a profession can harness its collective power to affect change to stand in solidarity with Tribes exercising their sovereignty. Organizations such as the American Society of Landscape Architecture (ASLA) advocate for climate-related policies. What if each ASLA member committed to co-generate with specific Tribes (federally recognized or not) within the ancestral territories where those ASLA members lived? How would they approach such partnerships and what guidelines and policies can be formalized to do so?

The DDF's spine (or foundation) is the Indigenous principle of free, prior, informed consent which gives space to ask for Tribal approval and feedback at all stages of a project. This is complementary to landscape design's iterative and critique-seeking process. The DDF's practices of honoring Tribal sovereignty and

68 National Oceanic Atmospheric Administration, "Tribal Cultural Landscapes: Implementing a TCL Approach," accessed May 18, 2021, https://sanctuaries.noaa.gov/tribal-landscapes/tcl-approach.html.

69 University of Washington, "Memorandum of Understanding Between Northwest Regional Tribes and the University of Washington" (University of Washington, September 11, 2010).

70 Karuk Tribe and University of California Berkeley, "Practicing Píkyav – Karuk – UC Berkeley Collaborative," n.d., https://nature.berkeley.edu/karuk-collaborative/?page_id=165.

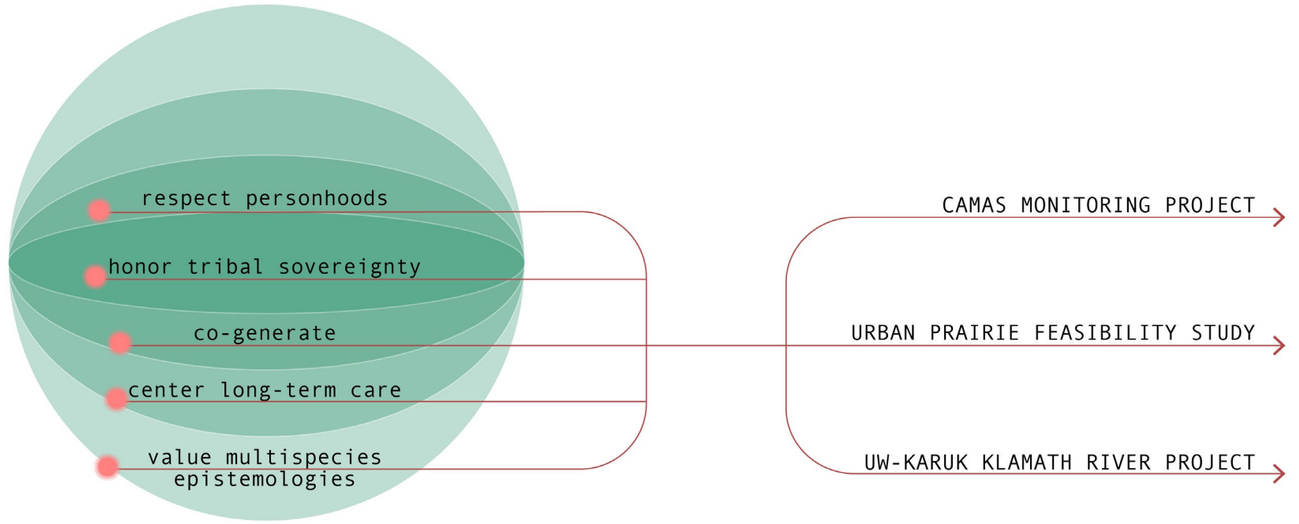


Figure 4.1 The selected DDF five practices implemented in my thesis research projects.

co-generating means beginning to formalize with the UW-Karuk Klamath River Project co-designers in the Karuk Tribe on what Karuk knowledge and site information I can or cannot disseminate in this thesis. My advisor has recommended to me to give ample time to request for feedback on any publicly shared texts, graphics, and design. The role of being a co-designer will also mean that I have a responsibility to ask if documents are for internal (Karuk use only) or external use, as well. As part of Karuk protocols, the UW-Karuk Klamath River Project landscape architecture design team will present our conceptual design to the Karuk Resources Advisory Board in July 2021 for further feedback.
The UW-Karuk Klamath River Project highlights the DDF's practice of respecting personhoods of all biotic life and the abiotic forms that support life. This practice critically disrupts the history of over-development and extractive practices of landscape design construction. It goes against the history of plantation formations in the Deep South and settler colonial monocultures because respecting personhoods means encouraging agroecological practices that sustain the site's existing ecosystem processes. The aim of honoring more-than-human species and the elemental forces that support them is to design conservatively or with a light touch and letting Karuk fires and the Klamath River shape the niches of plant communities that will grow on the land. Consequently, designing with a lighter touch is particularly sensitive to the costs of human labor, heavy machinery, and importing tons of new materials that largescale highly engineered restoration projects require. These highly engineered elements of the design can be a part of a list of options based on the needs of the Tribe but among more sustainable options that work with on-site materials such as existing aggregate (mine tailing rocks), soil, plants, fire and the River.

List of Figures
(images are my own unless indicated otherwise)

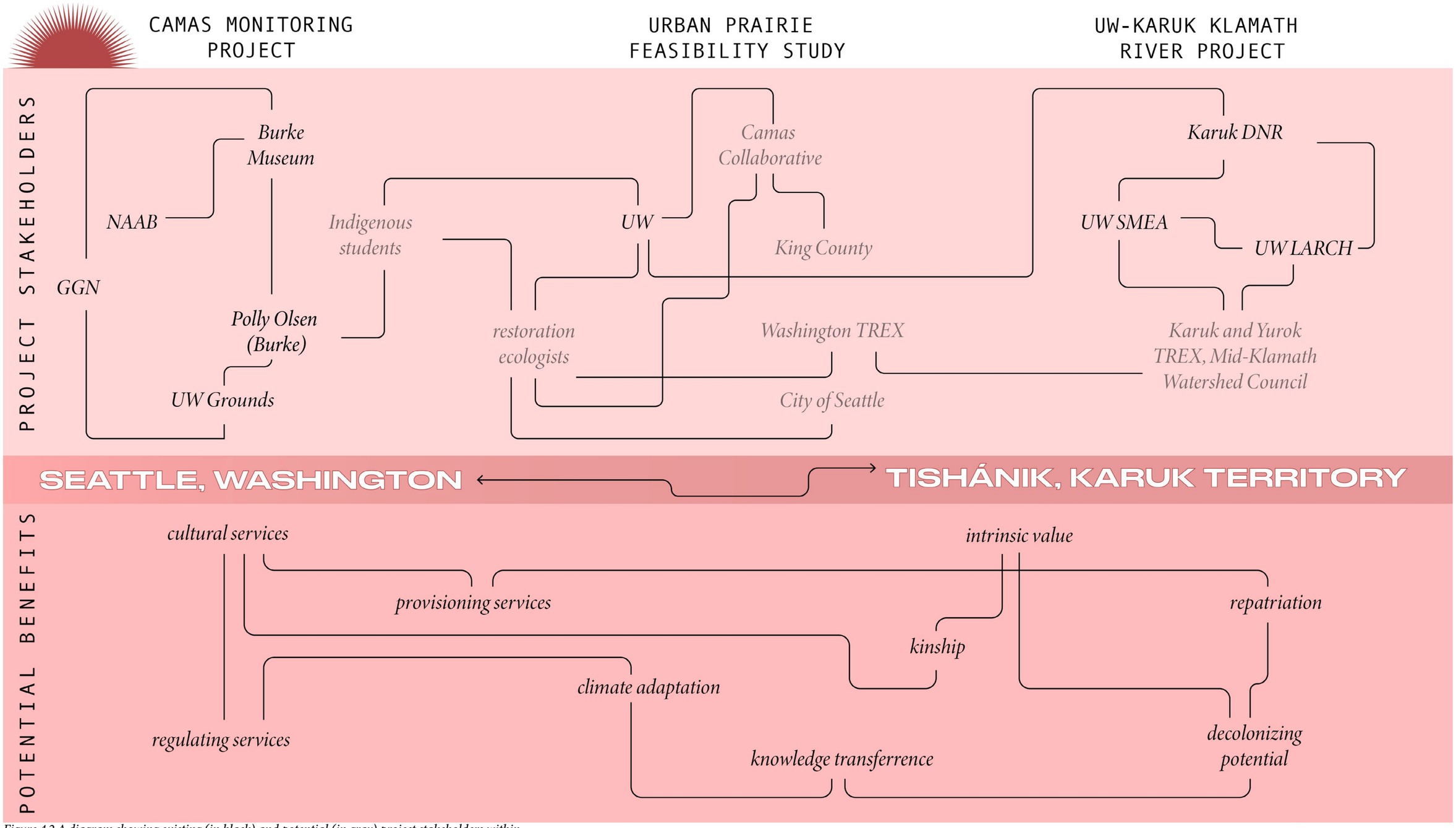


Figure 4.2 A diagram showing existing (in black) and potential (in gray) project stakeholders within the two research projects and the potential benefits of connecting the urban-wildlife divide through prairie landscapes.

5. decolonizing design in practice: autoethnographic findings

Section 1a. Undoing My Settler Assumptions and Disrupting Harm: Camas Meadow at the Burke Museum

Through a research fellowship nomination in 2020 through the College of Built Environment, I was introduced to the camas meadow at the Burke Museum in the University of Washington in Seattle, the ancestral lands of the Duwamish Tribe. The fellowship program partners a graduate student, a faculty member and a design firm to pursue a research topic related to the firm's projects. My interest in plant communities and soil led me to pursue the research opportunity to study the camas meadow at the Burke Museum. Although I was not accepted to the fellowship, a faculty member, who would eventually develop the project with me, alerted me to a potential funding stream through the university. In my research to co-write the proposal, I learned about the importance of the camas meadow at the Burke, the history of the design and consequently, the endemic prairie habitat mosaics of the Puget Lowlands.

In 2019 as part of their building redesign, the Burke Museum unveiled their Living Collections, a designed landscape that the landscape architecture firm GGN and a native plant nursery Oxbow Farm and Conservation Center designed and planted respectively. Olson Kundig—the architecture firm in charge of the Burke building's redesign—created a levelled area known as the "yard" (functioning currently as parking) where the original museum structure used to be. And surrounding the yard was GGN's green frame. The plant palette aimed to evoke two endemic ecosystems of the Pacific Northwest: the Douglas fir forest and the camas meadow.

My research team (consisting of my faculty co-lead and myself) created the Camas Monitoring Project with underlying settler assumptions that created challenges to building trust with the camas meadow's Indigenous stakeholders. One assumption was that the research did not need further approval since the research topic was suggested by the firm that designed the site. Another assumption was that my team could submit a project proposal to seek funding without prior approval from the Burke Museum, the Burke's Tribal Liaison and the university's multi-Tribal Native American Advisory Board (NAAB). From the beginning, this assumption negatively impacted trust and relationship building with the camas meadow stakeholders because my team did not follow the process of informed consent nor did we include said stakeholders in decision-making, planning and idea-generation on our research project. I was not aware of the decision-making process between the Burke and the University at large with the NAAB for Indigenous-related programming in the university. My lack of knowledge and my own underlying assumptions opened up the opportunity for me to learn more about Tribal and non-Tribal agency agreements. One important lesson I have learned is to assume instead that there is an existing Native American governing body to consult on Indigenous-related programming that an agency works with.

I was particularly sensitive to the affective reactions that Indigenous stakeholders experienced surrounding two instances relating to the Camas Monitoring Project. The first surrounded a tense moment where I was introducing a Western ecological field protocol of staking out plot samples in the camas meadow and the Burke's Tribal Liaison reacted negatively. Despite receiving consent beforehand to use metal rebar stakes to plot them, I realize that the act of staking symbolized violence that could imply harm against the camas as sacred beings. Our Tribal Liaison mentioned she was having a physical reaction which I understood palpably as a trauma response. The second instance was during a presentation to introduce the Camas Monitoring Project to the NAAB when multiple Tribal community members expressed frustrations such as being asked to sign research approval without being a part of the decision-making process, that our team did not ask local Tribes to be a part of this, and that the camas is sacred and considered a Sister to some Tribes. Again, I felt these affective reactions as trauma responses to ongoing settler violence. Although our research team may not have had the expressed intention to perpetuate harm, our underlying assumptions skipped the protocols and processes to pursue an Indigenous-related research project in a good way.

These interactions were formative in my learning process as a designer because it gave me the opportunity to learn from the NAAB, a collective governing body from different regional Tribes in Washington, how they exercise their Tribal sovereignty as representatives of their own respective Tribes. The Camas Monitoring Project research team has been working on the feedback that the NAAB has given us. Unfortunately, due to the short amount of time I have left at the University of Washington, I decided not to pursue a collaborative relationship with local Coast Salish Tribes on the camas meadow but since the Camas Monitoring Project has two more years, I am adding this as a recommendation for the next student researcher who transitions into the project.

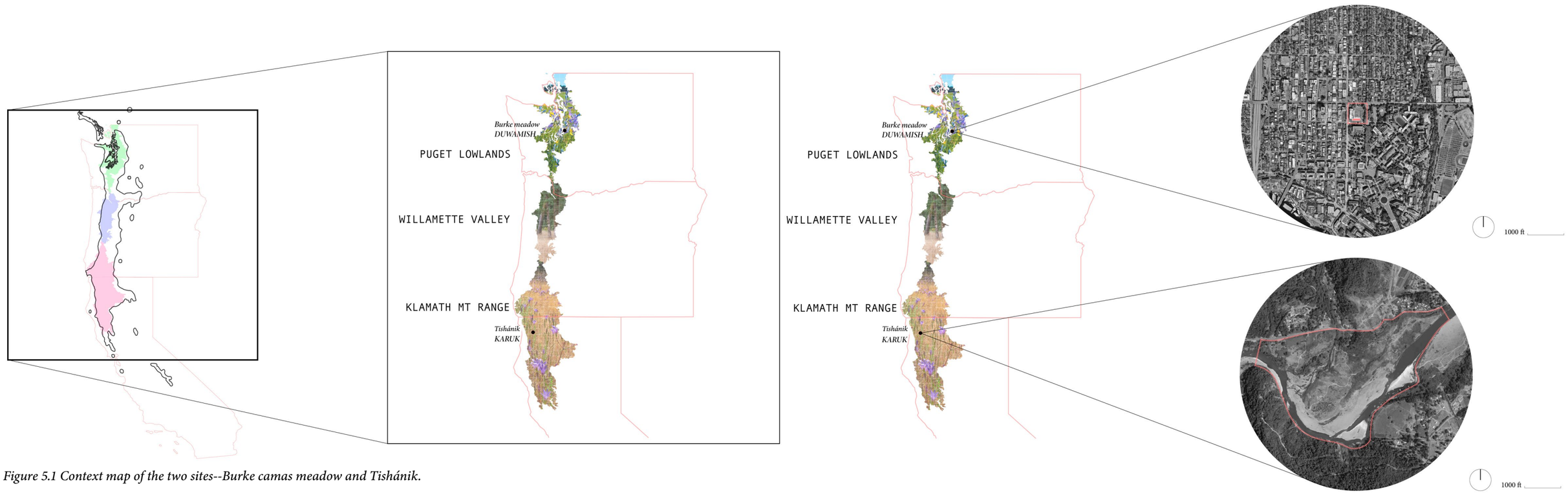


Figure 5.1 Context map of the two sites--Burke camas meadow and Tishánik.

Section 1b. To Honor Tribal Sovereignty: Tishánik Site Analysis with the Karuk

Fortunately, the underlying settler assumptions I had during the inception of the Camas Monitoring Project created avenues for learning that would eventually lead me to the UW-Karuk Klamath River Project. This research project was my first introduction to the Karuk Tribe and their ecocultural revitalization plan for a portion of the Mid-Klamath River watershed. The UW-Karuk Klamath River Project works with Karuk community members and scholars, scientists and students to center the ecocultural needs of the Karuk as the dam removal are still in its planning stages. Since the early 2000s, the Karuk and Yurok Tribes have campaigned for the removal of all four Klamath dams to restore critical salmon habitat.[71] It took a decade for the project to finally take place after Berkshire Hathaway-PacifiCorp, the company that owns the dams, agreed to their removal. With such a large and complex removal and restoration project, honoring Tribal sovereignty by supporting the Tribes' restoration visions and goals for the Klamath River Basin.

Tishánik, land that has been Tribally owned since 2015, is a ceremonial site, a site of ecocultural scientific research, and a site of opportunity to fully realize the Karuk stewardship model that reconnects and decolonizes the watershed-fireshed-foodshed[72]. Settler institutions, private companies and federal agencies more concerned with water as a profitable resource and prescribed burns as a means to protect economic centers, overlook the Karuk's scalar view of their territory as a foodshed, watershed and fireshed simultaneously.

> "Foodsheds and cultural foodscapes attempt to 'decolonise scale' by reorienting the spatiality of Klamath resource management away from a focus on export-oriented timber, ranching, and agriculture, and towards a scalar orientation based on revitalization of indigenous foodways, cultural agroecosystem management and stewardship of traditional foods throughout the Klamath."[73]

Within the larger Orleans city, approximately 72% of the Native community "rarely or never had the access they desired to Native foods throughout the year."[74] Access to Native foods is generated by access to important lifeways such as cultural burning, ceremony, and stewarding both the land and the River. Tishánik, through its ecocultural revitalization by the Karuk Tribe, can be one

71 Leontina M. Hormel and Kari M. Norgaard, "Bring the Salmon Home! Karuk Challenges to Capitalist Incorporation," Critical Sociology 35, no. 3 (May 1, 2009): 343–66, https://doi.org/10.1177/0896920508101502.

72 Sarna-Wojcicki, Sowerwine, and Hillman, "Decentring Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin."

73 Sarna-Wojcicki, Sowerwine, and Hillman.

74 The Karuk Tribe and the University of California at Berkeley, "Klamath Basin Food System Assessment," n.d.

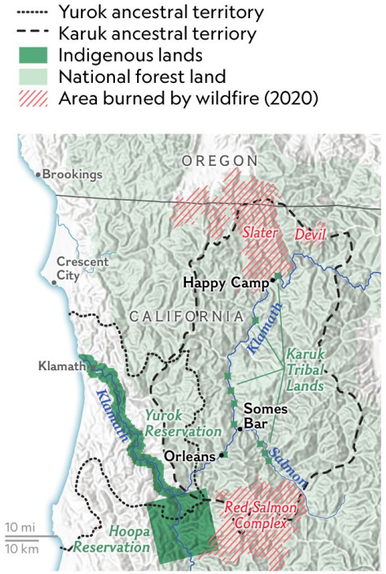


Figure 5.3 A map showing Yurok and Karuk territories and areas burned by wildfires in 2020. Source: National Geographic

among other sites that will become a multi-scalar model of food sovereignty as well as Tribal sovereignty as a whole.

Fire history in Tishánik is rich. Like other Karuk ecocultural revitalization programs, their burn management strategies are advanced and highly adaptive, with a keen awareness of how to build power with other agencies and governing bodies. During the onset of the pandemic in the summer of 2020 and with only a sliver of a burn window, the Karuk TREX hosted a cooperative burn at Tishánik with the Mid-Klamath Watershed Council, the Orleans Volunteer Fire Department and the US Forest Service. Partially to get a head start on non-native weed removal and to manage food and basketweaving plants that depend on fire, the Karuk combines the watershed-fireshed-foodshed scalar framework[75] to steward both Tishánik and the Klamath. The interagency agreement between the participants proved that performing the much needed low-intensity burn could avoid such wildfire disasters like the Slater Fire that damaged so many homes in nearby Happy Camp. Following the lead of the Karuk Tribe while supporting them to

75 Sarna-Wojcicki, Sowerwine, and Hillman, "Decentring Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin."

meet shared goals, the US Forest Service in this region has changed their Tribal relationship for the better.

Tishánik was also a site of settler land-shaping. Since the late 1800s, the Orleans Gold Mining Syndicate had their hydraulic dredge mining operations in and around the site. The legacy of the mining operations marks the land there: mine tailings litter the bank of the Klamath and sheer cliffs where a hill used to be were carved by the force of water cannons. Channelization upriver and nearby Camp Creek have also increased erosion on the riverbank across Tishánik which is a concern during high flood events. The impacts on salmon, the ecosystem and Karuk lifeways from the history of settler colonialism is palpable.

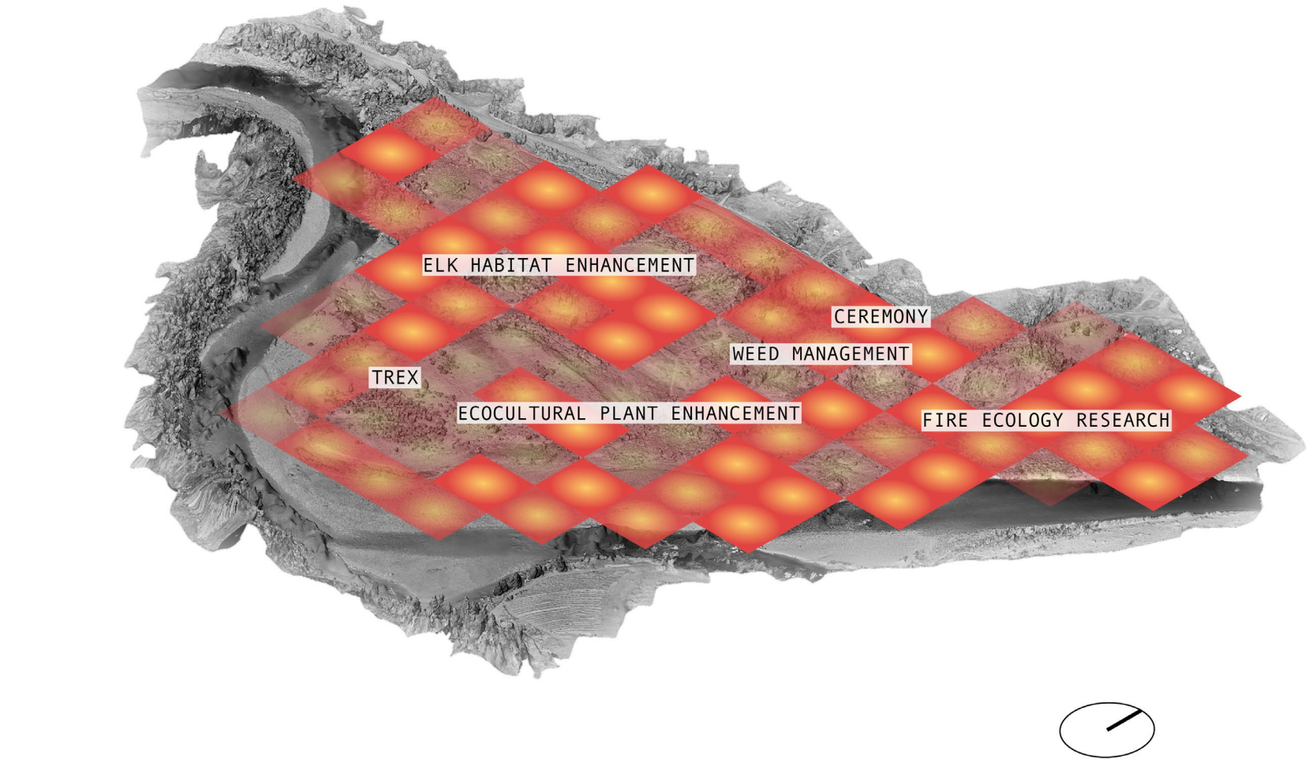
Figure 5.2 Collage image of UW-Karuk Klamath Project stakeholders Lisa Hillman, Leaf Hillman and Kathy McCovey.

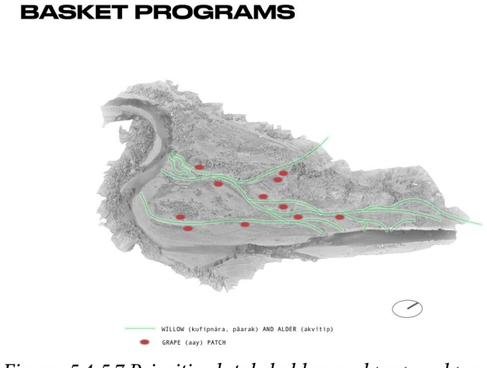
Section 2. To Respect Personhoods: Conceptual Design at Tishánik

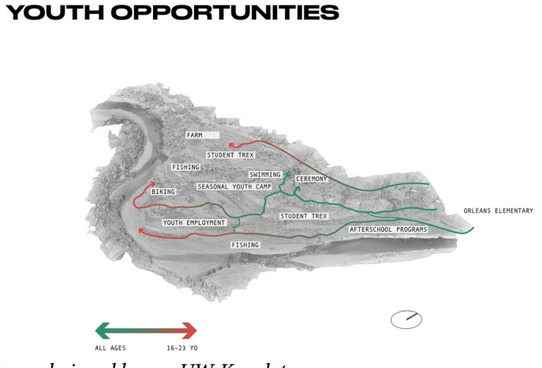
Researching Karuk scholarly publications and reading ethnographic interviews of Tribal members prior to meeting with Leaf Hillman and Lisa Hillman (the UW-Karuk Klamath River Project's main Tribal co-designers), gave me some context on Karuk design principles, intent and priorities. However, it was not until our UW research-design team were able to visit Tishánik to speak with Leaf and Lisa Hillman directly that I could learn the specific biotic life and abiotic forms that generate life that were important to prioritize for the conceptual design. As I experienced Tishánik through Leaf and Lisa's guided site visits, these specific biotic life and abiotic forms became the ecocultural focus groups and more-than-human stakeholders who exist or could potentially exist there. The Klamath River, young people, elders, fire, salmon, Indian and deer potato, blue wildrye, willow, graperoot, and elk were the focus groups that Lisa and Leaf Hillman emphasized. Hearing this, I then began conceptualizing how to respect the personhoods of these stakeholders by loosely proposing potential locations for them at Tishánik.

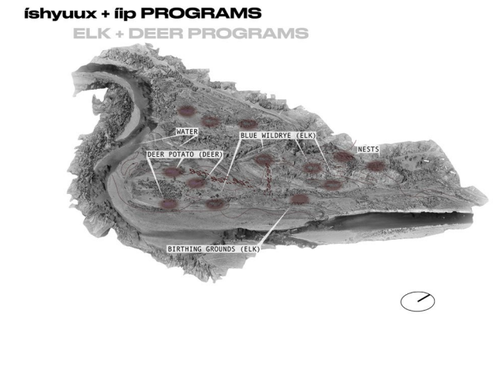
Having been a farmer and landscaper for most of my adult life, I then chose a select group of biotic and abiotic stakeholders that aligned with my specific set of knowledge and research interests. I gravitated towards pyrodiversity, fire-dependent prairie habitats and species, ethnobotanical programs, and youth-related programs as my contributions to the research for the conceptual design.

Figures 5.8-5.11 Clockwise from top left: More-than-human stakeholders in Karuk Aboriginal Territory including deer, Indian potato, willow and the River. Source: Jocine Velasco and Ry Yahn









Figures 5.4-5.7 Prioritized stakeholders and proposed programs co-designed by our UW-Karuk team.

Section 3. To Cogenerate: UW-Karuk Klamath River Project

Facilitated by Leaf Hillman and Lisa Hillman with our Principal Investigator (PI) Cleo Woelfle-Erskine, the initial phase of this project is to draft a conceptual restoration proposal to be presented to the Tribe at large in July of 2021. The UW-Karuk design team for this particular landscape project consists of our PI, Woelfle-Erskine (associate professor at University of Washington Seattle), Lisa and Leaf Hillman (Karuk Tribe), two graduate student investigators and three landscape architecture graduate student researchers (including myself). We, the landscape architecture students, were tasked to research, analyze and begin drafting the initial conceptual master plan for Tishánik based on scenarios to dechannelize the Klamath's flow.

Our team organized one week-long field work trip to Tishánik in March 2021. In the Fall of 2020 prior to the Tishánik trip, our team held weekly meetings over Zoom to workshop our respective thesis topics before we introduced ourselves and presented our ideas to Leaf and Lisa Hillman. We conducted two meetings with the Hillmans in 2020. On our second meeting in December 2020, we were joined by Shawn Borque (Karuk Department of Natural Resources) and Dan Sarna (University of California Berkeley) to provide additional context (existing GIS data, Tribal interviews, contacts) as secondary knowledge sources on Tishánik. Our initial research also included attending Karuk lectures (ie, *Píkyav on the Klamath River: Karuk restoration using fire and flood* supported by the Center for American Indian and Indigenous Studies at the University of Washington) and reading publications published by Karuk and non-Native scholars relating to studies and projects in the Klamath watershed.

During the spring trip to Tishánik, field work included supporting a member of our team with vegetation surveys using a modified Relevé protocol adapted from the California Native Plant Society. From this field work, I was able to perform site analysis and plant identification with the prairie and oak savanna plant communities on site. I mapped GPS waypoints for areas of plant species interest: willow stands, Indian potato patches, and slopes where native grape is plentiful. Another landscape architecture student on our team marked waypoints for low points and high points along the river's riparian corridor as well as points on a historic channel located just north of the river. Site meetings with Lisa Hillman included learning how to gather plant materials for basket weaving as she described program and plant species priorities. Meetings with Leaf Hillman provided nuanced historical and personal accounts of hydrological history, land development, and mining history of the site. Our team received two tours with members of the Salmon River Restoration Council at Kelly Gulch on the North Fork Salmon River. A precedent study, Kelly Gulch was a completed fisheries and riparian enhancement restoration project that included hydraulic structures, fish habitat structures, revegetation and opening side channels.[76]

During the first few days on our field visit at Tishánik, our team began generating ideas with one another. Lisa Hillman knows the site and knows the ethnobotanical plants, their uses and how to grow them more than any of us in the group so we asked for her feedback. She had visions of a demonstration garden for the site that incorporated youth programming. As a basketweaver and gatherer, she also had visions of making the site more accessible and amenable to the basketweaving plants and the people that gathered them. The mine-tailings where the Indian and deer potato patches were growing made it nearly impossible to harvest the corms by hand. For this design idea, I suggested a test plot experiment where good soil can be dumped on top of the cobbles to see if the Indian and deer potato could grow in a looser, more harvestable growing medium. Lisa told us that these corms love growing in rocky areas and that might not work but the idea could be a scientific experiment done with young people during youth programming in the summer. Lisa's ideas gave me the idea to create a planting palette and within it, another palette for an ethnobotanical prairie demonstration garden.

One of the graduate investigators on our larger research team was able to give Lisa Hillman printed copies of the first iteration of the proposal for ecocultural programs and their relative location at Tishánik. This brings the landscape design process to its next iterative phase to refine the conceptual planting design on site. I am hoping to produce two cross sections of the site that can begin to show in a more tangible view a sense of scale, potential habitat and planting diversity, canopy coverage and seasonal programs.

76 Rachel Shea and Michael Love, "Kelly Bar Off-Channel Fisheries and Riparian Habitat Enhancement Project," Basis of Design Report (Salmon River Restoration Council, March 2016).

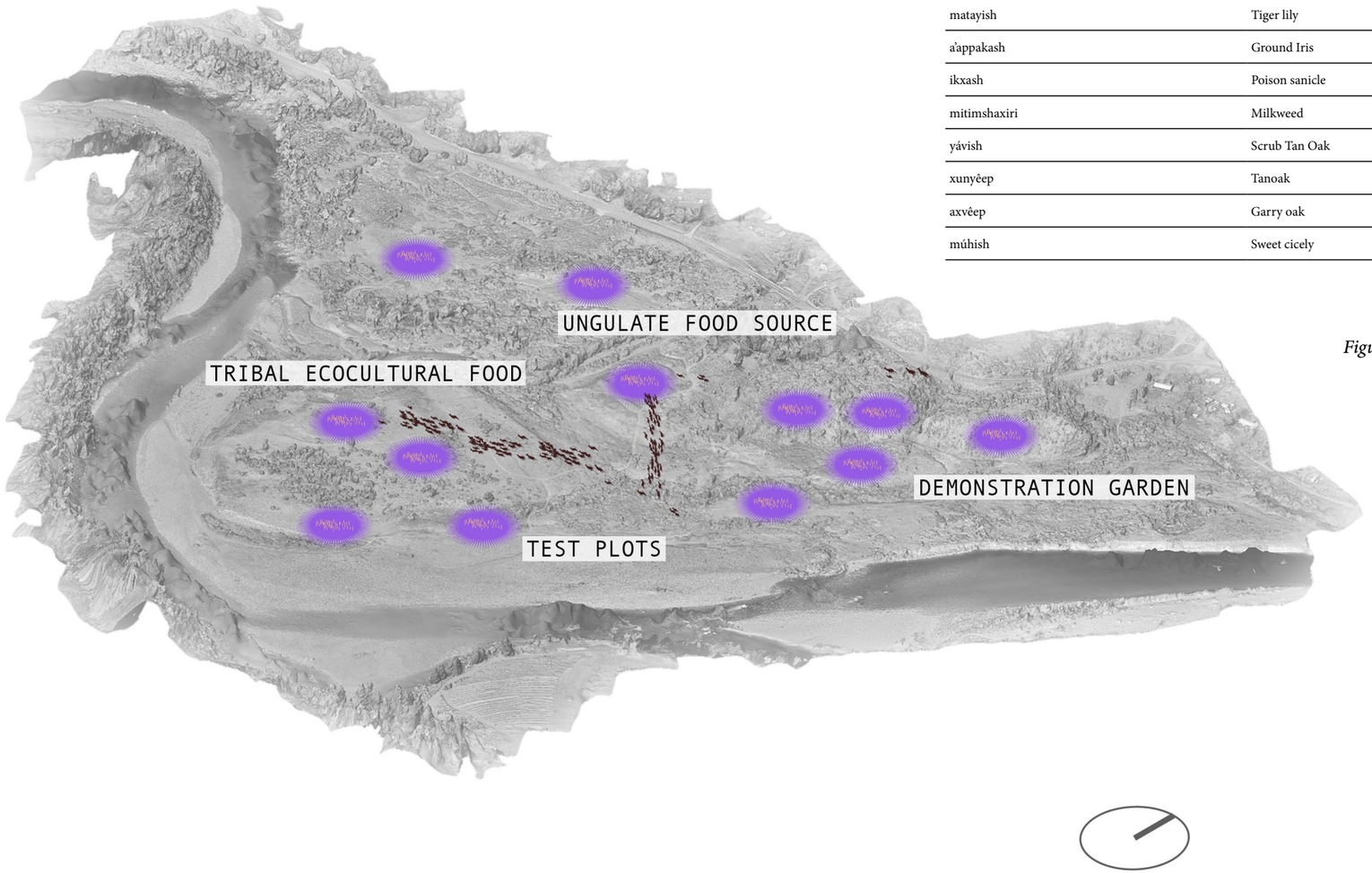
Figures 5.12 Lisa Hillman shows a medicine basket she is weaving with Leaf Hillman behind her. Source: Jocine Velasco

Figures 5.13 Lisa Hillman (right) shows Sofi (left) and I how to gather graperoot. Source: Jocine Velasco

Figures 5.14 Lisa gathering Indian potato. Source: Jocine Velasco

Karuk	Common Name	Species	Habitat
pufichxannáchyuh	Wild Onion	*Allium bolanderi*	rocky clays including serpentine, dry openings, and oak savannas
xannáchyuh	Narrow-leaved onion	*Allium amplectens*	dry grassland and woodland
purukuri	Blue wildrye	*Elymus glaucus ssp. glaucus*	open areas
imyúha	Common soap plant	*Chlorogalum pomeridianum; C. angustifolium*	open woodland, chaparral, and grassland
avarhaira	Indian tobacco	*Nicotiana quadrivalvis var. bigelovii*	open, well-drained washes, slopes
fúuk	Wild carrot	*Daucus carrota*	open areas, disturbed places
kíshvuus	Wild celery	*Lomatium californicum*	rocky areas, brushy slopes
ixyunihatáyiith	Firecracker flower	*Dichelostemma ida-maia*	montane forests, woodlands, coastal meadows; works well with Broadiaea spp, Oregon lily; Understory for Madrones and Tanoaks
táyiith ataychúkkinach	Indian potato, blue dicks	*Dichelostemma capitatum*	open woodland, scrub, desert, grassland
pufichtáyiith	Deer potato	*Triteleia laxa*	grassland, open woodland; or grassland, chaparral, open woodland
panyúrar / panyurara	Beargrass	*Xerophyllum tenax*	
matayish	Tiger lily	*Lilium pardalinum*	chaparral, woodlands
a'appakash	Ground Iris	*Iris macrosiphon*	sunny grasslands, meadows and open woodlands
ikxash	Poison sanicle	*Sanicula bipinnata*	wetlands, swamps
mitimshaxiri	Milkweed	*Asclepias eriocarpa*	many habitat types, especially dry
yávish	Scrub Tan Oak	*Lithocarpus densiflora*	
xunyêep	Tanoak	*Notholithocarpus densiflorus*	Redwood, mixed-evergreen forest
axvêep	Garry oak	*Quercus garryana*	slopes, mixed-evergreen, conifer forest
múhish	Sweet cicely	*Osmorhiza brachypoda*	chaparral, woodlands, coniferous forests

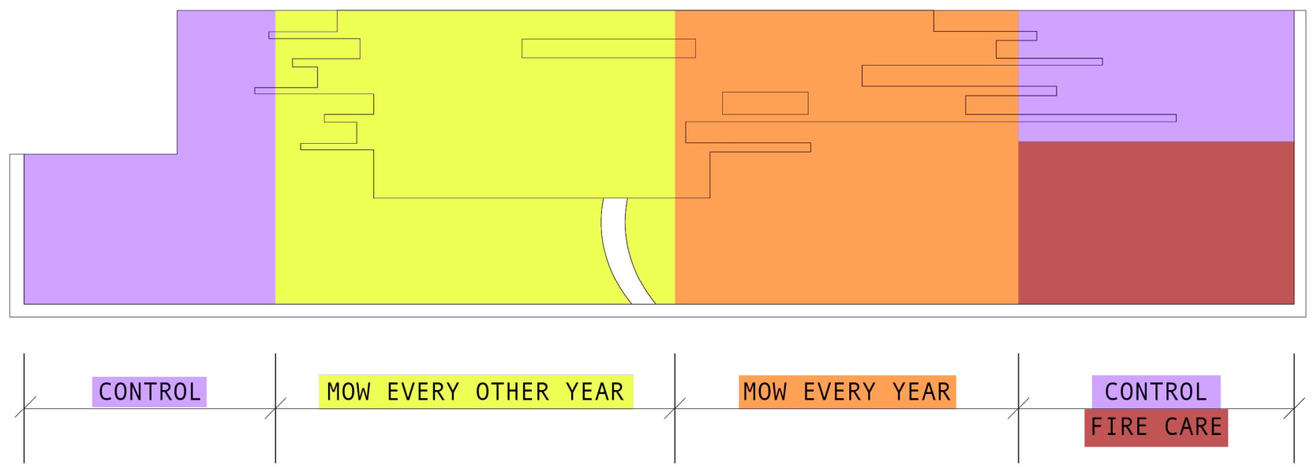
Figures 5.15 My proposed plant palette for a future ecocultural demonstration garden. Karuk names source: Karuk Tribe Public Dictionary http://linguistics.berkeley.edu/~ karuk/index.php



Figures 5.16 Corm and bulb programs.

Section 4. To Center Long-term Care of the Land: Camas Monitoring Project

Figures 5.17 A 1x1 meter grid made of PVC pipe and string for grid sampling. Source: Jocine Velasco



Figures 5.18 The Camas Monitoring Project's first proposed field experiment.

Returning back to the Camas Monitoring Project after my field visit at Tishánik in the spring of 2021 lent me a valuable perspective about the camas meadow's Indigenous stakeholders. Not only do Indigenous communities hold the knowledge to long-term stewardship but they are also the active participants that assume the responsibility of stewardship. I could not uncouple this reality with the fact that stewardship, social reproduction and other forms of care-work under Western settler and white supremacist economic structures are gendered, racialized, and sexualized. Marxist-feminist scholars have written that the work of Indigenous, Black, Latinx women and women in the so-called Third World are placed in interlocking hierarchies at the bottom.[77] The DDF practice to center the long-term care of the land means a design sensitivity to said women's life-generating labor of subsistence land stewardship and its knowledge transference. It may or may not be a coincidence that the two primary Indigenous stakeholders and collaborators I work with for these projects both identify as Indigenous women, and both see their active role as caretakers of the camas root and the Indian potato respectively. The shift in end goals here is less about the public's perception on aesthetics, whether the landscapes stay neat and orderly, but rather that the plants are alive, proliferating, healing the land and sustaining people. And it is with the plants' caretakers that designers owe the questions, "Does this look aesthetically good enough to you? Does it look neat or orderly?"[78] if we have to ask them at all.

Learning from the Indigenous women stakeholders has unraveled my underlying settler assumptions and has prompted our team to examine and improve the Camas Monitoring Project on the University of Washington – Seattle campus in its early stages. In April of 2020, our team (my faculty advisor for the project and myself) proposed a research project that would study the meadow for three years and to conduct field experiments to test specific maintenance strategies. The final deliverable would be a camas meadow management plan based on the three-year research project. The original intent of the Camas Monitoring Project proposal is to center long-term care of the camas meadows but it was through an ongoing iterative process of co-stewardship with other meadow stakeholders that facilitated tangible long-term care. What I mean by long-term care is the post-design and post-construction labor by paid or unpaid stakeholders of the camas meadow. This labor includes land maintenance strategies such as weeding, mowing, irrigation, field monitoring itself and Indigenous care like gathering and replanting of ecocultural plants like the camas (specifically *Camassia quamash* and *Camassia leichtliniii*) and bitterroot (*Lewisia columbiana*). The vision of the Camas Monitoring Project is to inform future design and planning of camas meadows and similar ecocultural landscapes in urban areas in the Pacific West.

As the Camas Monitoring Project continued in the summer of 2020, I began monitoring not only the ecological conditions of the camas meadow but the social context it exists in. For the first year, our team focused on adapting our research methods, building a

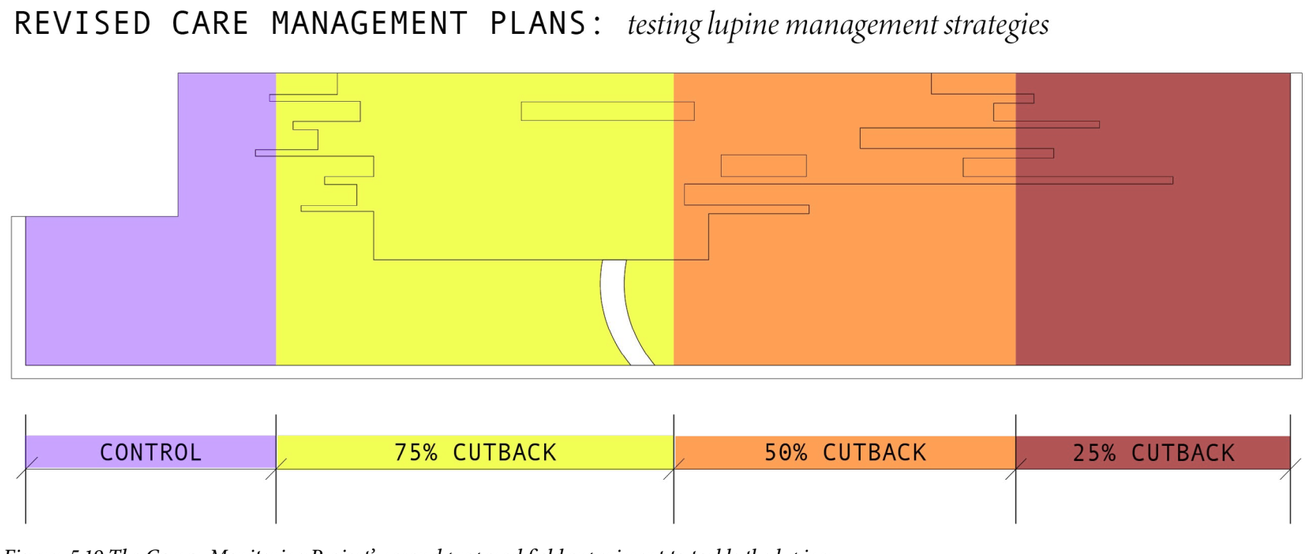
77 Silvia Federici, Revolution at Point Zero: Housework, Reproduction, and Feminist Struggle, Common Notions Series (Oakland, CA : Brooklyn, NY: PM Press ; Common Notions : Autonomedia, 2012); Joy James and Jaime Amparo Alves, "States of Security, Democracy's Sanctuary, and Captive Maternals in Brazil and the United States," Souls (Boulder, Colo.) 20, no. 4 (2018): 345–67, https://doi.org/10.1080/10999949.2018.1521690; Mariarosa Dalla Costa and Giovanna Franca Dalla Costa, Women, Development, and Labor of Reproduction: Struggles and Movements (Trenton, NJ: Africa World Press, 1999); Whyte, "Indigenous Women, Climate Change Impacts, and Collective Action"; Nancy Fraser, "Contradictions of Capital and Care," New Left Review, no. 100 (2016): 99–117.

78 This responds to Joan Nassauer's seminal work where she states, "In the everyday landscape of North America, the recognizable system of form typically is characterized by neatness and order. While many observers have associated neatness and order with the human desire to control or dominate the landscape, these characteristics are more validly interpreted as signs of sociable human intention. Neatness cannot be mistaken for untended nature; it means a person has been in a place and returns frequently. It means a place is under the care of a person." Nassauer, "Messy Ecosystems, Orderly Frames."

working relationship with the meadow's stakeholders, monitoring the meadow and performing a field experiment trial. Our research team monitored the meadow plants over time in these ways: by using grid sampling for vegetation surface cover and by photo point monitoring. Since I was not formally trained in ecology or other science fields, these Western methods based in quantitative data were unfamiliar to me. I also found the connection between grid sampling—a Western standard for environmental monitoring—and the grid (the plat surveys I mentioned in the first chapter) used by Euro-American settler colonizers to section off townships to be super relevant and worth internally analyzing through a decolonizing design lens. The method of staking our test plots with rebar before we began our grid sampling was also originally a settler colonial tool. I could not help but think the negative reaction the Burke Tribal Liaison had about the act of staking metal next to sacred prairie plants was a reaction to the persistent legacy of colonial violence. Because of this, the Camas Monitoring Project are using wooden stakes such as gathered willow branches for our test plots.

Landscape architecture, as a creative and experimental discipline, gave me the avenue to try out other methods as part of a decolonizing process. It was a priority for me to present research data while analyzing the Western methods that utilized the grid form. For instance, I wanted to visualize the grid sampling results of the camas meadow test plots in a graphic that was grounded in quantitative data but could be more easily understood. I created a series of simple animated GIFs that showed the grid sample results in colors that signified the plants in the camas meadow. However, to determine the success and usefulness of this series of graphics would require feedback from the meadow stakeholders which I have not had the ability to receive yet.

Going to the site once or twice a month for grid sampling and photo points gave me the opportunity to make empirical observations of the camas meadows more accurately. Earlier on in the project, our research team learned from the Burke's Tribal Liaison, one of our meadow co-stakeholders, that the northwestern side of the meadow closest to the Burke building was planted by Tribal elders and a ceremony was held during the planting. The Burke's Tribal Liaison also had visions of programs related to camas and/or bitterroot gathering as well. Knowing the areas and plants of priority of Indigenous stakeholders became a priority for our research team because of this. For instance, it was critical for us to record that two microclimates exist within the camas meadow and to communicate this observation as part of our site analyses. Based on the surface cover, number and physical appearance of the plants in the meadow in the summer of 2020, we deduced that the western corner of the meadow was considerably warmer and drier than the eastern corner of the meadow. The cause of the western microclimate was the heat reflecting from the Burke building as well as a southfacing exhaust vent that blows warm air onto the meadow. This could potentially impact the species planted by Tribal elders—and prioritizing this area helped our research team in planning for our first field experiment proposal.



Figures 5.19 The Camas Monitoring Project's second proposed field experiment to tackle the lupines.

In September 2020, our team proposed our first field experiment that introduced fire management to our co-stakeholders at the Burke Museum, UW Grounds and the Native American Advisory Board. The field experiment was to divide the meadow into four plot sections where each section was to be managed with a specific care strategy in the fall or winter after all meadow plants have senesced. The care strategies were: 1) no strategy (control), 2) mow every other year, 3) mow once a year, and 4) introduce a very low-severity fire. The control plot that would have no care strategy was the area where Tribal elders planted. This was to minimize the risk of damage to emerging plants such as the camas. In a site visit with the meadow's co-stewards, UW Grounds lead gardener and the Burke's Tribal Liaison, our research team proposed the field experiment and asked if they could join us in mapping the field experiment plot sections. I realized that introducing fire at such a highly visible and urban landscape seemed too radical, but I was surprised when the reaction from our two co-stewards was not an immediate refusal of the idea. The proposed section for the very low-severity fire care would be the easternmost section of the camas meadows, the farthest away from the Burke building. The UW Grounds lead gardener wanted to know if we could make the proposed fire section 50% smaller and make the other 50% another control plot. The Tribal Liaison was supportive of the field experiment, including the introduction of fire. The NAAB did not have an explicit decision about our field experiment proposal. A month later, we asked the UW Grounds again about the possibility of low-severity fire introduction as a management strategy for the experiment. Our team was told that there are costly permitting fees that may deter us from performing a burn on such a small area. Knowing this was too novel of an experiment to take on, our team have decided to pursue this particular field experiment at a later time.

Figures 5.20 A photograph of me (author) monitoring the camas meadow at the Burke Museum. Source: Ken Yocom

Figures 5.21 Stakeholders cutting back lupines at the Burke Museum Camas Meadow volunteer event and field experiment. Source: Rachel Ormiston

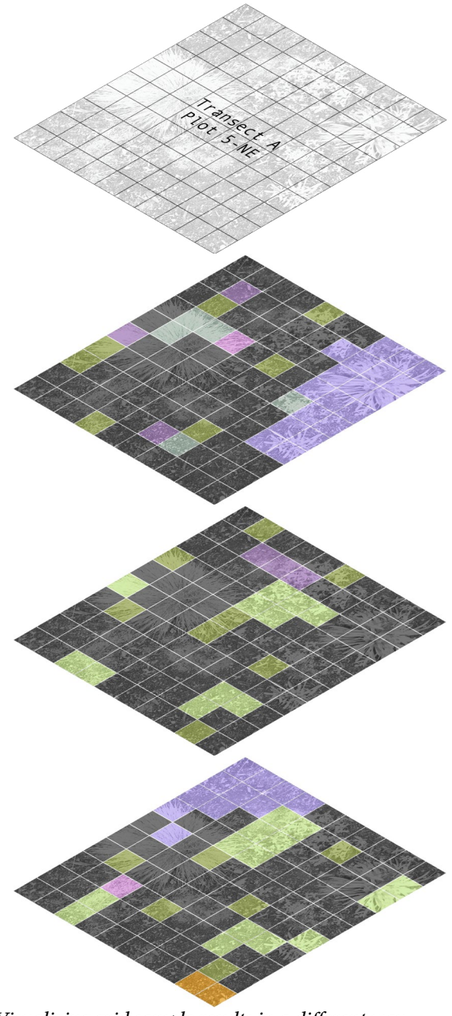
The second field experiment proposal came to our research team because of an unexpected overgrowth and proliferation of the sickle keeled lupine (*Lupinus albicaulis*) species in the camas meadow. Our research team were assured that the small window of snow and below-freezing temperatures during winter would slow the lupine growth, but our hypothesis was incorrect. Since our monitoring began in July of 2020, lupine dominated much of the overall surface coverage of the meadow. Our research team called another meeting in March of 2021 out of concern that the lupine management will be more complex than all co-stewards have expected. What I began to observe with the morphology of the lupines brought a challenging issue: the lupine species are crowding out smaller and less-established prairie species. The concern was then confirmed by a Burke Herbarium co-stakeholder who has experience with propagating native prairie species including *Lupinus albicaulis*. He voiced that the lupines would shade out the emerging spring bulbs like camas, chocolate lily and bitterroot. But another issue presented itself when I began observing newly sprouting plants were showing extensive leaf damage from browsing. The only emerging species that showed little to no browsing damage were located underneath the peripheral edges of the lupine bushes where sunlight could still filter in but where lupine branches provided a vegetative fence against browse.

This presented an opportunity to center long-term care by co-generating on a shared goal to address an issue we did not necessarily have a solution for. During our March meeting, our co-stakeholders at UW Grounds and the Burke and our team agreed to collaborate on a volunteer work event to tackle the lupine cutback. The Burke and our research team would reach out to networks for volunteers while UW Grounds would provide wheelbarrows and to remove the litter pile after the event. Our research team would create the program and plan operations for the volunteers. We suggested that we use the volunteer event as an opportunity to perform our field experiment. The Camas Monitoring team would section off areas of the meadow into three: 1) control (no lupine

Figures 5.22 A great camas bloom almost hidden in a sea of sicklekeel lupines at the camas meadow, Burke Museum, University of Washington - Seattle Campus. Source: Jocine Velasco

cutback), 2) 25% lupine cutback and 3) 50% lupine cutback. The lupine cutback would decrease the overall surface coverage of each lupine bush by cutting outer branches down to the plant's base. During the event, an estimated 35 people volunteered and pruned lupines for a total of 105 hours. Many volunteers were affiliated with the Burke or the University of Washington who were familiar with the camas meadow.

The volunteer work event widened the stewardship and diversified the stakeholders of the camas meadow even further. The combination of the COVID pandemic and the springtime weather brought more volunteers than our team expected. The lupine cutback itself was messy and the lupines themselves did not look tidy or uniform because the amount that was removed varied depending on the volunteer. However, the 35 people who came during the event and communed with the plants are now more familiar with the camas meadow at the Burke than they had been before. The lupine maintenance will require more care in the long-term and at least two volunteers mentioned to me directly that I can reach out to them for the next round of maintenance. The social impact of the camas meadow as an ecocultural landscape in a highly visible, urban area has the potential to be made stronger if groups of people are actively engaged in its stewardship. Presence of a diverse group of people performing a diverse set of prairie management strategies at the camas meadow may just be the cues of human care[79] that prairie revitalization in the Pacific West may need. More diverse and inclusive forms of long-term care—led especially by Indigenous stakeholders—for the camas meadow in the future may also begin to fully address settler colonial history and educate around climate adaptation.



Figures 5.23 Visualizing grid sample results in a different way.

79 Nassauer.

Section 5. To Value Multispecies Epistemologies: The Living Prairie Plant Display

The last DDF practice I wanted to highlight is to value multispecies epistemologies by celebrating Othered ways of knowing. As I monitor the camas meadow every month, my mind would wander counting the squares on my field sampling plot. I began asking myself questions like, "If climate projections tell us that we who live in the Pacific West must learn to live with fires in warmer and drier landscapes, can we listen to what fire-resilient plants teach us?" And "how were prairies, grasslands and oak savanna plants able to thrive because of fire?" I found my answers underground. What I learned was a deep network of prairie roots and a strong base that keep each plant alive when fires burn some or all of the plant's above-ground parts. Take for example the slow-growing Garry oak. They easily survive fires when they are saplings and if a fire is severe enough to cause top-kill, they readily sprout from their root crown or roots.[80] Although an herbaceous species, the arrowleaf balsamroot (*Balsamorhiza sagittata*) grows in a similar fashion where they sprout vigorously post-fire from a thick underground base (caudex) and form deep roots.[81] And lastly, blue wildrye (*Elymus glaucus*) have evolved to have aerial parts that burn quickly "with little heat transferred down into the root crown."[82] Fire-resilient plants taught me to value their knowledge and communing with prairie plants convinced me to share what I have learned.

Similar to cultural artforms such as basketweaving, landscape design-build hybridizes design, art and craft by working with our hands. Utilizing woodwork, pyrography, illustration and horticulture, I created the Living Prairie Plant Display as a small design-build project to highlight multispecies epistemologies of the prairie plants of the Puget Sound. I wanted to showcase the hidden underground life of plants such as camas as a way to shift public perceptions on the aesthetics of a "natural" prairie landscape. In the fall and winter, these plants go into dormancy

Figures 5.24 Planting selected prairie plants into the Living Prairie Plant Display. Source: Perry Hohlstein

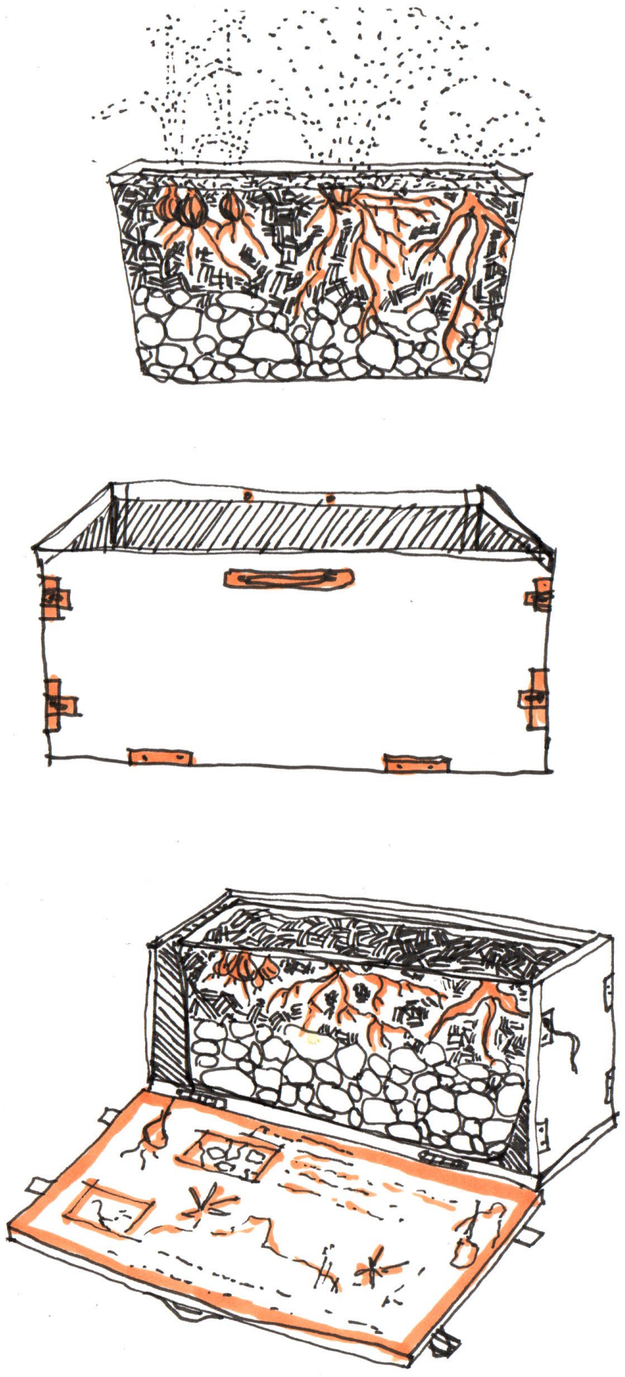
Figures 5.25-5.27 From left to right: Image of plant starts donated by Oxbow Native Nursery. Image of me (author) building the base of the Living Prairie Plant Display. Image of me (author) planting. Source: Perry Hohlstein

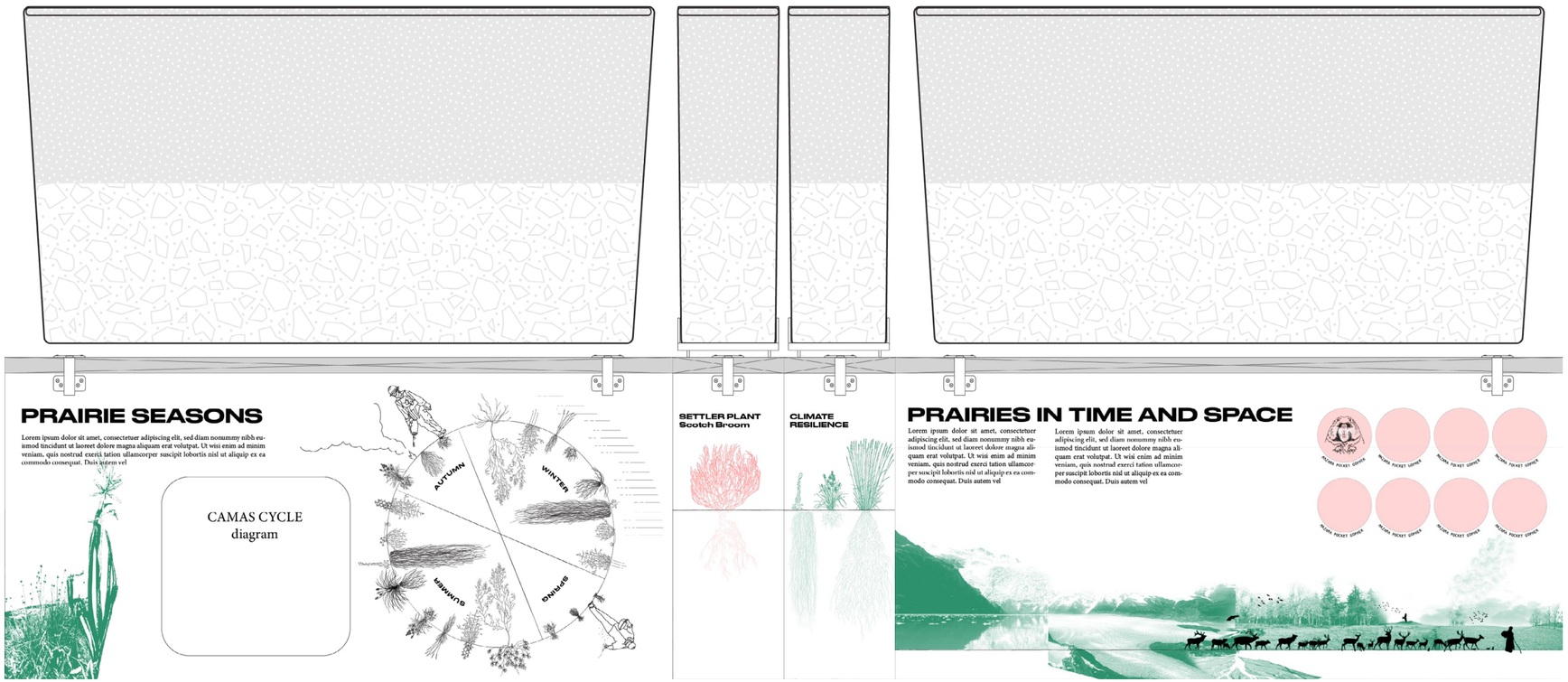
80 Corey L. Gucker, "Quercus Garryana," in Fire Effects Information System, [Online] (U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, 2007), https://www.fs.fed.us/database/feis/plants/tree/quegar/all.html.

81 Jack McWilliams, "Balsamorhiza Sagittata," in Fire Effects Information System, [Online] (U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, 2002), https://www.fs.fed.us/database/feis/plants/forb/balsag/all.html.

82 Kathleen A. Johnson, "Elymus Glaucus," in Fire Effects Information System, [Online] (U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, 1999), https://www.fs.fed.us/database/feis/plants/graminoid/elygla/all.html.

THE LIVING PRAIRIE PLANT DISPLAY: DESIGN-BUILD PROTOTYPING





Figures 5.28-5.29 Left to right: Rough sketch of the prototype. Digital mock-ups of the interpretation in the panels of the display.

and may appear dead on the surface but are actually storing their life-supporting potential just inches below ground. Interpretation on the collapsible wooden case highlights the role of Indigenous burning in extending the reaches of prairie habitat distribution and increasing camas productivity, prairie habitat ecosystem services, and the role of the settler-introduced Scotch broom plant.

The design of the Living Prairie Plant Display is relatively simple and its intent even more simple: to reveal the root structures of prairie plants in soil but to keep the plants alive. The planter boxes are transparent acrylic containers in which I drilled holes at the bottoms. The wooden case is made of four panels made of pine attached to a cedar base with hinges. The panels reveal interpretation about prairies in the Puget Sound region and the underground life of prairie plants. Having the living plants as collaborators on this design-build prototype allows me to observe more closely the success of the design. The plants teach me if their roots are being exposed with too much light in the display case, by showing signs that they are either healthy or not healthy. Although I have not had the chance to present the Living Prairie Plant Display to the Burke's Tribal Liaison, I had the opportunity to present the prototype to Lisa and Leaf Hillman during my Tishánik visit in the spring of 2021. The display brought idea generation around possible youth programming to construct a version of the Living Prairie Plant Display with their own ethnobotanical plants. I hope to iterate another display prototype in the near future if it is useful for either the Burke or for the Karuk Tribe.

Figures 5.30 The Living Prairie Plant Display in the "wild".

Figures 5.31 The finished prototype of the Living Prairie Plant Display with a panel opened to reveal interpretation inside the wooden case.

Figures 5.32 The underground life of prairies.

Figures 5.33 Detail of the interpretation inside the panels of the display's wooden case. The interpretation is made with ink transfer and pyrography.

Figures 5.34 The finished prototype of the Living Prairie Plant Display with the wooden case closed.

Figures 5.35 The finished prototype of the Living Prairie Plant Display with a panel opened to reveal interpretation inside the wooden case.

Figures 5.36 Detail of a panel of the Living Prairie Plant Display.

List of Figures
(images are my own unless indicated otherwise)

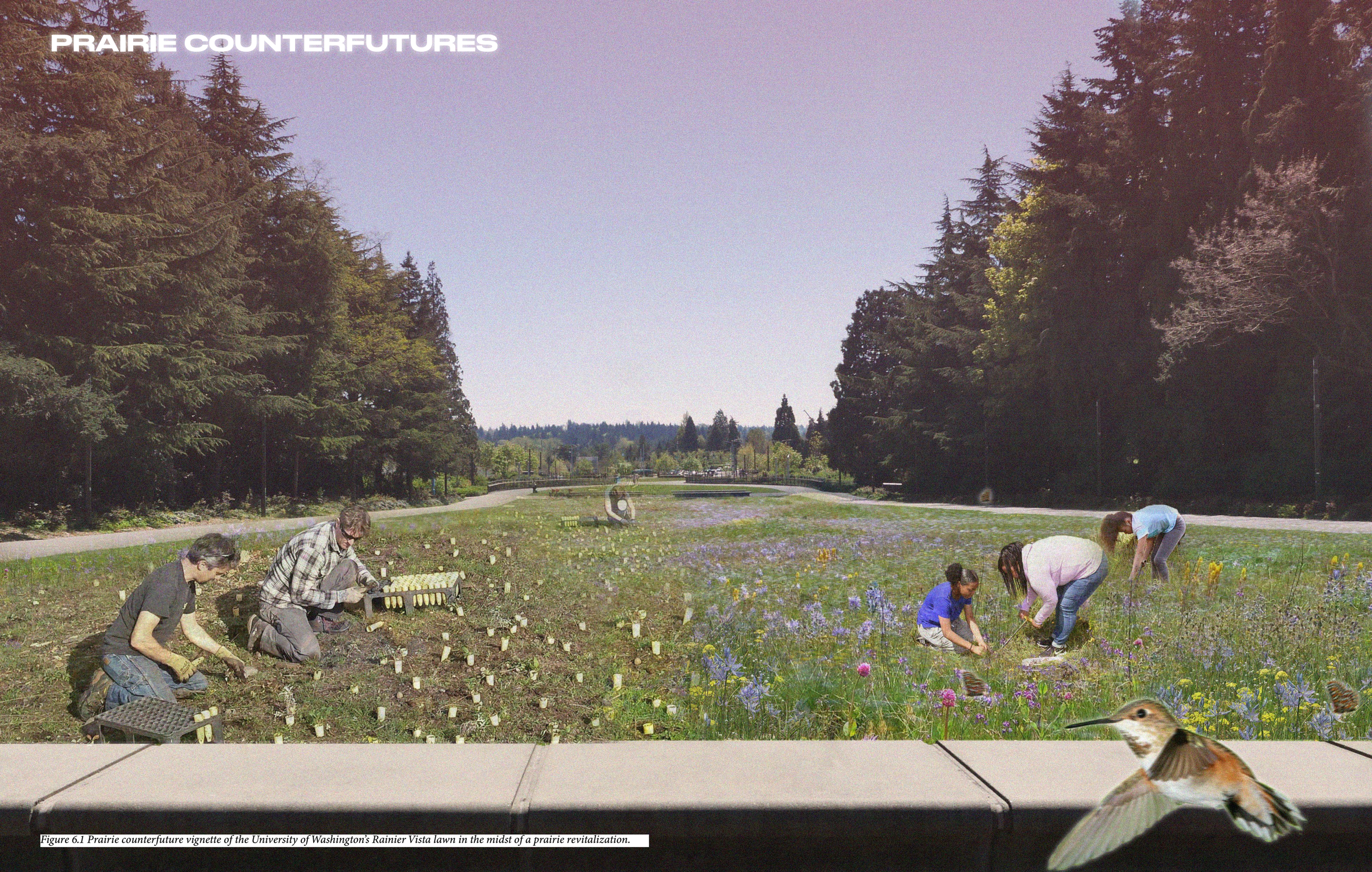


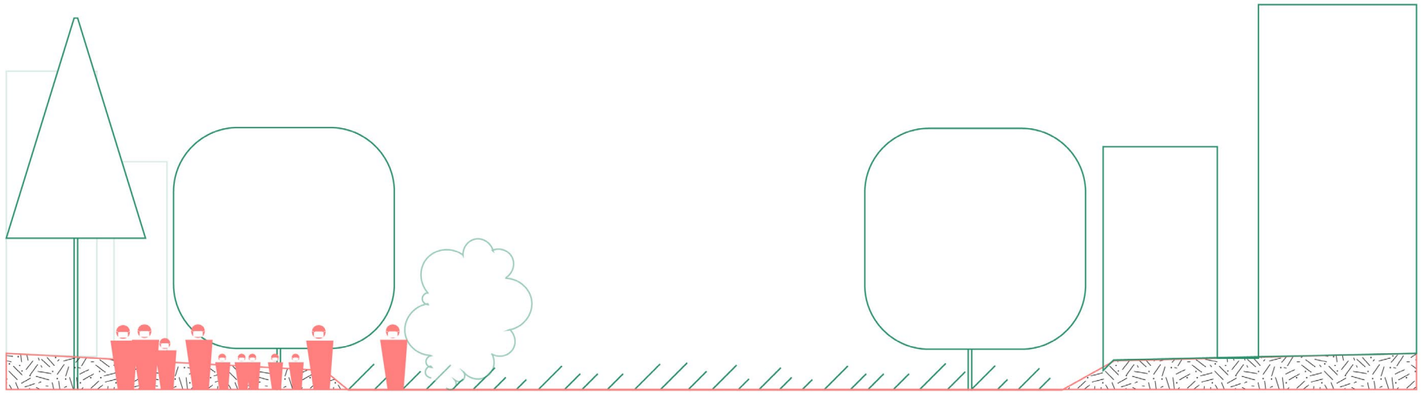
Figure 6.1 Prairie counterfuture vignette of the University of Washington's Rainier Vista lawn in the midst of a prairie revitalization.

6 conclusion

Prairie Counterfutures: No Climate Adaptation Without Ecocultural Revitalization

As landscape design in the Pacific West continue to strategize for a warmer and drier future, the more likely that fire-dependent prairie, grassland and oak savanna habitats will be incorporated as novel ecosystems in both urban and wildland areas. Landscape projects such as GGN's Burke Museum camas meadow and Site Workshop's Dune Peninsula Park have already included endemic prairie and Garry oaks species in their respective planting palettes. However, without a resurgence of Indigenous fire practitioners to steward these habitats, will such landscapes survive much less thrive? In an article investigating the role of settler colonialism to Garry oak ecosystem loss, the palaeoecologists Marlow Pellatt and Ze'ev Gedalof point out that prairie, grasslands and oak savannahs are inextricably linked to the Indigenous stewards that managed them with fires. Without Tribes and their knowledge of fire management, a climate adaptation strategy for a warmer and drier Pacific West will not be successful.[83] This article—unfortunately the only one I came across—urges for an active decolonizing process in Garry oak ecosystem restoration.

83 Marlow G. Pellatt and Ze'ev Gedalof, "Environmental Change in Garry Oak (Quercus Garryana) Ecosystems: The Evolution of an Eco-Cultural Landscape," Biodiversity and Conservation 23, no. 8 (July 1, 2014): 2053–67, https://doi.org/10.1007/s10531-014-0703-9.



Figures 6.2 A diagram showing a proposed Urban TREX microburns.

Indigenous nations and communities will steward their ancestral lands into the future, but the legacy of settler colonialism, imperialism, slavery and capitalist extraction perpetuates violence against them and in varying ways, against all of us. Climate adaptation means decolonizing ourselves to materially support Indigenous-led ecocultural revitalization, in the so-called wildlands and urban areas of the Pacific West. For the field of landscape architecture and landscape design, decolonizing epistemological methods is crucial in order for us to meet our sustainability, climate adaptation, and inclusivity design goals. I argue that the existing landscape design process provides an iterative, inter-disciplinary and expansive space to co-generate with Tribal governments and Tribal community members as the long-term stewards and experts of land care. However, settler colonialism is inevitably deeply embedded in our research, design and implementation and it is our labor as non-Native people to unsettle ourselves and the structures that directly and systemically harm Tribes and their ancestral lands.

The Decolonizing Design Framework I have used in the Camas Monitoring Project and the UW-Karuk Klamath River Project hopes to disrupt and deepen my landscape design process in order to support prairie revitalization in this region and their subsequent Indigenous fire management. The DDF proposes to deepen existing landscape design methods such as site analysis, conceptual design, participatory design, design-build prototyping and landscape management planning. In order to do this, DDF prioritizes 5 key practices: 1) to honor Tribal sovereignty, 2) to respect the personhoods of biotic and abiotic life that exist on any given site, 3) to co-generate with a Tribe on shared climate adaptation goals, 4) to center long-term care of the land, and 5) to value multispecies epistemologies. The framework is informed by the Indigenous stakeholders of the two research projects in this thesis. The framework is also influenced by Indigenous, decolonial, feminist and queer scholars whose works have pushed me to analyze dominant Western settler narratives on historic prairie loss in the Pacific West. This thesis hopes to add to the body of work decolonizing landscape scholarship.

RAINIER VISTA PRAIRIE

`size`

approx. 2 acres

`design intent`

highlights Puget Sound prairies by converting existing lawn space; centering historic and current Indigenous land stewardship; follows Olmsted "genius of place" parks philosophy

`potential stewards`

University of Washington, GGN, Seattle Parks and Rec, Friends of Seattle's Olmsted Parks

`plant highlights`

blue wildrye, arrowleaf balsamroot, tapertip onion, nodding onion, paintbrush spp., roemer's fescue, slender wheatgrass, biscuitroot, bitterroot, kinnikinnik, idaho blue-eyed grass

`growing conditions`

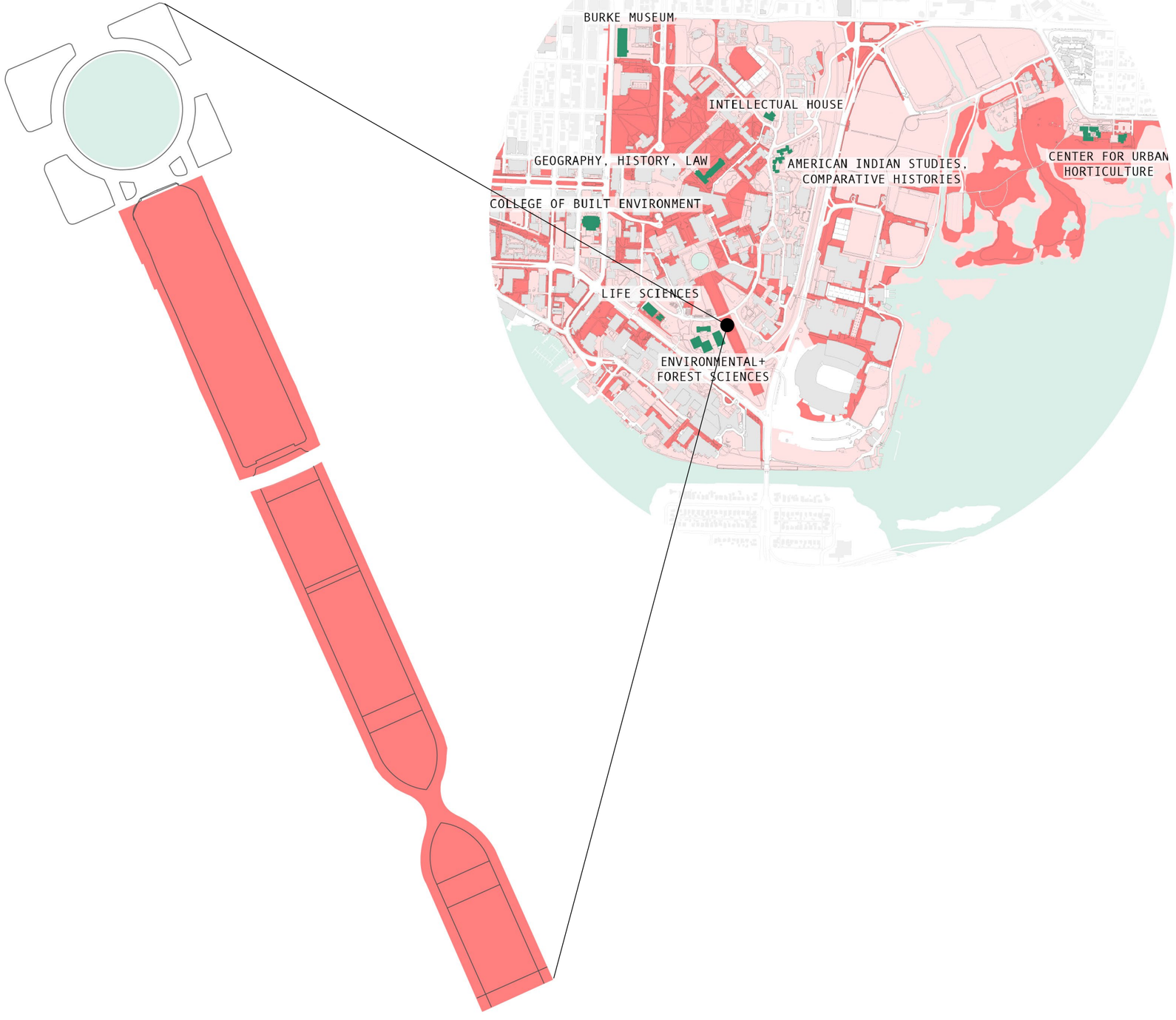
dry-mesic prairie, sunny

`management strategy`

mowing, transition to low-intensity burning

`precedents`

Mima Mounds, Canemah Bluff Nature Park (Portland)



Figures 6.3 A UW Prairie Feasibility map assessing the Rainier Vista Bridge's potential as an ecocultural prairie landscape.

Figure 6.4 Prairie counterfuture vignette of the University of Washington's Rainier Vista lawn in 2050 as a site for very low-intensity fires and in 2300 as a thriving grazing grounds for elk.

List of Figures
(images are my own unless indicated otherwise)

bibliography

Alexander, W. C. Farm Workers with Horse-Drawn Combine Harvesting Wheat, Almira, Washington, August 1911 - Industries and Occupations Photographs - University of Washington Digital Collections. August 1911. Photography. PH Coll 334. Alaska and Pacific Northwest early photographers collection. https://cdm16786.contentdm.oclc.org/digital/collection/indocc/id/77/rec/17.

Agamben, Giorgio. Homo Sacer: Sovereign Power and Bare Life. Homo Sacer 1. Stanford, Calif.: Stanford University Press, 1998.

Boyd, Robert T. Robert Thomas. Indians, Fire, and the Land in the Pacific Northwest. 1st ed. Corvallis, Or.: Oregon State University Press, 1999.

Brady, Matthew. "Hon. Isaac Ingalls Stevens." Still image, 1855. https://www.loc.gov/pictures/resource/cwpbh.02650.

Bramwell, Lincoln. "1911 Weeks Act: The Legislation That Nationalised the US Forest Service." Journal of Energy & Natural Resources Law 30, no. 3 (2012): 325–36. https://doi.org/10.1080/02646811.2012.11435298.

Cagle, Susie. "'Fire Is Medicine': The Tribes Burning California Forests to Save Them." The Guardian, November 21, 2019, sec. US news. https://www.theguardian.com/us-news/2019/nov/21/wildfire-prescribed-burns-california-native-americans.

Croover-Payette, Amy. "Native American Community, Metro Work Together to Provide Culturally Appropriate Access to Public Land." Metro, July 10, 2017. https://www.oregonmetro.gov/news/native-american-community-metro-work-together-provide-culturally-appropriate-access-public-land.

Dalla Costa, Mariarosa, and Giovanna Franca Dalla Costa. Women, Development, and Labor of Reproduction: Struggles and Movements. Trenton, NJ: Africa World Press, 1999.

Diawara, Manthia. "One World in Relation: Édouard Glissant in Conversation with Manthia Diawara." NKA (Brooklyn, N.Y.) 2011, no. 28 (2011): 4–19. https://doi.org/10.1215/10757163-1266639.

Dressler, Wolfram H., Will Smith, Christian A. Kull, Rachel Carmenta, and Juan M. Pulhin. "Recalibrating Burdens of Blame: Anti-Swidden Politics and Green Governance in the Philippine Uplands." Geoforum, February 2020, S0016718520300348. https://doi.org/10.1016/j.geoforum.2020.01.024.

Engber, Eamon A., J. Morgan Varner, Leonel A. Arguello, and Neil G. Sugihara. "The Effects of Conifer Encroachment and Overstory Structure on Fuels and Fire in an Oak Woodland Landscape." Fire Ecology 7, no. 2 (August 2011): 32–50. https://doi.org/10.4996/fireecology.0702032.

"FAO - News Article: 6 Ways Indigenous Peoples Are Helping the World Achieve #ZeroHunger." Accessed April 5, 2021. http://www.fao.org/indigenous-peoples/news-article/en/c/1029002/.

Federici, Silvia. Revolution at Point Zero: Housework, Reproduction, and Feminist Struggle. Common Notions Series. Oakland, CA : Brooklyn, NY: PM Press ; Common Notions : Autonomedia, 2012.

Forest Service Northern Region. "Aftermath of the 1910 Fires." 1910. Photo. https://www.flickr.com/photos/fsnorthernregion/4930354848/.

Ford, Allison, and Kari Marie Norgaard. "Whose Everyday Climate Cultures? Environmental Subjectivities and Invisibility in Climate Change Discourse." Climatic Change 163, no. 1 (November 2020): 43–62. https://doi.org/10.1007/s10584-019-02632-1.

Fraser, Nancy. "Contradictions of Capital and Care." New Left Review, no. 100 (2016): 99–117.

Gallant, Alisa L., Andrew J. Hansen, John S. Councilman, Duane K. Monte, and David W. Betz. "Vegetation Dynamics under Fire Exclusion and Logging in a Rocky Mountain Watershed, 1856-1996." Ecological Applications 13, no. 2 (2003): 385–403. http://www.jstor.org/stable/3099906.

Gucker, Corey L. "Quercus Garryana." In Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, 2007. https://www.fs.fed.us/database/feis/plants/tree/quegar/all.html.

Hamman, Sarah T., Peter W. Dunwiddie, Jason L. Nuckols, and Mason McKinley. "Fire as a Restoration Tool in Pacific Northwest Prairies and Oak Woodlands: Challenges, Successes, and Future Directions." Northwest Science 85, no. 2 (July 2011): 317–28. https://doi.org/10.3955/046.085.0218.

Higgins, Jerome S. Subdivisions of The Public Lands: Described and Illustrated with Diagrams and Maps. Higgins & Company, 1887.

Hillaire, Pauline R., and Gregory P. Fields. Rights Remembered: A Salish Grandmother Speaks on American Indian History and the Future. Lincoln, UNITED STATES: Nebraska, 2016. http://ebookcentral.proquest.com/lib/washington/detail.action?docID=4456532.

Ho, Vivian. "Fire Tore through the Karuk Tribe's Homeland. Many Won't Be Able to Rebuild." The Guardian, October 23, 2020. http://www.theguardian.com/us-news/2020/oct/23/karuk-tribe-california-slater-fire-insurance.

Hogeland, William. Autumn of the Black Snake: The Creation of the U.S. Army and the Invasion That Opened the West. First edition. New York: Farrar, Straus and Giroux, 2017.

Holden, Robert, and Jamie Liversedge. Landscape Architecture: An Introduction. London, UNITED KINGDOM: Laurence King Publishing, 2014. http://ebookcentral.proquest.com/lib/washington/detail.action?docID=1876176.

Hormel, Leontina M., and Kari M. Norgaard. "Bring the Salmon Home! Karuk Challenges to Capitalist Incorporation." Critical Sociology 35, no. 3 (May 1, 2009): 343–66. https://doi.org/10.1177/0896920508101502.

Indigenous Peoples Council on Biocolonialism. "Indigenous Research Protection Act." Indigenous Peoples Council on Biocolonialism, n.d. http://www.ipcb.org/publications/policy/files/irpa.html.

James, Joy, and Jaime Amparo Alves. "States of Security, Democracy's Sanctuary, and Captive Maternals in Brazil and the United States." Souls (Boulder, Colo.) 20, no. 4 (2018): 345–67. https://doi.org/10.1080/10999949.2018.1521690.

Johnson, Kathleen A. “Elymus Glaucus.” In Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, 1999. https://www.fs.fed.us/database/feis/plants/graminoid/elygla/all.html.

“Joint Base Lewis McChord | Sentinel Landscapes.” Accessed April 11, 2021. https://sentinellandscapes.org/landscapes/joint-base-lewis-mcchord/.

Karuk Tribe, and University of California Berkeley. “Practicing Píkyav – Karuk – UC Berkeley Collaborative,” n.d. https://nature.berkeley.edu/karuk-collaborative/?page_id=165.

Kimmerer, R.W., and F.K. Lake. “The Role of Indigenous Burning in Land Management.” Journal of Forestry 99, no. 11 (November 1, 2001): 36–41. https://doi.org/10.1093/jof/99.11.36.

Kinsey, Clark. Logging Crew and Donkey Engine beside Railroad Track, Emery and Nelson, Inc., ca. 1917. 1917. Photography. https://digitalcollections.lib.washington.edu/digital/collection/clarkkinsey/id/214/rec/7.

LaDuke, Winona. The Militarization of Indian Country. East Lansing: Makwa Enewed, 2012.

Lewis, Henry T. “Patterns of Indian Burning in California: Ecology and Ethnohistory.” American Anthropologist 77, no. 3 (1975): 685–86. https://doi.org/10.1525/aa.1975.77.3.02a00880.

Li, Jiayang, and Joan Iverson Nassauer. “Cues to Care: A Systematic Analytical Review.” Landscape and Urban Planning 201 (September 2020): 103821. https://doi.org/10.1016/j.landurbplan.2020.103821.

Mann, Charles. “An Indigenous Practice May Be Key to Preventing Wildfires.” History, December 17, 2020. https://www.nationalgeographic.com/history/article/good-fire-bad-fire-indigenous-practice-may-key-preventing-wildfires.

Marks-Block, Tony, Frank K. Lake, and Lisa M. Curran. “Effects of Understory Fire Management Treatments on California Hazelnut, an Ecocultural Resource of the Karuk and Yurok Indians in the Pacific Northwest.” Forest Ecology and Management 450 (October 2019): 117517. https://doi.org/10.1016/j.foreco.2019.117517.

Marques, Bruno, Greg Grabasch, and Jacqueline McIntosh. “Fostering Landscape Identity Through Participatory Design With Indigenous Cultures of Australia and Aotearoa/New Zealand.” Space and Culture 24, no. 1 (June 27, 2018): 37–52. https://doi.org/10.1177/1206331218783939.

Mauger, Guillaume S., Joseph H. Casola, Harriet A. Morgan, Ronda L. Strauch, Brittany Jones, Beth Curry, Tania M. Busch Isaksen, Lara Whitely Binder, Meade B. Krosby, and Amy K. Snover. “State of Knowledge: Climate Change in Puget Sound.” Seattle: Climate Impacts Group, University of Washington, 2015.

McGrath, Daniel. “The Model Tribal Probate Code: An Opportunity to Correct the Problems of Fractionation and the Legacy of the Dawes Act.” Journal of Gender, Race and Justice, 2017. Gale Academic OneFile. http://link.gale.com/apps/doc/A492465327/AONE?sid=bookmark-AONE&xid=87c3a1ee.

McIntosh, Jacqueline, and Bruno Marques. “View of Designing for Culturally-Diverse Communities. The Role of Collaborative, Interdisciplinary Design-Led Research.” The Journal of Public Space, Special Issue, 2, no. 3 (2017). https://www.journalpublicspace.org/index.php/jps/article/view/281/280.

McWilliams, Jack. “Balsamorhiza Sagittata.” In Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, 2002. https://www.fs.fed.us/database/feis/plants/forb/balsag/all.html.

Moten, Fred. Black and Blur. Moten, Fred. Consent Not to Be a Single Being ; v. 1. Durham: Duke University Press, 2017.

Nassauer, Joan Iverson. “Messy Ecosystems, Orderly Frames.” Landscape Journal 14, no. 2 (1995): 161–70. https://doi.org/10.3368/lj.14.2.161.

———. “Monitoring the Success of Metropolitan Wetland Restorations: Cultural Sustainability and Ecological Function.” Wetlands 24, no. 4 (December 2004): 756–65. https://doi.org/10.1672/0277-5212(2004)024[0756:MTSOMW]2.0.CO;2.

National Oceanic Atmospheric Administration. “Tribal Cultural Landscapes: Implementing a TCL Approach.” Accessed May 18, 2021. https://sanctuaries.noaa.gov/tribal-landscapes/tcl-approach.html.

Nicholas J. Reo, Kyle Whyte, Darren Ranco, Jodi Brandt, Emily Blackmer, and Braden Elliott. “Invasive Species, Indigenous Stewards, and Vulnerability Discourse.” American Indian Quarterly 41, no. 3 (2017): 201. https://doi.org/10.5250/amerindiquar.41.3.0201.

Pellatt, Marlow G., and Ze’ev Gedalof. “Environmental Change in Garry Oak (Quercus Garryana) Ecosystems: The Evolution of an Eco-Cultural Landscape.” Biodiversity and Conservation 23, no. 8 (July 1, 2014): 2053–67. https://doi.org/10.1007/s10531-014-0703-9.

Preston, D. “Nisqually Honors Ancestors on Joint Base Lewis-McChord with Walk.” Northwest Treaty Tribes (blog), May 1, 2019. https://nwtreatytribes.org/nisqually-honors-ancestors-on-joint-base-lewis-mcchord-with-walk/.

Sarna-Wojcicki, Daniel, Jennifer Sowerwine, and Lisa Hillman. “Decentring Watersheds and Decolonising Watershed Governance: Towards an Ecocultural Politics of Scale in the Klamath Basin” 12, no. 1 (2019): 26.

Service, Bain News. “J.W. Weeks.” Still image, 1915. https://www.loc.gov/pictures/resource/ggbain.31644.

Sharky, Bruce. Thinking about Landscape Architecture: Principles of a Design Profession for the 21st Century. [First edition]. New York, NY: Routledge, 2016.

Shea, Rachel, and Michael Love. “Kelly Bar Off-Channel Fisheries and Riparian Habitat Enhancement Project.” Basis of Design Report. Salmon River Restoration Council, March 2016.

Simonsen, Jesper, and Toni Robertson. Routledge International Handbook of Participatory Design. Routledge International Handbooks. New York: Routledge, 2013.

Storm, L., and D. Shebitz. “Evaluating the Purpose, Extent, and Ecological Restoration Applications of Indigenous Burning Practices in Southwestern Washington.” Ecological Restoration 24, no. 4 (December 1, 2006): 256–68. https://doi.org/10.3368/er.24.4.256.

The Karuk Tribe and the University of California at Berkeley. “Klamath Basin Food System Assessment,” n.d.

The Nature Conservancy. “Prescribed Fire Training Exchanges.” Conservation Gateway. Accessed April 18, 2021. http://www.conservationgateway.org/ConservationPractices/FireLandscapes/HabitatProtectionandRestoration/Training/TrainingExchanges/Pages/fire-training-exchanges.aspx?fbclid=IwAR0uEyLcjLdAakZUwcOkZo75innyeSDn0Zzz58ZfUSB3V8Q3-d4KAejFnTA.

Trott, Lindsay. “Walk of Honor: Nisqually Indian Tribe Visits Land of Ancestors.” Nisqually Valley News, May 9, 2013. http://www.yelmonline.com/stories/walk-of-honor-nisqually-indian-tribe-visits-land-of-ancestors,119643.

Trowbridge, Charlotte C., Amanda Stanley, Thomas N. Kaye, Peter W. Dunwiddie, and Jennifer L. Williams. “Long-Term Effects of Prairie Restoration on Plant Community Structure and

Native Population Dynamics: Long-Term Effects of Prairie Restoration." Restoration Ecology 25, no. 4 (July 2017): 559–68. https://doi.org/10.1111/rec.12468.
Tuck, Eve, and K Wayne Yang. "Decolonization Is Not a Metaphor." Decolonization: Indigeneity, Education & Society 1, no. 1 (2012): 1–40.
Tuhiwai Smith, Linda. Decolonizing Methodologies: Research and Indigenous Peoples. London, United Kingdom: Zed Books, 2012. http://ebookcentral.proquest.com/lib/washington/detail.action?docID=1426837.
United States Congress. "A Century of Lawmaking for a New Nation: U.S. Congressional Documents and Debates, 1774 - 1875." In Journals of the Continental Congress, 27:446. Accessed April 19, 2021. http://memory.loc.gov/cgi-bin/ampage?collId=lljc&fileName=027/lljc027.db&recNum=83.
University of Washington. "Memorandum of Understanding Between Northwest Regional Tribes and the University of Washington." University of Washington, September 11, 2010.
"USA Department of Defense Lands - Overview." Accessed April 17, 2021. https://www.arcgis.com/home/item.html?id=6b911a60a5a4465a85fd5c42668bf907.
Walstad, John D., Steven R. Radosevich, and David V. Sandberg. Natural and Prescribed Fire in Pacific Northwest Forests. Corvallis, Or.: Oregon State University Press, 1990.
Washington Department of Natural Resources. "Prescribed Fire Training Gives Firefighters Skills to Improve Forest Health, Increase Community Protection | WA - DNR." Washington Department of Natural Resources. Accessed April 19, 2021. https://www.dnr.wa.gov/news/prescribed-fire-training-gives-firefighters-skills-improve-forest-health-increase-community.
Whyte, Kyle Powys. "Indigenous Women, Climate Change Impacts, and Collective Action." Hypatia 29, no. 3 (2014): 599–616. http://www.jstor.org/stable/24542019.
Whyte, Kyle Powys, and Chris Cuomo. "Ethics of Caring in Environmental Ethics: Indigenous and Feminist Philosophies." In The Oxford Handbook of Environmental Ethics, 1st ed. Oxford Handbooks. Oxford University Press, 2017. https://doi.org/10.1093/oxfordhb/9780199941339.013.22.
Wilkinson, Charles F. Messages from Frank's Landing: A Story of Salmon, Treaties, and the Indian Way. Seattle: University of Washington Press, 2000.
Williams, Gerald W. "The USDA Forest Service - The First Century." Historical analysis. Washington D.C.: USDA Forest Service, April 2005.
Winterbottom, Daniel. Design-Build: Integrating Craft, Service, and Research through Applied Academic and Practice Models. Milton: Taylor and Francis, 2020. https://doi.org/10.4324/9781315679372.
Woelfle-Erskine, Cleo. "The Watershed Body: Transgressing Frontiers in Riverine Sciences, Planning Stochastic Multispecies Worlds." Catalyst: Feminism, Theory, Technoscience 3, no. 2 (September 22, 2017). https://go-gale-psdo?p=AONE&sw=w&issn=23803312&v=2.1&it=r&id=GALE%7CA561685860&sid=googleScholar&linkaccess=abs.
Wray, J., and M. K. Anderson. "Restoring Indian-Set Fires to Prairie Ecosystems on the Olympic Peninsula." Ecological Restoration 21, no. 4 (December 1, 2003): 296–301. https://doi.org/10.3368/er.21.4.296.
Zeunert, Joshua. Landscape Architecture and Environmental Sustainability: Creating Positive Change through Design. Required Reading Range. Course Reader. London ; New York: Fairchild Books, 2017.