



**NATURAL  
RESOURCES**

DAVE UPTHEGROVE  
COMMISSIONER OF PUBLIC LANDS

**WESTERN WASHINGTON  
FOREST HEALTH  
STRATEGIC  
PLAN**

## ACKNOWLEDGEMENTS

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The Forest Health Advisory Committee (FHAC) was established by RCW 76.06.200 in 2017. The mission of the FHAC is to contribute to the improvement of forest health by providing guidance and advice to the Commissioner on forest health conditions and solutions thereby helping to make Washington forests, regardless of ownership, healthier and more resilient to insects, disease, invasive species, catastrophic wildfire, climate change, and other disturbance. Specifically, this committee helps to inform successful implementation of the 20-Year Forest Health Strategic Plan: Eastern Washington, Western Washington Forest Health Strategic Plan, and Washington's Forest Action Plan.

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**Lower Elwha Klallam Tribe**  
**Nooksack Indian Tribe**  
**Nisqually Indian Tribe**  
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**All photos from Washington DNR archives unless otherwise noted.** Cover photos (clockwise from top left): New 2D Bridge on the Olympic National Forest in the Calawah Watershed, DNR Federal Lands Program; Restored Elwha River (Credit Hal Bergman); DNR Service Forestry Program meeting with a small forest landowner; Forest monitoring on the Olympic Experimental State Forest.

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# WESTERN WASHINGTON FOREST HEALTH STRATEGIC PLAN



WASHINGTON STATE DEPT OF  
**NATURAL  
RESOURCES**

**DAVE UP THE GROVE**  
COMMISSIONER OF PUBLIC LANDS

DECEMBER 2025



PAVL POLO / UNSPLASH

**“THE WASHINGTON  
STATE DEPARTMENT  
OF NATURAL  
RESOURCES IS COMMITTED  
TO IMPLEMENTING THIS PLAN  
THROUGH COLLABORATION,  
TRANSPARENCY, AND  
ACCOUNTABILITY.”**

**DAVE UP THE GROVE**  
COMMISSIONER OF PUBLIC LANDS



## LETTER FROM COMMISSIONER OF PUBLIC LANDS AND STATE FORESTER



**DAVE UPTHEGROVE**  
Commissioner of Public Lands



**GEORGE GEISSLER**  
State Forester

Dear Partners,

Washington’s forests are central to the identity and prosperity of our state. They provide spiritual renewal, clean water, sustain fish and wildlife habitat, store carbon, and support vibrant rural economies. For Tribal Nations, communities, and generations of Washingtonians, forests are also places of cultural connection and inspiration. Protecting and sustaining these forests for the future is a shared responsibility—and one of the most important challenges of our time.

Western Washington’s forested landscapes face growing pressures. Climate change is already reshaping patterns of rainfall, snowpack, and drought; increasing the risks of wildfire, flooding, insects, and disease. Population growth and land conversion continue to fragment working forests, while communities face housing shortages and decades-long economic transitions. At the same time, aging forest infrastructure, including forest roads and our wood products infrastructure, require investment and revitalization. These challenges are complex, interconnected, and urgent.

The Western Washington Forest Health Strategic Plan charts a path forward. DNR developed this plan with input and feedback from Tribes, landowners, local governments, federal agencies, industry, conservation organizations, and community members. This plan articulates an ambitious Vision and Mission and sets shared Goals and Priority Actions to sustain forest and watershed health, strengthen rural economies, and ensure equitable access to forest benefits. It builds on the lessons of the 20-Year Forest Health Strategic Plan for Eastern Washington, while recognizing the unique ecological, social, and cultural context of the west side.

The Washington State Department of Natural Resources is committed to implementing this plan through collaboration, transparency, and accountability. We will work to align investments, support active stewardship across land ownerships, and expand opportunities for rural communities to thrive. Just as importantly, we will track progress, learn from results, and adapt our strategies over time to ensure that Washington’s forests remain healthy and resilient for generations to come.

We extend our gratitude to the Forest Health Advisory Committee, Western Washington Forest Health Strategic Plan Work Group, Tribes, local partners, and community members who contributed their time and expertise to the development of this plan. Together, we can meet today’s challenges and ensure thriving forests for the future.

Sincerely,



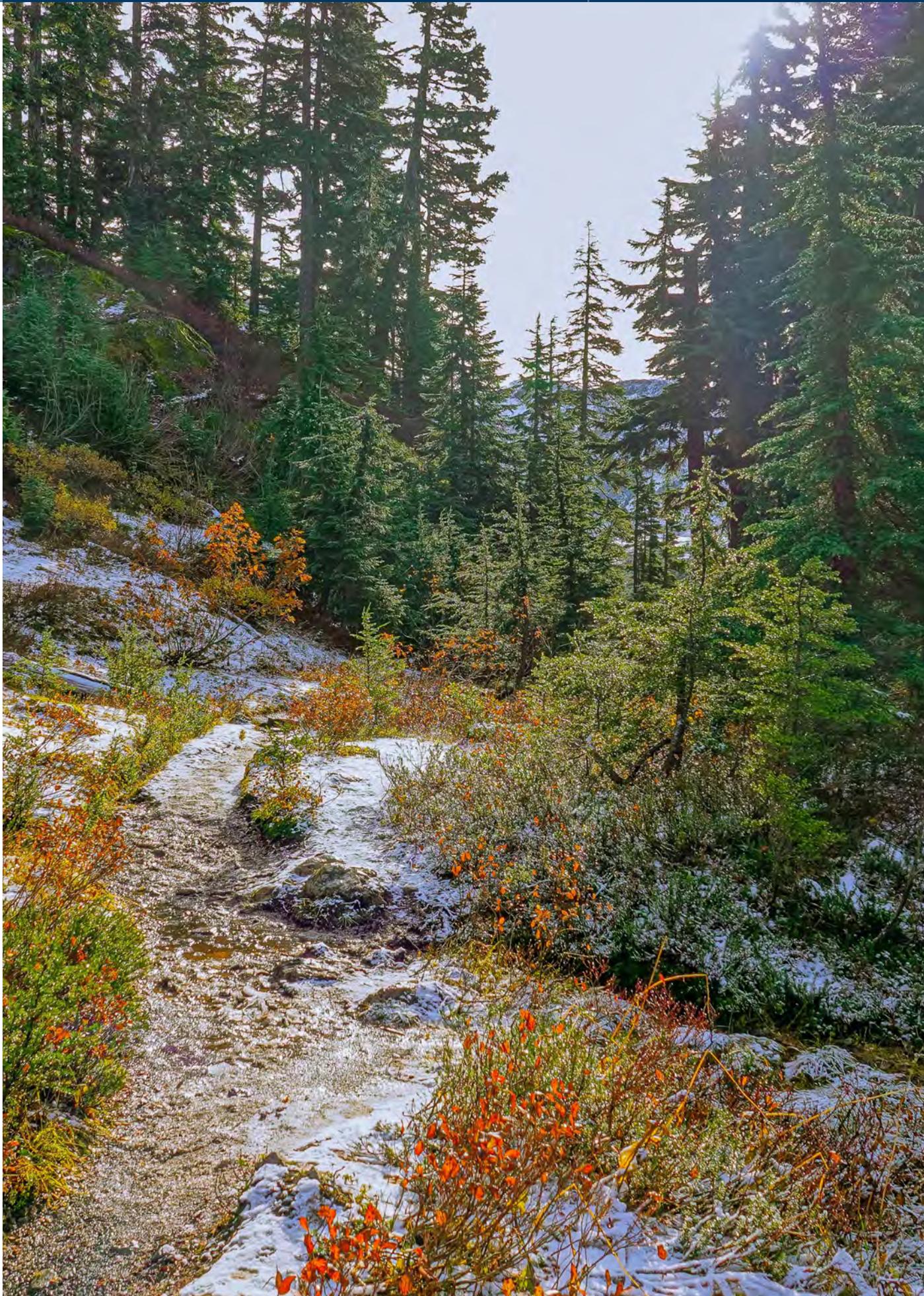
**DAVE UPTHEGROVE**  
Commissioner of Public Lands



**GEORGE GEISSLER**  
State Forester and Deputy Supervisor  
for Wildfire and Forest Health



PAVL POLO / UNSPLASH



# Introduction

**Forests in western Washington are vital to the region’s identity, economy, and quality of life. They provide clean air and water, sustain fish and wildlife habitat, store carbon, and support local jobs in forestry, recreation, and tourism. These forests also hold deep cultural significance for Tribes and serve as places of connection, renewal, and education for millions of residents and visitors. Yet, western Washington forests are increasingly threatened by climate change, drought, and the pressures of development and urbanization.**

The Western Washington Forest Health Strategic Plan represents an all-lands, all-hands effort to bring people together to identify priorities for how to collectively steward and manage these forests. The Western Washington Forest Health Strategic Plan builds on lessons learned during the development and implementation of the [20-Year Forest Health Strategic Plan: Eastern Washington](#), and it reflects the outcomes of productive, collaborative conversations centered on the most pressing threats to forest health and resilience in western Washington. This strategic plan is formally integrated into the 2025 revision of the State Forest Action Plan, ensuring both plans align and leverage existing forest health and resilience initiatives across the state.

The development of this strategic plan came at a time of significant change, including evolving federal priorities and constrained state budgets, making collaboration and strategic investment more important than ever. The planning process sought to identify a shared vision and mission, as well as goals, priority strategies, and actions for the Department of Natural Resources (DNR) and its partners to advance over the next decade. This plan also aims to increase efficiency and effectiveness of forest health work by leveraging limited resources to achieve the greatest impact and highlighting key areas where additional strategic investments are needed to meet shared goals.

This introductory section focuses on emerging forest health issues, western Washington wildfire, and socioeconomic considerations. The content in this section highlights the ecological drivers of forest restoration and management in western Washington, with a focus on drought, insects and disease, as well as wildfire. This section also touches on the important roles of communities, forest workers, Tribes, and the forest products industry in responding to these challenges.

JOHN MCCOLGAN / BLM



▲ Forest provide clean air and water, sustain fish and wildlife habitat, store carbon, and support local jobs.



# Emerging Forest Health Issues in Western Washington

## **Western Washington's forests face a growing array of stressors.**

Climate change is amplifying existing challenges and intensifying drought, which can increase tree stress. Insects and disease outbreaks are likely to expand into new areas as drought intensifies, and trees become more vulnerable. A changing climate may also alter the frequency and severity of disturbances such as windstorms, extreme heat events, and wildfires. These emerging threats are complex and interrelated, requiring adaptive, science-based management and collaboration across ownerships. Understanding and preparing for these changes is essential for sustaining the ecological, cultural, and economic benefits forests provide to western Washington communities.

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**THESE EMERGING THREATS  
ARE COMPLEX AND INTERRELATED  
REQUIRING ADAPTIVE, SCIENCE-BASED  
MANAGEMENT AND COLLABORATION  
ACROSS OWNERSHIP BOUNDARIES.**



▲ The 2021 heat dome led to extreme heat across the Pacific Northwest. The extreme heat scorched many trees and killed seedlings across the region.

## Drought

Drought is not new to western Washington, but it is anticipated to become more frequent, intense, hotter, and complex due to climate change. Although total annual precipitation may increase in some areas, warmer winters and rising snowlines are reducing snowpack and shifting the timing of streamflow, resulting in less available water during the critical late summer months when forests, communities, and aquatic ecosystems need it most.

Longer dry periods and hotter summers will amplify evaporation rates, further drying soils and increasing competition for limited water resources. Water stress weakens trees and reduces their resistance to pathogens such as bark beetles, root diseases, foliar pathogens, and other pests. In some areas, such as western Washington lowlands, recurring drought is already linked to localized mortality in species like western redcedar (*Thuja plicata*) and bigleaf maple (*Acer macrophyllum*).

As the severity and intensity of drought increase in western Washington:

- Resistance and resilience to other disturbances like root disease and wildfire will decrease.
- Native insect and disease outbreaks may expand in frequency and range.
- Non-native pests and pathogens may establish or spread more rapidly.
- Seedling mortality may increase during establishment phases.

### Building Drought Resilience in Forests

Forest management can play a significant role by reducing the impacts of drought. Proactive and adaptive strategies may include:

- Forest thinning to reduce stand density and moisture competition.
- Favoring site-appropriate or drought-tolerant species during planting and regeneration.
- Designing projects to enhance the landscapes retention of water, including retaining snow and slowing melt by using topography and vegetation.
- Identifying and protecting drought refugia areas, such as microclimates that retain soil moisture and provide important habitat under drying conditions.

These strategies can help maintain forest health, promote biodiversity, reduce the risk of large-scale tree mortality, and support more successful reforestation and long-term forest adaptation.



**LONGER DRY PERIODS  
AND HOTTER SUMMERS  
WILL AMPLIFY  
EVAPORATION RATES,  
FURTHER DRYING SOILS  
AND INCREASING  
COMPETITION FOR  
LIMITED WATER  
RESOURCES.**



## Native Forest Insect and Disease Impacts

A wide range of native disturbance agents like insects, fungi, animals, and parasitic plants are always active in western Washington and can cause varying levels of tree mortality or dieback. Native insects and pathogens at low levels can provide important ecological roles in nutrient cycling. However, when insects and pathogens reach higher levels, the increased damage can cause significant changes in stand structure and forest composition over time. These increases, referred to as outbreaks in the case of insects, are sometimes linked to disturbance events such as drought, extreme weather, and wildfire, all of which may generate pulses of fresh breeding material, improved growth conditions for fungi, and weakened tree defenses.

There has been an increase over recent decades in the effects of otherwise minor damage agents, typically opportunists, taking advantage of severely weakened trees. Damage from these “secondary” agents, so named because their outbreaks rarely cause mortality of healthy trees, is becoming more widespread and potential outcomes are not well understood. Examples include the range expansion of California fivespined Ips into western Washington, elevated levels of mortality from Douglas-fir engraver, and increased incidence of sooty bark disease in maple trees.

In changing climate conditions, more unprecedented secondary pathogen and insect events may occur and will need to be closely monitored to better understand the contributing factors and impacts.

▲ Western redcedar along US-101 near Humptulips (Grays Harbor County) impacted by heat scorch photographed in July 2021.

## Threats from Invasive Insects and Pathogens

Non-native forest insects and pathogens such as the emerald ash borer, spongy moth, and *Phytophthora ramorum* (Sudden oak death pathogen) are major threats to western Washington forests. Native trees do not have effective defense mechanisms and natural controls such as predators and parasites are often limited. Western Washington is also at increased risk of new invasive introductions due to the higher number of pathways (due to the amount of people that live and travel through the region) through which pests can be introduced. These factors make invasive insect and pathogen outbreaks more likely and challenging to control.

New introductions occur frequently. Early detection and rapid response are critical for preventing establishment in our forests and communities. Some invasive threats can be extremely challenging or impossible to eradicate following introduction to the ecosystem, especially those that live inside tree stems and bark. Once a non-native forest insect or pathogen becomes established in Washington's forests, it becomes the responsibility of land management agencies to manage those threats to forest health.

Key actions for increasing preparedness and improving response to new and emerging forest pest events include:

- **Maintaining regular monitoring programs** such as aerial surveys, trap and baiting surveys, and ground-based damage monitoring plots.
- **Initiating new monitoring projects** to evaluate severity, distribution, and causal factors of new and emerging forest damage events.
- **Conducting outreach and education.**
- **Planning for rapid response** to new invasive species introductions.
- **Acknowledging uncertainties** and knowledge gaps in the ways different forest types and insect/disease species may respond to more frequent and intense drought and other climate change effects.
- **Promoting an integrated pest management approach** with an emphasis on increasing forest resilience.



**Top:** Fir engraver galleries in the Olympic National Park in 2024.  
**Bottom:** Fork-shaped egg galleries of California fivespined ips (CFI) in ponderosa pine in Seattle. CFI, a pine engraver beetle native to Oregon and California, was first detected in Washington state in 2010.



## Abiotic Disturbances

Abiotic disturbances, disturbances caused by non-living factors, are a natural and integral part of forest ecosystems. They influence forest structure, composition, and function, and can be important for maintaining biological diversity and facilitating regeneration. Abiotic disturbances such as wildfire, drought, windstorms, flooding, and other extreme weather events can cause tree mortality on both small and large scales. Surviving trees may be damaged or weakened by these events. Abiotic disturbances can also increase tree susceptibility to attacks by insects and pathogens.

Observed impacts of drought and extreme heat events in western Washington forests have increased in recent decades. The number and concentration of insects and pathogens are also often increasing in trees damaged by drought and heat. Combinations of abiotic and biotic factors can contribute to tree decline and mortality, sometimes referred to as “decline complexes.” Novel decline complexes have been increasingly observed in western forests. The underlying causes and long-term impacts are often not well understood.

▲ Silver fir beetle-caused mortality in Pacific silver fir in eastern King County in 2003. Many forest insects and diseases are linked to drought.



Bear Gulch Fire,  
July 23, 2025.



# Wildfire in Western Washington

**Western Washington forests evolved with wildfire and cultural burning**, yet in a very different way than the fire-prone forests of eastern and central Washington. Most of the east Cascades experienced regular, low and mixed severity wildfire, which shaped species composition, forest structure, and created fire-adapted ecosystems. In western Washington, there are significant variations in fire regimes. Large areas historically experienced relatively infrequent, stand-replacing fires; while some portions of western Washington, such as lowland and rain shadow areas, experienced more frequent, mixed-severity fire. Many intermediate fires were due to cultural burning.

Large wildfires in western Washington today pose significant risks to communities, infrastructure, drinking water, critical habitat, and other high value resources. Wildfires that are low likelihood, high consequence natural disasters can be difficult to plan for given the long time horizons between events. Climate change is anticipated to increase the likelihood of wildfire in western Washington, and human population growth may also increase the potential for human-caused fires.

This plan lays out the current state of knowledge about western Washington wildfire, as well as areas of uncertainty. Given the uncertainty associated with wildfire on the west side of the Cascades, investments in scientific research are critical to better understand changing fire dynamics and the most effective mitigation measures. This plan includes present-day actions, based on best available evidence, with the goal of reducing risk and being more prepared and resilient when wildfires occur. The plan also recommends investments in scientific research, monitoring, and planning to ensure our strategies adapt to changing climatic conditions over time.



▲ Post-fire debris flow in the footprint of the Bolt Creek Fire, Snohomish County.

## Western Washington Fire: Historical Regimes and Timing

Fire regimes are used to describe and categorize the frequency, size, severity, and seasonality of fires in a given area (Agee 1993). Historical fire regimes in western Washington include a variable mix of low, moderate, and high-severity fires at a range of return intervals from frequent to very infrequent. Insights on these complex fire regimes are evidenced by inventories of tree ages and studies utilizing fire scars (Wendel and Zabowski 2010; Wetzell and Fonda 2000, Bakker et al 2019), fire scars on tree rings (Merschel et al. in prep), and traditional knowledge and records of fire by Indigenous peoples. Indigenous knowledge and other records are supplemented by additional non-native accounts and in early 20th century forest inventory and mapping (Reilly et al 2021, WA DNR 2023, WA DNR 2025).

Current research identifies three main fire regime types in western Washington:

### **FIRE REGIME TYPE 1**

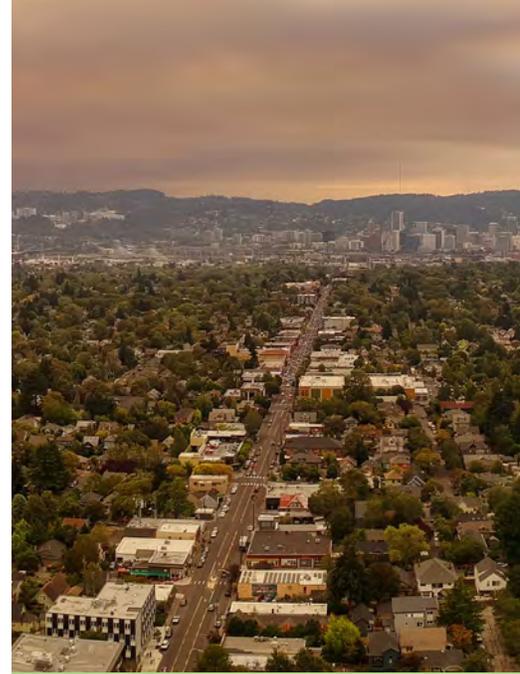
It includes a large proportion of high-severity, stand-replacing, infrequent fire, with very few other fire events. There are often three factors that need to happen simultaneously for these larger, high-severity fires to occur: sustained seasonal drought conditions, an ignition source, and a strong east wind event. Return intervals for these large, high-severity burns range from 100 to 600 years, depending on different topographic, ecological, and social factors (Fales and Donato, Donato and Blazina 2020, Reilly et al. 2022).

A few examples of this type of large-scale, stand-replacing fire include the 1902 Yacolt Burn in Washington (see photos on next page) and the 2020 Labor Day fires in Oregon (Reilly et al 2022). Despite occurring 118 years apart, these fires burned during the exact same week, during the seasonal late-August-to-mid-September window when these large, high-severity burns typically occur (Fales and Donato 2024).

### **FIRE REGIME TYPE 2**

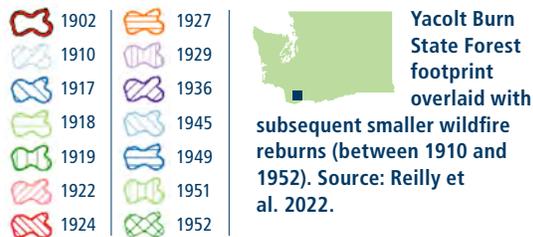
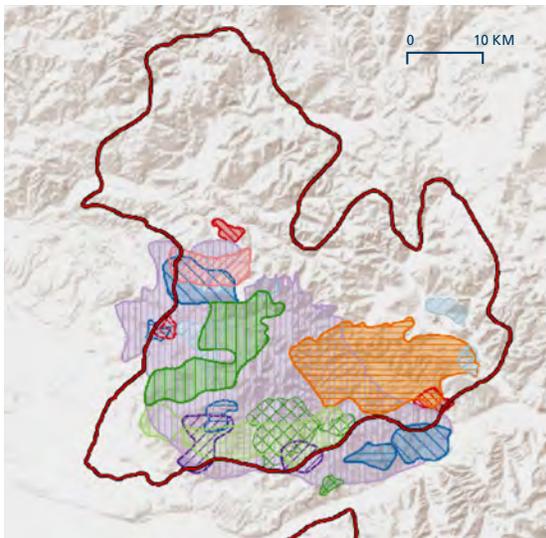
It includes infrequent stand-replacing fires similar to those in Regime Type 1, along with reburns and other sporadic intermediate fires. Reburns, which typically occur in the first several decades following stand-replacing fire, are quite common, sometimes affecting or partially affecting a burn footprint several times over. The Yacolt Burn, which partially reburned at least 13 times between 1910 and 1952, is a prominent example of this dynamic (Reilly et al. 2022). Fire return intervals for other intermediate fires (between stand-replacing-fire/reburn episodes) are widely variable, but typically occur every 60 to 150 years.

Downtown Portland during  
the 2020 Labor Day fires  
in Oregon.



**HISTORICAL FIRE  
REGIMES IN WESTERN  
WASHINGTON INCLUDE  
A VARIABLE MIX OF  
LOW, MODERATE, AND  
HIGH-SEVERITY FIRES  
AT A RANGE OF RETURN  
INTERVALS.**

The Yacolt Burn, in southwest Washington and part of Oregon, partially reburned at least 13 times between 1910 and 1952.



### FIRE REGIME TYPE 3

It includes infrequent stand-replacing fires with smaller reburn patches, as well as more frequent intermediate fires. Due to the location of these fires—along historic travel corridors and river bottoms, as two examples—Regime 3 tends to be associated with Indigenous burning. Fire was used by Indigenous peoples across western Washington (Anderson 2009, Hooper 2015, Norton et al. 1999, White 1999, Bakker 2019, Eisenberg 2021 et al., Hennebelle et al. 2020, Wetzel and Fonda 2000, Storm and Shebitz 2006). For example, Garry Oak (Oregon white oak; *Quercus garryana*) ecosystems are particularly noted for their history of being managed through fire (Grand and Berger 2024). Historical records, place names, oral histories, tree burn scars, and lake sediment deposits also demonstrate that frequent, intermediate fires occurred in wetlands, upland forests, alpine forest openings, and forest meadows.

It is important to note that, with abundant, fast-growing fuel and infrequent, stand-replacing fire regimes on the west side, interventions normally associated with reducing wildfire severity, such as thinning and prescribed fire, are not as likely to influence subsequent fires as they are in dry east side forests (Halofsky et al. 2018; Reilly et al. 2022). Landscape-scale fuel treatments are a key wildfire risk mitigation measure in eastern Washington and a large component of forest health. In western Washington, treatments such as prescribed fire can carry important socio-ecological or cultural benefits, however little is known about the efficacy of fuels management at a landscape-scale.



Bear Gulch Fire burning on the north side of Lake Cushman in Olympic National Forest and National Park, near Hoodspport, WA in 2025.

## Wildfire Hazard in Western Washington

Western Washington has a complex and unique relationship with wildfire compared to eastern Washington. The differences in frequency and size of recent fires between eastern and western Washington is strikingly apparent (see map below). The number of large wildfires and the average annual area burned, are significantly higher in eastern Washington.

A wildfire hazard potential map is a geospatial product that can help to inform evaluations of wildfire risk or prioritization of fuels management needs across large spatial scales. The specific objective of a wildfire hazard potential map is to depict the relative potential for high-intensity wildfires that may be difficult to manage.

The most recent version of Washington's wildfire hazard potential map (shown on next page) is based on landscape conditions at the end of 2020 and wildfire simulation modeling that incorporates a wide range of possible weather scenarios. Western Washington forests are mainly classified as low to very low wildfire hazard, whereas most eastern

Washington forests are classified as high and very high hazard. This is primarily a function of the annual burn probabilities for western Washington, which are an order of magnitude lower than eastern Washington.

While wildfire hazard remains relatively low in western Washington, the risks associated with fire to human communities, critical habitat, and infrastructure are often higher. Western Washington, which accounts for only one-third of the state's area, is home to more than 60% of the state's residents. Given the density of people and values at risk in western Washington, community-level wildfire preparedness including home hardening, defensible space, and evacuation planning are the highest priorities (Calkin et al. 2023, Oregon Building Code 2023, NRDC 2025).

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**THE STEWARDSHIP AND MANAGEMENT OF WASHINGTON'S FORESTS DEPEND ON PEOPLE, AND HEALTHY FORESTS ARE CRITICAL TO THE STATE'S SOCIAL, CULTURAL, AND ECONOMIC VITALITY.**

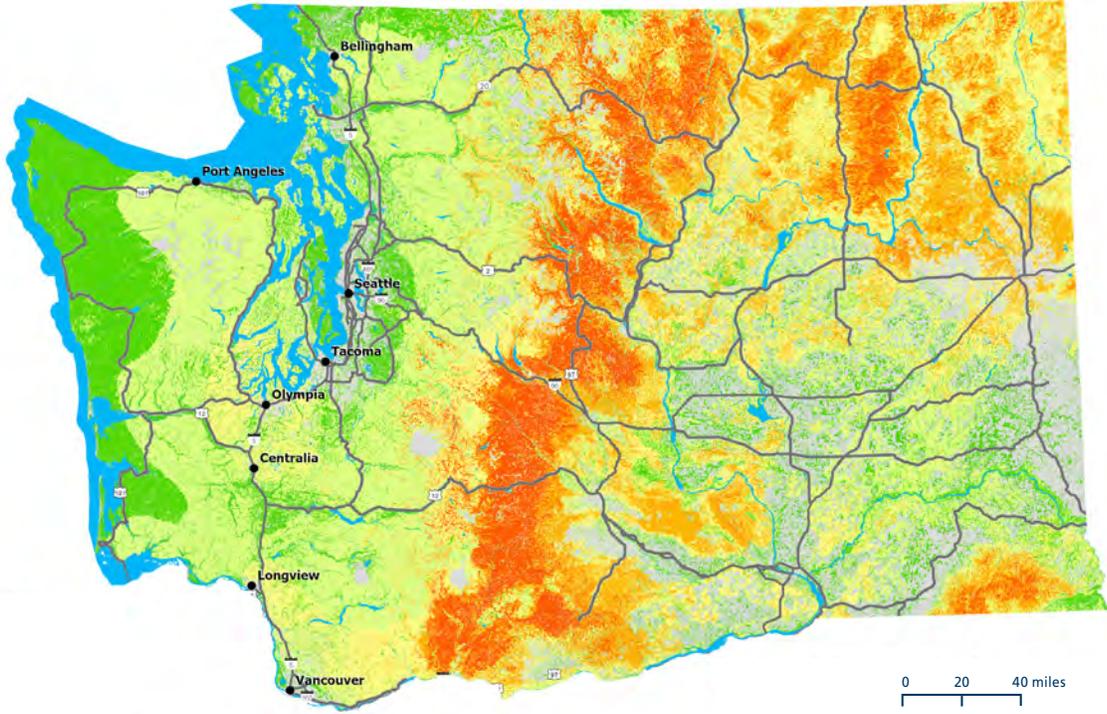
### Wildfire Hazard Potential

- Very Low
- Low
- Moderate
- High
- Very High
- \*Non-burnable
- Water

Wildfire hazard potential represents a combined index of burn probability and fire intensity.

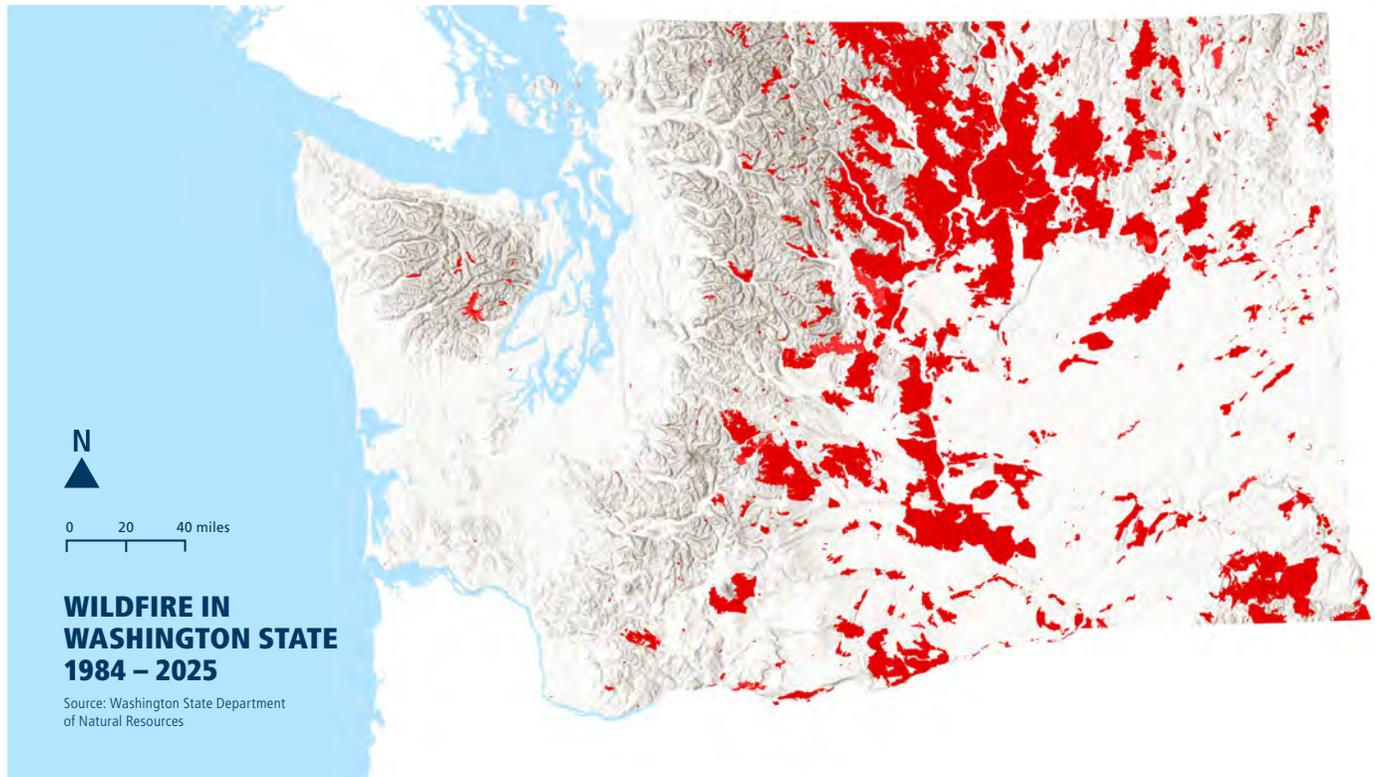
\*Non-burnable is developed, agricultural fields, perennial snow/ice, and bare ground.

Source: USDA Forest Service, Rocky Mountain Research Station.



## WILDFIRE HAZARD POTENTIAL IN WASHINGTON STATE

▲ Wildfire hazard potential map is a raster geospatial product produced by the USDA Forest Service, Fire Modeling Institute 2023. Areas mapped with higher wildfire hazard potential values represent fuels with a higher probability of experiencing torching, crowning, and other forms of extreme fire behavior under conducive weather conditions, based primarily on landscape conditions at the end of 2020.



## WILDFIRE IN WASHINGTON STATE 1984 – 2025

Source: Washington State Department of Natural Resources



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**INVESTMENTS IN SCIENTIFIC RESEARCH ON BOTH HISTORIC FIRE REGIMES AS WELL AS FUTURE FIRE SCENARIOS IN WESTERN WASHINGTON ARE A HIGH PRIORITY FOR THE STATE.**

## **Future of Western Washington Wildfire and Additional Research Needs**

Fire modeling shows that wildfire risk will increase in western Washington (Halofksy et al. 2018, Dye et al. 2024). None of the models, however, show an increase that puts western Washington in a fire regime with the frequency of fire currently seen in eastern Washington.

Humans start the vast majority of wildfires in Washington. As a result of increasing human population growth, especially in western Washington, the number of wildfire starts and the number of wildfires that threaten communities may increase. Investments in fire prevention are critical to reduce the number of fire starts.

When fires occur, it will be important to have capacity to quickly detect and suppress fires that threaten values at risk. Adequate suppression capacity will be especially important for wildfires in the wildland urban interface (WUI) where fires are more dangerous and expensive to suppress. Wildfires that move into suburban and urban areas can also become conflagrations that spread from structure to structure.

Investments in scientific research on both historic fire regimes as well as future fire scenarios in western Washington are a high priority for the state. The knowledge and tools used to better understand past fire history in western Washington need to be expanded to include additional fire history reconstruction research and oral histories and passed-down knowledge of Indigenous peoples (Kinkade 1991, Hoskins 1941, Hooper 2015). Research is also needed to determine how climate change will influence future fire regimes, the role of forest management in influencing fire behavior, fuels treatment effectiveness and longevity, and best management practices to prepare for post-fire impacts (Rivershed SPC and WA DNR 2025).

# Social and Economic Considerations in Western Washington

**Forests in western Washington** are deeply intertwined with the region’s people, culture, and economy. They support livelihoods, sustain communities, and provide opportunities for recreation, education, and cultural expression. The benefits and burdens of forest management are not shared equally. Historic and systemic inequities, economic transitions, and housing challenges have shaped who can access, work in, and benefit from forest landscapes.

The Western Washington Forest Health Strategic Plan recognizes that healthy forests depend on people to steward them, and that advancing forest resilience requires integrating social, cultural, and economic realities into stewardship decisions. This section highlights the human context of forest health, emphasizing equity, environmental justice, Tribal inclusion, and forest workers.

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**HISTORIC AND SYSTEMIC  
INEQUITIES, ECONOMIC  
TRANSITIONS, AND HOUSING  
CHALLENGES HAVE SHAPED  
WHO CAN ACCESS, WORK IN,  
AND BENEFIT FROM FOREST  
LANDSCAPES.**

CLARK CONSERVATION DISTRICT



▲ Clark Conservation District assisting with tree planting.

## Access to Forest Benefits

The Forest Resilience Division Environmental Justice Implementation Plan structural and systemic barriers prevent many communities, particularly low-income households, communities of color, immigrants, youth, people with disabilities, rural communities, and Tribal members, from enjoying the full range of forest values. These barriers include lack of affordable transportation, proximity to public forestlands, language and cultural disconnects, and financial costs to access forests, such as user fees, permits, and equipment expenses.

Cultural and historical inequities compound these challenges. Many Indigenous communities retain ancestral ties and have federal treaty rights to forested landscapes, yet lack full representation in land management decision-making. Ensuring that all Washingtonians can connect with forests, whether for recreation, healing, ceremony, or livelihood enhances environmental justice, strengthens public support for conservation, and fosters a more inclusive forest stewardship ethic.

### DNR Forest Resilience Environmental Justice Implementation Plan

It is critical that forest policies and programs advance environmental justice and support Indigenous self-determination. Senate Bill 5141, also known as the Healthy Environments for All (HEAL) Act, became law on July 25, 2021 and established mandates for seven agencies in Washington, including DNR. In response, DNR's Forest Resilience Division published its Environmental Justice Implementation Plan. While originally published as a standalone document, it is now integrated into the State Forest Action Plan and incorporated throughout this Western Washington Forest Health Strategic Plan.

The Environmental Justice Implementation Plan outlines key actions to improve equity outcomes for forest resilience work. Those include development of inclusive decision-making structures, strengthening outreach to historically underserved and marginalized communities, and tracking and improving outcomes with equity metrics.

In developing the implementation plan, DNR focused on listening, relationship-building, supporting, and partnering with Tribal nations, Indigenous individuals, historically underrepresented forest workers and their families, and communities in and around both rural and urban forests. The plan seeks to address issues related to treaties and worker rights while incorporating results of community-led, community-centered initiatives. The plan includes five overarching goals and 58 associated actions.

#### FOREST RESILIENCE DIVISION ENVIRONMENTAL JUSTICE GOALS

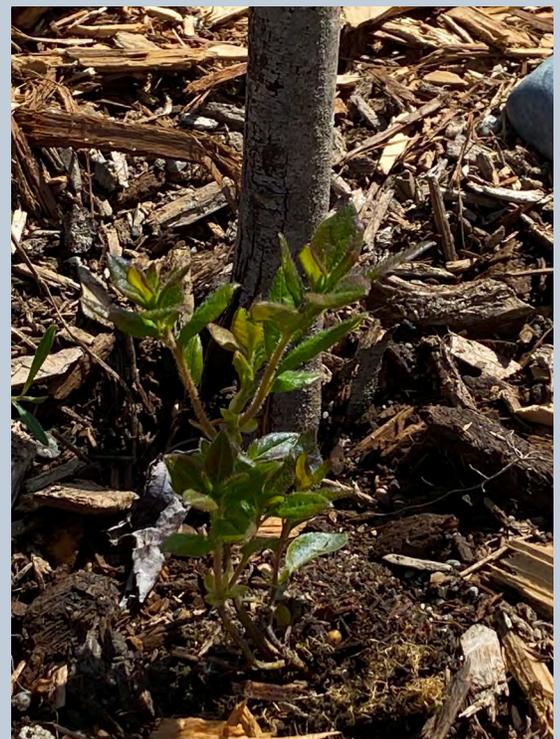
**Goal 1:** Increase and enhance Tribal partnerships to achieve forest resilience goals

**Goal 2:** Develop, strengthen, and expand partnerships and resources for groups and demographics historically underserved by our programs.

**Goal 3:** Make forest resilience communication materials more accessible to a wider number of Washingtonians.

**Goal 4:** More equitably partner with and support communities in forest resilience planning and implementation efforts.

**Goal 5:** Review and identify opportunities to improve internal policies, contracting, education, and training requirements to better prioritize equitable implementation practices.



▲ Close-up of a recent planting at Chief Leschi School's new on-campus forest garden.



## Tribal Inclusion

Washington is home to 29 federally recognized Tribes, many of which retain treaty rights and cultural ties to forested landscapes. The [25-Year Monitoring Report on Tribal Inclusion](#) that informed the Northwest Forest Plan amendment process emphasizes the need for stronger federal-Tribal consultation, consistent recognition of Indigenous knowledge, and increased Tribal access to co-management opportunities. Priorities identified by the monitoring report, as well as other Tribal planning efforts include:

- **Enhancing Tribal sovereignty** and co-management authority.
- **Expanding funding** for Tribal-led restoration, wildfire prevention, and cultural resource protection.
- **Integrating Indigenous knowledge** into forest management planning.
- **Ensuring meaningful, early, and ongoing consultation.**

Partnerships with Tribes must be grounded in respect and shared governance. Investments in cultural resource protection, Indigenous stewardship practices, and Tribal workers are critical to these partnerships. These efforts may include co-developing restoration projects, honoring access rights, and funding Tribal-led initiatives focused on forest health, wildfire resilience, and climate adaptation.

**PARTNERSHIPS  
WITH TRIBES MUST  
BE GROUNDED IN  
RESPECT AND SHARED  
GOVERNANCE.**



**A SUSTAINABLE  
NATURAL RESOURCE  
ECONOMY DEPENDS  
NOT ONLY ON  
HEALTHY FORESTS  
AND FUNCTIONING  
MARKETS, BUT ON THE  
PEOPLE WHO LIVE AND  
WORK IN FORESTED  
COMMUNITIES.**

## **Forest Products Infrastructure and Workforce**

Timber-dependent communities have experienced major economic and demographic shifts due to modernization of mill and harvest technology, mill closures, shifting societal values, declining harvest levels on public lands, and contemporary land ownership patterns. This has led to job losses, reduced public services and county revenue, and eroded local forestry knowledge and skills.

Washington has lost significant milling capacity over the past 30 years. This challenges the economic viability of forest health treatments due to longer distances from worksites to markets and high haul costs. Removing small-diameter trees and woody biomass, which are essential for improving forest health in many overstocked forests, aren't economically viable without local markets. Simultaneously, skilled forestry professionals from equipment operators to road engineers are in short supply due to an aging workforce and underinvestment in training, education, and apprenticeship opportunities.

Future forest stewardship depends on investments in natural resources education and training opportunities today. Increasing access to natural resource education programs is critical to ensuring young people and early natural resource career professionals can explore forestry careers. Creating healthy and resilient forest ecosystems can contribute to revitalizing rural communities.

### **Natural Resources Workforce Housing**

A sustainable natural resource economy depends not only on healthy forests and functioning markets, but on the people who live and work in forested communities. A growing housing crisis in rural and natural resource dependent communities throughout Washington is undermining efforts to recruit, retain, and support the workforce necessary for forest stewardship, conservation, recreation management, wildfire response, and related fields.

There is growing recognition that forest management and affordable housing can and should be linked. New technologies and materials including mass timber and other wood innovations make it possible to create durable, climate-smart housing while supporting diverse local wood product markets and rural economies.

# Planning and Engagement Process

**Western Washington has a long history of collaboration** and coordination in forest and watershed management. Building on past efforts, the development of the Western Washington Forest Health Strategic Plan was guided by an inclusive, collaborative process that drew on the expertise, values, and perspectives of partners and communities across the region. Since 2020, DNR engaged extensively with the Forest Health Advisory Committee, federal and state agencies, Tribes, conservation organizations, timber industry representatives, and local community partners to inform this planning process. Recognizing the diversity of western Washington's forest ecosystems, ownerships, and management objectives, the Department of Natural Resources (DNR) designed a process that emphasized shared learning and meaningful engagement.

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**BUILDING ON PAST EFFORTS,  
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HEALTH STRATEGIC PLAN WAS  
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AND PERSPECTIVES OF PARTNERS  
AND COMMUNITIES ACROSS  
THE REGION.**



▲ Western Washington Forest Health Strategic Work Group members tour small forest landowners forest management projects in Jefferson County. Photo taken during the Chimacum Field Tour, August 2025.

## Guiding Questions

The strategic planning process was guided by three overarching questions:

- Where will coordinated planning, proactive stewardship, accelerated implementation, and focused investments lead to improved forest health and resilience in western Washington?
- What programs, tools, investments, and policies are needed to foster active forest management that strengthens forest and watershed resilience?
- What investments and actions can DNR and partners lead that are additive—not duplicative—of existing efforts and within our span of control?

These guiding questions helped inform external partner engagement and the content of the strategic plan.

## Forest Health Advisory Committee Recommendations

The planning effort began with [foundational recommendations](#) from the Forest Health Advisory Committee (FHAC), which has provided guidance to DNR on statewide forest health priorities since its establishment nearly a decade ago. In December 2024, the FHAC submitted recommendations to DNR regarding the primary challenges facing western Washington forests, an all-lands vision statement for forest health and resilience, and guiding principles for partner engagement. These recommendations established a framework for subsequent collaboration and helped shape the initial scope and structure of the plan.

## Formation of the Western Washington Forest Health Strategic Plan Work Group

To further broaden participation and ensure diverse perspectives were represented, DNR convened an ad hoc Western Washington Forest Health Strategic Plan Work Group in Spring 2025. The work group included more than 50 members representing Tribes, local governments, state and federal agencies, conservation organizations, industry partners, researchers and academic partners, and community-based organizations. Members brought expertise in forest ecology, watershed management, land conservation, wildfire preparedness, rural economic development, and environmental justice.

The work group met twice as a full group in 2025, in July and October, to review and refine draft vision and mission statements, goals, and strategic priorities. Between meetings, members provided targeted input through two structured surveys, three field tours, and more than 50 one-on-one and small group discussions facilitated by DNR staff. Individual meetings with local governments, industry representatives, and conservation partners also helped identify shared priorities and clarify areas of alignment with existing initiatives.



▲ Western Washington Forest Health Strategic Plan work group members tour the Yellowjacket Creek aquatic restoration project led by the Cowlitz Indian Tribe (top) and the Hampton Lumber sawmill in Randle, WA (bottom).



## Tribal and Partner Outreach

In addition to the structured work group process, DNR conducted extensive one-on-one outreach with Tribal governments and related key partner organizations across western Washington. These conversations provided space for deeper dialogue on Tribal priorities, culturally significant resources, and opportunities to incorporate Indigenous Knowledge and co-stewardship approaches into the plan. DNR staff also conducted a crosswalk of Tribal nation natural resource management plans, climate vulnerability analyses and adaptation plans, and other planning documents to identify key forest health concerns and challenges of western Washington tribes. This robust and participatory process helped DNR incorporate and reflect the knowledge and priorities of Tribal partners throughout this strategic plan. Each Strategic Plan Goal area includes strategies and actions that reference Tribal priorities and interests that DNR staff heard throughout the external engagement process.

## Field-Based Learning and Regional Engagement

Recognizing that forest health challenges and opportunities vary across western Washington, DNR hosted a series of three field trips during the summer of 2025 to ground the planning process in place-based learning. These field visits were designed to foster shared understanding among participants by exploring distinct ecological and socioeconomic contexts:

- **Darrington (July 2025):** Focused on public lands management, workforce development, and collaborative restoration with tribes, non-profits, and government entities in the Cascade foothills.
- **Jefferson County (August 2025):** Delved into county-led sustainable forestry, forest health and watershed resilience, localized innovations in forest economies, and community engagement efforts on local and privately owned forests on the Olympic Peninsula.
- **Packwood (September 2025):** Examined community wildfire preparedness and forest management approaches that may contribute to wildfire resilience in east Lewis County as well as field tour stops focused on forest products infrastructure and Tribally led watershed restoration.

Each field trip featured presentations and site tours led by land managers, conservation groups, and community partners. The insights gathered from these discussions directly informed the plan's goals and priority strategies and actions.

▲ Western Washington Forest Health Strategic Plan work group members learned about forest health issues on the Mount Baker-Snoqualmie National Forest during the Darrington field trip.

## Strategic Plan Scope and Content

This plan is intended to address forest health challenges and opportunities across public, private, and Tribal lands in western Washington. It establishes goals and priority strategies and actions, while focusing investments to enhance the long-term ecological, economic, and social sustainability of the region's forested landscapes. The plan seeks to align with scientific, social, cultural, and economic realities, while avoiding being redundant with existing strategic plans and initiatives. In that spirit, DNR defined the scope of this strategic plan, in consultation with the Western Washington Forest Health Strategic Plan Work Group and additional partners. This plan primarily addresses the following forest health and resilience issues in western Washington:

- Forest and Watershed Resilience and Climate Change:** Restoring the landscape-scale structure, pattern, composition, connectivity and function of forests and watersheds to a more resilient state and preparing the landscape for the anticipated effects of climate change, especially drought. This includes, but is not limited to, management and implementation decisions that accelerate the development of late-seral conditions, enhance connectedness of forests, diversify species composition, create high-quality early seral habitat, and address threats posed by invasive species. This goal area of the plan also seeks to bolster investments in a sustainable forest road network that provides access for Tribal and treaty rights, recreation, forest management, and fire response and emergency management needs while restoring and maintaining healthy watersheds for fish and wildlife.
- Preventing Forest Conversion:** Washington has lost more than one million acres of forestland to development since the 1970s. The plan seeks to ensure private forest landowners have access to tools, education and technical assistance to reduce conversion risk. Similarly, the plan emphasizes the need to utilize and expand available programs to conserve working forest lands at risk of development.
- Rural Economic Development:** Supporting rural economic development opportunities and pathways. This includes identifying current and potential workforce development options, particularly in rural communities; fostering production and processing of sustainable local forest products; developing and supporting wood innovations; and building workforce housing in rural communities.
- Wildfire:** While the incidence of fire in western Washington is low compared to eastern Washington, wildfire risk is increasing on the west side. The plan recognizes the importance of investing in scientific research while also taking actions to reduce human-caused ignitions and prepare communities and landscapes for resilience and recovery when fire occurs.

This voluntary plan was developed to provide an all-lands vision, mission, goals, strategies, and actions that DNR and partners can collectively take to improve and sustain health and resilient forests in western Washington. It complements but does not replace other planning and policy efforts that are relevant to western Washington forests.

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**THE PLAN SEEKS TO ALIGN WITH SCIENTIFIC, CULTURAL, AND ECONOMIC REALITIES, WHILE AVOIDING BEING REDUNDANT WITH EXISTING STRATEGIC PLANS AND INITIATIVES.**

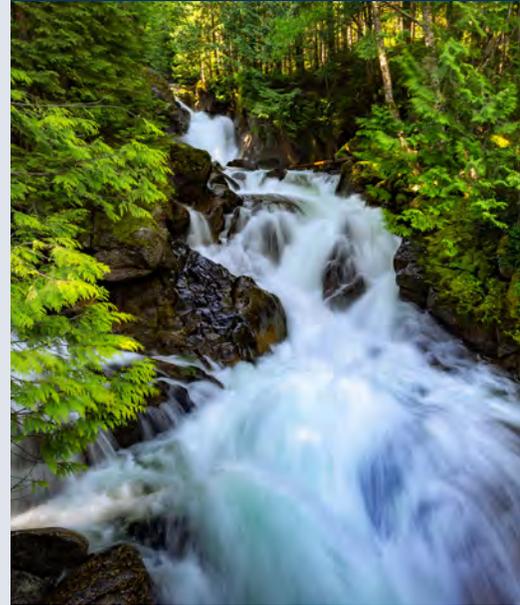
# Vision and Mission

## VISION

**Western Washington's forested landscapes are ecologically healthy and meet the socioeconomic and cultural needs of current and future generations.**

## MISSION

**Foster coordinated, voluntary actions and investments across western Washington that: promote forest and watershed health and climate resilience; respect landowner objectives; enhance the cultural, social, and economic vitality of historically forest-dependent rural communities; and strengthen collaborative stewardship across Tribes, agencies, landowners, and communities.**



## DEFINITIONS

**Forest Health:** Forest health is the condition of a forest ecosystem reflecting its ability to sustain characteristic ecological structure, function, and processes; resilience to fire, insects and other disturbance mechanisms; adaptability to changing climate and increased drought stress; and capacity to provide ecosystem services to meet landowner objectives and human needs.

**Forest Resilience:** Resilience is the capacity of forests to persist through and recover from disturbance while maintaining its structure and function and the ecosystem services they provide. This includes the ability to change and adapt to changing climate and disturbance regimes without shifting to a qualitative different state (e.g. shift from forest to grassland).

**Forest Stewardship:** Forest stewardship is the active, long-term management of a forest's resources to ensure its health and productivity for the present and future, balancing economic, ecological, cultural, and social benefits.

# Goals and Priority Strategies and Actions

This section of the plan details the five overarching goals and priority strategies and actions to accelerate forest health and resilience in western Washington. The five goals are:

- 1. Enhance forest and watershed health** and resilience in western Washington.
- 2. Maintain working forests** in western Washington by reducing the risk of forest conversion to non-forest uses.
- 3. Support and expand natural resource economies** in western Washington by increasing sustainable timber supply and investing in workforce, housing, infrastructure, and innovation that advances forest health and resilience.
- 4. Increase understanding of wildfire and invest in appropriate actions to mitigate wildfire risk** in western Washington forests, communicate the risks and actions effectively, and acknowledge that wildfire risk and mitigation actions are inherently different than eastern Washington.
- 5. Support Western Washington forest health** assessments, monitoring, research, and adaptive management.

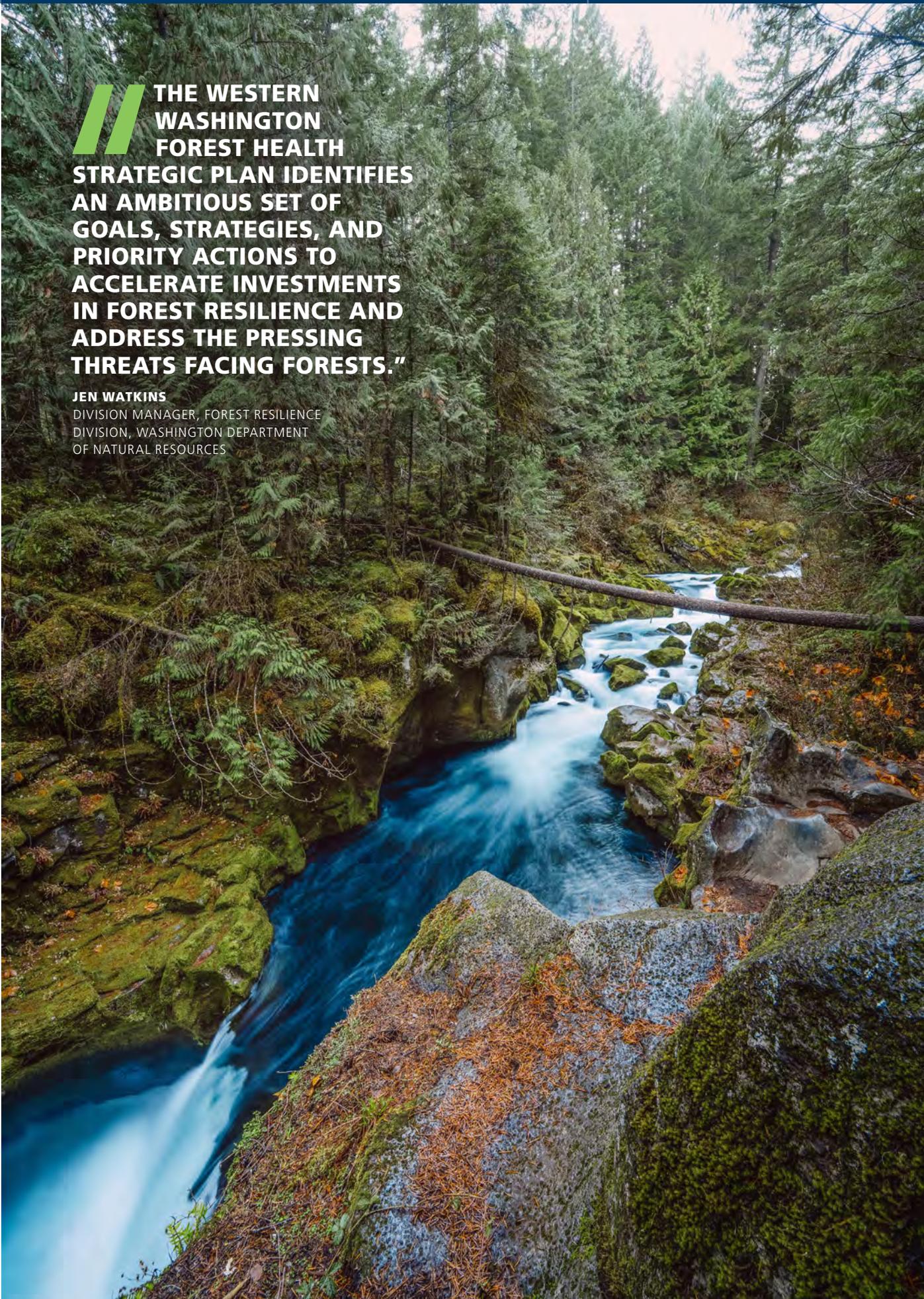
The rest of this section highlights the strategic plan goals and the related strategies and actions that DNR and partners will take to enhance forest health and resilience in western Washington. These priorities represent the interests, values, and concerns that DNR staff heard through meetings and fields tours associated with this strategic planning process. These commitments seek to reinforce and support existing forest health initiatives in western Washington as well as to identify new areas to focus our shared work.



CRISTOFER JESCHKE / UNSPLASH

**THE WESTERN  
WASHINGTON  
FOREST HEALTH  
STRATEGIC PLAN IDENTIFIES  
AN AMBITIOUS SET OF  
GOALS, STRATEGIES, AND  
PRIORITY ACTIONS TO  
ACCELERATE INVESTMENTS  
IN FOREST RESILIENCE AND  
ADDRESS THE PRESSING  
THREATS FACING FORESTS.”**

**JEN WATKINS**  
DIVISION MANAGER, FOREST RESILIENCE  
DIVISION, WASHINGTON DEPARTMENT  
OF NATURAL RESOURCES





## GOAL

## 1

## Enhance forest and watershed health and resilience in western Washington.

### Forest health is the condition of a forest ecosystem

reflecting its ability to sustain characteristic structure, function, and processes; resilience to fire, insects and other disturbance mechanisms; adaptability to changing climate and increased drought stress; and capacity to provide ecosystem services to meet landowner objectives and human needs.

A primary goal of this plan is to accelerate the restoration of ecological processes through forest health treatments. Forest health treatments will improve forest ecosystem resistance to stressors such as drought and insects and disease and increase forest diversity, which will enhance the ability of forest ecosystems to adapt to changing conditions and recover from disturbances.

Climate change is accelerating shifts in forest dynamics. These changes are already altering growth, regeneration, and disturbance patterns in forests and are expected to have widespread and lasting impacts on ecosystems, communities, and forest-dependent industries. All future emissions scenarios show Washington is projected to experience hotter and drier summers, reduced snowpack and earlier spring runoff, lower late-summer stream flows, higher water temperatures, and more intense rainfall during winter storms.

The priority strategies and actions identified in this section of the plan seek to increase the capacity of forests to adapt to changing climactic conditions while retaining and enhancing the benefits forests provide to people and wildlife.



**Above:** Skykomish River watershed.  
**Opposite page:** Segelsen 2 restoration thinning project in the Finney Adaptive Management Area on the Mount-Baker Snoqualime National Forest. This was a 60 year old second growth stand of primarily dense Douglas-fir and western hemlock that was thinned to accelerate the development of late-successional stand conditions and improve overall resilience of the stand. This photo captures post-thinning stand conditions. The thinning was administered by the DNR Federal Lands Program under the Good Neighbor Agreement with the USDA Forest Service.

**Goal 1****Priority strategies and actions to enhance forest and watershed health and resilience.**

- |            |   |  |
|------------|---|--|
| <b>1.1</b> | <b>Forest Stewardship and Active Management</b>               | Increase the pace and scale of forest stewardship across land ownerships, with a focus on priority landscapes and practices that enhance forest and watershed resilience to drought, flooding, wildfire, insects, and disease while respecting landowner objectives.   |
| <b>1.2</b> | <b>National Forest Road Strategy</b>                          | Create and implement a Western Washington National Forest Road Strategy where the USDA Forest Service, state agencies, Tribes, local governments, and other partners make meaningful, ongoing investments towards a sustainable National Forest road program that provides an operationally resilient road network while minimizing impacts to natural and cultural resources.   |
| <b>1.3</b> | <b>Integration of Indigenous Knowledge (IK)</b>               | Engage with Tribes to incorporate Indigenous Knowledge into forest planning and management, so that cultural values and Indigenous stewardship practices inform strategies for resilience. Identify and pilot pathways to prioritize historic sites, traditional places, and traditional materials in restoration projects, timber harvests, and other forest health work. Increase opportunities for cultural burning and Indigenous-led burning where appropriate in western Washington. |
| <b>1.4</b> | <b>Diversity of Forest Structures and Species Composition</b> | Enhance climate and drought resilience and structural complexity of forests through active management and promote a diversity of forest structures and species composition.  |
| <b>1.5</b> | <b>Reforestation</b>  | Invest in climate-smart reforestation, including research, infrastructure and re-planting capacity with a focus on ecologically appropriate post-fire recovery, post-harvest planting needs, and drought-tolerant seedlings. Provide landowners conducting regeneration harvests increased opportunities to reforest with native seed that is adapted to future climatic conditions through assisted migration and assisted range expansion.   |
| <b>1.6</b> | <b>Invasive Species, Emerging Pathogens and Insects</b>       | Increase partnerships and investments to address invasive species including plants, pathogens, and insects by emphasizing early detection, rapid response, monitoring, and adaptive management. Collaboratively develop protocols and best management practices to limit or halt the spread of invasive plants, insects and pathogens.   |



**THE STRATEGIES AND PRIORITY ACTIONS IN THIS GOAL AREA ARE INTENDED TO INCREASE THE PACE AND SCALE OF FOREST STEWARDSHIP ACROSS LAND OWNERSHIPS WITH A FOCUS ON PRIORITY LANDSCAPES AND PRACTICES THAT ENHANCE FOREST AND WATERSHED RESILIENCE.**



**Above:** Olympic National Forest.  
**Left:** Mount Baker-Snoqualmie National Forest. Photo taken near the Tulalip Tribes' Beaver Project.

Goal 1	Priority strategies and actions to enhance forest and watershed health and resilience.
1.7	<p><b>Riparian Forest Health</b> Reduce barriers to planning, implementation, and monitoring of riparian forest health thinning and restoration work. Expand incentive programs and identify funding and capacity needs to assist public and private landowners interested in conducting projects that restore riparian forest health, restore floodplain and forest wetland connectivity, and increase water storage and snowpack retention.</p>
1.8	<p><b>Small Forest Landowners</b> Expand education, incentives, financial cost-share programs, and technical assistance to encourage adoption of voluntary forest health treatments for small forest landowners.</p>
1.9	<p><b>Climate Vulnerability and Landscape Evaluations</b> Conduct climate vulnerability assessments and landscape evaluations. Utilize best available science and analytical tools to produce landscape-level forest and watershed health data and prescriptions for forest landowners, managers, and partners to inform the prioritization and design of treatments.</p>
1.10	<p><b>Recreation</b> Support maintenance and enforcement on recreational lands to mitigate detrimental impacts from unsanctioned activities including dumping, shooting, burning, unauthorized trail development and other resource-damaging activities.</p>

## Western Washington National Forest Roads Strategy

For decades, western Washington national forest roads have suffered from declining road budgets and underinvestment. At the same time, our region's national forests continue to be the most widely visited public lands in our region: Oregon and Washington's national forests host 14.7 million visitors per year—6.4 million more visitors than any other public land type in the Pacific Northwest.

Western Washington national forest roads are a true lifeline for the region, and support many uses and needs. Roads provide access to traditional and accustomed harvesting and hunting locations, helping fulfill treaty obligations for more than 25 sovereign nations. They offer access to popular recreational trails, access for communities that can aid in emergency management and response and facilitate forest management and restoration projects.

High levels of public use, combined with decades of deferred road maintenance, have left the western Washington national forest road network, which includes the roads on the Mount Baker-Snoqualmie, Gifford Pinchot, and Olympic National Forests, with a current cumulative maintenance need of more than \$236 million. The Western Washington National Forest Roads Strategy is a joint effort led by a core team from USDA Forest Service, Washington State Department of Natural Resources, Washington Department of Fish and Wildlife, and Washington Department of Ecology, with additional support and guidance from the US Department of Transportation's Volpe Center. As of Fall 2025, these partners are currently developing a strategic roadmap for investing in and maintaining national forest roads across western Washington. The strategy centers around region-wide goals for the physical road network, as well as specific road equipment and capacity needs to keep our national forest roads regularly maintained and useable.



**WESTERN  
WASHINGTON  
NATIONAL FOREST  
ROADS ARE A TRUE  
LIFELINE FOR THE  
REGION, AND SUPPORT  
MANY USES AND  
NEEDS.**



◀ Pipe being laid as part of the Boardman Road Maintenance GNA Project on the Mount-Baker Snoqualmie National Forest.



## Forest Road Vulnerability

Forest transportation infrastructure is increasingly vulnerable to damage from climate-driven changes, including:

- **More precipitation falling** as rain instead of snow and increased risk of rain on snow events.
- **More frequent and intense storms** and peak stream flows.
- **Increased sedimentation**, washouts, and landslides.
- **Post-fire hydrologic shifts** that alter runoff patterns.

While significant progress has been made on private lands under the Forest and Fish Rules' Road Maintenance and Abandonment Plans (RMAPs), large gaps remain—particularly on federal lands. Additional investments are needed to upgrade culverts, stabilize slopes, and protect water quality.

▲ Active installation of the 2D Bridge in the Calawah watershed on the Olympic National Forest.

## Western Washington Pilot Landscape Evaluations

Recognizing the importance of maintaining and improving forest health and resilience statewide in Washington, the state legislature directed the Department of Natural Resources (DNR) to establish a forest health assessment and treatment framework. In 2017, DNR collaboratively developed the 20-Year Forest Health Strategic Plan for Eastern and Central Washington. The strategic plan defined a process and methodology to inform investments in treatments: first, by identifying priority landscapes, and second, by assessing each priority landscape using a process referred to as a landscape evaluation.

In 2020, Washington's State Forest Action Plan recognized that forest ecosystems in western Washington face unprecedented issues. The 2020 Forest Action Plan included the first set of priority landscapes for western Washington, using an adjusted eastern Washington methodology that accounts for differences in vegetation types, fire regimes, ownership patterns, and socio-economic conditions. The State Forest Action Plan also lays out the following objectives to guide landscape evaluations in western Washington:

- **Prepare the landscape** for the anticipated effects of future climate change, especially drought.
- **Restore landscape structure and pattern** to a more resilient state including accelerating the development and connectedness of patches of mature forests and fostering the creation of high-quality early seral habitat.
- **Address aquatic restoration needs** and ensure forests continue to provide clean and cold water.
- **Increase the understanding** of the changing dynamics of fire regimes in light of climate change.
- **Support rural economic development** including sustainable timber production.

DNR scientists and external partners developed a technical process to establish a preliminary set of ecological and social indicators, along with assessment tools, to inform discussions and planning towards future landscape evaluations in western Washington. These preliminary indicators and evaluation tools were applied to two pilot landscape planning areas – Middle Snohomish and Packwood – which were chosen based on the range of forest health challenges, concerns, and opportunities they represent for western Washington.

The pilot landscape evaluations were the first step in developing more robust forest health assessments and methodologies for western Washington. As DNR works to implement and further define forest health in western Washington, these landscape evaluations provide localized opportunities to test, implement, and monitor approaches to forest health and resilience.



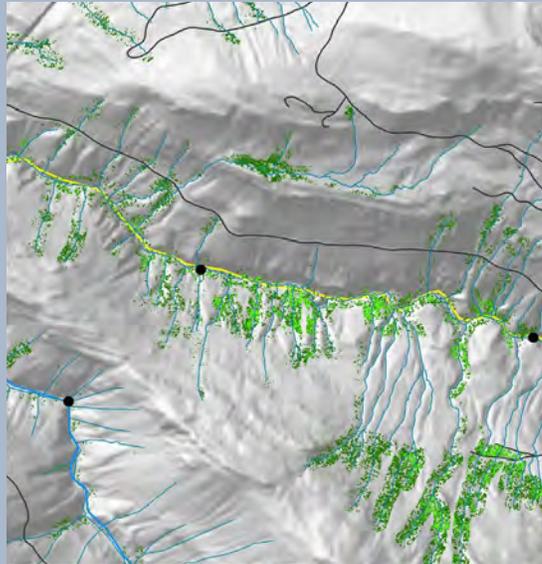
Young Douglas fir plantation east of Vancouver, WA. Pacific Cascade Region, DNR.

**THE PILOT LANDSCAPE EVALUATIONS WERE THE FIRST STEP IN DEVELOPING MORE ROBUST FOREST HEALTH ASSESSMENTS AND METHODOLOGIES FOR WESTERN WASHINGTON.**



### Learn more:

Read the [Western Washington Pilot Landscape Evaluation Report](#) or visit [DNR's Forest Resilience Division Digital Library](#).



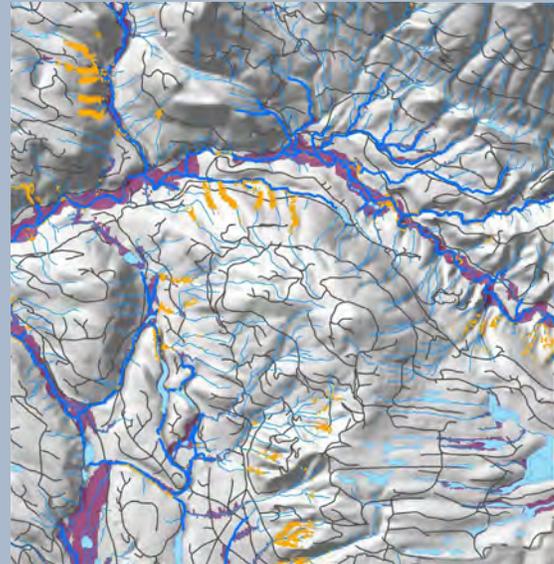
### Packwood Riparian Condition

- Tree Height 150-200 ft in 45 ft Buffer
- Tree Height >200 ft in 45 ft Buffer

#### Predicted Water Temp (NW) 2040

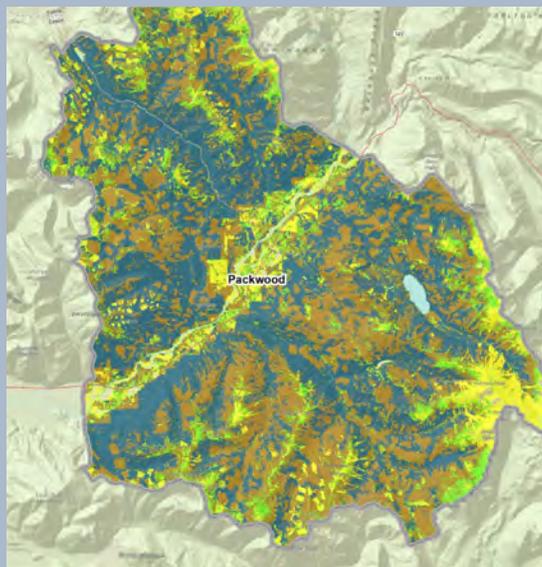
- <12 Degrees C
- >12 Degrees C

- Waterbodies
- Fish Passage barriers
- Roads



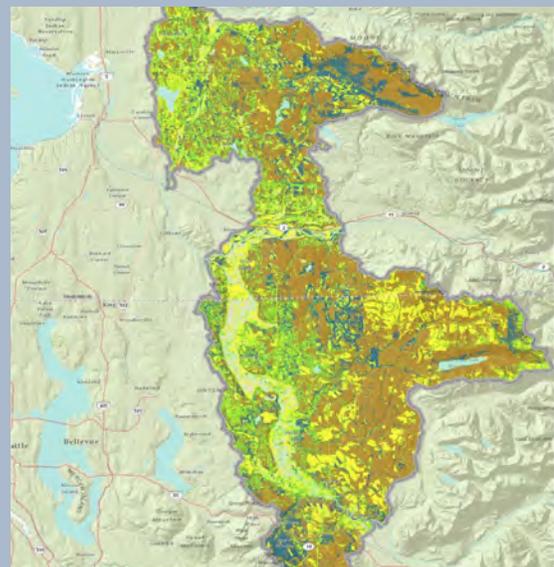
### Middle Snohomish Riparian Condition

- Tree Height 150-200 ft in 45 ft Buffer
- Tree Height >200 ft in 45 ft Buffer (very few)
- Steelhead Distribution (SWIFD)
- Planning Area
- Floodplains
- Waterbodies
- Streams
- Roads



### Packwood Forest Structure

- Old
- Mid Closed
- Mid Open
- Early
- Planning Area



### Middle Snohomish Forest Structure

- Old
- Mid Closed
- Mid Open
- Early
- Planning Area





## GOAL

## 2

## Maintain working forests in western Washington by reducing the risk of forest conversion to non-forest uses.

**Avoiding the conversion of working and natural forestlands** is one of the most cost-effective and permanent strategies to protect ecosystem services, carbon storage, wildlife habitat, and the long-term sustainability of forest-dependent rural economies. Recent analyses highlight the ongoing urgency found:

- Since the 1970's more than one million acres of forestland in Washington State has been permanently converted into non-forest uses.
- Between 2007 and 2019, Washington State lost an estimated 394,000 acres of forestland statewide, or roughly 30,000 acres per year, an area the size of an average sub-watershed in Washington.
- A 2009 University of Washington study projected that nearly 1 million acres (18 percent) of the 5.4 million acres of private forestland in western Washington is at risk of conversion by 2080.

Development pressure remains especially high in fast-growing areas. In western Washington, forestland near the I-5 corridor, particularly in Clark, King, Pierce, Snohomish, and Thurston counties, is under the greatest threat.



▲ Forest-bordering developments that convert forests to residential areas have become increasingly common in western Washington.

## Goal 2

### Priority strategies and actions to address the threat of forest conversion in western Washington.

#### 2.1 High-Risk Areas

In partnership with conservation groups, private landowners, land trusts, Tribes, state agencies, counties, and communities, utilize the statewide assessment of forestland conversion risk to prioritize areas of high ecological, cultural, economic, and community value for permanent conservation.

#### 2.2 Incentives and Funding

Increase funding for conservation easements, acquisitions, and financial incentives that help landowners in western Washington keep forests as forests. Better coordinate and align existing federal, state, local, and nonprofit programs to maximize the impact of investments.

#### 2.3 Tribal Values

Prioritize the values and needs of Tribes for lands with high potential for land conversion.

#### 2.4 Small Forest Landowners

Expand technical assistance, financial cost-share programs, and other tools to support small forest landowners in managing and maintaining their forests in a healthy and resilient state. Provide resources and planning support to keep forestlands intact through generational transitions.

#### 2.5 Community Forests

Support the establishment and growth of community forests that provide local stewardship, economic opportunities, and Tribal and public access for communities in western Washington.

### Ecological, Economic, and Community Benefits

Avoiding forest conversion provides lasting benefits:

- Climate mitigation through long-term carbon storage.
- Habitat protection for fish and wildlife, including endangered species.
- Water quality protection through forested watersheds and stream buffers.
- Flood control and slope stability in developed areas.
- Cultural and recreational access for local communities and Tribes.
- Economic resilience through sustainable forestry, tourism, and ecosystem services.



**THE DECISIONS MADE TODAY ABOUT WHERE DEVELOPMENT OCCURS, WHICH FORESTS ARE PROTECTED, AND HOW WORKING FORESTS ARE SUPPORTED WILL HAVE LASTING IMPACTS ON WASHINGTON'S COMMUNITIES, ECONOMY, AND ENVIRONMENT.**



## Policy Tools and Planning Efforts

The decisions made today about where development occurs, which forests are protected, and how working forests are supported will have lasting impacts on Washington's communities, economy, and environment. Washington's Growth Management Act (GMA) requires cities and counties to adopt comprehensive land use plans that direct new development toward urban areas. These plans help conserve "rural" and "resource" lands. DNR and partners will monitor efforts related to forest resource land protections in the Growth Management Act.

Planning efforts alone are not enough to stem the tide of forest loss. Strategies that proactively avoid conversion by securing working forest easements, supporting private landowners to retain and manage their forestland, investing in community forests, and prioritizing conservation acquisitions are needed to complement local planning and zoning tools. By investing in avoided conversion strategies now, Washington can conserve its forests as a foundation for climate resilience, biodiversity, and quality of life for generations to come.

▲ Expansion of human development into formerly forested areas impacts wildlife movement, hydrology and water runoff, and carbon sequestration potential. Photo taken near Mt. Si near North Bend, WA.



**GOAL**  
**3****Support and expand natural resource economies in western Washington by increasing sustainable timber supply and investing in workforce, housing, infrastructure and innovation that advances forest health and resilience.**

**Washington's forests are shaped not only by ecological processes** but also by the people who manage and depend on them. Forest ownership patterns, demographics, cultural values, and economics all influence forest conditions and management outcomes across the state.

Washington's forests are owned and managed by families, industrial landowners, conservation organizations, Tribes, and public agencies—each with unique values and land management objectives. The Western Washington Forest Health Strategic Plan supports voluntary conservation programs and practices, and successful implementation of this plan relies on understanding and respect for the diverse landowner objectives in the state. The programs and priorities described in this plan recognize that some landowners prioritize habitat and aesthetics, while others require consistent financial returns. Creating flexible tools can help to accommodate this diversity. Supporting all landowners, as well as maintaining forests as working forests, is a win-win opportunity for all Washingtonians.



**WASHINGTON'S FORESTS ARE SHAPED NOT ONLY BY ECOLOGICAL PROCESSES BUT ALSO BY THE PEOPLE WHO MANAGE AND DEPEND ON THEM.**

### Goal 3

#### Priority strategies and actions to advance rural economic development in western Washington.

- 3.1 Sustainable Forest Products Supply**  
Encourage a diverse, stable, sustainable, and robust supply of locally sourced and processed forest products from public, private, and Tribal forestlands to support existing and new forest products infrastructure and associated socio-economic benefits. On public lands, work collaboratively to increase the consistency, availability, and predictability of forest resources including timber and non-timber forest products.
- 3.2 Workforce Training and Development**  
Maintain and expand education, training programs and apprenticeship programs for forestry, watershed restoration, and wood innovation. Partner with local organizations, Tribes, community colleges, universities, and local schools to build skills training programs with a focus on rural and underserved forest-dependent communities.
- 3.3 Forest Workers**  
Support the expansion and continuation of natural resource education programs aimed at youth, young adults, and historically underrepresented communities and Tribes to develop the next generation of forest workers. Create a pilot grant program to fund forest worker training and education programs.
- 3.4 Workforce Housing**  
Increase natural resource workforce housing availability and affordability in rural and Tribal communities to attract and retain forestry, wildfire, and restoration workers. In the implementation of this plan, develop at least two natural resource workforce housing sites in western Washington.
- 3.5 Wood Innovations and Mass Timber**  
Support entrepreneurship and wood innovation campuses and cooperatives that link restoration projects to rural economic development. Grow markets for low-value materials (e.g., small-diameter logs, biomass, historically uneconomical tree species, restoration byproducts) to increase the economic viability of forest health treatments. Encourage investment in new and emerging technologies, including mass timber. Facilitate forward-looking market and supply planning for larger diameter logs to ensure capacity to utilize timber harvested from extended rotations.



**THIS GOAL AREA IS INTENDED TO SUPPORT AND EXPAND NATURAL RESOURCE ECONOMIES IN WESTERN WASHINGTON.**



<p><b>Goal 3</b></p>	<p><b>Priority strategies and actions to advance rural economic development in western Washington.</b></p>
<p><b>3.6</b></p>	<p><b>Agency Hiring Policies and Practices</b> Emphasize diverse agency-community connections, including promoting hiring and placement in rural, forest-dependent communities to the extent practicable to strengthen local economies and foster stronger connections between agency staff and the communities they serve.</p>
<p><b>3.7</b></p>	<p><b>Benefits of Sustainable Local Forest Products</b> Through communication channels and utilizing examples grounded in western Washington forests, promote the benefits of sustainable local forest products that advance our state’s ecological, economic, social, and cultural goals.</p>
<p><b>3.8</b></p>	<p><b>Ecosystem Services</b> Diversify revenue streams from forest land through the sale or lease of ecosystem services. Identify profitable forest management systems that include both timber harvest and ecosystem services revenue.</p>
<p><b>3.9</b></p>	<p><b>Interagency Collaboration and Partnerships</b> Foster collaborative efforts among agencies, Tribes, local governments, nonprofits, industry, and forest collaboratives to increase understanding and knowledge exchange of rural economic challenges and opportunities and align investments in forestry-related rural economic development.</p>

▲ Ensuring a sustainable supply of timber can help maintain existing sawmills like the Hampton Lumber sawmill in Randle, WA shown here.



Kellogg Middle School in Shoreline, WA; Right: Washington School for the Deaf in Vancouver, WA.

LARA SWIMMER-ESTO

**THESE EFFORTS  
COMPLEMENT  
STATEWIDE INITIATIVES  
TO EXPAND THE  
USE OF MODULAR,  
PREFABRICATED, AND  
CROSS-LAMINATED  
TIMBER (CLT)  
CONSTRUCTION AS  
COST-EFFECTIVE  
AND CLIMATE-  
FRIENDLY BUILDING  
SOLUTIONS.**



## **Innovative Approach to Affordable Housing**

The Washington State Department of Natural Resources is leading an innovative initiative to help meet the state’s housing needs by leasing state trust lands for affordable housing development in appropriate areas, particularly in rural communities where the need is most acute. The agency’s work, supported by legislative investments, enables long-term leases for projects that create low-income housing, workforce housing, and emergency housing while maintaining public ownership of trust land assets.

DNR’s housing work has focused on several key strategies:

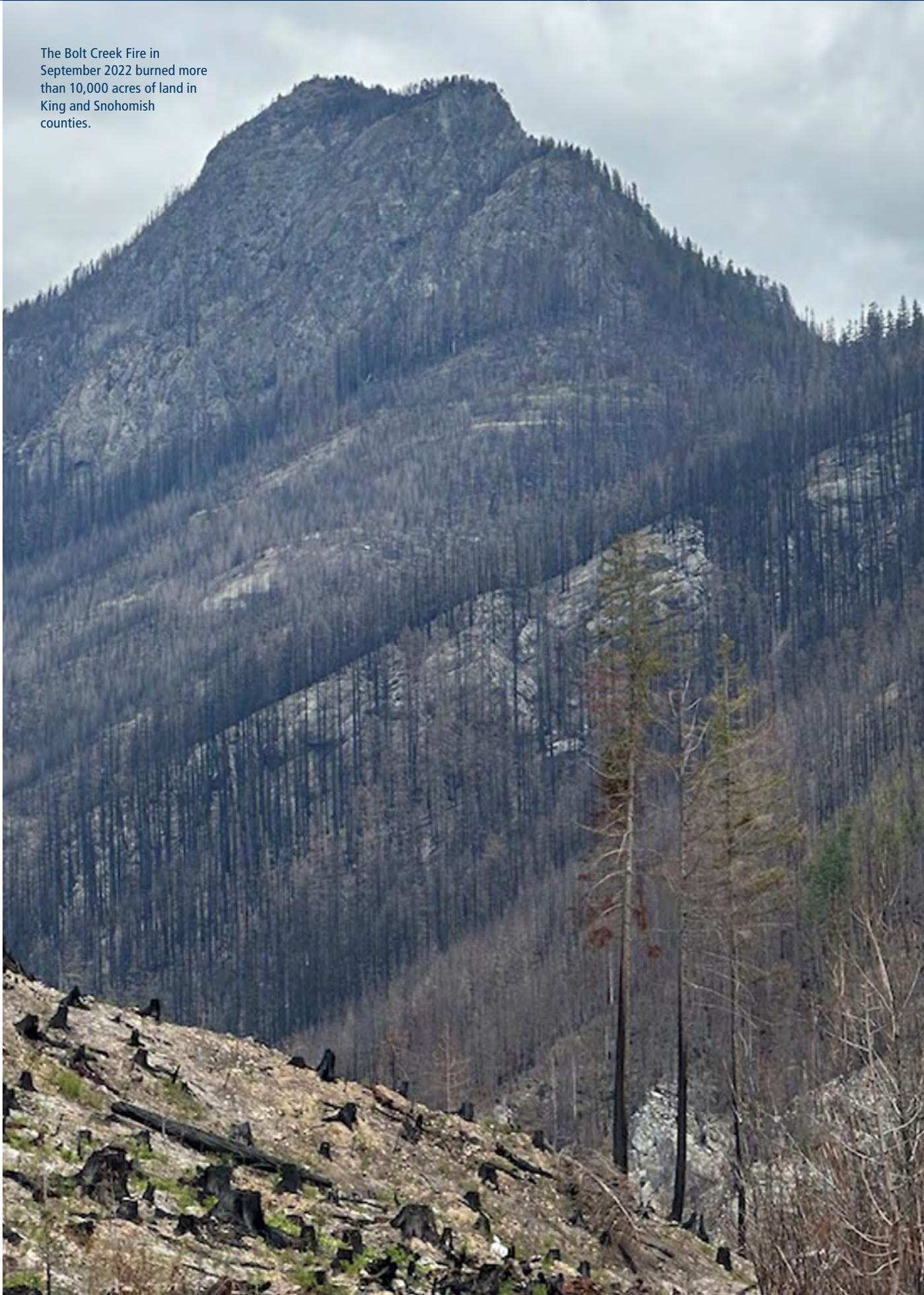
- **Identifying state trust lands** near community infrastructure (e.g., schools, roads, utilities) that can support housing development.
- **Partnering with local governments**, housing authorities, Tribes, and nonprofit developers to advance housing projects on public lands.
- **Demonstrating the viability** of mass timber construction and wood innovation in affordable housing design.
- **Aligning housing investments** with wildfire response needs, including bunkhouses and seasonal workforce housing for firefighters and forest restoration crews.
- **Encouraging co-location of housing** with natural resources infrastructure such as wood innovation campuses and vocational training centers.

These efforts complement statewide initiatives to expand the use of modular, prefabricated, and cross-laminated timber (CLT) construction as cost-effective and climate-friendly housing solutions. They also create new demand for wood sourced from forest health projects, helping to close the loop between ecological restoration and economic development.





The Bolt Creek Fire in September 2022 burned more than 10,000 acres of land in King and Snohomish counties.



## GOAL

## 4

**Increase understanding of wildfire and invest in appropriate actions to mitigate wildfire risk in western Washington forests, communicate the risks and actions effectively, and acknowledge that wildfire risk and mitigation actions are inherently different than eastern Washington.**

**The frequency of large wildfires** in western Washington is low, but when a fire occurs, the risks to people, property, and other values is high. Priority strategies and actions in western Washington to address wildfire focus on:

- Increase scientific understanding of current and future wildfire regimes
- Invest in fire prevention and suppression
- Develop tailored wildfire hazard and risk maps for western Washington
- Support homeowners and communities interested in defensible space home hardening, and evacuation planning
- Invest in post-fire restoration capacity

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**WHEN A FIRE OCCURS IN WESTERN WASHINGTON, THE RISKS TO PEOPLE, PROPERTY, AND OTHER VALUES IS HIGH.**





Bolt Creek Fire as seen from Highway 2 near Skykomish.



Nakia Creek Fire



▲ Post-fire debris flow aftermath following the Easy Fire in Okanogan and Skagit Counties 2024.

## Landscape-Level Linkages Between Forest Health and Wildfire

Wildfire-related forest health work in western Washington can be markedly different from that in eastern Washington. Landscape-scale forest health treatments in western Washington are not a priority strategy identified in this plan. Instead, DNR recommends that landowners interested in reducing wildfire risk develop site specific prescriptions that consider landowner objectives and account for the regular maintenance of fuels treatments that will be required.

For landowners concerned about wildfire risk, consider the following when prioritizing treatments in western Washington:

- **Prioritize defensible space, home hardening, and evacuation planning:**

Homeowners in western Washington that are very concerned about wildfire risk should prioritize implementing Firewise USA principles and having a plan for when a wildfire strikes.

- **Consider high priority locations for strategic fuel breaks:**

Shaded fuel breaks may be appropriate along important roads, such as along evacuation routes, or ridges, and can be helpful in controlling fire behavior (Hersey and Barros 2022). However, western Washington forests are highly productive, thus efforts to mitigate fuels with an intended purpose of reducing wildfire risk must consider the costs associated with long-term maintenance.

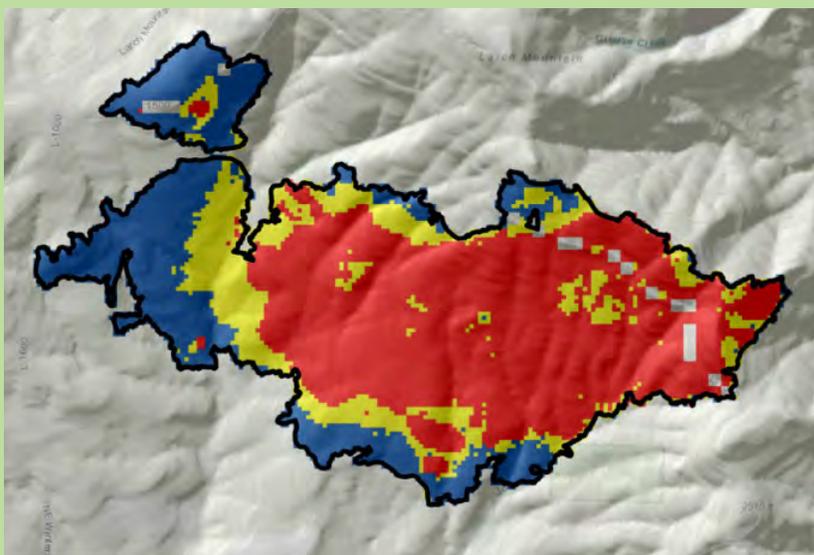
- **Promote species diversity and retain hardwoods:**

Deciduous tree species often retain more moisture than conifers and can act as a “heat sink” during a wildfire event; they also lend resilience by resprouting rapidly from intact root systems. Retaining or intentionally planting hardwood species may be an appropriate strategy to increase fire resilience in certain locations.

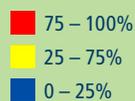
The wildfire priority strategies and actions in this section represent our current understanding of wildfire-related needs in western Washington. These priorities are anticipated to evolve as our understanding of wildfire resilience in western Washington grows over time.



2022 Nakia Creek Fire.



**NAKIA CREEK FIRE  
BURN SEVERITY**  
(% Basal area lost)



**The Nakia  
Creek Fire** in

October 2022 was a significant, human-caused wildfire that burned nearly 2,000 acres in the Yacolt Burn State Forest in Clark County.

**Goal 4**

**Priority strategies and actions to support wildfire resilience in western Washington.**

- 4.1 Wildfire Science Investments**  
Invest in scientific research to increase understanding of current landscape-scale wildfire risks, projected changes, and effective mitigation measures. Implement and monitor vegetation and fuels management focused on wildfire risk reduction in western Washington in strategic locations.
- 4.2 Wildfire Science Communication**  
Communicate recommendations for addressing landscape-scale wildfire risk in western Washington forests to natural resource agencies, landowners, land managers, emergency management professionals, and stakeholders based on the best available science.
- 4.3 Washington State Wildland Fire Protection 10-Year Strategic Plan**  
Continue to implement and update the Washington State Wildland Fire Protection 10-Year Strategic Plan, including relevant community wildfire preparedness and resilience goals, strategies and actions for western Washington that are a necessary complement to work in the forest for wildfire resilience.
- 4.4 Wildfire Hazard and Risk Maps**  
Create wildfire hazard and risk maps that effectively communicate the level of wildfire hazard and risk in western Washington relative to the whole state. Map local variability in wildfire hazard and risk as appropriate based on data limitations and ensure alignment between state, private, and local wildfire risk science, communication strategies, priorities, and actions. Utilize Community Wildfire Protection Plans and best available science to appropriately identify priority areas to focus mitigation efforts.
- 4.5 Post-Fire Restoration**  
Invest in post-fire outreach and education and restoration actions. Utilize post-fire vegetation management where necessary to achieve more resilient post-fire vegetation and landscape conditions, as well as to support forest management, reforestation, public safety, wildfire risk reduction and ecological objectives.
- 4.6 Wildfire Risk Reduction Objectives and Forest Management**  
Where appropriate, incorporate wildfire risk reduction objectives into western Washington forest management actions with an emphasis on the Olympic rain shadow, San Juan Islands, and portions of the Puget Sound lowlands and Cascade foothills regions. Implement and monitor approaches to vegetation and fuels management focused on wildfire risk reduction in additional locations where appropriate in western Washington.

Bear Gulch Fire in 2025.





<b>Goal 4</b>	<b>Priority strategies and actions to support wildfire resilience in western Washington.</b>
<b>4.7</b>	<b>Fire Suppression and Management</b> Work collaboratively with local practitioners, government officials, and communities to develop adequate wildfire and conflagration management and preparedness capacity in western Washington to help minimize risks to communities, infrastructure, and natural and cultural resources. Develop coordinated strategies and actions to reduce the potential for catastrophic losses that can occur as a result of wildfires and conflagrations driven by late- season east wind events.
<b>4.8</b>	<b>Fire Prevention</b> Reduce human-caused fires in western Washington through prevention education, outreach, and enforcement. Invest in educational signage and restrictions of ignition-starting activities (such as fireworks or campfires) in and around forested areas with high human use. Develop plans to temporarily close public access to high-fire danger areas and shut off utilities during high-risk weather events, such as east wind events.
<b>4.9</b>	<b>Western Washington Wildfire Guidance Document</b> Develop a document that provides guidance on science and recommendations for wildfire mitigation strategies, prevention, preparedness and post-fire recovery specifically for western Washington counties, communities, natural resource agencies, emergency management professionals, landowners, and land managers.
<b>4.10</b>	<b>Potential Operational Delineations (PODs) and Potential Control Lines (PCLs)</b> DNR will lead the delineation of western Washington Potential Operational Delineations and Potential Control Lines in collaboration with major landowners, land managers, and fire districts, as appropriate.

▲ Service Forestry Specialist Donald Meeks introduces landowners to the concept of home ignition zones as it relates to wildfire preparedness.

## Community and Homeowner Preparedness

This plan's priority actions and strategies are tied to those actions that relate to forest health and management choices. The actions outlined in this section of the plan also seek to complement strategies and actions centered on increasing community resilience and emergency management around western Washington wildfire.

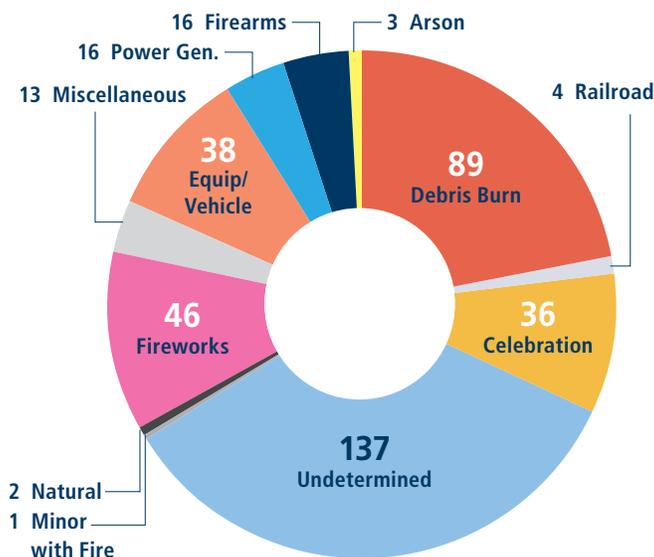
Community Wildfire Protection Plans (CWPP) are developed by local jurisdictions and communities to identify locally tailored and specific actions to reduce wildfire hazard and risk. The Washington State Fire Adapted Communities Learning Network hosts several online resources that can aid communities in planning and updating their CWPP.

The number one way for homeowners to increase the wildfire resiliency of their home is through home hardening and defensible space. Given the density of housing, evacuation planning is also a top need and concern.

At the state level, additional modeling and planning work is currently underway in support of Engrossed Senate Bill 6120, which will develop statewide wildfire risk and wildfire hazard mapping in conjunction with counties and communities.

### WESTERN WASHINGTON FIRE IGNITIONS ON DNR-MANAGED LANDS (2025)

DATA AS OF 9/5/25 FROM FIRE INCIDENT REPORTING SYSTEM (FIRES). SOURCE: DNR



▲ The 10-Year Wildland Fire Strategy, Pre-Fire Planning for Post-Fire Recovery: Western Washington and county-level Community Wildfire Protection Plans are all documents this strategic plan works to complement.

**THE NUMBER ONE WAY FOR HOMEOWNERS TO INCREASE THE WILDFIRE RESILIENCY OF THEIR HOME IS THROUGH HOME HARDENING AND DEFENSIBLE SPACE.**



## Reforestation and Seed Supply Challenges

The increased frequency of high-severity wildfires and other disturbances will likely outpace current seed and seedling supply, especially for drought-adapted or genetically appropriate stock. Some species may no longer be suitable for particular locations, necessitating shifts in assisted migration or species selection.

### Key challenges include:

- Limited availability of regionally adapted seed.
- Potential mismatch between seed zones and future climate conditions.
- Reduced success of natural regeneration in large, severely burned areas.
- Increasing need for climate-smart reforestation planning.



To learn more about reforestation strategies, review the [State Forest Action Plan](#).

▲ Brant Lindquist plants a seedling at one of DNR's westside post-fire reforestation research sites in the footprint of the Black Hole Fire. This study is assessing various operational reforestation alternatives following wildfire in Western Washington and is replicated in the Black Hole, Nakia Creek, and Eight Road fires.



## GOAL

## 5

**Support Western Washington forest health assessments, monitoring, research, and adaptive management.**

**Western Washington forests are dynamic and diverse.** As DNR and partners advance the goals of this plan, monitoring helps provide a necessary feedback loop to inform adaptive management. Monitoring, especially long-term monitoring, is particularly helpful as we encounter new challenges. For example, experimental treatments to address the threats posed by drought will help us to determine which species may be most likely to thrive under future conditions. In areas we work to reforest—such as the former Elwha dam lakebeds that are returning to riverside riparian forests—monitoring can be a key ingredient to success. The Lower Elwha Klallam Tribe and National Park Service, with assistance from other partners, have continually adapted and updated their plans due to unanticipated changes and ecological response during recovery.

As we embrace the uncertainty associated with climate change—watching, learning and then adapting our efforts will be critical to ensuring our strategies and actions are effective.



▲ Participants develop experimental techniques to help slow the spread of emerald ash borer at a workshop in Vancouver.

**Goal 5**

**Priority strategies and actions to support forest health monitoring, scientific research, and adaptive management.**

- 5.1 Emerging Forest Health Threats**  
 Increase state and federal investments in forest health monitoring including aerial surveys, field monitoring, technical assistance, and landowner outreach and education. Invest in aerial imagery that provides wall-to-wall mapping of critical forest health threats.
- 5.2 Indigenous Knowledge**  
 Integrate Indigenous Knowledge (IK) alongside western science in adaptive decision-making. Explore and pilot pathways for more system-wide incorporations of IK into forest health management and training. Identify potential pathways for cultural burning and Indigenous-led burning in western Washington.
- 5.3 Genetic and Species Pathways for Native Trees and Plants**  
 Retain unique native genotypes that are vulnerable to climate-related ecosystem changes through collaborative identification, planning and retention efforts such as coordinated seed archiving or adaptations at seed orchards. Prioritize projects that help restore or create climate-resilient habitat for potential assisted migration pathways and opportunities.
- 5.4 Western Washington Wildfire Science**  
 In support of Goal 4, invest in scientific research to increase understanding of current landscape-scale wildfire risks, projected changes, and potential mitigation measures. Implement and monitor vegetation and fuels management focused on wildfire risk reduction in western Washington where appropriate. Communicate recommendations for addressing landscape-scale wildfire risk in western Washington forests.
- 5.5 Applied Science to Inform Management**  
 Prioritize investments in research at the state and federal level to continue to expand our understanding of forest ecosystems and socio-economic well-being in forest-dependent communities. In partnership with land managers, support evidence-based decision-making.



▲ Seed movement demonstration site in Olympic Region, DNR State Uplands.



◀ DNR Silviculture staff evaluate the root system development of container-grown Douglas-fir seedlings



<b>Goal 5</b>	<b>Priority strategies and actions to support forest health monitoring, scientific research, and adaptive management..</b>
<b>5.6</b>	<p><b>Forest Health Research and Assessments Summary</b> Create a summary of major forest health research, monitoring, and assessment projects in western Washington being led by state agencies, universities, federal agencies, tribes and other partners.</p>
<b>5.7</b>	<p><b>Future Desired Conditions</b> Identify thresholds or trends (e.g. mortality rates, etc.) that trigger evaluation of strategies. Support pilot projects and experimental treatments to test new approaches to forest health and climate adaptation in western Washington.</p>
<b>5.8</b>	<p><b>Adaptive Riparian Forest Management</b> Utilize best available science to implement adaptive riparian forest and wetland management to better meet landowner and ecological objectives.</p>

▲ USDA Forest Service staff field meeting with partners on the Mount Baker-Snoqualmie National Forest to discuss forest management needs.



View of the South  
Fork Skokomish in Olympic  
National Forest.



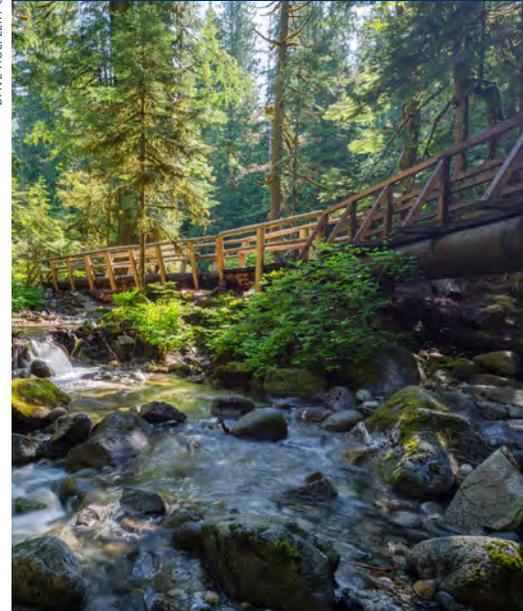
# Forest Health Watershed Prioritization and Priority Landscapes

**As a part of the 2020 Forest Action Plan,** scientists and natural resource practitioners from DNR, University of Washington, USDA Forest Service, Washington Department of Fish and Wildlife, Natural Resource Conservation Service, and U.S. Fish and Wildlife Service worked together to develop a methodology to use existing spatial datasets to map and inform a landscape prioritization process. Spatial data of forest health and resilience indicators and values at risk were combined to create a forest health watershed prioritization map. The forest health watershed prioritization map provided a foundation for discussions internally at DNR and with external partners to identify priority landscapes for coordinated planning, active management, and focused investments.

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**THE FOREST HEALTH WATERSHED  
PRIORITIZATION MAP PROVIDED A  
FOUNDATION FOR DISCUSSIONS...  
TO IDENTIFY PRIORITY LANDSCAPES  
FOR COORDINATED PLANNING,  
ACTIVE MANAGEMENT, AND FOCUSED  
INVESTMENT.**

DAVE HOEFLER / UNSPLASH



▲ Deception Falls on Mount Baker-Snoqualmie National Forest.



**The key framing question guiding prioritization is:**

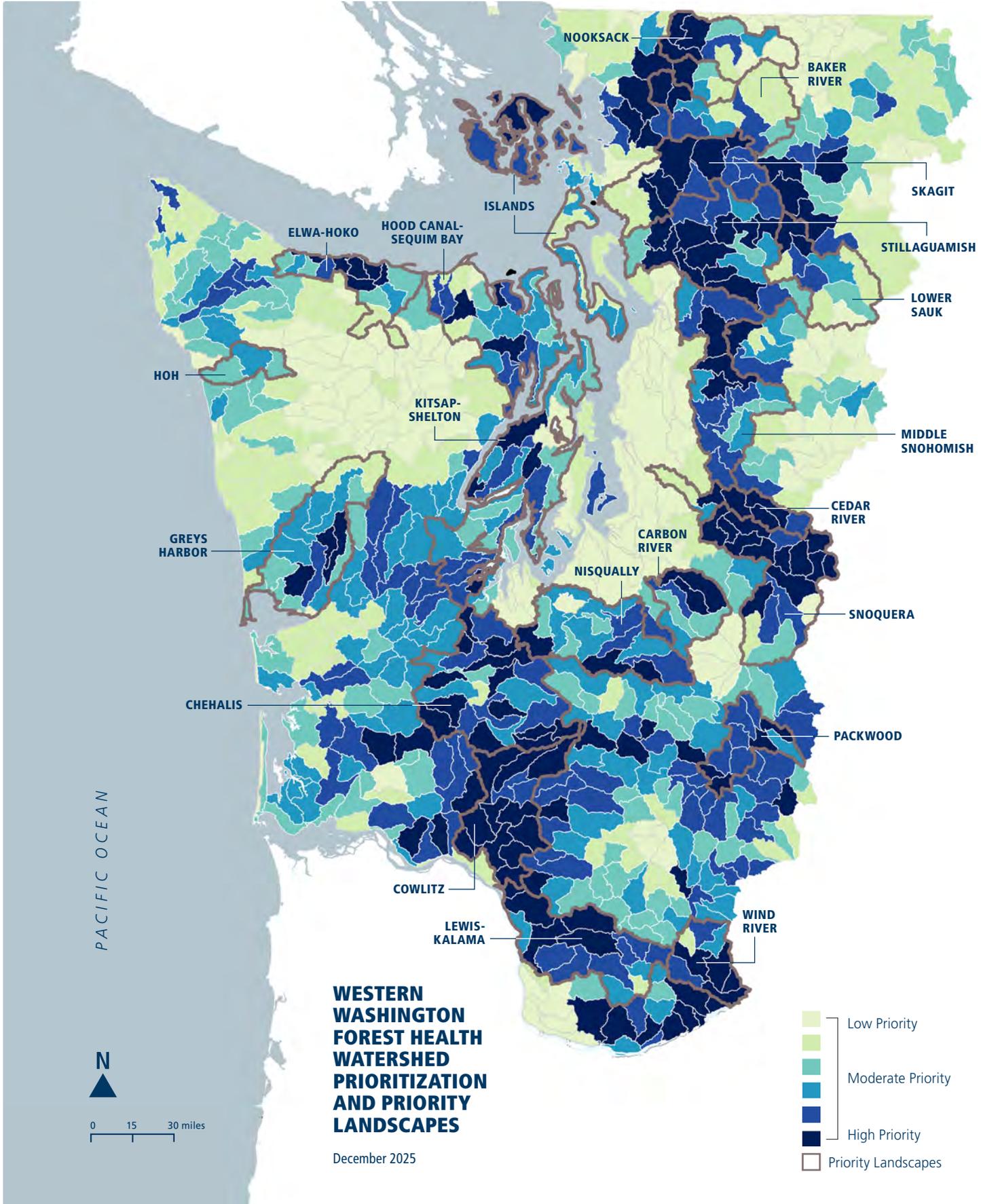
*Where will coordinated planning, active management and implementation, and focused investments lead to improved forest health and resilience?*

In 2025, DNR updated the forest health watershed prioritization map using newly available spatial datasets and added three data layers to inform the 2025 revision of the State Forest Action Plan and Western Washington Forest Health Strategic Plan. Of the original 12 data layers used in 2020, 10 were updated with new and improved datasets. New data layers included wildfire hazard, risk of forest conversion, and a customized wildlife habitat connectivity map to capture emerging forest health and resilience concerns for western Washington. See the Appendix for a full description of the methodology and data sets.

The resulting data-driven prioritization map, along with input from partners about their local geographic priorities, informed conversations between DNR and external partners to revise priority landscape designations. Input from USDA Forest Service, DNR Service Forestry Program, and Tribal staff, representatives, and members was critical to identifying shared priority landscapes.

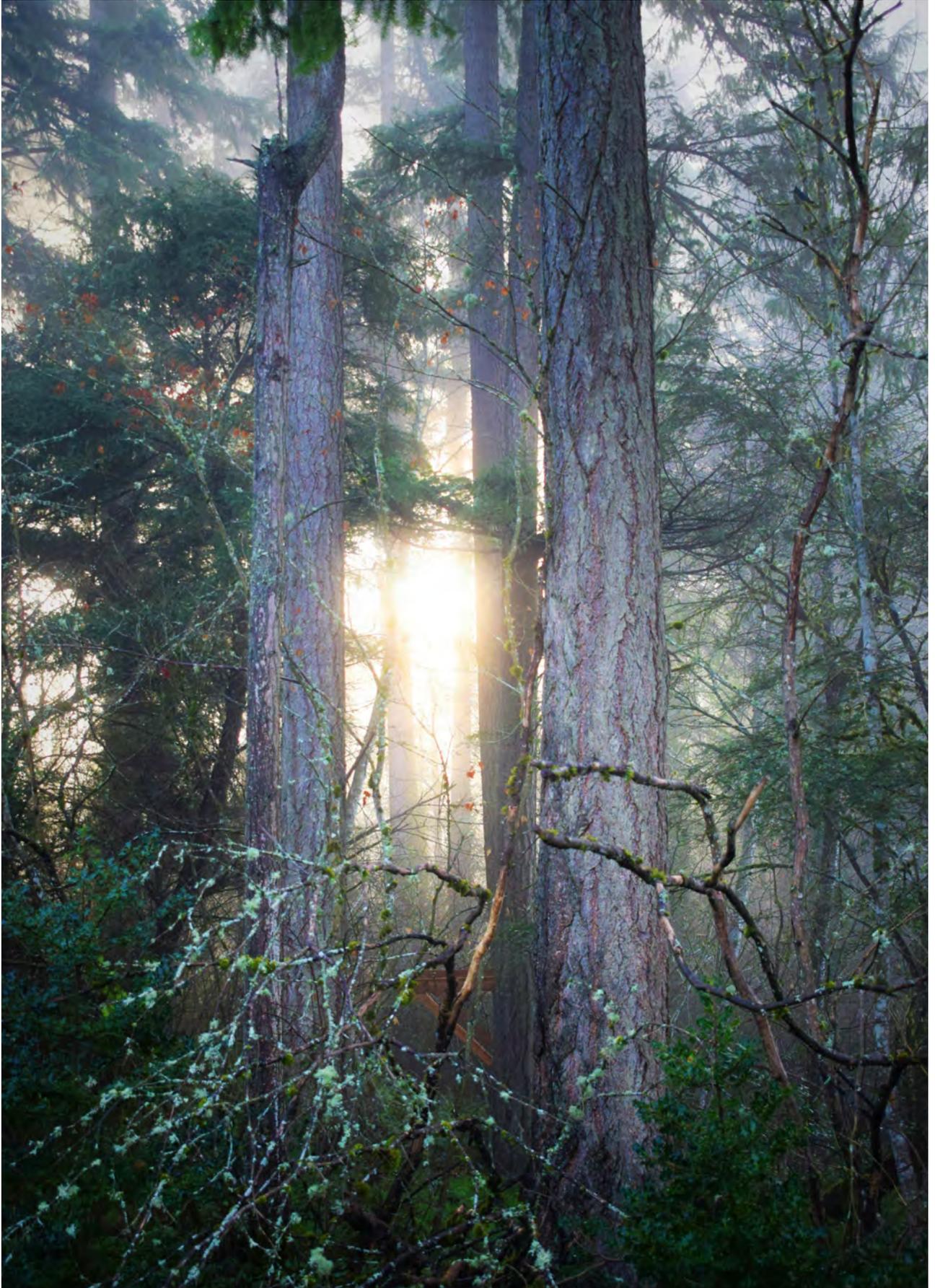
Focusing agency investments and collaboration in these priority landscapes will lead to increased forest health and landscape resilience in western Washington. Priority landscapes provide a geographic focus of DNR's Shared Stewardship Investment Strategy for landscape resilience in western Washington. Priority actions in these watersheds use existing resources and programs at DNR, such as the Good Neighbor Authority, to accelerate outcomes on federal lands, and the Forest Stewardship Program, which provides assistance to non-industrial private forestland owners.

**PRIORITY LANDSCAPES  
PROVIDE A GEOGRAPHIC  
FOCUS OF DNR'S  
SHARED STEWARDSHIP  
INVESTMENT STRATEGY  
FOR LANDSCAPE  
RESILIENCE IN WESTERN  
WASHINGTON.**





FROGGYS / UNSPLASH





**APPENDIX**

**Western Washington  
Forest Health Watershed  
Prioritization Data and  
Methods**

**FOREST HEALTH & RESILIENCE  
INDICATORS + VALUES AT RISK =  
FOREST HEALTH WATERSHED  
PRIORITIZATION**

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## Data Sources and Methodology for Prioritizing Hydrologic Unit Code (HUC) 6 Watersheds

The spatial data used to prioritize HUC 6 watersheds in western Washington are organized into two categories:

- **Landscape resilience and forest health indicators.**
- **Values at risk.**

Landscape resilience and forest health indicators include data that represent anticipated exposure to climate change, drought risk, wildfire hazard, forest productivity, and amount of mid-aged, closed canopy forest. Values at risk include fish and wildlife habitat, ecosystems of concern, and ecosystem services (e.g. drinking water, timber, carbon storage). Risk of forest conversion and the number of acres in ownership by small forest landowners were also included as values at risk.

All metrics were summarized at the HUC 6<sup>1</sup> watershed level (an average HUC 6 watershed is approximately 20,000 acres).

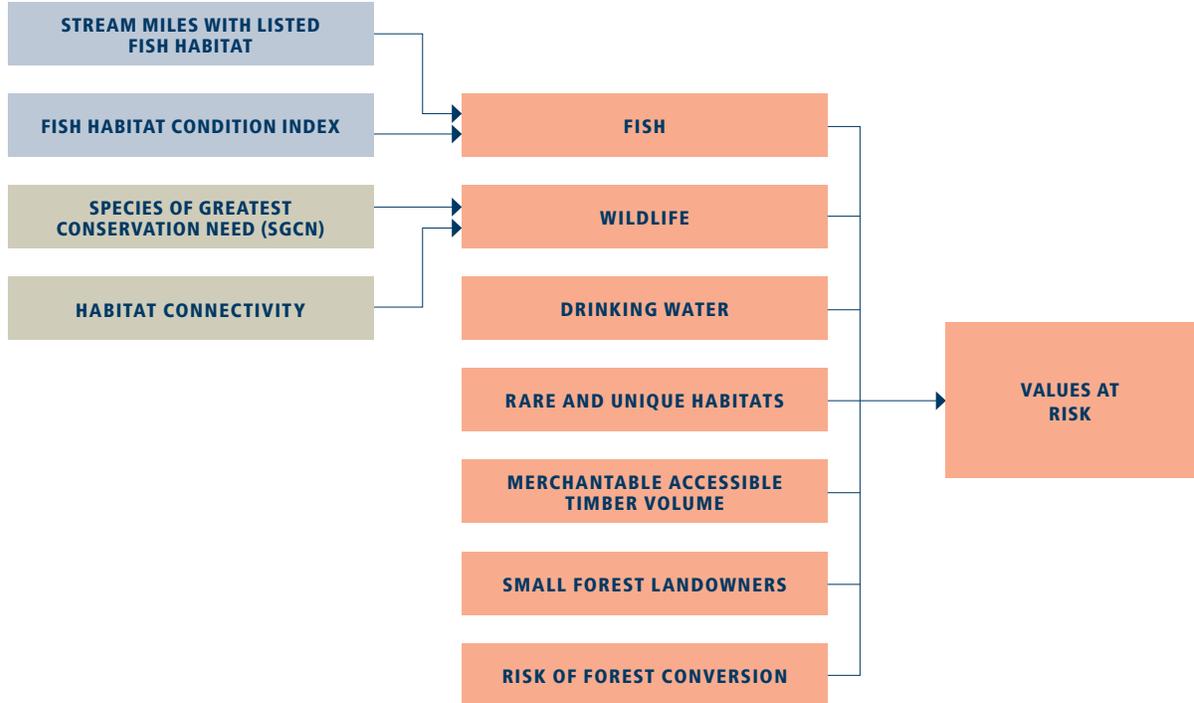
<sup>1</sup>HUC: Hydrologic unit code. The U.S. Geological Survey developed the hydrologic unit system to classify watersheds (e.g. HUC 1, HUC 2, HUC 3, HUC 4, HUC 5, HUC 6). The smaller the number, the bigger the geography. The average HUC 6 watershed is approximately 20,000 acres. For comparison, the average HUC 5 watershed is approximately 150,000 acres.



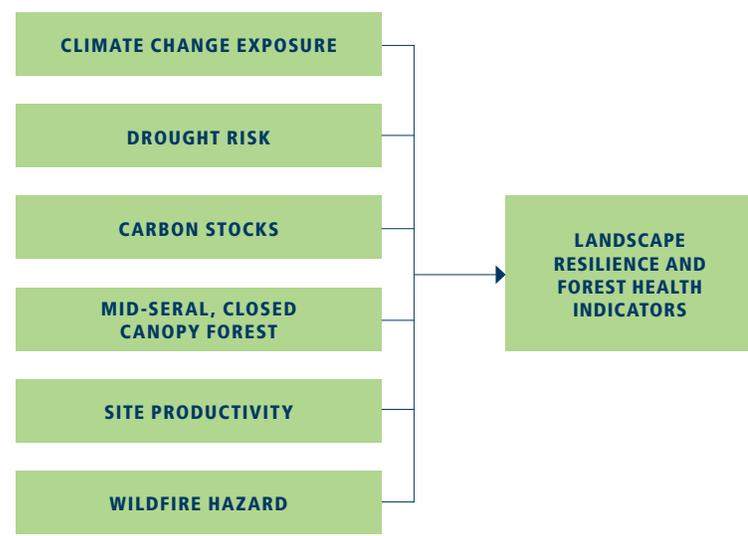
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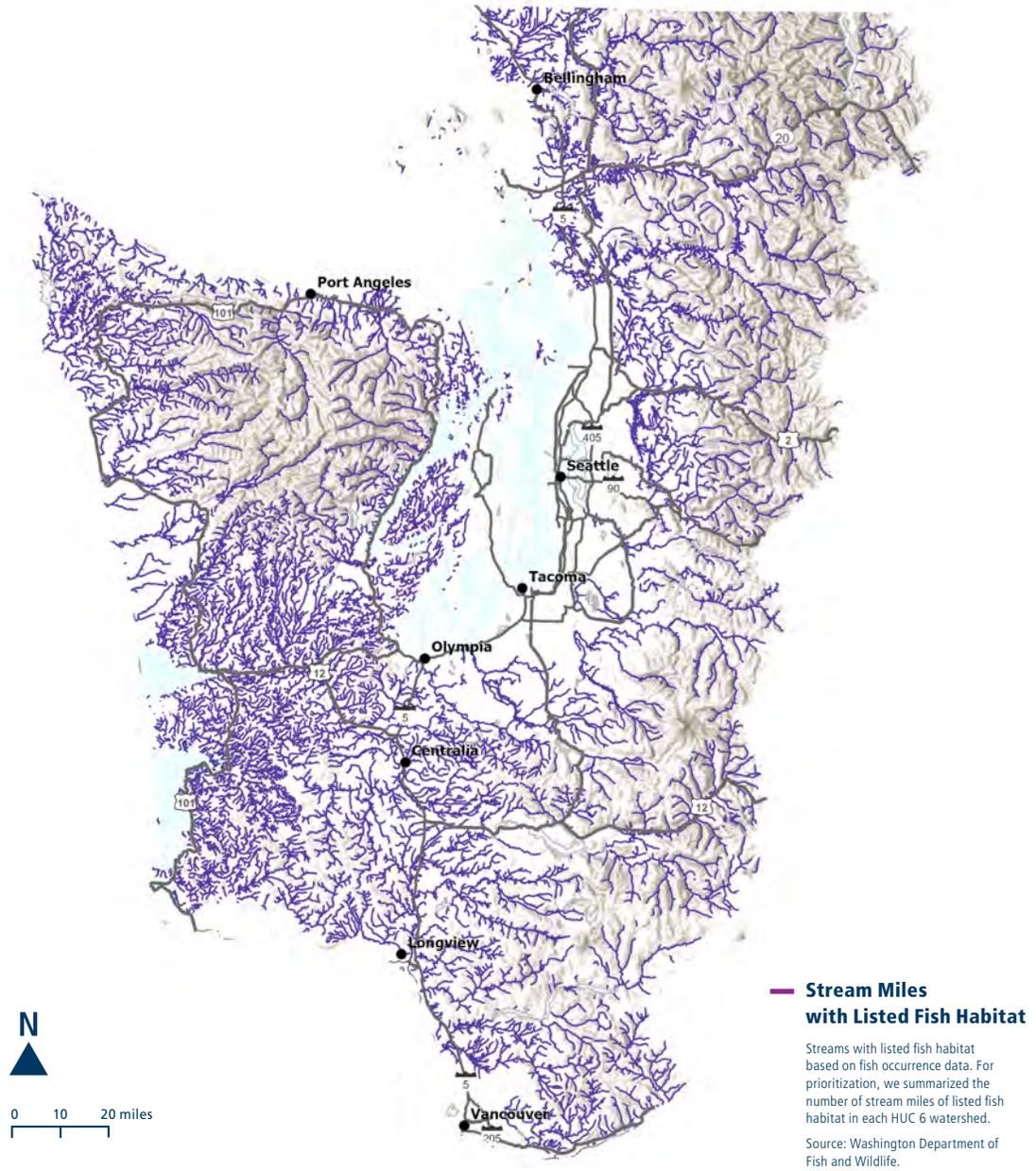
**THE WATERSHED PRIORITIZATION PROCESS, COMBINED WITH INPUT FROM COMMUNITIES, LANDOWNERS AND AGENCY PARTNERS, INFORMED THE SELECTION OF PRIORITY LANDSCAPES IN WESTERN WASHINGTON.**

## VALUES AT RISK



## LANDSCAPE RESILIENCE AND FOREST HEALTH INDICATORS

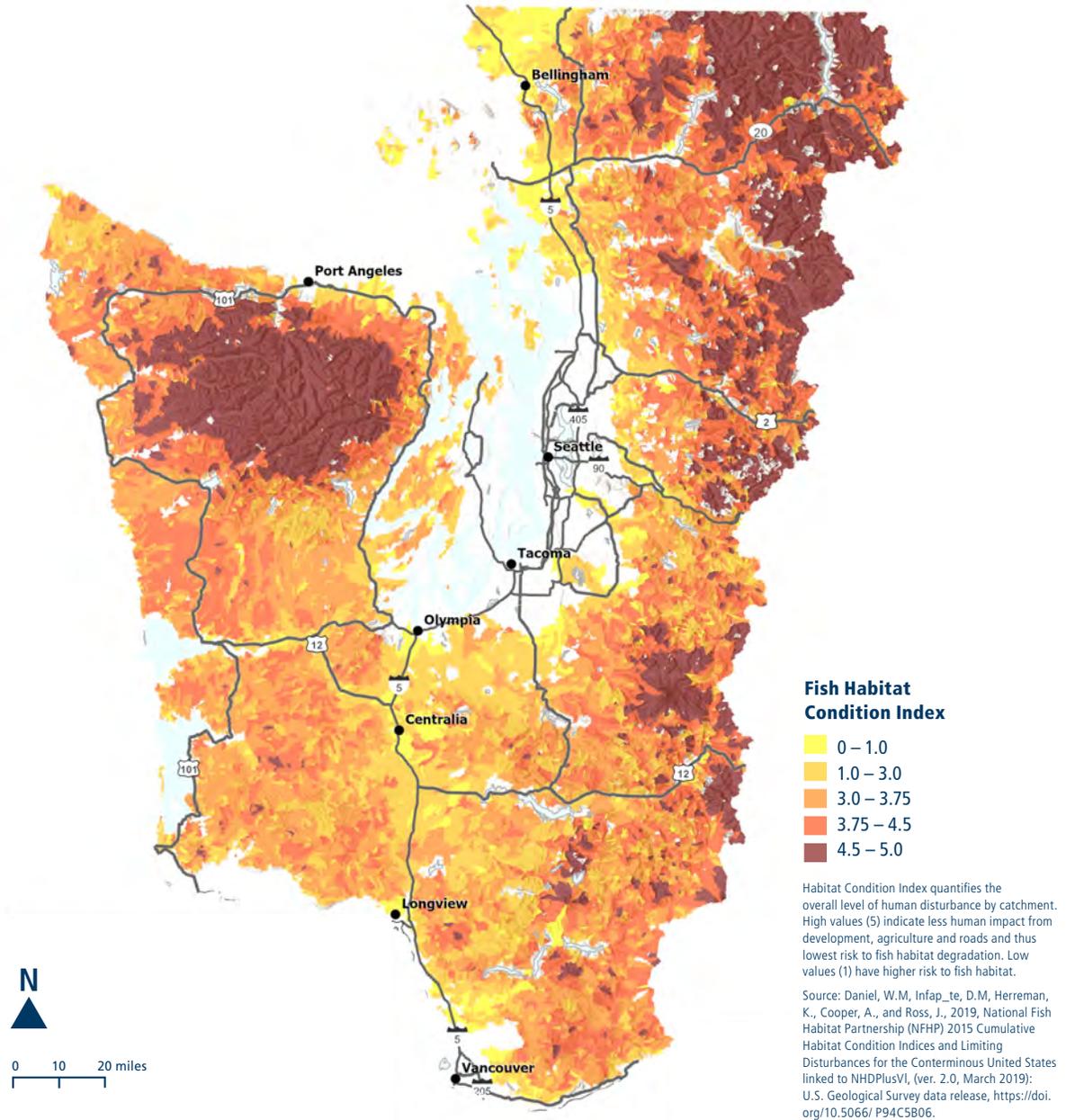




### STREAM MILES WITH LISTED FISH HABITAT

SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW)

WDFW provided fish occurrence data, which is summarized by the number of stream miles of listed fish habitat in each Hydrologic Unit Code (HUC) 6 watershed. The number of stream miles was divided by the size of the watershed in acres to obtain a score. Higher values represent watersheds with more miles of stream with endangered or threatened fish species, thus a greater amount of habitat.

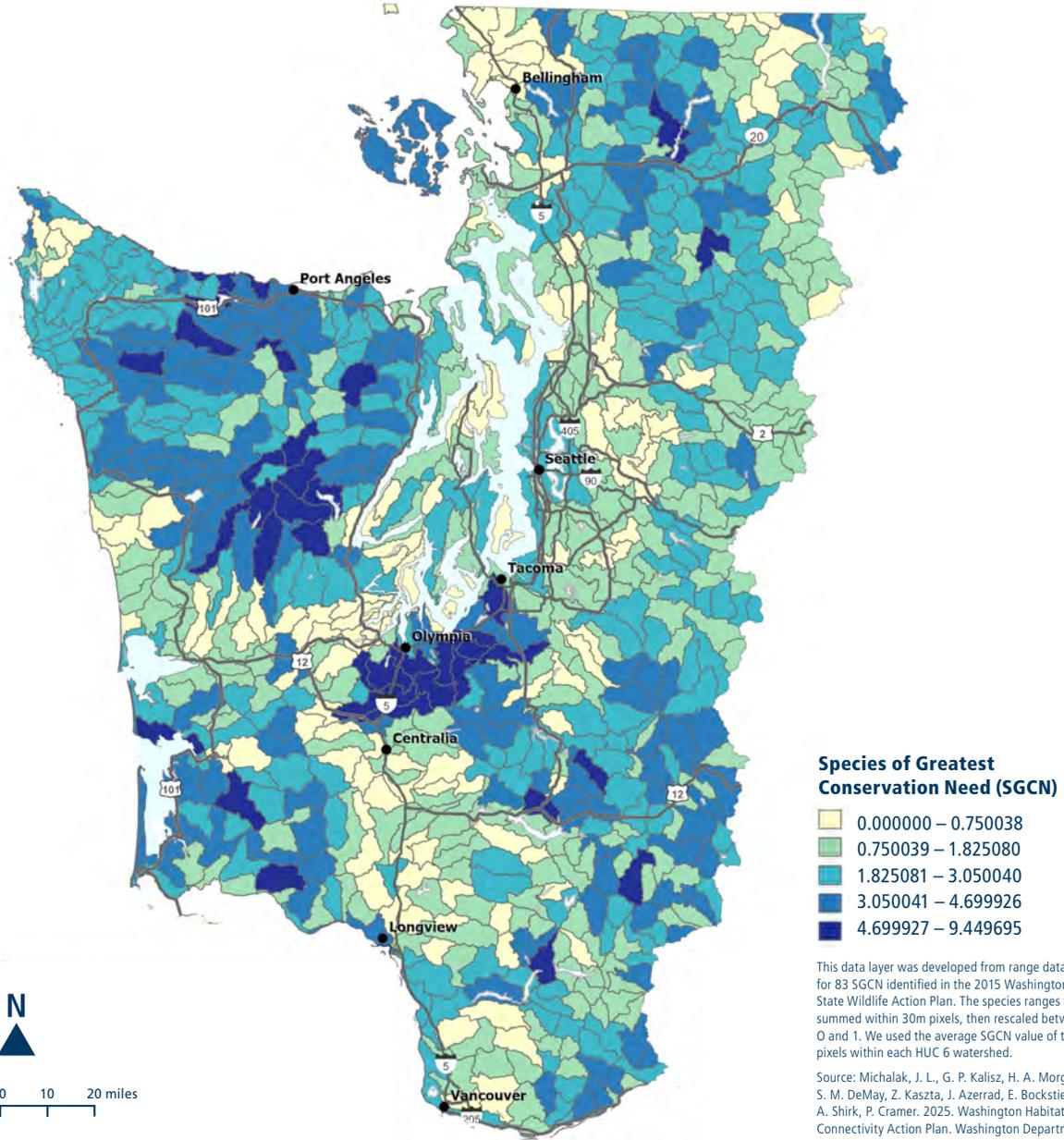


### FISH HABITAT CONDITION INDEX

SOURCE: U.S. GEOLOGICAL SURVEY - NATIONAL FISH HABITAT ASSESSMENT HABITAT CONDITION INDEX (2015)

Habitat Condition Index quantifies the overall level of human disturbance (e.g. road density, stream crossings, percent in agriculture, percent in developed areas, etc.) by catchment (Daniel et al. 2019, Esselman et al. 2010). The scores of the catchments in each HUC 6 were averaged to create a score. Watersheds with high values (5) have had less human impact from development, agriculture and roads and thus lowest risk to fish habitat degradation (higher aquatic integrity and function). Low values (1) have higher risk to fish habitat.

The fish habitat condition index was combined with the fish stream miles layer to create a single fish layer for prioritization scoring.

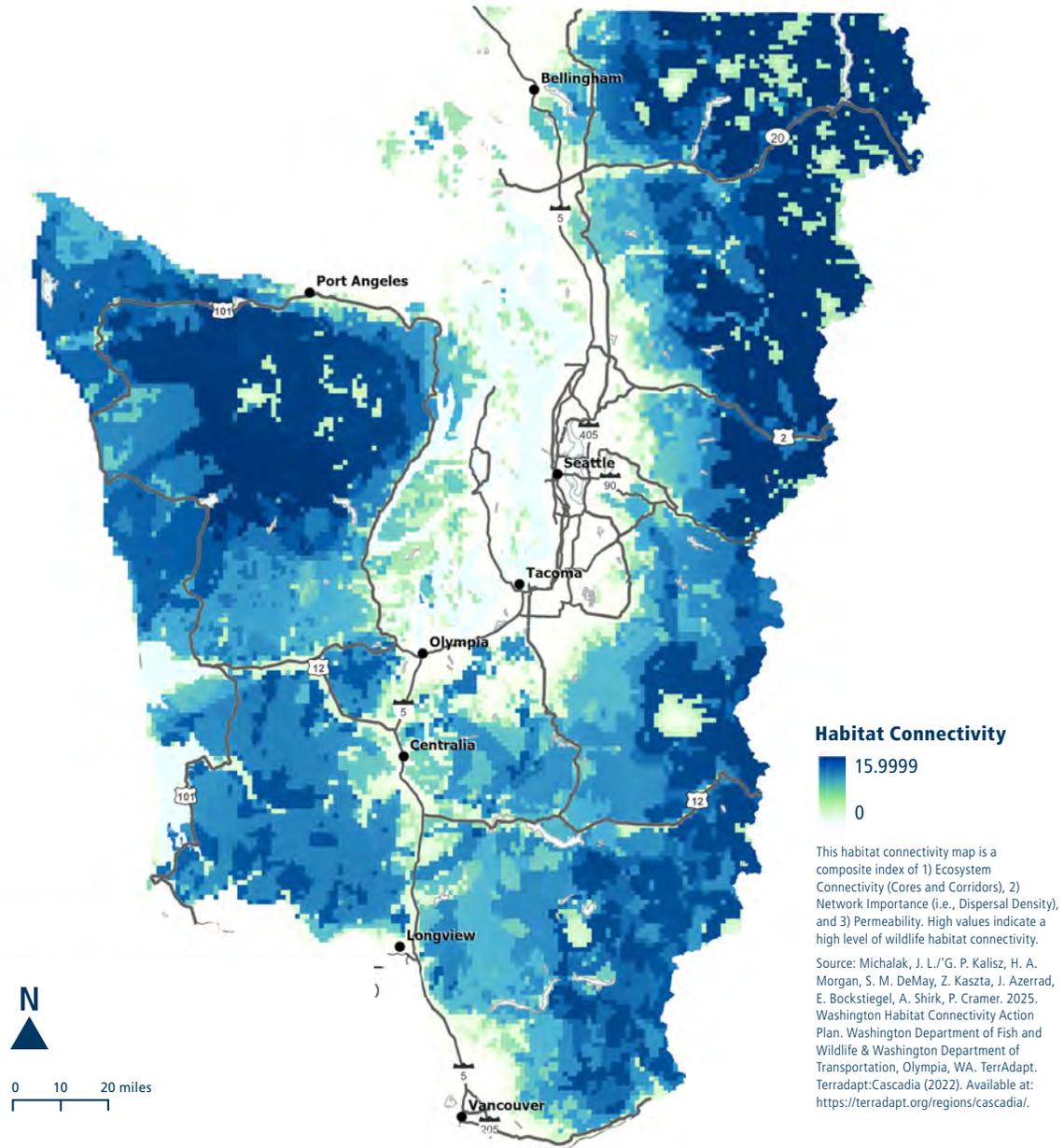


### SPECIES OF GREATEST CONSERVATION NEED (SGCN)

SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE - WASHINGTON STATE WILDLIFE ACTION PLAN (2015)

This Species of Greatest Conservation Need (SGCN) data layer was developed by the WA Department of Fish and Wildlife from range data for 83 SGCN identified in their 2015 Washington State Wildlife Action Plan (WDFW 2015). To focus on terrestrial habitat, data for flying birds without protection status was down weighted to

0.75 of their initial score. Species included in the habitat connectivity layer (details below) were also down weighted to 0.75 of their initial score. The species ranges were summed within 30m pixels, then rescaled between 0 and 1. We used the average SGCN value of the pixels within each HUC 6 watershed. Watersheds with high values (unitless) have the highest species richness and ranking.



### HABITAT CONNECTIVITY

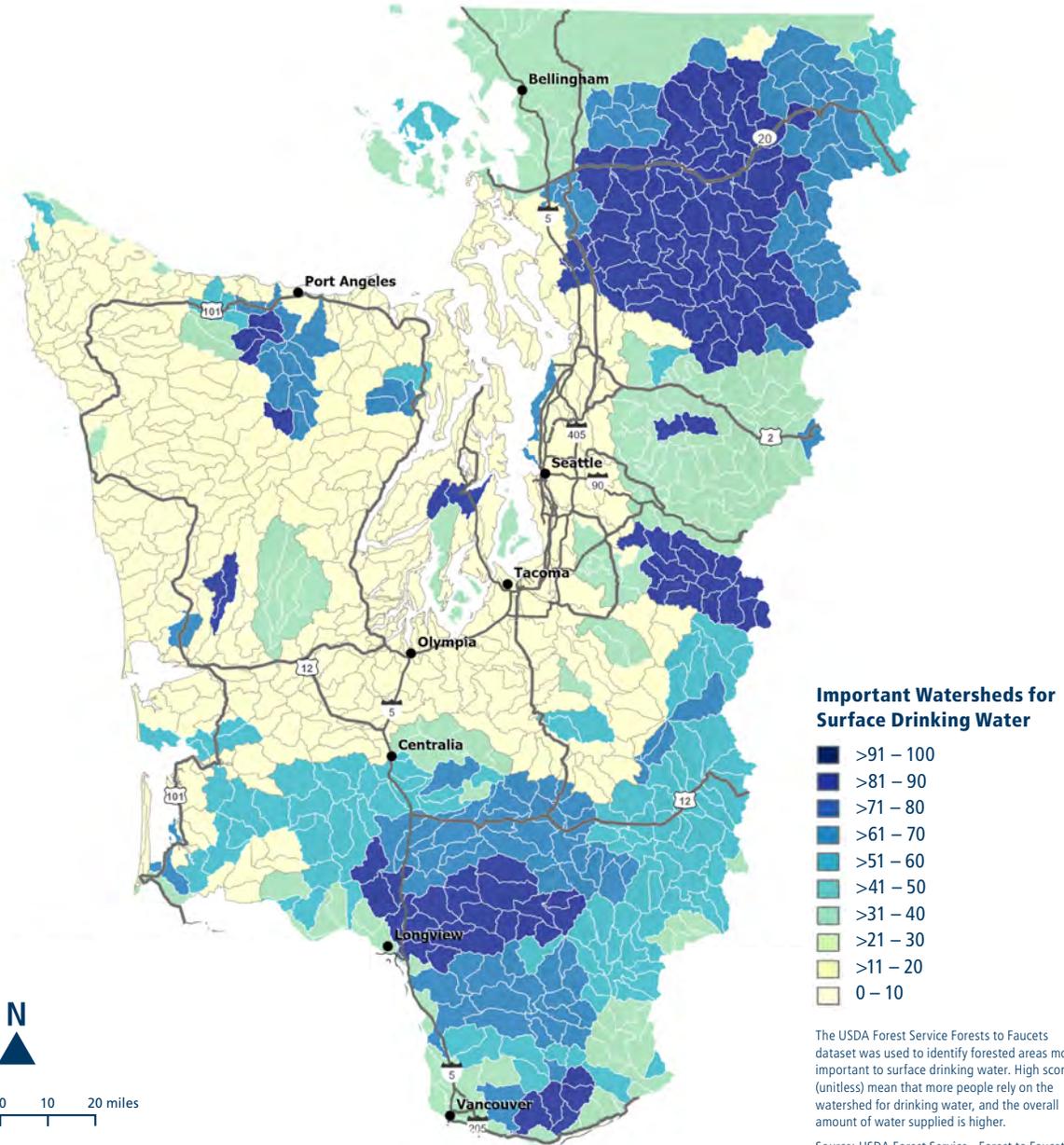
SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE AND TERRADAPT - WASHINGTON HABITAT CONNECTIVITY ACTION PLAN (2025)

This is a composite index of habitat connectivity developed by the WA Department of Fish and Wildlife as a part of their 2025 Washington Habitat Connectivity Action Plan, with support from the nonprofit TerrAdapt (Michalak et al. 2025, TerrAdapt 2022). The habitat connectivity map we used is a composite of 1) Ecosystem Connectivity (Cores and Corridors), 2) Network Importance (i.e., Dispersal Density), and 3) Permeability. Ecosystem connectivity represents broad-scale, structural habitat connectivity. It maps wildlife habitats and the general movement routes connecting them for a variety of species, from highly sensitive specialists to generalists.

Network importance represents “the importance of landscape routes and cores based on connectivity to larger, high-quality habitat areas at the statewide network level.” Permeability represents the degree to which any unit of the landscapes is connected to adjacent areas. The three layers were combined with Ecosystem Connectivity weighted by 10x, Network Importance by 5x, and Permeability 1x of their initial scores. We used the average value of the composite connectivity layer of the pixels within each HUC 6 watershed. Watersheds with high values (unitless) have a high level of wildlife habitat connectivity.

The habitat connectivity layer was combined with the species of greatest conservation need layer to create a single wildlife layer for prioritization scoring.

VALUES AT RISK

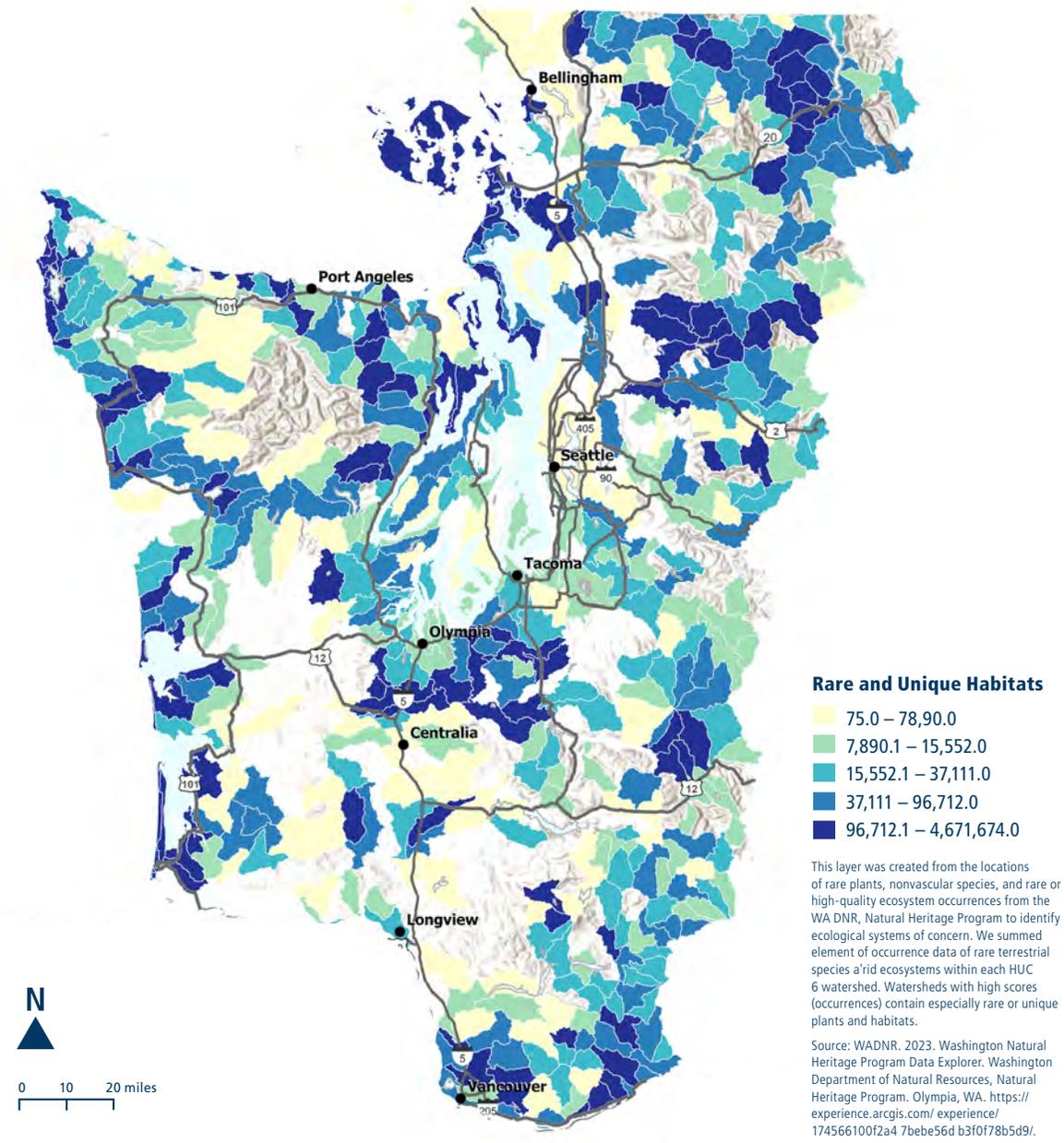


**DRINKING WATER**

SOURCE: USDA FOREST SERVICE – FOREST TO FAUCETS 2.0

The USDA Forest Service Forests to Faucets dataset was used to identify forested areas most important to surface drinking water (Mack et al. 2022). Scores are based on the number of people that derive water from a watershed and the amount of water supply. Scores are for each HUC 6 watershed. High scores (unitless) mean that more people rely on the watershed for drinking water, and the overall amount of water supplied is higher.

VALUES AT RISK

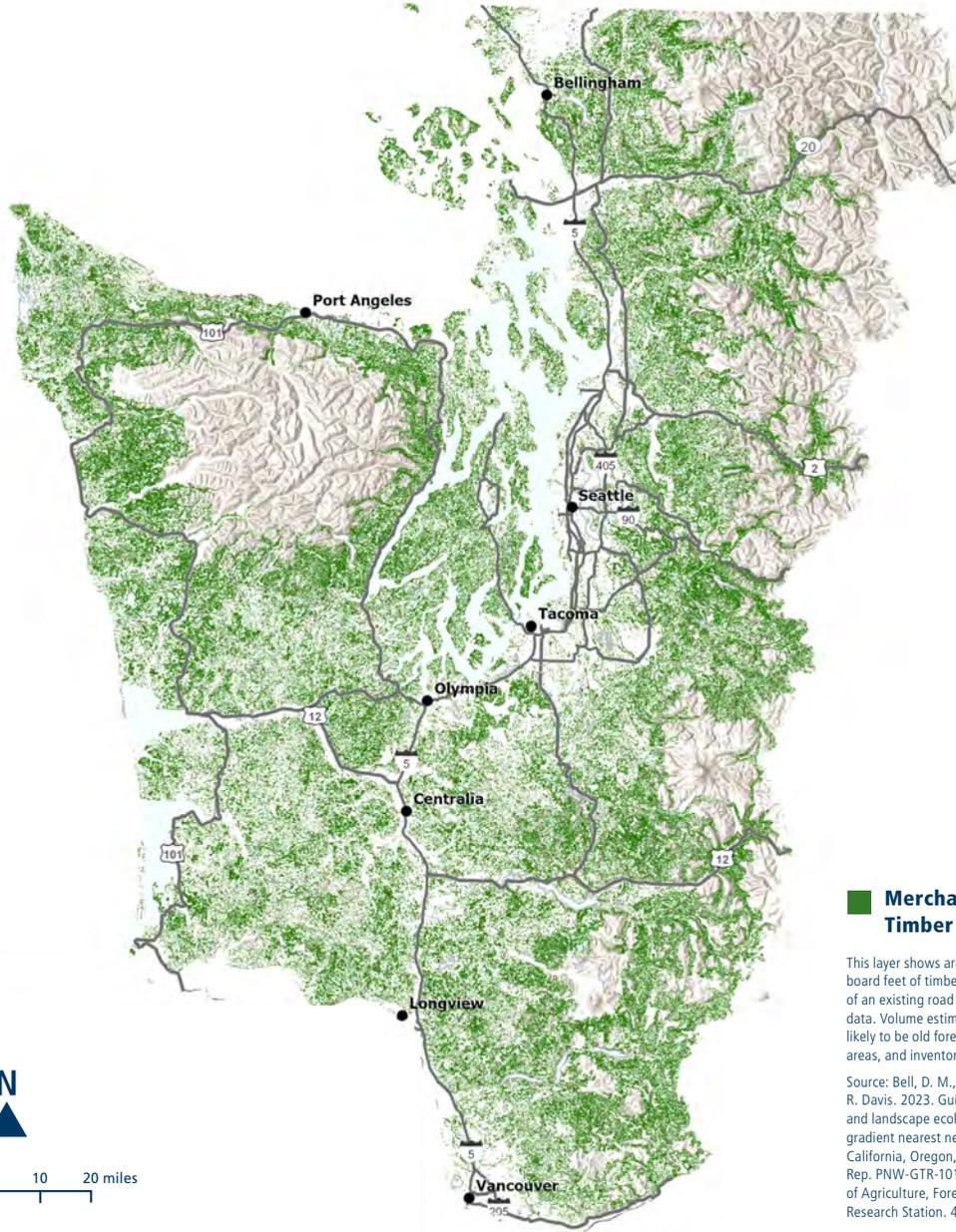


**RARE AND UNIQUE HABITATS**

SOURCE: WASHINGTON DEPARTMENT OF NATURAL RESOURCES,  
NATURAL HERITAGE PROGRAM

This layer was created from the locations of rare plants, nonvascular species, and rare or high-quality ecosystem occurrences from the WA DNR, Natural Heritage Program to identify ecological systems of concern (WDNR 2023). We summed element of occurrence data of rare terrestrial species and ecosystems within each HUC 6 watershed. Watersheds with high scores (occurrences) contain especially rare or unique plants and habitats.

VALUES AT RISK



**Merchantable Accessible Timber Volume**

This layer shows areas with more than 25,000 board feet of timber per acre within 1,500 feet of an existing road based on GNN timber volume data. Volume estimates exclude pixels that are likely to be old forests, national parks, wilderness areas, and inventory roadless areas.

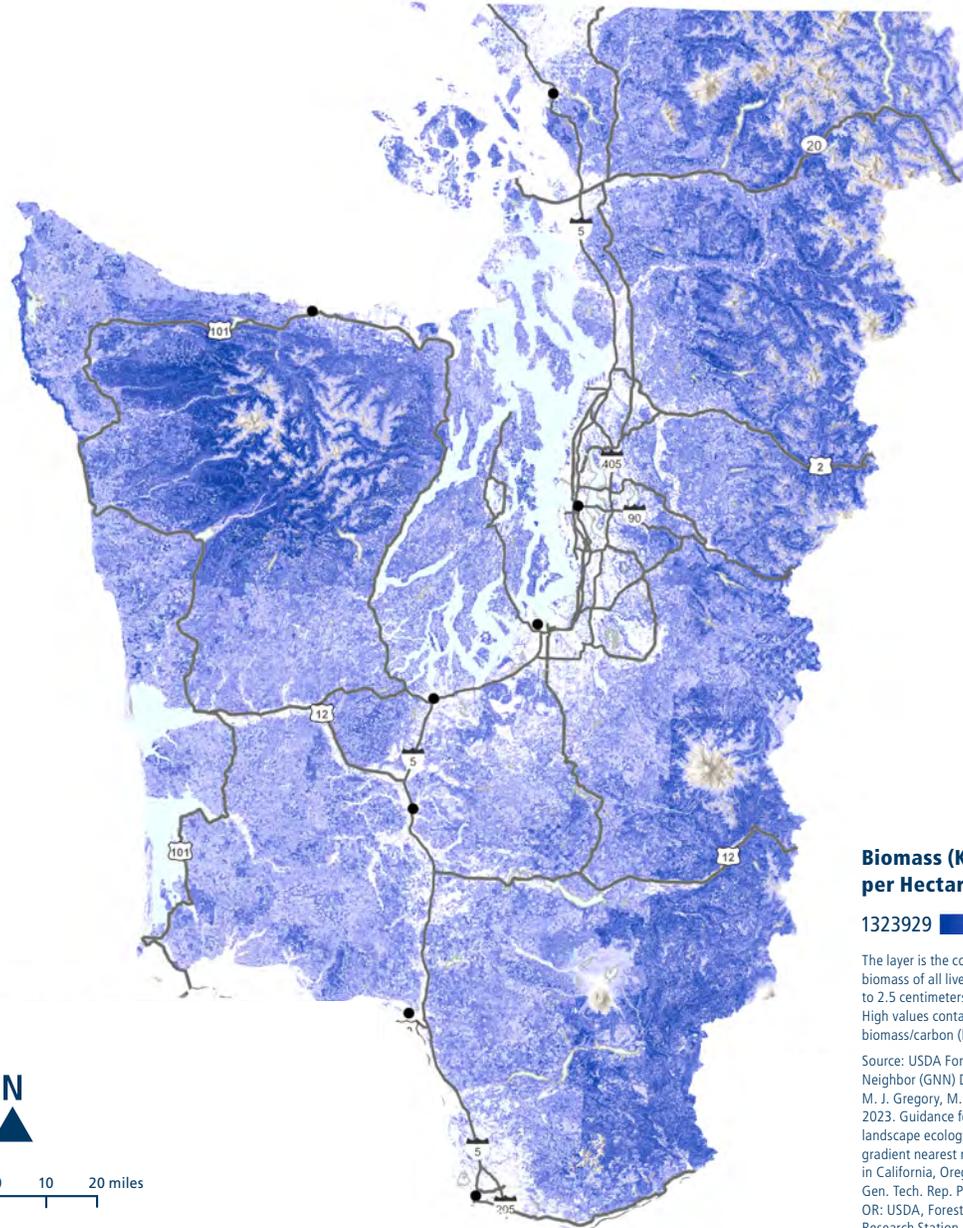
Source: Bell, D. M., M. J. Gregory, M. Palmer, and R. Davis. 2023. Guidance for forest management and landscape ecology applications of recent gradient nearest neighbor imputation maps in California, Oregon, and Washington. Gen. Tech. Rep. PNW-GTR-1018. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest Research Station. 41 p.(Online only). 1018.

**MERCHANTABLE ACCESSIBLE TIMBER VOLUME**

SOURCE: USDA FOREST SERVICE, GRADIENT NEAREST NEIGHBOR (GNN) DATA AND WASHINGTON DEPARTMENT OF NATURAL RESOURCES, ROAD LAYER

WA DNR created this layer to show areas with more than 25,000 board feet of timber per acre within 1,500 feet of an existing road. The source data uses GNN data from the USDA Forest Service to calculate the number of acres that meet the 25,000 board feet threshold (Bell et al. 2023). Volume estimates exclude pixels that are likely to be old forests, based on the Old Growth Structure Index from GNN (OGSI-200). National parks, wilderness areas, and inventory roadless areas were also excluded. The roads layer is from DNR. The number of acres with merchantable, accessible timber volume in each HUC 6, divided by the total area of the HUC 6, was used as the score.

VALUES AT RISK



**Biomass (Kilograms per Hectare)**

1323929  0

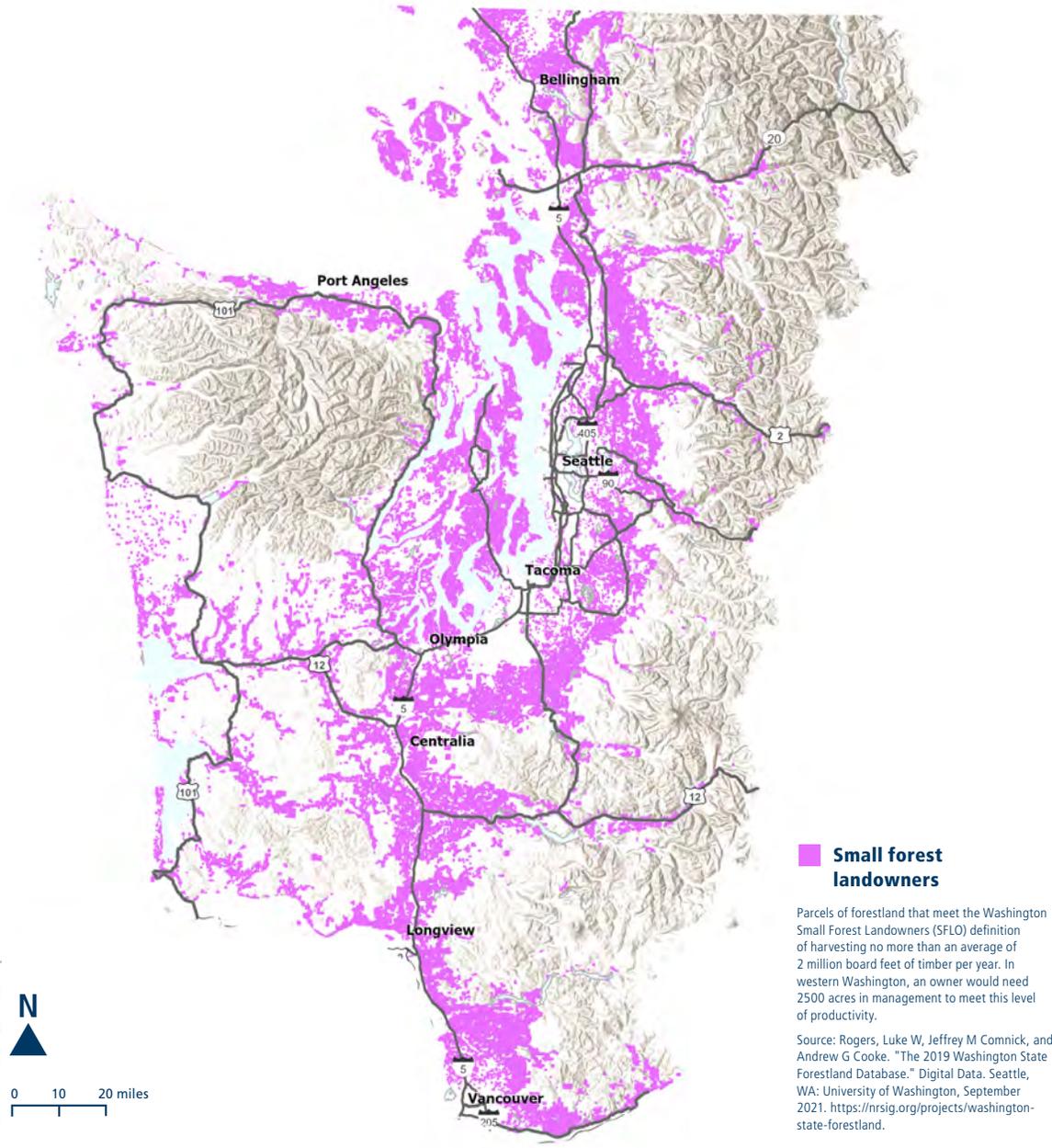
The layer is the component ratio method biomass of all live trees greater than or equal to 2.5 centimeters diameter at breast height. High values contain higher live, standing biomass/carbon (kilograms per hectare).

Source: USDA Forest Service, Gradient Nearest Neighbor (GNN) Data Citation: Bell, D. M., M. J. Gregory, M. Palmer, and R. Davis. 2023. Guidance for forest management and landscape ecology applications of recent gradient nearest neighbor imputation maps in California, Oregon, and Washington. Gen. Tech. Rep. PNWGTR-1018. Portland, OR: USDA, Forest Service, Pacific Northwest Research Station.

**CARBON STOCKS**

SOURCE: USDA FOREST SERVICE, GRADIENT NEAREST NEIGHBOR (GNN) DATA

The average standing biomass per HUC 6 watershed was summarized by kilograms per hectare. The source data for this layer were the component ratio method biomass of all live trees greater than or equal to 2.5 centimeters diameter at breast height from GNN data (Bell et al. 2023). Watersheds with high values contain higher live, standing biomass/carbon (kilograms per hectare).



### SMALL FOREST LANDOWNERS

SOURCE: UNIVERSITY OF WASHINGTON – 2019 WASHINGTON STATE FORESTLAND DATABASE

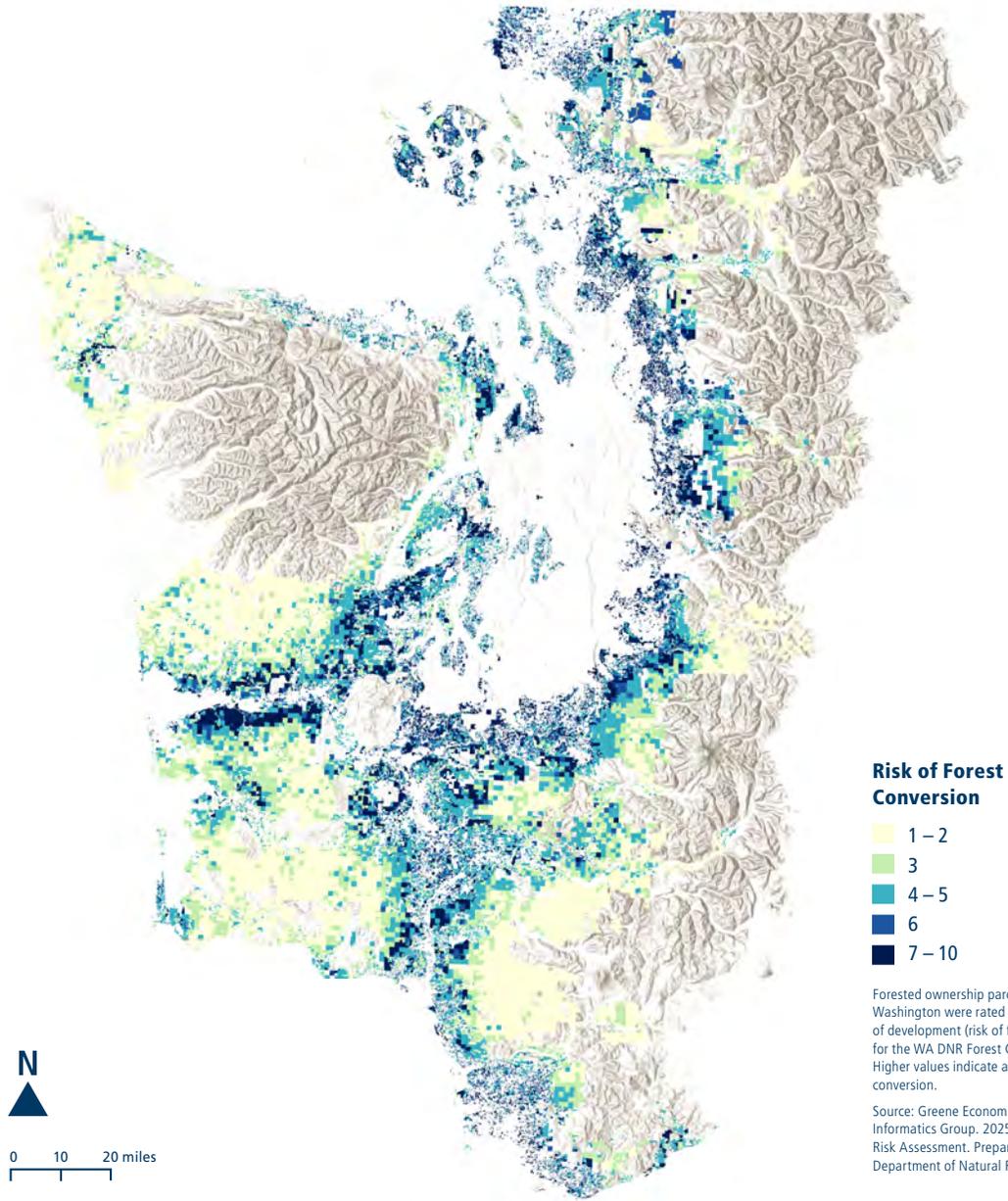
The 2019 Washington State Forestland Database was developed by the Natural Resource Spatial Informatics Group at the University of Washington School of Environmental and Forest Sciences (Rogers et al. 2021). We filtered the parcels of forestland that meet the Washington Small Forest Landowners (SFLO) definition of harvesting no more than an average of 2 million board feet of timber per year. In western Washington, an owner would need 2500 acres in management to meet this level of productivity. We took the sum of SFLO acres within each HUC 6 watershed and divided by the total area of that watershed. For the resulting SFLO layer, watersheds with high values contain more SFLO area, relative to the size of the watershed.

#### Small forest landowners

Parcels of forestland that meet the Washington Small Forest Landowners (SFLO) definition of harvesting no more than an average of 2 million board feet of timber per year. In western Washington, an owner would need 2500 acres in management to meet this level of productivity.

Source: Rogers, Luke W, Jeffrey M Connick, and Andrew G Cooke. "The 2019 Washington State Forestland Database." Digital Data. Seattle, WA: University of Washington, September 2021. <https://nrsig.org/projects/washington-state-forestland>.

VALUES AT RISK

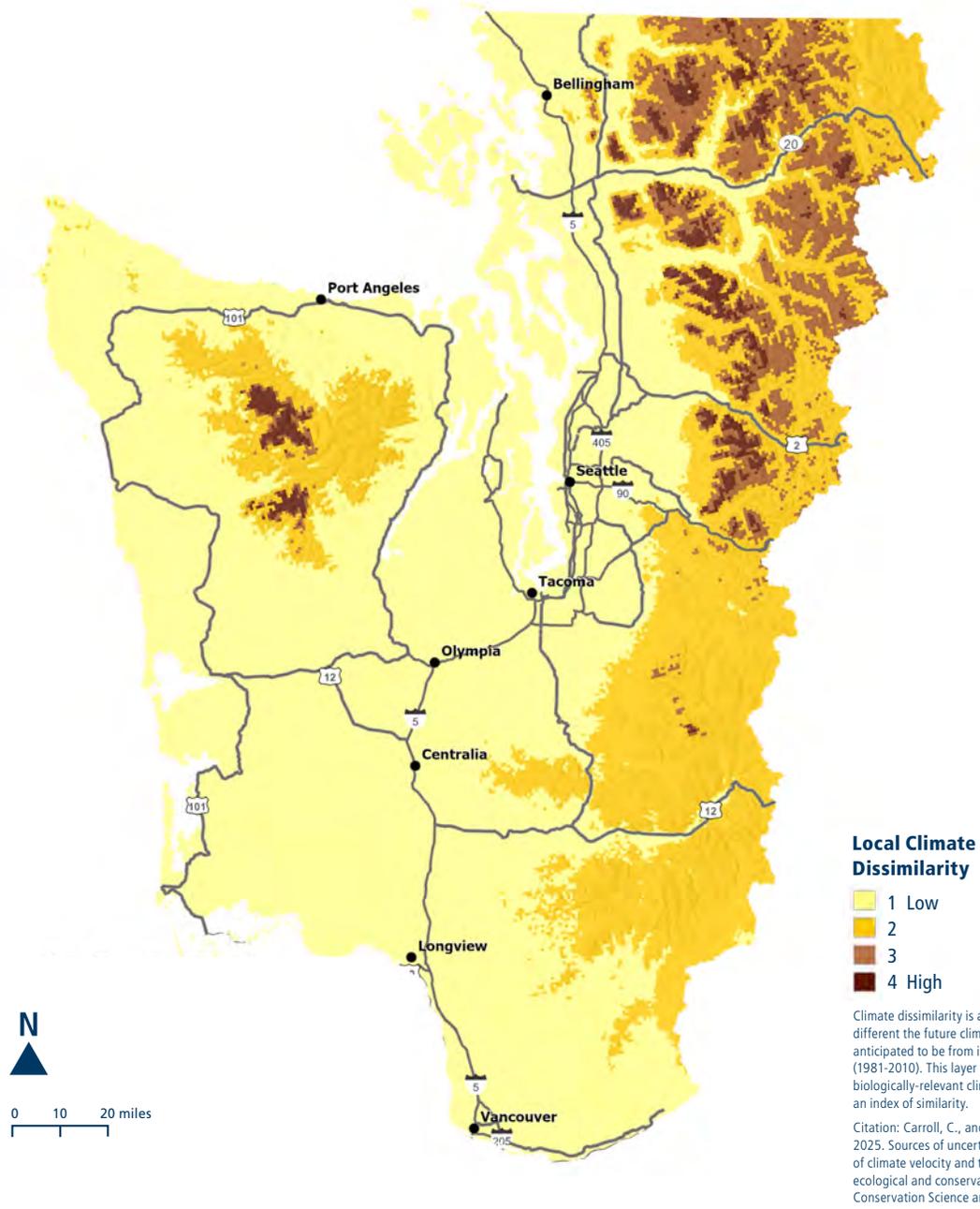


**RISK OF FOREST CONVERSION**

SOURCE: WASHINGTON DEPARTMENT OF NATURAL RESOURCES – FOREST CONVERSION PROJECT

Forested ownership parcels across Washington were rated for their probability of development (risk of forest conversion) for the WA DNR Forest Conversion Project (Greene Economics 2025). The probability of conversion was summed for each parcel within a HUC 6 watershed. Watersheds with higher values have a higher risk of forest conversion.

LANDSCAPE RESILIENCE AND FOREST HEALTH INDICATORS

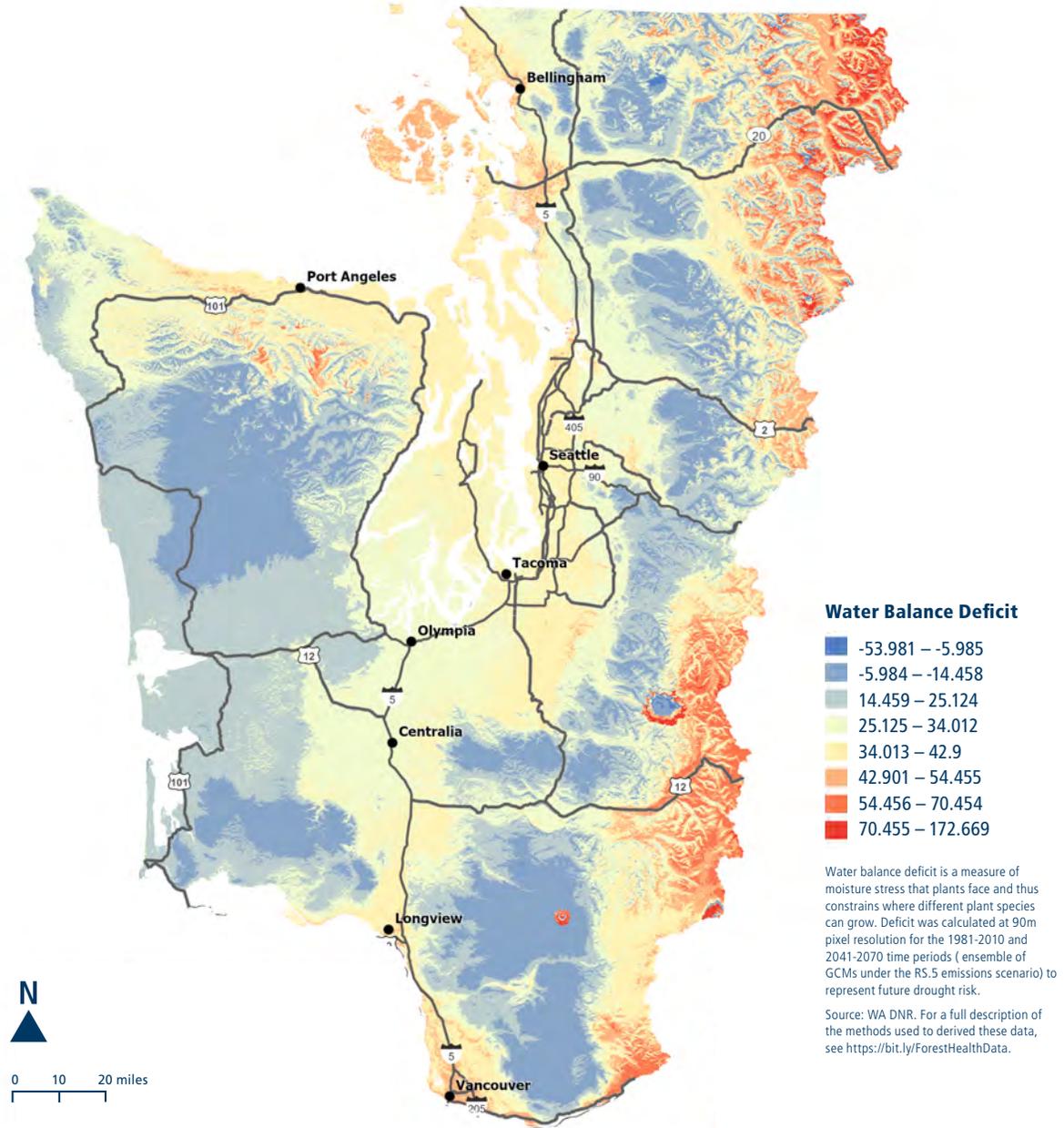


### CLIMATE CHANGE EXPOSURE

SOURCE: KLAMATH CENTER FOR CONSERVATION RESEARCH

Climate dissimilarity is a measure of how different the future climate is anticipated to be from its current climate. This layer combines 11 biologically-relevant temperature and precipitation variables into an index of similarity (Carroll and Mahony 2025). The current climate period used climate data from 1981-2010, while the projected future climate was for 2041-2070 using the average of eight different climate models (ensemble of global circulation models) for the Shared Socioeconomic Pathway (SSP5-8.5) high emissions scenario. The average dissimilarity of the pixels in each HUC 6 were used as the score. Watersheds with high values are likely to experience the largest change between current climate and future climate.

LANDSCAPE RESILIENCE AND FOREST HEALTH INDICATORS



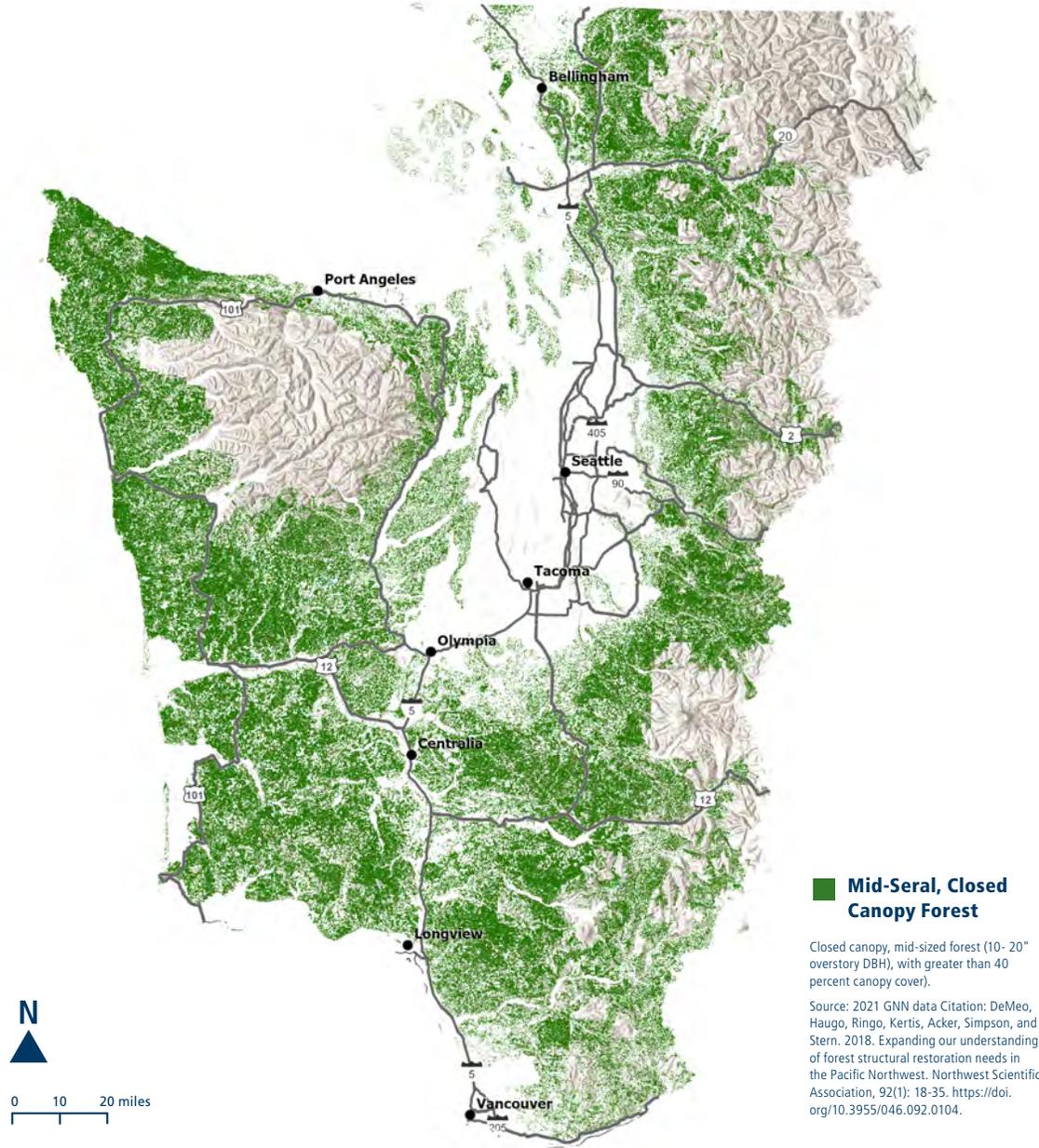
**DROUGHT RISK**

SOURCE: WASHINGTON DEPARTMENT OF NATURAL RESOURCES – CLIMATIC MOISTURE DEFICIT, CLIMATE NORTH AMERICA – CLIMATE DATA

The projected increase in water balance deficit was included to capture the projected changes in climate that will exacerbate forest health problems. Water balance deficit is a measure of moisture stress that plants face and thus constrains where different plant species can grow. Increases in deficit elevate fire behavior and make forests more susceptible to insect and disease outbreaks. Deficit was calculated at 90m pixel resolution for the 1981-2010 and 2041-2070 time periods (ensemble of

global circulation models under the R8.5 “business as usual” emissions scenario). The average value of the absolute difference between the current and future was used as the score for each HUC 6. Climate data and climate projections from [Climate North America](#) were used (Mahony et al. 2022, Wang et al. 2016, 2025). For a full description of the methods used to derive these data, see <https://bit.ly/ForestHealthData>. Watersheds with high values (mm of deficit) represent areas where higher increases in deficit are projected and thus higher drought stress is likely.

LANDSCAPE RESILIENCE AND FOREST HEALTH INDICATORS



**MID-SERIAL, CLOSED CANOPY FOREST**

SOURCE: USDA FOREST SERVICE REGION 6 – RESTORATION NEEDS ASSESSMENT

Dense mid-aged forests are generally over-abundant in watersheds in western Washington relative to historical conditions. High density forests are also more susceptible to many forest health problems such as drought stress, insect outbreaks, and pathogens. This mid-seral, closed canopy forest layer is from the most recent version of the restoration needs assessment conducted by Madison Laughlin from the University of Washington for Region 6 of the USDA Forest Service. The needs assessment is based on methods developed by The Nature Conservancy and the USDA

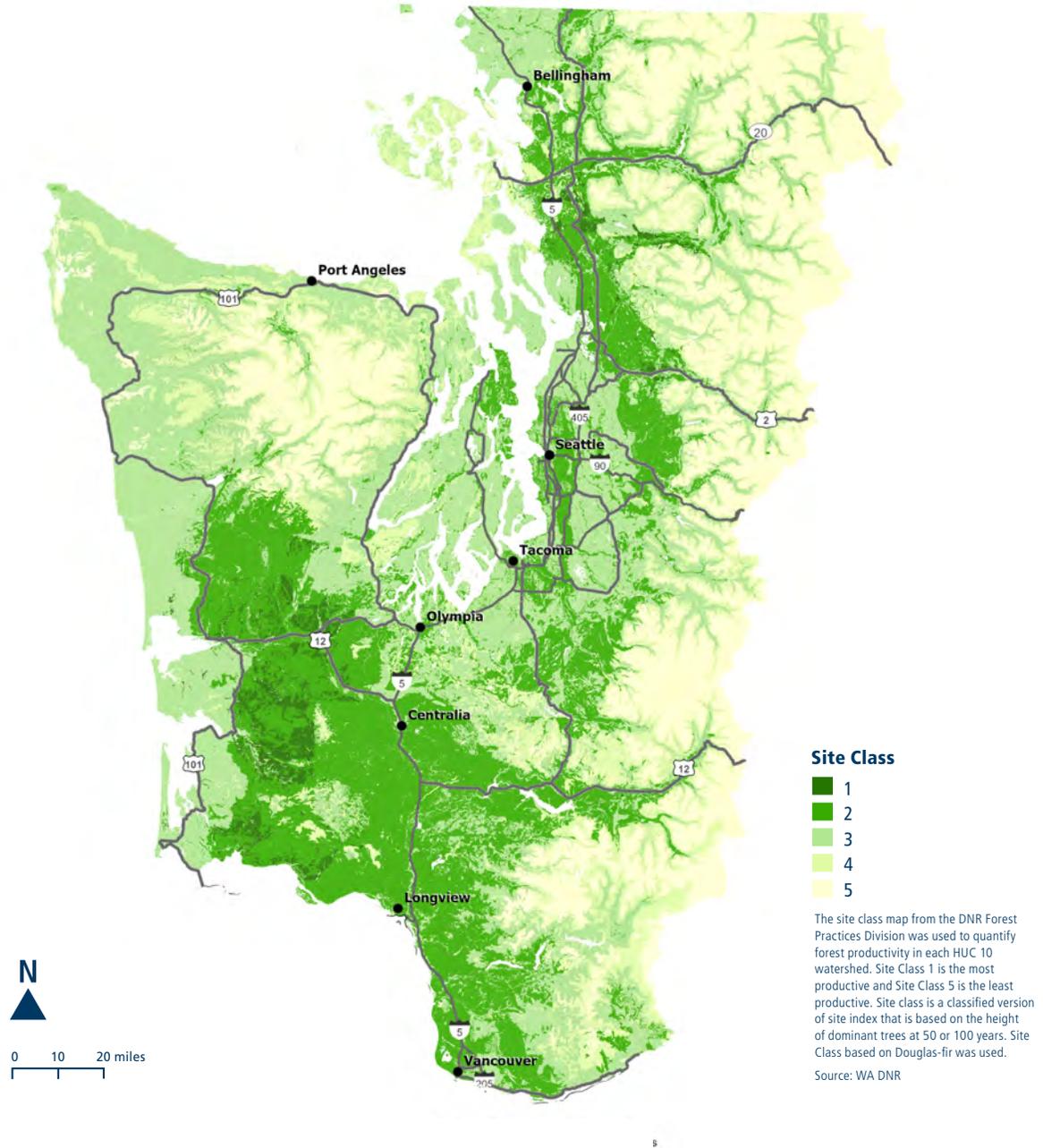
Forest Service (DeMeo et al. 2018, Laughlin et al. 2023). For this metric, the map of structure classes from the assessment was used to quantify the amount of closed canopy, mid-sized forest (10- 20" overstory DBH), with greater than 40 percent canopy cover) within a HUC 6 watershed. The source data is 2021 GNN data, with updates for fires and treatments that occurred in 2022-2023. The total number of mid-seral, closed canopy acres across each HUC 6, divided by the total areas of the HUC 6, was used as the score. Watersheds with high values have a higher proportion of mid-seral-closed canopy forest.

**Mid-Seral, Closed Canopy Forest**

Closed canopy, mid-sized forest (10- 20" overstory DBH), with greater than 40 percent canopy cover).

Source: 2021 GNN data Citation: DeMeo, Haugo, Ringo, Kertis, Acker, Simpson, and Stern. 2018. Expanding our understanding of forest structural restoration needs in the Pacific Northwest. Northwest Scientific Association, 92(1): 18-35. <https://doi.org/10.3955/046.092.0104>.

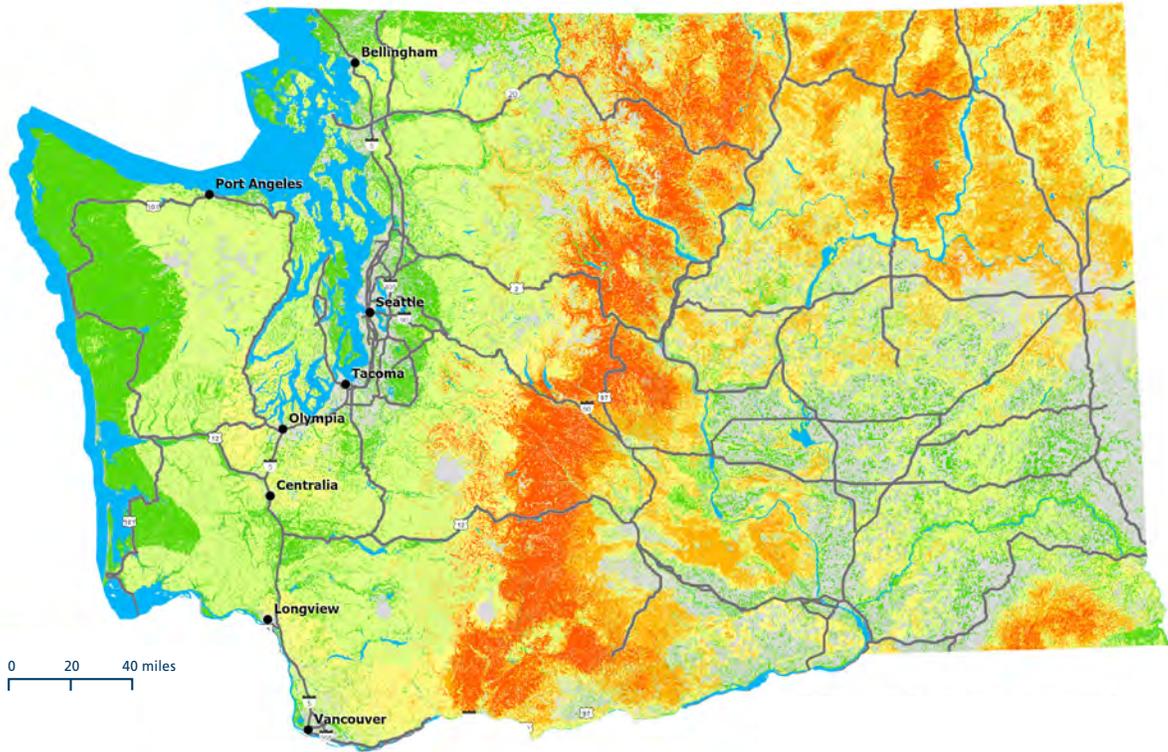
LANDSCAPE RESILIENCE AND FOREST HEALTH INDICATORS



**SITE PRODUCTIVITY**

SOURCE: FOREST PRACTICES DIVISION,  
WASHINGTON DEPARTMENT OF NATURAL RESOURCES

The site class map from the DNR Forest Practices Division was used to quantify forest productivity in each HUC 6 watershed. Site Class 1 is the most productive and Site Class 5 is the least productive. Site class is a classified version of site index that is based on the height of dominant trees at 50 or 100 years. Site Class based on Douglas-fir was used. A random forest model using climate variables and soil water holding capacity was used to extend this layer to federal lands that are not covered in the available layer. The average site class of the pixels in each HUC 6 were used as the score. Watersheds with lower values are the more productive.



### WILDFIRE HAZARD

SOURCE: USDA FOREST SERVICE,  
ROCKY MOUNTAIN RESEARCH STATION

Wildfire hazard potential represents a combined index of burn probability and fire intensity. This layer was created by the USDA Forest Service, Rocky Mountain Research Station from updated national datasets of annual burn probability and fire intensity generated with the large fire simulation system (FSim). LANDFIRE 2020 (version 2.2.0) vegetation and wildland fuels data and point locations of fire occurrence from 1992-2020 were used as part of their mapping process. Wildfire hazard potential is not an explicit map of wildfire risk as it does not include the impact of fire on highly valued natural resources and assets (e.g. structures, infrastructure). Wildfire hazard potential represents an average scenario not extreme events, nor is it a forecast of any particular wildfire season. Watersheds with higher values indicate an increase in wildfire hazard potential.

#### Wildfire Hazard

- Very Low
- Low
- Moderate
- High
- Very High
- \*Non-burnable
- Water

Wildfire hazard potential represents a combined index of burn probability and fire intensity. This layer was created by the USDA Forest Service, Rocky Mountain Research Station.

\*Non-burnable is developed, agricultural fields, perennial snow/ice, and bare ground.  
 Citation: Dillon, Gregory K. 2023. Wildfire Hazard Potential for the United States (270-m), version 2023. 4th Edition. Updated 17 July 2024. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2015-0047-4>.

**WILDFIRE HAZARD  
POTENTIAL REPRESENTS  
AN AVERAGE SCENARIO, NOT  
EXTREME EVENTS, NOR IS IT  
A FORECAST OF ANY  
PARTICULAR WILDFIRE  
SEASON.**



Western Washington Forest Health Strategic Plan Work Group meeting in Packwood, Washington in 2025 to discuss wildfire risk reduction and landscape resilience strategies in the wildland urban interface (WUI).

## Combining Metrics Into Prioritization Scores

To rank and prioritize HUC 6 watersheds, the datasets making up the values at risk and the landscape resilience and forest health indicators were combined using the process described below. Note that all scores are relative. A low score does not mean that a watershed has no forest health concerns or need for action. Instead, it means that metrics and overall needs are lower relative to other watersheds. In combining metrics into composite scores, DNR scientists used the simplest, most transparent approaches possible unless a clear need and advantage for a more complicated approach existed. We did not apply any weights to the metrics.

**1. Derive HUC 6 scores:** For each dataset the value of pixels or smaller geospatial features (lines, polygons, etc.) across each HUC 6 were aggregated to derive a single score for each HUC 6. This was done in different ways for different datasets; see the descriptions of each dataset in this appendix. For some datasets, the average of the pixels across each HUC 6 was derived. In others, the sum of the acres or stream miles divided by the total area of the HUC 6 was calculated. Other datasets were provided to DNR with a score for each HUC.

**2. Rank watersheds for each metric:** A simple ranking approach was used to convert the HUC 6 scores derived for each dataset onto a standardized 0-1 scale. For each dataset or metric, values for the HUC 6 watersheds were first ranked with ties allowed. The ranks were then standardized by dividing by the highest rank for each dataset. The watershed with the highest value for a dataset has a score of 1 and the lowest value a score of 0. This relative approach resulted in similar contributions of each metric to the composite scores.

Before calculating the ranking, raw scores for all metrics were first rounded to a specified numeral for each metric, based on the distribution of that metric. For example, increase in deficit was rounded to the nearest 5. (e.g. 5, 20, 40). Acre metrics were rounded to the nearest 100 (e.g. 800, 2,100, 5,500). Rounding created tied rankings for watersheds that had close scores. This removed artificial differentiation from small differences in scores.

**3. Calculate composite scores and rankings:** Rankings for all metrics were added together to derive a composite score. Note that two wildlife metrics were first combined into a single averaged wildlife metric; the same was done with the two fish metrics. DNR scientists explored more complex approaches to combining metrics, but determined that this simpler approach worked as well as any of the others.

**RANKINGS FOR  
ALL METRICS WERE  
ADDED TOGETHER TO  
DERIVE A COMPOSITE  
SCORE.**

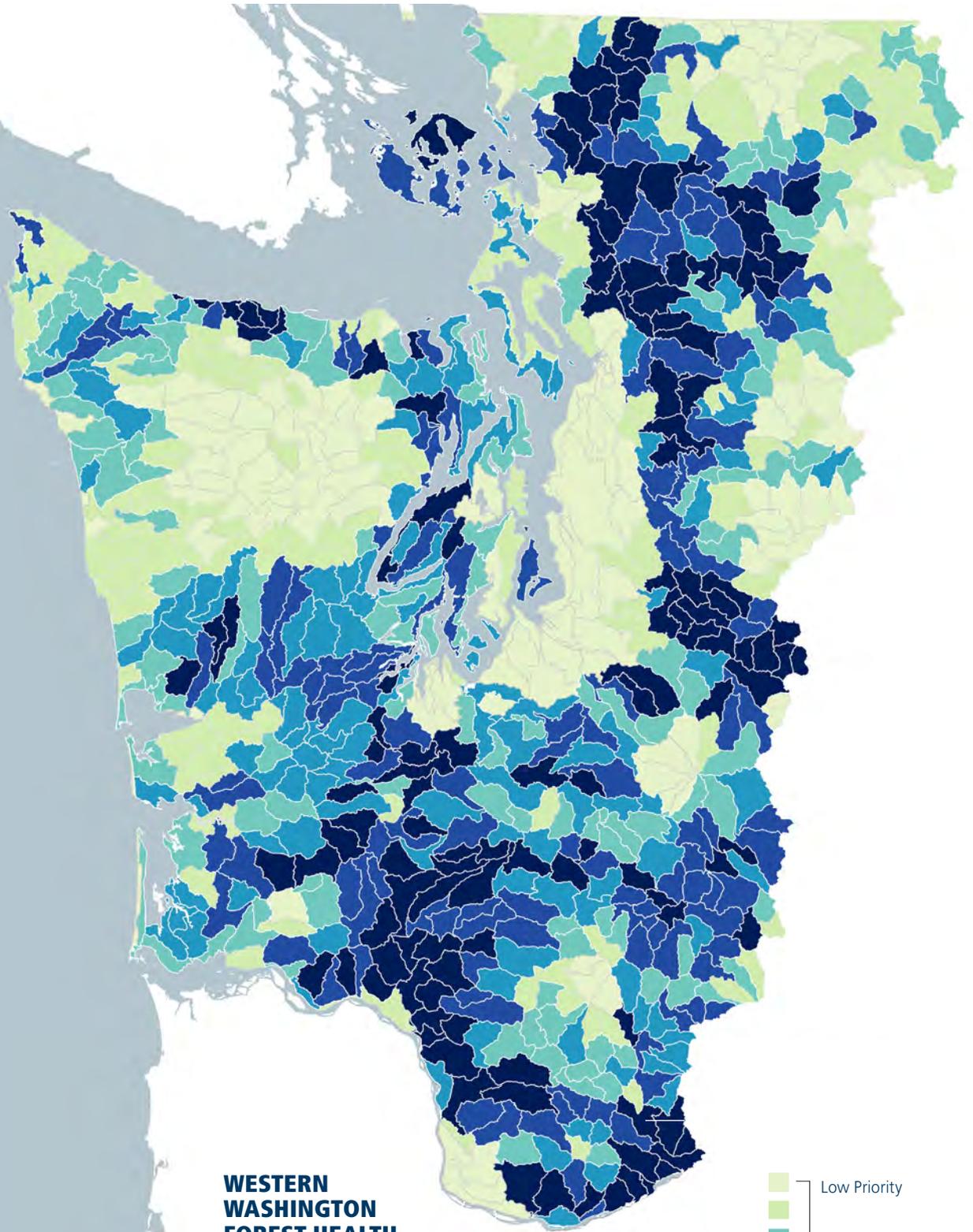
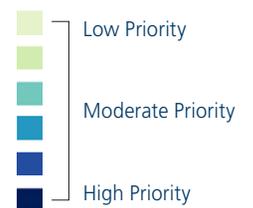
PACIFIC OCEAN



0 15 30 miles

**WESTERN  
WASHINGTON  
FOREST HEALTH  
WATERSHED  
PRIORITIZATION**

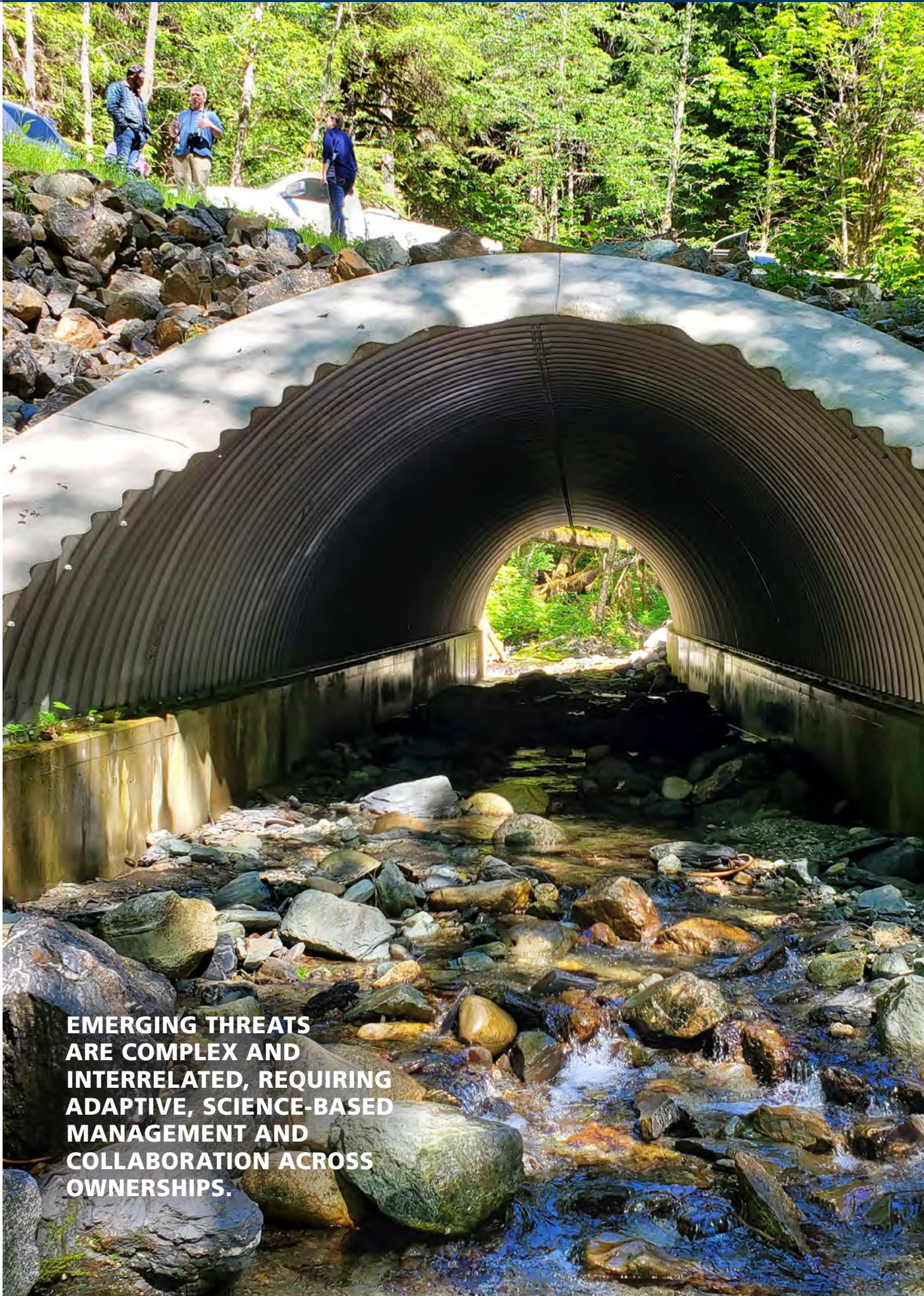
December 2025



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