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Restoring the Nooksack Watershed Through Community-Driven Forest Stewardship

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Restoring the Nooksack Watershed Through Community-Driven Forest Stewardship

A field project presented to the faculty of Western Washington University in partial fulfillment of the requirements for a Master's of Arts Degree in Environmental Studies

Alexander Harris

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Master's Field Project

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Introduction

Native salmon runs in the South Fork Nooksack River watershed have dramatically declined from historical levels, primarily due to the degradation of their habitat and a persistent decline in water quality and quantity. Research suggests that commercial logging—the largest land use in the watershed—has been a primary driver of these watershed impairments. Community-driven forest stewardship offers an alternative approach to forest management that can help restore watershed health while simultaneously producing high-quality wood products and supporting local jobs in the woods. Stakeholder groups have joined Whatcom County and the Nooksack Tribe to develop a community forest on Stewart Mountain, just east of Bellingham; however, it remains uncertain how the forest should be managed and which entity should eventually own the land.

This graduate research project includes an inventory of all community forests throughout the Pacific Northwest and an examination of their approaches to governance, ownership, and forest management. Three case studies were selected based on their unique approach to community forestry, and each was studied in greater detail through an extensive review of background documents and in-depth interviews with key partners involved with the projects. This research informed a series of recommendations regarding which ownership and governance models are most conducive to the proposed Stewart Mountain Community Forest (SMCF).

This report represents one of two parts associated with my graduate research project—the other being entirely focused on tribal water rights and the water rights adjudication process that has been initiated in the Nooksack watershed (see *Water Rights Adjudication in the Nooksack Watershed,* Harris 2022). The Nooksack adjudication has the potential to spur collaborative and innovative solutions—such as community forestry—that produce meaningful conservation gains for fish and greater water certainty for farmers in the years ahead. As I argue in both papers, if successfully implemented, community-driven forest stewardship in the Mt. Baker Foothills holds great potential to address many of the Nooksack basin's water challenges, while also bolstering the resilience of the watershed to future climate impacts.

I. BACKGROUND: THE NOOKSACK WATERSHED

The Nooksack River watershed covers roughly 830 square miles in northwestern Washington and southern British Columbia. The watershed comprises three major forks—the North, Middle, and South Forks—which originate in the Mount Baker Wilderness and eventually converge near Deming, WA to form the mainstem Nooksack River (see Figure 1). The South Fork Nooksack River originates on the east and west flanks of the Twin Sisters Range and drains an area slightly larger than Seattle city limits (186 square miles).

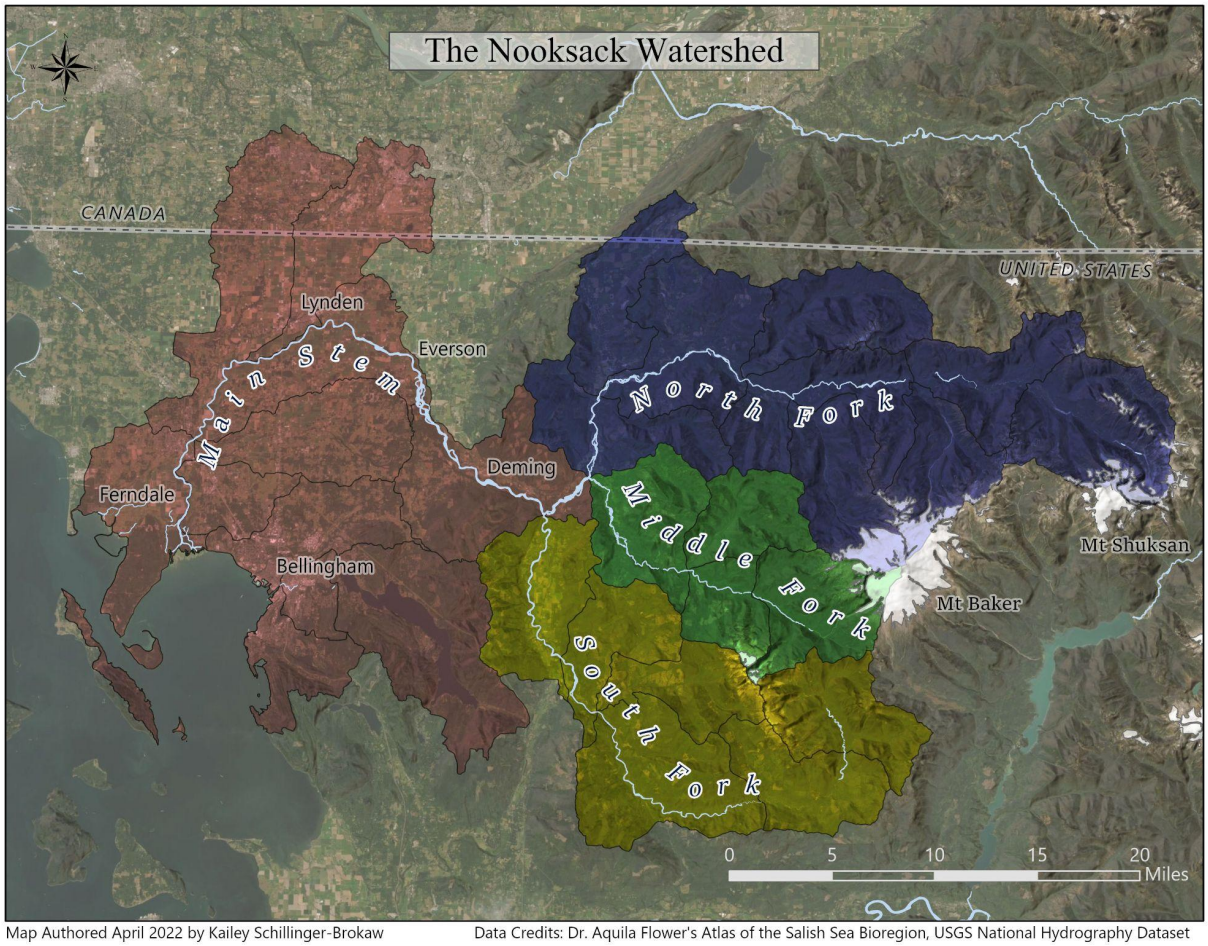


Figure 1: The Nooksack Watershed (Schillinger-Brokaw & Harris 2022).

The South Fork is generally considered the most immediately threatened by climate change because, unlike the North and Middle Forks, the South Fork is no longer fed by glaciers and currently suffers from numerous water impairments associated with land use. Hydrologic modeling

conducted by researchers at Western Washington University predicts that August flows will decrease by 57-65% by the end of the century and mean August stream temperatures will increase by roughly 5-6 degrees Celsius (Murphy 2016; Truitt 2018).

The South Fork Nooksack River is home to numerous species of anadromous salmonids, such as Chinook, coho, pink, sockeye, chum, and steelhead, as well as non-ocean-faring fish like resident coastal cutthroat trout, rainbow trout, and bull trout. Three of the South Fork's salmonid populations are currently listed as "threatened" under the federal Endangered Species Act (ESA), but perhaps the most endangered of these fish is the South Fork's spring Chinook population (WRIA 1 Salmonid Recovery Plan 2005). Today, Pacific salmon runs in the greater Puget Sound system are estimated to be less than 10% of the runs in the late 19th century (Lackey 2000). Local, state, and federal government agencies have spent billions of dollars trying to restore salmon habitat in western Washington; yet, despite these efforts, many native populations of salmon and steelhead continue to decline.

Recovering Puget Sound Chinook populations is seen as the most important strategy to stabilize Puget Sound's Southern Resident Killer Whale population. The recovery of the Nooksack River watershed's native salmonid populations is also a major priority for both the Nooksack and Lummi peoples, who have relied on these salmon runs since time immemorial. Natural resource staff with the Nooksack Tribe have stated:

> "The possible extinction of salmonids, particularly spring Chinook salmon, from the Nooksack River is unacceptable because the Tribe is dependent on these species, and being place-based, the Tribe cannot move its geographic base or homeland to where salmon will be located under future climatic conditions" (Grah & Beaulieu 2013).

The primary reason for salmon and steelhead declines in the South Fork watershed is the loss of suitable habitat and the decline in water quality and quantity (Environmental Protection Agency 2016). The South Fork violates water quality standards established by the Environmental Protection Agency (EPA) and is currently listed under section 303d of the Clean Water Act (CWA) for excessive temperature and elevated turbidity levels (WA Department of Ecology). The South Fork also violates

CWA standards for having too little water during the summer months, which further exacerbates turbidity and temperature impairments.

Water levels in the Nooksack watershed have continually declined in recent decades. Over the past half-century, the stream gauge near the Nooksack River delta has reported an average decline in summer streamflows of about 0.5% annually. Concerningly, the rate of decline has accelerated in the past decade, with summer streamflows now dropping by an average of 3% annually (Hirst 2020). Hydrographs clearly show that the Nooksack watershed as a whole—and the South Fork watershed in particular—now experience greater peak flow events during winter months and diminished streamflows during summer months compared to historical conditions.

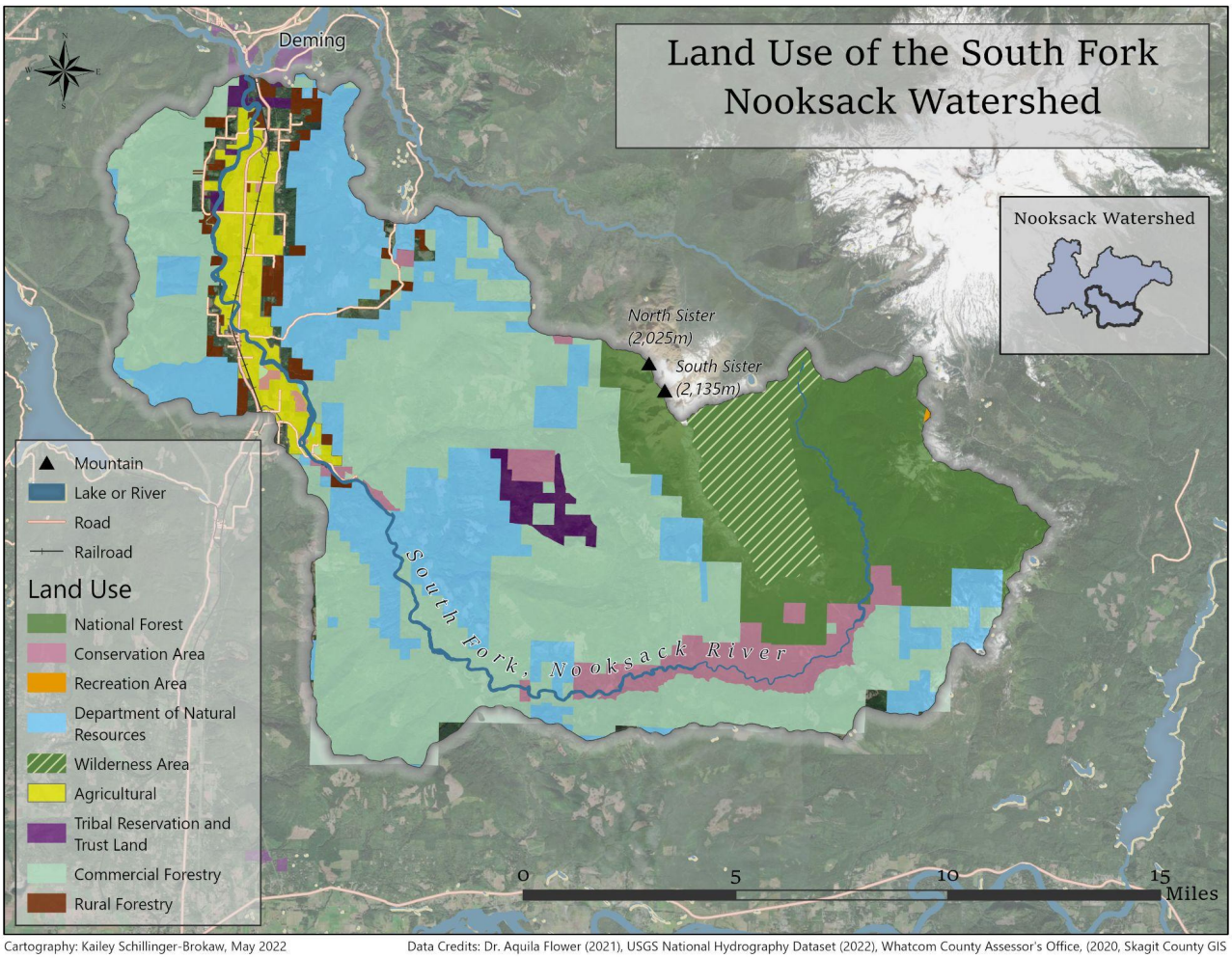


Figure 2: Land use of the South Fork watershed (Schillinger-Brokaw & Harris 2022). Timber companies and DNR own and manage roughly 63% of the watershed by area.

Commercial forestry is the dominant land-use in the upper South Fork watershed, whereas the lower watershed comprises a mix of agricultural land use and commercial forestland. Over the past century, logging companies have converted most of the South Fork watershed into young, even-aged Douglas-fir plantations. This approach—known as "industrial forestry" or "clearcut-plantation forestry"—generally entails clearcutting on short, 40-year rotations, and replanting uniform, single-species plantations. The two largest landowners in the United States, Sierra Pacific Industries and Weyerhaeuser Company, are also the two largest private landowners in the South Fork watershed. These timber corporations—along with the other major landowner, the WA Department of Natural Resources (DNR)—manage forests within the watershed industrially by clearcutting even-aged, single-species tree plantations on short, 40-50 year rotations.

II. HYDROLOGIC IMPACTS OF INDUSTRIAL FORESTRY

The scientific literature has identified a clear and persistent correlation between watershed impairments and industrial forest practices. According to numerous scientific analyses, industrial forest practices in the South Fork watershed have contributed to various water quality impairments that adversely impact native salmonid populations (Department of Ecology 2020; Nooksack Indian Tribe 2018; Nooksack Indian Tribe 2017; Washington State Conservation Commission 2002; EPA 2016). The South Fork is already listed as an impaired water body under the CWA for excessive sediment levels (i.e. "turbidity") and elevated temperatures, both of which will get worse as climate change reduces snowpack and increases peak flow events (Climate Impacts Group, University of Washington 2015). While a wide variety of land uses have contributed to these impacts, researchers have concluded that commercial forestry—the dominant land use in the South Fork basin—is likely the primary driver of watershed impairments in the watershed (Department of Ecology, SFNR Temperature TMDL 2020; Environmental Protection Agency, SFNR Climate TMDL Pilot 2017).

Industrial Forestry and Peak Flows

Throughout the past half-century, the scientific community has developed an impressive collection of research that documents how industrial forest practices elevate peak flows. A science synthesis produced by Dr. Gordon E. Grant and his colleagues at the US Forest Service Pacific Northwest Research Station provides perhaps the most comprehensive compendium of how industrial logging practices contribute to hydrologic impairments in the Pacific Northwest (Grant et al. 2008). The synthesis surveys over 100 peer-reviewed scientific studies spanning the last five decades and identifies a *direct correlation between clearcut logging and increases in peak flows.* Peak flows—a term to describe the maximum rate of water discharge in rivers and streams during storms—are associated with landslides, mass wasting, streambed scour, and other forms of erosion that detrimentally affect fish.

By causing water to move faster through the hydrologic system, industrial logging practices not only contribute to increased turbidity and erosion, but can also lead to modifications in stream channel morphology. Increased peak flows can contribute to channel incision, leading to less sinuosity, less channel complexity, and disconnection from the channel's historic floodplain (Nooksack Indian Tribe 2017). Additionally, increases in peak flows can endanger human communities downstream by elevating the risks of floods and landslides.

One study published in 1996 reviewed several decades of streamflow data on adjacent logged and adjacent unlogged basins (Jones and Grant 1996). The researchers found that smaller basins where road building and clearcut logging took place produced peak flows roughly 50% higher than reference basins of the same size, and larger basins produced roughly 100% higher peak flows than unlogged reference basins. The scientists found that road density was especially relevant to these logging-related increases in peak flows, due to the ability of roads to intercept subsurface flows and channelize water into streams via ditches and culverts.

One study compiled 45 years of data in the Carnation Creek Study Area, a long-term ecological research site on Vancouver Island, to draw conclusions about the effects industrial logging

can have on salmon populations (Tschaplinski & Pike 2016). The Carnation Creek Study involved a clear "before-and-after" approach to forestry research, where a basin was studied for years before an extensive harvest operation was initiated. According to the researchers:

> Forty-five years of research on Carnation Creek coho salmon have revealed two principal pathways of forestry-related effects on that species. First, shifts were observed in the stream thermal environment, which occurred immediately and which persist today. Second, changes in stream morphology and physical habitats first observed 2–3 years after riparian harvest progressed slowly over nearly three decades to accelerate and peak only recently.

The Carnation Creek Study showed how clearcut logging and associated road building can contribute to legacy impacts that alter stream channel morphology and increase temperatures over long periods of time. Perhaps most importantly, the results of this study show that "forestry-related alterations may take decades to fully develop and persist for decades longer without watershed and stream channel restoration" (Tschaplinski & Pike 2016).

Industrial Forestry and Summer Streamflows

Recent advancements in water quality monitoring and hydrologic modeling have given scientists an enhanced understanding of how forest conditions affect summer streamflows. Among these advancements is a new eco-hydrologic model known as VELMA, which allows watershed planners to plug in data associated with streamflow, forest condition, topography, and other variables to ascertain the impact that forest management has on streamflow levels in any given basin. Recently, the Nooksack Tribe hired Natural Systems Design (NSD) to conduct VELMA modeling in the South Fork watershed. NSD's April 2022 report found that intensive logging activities likely contribute to diminished summer streamflows in the South Fork Nooksack River, and that additional water could be made available in late summer if forest management practices were improved (Dickerson-Lange 2022).

The VELMA model has been corroborated by numerous scientific studies conducted in recent years in westside forests of the Pacific Northwest. Recently, researchers at Oregon State

University published a study that drew conclusions about the role forest management plays in streamflow levels in summer months (Segura et al. 2020). Dr. Catalina Segura and her colleagues analyzed 60 years of data collected on paired stream basins in the Alsea watershed, located in Oregon's Coast Range. Some basins were logged according to the rules laid out by Oregon's current forestry regulations, while others were allowed to mature to over 100 years of age. The researchers found that streams in logged basins produced 50% less water during summer months than streams in unlogged basins. These streamflow deficits persisted for more than half of the year, being most pronounced in late summer. The researchers suggest that the high evapotranspiration rate of young Douglas-fir plantations is the primary cause of this deficit. In other words, younger trees use water less efficiently than older forests, which means young timber plantations draw more water out of the system and release it to the atmosphere, thereby contributing to less water flowing in streams and rivers.

Another related study conducted by Dr Julia Jones and her colleague Timothy Perry studied data collected in eight paired basins over six decades to inquire into the streamflow consequences of industrial forest practices (Perry & Jones 2017). The researchers studied forestlands that were set aside over 70 years ago for the purpose of research located within the H.J. Andrews Experimental Forest (east of Eugene, Oregon) and the South Umpqua Experimental Forest (east of Roseburg, Oregon). Half of the basins studied were clearcut according to current legal standards, while the others were left standing.

The research produced a clear and powerful conclusion that Douglas-fir plantations diminish summer streamflow by 50%, a finding corroborated by Segura et al. 2020. Perhaps more importantly, these streamflow deficits caused by industrial logging practices lasted for long periods of time. According to the six decades of data, low flows in clearcut-and-replanted basins persisted and intensified for over a half-century after the initial harvest of the basin. This means that clearcutting today will produce diminished water levels well into the late 21st century. Scientists predict that climate change will dramatically alter hydrologic systems and lead to a water shortage crisis in

the Pacific Northwest during the latter half of this century (Climate Impacts Group, University of Washington 2015).

While these studies were conducted in Oregon, the findings linking tree plantations to diminished summer streamflows are highly applicable to Washington's westside forests (Frissell 2017). These studies have important implications for forest management in Washington because they suggest that industrial forest practices—especially when conducted on a watershed-scale—can greatly diminish water quantity in the summer months when farmers and salmon need it most. This science will also likely play a key role in the development of community forests, especially as climate change and population increases contribute to water shortages during summer months.

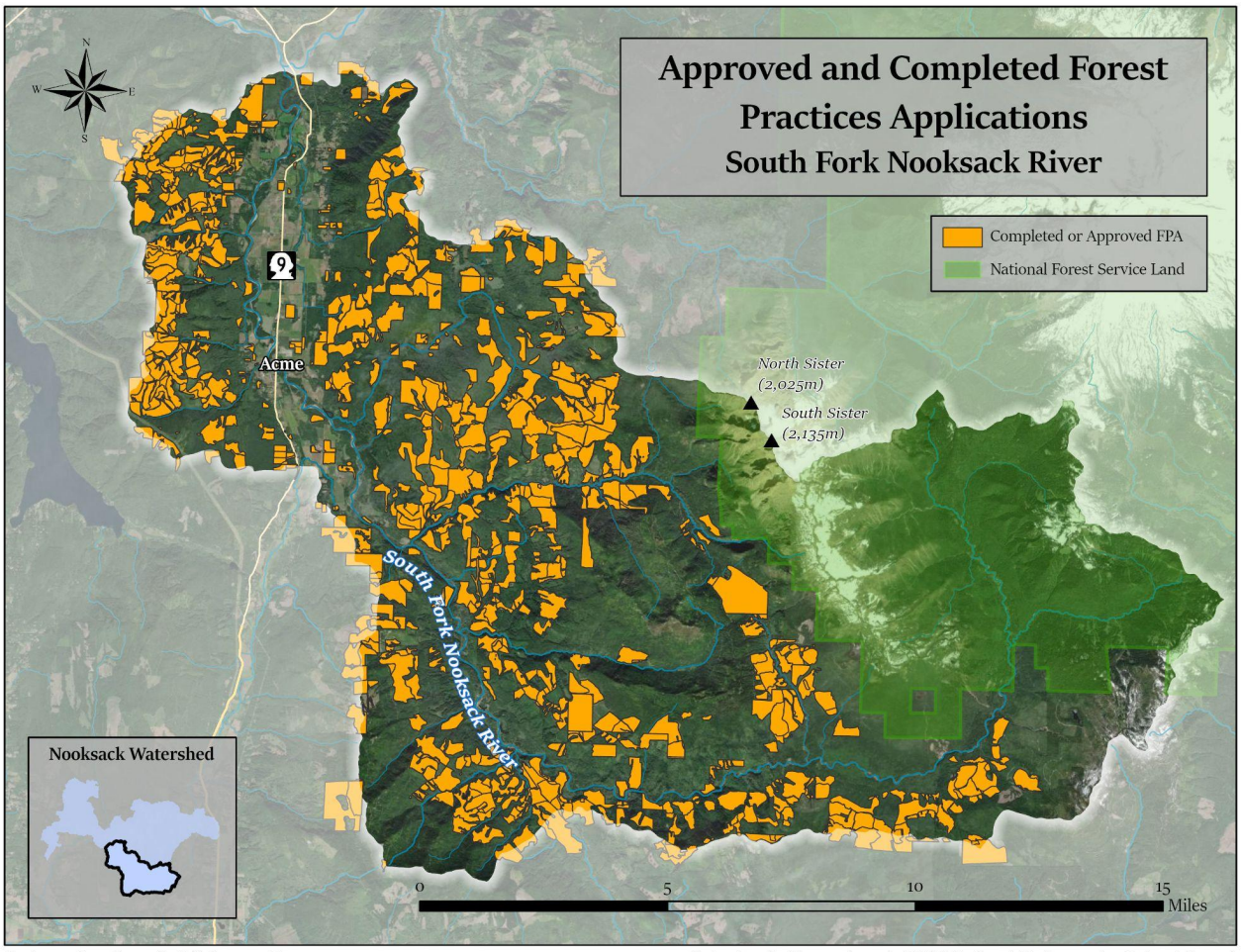


Figure 3: Approved & Completed Forest Practices Applications in the South Fork watershed 1997-2022 (Rothlisberger & Harris 2022). FPAs are required for all timber sales and associated logging activities under Washington's forest practices rules. Data provided by DNR.

Unfortunately, researchers are unable to fully disentangle legacy impacts associated with past logging activities from on-going impacts associated with current logging activities. Roughly 20 years ago, Washington forest practices rules were greatly improved when the Forests & Fish reforms increased stream buffers and strengthened road maintenance and abandonment standards for private and state logging operators (Forest & Fish Report 1999). Many contend that contemporary forest practices do not contribute to the water quality and quantity impairments listed above, while others argue that the Forests & Fish reforms did little to address cumulative impacts on watersheds. The truth lies somewhere in-between, but fully disentangling these effects is effectively impossible.

III. COMMUNITY FORESTRY

Ecological Forestry: An Alternative Approach to Forest Management

Despite the wealth of scientific research about the hydrological consequences of industrial logging, forest practices are largely exempt from numerous regulatory programs seeking to address cumulative impacts from non-point pollution sources (e.g. Ecology's TMDL process that exempts forest practices through the Clean Water Act Assurances). Just as an individual natural gas power plant does not "cause" climate change, an individual clearcut does not single-handedly destroy salmonid habitat. Only when industrial forest practices are applied at a vast spatial and temporal scales are the cumulative impacts from clearcuts, plantations, and road networks great enough to increase temperatures, elevate turbidity levels, and decrease summer streamflows. The cumulative nature of these impairments has proven impossible for regulatory agencies to address effectively. Therefore, it is imperative to explore alternative approaches to forest conservation that do not involve changing forest practices regulations.

Ecological forest management offers such an alternative. Ecological forestry is a general term to describe silvicultural techniques that emphasize the diversity of species, tree ages, and forest structures, while promoting ecosystem integrity and resilience. Ecological forestry is also a

silvicultural philosophy that recognizes forests as complex ecosystems capable of producing a wide range of benefits, which differs from the industrial forest management model that agronomically manages forests as collections of trees to be logged for maximum profit potential (Franklin et al. 2018). A key component of the ecological forestry approach is to balance numerous values and uses rather than pursuing a single objective (e.g. presevertaion or return on investment).

Generally, ecological foresters adopt an "uneven-aged" approach to forestry, which involves thinning at various intensities to produce wood products and enhance forest characteristics that are typically associated with natural ecosystems. Selective silviculture is an art and a science because it requires skillful consideration of what is harvested and what is left behind. Thinning can include a broad spectrum of forestry treatments, such as thinning from below (harvesting smaller understory trees and leaving large dominant trees) or thinning from above (harvesting larger trees that are more commercially viable and leaving smaller trees).

Ecological foresters commonly utilize an approach known as "variable density thinning" (VDT), which involves thinning at various intensities across different stands to leave behind a mosaic of unthinned, moderately thinned, and heavily thinned patches. VDT can sometimes include small gap cutting, which is the practice of clearing up to ~5 acres to add to structural complexity and provide early seral habitat for wildlife. Another common practice among practitioners of ecological forests is to conduct pre-commercial thinning in dense plantations, which involves culling small trees to improve forest health and "release" the more dominant trees, thereby reducing competition and accelerating forest growth. By mimicking natural disturbances, this approach can increase the structural complexity, age distribution, and species make up in forest stands, which provides habitat for a wide range of wildlife species and enhances the overall resilience of the ecosystem to withstand future climate impacts.

Numerous analyses suggest that adopting this approach to forest stewardship in the Mt Baker Foothills can improve water quality (turbidity and temperature), increase summer stream flows, and restore habitat conditions essential to recovering endangered salmonid populations. For

example, a 2017 report by Dr Susan Dickerson-Lange suggests that short-rotation, even-aged forestry in the Mt Baker Foothills is currently contributing to a wide variety of impairments in the South Fork watershed, such as excessive temperatures, elevated turbidity levels, and diminished summer streamflow (Dickerson-Lange 2017). Dickerson-Lange's report also highlights the projected hydrologic impacts of a warming climate, such as frequent landslide events, more extreme peak flow events, warmer water temperatures, and less water in late summer. Perhaps most importantly, the report provides recommendations for how the Nooksack Tribe and other stakeholders can address these impairments by advancing alternative approaches to forest stewardship. Among these recommendations is to advance an uneven-aged, selective thinning approach to forestry in the South Fork Nooksack River watershed, which can help mitigate watershed impairments and future weather extremes by increasing summer streamflows, reducing peak flow events, and restoring key hydrologic functions in the watershed.

Another resource that describes the importance of this approach in the South Fork watershed is *South Fork Nooksack Watershed Conservation Plan*, which the Nooksack Tribe finalized in 2018. The plan was borne out of four years of extensive engagement with community members and key stakeholders in the South Fork watershed. The plan provides a comprehensive overview of the current hydrologic and ecological conditions of the South Fork watershed, as well as the historic "baseline" conditions. The plan also provides a list of recommendations to help restore the hydrologic and ecological functions that salmon and other native species depend on for survival. One of the plan's recommendations is to promote community forestry in the Mt Baker Foothills to address the cumulative impacts associated with on-going commercial forest operations.

A Definition of Community Forestry

Community forestry is an increasingly common vehicle to apply ecological forestry at scale and enhance numerous forest benefits. While there is no single definition of a community forest, most examples are owned by a local government, tribe, or community-based organization and

managed to produce multiple benefits for the local community in perpetuity (Trust for Public Land 2021). Additionally, most community forests include pathways for the community to participate in the decision-making processes regarding how the forest is managed. No two community forests are identical, largely because the objectives of a community forest are largely reflective of community values, which vary widely from community to community.

Notably, most community forests are not parks or reserves; rather, most community forests are working forests that continue to be logged for wood products. That being the case, most community forests adopt a lighter approach to timber harvesting than conventional logging operations, especially since intensive timber production can undermine many of the community and ecological benefits that forests provide.

The academic literature on community forest development is still nascent, but the field is growing rapidly. A crucial resource for understanding the state of the community forest movement in the region is the 2017 article, *Enabling Conditions and Barriers to Community Forest Development in the Pacific Northwest* (Urgenson et al. 2017). This report includes technical analysis of the different models available for community forestry and provides detailed case examples of 12 community forests throughout the region that have successfully implemented their projects. The report considers the diverse methods that were used to fund the acquisitions of these properties, and also provides a synopsis of the various governance structures used by these community forests. The last section of the report analyzes the different forest management approaches used in these study-forests and explores the pros and cons of each approach.

Other community forestry resources include:

- Northwest Community Forest Coalition
- The Community Forest Handbook (NWCFC 2018)
- Funding and Financing for Community-Owned Forests (NWCFC & Sustainable NW 2018)
- Economic Impacts of the Mt. Adams Community Forest, 2014-2017 (DNR 2018)
- Community Forests: A path to prosperity and connection (Trust for Public Land 2021)
- Community Forest Governance Matrix (Sustainable Northwest 2017)

Stewart Mountain Community Forest

Currently, Whatcom County is working with the Nooksack Indian Tribe, Whatcom Land Trust, and Evergreen Land Trust to develop a community forest on Stewart Mountain, located in the South Fork Nooksack River valley. While significant progress has been made in recent years, the Stewart Mountain partners remain uncertain about which model of community forestry is most appropriate for the proposed Stewart Mountain Community Forest (SMCF). My graduate research seeks to aid this inquiry by studying the various ownership models, governance structures, and approaches to forest management that other community forests have adopted—with the ultimate intention of providing Stewart Mountain partners with a series of recommendations about which approach is most conducive to the stated goals of the SMCF.

The proposed Stewart Mountain Community Forest is a collaborative stewardship effort to adopt ~6,000 acres of commercial forestland to be managed as a "working forest" that balances a wide variety of ecological, economic, and community benefits. All forest management activities within the SMCF will be guided by numerous objectives, but chief among these is to enhance watershed health and recover native salmonid populations in the South Fork watershed through improved forest management practices. Achieving this objective requires adopting a long-term commitment to forest stewardship, which is at the heart of the community forest model.

The SMCF will also be managed to achieve other objectives, such as sustaining local employment opportunities throughout the forestry sector. The SMCF will utilize ecological forestry techniques that emphasize the diversity of species, tree ages, and forest structures while producing a consistent supply of wood products in perpetuity. These silvicultural strategies are inherently labor-intensive because foresters need to make informed decisions on how to meet economic objectives while promoting ecological goals.

Another goal is to expand public access to Stewart Mountain for recreational opportunities as well as cultural access for local tribal members. The property provides numerous access points to the South Fork Nooksack River itself, as well as dozens of waterfalls and exceptional views of the

Twin Sisters and Mt Baker throughout the property—making it an ideal location to hike, mountain bike, birdwatch, and ride horses. Stewart Mountain partners have committed to incorporate input from local community members and key stakeholders regarding how the property is managed and how its different uses will be balanced. Towards that end, the Stewart Mountain partners convened an Interim Community Advisory Team (I-CAT) in May of 2022, which consists of 16 community members representing various stakeholder groups and community interests. More information about the SMCF can be found here: www.stewartmountaincf.org

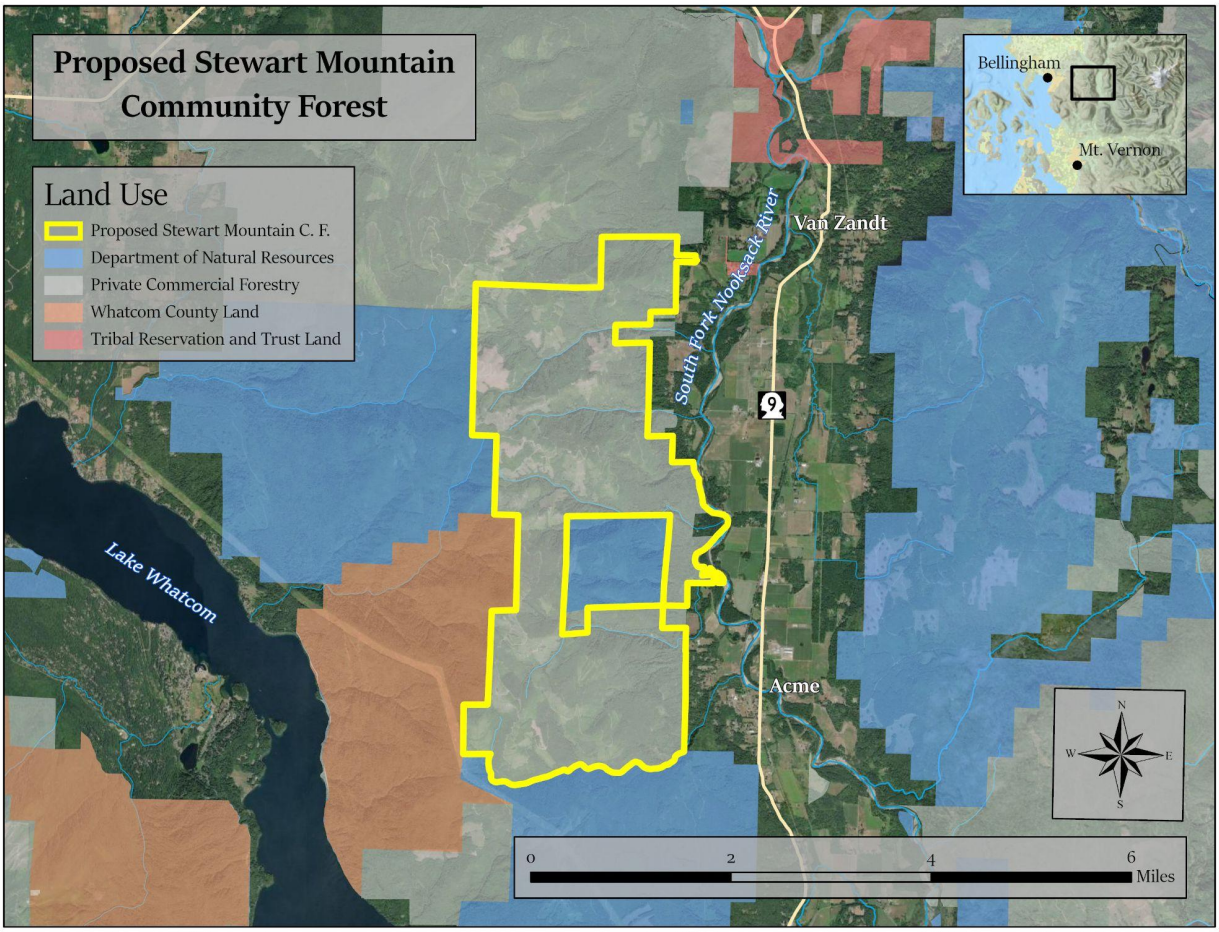


Figure 4: The proposed SMCF (Rothlisberger & Harris 2022). Notice that Whatcom County and DNR are neighboring landowners. Two of the three case studies explored below involve county and DNR ownership.

Community Forestry in the Pacific Northwest

In recent years, community forests have proliferated throughout the Pacific Northwest, advanced by diverse stakeholders to achieve a wide range of objectives. These community forests offer various models for how to collaboratively achieve social, economic, and ecological goals, but some models are more relevant to western Washington than others. To better understand the lay of the land, I conducted an inventory of all community forests in the greater Pacific Northwest region (see Figures 5, 6, and 7). The question of what counts as a community forest and what does not is actively debated in the conservation community—with some contending that only working forests should be included in the definition. To determine the scope of my inventory, I only included community forests if they had "community forest" in their name or if they were locally-owned working forests managed for multiple benefits on the community's behalf.

In all, there are roughly 20 active community forests in the Pacific Northwest, most of which are in the State of Washington. These community forests are owned by a variety of different entities, such as cities, counties, state agencies, tribes, and non-profits. Several community forests listed below in Figures 5, 6, and 7 are not working forests and instead prioritize conservation, recreation, and community education; however, most of the community forests listed include at least some forest management. I identified at least 16 *proposed* community forests still in development, some of which are closer to becoming a reality than others.

I did not include municipal forests that served only as drinking watersheds, although many of these forests exist. Properties like the Cedar River watershed (Seattle's drinking water source) and the Bull Run watershed (Portland's drinking water source) are managed for local benefit; however, these are not working forests and there is little to no public access to these forested properties; therefore, I decided to omit them from my inventory.

COMMUNITY FORESTS OF THE PACIFIC NORTHWEST

NAME	STATE	ACRES	OWNER	COORDINATES
Anacortes Community Forest Lands	WA	2,950	City of Anacortes	48.464705, -122.620343
Canyon Lake Community Forest	WA	2,300	Whatcom County + WWU	48.825738, -122.051205
Chimacum Ridge Community Forest	WA	853	EFM (Jefferson Land Trust may soon adopt the CRCF)	47.980838, -122.76058
Chuckanut Community Forest	WA	82	City of Bellingham	48.709422, -122.493125
Indian Creek Community Forest	WA	350	Kalispel Tribe	48.249995, -117.148627
Klickitat Canyon Community Forest	WA	2,405	DNR	46.033048, -121.177522
Montesano Municipal Forest	WA	4,938	City of Montesano	47.01854, -123.580423
Mt Adams Community Forest	WA	965	Mt Adams Resource Stewards	45.970111, -121.35859
Nason Ridge Community Forest	WA	3,714	Chelan County	47.785465, -120.748927
Nisqually Community Forest	WA	2,880	Nisqually Community Forest	46.790064, -122.012676
Stemilt-Squilchuk Community Forest	WA	3,388	Chelan County	47.28628, -120.31807
Teanaway Community Forest	WA	50,241	DNR	47.286329, -120.879728
Trillium Community Forest	WA	721	Whidbey Camano Land Trust	48.040494, -122.577938
Bear Ridge Community Forest	WA	*Proposed*	*Proposed*	46.315867, -123.915433
Chewelah Community Forest	WA	*Proposed*	*Proposed*	48.327057, -117.760913
Clallam County Community Forest	WA	*Proposed*	*Proposed*	
Cle Elum Ridge Community Forest	WA	*Proposed*	*Proposed*	47.259444, -121.03183
Dishman Hills Community Forest	WA	*Proposed*	*Proposed*	47.573687, -117.287973

Fry Creek Community Watershed	WA	*Proposed*	*Proposed*	46.99812, -123.84354
Gold Hill Community Forest	WA	*Proposed*	*Proposed*	48.328455, -117.760082
Hoquiam Community Forest	WA	*Proposed*	*Proposed*	46.985702, -123.916497
Illahee Preserve Community Forest	WA	*Proposed*	*Proposed*	47.60339, -122.610368
Newberry Woods Community Forest	WA	*Proposed*	*Proposed*	47.645924, -122.753101
North Kitsap Divide Community Forest	WA	*Proposed*	*Proposed*	47.78788, -122.571223
Olympic Community Forest	WA	*Proposed*	*Proposed*	
Simcoe Mountains Community Forest	WA	*Proposed*	*Proposed*	45.947065, -120.553123
South Silver Lake Community Forest	WA	*Proposed*	*Proposed*	
Stewart Mountain Community Forest	WA	*Proposed*	*Proposed*	48.749755, -122.232303
Butte Falls Community Forest	OR	430	City of Butte Falls	42.546618, -122.568389
East Moraine Community Forest	OR	1,791	Wallowa County	45.306335, -117.195348
Hood River County Forest	OR	31,000	Hood River County	45.638095, -121.654733
Mt. Emily Recreation Area	OR	3,669	Union County	45.394933, -118.111703
Arch Cape Forest	OR	*Proposed*	*Proposed*	45.811867, -123.935885
Post Falls Community Forest	ID	518	City of Post Falls	47.70156, -116.969454
Blackfoot Community Conservation Area	MT	5,600	Blackfoot Challenge	47.068611, -113.113823
Arcata Community Forest	CA	2,300	City of Arcata	40.874099, -124.067108

Figure 5: Inventory of all community forests in Washington, Oregon, Idaho, western Montana, and Northern California (Harris 2022).

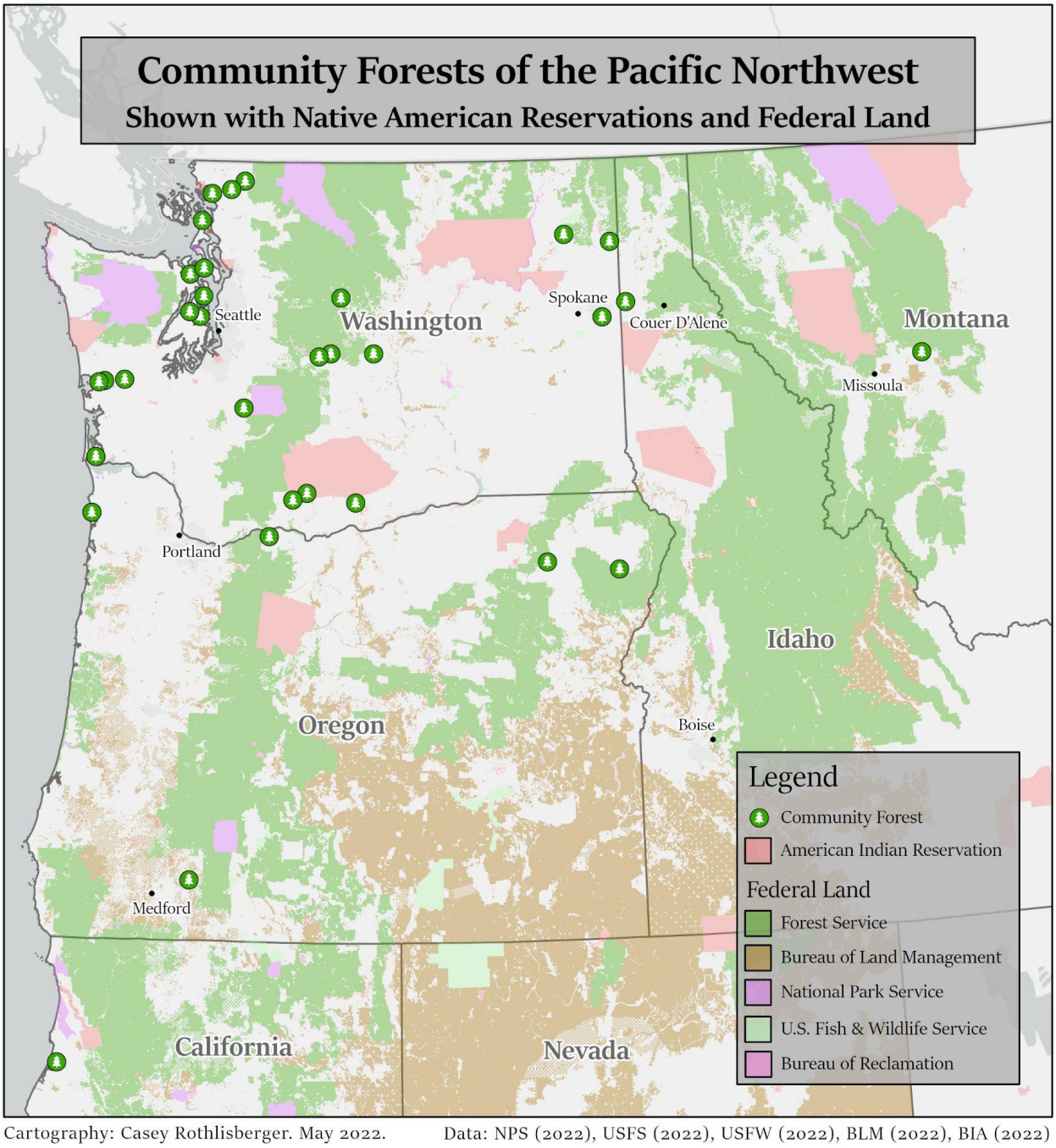


Figure 6: Community Forests of the PNW (Rothlisberger & Harris 2022). Note: proposed community forests are excluded from this map.

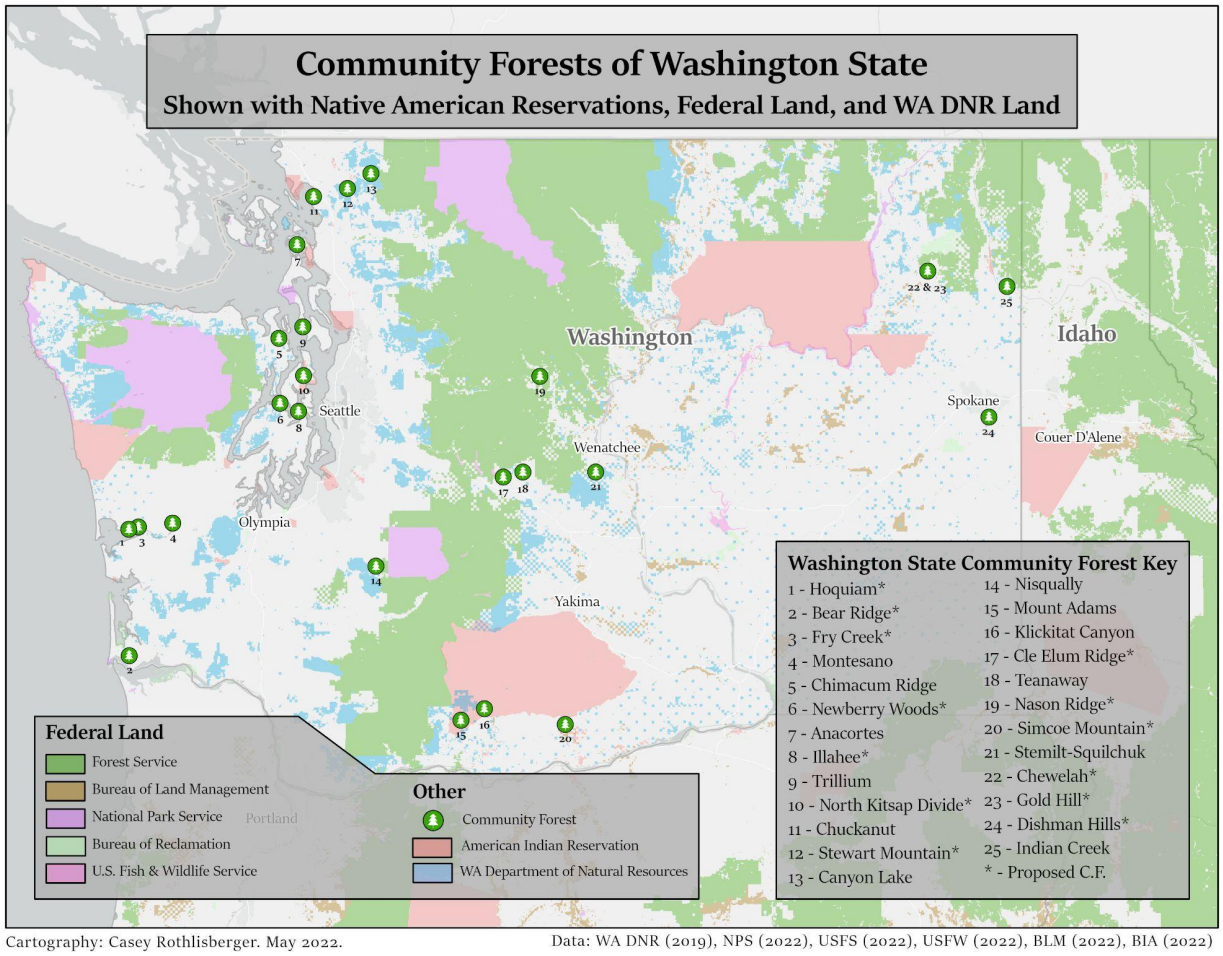


Figure 7: Community Forests of Washington (Rothlisberger & Harris 2022).

Once I completed an inventory of all community forests throughout the region, I identified three case studies to study in greater detail. Each of the case studies listed below has a different ownership model, and each has adopted a unique suite of management objectives (see Appendix A: Case Study Table). The three case studies I chose were:

1. **Nisqually Community Forest**
   - Owned by a non-profit with the same name
2. **Teanaway Community Forest**
   - Owned by the WA Department of Natural Resources
3. **Nason Ridge Community Forest**
   - Owned by Chelan County

IV. NISQUALLY COMMUNITY FOREST

Introduction

The Nisqually Community Forest (NCF) spans 2,880 acres of high-elevation forestland in the Mount Rainier Foothills. The NCF is actively managed to restore watershed health and protect recreational access while simultaneously producing high-quality wood products and supporting local jobs. The NCF is perhaps the most sophisticated of its kind in the northwest due to its innovative approach to acquiring land, monetizing carbon, partnering with the Nisqually Indian Tribe, and applying ecological forestry at scale. The Nisqually Community Forest has also worked with researchers to conduct hydrologic modeling that demonstrates how their approach to ecological forest management practices can increase late summer streamflows in the upper Nisqually River watershed. The NCF takes a restorative approach to forest management and applies a unique selective harvesting regime across a sizable acreage. This community forest provides a compelling model for how communities throughout western Washington can take local control of commercial forestland to restore watershed health, recover salmon runs, and produce wood products in perpetuity.

History

The Nisqually Community Forest was first envisioned over a decade ago when members of the Nisqually Land Trust began learning more about the robust tradition of community forestry in the Northeast United States. New England boasts dozens of community forests of all types, however, in the West, working forests that are locally-owned and managed for multiple benefits are somewhat rare. Nisqually Land Trust became interested in this model and initiated efforts to acquire commercial forestland to be actively managed for watershed and community benefits.

A primary impetus of the project was the continued decline of the Nisqually River's steelhead runs, which have historically played an important role to tribal, commercial, and

recreational fishermen. In the late 1990s, Nisqually steelhead numbers dwindled to all-time lows, spurring significant restoration efforts to restore fish habitat and improve water quality. The Nisqually River Delta is the largest undeveloped delta in Puget Sound, and currently over three-quarters of riparian forests in the anadromous zone are permanently conserved (Native Fish Society 2022). Since 1982, the Nisqually has been closed to hatchery steelhead in order to help recover native stocks, and in 2016 the Washington Department of Fish & Wildlife designated the Nisqually watershed as a "Wild Steelhead Gene Bank" due to the importance of Nisqually steelhead to the overall recovery of Puget Sound steelhead.

Despite some progress on fish recovery, the future of the Nisqually watershed's steelhead and salmon runs remains uncertain. Numerous reaches of the Nisqually watershed violate water quality standards established by the Environmental Protection Agency (EPA) and are currently listed under section 303d of the Clean Water Act (CWA) for excessive temperatures (WA Department of Ecology 2022). Additionally, climate projections for warmer temperatures and lower summer streamflows will likely only exacerbate these impairments.

The Mashel River is the principal tributary to the Nisqually River and a primary migration route for salmon and steelhead into the upper Nisqually watershed. The Mashel and its headwaters are federally-designated critical habitat for steelhead trout, but this designation has no bearing on private landowners. Streamflows are excessively low in the summer (average of 6 cubic feet per second, or cfs) and stream temperatures have become dangerously warm in recent decades. A potential contributor to these impairments is the extensive logging activity that covers the vast majority of the Mashel watershed. Intensive forest practices involving short harvest rotations, even-aged tree plantations, and extensive road building are known to contribute to increases in turbidity, peak flows, and stream temperatures, as well as other adverse hydrologic impacts.

According to the respondents I interviewed, a primary impetus for the Nisqually Community Forest was the need to restore the Nisqually watershed after decades of intensive forest practices. One respondent said, "The Mashel watershed was harvested river to ridge." Respondents

described a long history of logging-related slope failures in the Mashel watershed that contributed to elevated turbidity and the destruction of downstream fish habitat. Eventually, NCF partners decided it was time to take action.

In the late 2000s, the Nisqually Land Trust convened a partnership with the Nisqually Indian Tribe, Nisqually River Foundation, and Northwest Natural Resources Group to explore opportunities for improved forest management in the uplands of the Nisqually watershed. In 2011, these partners were awarded a planning grant by the National Park Service (NPS), which included technical assistance from an NPS community planner. With the help of NPS, the Nisqually partners convened the "Nisqually Stakeholder Group," an advisory committee made up of 26 individuals representing different interest groups in the watershed, each with a "specialized subject-matter expertise." This stakeholder group met for over two years before producing a summary report in 2013, which outlined how a "Nisqually Community Forest" should be owned and managed. The summary report described a vision for adopting 20,000 to 30,000 acres into local ownership to be managed for wood production, forestry jobs, recreation, education, wildlife habitat, and watershed recovery.

In 2014, Nisqually Land Trust, Nisqually Tribe, Nisqually River Foundation, and Northwest Natural Resource Group formed a non-profit based on stakeholder input, which became known as the "Nisqually Community Forest" (details about this non-profit below). In the years that followed, the NCF conducted four transactions with Hancock Timber Resource Group to acquire a total of 2,880 acres. Here is a breakdown of these transactions:

- 2016: NCF acquires 640 acres
- 2017: NCF acquires an additional 640 acres adjacent to first parcel
- 2018: NCF acquires 640 more acres, also contiguous with the other parcels.
- 2021: NCF acquires 960 acres adjacent to its other holdings.

This fourth transaction was unique because it happened in conjunction with another transaction between Hancock and the Nisqually Indian Tribe for 1,200 acres. In April 2020, the

tribe was awarded a low-interest loan for $14 million via the EPA's Clean Water State Revolving Fund, which is administered by the Department of Ecology. The Clean Water State Revolving Fund provides governmental entities with permanent, low-cost loans that can be used for acquiring land for water quality purposes. The tribe used ~$6 million of their Clean Water Revolving Loan to purchase the property and will soon use funds from the Washington Recreation and Conservation Office (RCO) to pay down a portion of the loan.

The tribe's 1,200 acres are not technically a part of the Nisqually Community Forest, at least not yet; however, Nisqually partners have indicated that eventually there will be a more formal relationship between the NCF and the tribe's acreage. The goal is to manage these contiguous lands with a more coherent landscape-level approach to forest restoration and sustainable timber production.

Ownership Model

After receiving feedback and input from key stakeholders in the area, the Nisqually partners began exploring different ownership options that would be conducive to the objectives that had been identified. The NCF contracted a lawyer to develop a matrix of seven ownership options spanning the spectrum from traditional 501(c)(3) non-profits to for-profit LLCs. The NCF partners determined that the best path forward was to create a "type 1 supporting organization" because this approach could balance many of the needs for the project.

This type 1 supporting organization is a wholly-owned subsidiary of the Nisqually Land Trust (NLT) with its own 501(c)(3) status and its own independent board. The NCF is an independent body that diligently keeps a clear separation from the NLT to ensure that a liability wall protects the land trust from potential legal risks. Per IRS requirements, the land trust reserves one point of control over the NCF: NLT's Board of Directors appoint and dismiss members of the NCF Board of Directors, and a seat on the NCF board is reserved for an NLT staff person or board member. One advantage of this approach is that the NCF continues its close affiliation with the

Nisqually Land Trust, which is a known entity with years of good reputation—all while retaining a degree of independence from the land trust.

There are many other advantages to this approach, the most important of which is the ability of the NCF to retain its non-profit status while generating revenue from commercial forestry activities and non-timber forest products. By qualifying as a 501(c)(3), the NCF can apply to a whole suite of acquisition and stewardship grants that would not be available otherwise. Additionally, the particular legal structure of the non-profit does not require the NCF to receive a minimum of 33% of its revenue from public support, as is the case with most other non-profits. Since a major goal of the NCF is to produce sustainable timber products and be financially self-sustaining, this legal structure allows the NCF to generate a portion (or all) of its revenue from timber production.

This model may be attractive to Stewart Mountain partners and others in the region developing a community forest because it provides a viable pathway for the community forest to be self-sustaining over time. A consistent challenge I observed in my research across numerous community forest models is the ability to sustain the administration and management costs of a community forest once the land has been acquired. The most obvious pathway for balancing the books is sustainably producing timber products in perpetuity, as well as monetizing carbon and non-timber forest products.

This approach is theoretically feasible for most community forests. However, many CFs acquire land after most of the merchantable timber has already been harvested, which leaves a degraded timber base with limited management opportunities. This means that CFs often have to wait for 5, 10, or even 20 years before any commercial logging occurs. This creates a gap between the time the land is acquired and when timber receipts begin to arrive. Carbon offset money may provide one opportunity to fill this gap, but perhaps a more important source of funding is stewardship grants that are not available for private LLCs. Therefore, the NCF's ownership model provides a compelling template that may prove useful for other community forests.

Governance Structure

The NCF has a simple model for how decisions are made. Essentially, the NCF Board of Directors holds the ultimate decision-making authority for all acquisitions and land management activities. The board approves all contract work conducted by forest planners, loggers, and road builders and approves each action taken relating to forest management and recreation management. The Nisqually Land Trust may continue to act as a purchasing agent for the NCF, but the ultimate decision-making power lies with the NCF Board.

The board is comprised of the following individuals:

- **President:** Bryan Bowden, retired community planner, National Park Service
- **Vice President:** Justin Hall, Executive Director, Nisqually River Foundation
- **Secretary:** Kirk Hanson, Director of Forestry, Northwest Natural Resource Group
- **Treasurer:** George Walter, Environmental Program Supervisor, Nisqually Indian Tribe
- **At large:** Jeanette Dorner, Executive Director, Nisqually Land Trust
- **At large:** Paula Swedeen, Principal, Swedeen Consulting
- **At large:** Michele Buckley, Board Member, Nisqually Land Trust

Initially, NCF partners worked with the Nisqually Stakeholder Group to help develop the goals and scope of the project; however, currently there is not a formal stakeholder advisory committee that advises the ongoing activities in the NCF. The respondents I interviewed indicated that this kind of committee will likely be formed in the near future, especially now that the COVID-19 pandemic has waned. The NCF Forest Management Plan describes a process by which the NCF board will create a "Citizen Advisory Committee," which will consist of 7-11 community stakeholders who give advice and recommendations regarding forest management decisions.

According to the Forest Management Plan, additional efforts will be taken to building community buy-in, including:

- Guided tours of the NCF;
- NCF board members attending public events to represent the community forest;
- Participation in related planning projects;
- Regular educational workshops for the general public to learn more about forest management activities in the NCF;
- Engagement with elected officials about specific policies relating to community forestry.

Currently, the NCF hires a part-time consultant to handle basic administrative tasks and provide support to the NCF Board. In the coming years, the NCF hopes to hire its first dedicated staffer, who will serve as the Executive Director of the NCF non-profit. The NCF respondents I interviewed said that ideally this staffer would work on organizational development *and* forest management planning, which will minimize costs and better integrate the various components of the NCF operation.

Management and Stewardship

Northwest Natural Resource Group (NNRG) holds a master contract with the NCF to conduct forest planning and ensure the NCF's forest management objectives are achieved. Contracts for road building and logging work are set up directly between the contractor and the Nisqually Community Forest, but NNRG facilitates these relationships and oversees the implementation of management activities.

In 2019, NNRG developed the NCF Forest Management Plan, which identifies forest management objectives and provides a framework for all forestry activities. The FMP clearly defines the many problems that the NCF seeks to address, such as the uniform forest structure and species makeup of the property's tree plantations. The FMP describes many of the adverse hydrologic impacts that intensive even-aged forest management (i.e. clearcut-plantation forestry, or industrial forestry) has had on the Nisqually watershed in recent decades. The FMP says,

> The NCF's overriding conservation goal is to permanently protect and restore habitat for threatened Nisqually steelhead trout and Chinook salmon and to protect the recovery trajectory of the Mashel River sub-basin and upper Busy Wild Creek through acquisition of sensitive properties under immediate threat of clearcut logging. Acquisition of this forestland ensures that the watershed continues to recover from past forestry practices. It will protect a portion of the watershed critical for sediment-supply processes from intensive logging that could result in devastating erosion, and it will provide future opportunities for active forestland restoration, including road abandonment and riparian enhancement.

The NCF seeks to restore watershed health through the broadscale application of uneven-aged forestry, which can include a wide spectrum of silvicultural treatments, such as:

- **Regular pre-commercial thinning:** culling small trees to improve forest health and accelerate the growth of more dominant trees;
- **Thinning from below:** harvesting smaller understory trees and leaving large dominant trees;
- **Thinning from above:** harvesting larger trees that are more commercially viable and leaving smaller trees;
- **Variable density thinning:** varying the thinning intensity across various stands to leave behind a mosaic of unthinned, moderately thinned, and heavily thinned patches.
- **Small gap cutting:** clearing a ~5-acre area to add to structural complexity and provide early seral habitat for wildlife.

The NCF FMP describes many of the benefits that uneven-aged forest management can bring to the property. For example, the FMP outlines how enhancing the structural complexity and biological diversity of the NCF property will enhance the forest's resilience to future climatic variation. Uneven-aged management produces many hydrologic benefits compared to the industrial model, such as slope stabilization, decreased peak flows, and increased summer streamflows.

Another benefit will be continued employment opportunities in the local forestry sector. Selective-based silviculture requires frequent entry into the forest to pre-commercially thin or commercially thin, and therefore this approach will help promote jobs in the woods in perpetuity.

Of course, an additional benefit of uneven-aged management is the improved recreational experiences made possible by more diverse forests.

A key component of the NCF FMP is to increase buffers around sensitive sites (e.g. steep slopes) and riparian areas. Additionally, the FMP makes clear that certain areas with ecological value—such as mature, unplanted forests—will be conserved for wildlife and watershed benefits. The FMP separates the NCF property into three different management long-term pathways, each with its own management objectives:

1. **Late seral**: management in these areas is focused on promoting the development of late seral forest function and structure. These areas include steep slopes, riparian areas, and other sensitive sites that are not well suited to commercial forestry.
2. **Diversity**: management of these stands will emphasize the development of late seral forest function through the application of periodic thinnings.
3. **Working forest**: managed in these forests will prioritize sustained timber production through the application of ecological forestry techniques described above (uneven-aged management). These areas are generally located on modest slopes away from streams, and where there is road access.

The FMP also includes a wide range of other helpful information, such as:

- Property description (species, topography, land-use history, surrounding area, etc)
- Natural resource analysis (soils, hydrology, fish ecology, wildlife habitat)
- Forest inventory
- Desired future condition
- Road maintenance

Unlike many other community forests, the NCF has been able to initiate its sustainable logging program in its first years of operation because the timber base included merchantable timber upon acquisition. According to the respondents interviewed, the NCF has generated significant revenue from its selective thinning regime thus far, which has contributed to a comfortable savings account that will aid the NCF in its next phase.

Another key management component of the Nisqually Community Forest is the participation in carbon markets to generate revenue for carbon storage and sequestration. In 2015, the Nisqually Land Trust sold 35,000 carbon credits to Microsoft through California's regulatory carbon-credit program. The 520-acre property that was conserved is adjacent to the property that eventually became the Nisqually Community Forest but not within its borders. One respondent highlighted the importance of selling more than just carbon—the story itself is very valuable. Voluntary buyers are very attracted to carbon projects that protect a local forest where you can walk around and see all the other co-benefits. This is helpful advice for Washington community forests because many big companies in the Puget Sound area are likely willing to pursue local carbon offset projects that come with a compelling story and a suite of co-benefits.

More recently the Nisqually Community Forest entered the voluntary carbon market through a San Francisco-based firm called Bluesource. Unlike California's bureaucratic and time-intensive carbon market, the voluntary market can be advantageous for several reasons. The chief advantage is that carbon revenue comes in yearly as carbon accrues on the property, which differs from the California carbon market which is paid upfront. This regular source of income can help service a loan or pay for ongoing stewardship costs, both of which are relevant to new community forests. Additionally, the voluntary carbon market can be highly profitable, depending on what the market is doing. NCF contracts with Bluesource to find buyers and work out the contractual nuances, which can be very helpful for community forest partners without much carbon expertise.

Lastly, the Nisqually partners worked with the EPA to model some of the watershed benefits that would come as improved forest practices were implemented on the property. The NCF partners used a model known as VELMA (described above on page 10) to determine roughly how much more water could be produced in late summer by extending harvest rotations. In 2018, NCF partners published their results and analyzed the many tradeoffs between timber production, watershed benefits, fish and wildlife habitat, flood prevention, and carbon benefits (Hall et al. 2018).

Their analysis concludes that longer harvest rotations would deliver significant streamflow gains to the Mashel watershed, while also producing a wide range of other benefits.

In all, the Nisqually Community Forest provides a very compelling example of how to pursue community-driven forest stewardship at scale. The ownership model, governance structure, management approach, and funding sources are all very applicable to the Stewart Mountain Community Forest, as well as other proposed community forests in western Washington.

Funding Sources

- National Park Service: Rivers, Trails, & Conservation Assistance program (technical assistance only)
- Conservation Fund loan
- Puget Sound Energy Foundation grant
- Nisqually Indian Tribe
- Puget Sound Acquisition and Restoration Large Cap
- Pierce County Conservation Futures
- US Forest Service Community Forest Program
- Washington Wildlife and Recreation Program
- Salmon Recovery Funding Board
- Washington Recreation and Conservation Office: Community Forest Grant Program
- Washington Department of Ecology: Streamflow Restoration Program
- Washington Department of Ecology: Clean Water State Revolving Fund Loan (for the Nisqually Tribe's land

Key Resources

Nisqually Community Forest website

Nisqually Community Forest Management Plan (2019)

Meet the Nisqually Community Forest—Online Panel Discussion 2020

Nisqually Community Forest VELMA modeling to evaluate effects of forest management scenarios on streamflow and salmon habitat

Nisqually Community Forest VELMA modeling PowerPoint slides

Respondents Interviewed

Joe Kane

- Former Executive Director
- Nisqually Land Trust

Justin Hall

- Executive Director
- Nisqually River Foundation

Kirk Hanson

- Director of Forestry
- Northwest Natural Resource Group

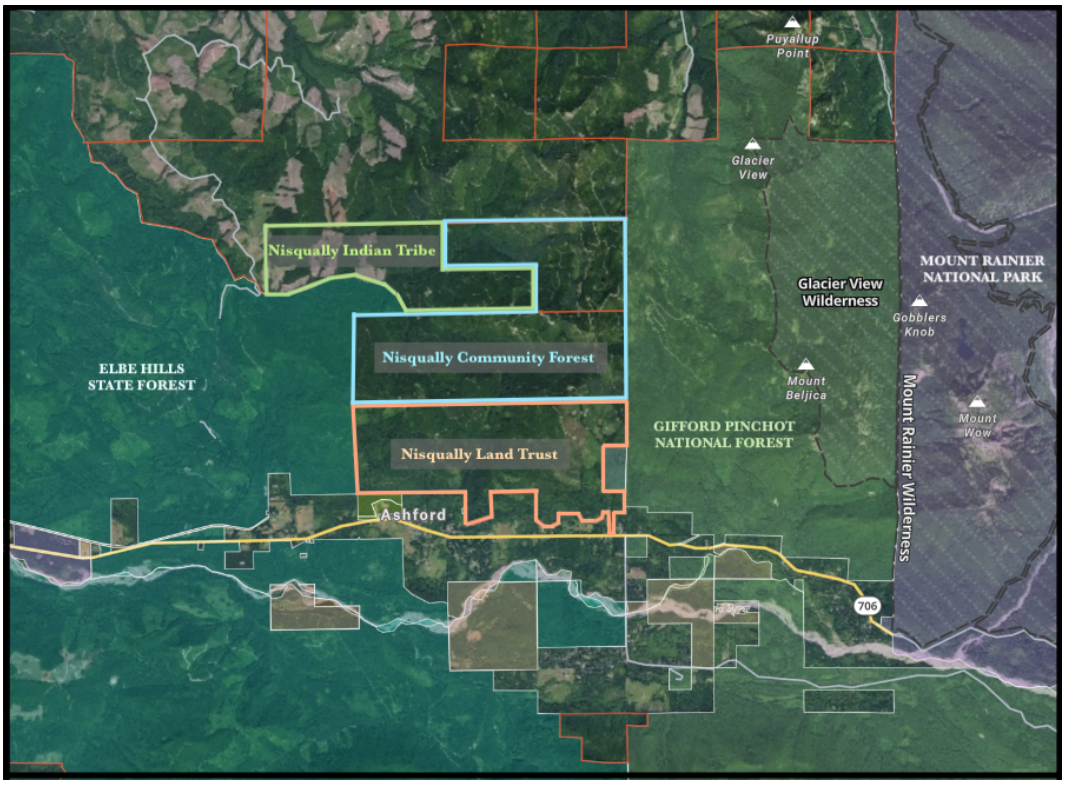


Figure 8: Proximity Map of the Nisqually Community Forest (Harris 2022)

V. TEANAWAY COMMUNITY FOREST

Introduction

The Teanaway Community Forest (TCF) is the largest in the Pacific Northwest, spanning over 50,000 acres in the upper Yakima River watershed. Located just an hour and a half east of Seattle, the Teanaway consists of mixed-conifer and ponderosa pine forestland managed for multiple benefits, including watershed protection, wildlife habitat, sustainable timber production, and expanded recreational opportunities. The Teanaway is notable for its scale and its unique approaches to ownership, governance, and management—all of which were carefully calibrated to achieve specific objectives in the upper Yakima watershed. The Washington Department of Natural Resources (DNR) owns the property and co-manages the community forest with the Washington Department of Fish & Wildlife (WDFW), making the TCF one of only two community forests in Washington that are owned and managed by state agencies. This unique state-ownership model is complemented by an active and engaged Advisory Committee that advises the agencies on questions regarding forestry activities, habitat restoration, and recreation management. The TCF model may be relevant to other communities around the state who are attempting to acquire and manage land at a spatially-significant scale, however, the model also comes with some drawbacks.

History

The origins of the Teanaway Community Forest can be traced back to the Yakima basin general stream adjudication process that was initiated in 1977. A general stream adjudication involves the State of Washington bringing all water rights claimants into a single court process to establish the legal extent of water usage for agricultural, industrial, commercial, and municipal uses. Water law in Washington State operates under the "prior appropriation" framework, which allocates water rights based on seniority. This means that during times of scarce water resources, water users

who have the newest (and most junior) water rights may be cut off from water use to ensure that users with the oldest (and most senior) water rights can use their allotted water right in full.

Surprisingly, the state does not have a comprehensive understanding of who is legally using water and who is not, even though water is a precious natural resource that is collectively owned by the general public. Water rights adjudication is a method to quantify the legal extent of everyone's water rights while also establishing the relative seniority of each water rights holder. This allows the state to make regulatory and management decisions that enforce the water code and other water resources policies.

The Yakima basin adjudication was the state's first attempt to adjudicate water rights on an entire watershed—a process that took 42 years to complete. One factor that makes the Yakima adjudication unique from other adjudications is that a federally-recognized tribe, the Yakama Nation, participated in the process so the court could adjudicate and quantify their water rights. A long history of court decisions has established two primary forms of water rights for Washington tribes: on-reservation water rights and off-reservation water rights. The first to be established were the on-reservation water rights, which guaranteed tribes the right to use water for municipal, agricultural, or commercial uses on their reservations. The off-reservation water rights trace back to 1854-1855 when most Washington tribes signed treaties with the federal government that recognized the right of the tribes to take "fish at usual and accustomed grounds... in common with all citizens..." Over the years, federal courts have concluded that tribes with this treaty-protected fishing right also hold off-reservation water rights that require a certain amount of water to remain instream to support healthy fish populations. Notably, these off-reservation water rights are automatically the most senior in any watershed where they exist, with the priority date being "since time immemorial."

The Yakima adjudication quantified both on-reservation water rights for the Yakama Nation, and also an off-reservation water right for sufficient instream flows. The adjudication also clarified the legal extent of agricultural water use, which meant some farmers were required to cut back or

cease their water use entirely. As the adjudication process neared its end, stakeholders, the Yakama Nation, and government agencies recognized that all parties would benefit if they collaboratively worked together to "grow the size of the pie." This kicked off the process that eventually culminated in the development of the Yakima Basin Integrated Plan (YBIP) in 2012. (To learn more about the Yakima adjudication and tribal water rights, see *Water Rights Adjudication in the Nooksack Watershed*, Harris 2022).

The Yakima Basin Integrated Plan is an unprecedented planning effort to comprehensively address many of the Yakima basin's challenges by taking a collaborative, watershed-scale approach to water resources management. This ambitious plan includes programs to restore fish habitat, improve fish passage, enhance water quality, increase water quantity, expand storage infrastructure for surface water resources (i.e. bigger reservoirs), and more (Department of Ecology 2017). One respondent described the 30-year YBIP as really being a 60-year plan—the first 30 years being the contentious legal fights during the adjudication. He said, "Everybody got really good at stopping the other from getting what they wanted, but they weren't getting what they needed either." The respondent said an essential ingredient to making the YBIP happen was the collective realization among stakeholders and governments that they could "gain more by being hitched together than we would separately." Another respondent said that eventually stakeholders realized that "increasing late season lows is good for irrigators and for salmon."

Between 2009 and 2012, the Bureau of Reclamation worked with the Department of Ecology, the Yakama Nation, and key stakeholders to develop a plan that included something for all the partners involved. The plan enjoyed bipartisan support and had buy-in from the Yakama Nation and key government agencies, making it very attractive to state legislators who were asked to fund the plan. In 2013, the Washington State Legislature approved the plan and allocated more than $143 million to begin implementing some of the projects identified in the plan (RCW 90.38.130). The State also pledged to cover half of the approximately $3.4 billion total cost of implementing the Integrated Plan over the next three decades (Ecology 2016).

The largest expenditure of the initial allocation ($100 million) went towards the acquisition of ~50,000 acres of private forestland in the upper Yakima watershed to create the Teanaway Community Forest. The primary purpose behind the TCF was to restore habitat conditions in the Teanaway River basin and enhance the watershed functions that healthy forests provide. The legislature authorized DNR to own the property and co-manage it with WDFW. The legislation also provided guidelines on how the forest must be managed and governed (more details on governance and management below).

The acquisition of the TCF had been identified as a priority by various conservation non-profits for many years prior to 2013 due to the unique ecological character of the area and the long history of these working lands being open to hunting and recreational access. When the landowner proposed to develop large portions of the property, conservation interests became more motivated to acquire the Teanaway and keep it as a working forest. The YBIP included details about what kinds of land acquisition should take place to further the larger objectives of the plan, such as key portions of the upper Yakima watershed that could deliver hydrologic benefits to farmers and fish downstream. Being the last large undammed tributary to the Yakima, the Teanaway River was identified as a top priority for watershed protection.

The story about how the legislature became convinced to spend $100 million to acquire all 50,241 acres in a single transaction is lengthy and complex. The process of "how the sausage was made" involved a series of negotiations between legislators and various agricultural and conservation interests, which eventually culminated in a deal where the entire property would be acquired instantaneously; however, conservative legislators included a "poison pill" that threatened to undo the Teanaway Community Forest unless certain conditions were met.

The poison pill was intended to ensure the continued participation of environmental interests in the other components of the YBIP after the TCF was created. A significant portion of the YBIP is focused on building higher dams and expanding reservoir capacity, which in one case would flood old-growth forest along Bumping Lake. In order to ensure environmental interests

would stay at the table to see those reservoir expansions through, the authorizing legislation that created the TCF specifies that permits and funding to expand water storage facilities must be secured by June 30, 2025, or else the TCF will be turned into trustland that DNR must manage for revenue. Other fates could befall the TCF if these conditions are not met, such as the DNR selling the property altogether; however, the Board of Natural Resources would play a role in deciding how DNR responds in this scenario.

The poison pill has incentivized environmental interests to promote the success of the YBIP's other components, rather than only focusing on the TCF. Two respondents I interviewed said that significant progress has been made to achieve these benchmarks, but success may not be achieved by 2025. Therefore, the timeline will likely be renegotiated to ensure the poison pill does not threaten the TCF's status going forward.

The future of the Teanaway may involve an expansion into a neighboring parcel known as Cle Elum Ridge. The Cle Elum Ridge property spans 9,400 acres that lies between the Teanaway Community Forest and the towns of Cle Elum and Roslyn. Residential development threatens the property, and there is a need for the forest to be managed for fire risk reduction to protect the already-developed areas below the ridge. The Cle Elum Ridge effort is being led by the Checkerboard Partnership, a collaborative group consisting of agency representatives, Yakama Nation representatives, elected officials, academics, forestry professionals, conservation interests, and community members.

The proposed "Cle Elum Ridge Community Forest" was awarded $3 million in the Recreation and Conservation Office's Community Forest Grant Program, which will fund the acquisition of 1,250 acres. The question now is which ownership model the community forest should adopt. Since the Cle Elum Ridge property is adjacent to the TCF property, there is a possibility that the property would be adopted by the state to be managed as part of the greater Teanaway Community Forest; however, since DNR is already working with a limited budget to manage recreation on the TCF, the prospect of adopting more acreage without additional operating

funds is not very attractive. Whether or not DNR agrees to take on this additional acreage will indicate the long-term trajectory of this community forest model, which despite its drawbacks, is perhaps the most ambitious of any community forest in the region.

Ownership Model

In 2011, DNR developed the Washington Community Forest Trust Program, which allows the agency to purchase private land and form a community forest in order to protect the forest from development. Land conversion from working forest status to development is a major problem in Washington, which has spurred DNR to scale up its efforts to prevent further sprawl into forestland (DNR 2021). Despite its potential, DNR's Community Forest Program has only been used twice: once for the Teanaway Community Forest and then again for the Klickitat Canyon Community Forest. Numerous respondents I interviewed throughout my graduate research project identified various weaknesses with the program, such as the requirement for the community partner that initiates the creation of a DNR-owned community forest to secure a least 50% of the "difference between the parcel's appraised fair market value and the parcel's timber and forest land value" (DNR 2022).

Early on, TCF proponents identified another of the program's problematic requirements: that DNR-owned community forests generate enough revenue to cover all of DNR's on-going management costs on the property. This requirement can be problematic for properties that have been intensively logged prior to acquisition, leaving little to no merchantable timber to work with in the early years—as was the case with the Teanaway property. Therefore, an exception to the program's requirements was granted in the authorizing legislation that created the TCF, thereby allowing the legislature to fund management-related costs in the TCF. Several respondents mentioned that without significant changes to DNR's Community Forest Trust Program, it seems unlikely that other communities will be able to develop DNR-owned community forests in other parts of the state.

DNR holds the fee-title ownership for the 50,241-acre property, but WDFW owns a "Habitat Restoration and Working Lands Easement" on the property and plays an integral role in the governance of the TCF.

Governance Structure

Shortly after the property was acquired in 2013, the agencies entered into an "Interagency Agreement" to work together as "collaborative land managers." The Interagency Agreement outlines a joint decision making process in which both DNR and WDFW fully collaborate on all decisions relating to land management, policy questions, and public relations issues. The goal is to combine the "expertise and resources of the two sister agencies" by committing to work together and prioritize communication between the agencies. Both respondents I interviewed from the DNR and WDFW emphasized how important regular communication was to the success of the Teanaway Community Forest. Since 2013, the agencies have held a weekly coordinating meeting to ensure that co-management runs smoothly. One respondent recommended that all community forests that involve numerous partners working closely together prioritize regular communication to avoid conflict and misunderstandings down the road.

Since the Teanaway was the first community forest that DNR and WDFW owned, there were inevitably kinks that needed to be worked out in the early days of the partnership. For example, DNR's primary responsibility is to manage over 2 million acres of trustland to generate timber revenue for numerous beneficiaries. The agency also takes some steps to manage for recreation, although recreation infrastructure on DNR lands is limited. DNR's emphasis on commercial logging is very different from WDFW's charge to protect and restore habitat for fish and wildlife species. One respondent described this tension and mentioned that early on the agencies decided to "play to each other's strengths." This meant that WDFW took the lead on restoration projects and DNR took the lead on recreation management and forest planning.

Another key component of the TCF's governance structure is the Advisory Committee made up of 23 representatives from various partner groups who support the project. Certain seats are reserved for the Yakama Nation, Kittitas County, and the Department of Ecology, but other seats are filled by local recreation, conservation, and economic interests in the area. The Teanaway Community Forest Advisory Committee plays a key role in making decisions about forestry activities, habitat restoration, and recreation management, and the committee was intimately involved in the development of the TCF Forest Management Plan and the TCF Recreation Plan. Members of the committee also serve as ambassadors for the community forest, which helps connect the larger community to the project. Members represent diverse recreational uses, such as hiking, ATV riding, hunting, fishing, horseback riding, and snowmobiling, and there are also seats filled by local residents, farmers, and conservation professionals. Members are selected by WDFW and DNR and do not have term limits.

The Advisory Committee attempts to make decisions based on consensus, but due to the size and diversity of the group, this is not always possible. According to Urgenson et al.'s profile of the TCF, "When 100% consensus has not been possible, the Committee takes a step back, agrees on a broader, high-level strategic framework, and decides to refocus on the topic of contention when they have more resources for it. At some point if they still cannot reach consensus, the lead state agencies will look at the majority opinion and come to a decision on how to move forward" (Urgenson et al. 2017). Occasionally, sub-committees have been formed on an ad-hoc basis to resolve detailed questions relating to grazing, recreation, or other issues.

The Advisory Committee meets quarterly and invites members of the public to attend and participate in meetings. DNR and WDFW staff actively participate in the Advisory Committee's meetings, which helps ensure full communication between the agencies and the committee members. While the Advisory Committee does not hold formal governance power, one respondent who used to serve on the committee said that there wasn't a single decision made by the Advisory

Committee that the agencies ignored. Details about these meetings can be found on the Teanaway Community Forest Advisory Committee's webpage.

Roughly 6,000 people receive the TCF newsletter, which helps keep the community involved and informed (Urgenson et al. 2017). Additionally, the TCF used to host public events and tours of the property (prior to the COVID-19 pandemic). The TCF Advisory Committee maintains an active Facebook page with over 1,400 followers, which serves as an effective means to communicate and interact with the public.

Management and Stewardship

The legislation that authorized the creation of the Teanaway Community Forest outlines the following five objectives of the project—all of which were originally crafted during the creation of the Yakima Basin Integrated Plan:

1. To protect and enhance the water supply and protect the watershed;
2. To maintain working lands for forestry and grazing while protecting key watershed functions and aquatic habitat;
3. To maintain and where possible expand recreational opportunities consistent with watershed protection, for activities such as hiking, fishing, hunting, horseback riding, camping, birding, and snowmobiling;
4. To conserve and restore vital habitat for fish, including steelhead, spring chinook, and bull trout, and wildlife, including deer, elk, large predators, and spotted owls; and
5. To support a strong community partnership, in which the Yakama Nation, residents, business owners, local governments, conservation groups, and others provide advice about ongoing land management.

Based on these objectives, DNR and WDFW worked with the Advisory Committee and the community at large to develop the TCF Forest Management Plan in 2015. The FMP provides additional detail about each of the five goals listed above and lists more specific objectives under each goal, as well as "strategies and tools" that will be used to achieve those objectives. The FMP also lays out criteria by which the agencies and the Advisory Committee will measure progress for each goal.

The FMP stays somewhat high-level but provides clear directives for how the agencies should manage the community forest to balance its numerous goals. Importantly, the FMP highlights the role the TCF plays in fulfilling the hydrologic goals developed in the Yakima Basin Integrated Plan, and makes clear that goals #2, #3, #4, and #5 must complement goal #1: To protect and enhance the water supply and protect the watershed.

A few years later, a Recreation Plan was finalized for the TCF (page 75 of the Forest Management Plan). The Recreation Plan lists the various uses that the TCF aims to accommodate and lays out strategies to ensure these uses remain compatible with one another. This is no small task, given that the TCF allows for camping, fishing, hunting, ATV riding, horseback riding, snowmobiling, mountain biking, hiking, and other activities. All respondents I interviewed for this project agreed that recreation management has been one of the greatest challenges for the project so far, especially because funding to manage the influx in recreation visitation has been limited.

While the TCF is meant to remain in working forest status, there has not been any commercial timber harvest since the state acquired the property in 2013. This has caused many to criticize the TCF for its continued dependence on state appropriation funds instead of generating its own revenue from sustainable timber harvest. However, the TCF property was heavily logged prior to 2013, and therefore the timber base that was inherited lacks commercial opportunities that can support commercial harvest. In the coming years, DNR plans to initiate a commercial harvest regime that is consistent with the recreational and conservation goals listed above, but little commercial activity can be done until the forest matures. Currently, grazing leases provide one of the major funding sources for the Teanaway, although this revenue provides only a small portion of operational costs associated with recreation and road maintenance.

Little commercial revenue has come out of the TCF so far, but WDFW, DNR, and the Yakama Nation have done considerable work to advance restoration objectives. To date, significant work has been accomplished to restore the rivers and streams that run through the TCF. Log installments have occurred at various locations throughout the property, which has helped promote

floodplain connectivity and improved habitat complexity for fish. Additionally, most of the fish barriers have been removed on the property, and DNR is working to mitigate sediment delivery associated with forest roads. Some forest restoration work has been completed to date, such as pre-commercial thinning of dense plantation stands and fuels reduction work that has helped improve forest health.

Funding Sources

Most funding for the Teanaway Community Forest has come from the operating budget that the legislature authorized in 2013 and additional capital funds that have helped pay for deferred road maintenance and restoration work. The Washington Recreation and Conservation Office (RCO) has also provided grant funds to support recreational improvements on the property.

Key Resources

- Teanaway Community Forest webpage
- Teanaway Community Forest Advisory Committee webpage
- Teanaway Community Forest - Forest Management Plan (and Recreation Plan)
- Legislation that authorized the TCF (2013)

Respondents Interviewed

Larry Leach

- Assistant Region Manager for State Lands, Southeast Region
- Washington Department of Natural Resources

Mike Livingston

- South Central Regional Director
- Washington Department of Fish & Wildlife

Tom Tebb

- Director of Office of Columbia River
- Department of Ecology

Darcy Batura

- Forest Partnerships Manager
- The Nature Conservancy

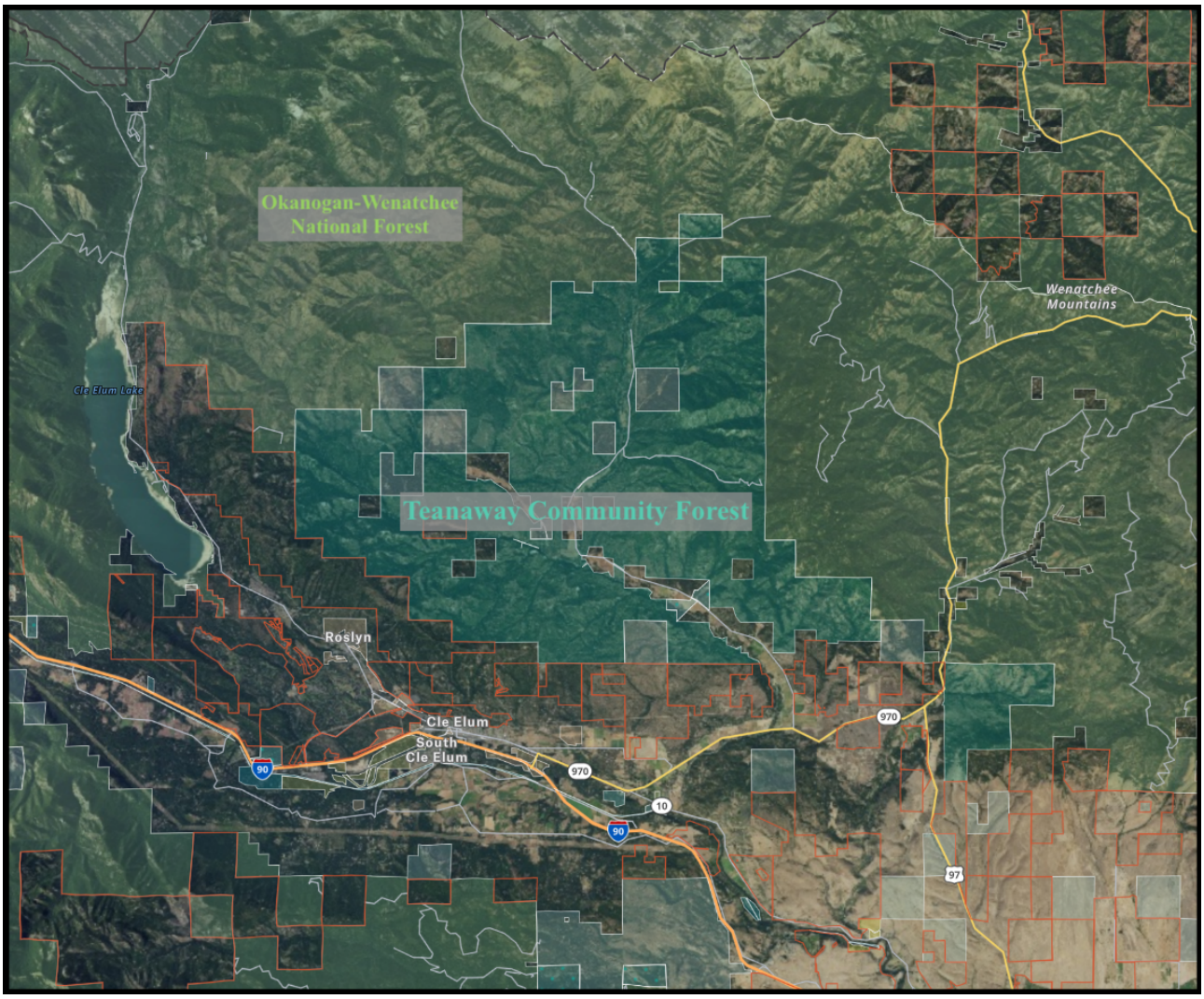


Figure 9: Proximity Map of the Teanaway Community Forest (Harris 2022).

VI. NASON RIDGE COMMUNITY FOREST

Introduction

The Nason Ridge Community Forest (NRCF) is Washington's newest community forest, with Chelan County having acquired the 3,714-acre property in April 2022. Located two hours east of Seattle along Highway 2, Nason Ridge is a prominent mountain flanked by Lake Wenatchee and Nason Creek and surrounded by National Forest land, a State Park, and some private holdings. The NRCF model was developed by Chelan County, Western Rivers Conservancy, and Chelan-Douglas Land Trust with support from active and dedicated stakeholders and community members. This nascent community forest has great potential to demonstrate how a working forest can simultaneously advance watershed recovery and climate resilience goals while also expanding recreational opportunities and supporting the local timber economy.

History

Since the early 1900s, the Nason Ridge property has been managed for timber production, but the property has historically been made available for public access and recreation. This created a constituency for Nason Ridge that most commercial forestlands in Washington do not have. For many decades, Lake Wenatchee has been a major tourist destination, with Lake Wenatchee State Park hosting camping and boating opportunities. Over the past several decades, the lake has also seen substantial development, largely consisting of second homes and vacation rentals. The Nason Ridge area is very popular during summer months, and cross country ski trails on the property and nearby downhill ski resorts make this area a winter destination as well. Over the years, local residents and frequent recreators have become more interested in management activities that improve the health of the forest, reduce fire risks, and maintain the scenic value that Nason Ridge provides.

In late 2017, an opportunity arose to buy the property when Weyerhaeuser Company announced its intention to sell its acreage in the area. Doing what it does best, Western Rivers

Conservancy (WRC) acted quickly to take advantage of this opportunity. In June 2018, WRC bought the property from Weyerhaeuser to hold until a long-term landowner could be established. Western Rivers Conservancy acquires lands along rivers throughout the West to conserve critical habitat and to improve public access for compatible use and enjoyment. A critical element of WRC's approach is the ability to acquire key properties on quicker timelines than government agencies and non-profits can manage. WRC provides a bridge for government agencies, tribes, or non-profits to get their financing in order before conveying the properties to the eventual long-term landowners to be managed for conservation purposes in perpetuity.

At the time of acquisition, WRC worked closely with the Chelan-Douglas Land Trust to establish possible opportunities for long-term ownership and management. One compelling ownership model was for Chelan County to take on ownership of the property to be managed as a community forest; however, the county did not immediately commit to this option.

At the time, Chelan County already owned and managed the Stemilt-Squilchuck Community Forest (SSCF), which is home to 10 reservoirs that provide water to four irrigation districts downstream. A major priority of the SSCF is to restore forest health through the board-scale application of commercial and restorative thinning, which helps reduce fuel loads and increases the resilience of the forest to future wildfires. The Stemilt Partnership, which is facilitated by Chelan County, laid the framework for the SSCF and the on-going management activities that take place on the county's land and the adjacent state-owned land. Despite Chelan County's positive experience with owning the SSCF, county staff and county commissioners remained hesitant to commit to the long-term ownership of the Nason Ridge property.

While community forest planning was underway, Chelan-Douglas Land Trust and Western Rivers Conservancy initiated a public fundraising campaign to generate funds that could help acquire the property and/or support management costs once the land was acquired. The fundraising campaign was enormously successful, generating $1.3 million in less than a year, demonstrating the enthusiasm and support among local community members. One of the motivating factors behind

the campaign was that if a long-term landowner failed to step up to the plate and buy the property, Western Rivers would be forced to sell property to a private landowner. Local landowners did not want to risk a new industrial logging company continuing intensive logging practices on the mountain, nor did they want the property to be developed (WRC estimates that roughly 185 residential lots could have been developed on the property). One respondent said, "Sometimes you need an active threat for a successful fundraising campaign."

The success of the fundraising campaign helped demonstrate the political support the project enjoyed; however, more certainty was needed before the county was willing to take on ownership. In 2019, Western Rivers Conservancy, Chelan-Douglas Land Trust, and Chelan County convened an Advisory Committee made up of approximately 30 members that included adjacent landowners such as Washington State Parks and the Kahler Glen Community Association, as well as representatives from recreation groups and local residents. Chelan County received $20,000 in funding from the Recreation and Conservation Office to work with the Advisory Committee in developing a forest management plan for the property and was given a short timeline to complete it.

In November 2019, the partners finalized the Nason Ridge Community Forest Management Plan (FMP). The document establishes the overall objectives of the community forest and provides detailed forest management goals that will guide forestry activities in the community forest (described below in the "Management" section). The FMP also outlines the long-term governance structure (described below in the "Governance" section). Several respondents said that the FMP was effective at convincing the county to take on this project because it demonstrated that: 1) there would be active forest management that could fund management activities on the property, and 2) there was widespread public support for a working community forest on Nason Ridge.

Upon completion of the FMP, the adjacent landowners to the Nason Ridge Community Forest property—Chelan-Douglas Land Trust, Kahler Glen Community Association, Washington State Parks, and Nason View LLC—signed an MOU with Chelan County that established the county's intention to become the long-term landowner of the property as long as the Nason Ridge

partners agreed to provide support for the county's ownership and management of the property. A key ingredient to getting the county to commit to ownership included the assurance that neighboring landowners would help with recreation management and community forest governance. Another crucial component that helped get county commissioners to sign off on this acquisition was the assurance that there would not be a burden on the county budget to keep the NRCF running, but instead that all management, operations, and administrative costs would be covered by grant funding, private donations, and eventual timber revenue.

The Nason Ridge partners were successful in winning salmon recovery funding from two local PUDs as well as the state, which could support a portion of the $5 million cost of the property. With significant assistance from WRC and CDLT, the county also successfully won grant funding through the Forest Legacy Program (FLP), while simultaneously ranking first out of 15 in the Recreation and Conservation Office's new Community Forest Grant Program. The Nason Ridge partners then had the luxury of choosing which of the two grants was more conducive to the Nason Ridge project. They chose to drop the FLP award and instead pursue the RCO program, although some respondents said the FLP funds could have also been a good fit for the project. Then in April 2022, Chelan County acquired the Nason Ridge property from Western Rivers, pooling their RCO grant, their salmon recovery funds, and a portion of their privately fundraised dollars to cover the acquisition cost.

Ownership Model

The Nason Ridge case study is exciting because it demonstrates how a local government, when supported by key partners and rallied by enthusiastic community members, can take a proactive approach to forest management to further its recreation and climate resilience objectives. Oftentimes, county planning around natural resource issues involves spending inordinate time on developing plans and completing studies that have little effect on actual management decisions on the ground (i.e. plans that gather dust on the shelf). For a county to acquire a large property and set

it on a different management trajectory requires bold leadership and vision, which is exactly what is on display in Chelan County.

As explained above, Chelan County decided to become the long-term landowner of the 3,714-acre property only after a variety of criteria were met:

- Public awareness and buy-in;
- Supportive partner groups with diverse expertise and experience;
- A strong Forest Management Plan that clearly identified short and long-term objectives and laid the foundation for active forest management;
- Assurance that county general funds would not be used to support the property;
- Alignment with many of the county's programs and objectives for the area.

An additional driver that motivated the county to acquire the property was the significant opportunity for forest and stream restoration. Having a county own and manage a community forest has numerous advantages, such as the ability to integrate land use and water resources management at a landscape scale. Chelan County is very active in salmon recovery efforts, and has developed the capacity to successfully obtain large grants to advance its restoration work. In fact, the county already had extensive experience restoring salmon habitat in lower Nason Creek, which is a key reach for salmon and steelhead spawning.

Another motivating factor for the county was to expand recreation opportunities in the area. Recreation is a major driver to the region's economy, and over the past 15 years county leadership and staff have taken a more active role to promote recreational opportunities. Unlike many counties, Chelan County does not have a Parks Department. Instead, the Chelan County Natural Resources Department took the lead on the Stemilt and Nason Ridge projects. Chelan Natural Resources saw itself as a natural facilitator between different stakeholder groups, which also made them a prime candidate to be the long-term landowner of the property. Counties that take on community forestry may benefit from having a Natural Resources Department to leverage grant funding and provide the necessary technical expertise to actively manage large forested landscapes.

Governance Structure

The 2020 MOU explicitly states that Chelan County will retain ultimate decision-making authority for the management of the property, but specifies that a Stewardship Committee will be formed to provide advisory assistance to the county and ensure management decisions conform to the Forest Management Plan. While formal decision-making power is reserved by Chelan County, the FMP makes clear that the county will prioritize community participation in governance processes.

The FMP states, "The underlying theme of community forests is the ability of local stakeholders to be involved in the leadership, investment, and stewardship of the forest resources." The FMP describes how the NRCF was borne out of the Upper Wenatchee Community Lands Plan, which was a community-driven conservation plan meant to help guide future investments for conservation and recreation projects. Nason Ridge was identified in the plan as "the best opportunity to create more contiguous public lands that could benefit the communities' identified recreation needs, as well as provide sustainable and working forests and wildlife habitat."

Building on that community planning work, the Nason Ridge Community Advisory Board helped develop the governance principles established in the Forest Management Plan. The FMP describes a "Stewardship Committee" that will be the primary means through which the community participates in the decision-making process. The FMP describes an "informal participation model," which puts the responsibility on stakeholders to designate representatives to sit at the table.

The US Forest Service is the only major adjacent landowner that did not sign onto the MOU; however, the agency signed a "letter of engagement" in August 2020 stating, "We strongly believe that there is mutual benefit to working together in this landscape."

Management and Stewardship

The FMP outlines the specific management objectives associated with forestry, stream restoration, and recreation. The plan goes into moderate detail about the ecology and climate of the area and the land-use history and condition of the property. These conditions in turn inform the forest management objectives, which include:

- Active forest management to improve and maintain forest health while generating funding for continued stewardship.
- Selective silviculture that promotes structural diversity, enhances water quality, improves wildlife habitat, and improves resilience to climate change.
- Proactive fuels management to create defensible space and reduce potential for catastrophic fire.

Wildfire has historically played a critical role in the forested ecosystems surrounding Nason Ridge, but the legacy of industrial logging and fire suppression have changed the species composition and forest structure of most stands on the Nason Ridge property. Today, most of the stands are under 25 years of age and require significant interventions in the future to reduce fuel loads and improve forest health. These will involve pre-commercial thinnings and commercial thinnings that increase the stands' structural complexity, age distribution, and species make up. Enhancing the structural diversity of the forest will not only provide habitat for a wide range of wildlife species, but reduce the severity of future burns. The FMP describes certain sensitive sites where commercial forestry will be limited—such as hillsides with slopes over 50%—and also requires expanded riparian buffers around small and large streams.

The FMP includes details about how management activities will be calibrated to improve water quality for fish and other aquatic species. These activities include: enhancing riparian vegetation, increasing tree retention on steep slopes, and reducing road density. The FMP contains seven pages devoted to road management, including standards for maintenance and strategies to further reduce the road density throughout the property.

The FMP also includes details about how the NRCF plans to manage recreation and public access. The recreation objectives listed include actively increasing recreational opportunities on the property and providing educational opportunities for the public (and youth) to learn about forest ecology and management. The FMP also specifies what kind of recreational access currently exists and what recreational opportunities could be created in future years.

Funding Sources

- Recreation and Conservation Office – Community Forest Grant Program
- U.S. Forest Service – Forest Legacy Program
- Salmon Recovery Funding Board
- The Chelan PUD Tributary Fund
- The Grant PUD Priest Rapids Coordinating Committee
- Washington Department of Ecology
- Save Nason Ridge fundraising campaign led by CDLT

Key Resources

- Nason Ridge Community Forest Management Plan (2019)
- Chelan County webpage for the NRCF
- Blog post about the recent acquisition by Chelan County

Respondents Interviewed

Erin McKay

- Senior Natural Resource Specialist
- Chelan County Natural Resources Department

Curt Soper

- Executive Director
- Chelan-Douglas Land Trust

Angela Morris

- Associate Director
- Chelan-Douglas Land Trust

Nelson Mathews

- Vice President
- Western Rivers Conservancy

Mik McKee

- Stewardship Director
- Western Rivers Conservancy

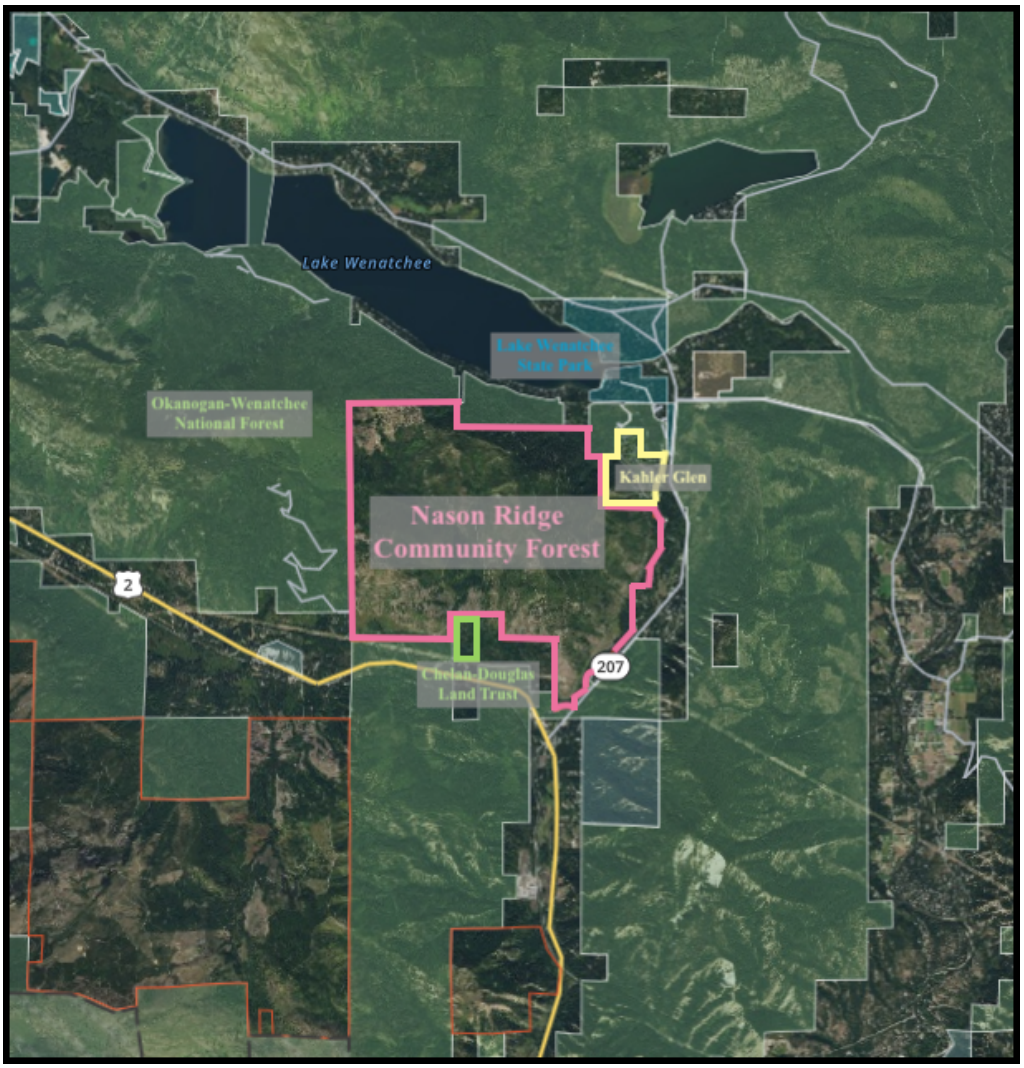


Figure 10: Proximity Map of the Nason Ridge Community Forest (Harris 2022).

VII. RECOMMENDATIONS

Based on my research, I have distilled the following recommendations for which ownership model, governance structure, and management approach would be most conducive to the proposed Stewart Mountain Community Forest (SMCF). Before I outline those recommendations, it would be pertinent to highlight a crucial piece of context. The SMCF aims to restore watershed functions that support salmon runs, which requires applying community forestry on a vast spatial and temporal scale (i.e. ecological forest management applied across thousands of acres over numerous decades). As outlined in this report's companion paper, *Water Rights Adjudication in the Nooksack Watershed* (Harris 2022), water rights adjudication in the Yakima watershed yielded the largest and most ambitious community forest in the state—the Teanaway Community Forest—which covers over 50,000 acres. The Nooksack watershed has recently been identified as the next watershed to be adjudicated, allowing governments and stakeholders to collaboratively develop some kind of "Nooksack Basin Integrated Plan." One component of this plan could be to apply community-driven forest stewardship at a watershed-scale, which could help moderate peak flow events during wet months and supplement low flows during dry months. The recommendations below should be considered in this context.

Ownership Recommendations

Based on the case studies I reviewed, there are numerous viable pathways for long-term ownership of Stewart Mountain; however, one model appears particularly promising for the SMCF project. I recommend that Whatcom County take on the role of long-term landowner of Stewart Mountain and that the county signs an MOU with the other Stewart Mountain partners (Nooksack Tribe, Whatcom Land Trust, and Evergreen Land Trust) that clearly establishes how each partner will help the county fulfill its ownership and management obligations. This approach was taken with the Nason Ridge Community Forest, with Chelan County adopting the property in April 2022.

Whatcom County is poised to be a successful long-term landowner of Stewart Mountain for numerous reasons. First, Whatcom County has extensive experience working with other governmental entities and stakeholder groups on complex watershed management issues relating to salmon recovery, flood mitigation, and other water resources issues. In fact, Whatcom County is currently playing a key facilitation role in WRIA 1 processes relating to the Nooksack adjudication. The county's experience and expertise in watershed management issues would ensure the long-term owner of Stewart Mountain advances a management regime on the property that supports watershed resilience and salmon recovery efforts. Additionally, the county has robust experience applying to various grant programs to fund watershed restoration work, which would help the SMCF as it pursues state and federal grants relating to the acquisition and management of the property.

Second, Whatcom County is an adjacent landowner, having reconveyed over 8,500 acres of DNR land within the Lake Whatcom watershed in the early 2010s. In general, owning contiguous acreages makes land ownership far simpler, especially on Stewart Mountain where numerous roads and recreational corridors run across various ownerships. Moreover, the county has neglected to manage the plantations it inherited from DNR a decade ago, and there may be some restoration thinning activity that is warranted in those Lake Whatcom watershed parcels. If the county were to become the long-term landowner of the SMCF, then it may be able to combine the management responsibilities of both sides of the mountain.

Another reason Whatcom County should be a strong candidate for long-term ownership of the SMCF is the county already owns the Canyon Lake Community Forest (CLCF). The CLCF is a 2,300-acre property located in the Mt Baker Foothills that is co-owned by Whatcom County and Western Washington University. The development of the CLFC in the late 1990s was primarily motivated by the need to protect ~700 acres of ancient old-growth forest that had miraculously escaped timber harvest and wildfire for almost 1,000 years. Over the years, Whatcom County has invested in recreation infrastructure; however, the primary access route to the property, Canyon

Lake Road, has washed out and cut off public vehicular access in recent years. If the county is able to restore road access to the property, the county may be in a position to consider restorative thinning in the dense, monoculture plantations that cover over half the property. Whatcom Land Trust holds a conservation easement (CE) on the property that only allows forest management activities that enhance the structural complexity and biodiversity of these plantation stands. The CE also specifies that any revenue generated from these restoration treatments must be invested back into the CLCF property. Such a management approach in the CLCF could dovetail well with management activities associated with the Stewart Mountain property.

Last, Whatcom County is accountable to the public, and therefore, already has structures in place to accommodate stakeholder feedback and public oversight. Having elected county councilmembers oversee the administration and governance processes of the community forest would bolster the public buy-in that the community forest needs to be successful. The county also has significant experience planning for recreation, which will be a major component of the Stewart Mountain project. Effectively incorporating the feedback of local community members into a recreation planning process will be essential for the SMCF, and the county is positioned well to accommodate such a process.

Besides my recommendation for Whatcom County's fee-title ownership of the SMCF, there may be opportunities to establish easements on the property that involve other entities. For example, a conservation easement developed by Whatcom Land Trust may be appropriate to establish strong sideboards on how the property is managed going forward. These sideboards could include additional restrictions to forest management activities beyond what the state forest practices rules require, which could help reduce the expense of the property. An additional easement owned by the Nooksack Tribe may be beneficial to guarantee cultural access and use to local tribal members. Such a cultural easement would be developed according to the needs and desires of the tribe in consultation with the long-term landowner.

Governance Recommendations

The governance structure of a community forest is often overlooked; however, establishing a clear and effective process by which decisions are made is critical to the success of any community forest. My recommendation to the Stewart Mountain partners is to sign an MOU once the first property has been acquired, which creates a "Governance Committee" made up of representatives from Whatcom County, Nooksack Tribe, and Whatcom Land Trust. This committee should adopt an executive oversight role for issues relating to property management and planning, public access, community engagement, revenue generation, and property acquisition. Depending on the final fee-title and easement ownership arrangements, two seats should be reserved for Whatcom County (as the fee-title owner), and one seat should be reserved each for the Nooksack Tribe and Whatcom Land Trust (as easement holders). Whatcom County would retain the ultimate authority to make decisions about the property, but the Governance Committee should strive for consensus-based decision-making, with clear bylaws on how decisions are made when consensus cannot be reached.

The other major component of governance is a Community Advisory Committee (CAC) that serves as a consultative resource to the Governance Committee. The SMCF partners have recently convened an Interim Community Advisory Team (I-CAT), which will help inform what the long-term CAC should look like. CAC membership should consist of South Fork valley residents, key stakeholders in the forestry community, representatives from both tribes (if possible), and representatives from relevant government entities (e.g. DNR, Ecology, WDFW, etc). The CAC should be convened shortly after the acquisition of Phase 1, and members should be chosen by the Governance Committee. A top priority for the CAC should be to help the Governance Committee develop a Forest Management Plan that outlines the management objectives for the SMCF as well as the management strategies to achieve those objectives. Another priority for the CAC should be to develop a Recreation Plan in collaboration with the Governance Committee and based on community feedback and input.

Management Recommendations

Since the Stewart Mountain partners have identified watershed recovery as a primary objective, it will be very important to carefully plan the silvicultural approach adopted on the Stewart Mountain property. I recommend the Stewart Mountain partners work with a professional forester to develop a Forest Management Plan (FMP) *prior* to the acquisition of the property. The Nason Ridge case study demonstrates that taking this step prior to buying the property can help demonstrate to stakeholders, community members, and elected officials that the community forest would be managed differently than before, and that the effort is grounded in sound economic planning. Establishing that on-going forestry activities will be economically sustainable is difficult to do without the help of a trained forester to conduct the necessary forest modeling and develop a corresponding management regime. The SMCF FMP should emulate the FMPs developed for the Nason Ridge CF, Nisqually CF, and Teanaway CF—as well as other applicable community forests in the region.

I recommend that the silvicultural approach taken on the Stewart Mountain property aligns with the philosophy and techniques described above in the "Ecological Forestry" section. This would entail transitioning the property's even-aged plantations into structurally-complex and biodiverse forests that are thinned at regular, frequent intervals. Such a management regime can eventually optimize wood production while simultaneously improving forest health and enhancing climate resilience. Variable density thinning applied at scale can also help mitigate many of the water quality problems associated with commercial logging, and research suggests that this approach can help increase low streamflows in late summer (Dickerson-Lange 2022).

It is essential to ensure that costs associated with forest and road management are covered by the revenue generated by the community forest. Sustainable timber harvest should be the primary means of achieving a consistent revenue stream, but since most of the stands on the SMCF are under 30 years old, there will have to be some kind of bridge funding that pays for management and administrative costs between the time the property is acquired and the time when timber revenue

can be generated. Grant funds for management and restoration can help make up part of this bridge funding, but grants are inconsistent and come with strings attached, which makes this approach less ideal.

Another viable opportunity to provide bridge funding is to monetize carbon sequestration and storage on the property. There are a variety of ways to do this, but perhaps the most promising is to hire a contracting firm to set up the carbon project on the property and sell credits to willing buyers on the voluntary market. These carbon credits would be calibrated based on what is stored currently in the forest and the growth potential of the forest and would also consider how the SMCF management standards go above and beyond what is legally harvestable on the property. This demonstrates "additionality," which is the monetizable carbon benefit that is sold on the market. Another opportunity to leverage carbon funds may be to pursue carbon offset money through Washington's new Climate Commitment Act cap and trade program, which is slated to begin on January 1, 2023.

My last management-related recommendation for the SMCF is to procure ample feedback and input from community members and stakeholders on how the community forest will manage recreation. Many valley residents are eager to expand recreational access to the Mt Baker Foothills, not only for their own enjoyment but also for the economic benefits associated with increased recreation traffic. Other residents, on the other hand, are worried about the negative effects that may come with increased visitation to the valley. These include trash, vandalism, traffic, illegal ATV riding, and other problems on full display elsewhere around western Washington. Many residents are worried specifically about the increase in mountain biking traffic that may occur as a result of the SMCF project. To achieve public buy-in for the SMCF, the Governance Committee and Community Advisory Committee should hold public meetings and provide opportunities to gather public input on questions relating to recreational use.

Conclusion

In conclusion, I believe community forestry can be a powerful conservation tool to recover native salmonid populations in the South Fork watershed while producing economic and recreation benefits to the local community. I hope my research provides insight into how others have utilized community forestry to achieve their own diverse objectives, and which models of ownership, governance, and management may be most conducive to the goals of the Stewart Mountain Community Forest. Many opportunities exist for future research into this nascent field, and I am confident that the broader community forest movement will only strengthen as more cross-pollination occurs among community forest operators. Here in Whatcom County, I hope the SMCF can serve as a pilot project that catalyzes the development of subsequent community forests throughout the Mt Baker Foothills, as well as elsewhere in the state. By applying this community-based model at scale, our communities can meaningfully contribute to the recovery of salmon populations, the revitalization of rural economies, and the long-term stewardship of our local forestlands.

VIII. METHODOLOGY

Since my graduate research has been a "field project" and not a "thesis," I chose to adopt research methods that aligned with research protocol in the professional field of natural resource policy—a field I have worked in since 2015. This entailed poring over scientific studies, reviewing technical documents, reviewing the academic literature, reading news articles, watching webinars, and leaning on my professional network to connect me to the respondents I interviewed. I also utilized law review articles and legal textbooks to aid my inquiry into adjudication, water law, and tribal water rights. My work was reviewed by faculty at Western, as well as professional colleagues of mine who work in the field. Additionally, each community forest profile was reviewed and vetted by each of the respondents I interviewed.

I decided to study three community forests in greater detail to distill key take-aways that could be shared with the Stewart Mountain partners. I selected my three community forest case studies based on the following criteria:

- Does the community forest seek to address watershed impairments relating to past commercial logging?
- Is the community forest a working forest? Does the community forest adopt ecological forest management practices?
- Does the community forest balance multiple uses, including conservation, timber production, and recreation?
- Does the community forest operate at a spatially significant scale?
- Does the community forest use an ownership model that could theoretically be available for the SMCF?

Based on this criteria, I originally selected four community forests to study in greater detail: the Nisqually Community Forest, the Teanaway Community Forest, the Nason Ridge Community Forest, and the Anacortes Community Forest Lands (ACFL). After interviewing three respondents and diving deeper into planning documents, I chose to omit the ACFL because I felt it was not fully pertinent to the SMCF. The ACFL is not a working forest, and is primarily managed for conservation, recreation, and education. Additionally, the City of Anacortes has owned most of the land base for many decades, and therefore, acquisition was not a major part of the ACFL story. For

these reasons (and others), I decided to drop this case study and instead focus only on the other three case studies.

Most community forests are initiated by a core group of two to five entities, so I decided to interview a representative from each key organization that participated in the development of the community forest. I developed an interview script with prompts and questions for the respondents (see the script here, also located in Appendix B below). My questions were focused mainly on ownership, governance, and management, but I also asked about funding sources for acquisition and on-going operation costs. I ended each interview asking what other documents I should read, and who else I should interview.

After I conducted this research, I developed a suite of recommendations for which ownership model, governance structure, and management approach were most appropriate for the proposed Stewart Mountain Community Forest. These recommendations were based on extensive conversation with Stewart Mountain partners, who I have worked with on this project as a professional consultant since 2020. Most of my recommendations were tethered to the vision and objectives that the SMCF partners have already identified, however, some of my recommendations explore options that have not yet been discussed in great detail among SMCF partners. I plan to present these recommendations to the SMCF partners in June 2022 and provide a more thorough overview of the different models of community forestry that I studied.

I implemented my research project in five phases:

Phase 1: Project Design

A. Conduct a preliminary review of the literature about community forests (CFs) to design the scope and scale of the research project.
B. Recruit graduate research committee members.
C. Pursue research grants.
D. Defend graduate research proposal.

Phase 2: Inventory

A. Conduct an inventory of all CFs throughout the Pacific Northwest.
B. Identify four case studies, each with a unique ownership model.

C. Develop a spreadsheet showing basic information about each CF.

Phase 3: Case Studies

A. Develop interview questions and process.
B. Obtain IRB approval. Exemption status granted 1/25/22 – application #4529EX21.
C. Build a profile of each case study by reviewing planning documents and background information. Identify: ownership model; governance structure; community engagement approach; and forest management objectives and strategies
D. Interview and survey key stakeholders of each case study to document their successes and failures and to learn what drove them to pursue the model they did.
E. Vet each profile with the respondents interviewed.

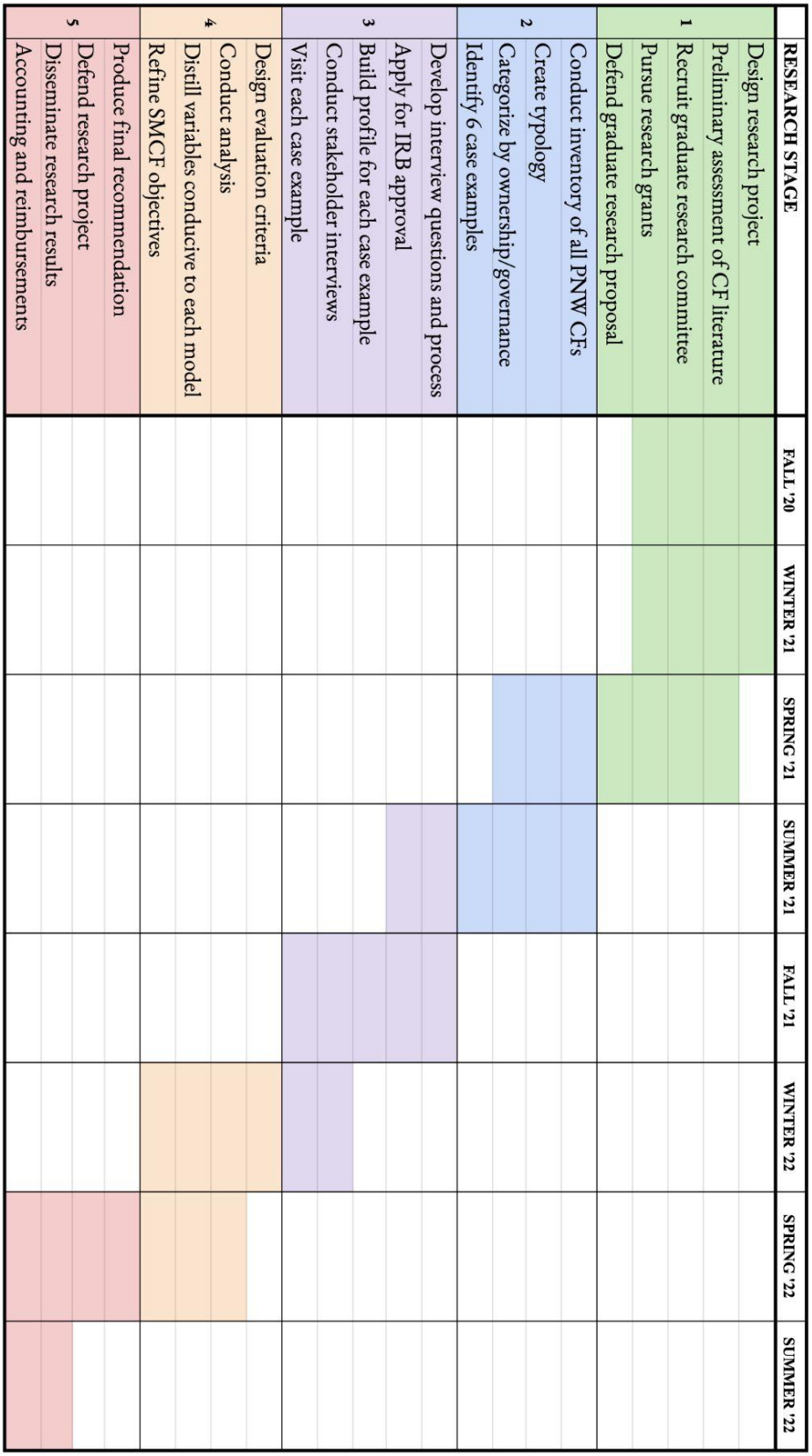
Phase 4: Analysis

A. Analyze the advantages and drawbacks of each approach of each model.
B. Consult with SMCF stakeholders to clarify and refine the key objectives of the SMCF.
C. Integrate my research on the Nooksack Adjudication into my analysis to determine how community forest could play out here in Whatcom County.
D. Contract GIS students at WWU to develop six maps that visually convey my research findings.

Phase 5: Final Recommendations

A. Produce my final recommendations to SMCF stakeholders on which ownership model, governance structure, and management strategies are most appropriate for the SMCF.
B. Defend research project before graduate research committee.
C. Disseminate research results in publications, academic symposiums, and professional conferences.
D. Finalize accounting for research grants and process reimbursements for research expenses.

Figure 11: Timetable for implementing my research project.



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Maps and Figures

Figure 1: The Nooksack Watershed (Schillinger-Brokaw & Harris 2022).

Figure 2: Land use of the South Fork watershed (Schillinger-Brokaw & Harris 2022).

X. ACKNOWLEDGEMENTS

I would like to thank my mentors and colleagues who aided my inquiry into community forestry and watershed management. First and foremost, I'd like to thank the partners who I have worked with to advance the proposed Stewart Mountain Community Forest. Each of you brings a nuanced and balanced perspective to the table, which has helped build a solid foundation for this community forest effort. Your vision and your persistence will be appreciated when the Stewart Mountain Community Forest becomes a reality.

To the faculty of Western Washington University's College of the Environment, thank you for constructing a productive ecosystem for me to test ideas and dive deep into the questions I deemed important. I would like to especially thank my advisor, Grace Wang, for her consistent support and continual guidance on this unique research project. I appreciate the help from my other committee members, Steve Hollenhorst and Oliver Grah, for their assistance on this technical project.

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XI. APPENDIX A: CASE STUDY TABLE

Three Different Models of Community Forestry

NAME	ACRES	OWNERSHIP	GOVERNANCE	MANAGEMENT
Nisqually Community Forest	2880 (plus 1,200 adjacent acres owned by the Nisqually Indian Tribe)	Nisqually Community Forest (type 1 supporting non-profit, wholly owned subsidiary of Nisqually Land Trust)	Board of the NCF non-profit makes management decisions; no formal stakeholder advisory group set up yet.	Working forest that enhances forest health to support watershed benefits and recreation. Carbon credits sold on the voluntary market.
Teanaway Community Forest	50,241	Washington Department of Natural Resources (co-managed with Washington Department of Fish & Wildlife)	Agencies make final decisions together according to an interagency agreement; large and active Advisory Committee participates in planning processes relating to recreation, restoration, and management.	Focus on restoration to support watershed health and salmon recovery. Recreation is another primary focus. Eventually it will be a working forest, although no harvest has taken place yet.
Nason Ridge Community Forest	3,714	Chelan County (as of April 2022)	Chelan County will make final decisions about the property in consultation with a Stewardship Committee that has yet to be developed.	Working forest managed to reduce fire risk and restore watershed health. Recreation is also a major management priority.

XII. APPENDIX B: INTERVIEW SCRIPT

Restoring the Nooksack watershed through community-driven forest stewardship

Interview Questions for Key Stakeholders and Representatives

DETAILS

- As a graduate student at WWU, Alexander Harris is conducting a research project that investigates five community forests in Washington and assesses their ownership and governance models. Harris will conclude his project with a recommendation on which approach is most conducive to the proposed Stewart Mountain Community Forest in Whatcom County.
- Harris will interview representatives from the organizations, tribes, and state/local agencies that have been most involved in these community forest initiatives.
- Interviews will be conducted via zoom, with some in person (outside, socially distant). All interviews will be recorded, but permission will be granted before recordings commence. Interviewees will have the option to remain anonymous.

VERBAL CONSENT

I will read the following to each participant prior to recording the interview:

> *Thank you for participating in my graduate research project at Western Washington University titled "Restoring the Nooksack watershed through community-driven forest stewardship." The primary goal of this research project is to examine several case examples of community forestry in order to determine which models of ownership and governance may be conducive to the proposed Stewart Mountain Community Forest. The primary audience for this research will be stakeholders and government representatives working to develop the Stewart Mountain project. By verbally consenting, you will allow me to record this interview and reference your name in my final report, which will be delivered to Stewart Mountain partner groups in June 2022. Do you consent to these terms?*

QUESTIONS

INTRODUCTION

1. What is your role in this community forest effort?
2. How long have you been involved?

HISTORY

1. What was the impetus behind the project? What brought the partners together to develop a community forest?
2. What were the motivating objectives and desired outcomes from the onset?
3. Which partner groups played a critical role in the formation of this CF?
4. How did these partner groups work together? Did you form a formal committee, or was collaboration more informal?

FUNDING SOURCES

1. Which sources of acquisition funding did you pursue before you were successful?
2. Which grants (if any) were awarded? What were you able to do with the funding?
3. Did you leverage funding from carbon credits or other ecosystem services to support acquisition? If so, who were your partners in these transactions?
4. How are the costs associated with management and administration funded currently, and how do you intend to fund these processes in the future?

OWNERSHIP

1. Which entity currently owns the community forest? If ownership is split, what is the arrangement?
2. How did the founding partner groups decide which entity should own the forest?
3. What legal agreements (i.e. easements, covenants, contracts, deed restrictions, multiple deed holders, etc.) were used to set up the project?
4. Do you believe this ownership model has been successful in achieving the stated goals of the community forest? What have been some advantages and disadvantages of this model?

MANAGEMENT

1. What are the management priorities for the forest?
2. Has a Forest Management Plan been developed? Can you share this with me?
3. What kind of forest management strategies are used to accomplish these objectives?
4. How much money is generated annually by forest harvest activities?
5. How is that money spent?

GOVERNANCE

1. What formal decision-making mechanisms are in place to decide how the forest is managed?
2. What role does the landowner entity play in decision-making?
3. Beyond the core management committee that makes final decisions about the forest, are there "stakeholder advisory committees" of any kind? What about a "scientific advisory council"?
4. What kinds of community outreach takes place? Does the community have any formal role in decision-making (e.g. electing committee members, filling out surveys, etc)?

CLOSING COMMENTS

1. What else would you like to share?
2. Which documents in particular should I review to learn more about this community forest? Are you able to share these documents with me?
3. Would you like to remain anonymous in my final report?