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**Sent:** Wednesday, April 13, 2022 9:55 AM  
**To:** Comp Plan Update  
**Subject:** FW:  
**Attachments:** DNR 2020 Forest Action Plan.pdf

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Good Morning,

Could you forward this out to the other commissioners. This is a 2020 DNR document for there Forest Action Plan.

Nicholas Knoellinger  
Planning Commissioner  
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# 2020 FOREST ACTION PLAN

Taking actions to restore  
and conserve Washington's  
forests so our environment and  
communities thrive.



**NATURAL  
RESOURCES**

HILARY S. FRANZ  
COMMISSIONER OF PUBLIC LANDS



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and conserve Washington's  
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WASHINGTON STATE DEPT OF  
**NATURAL  
RESOURCES**

**HILARY S. FRANZ**  
COMMISSIONER OF PUBLIC LANDS



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**HILARY S. FRANZ**  
Commissioner of Public Lands



**GEORGE GEISSLER**  
State Forester

## LETTER FROM COMMISSIONER OF PUBLIC LANDS AND STATE FORESTER

**At the Washington State Department of Natural Resources (DNR), we work every day to ensure that our state's lands, waterways, and communities thrive—now and for future generations. Supporting our forests is key to that mission.**

Washington has more than 22 million acres of forestland. From the lush rainforests on our coasts, to the rugged sub-alpine forests along the Cascade Crest, to the pine-dominated hillsides surrounding the Columbia Plateau, forests are an integral part of our landscapes and communities, and they provide a wealth of benefits to Washingtonians and the planet. They provide us with sustainable timber and jobs, produce clean air and water, sequester carbon, and support world-class outdoor recreation.

Our forests, however, face unprecedented threats that require bold action. Climate change is shifting precipitation patterns and increasing severe weather events. Drought is leading to tree die-off and increasing the forest's susceptibility to insect and disease damage. Invasive species are threatening native plants and wildlife habitat. In areas facing development pressures, our forests are disappearing. And an increase in severe wildfires are endangering communities and damaging our forests and infrastructure.

In response to these threats, DNR and its partners have developed this 2020 update to Washington's Forest Action Plan. This plan sets out strategic goals and actions to address these pressing threats at a meaningful scale. It requires that DNR prioritize the places most at risk, develop new partnerships to leverage expertise and resources, and invest in actions that will keep the Evergreen State true to its name.

This plan is also a roadmap for implementing Washington's Shared Stewardship Investment Strategy and further aligning strategies in priority landscapes with partners at the U.S. Department of Agriculture Forest Service, Washington Department of Fish and Wildlife, and a host of conservation organizations.

This action plan builds on the important contributions of previous planning efforts and serves as the link between the department's foundational strategic plans: the DNR Strategic Plan 2018-2022, the DNR Plan for Climate Resilience (2020), the Wildland Fire Protection 10-Year Strategic Plan (2018), the 20-Year Forest Health Strategic Plan: Eastern Washington (2017), and the State Wildlife Action Plan (2015). Linking these plans together under the umbrella of the 2020 Forest Action Plan update supports continued implementation of our priorities with partners—scientists, lawmakers, tribes, beneficiaries, communities—and will lead to improved outcomes on the ground.

Collectively, the priorities and goals identified in this plan enhance and protect ecosystem resilience, promote healthy and vibrant urban and rural communities, and strengthen the partnerships required to address the pressing threats facing forests today. This action plan also identifies critical forest health gaps and new areas of focus emerging in western Washington.

Our sincere thank you to all of the contributors to the 2020 Forest Action Plan update. Now is the time to address forest health in Washington. Our forests and our communities are counting on us.

**HILARY S. FRANZ**  
Commissioner of Public Lands

**GEORGE GEISSLER**  
State Forester



**// Forests are an integral part of our landscapes and communities, and they provide a wealth of benefits to Washingtonians and the planet.**

**State trust lands fund public services, including school construction, forests are essential to rural and urban economic development, and healthy forests support the success of aquatic species like our struggling orca and salmon."**

**HILARY FRANZ**  
Commissioner of Public Lands



KEN BEVIS / DNR



Clark County forestland owner Lee Morgan stands next to a remnant snag in his forest as DNR forester Boyd Norton looks on during a stewardship site visit. Common tree species in western Washington's moist forests include western redcedar, bigleaf maple, western hemlock, and Douglas-fir.



**THIS PLAN  
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ADDRESS THREATS  
FACING FORESTS IN  
WAYS THAT FOSTER  
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## OVERVIEW

The challenges and issues facing forest ecosystems today present pressing issues for communities and society. In response to these tremendous challenges the Washington State Department of Natural Resources (DNR) is taking an all-hands, all-lands approach to this Forest Action Plan revision, and integrating existing department priorities and those of our partners into this action plan.

The Forest Action Plan lets the state receive funding from the U.S. Department of Agriculture (USDA) Forest Service's state and private forestry programs. In 2019, these programs provided more than \$6 million to conserve and protect our state's forests. Since the first Forest Action Plan was published in Washington in 2010, the state has received more than \$50 million in federal investments.

The Forest Action Plan links existing strategic plans, proactively identifying actions to take collectively across Washington to address threats facing our forests. The action plan is intended to foster coordinated, cross-boundary management activities at a scale commensurate with the challenges facing forested landscapes today—thereby setting us up for a future where Washington remains known as the Evergreen State.

The priority landscapes established in this Forest Action Plan identify areas where active management and investments can improve forest health conditions based on scientific analysis, and where partnerships and projects already exist to maximize strategic use of limited federal Cooperative Forestry program funding in areas with a high opportunity for leveraging resources. DNR will bring the strength of its programs to these priority landscapes, but its work is not restricted to them.



## Scope of the 2020 Forest Action Plan

Washington's Forest Action Plan is a comprehensive review of forests across all lands—public, private, rural, and urban—that offers proactive solutions to conserve, protect, and enhance the trees and forests that people and wildlife depend on. Rooted in the best available science, this Forest Action Plan has four primary sections:

- Forest resource assessment.
- Cooperative forest program overview and priorities.
- Strategies to address issues, threats, and opportunities.
- Implementation and monitoring plan.

The forest resource assessment speaks to overarching challenges facing land and resource managers including the effects of drought, forest conversion (loss of forests due to activities like development or agriculture), wildfire, invasive species, insects and disease, and climate change. The cooperative forestry section articulates the program priorities for those areas funded through U.S. Department of Agriculture State and Private Forestry programs and highlights success stories that future investments in the state will build on. The strategies section supplements the commitments made in the cooperative forestry section and helps tie existing strategic plans and agency guidance under an umbrella set of goals and priority actions that address threats, issues, and opportunities facing forests. Finally, the implementation and monitoring plan outlines the primary ways in which DNR and partners will seek to track results associated with this action plan.

The action plan does not seek to replace any existing management authority or provide any regulatory-related guidance or action. Instead, this plan sets out to address threats facing forests in ways that foster voluntary and necessary work—collaboration, coordinated planning, and accelerated implementation.

Forest Action Plans have been published in every state, and each state is given discretion to determine how to make the plan relevant and useful. In Washington, this Forest Action Plan revision comes at an opportune time to showcase and build on previous strategic planning efforts. At the same time, the plan creates the enabling conditions to prepare for threats facing forests that will become more prevalent and pressing under a changing climate.

Considerable effort has been put into developing recent strategies at DNR — including the 20-Year Forest Health Strategic Plan, Wildland Fire Protection 10-Year Strategic Plan, and Plan for Climate Resilience. Our intent in this action plan is to recommit to these strategies and actions while clarifying the connections and links between them.

In western Washington, where a comprehensive all-lands plan for forest health and resilience has yet to be developed, this report created a methodology based on relevant forest health and resiliency indicators and values at risk to identify priority landscapes to focus shared stewardship investments through programs and authorities. Western Washington faces forest health and resilience challenges that are distinct from central and eastern Washington, but the overarching goals and intent remain focused on achieving outcomes that benefit local communities, wildlife, and forests.



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## WASHINGTON'S APPROACH TO 2020 FOREST ACTION PLAN REVISION

1. Demonstrate and clarify alignment across existing strategies and plans.
2. Identify programmatic and geographic priorities for forest health and resilience.
3. Foster coordinated planning and implementation at a scale commensurate with the threats facing forests.

## Cooperative Forestry Program Planning

USDA State and Private Forestry is a critical partner in addressing threats facing forests in Washington. This action plan includes a focus on those cooperative forestry programs funded through USDA State and Private Forestry, and serves as a reference document for program managers. Section 3 of this report focuses on cooperative forestry programs — highlighting the incredible contributions of DNR's partners and setting out a course of action for the next five years of program implementation.

Cooperative forestry program objectives and priorities identified within the action plan are consistent with DNR's existing strategic plans, USDA's National Priorities, and the interests and input of DNR's implementing partners. These goals and priorities will be referenced in future annual reports to USDA State and Private Forestry and assist program managers in monitoring and tracking their work.

## Stakeholder Engagement

The input of partners, resource specialists, and scientists was critical to the revision of the Forest Action Plan. Stakeholder engagement included a survey of partners, direct outreach to partners and resource specialists, presentations and meetings with numerous standing committees and advisory groups, and public webinars. The stakeholder engagement approach aligns with [DNR's Strategic Plan](#), which states, "Increase public engagement and commitment to our public lands." Specifically, the action plan addresses DNR Strategy E1.3 "Share engagement success throughout the agency to reinforce our culture of public service" and Goal E2 "Increased public awareness about the importance of sustainable natural resource management and the wide-ranging value of public lands for Washington's communities."

## 2020 FOREST ACTION PLAN REVISION STAKEHOLDER ENGAGEMENT STRATEGY

The following core tenets guided the agency in engaging diverse audiences and perspectives in creating the revised Forest Action Plan:

- Develop the plan collaboratively.
- Respect diverse landowner interests and partner perspectives.
- Use best available, peer-reviewed science.
- Publish a user-friendly and accessible action plan.
- Identify achievable milestones and track progress in implementing the plan over time.

## FOREST HEALTH

In this plan, **DNR defines forest health** as 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.



# Plans and Initiatives That Informed This Action Plan

Washington's 2020 Forest Action Plan revision incorporates a number of state strategic planning efforts and partner priorities. The overview included below highlights recent strategic planning efforts and initiatives that are highly relevant to the Forest Action Plan and summarizes the critical links between those respective plans and strategies and the Forest Action Plan.

## USDA STATE AND PRIVATE FORESTRY PRIORITIES

USDA State and Private Forestry help set high-level goals and foster alignment with partners. The three overarching goals for State and Private Forestry include:

- Conserve and manage working forest landscapes for multiple values and uses.
- Protect forests from threats.
- Enhance public benefits from trees and forests.

Every five years, state foresters are required to submit a report that describes Forest Action Plan implementation success stories that contribute to each of the three national priorities, in addition to identifying emerging threats that challenge them. These reports were first submitted in 2015. The intent is to share a national priorities highlights report with each Forest Action Plan revision and five-year review. Washington's 2020 Forest Action Plan incorporates cooperative forestry success stories throughout the report and serves as Washington's national priorities highlights report.

## WASHINGTON STATE SHARED STEWARDSHIP INVESTMENT STRATEGY

In May 2019, Commissioner of Public Lands Hilary Franz, Washington Department of Fish and Wildlife (WDFW) Director Kelly Susewind, Forest Service Chief Vicki Christiansen, and Regional Forester Glenn Casamassa signed a ["Shared Stewardship" Memorandum of Understanding \(MOU\)](#). At the time the MOU was the second of its kind in the nation and established clear commitments among public agency partners in Washington. The core elements of the MOU focus on three primary areas of mutual interest:

- Determine management needs and prioritize stewardship decisions.
- Use all existing tools to conduct the right work at the right places at the right scale.
- Conduct the work with partners and stakeholders.

The purpose of the Shared Stewardship Strategy is to address critical issues facing natural resources, managers, and communities, and to establish a foundation for future collaboration. The 2020 Forest Action Plan operationalizes these overarching goals into concrete goals and priority actions that will help focus the department's work and partnerships with WDFW, Forest Service, and others. The primary goals and desired outcomes are focused on ecological restoration, healthy communities, sustainable recreation, sustainable infrastructure, and conservation and protection of fish and wildlife.

### Washington's Shared Stewardship Principles:

- Use best available science to inform decisions.
- Use all authorities, programs, and tools to improve efficacy.
- Establish models to prioritize decision-making and identifying priority landscapes and projects.
- Use existing strategies and plans to guide work.
- Target investments to achieve scale and effectiveness.
- Foster strong working relationships and partnerships.
- Innovate, be willing to take measured risks and seize new opportunities with partners and keep in mind the "customer."

## 20-YEAR FOREST HEALTH STRATEGIC PLAN: EASTERN WASHINGTON

The [20-Year Forest Health Strategic Plan: Eastern Washington](#) sets out a vision focused on restoring fire-prone forested ecosystems and reducing wildfire risk to communities and infrastructure. Numerous partners developed the plan by collectively identifying the overarching vision, mission, and goals that guide DNR work in central and eastern Washington. Following plan adoption, DNR and partners identified 33 initial priority landscapes and watersheds for accelerated planning and implementation.

DNR's priority landscapes serve as the focus of program work across all-lands — from the Urban and Community Forestry Program to the Federal Lands Program and implementation of Good Neighbor Authority agreements. In nearly all cases, the priority landscapes help align resource allocation and investments across the department. This prioritization and focus is leading to improved outcomes on the ground and increasing the pace, scale, and quality of forest management and restoration work.

**Vision:** Washington's forested landscapes are in an ecologically functioning and resilient condition and meet the economic and social needs of present and future generations.

**Mission:** Restore and manage forested landscapes at a pace and scale that reduces the risk of uncharacteristic wildfires and increases the health and resilience of forest and aquatic ecosystems in a changing climate for rural communities and the people of Washington.

**Goal 1:** Conduct 1.25 million acres of scientifically sound, landscape-scale, cross-boundary management and restoration treatments in priority watersheds to increase forest and watershed resilience by 2037.

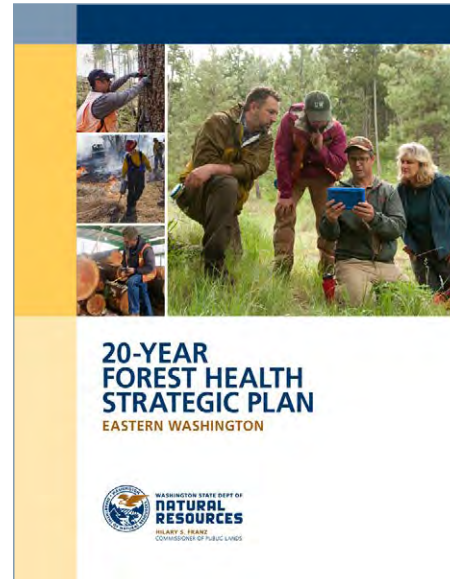
**Goal 2:** Reduce the risk of uncharacteristic wildfire and other disturbances to help protect lives, communities, property, ecosystems, assets, and working forests.

**Goal 3:** Enhance economic development through implementation of forest restoration and management strategies that maintain and attract private sector investments and employment in rural communities.

**Goal 4:** Plan and implement coordinated, landscape-scale forest restoration and management treatments in a manner that integrates landowner objectives and responsibilities.

**Goal 5:** Develop and implement a forest health resilience monitoring program that establishes criteria, tools, and processes to monitor forest and watershed conditions, assess progress, and reassess strategies over time.

One example of the increasing alignment and scaling of forest management work includes the prioritization and



implementation on state trust lands in central and eastern Washington. DNR has been addressing forest health on state trust lands through the Forest Improvement Treatment (FIT) program and capital funding. The FIT program leveraged DNR's Contract Harvesting Revolving Account (CHRA) to fund treatments that were not financially viable due to the low value of the wood. Between 2014 and 2018, DNR treated nearly 100,000 forested acres of state trust lands to reduce densities and fuel loadings and restore productivity. These treatments contributed to addressing all-lands restoration needs in priority landscapes. This strategic approach reduces risk of uncharacteristically severe wildfire on state trust lands and adjacent private and public lands.

Legislation passed in 2017 (House Bill 1711) directed DNR to develop and implement a policy for prioritizing investments in forest health treatments and identify priority areas for treatment in the next two, six, and 20 years on state trust lands. See the 2018 Forest Health Treatment Prioritization and Implementation (HB 1711 report to the Legislature) for more information. The legislation also created the forest health revolving account, which is separate from FIT. A Strategy to Restore Forest Health on State Lands was published by DNR in January of 2018, setting the stage for continued alignment across state agencies and partners working in central and eastern Washington.

**Reference:** [https://www.dnr.wa.gov/sites/default/files/publications/rp\\_statetrustlandsforesthealthreport1711.pdf](https://www.dnr.wa.gov/sites/default/files/publications/rp_statetrustlandsforesthealthreport1711.pdf)



## WILDLAND FIRE PROTECTION 10-YEAR STRATEGIC PLAN

The plan was developed through extensive stakeholder input and highlights four overarching goals and 10 strategies. The goals of the plan include:

**Goal 1:** Washington's preparedness, response, and recovery systems are fully capable, integrated, and sustainable.

**Goal 2:** Landscapes are resilient — in the face of wildland fire, they resist damage and recover quickly.

**Goal 3:** Communities are prepared and adapted for current and future wildland fire regimes.

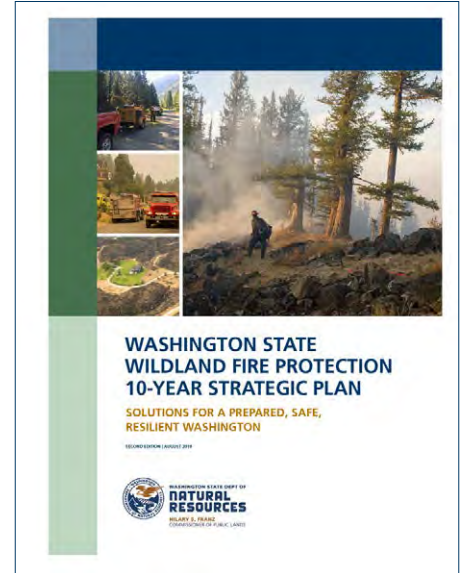
**Goal 4:** Response is safe and effective.

Successful implementation of the wildfire plan will help Washington safely manage and live with wildland fire. The anticipated outcomes of the plan include:

- Safety of the public and firefighters is provided for; wildland fire is suppressed when necessary and used where allowable.
- Unwanted human-related wildland fires are virtually eliminated.
- Costs to suppress wildland fires are reduced; risks and losses to communities and the economy are minimized.
- Communities and ecosystems are resilient and healthy; both can withstand and recover from wildland fire.

The plan represents a significant shift in our collective thinking — moving from a reactive to proactive approach that includes suppression and response, but also prevention, community preparedness, and landscape-scale forest health treatments.

The [Wildland Fire Protection 10-Year Strategic Plan](#), which applies statewide, was developed after the 20-Year Forest Health Strategic Plan, which applies to central and eastern Washington. The wildfire plan references strategies and goals in the forest health plan, and both plans seek to manage wildland fire risk, protect communities and highly valued resources, promote resilient landscapes, integrate landowner objectives and values, and recognize the appropriate role of fire on the landscape. The wildfire plan and forest health plan are fully integrated into this Forest Action Plan revision, effectively linking these two critical strategies under the umbrella of this report.



**// THE PLAN  
ADVANCES A  
COHESIVE APPROACH  
TO WILDLAND FIRE  
MANAGEMENT THAT  
FOCUSES ON WORKING  
WITH COMMUNITIES  
AND LANDOWNERS,  
AGENCIES, AND  
ORGANIZATIONS TO  
PROTECT HIGHLY VALUED  
RESOURCES AND  
PROMOTE HEALTHY AND  
RESILIENT LANDSCAPES.  
THE PLAN SUPPORTS FIRE  
PREVENTION, USE OF  
FIRE WHERE ALLOWED,  
AND FIRE SUPPRESSION.”**

**WILDLAND FIRE PROTECTION  
10-YEAR STRATEGIC PLAN**

Ravi Soin, left, whose family owns 5 acres of forest in western Washington, poses for a photo with King County forester Kristy McClellan near Issaquah during a forest stewardship site visit with King County staff. Forest Stewardship is a nationwide program providing advice and assistance to help family forest owners manage their lands.





## STATE WILDLIFE ACTION PLAN

In 2015, the Washington Department of Fish and Wildlife published an updated State Wildlife Action Plan (SWAP). The plan builds on the original SWAP that was published in 2005 and updated based on new data and science. Similar to the Forest Action Plan, SWAP is required by Congress in order for Washington to receive federal funding, in this case State Wildlife Grant funding to assess the health of wildlife in our state and identify actions to conserve wildlife and associated habitat before it disappears.

The purpose of the SWAP is to identify conservation priorities and statewide actions and strategies, provide tools and information to support conservation work, and foster collaboration among organizations. The 2015 SWAP identified species of greatest conservation need and numerous ecological systems of concern, many of which are forests or forest-adjacent.

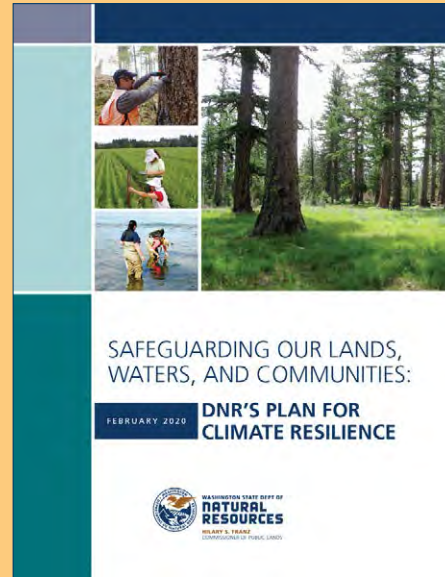
Washington's State Wildlife Action Plan works to identify conservation actions for species before they become imperiled and opportunities for recovery before they become limited and financially burdensome to the state and private landowners. Implementing SWAP will also support enhanced outcomes for forest ecosystems and the wildlife and people who rely on them.

### The SWAP Priority Conservation Issues Are:

- Habitat loss through conversion, fragmentation, and degradation.
- Invasive plants and animals.
- Water quantity and quality.
- Livestock grazing.
- Diseases and pathogens.
- Forest conservation and management practices.
- Inadequate data on wildlife and habitat.
- Climate change.
- Changes in patterns of natural disturbance.

SWAP identifies a number of forest management challenges that pose risks to wildlife in the state. Primary issues include: forest fragmentation by urbanization, transportation corridors, and land development; certain forest management practices that simplify forest habitats and reduce overall biological diversity; loss of natural fire cycles in central and eastern Washington due to fire suppression; and increases in defoliating insects and large-scale, high-severity wildfires.

**Reference:** <https://wdfw.wa.gov/sites/default/files/publications/01742/wdfw01742.pdf>



## DNR PLAN FOR CLIMATE RESILIENCE

In February 2020, DNR released its agency-wide [Plan for Climate Resilience](#), which highlights actions the agency can take to ensure it is prepared for, and adapting to, climate-related changes. The plan builds on the state Department of Ecology's 2012 strategic plan, *Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy*, and identifies high-priority opportunities to support coordination, investment, and implementation among DNR and its partners.

Key principles from the plan include the need for proactive preparation and to expand collaboration. The Plan for Climate Resilience also includes seven chapters on resource-specific needs and opportunities, including priority responses for DNR's programs that are highly relevant to the Forest Action Plan including Forest Management and Wildfire Management. The plan summarizes a number of challenges that are referenced and addressed throughout this action plan, including increased wildfire risks, increased risks from insects and diseases, reforestation challenges, and changes in forest productivity, among many others. Forest management and wildfire-related goals and priority actions are integrated into the Strategies Section of this report.



## Anticipated Use of This Action Plan

The authors of this report anticipate that DNR program managers and partners committed to implementing cooperative forestry programs will use this action plan to guide their program work. Agency partners — from the Washington Department of Fish and Wildlife to the Forest Service — are encouraged to integrate the strategies and priority landscapes in this report into their work plans and strategic planning processes. Tribes, First Nations, and other external partners — rural fire districts, land trusts, conservation districts, and community based organizations — play a critical role in the successful implementation of this plan. The authors hope these partners see value in referencing the goals and priority actions identified throughout this document as they seek to accelerate the protection and restoration of vital forest ecosystems.

The priorities and actions identified in the plan are intended to be used to direct investments to priority landscapes and partnerships over the next five years. The overarching strategies, goals, and priority actions, set the stage for deeper engagement with partners and the opportunity to leverage additional capacity and resources. Strategies outlined in this report are organized by theme and include:

- Landscape Resilience.
- Community Wildfire Preparedness and Wildfire Suppression.
- Keeping Forests as Forest: Risk of Conversion to Non-Forest Uses.
- Urban and Community Forest Resilience.
- Rural Economic Development.
- Stewardship of Family and Working Forests.
- Wildlife and Salmon Recovery.
- Water Quality and Quantity.

Overall, this action plan sets the stage for implementation of Washington's Shared Stewardship Investment Strategy, reinforces the department's commitment to existing priority landscapes, and creates the enabling conditions for expanded partnerships and investment in western Washington. All Washingtonians are encouraged to join this effort and connect with DNR staff to engage in the important forest health and resilience opportunities in front of our state.



**“The USDA Forest Service recognizes that to improve forests and watersheds at scale, it will require shared decision-making between private, state and federal land managers. The Washington State Forest Action Plan is the statewide scale roadmap all land managers can use to identify priorities and target investments in areas that hold the most promise to achieve the greatest benefits and shared goals. The Forest Service believes that Shared Stewardship, at its core, is about a way of doing business; it’s a way to leverage our combined resources to accomplish mutual goals to improve forest health conditions and reduce wildfire risks.”**

### GLENN CASAMASSA

USDA Forest Service, Regional Forester  
for the Pacific Northwest Region



**“Nearly 60 percent of Washington’s forestlands are owned and managed by state and local governments, tribes and private forest landowners. The Forest Service’s mission reaches across National Forest boundaries to work with these partners and landowners through our State and Private Forestry Programs, particularly where forest management and restoration priorities align. Through a variety of forest health, landowner assistance, urban and rural community forestry programs, we share responsibility and stewardship for the management and conservation of our forests and watersheds for ourselves and future generations.”**

### DEBBIE HOLLEN

USDA Forest Service State & Private Forestry  
Director, Washington, Oregon and Alaska



Forestland managers face numerous challenges today, including high-severity wildfires, tree insects and diseases, invasive species, climate change, and drought.



**KNOWING THE THREATS FACING WASHINGTON'S FORESTS, IT IS CLEAR THAT FORESTLAND MANAGERS MUST ALIGN AROUND SHARED PRIORITIES AND WORK ACROSS PROPERTY LINES TO ADVANCE BOLD AND STRATEGIC SOLUTIONS.**

## FOREST RESOURCE ASSESSMENT

**Forests provide critical services that support quality of life for Washingtonians — clean air and water, recreational opportunities, fish and wildlife, sustainable timber and natural resource jobs, and aesthetic values and enjoyment.**

Forests are managed for multiple resource values and by a diverse set of people, tribes, organizations, private landowners, companies, and agencies. Past management activities (including passive management and no management), climate change, and human-related development have resulted in unprecedented threats facing forests that span landownership boundaries and the authority of any one agency or partner.

This section of the Forest Action Plan provides an overview of the primary issues, threats, and opportunities facing forest ecosystems in the state — climate change, drought, insects and disease outbreaks, wildfire, invasive species, and conversion and loss of forests. The description of each of these threats provides necessary context to understand the goals and priority actions identified in the following sections.

This assessment also highlights the pressing nature of many natural resource management challenges the state faces and how those threats are being exacerbated by climate change. By characterizing and describing each threat it becomes imminently clear that it has never been more important to align around shared goals and priorities, foster cross-boundary planning and implementation, and advance bold and strategic investments to protect and restore forests. Forests are part of Washington's green infrastructure. Just like roads and bridges, forests support critical services that benefit all Washingtonians. Investing in this natural infrastructure enhances public benefits and reduces maintenance costs and the risk of expensive disasters over time.



## Forest Conditions and Trends: Issues, Threats, and Opportunities

Forest management and conservation are statewide issues with ramifications for all Washingtonians. The state's forests support billions of dollars in regional economic activity, provide the life-giving ecosystem services that support human populations, such as filtering water and storing carbon dioxide, and support diverse species of fish and wildlife, some of which are found nowhere else on the planet.

A variety of tribal, public, and private forest owners share ownership and management responsibility of Washington's forests. More than 12.5 million acres, or approximately 57 percent of all Washington forests, are publicly owned. The largest public landowner is the USDA Forest Service, with more than 8 million acres under management. About 28 percent of Forest Service lands are designated reserves such as wilderness areas and Wild and Scenic River corridors. National parks — Olympic, Rainer, and North Cascades — make up 5 percent of all forestland in the state. DNR manages 2.1 million acres, which are working forests managed to provide fish and wildlife habitat, clean water, outdoor recreation, and revenue to beneficiaries such as public schools.

Forest ownership patterns differ on the east and west sides of the state. The largest category of forestland owner in western Washington are private industrial timber companies, followed by the Forest Service. In eastern Washington, the Forest Service manages approximately 48 percent of forestland, followed by private, non-industrial forestland owners, which manage approximately 30 percent of all forestland.

Washington has a diversity of forest types, each facing a unique set of issues, threats, and opportunities. In the Puget Sound lowlands, human-related development is resulting in conversion of and the loss of forests. In the east Cascades, Blue Mountains, and Okanogan regions, the combination of climate change, drought, insect and disease outbreaks, and wildfire are projected to continue to increase, with larger and more intense disturbance events in the future. On the Olympic Peninsula and in southwest Washington, introduction of invasive species affects natural plant regeneration and native species.

In each of these diverse forested regions, ecological and evolutionary processes that have been underway for millennia are being disrupted and accelerated. Disturbance events are occurring at alarming scales and fundamentally changing forests, affecting habitat for native plants and animals and putting a number of species at risk of extinction over the next century.

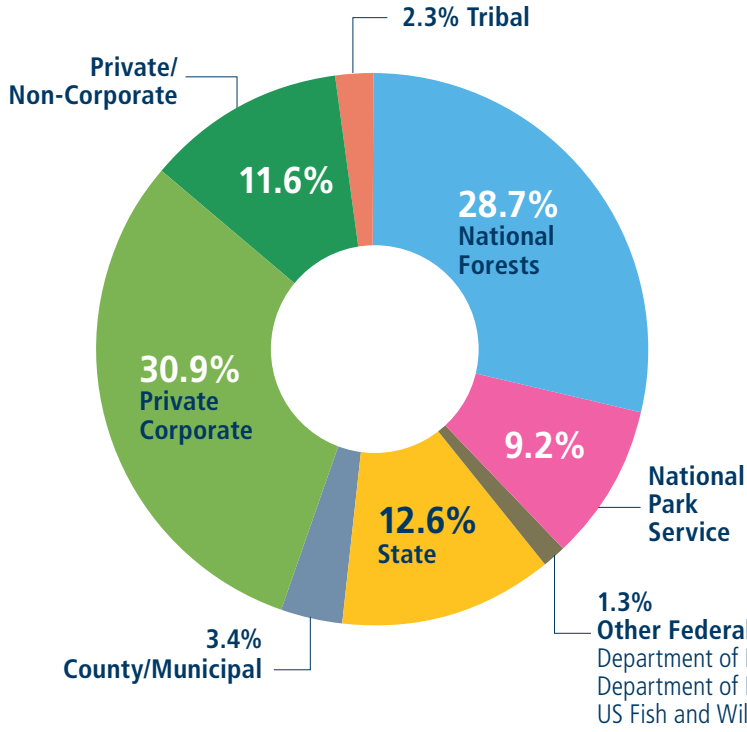
The threats and issues facing forest ecosystems span multiple ownerships and jurisdictions and therefore our response must be coordinated across all-lands. Identifying priority landscapes and directing resources toward those landscapes where investments and active management can increase forest health and resilience in direct response to these threats is a critical first step.

Numerous existing prioritization efforts and strategic plans address specific resource concerns and issues. Many of these plans and processes identify goals and priority actions that, when brought together, articulate a set of common needs and opportunities. This action plan integrates the priorities that have already been identified, and sets forth a vision that supports effective coordination and decision-making at DNR and with partners.



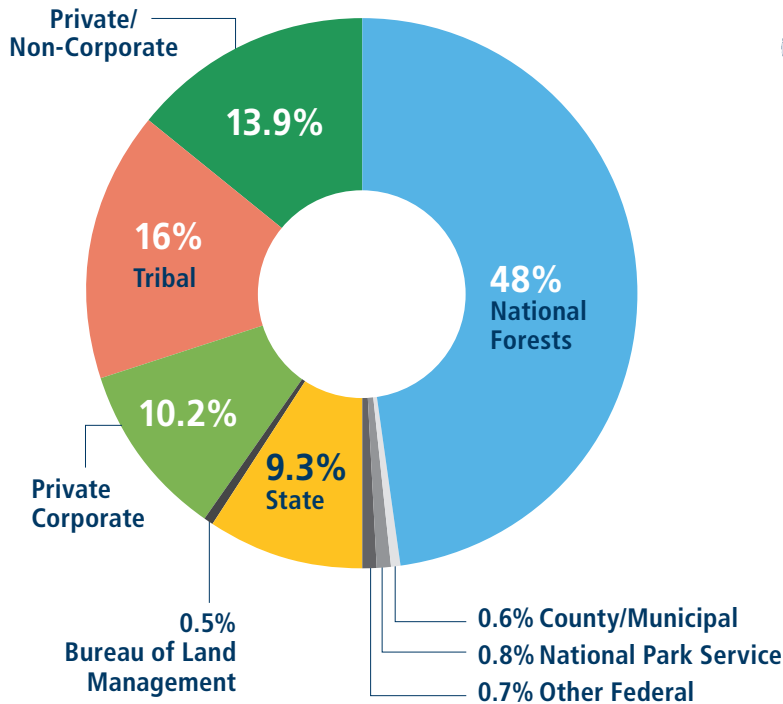
**DOUGLAS-FIR TUSSOCK  
MOTH LARVA**

**DNR MANAGES  
2.1 MILLION ACRES OF  
WORKING FORESTS  
TO PROVIDE FISH  
AND WILDLIFE  
HABITAT, CLEAN  
WATER, OUTDOOR  
RECREATION,  
AND REVENUE TO  
BENEFICIARIES  
SUCH AS PUBLIC  
SCHOOLS.**



### WESTERN WASHINGTON FORESTLAND OWNERSHIP

The largest category of forestland owners in western Washington are private industrial timber companies, followed by the USDA Forest Service.



### EASTERN WASHINGTON FORESTLAND OWNERSHIP

In eastern Washington, approximately 48 percent of forestland is federally managed, while private, non-industrial forestland owners manage approximately 30 percent of all forestland.



## Climate Change

Prevailing climactic conditions have a strong influence on forest ecosystems. Precipitation patterns, seasonality, temperatures, and storm events are the underlying forces that often dictate vegetation, growing conditions, and species present within the different ecoregions in the state.

Human-caused climate change is resulting in shifts in these underlying forces that will fundamentally change forest ecosystems as they exist today in Washington. Scientists predict that under all future greenhouse gas emissions scenarios, there will be longer periods of dryer and hotter weather, reduced snowpack and earlier peak streamflow, warmer water temperatures and reduced stream flows in late summer months, and increased risk of wintertime flooding events.

The DNR Plan for Climate Resilience summarizes many of the anticipated impacts of climate change on forests, including:

### INCREASED WILDFIRE POTENTIAL ACROSS THE STATE

As the climate warms and summers become drier, fire risk and area burned is projected to increase on both the east and west sides of the state. Warmer, drier summers and longer dry periods could cause the fire season to start earlier and last longer (Westerling 2016). Future increases in average annual acres burned put communities at risk, increase demand on first responders, could reduce timber yield, conflict with conservation goals, and lead to the potential for larger and more frequent salvage harvests. More wildfire may also increase demand for seedlings and other reforestation resources.

### POTENTIAL INCREASED DAMAGE FROM INSECTS AND DISEASE

Climate change is projected to reduce soil moisture in many parts of the state due to warming temperatures and longer dry seasons.<sup>3</sup> A reduction in available soil moisture can increase tree stress and result in greater vulnerability to other disturbances such as insects and pathogens. Especially in central and eastern Washington, the interaction between reduced soil moisture, insects, and disease pathogens will likely lead to greater tree mortality (Littke et al. 2018). Even in western Washington, reduced soil moisture during dry summers appears correlated with instances of local mortality of tree species such as western redcedar, western hemlock, big leaf maple, and grand fir. Some insect and pathogen populations are highly sensitive to temperature and humidity, extremely mobile, and may increase reproduction under changing climate conditions. Exotic insects or pathogens could also emerge on the landscape, analogous to recent outbreaks of chestnut blight or white pine blister rust.

### POTENTIAL SEED AND REFORESTATION CHALLENGES

Seed diversity and supply may become insufficient to support reforestation needs following increased wildfire and other disturbances. Changes in seedling genotypes and species may be necessary due to changes in viable tree growth ranges. Reforestation of some dry forest areas may no longer be ecologically viable due to declining site moisture and increasing summer temperatures. Larger patches of high-severity fire may also reduce the potential for natural regeneration.



**WESTERN HEMLOCK  
DAMAGE WAS CAUSED  
BY THE SCOLYTUS TSUGAE  
BARK BEETLE**



**WESTERN SPRUCE  
BUDWORM ADULT MOTH  
AND LARVAL CHEWING  
DAMAGE ON GRAND FIR**



## POTENTIAL INCREASES IN CONDITIONS THAT TRIGGER LANDSLIDES AND DEBRIS FLOWS

In areas with potentially unstable slopes, increased landslide and debris flow risk is expected in fall, winter, and spring due to continued declines in snowpack and projected increases in the frequency and intensity of heavy rain events (Mauger et al. 2015), as well as post-fire changes in soil absorbance. Where landslide risk increases, threats include harm to public safety, degradation of fish and wildlife habitat and water resources, and damage to productive timber lands.

## POTENTIAL CHANGES IN FOREST PRODUCTIVITY

As climate change causes warmer and drier growing conditions, some forests in the state will become increasingly moisture-limited and less productive, especially in the drier forests of central and eastern Washington and some drier locations in western Washington. In combination with increased risk from wildfire, insects, disease, landslides, and reforestation challenges, these reductions in forest productivity would result in an overall decline in woody biomass, and therefore timber. In contrast, other locations that are currently limited more by cold temperatures than moisture may see increases in tree productivity as temperatures warm and extend the growing season (Halofsky et al. 2018).

## POTENTIAL FOREST ROAD DAMAGE

The frequency of forest road damage could increase due to projected increases in the frequency and intensity of heavy rain events, more winter precipitation as rain rather than snow, increases in peak flows and sediment transport, and more landslides. Significant investments in addressing road-related issues on private lands were made as a result of the 2001 Forest and Fish Rules Road Maintenance and Abandonment Plans. Additional investments are required to address issues emerging because of climate change, and the incredible backlog of road maintenance on federal lands within the state.

## POTENTIAL IMPACTS TO AT-RISK SPECIES

Increased disturbance may affect critical habitat for forest-dependent species and may challenge the existing strategies that support species recovery.



## HOW WILL CLIMATE CHANGE AFFECT FOREST MANAGEMENT?

**Warmer, drier summers are anticipated to reduce soil water availability, increase drought stress and risks of insect and disease outbreaks, lead to more severe ecological and economic effects associated with invasive species, and affect natural forest regeneration — particularly in areas that experience high severity wildfires. There will also be changes in forest productivity. In western Washington, where trees don't regularly experience extended periods of drought, species like western redcedar, western hemlock, and grand fir are expected to be especially affected.**



Droughts occur when average temperatures increase and average precipitation (snow and rainfall) decreases. This can create water stress within a tree, stunting its growth, making it more susceptible to insects and diseases, and even killing it directly.

## Drought

Drought is defined as “an episodic deficiency in water availability that drives ecosystems beyond thresholds of vulnerability, affects ecosystem services, and triggers feedbacks in natural and human systems” (USDA 2017).

In Washington, the longest drought in several decades lasted nearly 116 weeks, beginning January 7, 2014 and ending on March 22, 2016. While 2016 brought large precipitation amounts to the state, including mountain snow, most of Washington ended the year classified as either “abnormally dry” or experiencing “moderate drought” (U.S. Drought Monitor).

The effects of recent droughts have been costly. Following the low snowpack of 2015, the state experienced some of the most severe wildfires in recorded history, low flows in streams and rivers that resulted in widespread fish mortality, and an estimated \$336 million in drought-related impacts to agriculture in the state. Snowpack plays an important role in the health of aquatic systems and freshwater availability, so while climate change may result in increased overall precipitation levels, significant shifts in water availability are anticipated in the future. Overall, the combination of longer dry periods, more sporadic heavy precipitation events, and warmer winters will lead to greater demand for the limited water that people, plants, and fish and wildlife rely on (USDA 2017).

Climate change will increase the likelihood of drought and affect forests in various ways. Forest growth and productivity is anticipated to decrease in most low- to mid-elevation coniferous forests as a result of drought-related water limitations. Higher elevation forests, however, are anticipated to experience longer growing seasons as a result of warmer winters, which could shift species composition of higher elevation sites. Despite longer growing seasons, species that thrive in harsh cold-weather environments like whitebark pine, which have already been affected by blister rust, may no longer persist in many higher elevation areas in Washington. Warming temperatures will also increase evaporation of available soil moisture and surface water, affecting reforestation efforts and the establishment of seedlings, and increasing the risk of widespread vegetation die-offs, similar to the tree kills experienced during the recent California drought.

Management actions taken today could mitigate the effects of drought on forests. Thinning forests to maintain more open conditions, favoring drought-tolerant species, increasing the use of natural or prescribed fires to reduce fuel loads, using landscape features and management activities to increase snow retention and slow snowmelt, and integrating “drought refugia” (areas likely to retain high soil moisture) into project designs will be important to reduce drought effects on forests in the state (USDA 2017). Additional priority actions to maintain and increase water quantity in forest ecosystems are identified in the Strategies Section of this plan.



ASPEN LEAF MINER DAMAGE

A number of insects and diseases have increased in recent years. In 2019, the second year of a Douglas-fir tussock moth outbreak, more than 5,000 acres in Kittitas and Chelan counties were affected. Spruce aphid was found in Sitka spruce on more than 10,600 acres along the coast, which is the highest level of activity recorded since 1998 ([Forest Health Highlights 2019](#)). Emerging insect threats in Washington include:

- Bark beetles.
- Balsam woolly adelgid.
- Aspen leaf miner.
- Spruce aphid.
- Douglas-fir tussock moth.

## Insect and Disease Outbreaks

Aerial Detection Surveys have been conducted every year in Washington since 1947, and the cooperative effort focuses on insect and disease monitoring across all land ownerships and covering 22 million acres of forests in the state.

Between 2015 and 2019 the number of acres affected by insects and disease nearly doubled – likely a result of severe drought. In 2019, Aerial Detection Surveys identified 658,000 acres of forestland with tree mortality, tree defoliation, or foliar disease, with approximately 401,000 of those acres attributable to native bark beetles.

According to Forest Health Specialists at DNR, increases in insects and diseases in 2019 is attributable, in part, to the drought experienced that year. It was the ninth-driest year on record and the driest for Washington since 1985. Both drought and temperature are projected to increase in Washington, and these changes can significantly influence outbreaks of forest insects and pathogens. Understanding the interactions between drought and the biological controls that keep insects in check is crucial in determining future forest productivity, species distributions, and other forest ecosystem services.

Outbreaks of some forest insects and fungal pathogens occur during or soon after drought. Outbreaks of forest diseases caused by canker and root rot pathogens are generally thought to become more frequent and severe with drought. However, diseases caused by pathogens directly affected by climate (i.e., Swiss needle cast, Dothistroma needle blight) are projected to have reduced effects under warmer and drier conditions. These groups of pathogens may cause disease in healthy hosts if the pathogens' environmental conditions (i.e., moist conditions during sporulation) are met.

In some cases, the intensity of a drought event influences insect- and disease-related risks. Moderate tree water stress can reduce bark beetle population performance and subsequent tree mortality, whereas intense drought increases bark beetle performance and tree mortality. In contrast to bark beetles, considerable uncertainty remains about the future impacts of defoliators (i.e., western spruce budworm and Douglas-fir tussock moth) on drought-stressed forests.

Management strategies have been proposed for current and changing climate scenarios. However, a changing climate will likely create novel conditions for which previous experience is unavailable. Therefore, in addition to increasing landscape resiliency and drought mitigation an emphasis is also needed on forest health strategies that consider ecosystem adaptability, such as:

- Selectively removing species that are maladapted for their current location, or soon to be.
- Planting with seed-sources that are well adapted to the predicted climate during the tree's lifespan.
- Employing treatments that reduce or do not exacerbate tree stress.
- Adopting other less-developed practices, such as fostering biological control.



▲ Young Douglas-fir trees show signs of defoliation (needle damage) by the Douglas-fir tussock moth in northern Okanogan County, where a new outbreak of the insect in 2019 resulted in approximately 600 acres of forest with damage. An inter-agency network of early-warning-system pheromone traps at approximately 250 locations in Washington are monitored annually to keep tabs on the tussock moth.

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**A REDUCTION  
IN AVAILABLE SOIL  
MOISTURE CAN  
INCREASE TREE STRESS  
AND RESULT IN GREATER  
VULNERABILITY TO  
OTHER DISTURBANCES  
SUCH AS INSECTS AND  
PATHOGENS.**

## Wildfire

Washington's forests evolved with fire, which has historically played a regenerative role by consuming small trees, duff, and branches and promoting the development of structurally complex, fire-tolerant forest ecosystems. As a result of past management practices, a century-long policy of fire suppression, expanding human footprint on the landscape, and a changing climate, the nature of wildfires and costs associated with suppression have significantly changed.

Historic fire regimes differed across the state depending on a host of factors: climate and weather patterns; elevation, slope, and aspect; cultural burning practices; and forest growth and productivity. Forests in central and eastern Washington generally experienced a dry, warm climate, and ignition-prone vegetation burned every few years to every few decades. In western Washington, a cooler, wet climate resulted in fires that burned less frequently.


In central and eastern Washington, scientists have identified 2.7 million acres of forest in need of active management to restore forest health and resilience (DeMeo et al. 2018). In response, DNR's 20-Year Forest Health Strategic Plan focuses state efforts in priority landscapes with a goal of conducting 1.25 million acres of treatment — including mechanical thinning and prescribed burning — by 2037.

Drought, a threat facing forests described earlier in this section, is an important factor that will likely influence future wildfire events. According to research by the Forest Service, the wildfire season is 78 days longer than it was in 1970 (USDA 2017). Longer, drier summers increase the amount of time that fuels are in a combustible condition, resulting in longer fire seasons. This trend appears likely to continue. Recent analyses suggest that the annual area burned each year is projected to quadruple by 2040 in forested areas. Burned areas are anticipated to experience larger patches of high severity wildfire, which will affect regeneration, wildlife habitat, slope instability, flood risk, aquatic systems, and fire suppression and recovery costs.

DNR maintains the largest on-call wildland fire department and responsibility for suppression and protection on 13 million acres of forestland in the state. The state cost to fight large wildfires in Washington averaged \$37 million per year between 2008 and 2012. The following five-year period, from 2013 to 2018, the average annual expense jumped to \$153 million. These figures do not include the other economic impacts associated with growing wildfires — losses of homes and structures, damage to roads and other infrastructure, and human health impacts of wildfire smoke, among others.

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**Note:** Data compiled from the Northwest Coordination Center (NWCC) annual reports 2008-2017 and 2018 Large Incidents to Date (11/9/2018). Large fires (more than 100 acres in timber or more than 300 acres in grass) across all jurisdictions were included in the calculation.



**LONGER,  
DRIER SUMMERS  
INCREASE THE  
AMOUNT OF TIME  
THAT FUELS ARE  
IN A COMBUSTIBLE  
CONDITION,  
RESULTING IN  
LONGER FIRE  
SEASONS.**



## Western Washington Wildfire

Wildfire frequencies in western Washington are incredibly diverse — from oak and prairie habitats that historically burned more than once each decade to coastal rainforest that burned once each millennia. A continued policy of understanding the diversity of forest types and historical fire conditions helps managers and policymakers evaluate the types of management that facilitate desired outcomes.

Historically, western Washington forests were a mosaic of structural stages and conditions. It is estimated that early seral conditions existed on up to 30 percent of the landscape at any given time, and old growth persisted on at least 50 percent of the landscape. Forest conditions in western Washington have shifted considerably over time as a result of human-related development and past management practices. Today, western Washington forests are below benchmarks of historical conditions. For example, there is only about 0.1 percent complex early seral habitat in western Washington (Donato, Halofsky, and Reilley 2019). While it may not be realistic or desirable to restore landscapes to historical conditions in portions of western Washington, these reference conditions help us understand landscape patterns and distributions of seral stages that inform how management actions today may help promote more resilient forests in the future.

Portions of western Washington, particularly in the rain shadow of the Olympic Mountains, offer opportunities where proactive management can increase forest health, promote unique habitats, and foster landscape resiliency to wildfire. This includes east Jefferson County, Whidbey Island, Fidalgo Island, and parts of the San Juan Islands, which have drier conditions than much of western Washington. Unique forested habitat types, including forested balds, Garry Oak (Oregon white oak), and prairies, historically experienced fires that maintained and supported the development of those systems. Expanding forest health treatments in areas with well-drained and dry soils, areas that have drier live fuel loading, and southerly slopes and aspects that are hotter and drier may also be warranted in other west-side forests.

Use of mechanical thinning and prescribed fire management in western Washington needs to be grounded in local site assessments in order to be most effective. There is still much to be learned about the role of wildfire in western Washington, how climate change will influence fire behavior in the future, and which proactive management techniques are appropriate for mitigating risk to natural resource values and human communities.

JOHN DEIR PHOTOGRAPHY



### WILDFIRE PREPAREDNESS IN WESTERN WASHINGTON

More than 70 percent of wildfires in the state are human caused. In the three-county area with some of the densest human development — King, Pierce, and Snohomish counties — there are approximately 2,500 wildfire starts per year, nearly four times more than Spokane. Despite high ignition levels, fires tend to be small as a result of successful early detection and suppression efforts, highlighting the important partnership and contributions of local fire districts and fire departments. Given the proximity of most western Washington forests to values at risk (e.g. homes, infrastructure, source water, etc.) a continued policy of aggressive fire detection and suppression is important to reducing risks and potential losses.



**GIVEN THE PROXIMITY OF MOST WESTERN WASHINGTON FORESTS TO VALUES AT RISK, A CONTINUED POLICY OF AGGRESSIVE FIRE DETECTION AND SUPPRESSION IS IMPORTANT TO REDUCING RISKS AND POTENTIAL LOSSES.**

### **WESTERN WASHINGTON WILDFIRE KEY RESEARCH NEEDS**

Additional research is needed to better understand and evaluate the issues and challenges posed by increased risk of wildfire in western Washington. Scientists and land managers have identified a number of key areas of future research, including:

- Past, current, and future role of fire in west-side forests including fire frequency and patterns, fire behavior and severity, and anticipated effects of climate change.
- Patterns of ignitions with changing climate and growing human population.
- Strategic fuel management and treatment effectiveness.
- Public perceptions of risk, wildfire, managed fire, smoke, prescribed burning, and fuels treatments.
- Engagement strategies in high-risk areas that foster behavior change.
- Social vulnerability to wildfire, including risks to communities, potential effects on recreation, and the economic effects of smoke.
- Effects of wildfire on aquatic and terrestrial fish and wildlife species, riparian areas, water supply, and water quality.
- Post-fire management needs and opportunities including planting, logging, and restoration.
- Facilitate adoption of land-use plans, regulations, and codes that reduce wildland fire risk in the wildland-urban interface (WUI)



## Invasive Species

**“Invasive species are non-native organisms that cause economic or environmental harm and are capable of spreading to new areas of the state” (WISC 2017).**

A number of state agencies work together to address invasive species-related threats and issues in the state: Washington Invasive Species Council, Washington State Department of Agriculture, Washington Noxious Weed Control Board, Washington State Department of Natural Resources, Washington State Department of Ecology, Washington Department of Fish and Wildlife, Washington State Parks, and Washington State Department of Transportation.

The Washington State Invasive Species Council, which was founded in 2006 by the state Legislature, plays an important coordinating role, supporting and engaging with the diverse range of agencies and organizations that mitigate the effects of invasive species and stop their spread.

Some invasive species are more destructive and have more significant economic impacts than others. Scotch broom is a particularly serious threat to forest ecosystems. Once established it prevents regeneration of native trees and shrubs, displaces forage for livestock and wildlife, and poses a significant fire hazard due to the plant’s oils. A range of other invasive plants and insects such as English ivy, Himalayan blackberry, yellow star thistle, knapweed, smooth cordgrass, and gypsy moths pose significant threats to forests, rangelands, and riparian and aquatic systems in the state. Research focused on invasive grasses also highlights common problems: invasion may tip vulnerable forests to non-forest states, over-story management has the potential to exacerbate grass invasion, and grass invasion often substitutes one fuel problem for another (Kerns et al. 2020).

Invasive species affect ecosystem health, fish and wildlife, and numerous aspects of the state economy. The Washington State Invasive Species Council evaluated industry-specific effects of 23 invasive species and quantified the economic losses for each sector (WISC 2017):

**Recreation:** \$47.6 million.

**Water Facilities:** \$100.5 million.

**Livestock:** \$282.9 million.

**Timber:** \$297 million.

**Crops:** \$589.2 million.

Invasive species are displacing native species, altering natural systems and function, and affecting numerous sectors of the state economy. Invasive species can also cause irreversible and costly harm to forests. Investments in prevention and early detection and response are critical. Once a new invasive species is established it is often extremely expensive to control the further spread and mitigate harm to natural resources. Long-term costs affect the overall state economy, but local municipalities and individuals often bear a disproportionate financial burden once a new invasive species is established in the state.

PHOTO FROM WA RECREATION AND CONSERVATION OFFICE



**ASIAN LONGHORNED BEETLE**

### WASHINGTON STATE INVASIVE SPECIES COUNCIL

**“Sustaining Washington’s human, plant, and animal communities and our thriving economy by preventing the introduction and spread of harmful invasive species” — WISC Mission Statement**

**The Council focuses its work in five major areas — leadership and coordination, prevention, education, and outreach, early detection and rapid response, and eradication and control — and three overarching goals:**

- **Provide policy-level direction, planning, and coordination to empower those engaged in the prevention, detection, control, and eradication of invasive species.**
- **Serve as a forum for invasive species education and communication.**
- **Develop a statewide invasive species strategy to coordinate and focus local, state, tribal, and regional management efforts.**

HIMALAYAN  
BLACKBERRY

SCOTCH BROOM



ASIAN GYPSY MOTH



ENGLISH IVY

Washington's [Urban Forest Pest Readiness Playbook](#) outlines four key steps to addressing threats posed by invasive species:

- Evaluating and understanding risk of introduction and spread.
- Building capacity to respond and reduce risk of establishment.
- Ensure strong lines of communication and an ability to expedite informed decision-making.
- Fostering community support to expand impact.

Once an invasive species is detected, conducting these steps requires close coordination with a host of agencies and landowners. DNR plays various roles to compliment the work of partners addressing invasive species, including conducting aerial surveying and detection, pest monitoring, private landowner technical assistance, strategic planning and monitoring, outreach and education, financial assistance, and coordination and leadership with various committees.

**INVASIVE SPECIES ARE DISPLACING NATIVE SPECIES, ALTERING NATURAL SYSTEMS AND FUNCTION, AND AFFECTING NUMEROUS SECTORS OF THE STATE ECONOMY.**



## Conversion and Loss of Forests

Conversion of forests to non-forest uses is caused by human-related development including urban growth and expansion of residential and commercial activities, development of transportation networks and right-of-ways, and conversion to agricultural production. Between 1978 and 2001, the state lost 700,000 acres of forestland in western Washington. During that same period, central and eastern Washington lost nearly as many acres, with the rate of conversion peaking to more than 1 percent of forestland lost each year between 1988 and 2004 (Bradley et al. 2007).

Since statehood in 1889, development has led to the loss of more than 80 percent of old growth forests in Washington (SWAP 2015). Today, more than 75 percent of Puget Sound estuaries and adjacent habitats, including mixed woodlands and floodplain forests, are heavily modified to the point that they no longer provide original ecosystem functions. Future loss of forests can be addressed, and if the state is successful, the decisions made will make significant contributions to the quality of life in the state.

Conversion and loss of forestlands further fragments the forested landscape, multiplying the effect on adjacent landowners, wildlife, and a diverse suite of ecosystem services and values.

Forest loss and fragmentation interrupts normal movement patterns of wildlife, increases human-wildlife interactions, increases competition from other species, increases risk of isolation from some wildlife breeding populations, and increases predation. Overall, the effects of fragmentation on wildlife are significant, leaving populations more susceptible to decline, disease, natural disasters, and disappearing completely in some areas.

In 2009, it was estimated that at least 18 percent of the 5.4 million acres of private forestland in western Washington would be at risk of conversion by 2080 (UW 2009). Since the 2009 analysis, data from 2019 suggest that between 2007 and 2012 the area of private forestland fell by an average of 0.7 percent per year (PCR 2020).

Conversion risk is anticipated to remain high along the Interstate 5 corridor in Clark, King, Pierce, Snohomish, and Thurston counties. Based on population-growth estimates from the state, in central and eastern Washington the greatest development pressure is likely to occur in Kittitas, Spokane, and Stevens counties. Many of Washington's counties are planning under the state's Growth Management Act, which requires local governments in fast growing and densely populated counties to develop and adopt comprehensive plans. These plans designate "rural" and "resource" zones to encourage new development to take place in existing urban areas where new streets and utilities are less expensive, which reduce taxpayer funded infrastructure investments. Despite this important ongoing planning, development trends suggest that there is a continued threat of substantial forest conversion.

**// INCREASING DEVELOPMENT IN PREVIOUSLY LESS-DEVELOPED LANDS TYPICALLY LEADS TO HABITAT LOSS AND FRAGMENTATION, INCREASED INVASIVE SPECIES, AND POLLUTION THAT CAN COMPROMISE THE HEALTH AND INTEGRITY OF MANY SPECIES AND HABITATS. DURING THE LAST 10 YEARS (2009-2019) THE STATE'S POPULATION GREW BY MORE THAN 870,000 PEOPLE, ADDING DEVELOPMENT PRESSURE AND OTHER STRESSORS TO THE STATE'S ALREADY FRAGMENTED WILDLANDS."**

**DNR PLAN FOR CLIMATE  
RESILIENCE 2020**



In response to concerns associated with the loss of forests, in 2019 the state Legislature passed Senate Bill 5330. The legislation focuses on the role of small forest landowners and requires the University of Washington to conduct a trends analysis that evaluates changes in ownership patterns over time. According to the National Woodland Owner Survey, small forest landowners are unique among forest landowners because “amenity values are the dominant reasons for owning; owners tend to be active on their land, but most are not engaged in traditional forestry programs; and owners are relatively old” (Bulter et al. 2016). The results of the survey suggest that program design and efforts tailored to the needs of small forest landowners will be important to successfully addressing conversion risk and supporting landowner objectives. The University of Washington analysis builds on the national survey and will include a 10-year retrospective analysis of conversion. The report will also determine the factors that contributed to small forest landowners selling property, and recommend actions the Legislature can take to help keep forestlands working. Results from that analysis will be integrated into work plans within the Forest Health and Resiliency Division and Small Forest Landowner Office at DNR, and fully integrated into future Forest Action Plan revisions.

**OVERALL, THE EFFECTS OF FRAGMENTATION ON WILDLIFE ARE SIGNIFICANT, LEAVING POPULATIONS MORE SUSCEPTIBLE TO DECLINE, DISEASE, NATURAL DISASTERS, AND DISAPPEARING COMPLETELY IN SOME AREAS.**



PHOTO COURTESY OF GINA FINSTAD

Gina and Pita Finstad stand in front of a large cedar tree left standing when Gina's grandfather logged the property near Morton years ago. In western Washington, nearly 14 percent of forestlands are managed by private, non-industrial landowners, who have a diverse range of objectives for their forests.





**BETWEEN  
2010 AND 2020,  
STATE AND  
PRIVATE FORESTRY  
PROGRAMS  
INVESTED  
MORE THAN \$50  
MILLION ACROSS  
WASHINGTON  
STATE TO PLANT  
TREES IN URBAN  
CENTERS, PREPARE  
COMMUNITIES  
FOR WILDFIRE,  
CONSERVE CRITICAL  
TRACTS OF  
FORESTLAND,  
AND MORE.**

## COOPERATIVE FORESTRY PROGRAMS

Congress passed the Cooperative Forestry Assistance Act in 1978. The act was designed to mitigate threats to the forests of private landowners by empowering the USDA Forest Service to partner with state forestry agencies, which typically match federal investments 2-to-1, to provide technical forest management assistance to landowners.

These federal investments leverage state agency and partner resources to sustain and protect a range of diverse values and benefits forests provide.

There are eight cooperative forestry programs funded through the Forest Service's State and Private Forestry organization that are administered by DNR and associated with this Forest Action Plan:

- Community Forest and Open Space Conservation Program
- Forest Legacy Program
- Urban and Community Forestry Program
- Forest Health Protection
- Forest Stewardship
- Landscape Scale Restoration
- State Fire Assistance
- Volunteer Fire Assistance

Over the 10-year period between 2010 and 2020, State and Private Forestry invested more than \$50 million in Washington state through these programs. This critical financial support enabled a suite of important actions across the state — from tree planting in urban centers to community preparedness for wildfires, to the acquisition of critical tracts of forestland at risk of development.

This section of the action plan provides an overview of each of the eight programs funded through USDA State and Private Forestry. Based on individual program requirements, this section also details priority actions and geographic priorities that will guide program work for the life of this action plan. The goals and priorities identified in this section of the report are specific to cooperative forestry programs and are intended to support and align with additional goals and priority actions identified in the Strategies Section.



## Community Forest and Open Space Conservation Program

What is a community forest? Broadly, it's a working forest owned and managed by, or on behalf of, a local community. The core tenets of a community forest:

- The community is involved in the establishment of the community forest.
- The community forest is owned and managed by, or on behalf of, a community.
- The governance structure ensures collaboration and community participation in management decisions.
- The community has access to the value and benefits of the forest that support and reinforce community priorities.
- The forest is permanently protected from conversion to development.

Community forests provide jobs, enhance rural economic development, conserve working forests from conversion, protect drinking water and water quality, support recreational access, and generate locally-driven economic, social, and environmental benefits. The Community Forest and Open Space Conservation Program provides competitive funding for communities interested in acquiring and permanently conserving working forests.

Washington is a national leader in the community forest movement. To date, community forest projects in the state have received \$1,625,913 in federal funding and led to permanent protection of 3,161 acres of forestland. Project partners, from community-based organizations to land trusts, have leveraged an additional \$5,256,200 to support these critical acquisitions. Community Forest and Open Space Conservation Program projects have resulted in more acres protected and the second-most federal funding received compared with all other states.

In recognition of the expanding role of communities in forest stewardship and management, the state Legislature passed a proviso in 2018 instructing the department to learn more about community forests. In partnership with a diverse range of interests, the department conducted an economic analysis of the Mt. Adams Community Forest, one of the first community forests in Washington, and compiled a list of potential community forest projects in the state. The process uncovered more than 20 community forest projects that are currently in development.

MT. ADAMS RESOURCE STEWARDS (MARS)



### **FEDERAL PROGRAM REQUIREMENTS<sup>1</sup> (USDA FOREST SERVICE 2020)**

- **Full fee title acquisition is required. Conservation easements are not eligible.**
- **Community forests can be owned by local governments, tribal governments, and qualified nonprofit entities.**
- **The program pays up to 50 percent of the project costs and requires a 50 percent non-federal match.**
- **Public access is required for Community Forest Program projects.**
- **Lands acquired through the program are actively managed in accordance with a community forest plan to provide community benefits.**

<sup>1</sup> Washington Community Forest Trust Program is a state level program that is distinct from the federal Community Forest and Open Space Conservation Program. Community Forest Trust lands are selected based on nominations by communities and purchased from willing sellers of private forestland or from other state land trusts. DNR prioritizes nominations based on the program's statutory goals and presents those projects to the Board of Natural Resources for consideration. Projects approved by the Board are submitted to the legislature for funding of the state's portion of property acquisition costs. The community partner is responsible for a local financial contribution of at least fifty percent of the difference between the parcel's appraised fair market value and the parcel's timber and forest land value. For more information visit: <https://www.dnr.wa.gov/managed-lands/washington-community-forest-trust-program>

## ECONOMIC AND COMMUNITY DEVELOPMENT THROUGH THE MT. ADAMS COMMUNITY FOREST

The Mt. Adams Community Forest is nestled in the heart of the Columbia River Gorge and encompasses approximately 1,000 acres of working forestland. The Mt. Adams Resource Stewards (MARS), a local nonprofit organization that owns and manages the community forest, promotes sustainable connections between the land, local economies, and rural communities in the region. A third-party analysis of management activities associated with 389 of the 1,000 acres the community forest found:

- **\$1.7 million in revenues generated for supporting living-wage jobs and forest stewardship efforts.**
- **\$8 million in county-wide economic benefits.**
- **59 months of full-time equivalent (FTE) employment opportunities created within Klickitat County.**
- **23,444 metric tons of carbon dioxide stored.**

Reference: [http://www.mtadamsstewards.org/wp-content/uploads/2018/11/Mt\\_Adams\\_summary1.pdf](http://www.mtadamsstewards.org/wp-content/uploads/2018/11/Mt_Adams_summary1.pdf)

Community forests represent an important opportunity in Washington to address the threat of conversion and stem the loss of working forests. DNR plays a critical role in enabling and fostering this burgeoning movement.

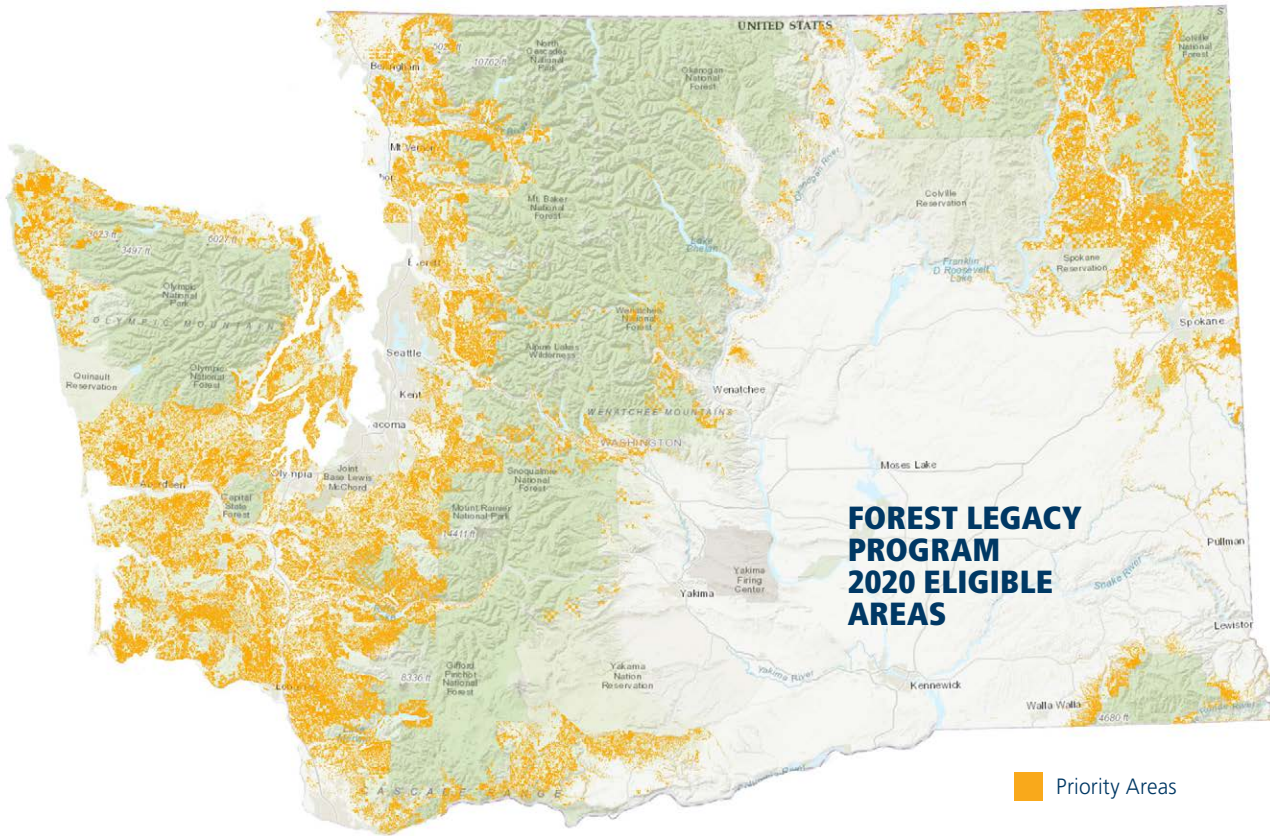
### COMMUNITY FOREST PRIORITY ACTIONS

- Build on the results of the 2018 budget proviso. Investigate opportunities to use existing funding sources to increase competitiveness of community forest projects, and accelerate acquisition of critical tracts of working forestlands at risk of conversion.
- Investigate the role of community forests and support projects that address strategies to achieve goals of the 20-Year Forest Health Strategic Plan, including to “collaborate with local governments and other partners in priority landscapes to provide incentives to discourage conversion of existing forest to non-forest uses” (Goal 4, Strategy 6) and to “reduce risk of conversion of forestland to non-forest uses” (Goal 2, Strategy 4).
- Conduct an evaluation of the role of community forests in reducing risk of conversion, especially in the wildland-urban interface where development influences fire suppression costs and wildfire fighter safety.
- Conduct an annual update of the community forest project list in partnership with the Northwest Community Forest Coalition and Washington Association of Land Trusts. Maintain a list of community forest projects currently in development in Washington.
- Evaluate DNR owned and managed community forests to better understand the ongoing costs associated with state owned and managed community forests. Integrate the results of this analysis in determining DNR’s role in future community forest projects in the state.
- Support community partners and land trusts applying for the federal Community Forest and Open Space Conservation Program. Successfully secure at least one federal grant each year and conserve at least 1,000 acres of additional working forest through the federal program by 2025.



MT. ADAMS RESOURCE STEWARDS (MARS)

**COMMUNITY FORESTS REPRESENT AN IMPORTANT OPPORTUNITY IN WASHINGTON TO ADDRESS THE THREAT OF CONVERSION AND STEM THE LOSS OF WORKING FORESTS.**



**Priority Areas**

**// In 1990, Congress created the Forest Legacy Program to protect environmentally important forest areas threatened by conversion to non-forest uses. Washington was one of the first states to participate... Washington's goals for the program have been not only to protect forestland from conversion, but also to protect water quality, habitat, and timber management."**

**2004 FOREST LEGACY PROGRAM ASSESSMENT OF NEED FOR WASHINGTON STATE**

## Forest Legacy Program

The Forest Legacy Program provides federal dollars to acquire forestland and conservation easements on working forests threatened by development. Since the early 1990s, the Washington state has received more than \$47 million through this program and permanently protected 69,000 acres of forest. These projects have leveraged an additional \$6 million in local government and private funding, and resulted in a more reliable long-term supply of timber for local mills, protection of drinking water sources, and maintenance of critical fish and wildlife habitat.

DNR will prioritize two strategic actions from 2020 to 2025 for the Forest Legacy Program. First, the department will re-establish a committee to provide oversight and advice to DNR in administering Forest Legacy Program. The committee will review annual applications and make funding recommendations. Second, the department will update the Forest Legacy Program Assessment of Need (AON). The AON includes an evaluation of forest resources, uses, and trends, and defines how the Forest Legacy Program will be applied in Washington. Eligibility criteria and project evaluation and prioritization procedures are outlined in the USDA Forest Legacy Program Implementation Guidelines (May 2017). These guidelines have been integrated into the Washington DNR Forest Legacy Program Scoring Guidance, which is included as an appendix to this report.

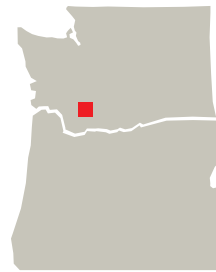
**The map above shows areas that are eligible for the Forest Legacy Program. The program is voluntary and requires participants to work with willing private landowners.**



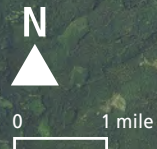
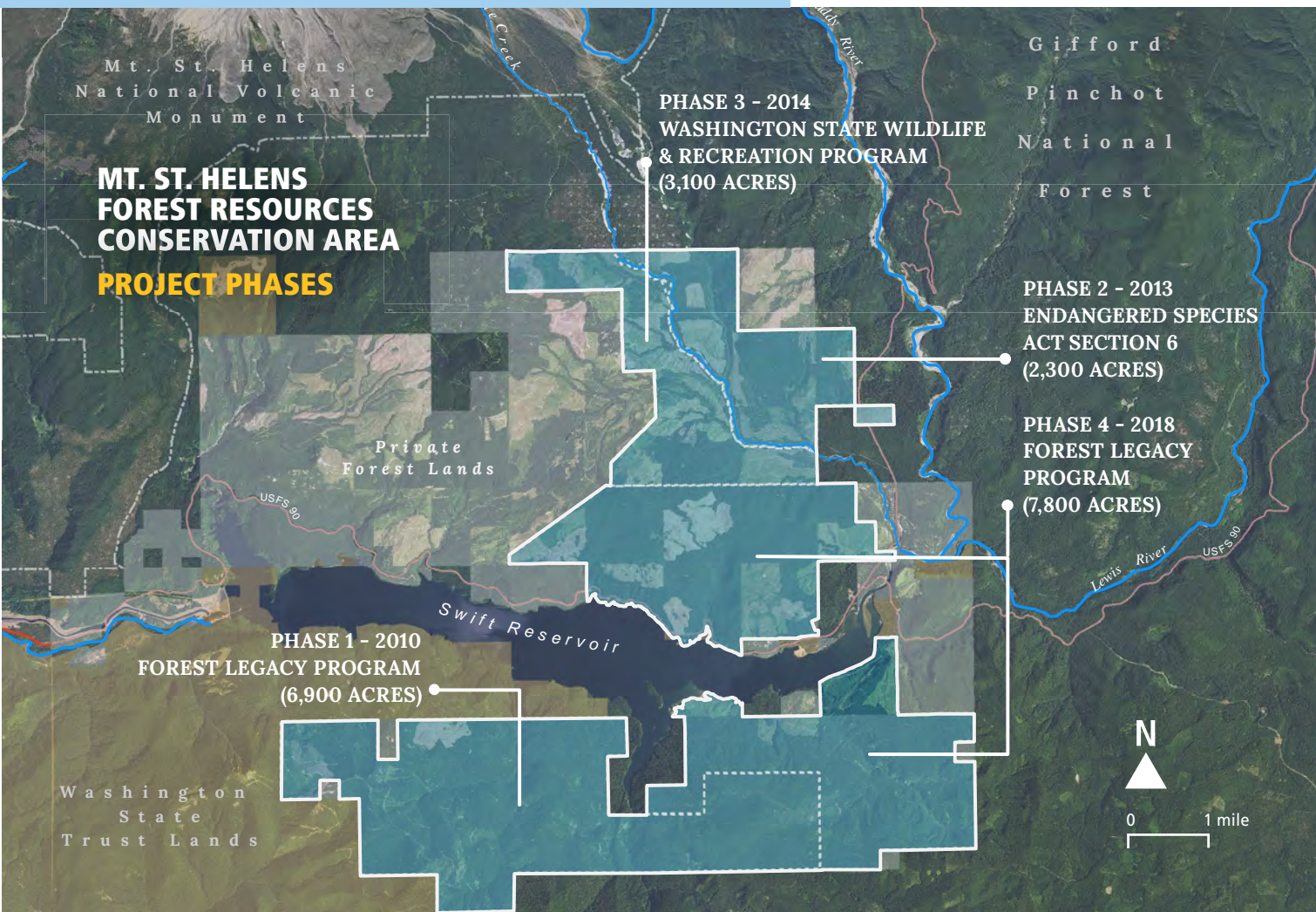
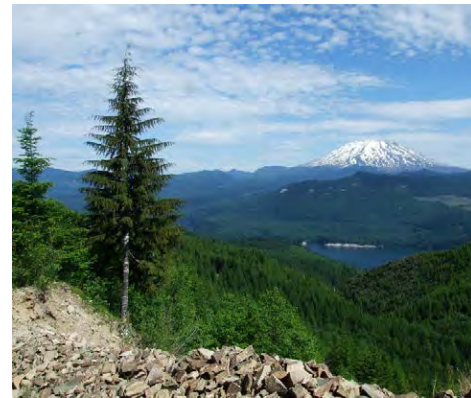
## COLUMBIA LAND TRUST AND TIMBER COMPANY POPE RESOURCES FIND COMMON GROUND, COMPLETE DECADE-LONG, 20,000-ACRE PLAN BENEFITTING LOCAL FORESTRY AND WILDLIFE

In 2018, [Columbia Land Trust announced](#) the culmination of a conservation effort more than a decade in the making on the southern slopes of Mount St. Helens. The Land Trust, in partnership with DNR, facilitated the purchase of conservation easements on 20,000 acres of working forestland surrounding the east end of Swift Reservoir.

Columbia Land Trust worked with Poulsbo-based timber company Pope Resources and Skamania County to develop the Mount St. Helens Forest Conservation Plan. The plan seeks to balance multiple objectives: avoiding fragmentation of working forestlands and wildlife habitat, enabling Pope Resources to continue forestry operations that supports economic activity in the area, and helping the county maintain a vital source of tax revenue. Funding for the most recent and final phase of the conservation plan was provided by the USDA Forest Service through a Forest Legacy grant.



This map below shows the four project phases for the Mount St. Helens Forest Conservation Plan.





## Urban and Community Forestry Program

The Washington State Urban and Community Forestry Program works to educate residents, local governments and decision-makers about the economic, environmental, psychological and aesthetic benefits of trees and to assist local governments, constituent groups and volunteers in planting and sustaining healthy trees and vegetation wherever people live and work in Washington state.

Urban and Community Forests comprises trees and associated vegetation growing along streets in the public right-of-way, as well as those found in forest preserves, natural areas, parks, on school campuses, and on other public properties. Cities and towns may also regulate the planting, care, and removal of trees in business parks, parking lots, or those on private properties. Collectively, individual trees throughout a community are working together in an ecological sense to reduce the adverse impacts of urbanization for the benefit of people, wildlife, waterways, and the broader landscapes that surround them. For example:

- Trees contribute to public health promotion and quality of life. Residents who enjoy access to healthy trees have reduced levels of stress and anxiety.
- Communities with an abundance of healthy, properly maintained trees have less neighborhood crime, more social cohesion, better student achievement, and improved mental health for seniors.
- Tree canopies provide shade and reduce the impacts of urban heat islands.
- Trees clean and control stormwater runoff, protecting the integrity of rivers and streams and reducing the severity of floods.
- Healthy and well-managed urban forests are essential to protecting watershed conditions and the health of steelhead, salmon, orcas, and other aquatic life.
- Trees and other green spaces provide wildlife habitat, including for pollinators like bees and butterflies.
- Urban forests and trees help sequester carbon from the atmosphere.

Trees in Washington's cities and towns are disappearing due to impacts of urban development, pollution, drought, storms, pests and diseases, invasive species, neglect or improper care, and increasingly, wildfire. Many of these threats are rapidly accelerating due to effects of climate change. Unchecked decline and loss of urban tree canopy erodes the essential character of our communities, reduces the well-being of Washington residents, and is likely to exacerbate environmental problems in communities or neighborhoods most vulnerable to climate change impacts. Proper urban and community forest management, where management decisions are based on data from recent resource assessments (tree inventory, canopy analysis, etc.) is essential for preserving the health, safety, character, and vitality of Washington's towns and cities.

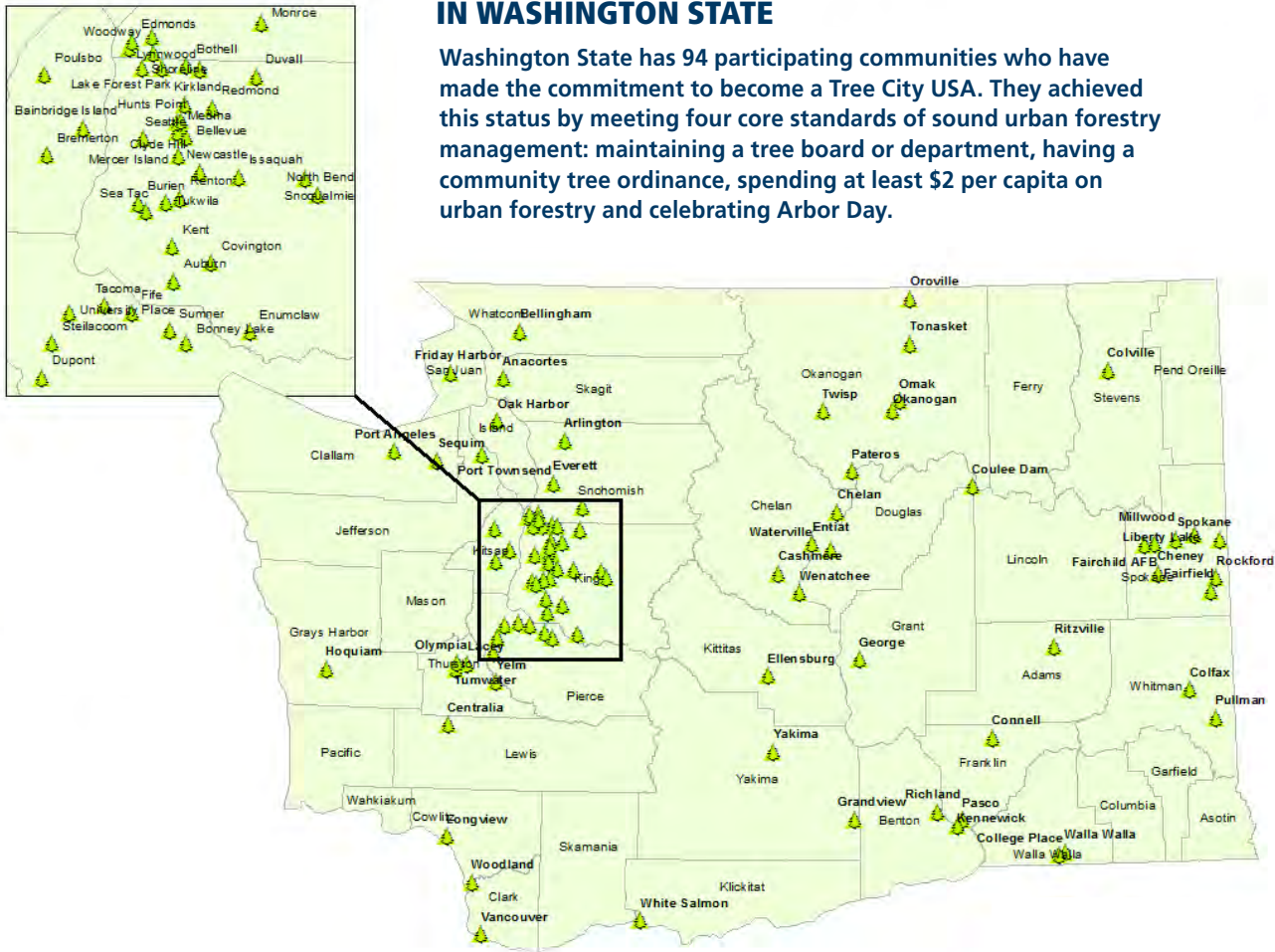


**The mission of Washington's Urban and Community Forestry Program is to provide leadership to create self-sustaining urban and community forestry programs that preserve, plant, and manage forests and trees for public benefits and quality of life. The program provides technical, educational, and financial assistance to Washington's cities and towns, counties, tribal governments, nonprofit organizations, and educational institutions.**



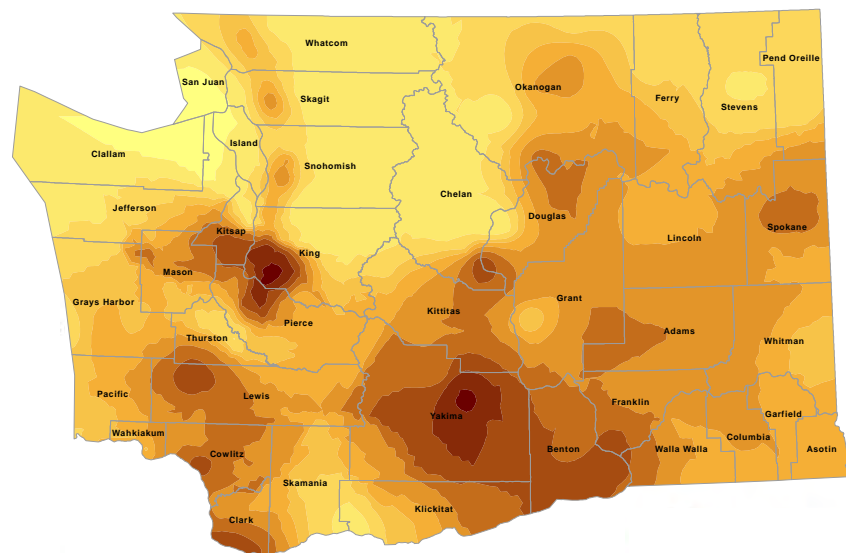
## TREE CITY USA COMMUNITIES IN WASHINGTON STATE

Washington State has 94 participating communities who have made the commitment to become a Tree City USA. They achieved this status by meeting four core standards of sound urban forestry management: maintaining a tree board or department, having a community tree ordinance, spending at least \$2 per capita on urban forestry and celebrating Arbor Day.



Opportunity areas were derived from an analysis of environmental health disparity data from the Washington State Department of Health, tree canopy data from the U.S. Geological Survey's National Land Cover Dataset, Tree City USA data, and income and demographic data from the U.S. Census. Areas of high opportunity indicate communities and regions of the state with high environmental health disparities where increased urban forestry efforts may have a relatively high impact; lower values indicate communities or regions with fewer environmental health disparities where urban forestry efforts, while still beneficial, may have a relatively lower impact.

## WELLNESS & EQUITY URBAN FORESTRY OPPORTUNITIES





## URBAN AND COMMUNITY FORESTRY PROGRAM PRIORITY ACTIONS

### GOAL 1

Advance the equitable delivery of program services to address urban forestry needs in communities or neighborhoods that may be particularly vulnerable to the effects of climate change.

A	<b>Seek opportunities to educate program staff</b> , conservation district partners, Washington Community Forestry Council members on environmental justice, social equity, institutional racism, and related topics.
B	<b>Work closely with the Washington Community Forestry Council</b> to implement norms and practices that will help the program strengthen its approach to diversity, equity, and inclusion as we make decisions and deliver program services.
C	<b>Seek opportunities to diversify</b> the Washington Community Forestry Council membership, which may include updating the council's Articles of Association.
D	<b>Dedicate a portion of pass-through grant funding</b> to facilitate implementation of projects and programming that address environmental health disparities in communities of greatest need.

### GOAL 2

Provide technical assistance, educational programming, training, resources, and support for urban forestry planning, management, and maintenance activities.

A	<b>Manage and promote the Tree City USA</b> , Tree Line USA, and Tree Campus USA programs in partnership with the Arbor Day Foundation. Promote and celebrate Arbor Day in partnership with federal, state, and local partners.
B	<b>Provide technical expertise, training, and guidance</b> to municipal staff with responsibilities for public tree care and management: <ul style="list-style-type: none"> <li>• Promote and encourage best management practices for urban and community forestry.</li> <li>• Support city and county foresters and local organizations in conducting municipal tree inventories, canopy analyses, and other resource assessments.</li> <li>• Provide guidance and assistance for the drafting and development of municipal tree ordinances and urban forestry management plans.</li> </ul>
C	<b>Support urban forestry education</b> with annual regional seminars and financial support to municipal staff and students entering the field of urban forestry and relevant events and conferences led by allied organizations.
D	<b>Develop an online database and map of urban tree data</b> in partnership with Washington State Department of Agriculture (WSDA) for use in invasive pest surveys, analysis, and rapid response planning in preparation for potential invasive pest outbreaks.
E	<b>Increase municipal forest pest readiness</b> through municipal training for pest detection, community preparedness assessments, and development of pest readiness response plans in partnership with the Washington Invasive Species Council (WISC).
F	<b>In partnership with program constituents, support the proper planting</b> , immediate aftercare, and sustained maintenance of trees, in accordance with industry-accepted best practices, on public and publicly-accessible properties within Washington cities and towns.



GOAL 3	
Forge partnerships to enhance delivery of urban and community forestry program services and grow the program’s communications portfolio to build greater awareness, recognition, and understanding of urban forest benefits.	
A	<b>Maintain interagency agreements with conservation districts</b> to provide regionally-based technical assistance on behalf of the urban and community forestry program.
B	<b>Develop and distribute outreach materials</b> to engage and educate on key urban forestry topics.
C	<b>Publish the Tree Link Newsletter</b> on a regular basis to keep constituents informed on topical urban and community forestry issues in Washington.
D	<b>Maintain the urban and community forestry program website;</b> explore the use of web-based mapping applications to improve delivery of information and communicate urban and community forestry success stories.

**PROPER URBAN AND COMMUNITY FOREST MANAGEMENT IS ESSENTIAL FOR PRESERVING THE HEALTH, SAFETY, CHARACTER, AND VITALITY OF WASHINGTON’S TOWNS AND CITIES.**

GOAL 4	
Procure additional funding and staffing to address urban forestry needs and unfunded initiatives in Washington state.	
A	<b>Reinvigorate the Evergreen Communities Act.</b>
B	<b>Reestablish the Urban Forest Restoration Program</b> to assist communities with invasive removal and other urban forest health work using Washington Conservation Corps crews.
C	<b>Increase regional delivery of urban forestry technical assistance</b> across the state, either through new agreements with conservation districts or hiring of agency staff in DNR regions.
D	<b>Promote the incorporation of trees into local stormwater management strategies</b> and help program constituents identify sites and plant trees in areas with a high capacity to mitigate stormwater runoff.
E	<b>Facilitate a statewide inventory of urban and community forests</b> using urban forest inventory and assessment protocols established by the Forest Service.
F	<b>Analyze and map forest fragmentation,</b> canopy loss and gain, and ecosystem services from trees and forests in urban areas.



## Forest Health Protection

DNR's forest entomologists, pathologists, and forest health specialists provide technical assistance and education to private landowners and state land managers with identification and management of forest insect pests and diseases. The primary focus is on insects and diseases that cause mortality, those that cause growth loss and stress, and those that affect wood quality. DNR emphasizes integrated forest pest management methods that focus on increasing stand resistance to insect attack and resilience following any damage that may occur.

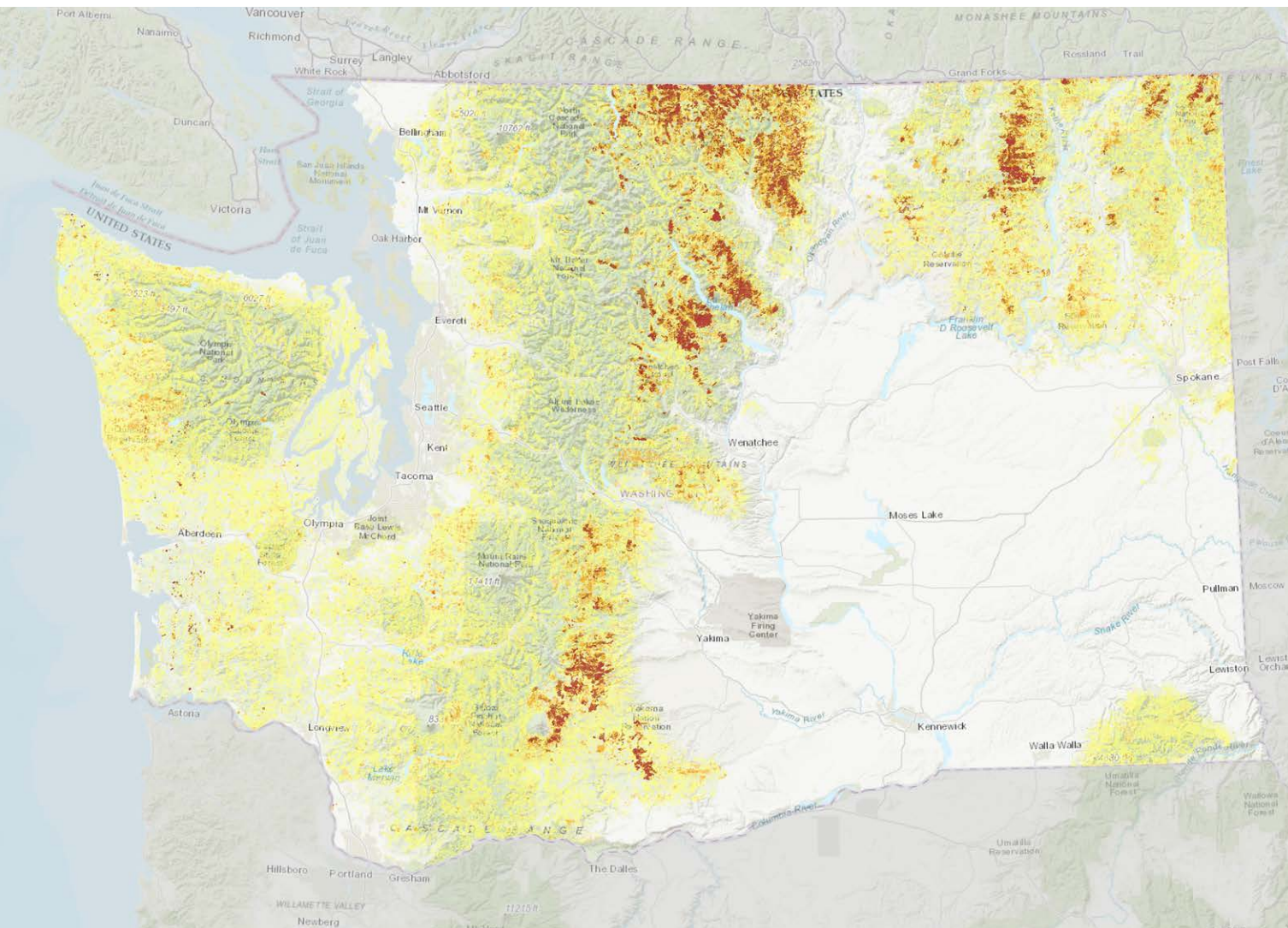
Landowner education in forest insects and diseases includes close coordination with Washington State University (WSU) Extension, including presentations at coached planning workshops and field days. Other education work includes teaching at Washington Contract Loggers Association (WCLA) trainings, newsletter articles, fact sheets, social media posts, media interviews, and distribution of outreach materials through workshops and DNR's website.

Annual monitoring programs include insect and disease aerial surveys, monitoring for invasive *Phytophthora ramorum* in waterways, and monitoring populations of Douglas-fir tussock moth and western spruce budworm in central and eastern Washington. When unexpected levels of damage occur, DNR conducts special monitoring projects to determine levels of mortality and potential causes.

Systematic aerial surveys are conducted to collect and report on forest insects, diseases, and other disturbances across federal, state, tribal, and private lands. The Forest Service, with the cooperation of state and private partners, has conducted the Pacific Northwest aerial surveys annually since 1947. Aerial surveys have proven to be an efficient and economical way to detect and monitor forest change events over large forested areas. Forest health conditions and findings of monitoring projects are reported annually in the Forest Health Highlights report and as needed through other reports, posters, or presentations at professional meetings and trainings.



▲ An observer uses digital tools to map forest damage during an aerial survey flight.



**WHEN UNEXPECTED LEVELS OF DAMAGE OCCUR, DNR CONDUCTS SPECIAL MONITORING PROJECTS TO DETERMINE LEVELS OF MORTALITY AND POTENTIAL CAUSES.**

**15-YEAR CUMULATIVE TREE MORTALITY**

2003–2017

- 5 or less dead trees per acre
- Between 5–10 dead trees per acre
- Between 10–25 dead trees per acre
- Between 25–50 dead trees per acre
- More than 50 dead trees per acre



## FOREST HEALTH EMERGING ISSUES AND TRENDS

- Bark beetle-caused mortality has been trending upward, especially from fir engraver, western pine beetle, Douglas-fir beetle, Douglas-fir engraver, and Ips pine engravers. The trend is likely related to inciting factors such as drought, wildfire damage, and recent defoliator outbreaks.
- Western spruce budworm defoliation continues to be of concern, but the affected area has decreased significantly.
- Over 5,000 acres of Douglas-fir tussock moth defoliation was recorded in an area of the central Cascades where it has not been previously mapped. A new outbreak is developing in Okanogan County.
- California fivespined Ips (CFI) damage continues in the Columbia River Gorge area. Annual monitoring has recorded CFI in nine new Washington counties since 2010.
- Northern spruce engraver was detected for the first time in eastern Washington in 2018 and a monitoring project has been initiated.
- Drought has led to increased conifer mortality and secondary bark beetle activity in many tree species.
- DNR has planted white pine blister rust resistance progeny (both western white pine and whitebark pine) for field evaluation sites in Washington, which continue to be monitored.
- Swiss needle cast aerial and ground surveys in western Washington are being conducted by DNR in cooperation with the Forest Service and University of Washington.
- DNR partnered with the University of Washington on a research project for bigleaf maple decline, which found correlations between damage and hotter summer droughts.
- Introduced gypsy moth populations continue to be frequently detected in Washington. Monitoring and eradication projects conducted by the Washington State Department of Agriculture (WSDA) have been very successful.
- Early detection of future introductions of other invasive species of concern in forestry is a high priority. DNR coordinates closely with WSDA, the Washington Invasive Species Council, and other agencies to raise awareness and encourage reporting.

TREE GALLERIES PHOTO: EDWARD H. HOLSTEN, USDA FOREST SERVICE; BUGWOOD.ORG; NORTHERN SPRUCE ENGRAVER: PEST AND DISEASES IMAGE LIBRARY, BUGWOOD.ORG



**NORTHERN  
SPRUCE  
ENGRAVER**

The northern spruce engraver is a bark beetle native to Washington state that colonizes in the stems and branches of spruce trees, leaving galleries like those seen above. The damage they cause can kill the tree.

**EARLY DETECTION OF  
FUTURE INTRODUCTIONS  
OF INVASIVE SPECIES OF  
CONCERN IN FORESTRY  
IS A HIGH PRIORITY.**

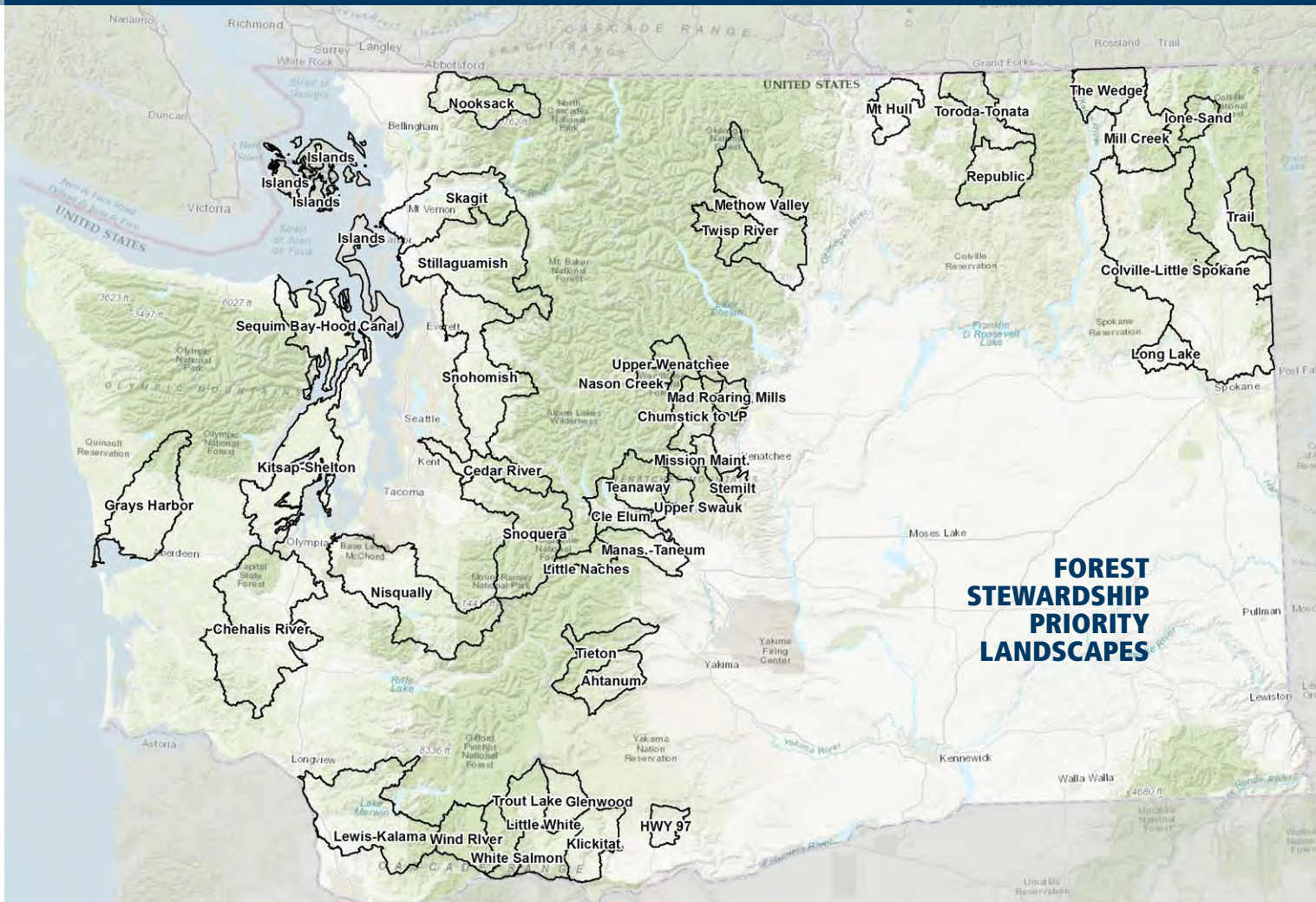
## FOREST HEALTH PROTECTION PRIORITY ACTIONS FOR 2020-2025

- Address both native and invasive forest pest species and their effect on forest resources.
- Detect, monitor, evaluate, and report forest pests and forest health conditions, and conduct activities to improve or maintain forest health conditions and sustainability. This includes producing an annual Forest Health Highlights report.
- Coordinate with Forest Service and Forest Inventory and Analysis (FIA) in reviewing annual FIA and forest health monitoring data to detect and evaluate forest health problems.
- Continue active cooperation with the Forest Service to conduct the annual insect and disease aerial survey and regularly communicate ways to improve safety, training, technologies, and methodologies.
- Reduce damage through effective integrated pest management, including prevention, suppression, and eradication.
- Work closely with the Forest Stewardship Program to provide cost-share assistance to landowners specific to reducing risk of insect and disease damage, such as through the Western Bark Beetle Initiative federal funds.
- Represent the forest health, forest entomology, and forest pathology expertise in the state, and review forest stewardship plans and best management practices for forest health guidance.
- Continue to provide science-based education and technical assistance to as many landowners and land managers as possible through close cooperation with stewardship programs, universities, and other agencies.
- Include education efforts where needed to limit the spread of invasive insects, such as the “Don’t Move Firewood” campaign and educational efforts led by conservation districts.
- Involve the WSDA as a partner where they are the lead agency for cooperative forest health. Elsewhere, engage them as a key stakeholder, as most states share pest management responsibilities between agriculture and forestry agencies.
- Collaborate regionally and nationally on insect pests. Collect georeferenced forest health data using national standards provided by the Forest Service so that cross-boundary comparisons can be made.
- Ensure flexibility and seek funding sources to respond to emerging situations that threaten forest health, such as new insect and disease outbreaks or introductions.

**WORKING  
WITH A VARIETY  
OF LANDOWNERS  
TO PRIORITIZE  
RESTORATION WORK  
IN WASHINGTON’S  
FORESTS IS KEY  
TO ACCOMPLISHING  
SHARED GOALS.**

COOPERATIVE FORESTRY  
PROGRAMS





## FOREST STEWARDSHIP PRIORITY LANDSCAPES

### Forest Stewardship Program

The priority landscapes for the FSP mostly overlap the 20-Year Forest Health Strategic Plan. Beginning in 2021, however, the Forest Stewardship Program priority landscapes will additionally include the Colville-Little Spokane Watershed because it is a high-priority area to address forest health and wildfire risk on private lands and in partnership with Washington Department of Fish and Wildlife. The department received a Landscape Scale Restoration grant that will support a WSU Extension forester to provide technical assistance in the Colville-Little Spokane Watershed.

The Natural Resources Conservation Service (NRCS) is identifying priority areas, and Washington's conservation districts have grants and technical assistance available in many areas of the state as well. DNR is interested in aligning the priority areas outlined in this action plan with our partners as much as possible. Alignment will leverage the resources of the DNR and partner agencies to maximize the benefit to the landowners and achieve larger landscape goals.

Additional program goals and priority actions for the Forest Stewardship Program are integrated into the Strategies Section of this report and aligned with work identified through the DNR Small Forest Landowner Office.

▲ Forest Stewardship priority landscapes identify areas that will be the focus of federal investments through this program. The priority landscapes were identified based on the guidance provided by the USDA and national Forest Stewardship modernization effort.

## FOREST STEWARDSHIP AND LANDSCAPE SCALE RESTORATION IN CHEHALIS RIVER BASIN

The Upper and Lower Chehalis Basins contain rich forestland that provides vital ecosystem services like fish and wildlife habitat, clean air, carbon storage, and sustainably harvested timber critical to the local and regional economy. While much of the forests are owned by federal, state, or industrial forest managers, over 250,000 acres are privately owned in small acreages, often ranging between one and several hundred acres. Climate change, invasive species, land conversion, and fragmentation threaten the ecological integrity of forests throughout the watershed, yet most private owners do not have the training or background to be able to recognize forest health issues, develop forest stewardship plans, and actively manage their forest.

The WSU Extension Forestry program partnered with DNR and the Grays Harbor Conservation District to assist forest owners in developing stewardship plans through targeted workshops, field days, and short courses. The highlight of this coordinated effort was the Forest Stewardship Coached Planning Short Course, which engaged landowners in the process of developing detailed forest stewardship plans. The short course includes an out-in-the-woods learning experience and a site visit from a professional forester on

their own property. Landowners are given one-on-one guidance in the creation of their stewardship plan which, when finished, makes them eligible for certification, reduced property taxes, and federal funding to implement forest management practices.

In addition to the effort to help landowners complete forest stewardship plans, a master forest stewardship plan was written for the entire Chehalis River Basin. This plan provided landscape-scale information for the region that landowners could use and supplement with their site-specific details.

The program was implemented by DNR Forest Stewardship Program staff. Project funding was provided by the USDA Forest Service Landscape Scale Restoration Grant Program, DNR, and the Grays Harbor Conservation District.

**Below: A group of small landowners spend time in the field together during a coached planning session.**





## State Fire Assistance Program

State Fire Assistance (SFA) is a grant program to support the infrastructure and personnel necessary for timely, professional, and coordinated wildland fire suppression actions throughout Washington. Funding is used to train interagency, volunteer fire service, and DNR personnel, by either conducting nationally approved courses in-house, or sending personnel to nationally approved courses offered elsewhere. The funding is also used to help pay for DNR personnel to administer the training program.

Through the SFA grant program, the DNR Wildfire Division is meeting the vision of safely managing and living with wildland fire for all of Washington, specifically by safely suppressing wildfires with certified firefighters that meet national training and qualification standards.

The Wildland Fire Protection 10-Year Strategic Plan emphasizes enhancing and sustaining a highly capable workforce (Goal 1, Strategy 3). SFA funding addresses the strategy directly. Some of the activities include conducting, coordinating, and implementing National Wildfire Coordinating Group training and qualification standards. This effort ensures adequate numbers of well-trained staff are available on a sustained basis to respond to wildfires; promotes standardization for training, qualifications, equipment, and communication methods in collaboration with interagency partners; and ensures the focus is on safe firefighting operations at every incident.

Additional goals and priority actions focused on wildfire preparedness and training are included in the Strategies Section.

## Volunteer Fire Assistance

In areas served by fire districts and fire departments, volunteer firefighters are frequently the first responders to wildfires. DNR supports fire districts through a suite of programs including Volunteer Fire Assistance (VFA), Federal Excess Personal Property (FEPP), and Firefighter Property (FFP) programs. These federal programs provide fire districts with training, equipment, and vehicles needed to suppress fires while they are still small — protecting natural resources, reducing overall fire suppression costs, and managing risks to lives and property.

The objective of the VFA program is to improve the capacity and capability of rural and volunteer fire districts. These districts protect rural communities from wildfire and play a substantial cooperative role with DNR and federal agencies in minimizing wildland fire impacts across the state. The program provides critical Forest Service funding for fire districts' wildfire missions. Funding also helps DNR implement federal excess property programs to provide districts with equipment that is cost-effective for conversion in fire and emergency service missions.

PHOTO: PEND OREILLE COUNTY FIRE DISTRICT 6



PHOTO: CITY OF ROSLYN FIRE DEPARTMENT



## VOLUNTEER FIRE ASSISTANCE PROGRAM

The Volunteer Fire Assistance program strategy focuses funding to meet the following priorities, while maintaining flexibility to adjust priorities to meet emerging needs:

- Support fire districts providing service to a rural community with a population of 10,000 or less.
- Support newly formed fire districts.
- Target fire districts with volunteer membership that is 80 percent or greater.
- Target fire districts that assist DNR and federal land management agencies with fire response.
- Target fire districts with fewer resources.
- Target areas of the state with a medium to high fire probability.



## Landscape Scale Restoration Program

The Landscape Scale Restoration Program (LSR) is a Forest Service State and Private Forestry competitive grant program. The landscape scale program promotes collaborative, science-based restoration of priority forest landscapes and furthers priorities identified in state Forest Action Plans.

Beginning in 2008, the Forest Service, in partnership with state foresters, embarked on a new effort to take an all-lands approach to address nationally significant resource challenges. The group focused on identifying the highest priority landscapes, and integrating State and Private Forestry program authorities to make a targeted and meaningful change on the landscape. The approach was:

- Focused on addressing issues of national importance and sustaining a diverse range of public benefits from forests and trees.
- Prioritized by using the best available technology and information to assess forest conditions and trends at the global, national, and state level and identified the best opportunities for investment toward meaningful change.
- Designed to achieve significant outcomes by emphasizing collaboration, innovative partnerships, and work at appropriate scales and by improving our ability to assess and demonstrate our effect on the ground. Resources were focused through a competitive process administered through a joint effort between the Forest Service and regional state forestry organizations (Council of Western State Foresters, Northeast-Midwest State Foresters Alliance, and Southern Group of State Foresters).

In 2014, using existing State and Private Forestry program funds, Congress recognized the LSR Program through annual appropriations and approved it as the funding mechanism for a competitive process focused on the priorities identified in state Forest Action Plans. The 2018 Farm Bill amended the Cooperative Forestry Assistance Act (CFAA), directing the Forest Service, in consultation with state foresters or appropriate state agencies, to provide financial and technical assistance to encourage collaborative, science-based restoration of priority forest landscapes. In response, the agency is implementing the changes identified in the CFAA through administrative changes. These changes build upon the foundation of the LSR Program. The fiscal year 2020 grant cycle was considered a transition year for the program with full execution of the 2018 Farm Bill to follow.

This program has provided vital support to the implementation of Washington's Forest Action Plan priorities with statewide effects in both planning and implementation. In addition to the success story in the Chehalis Basin covered in the Forest Stewardship Program portion of this report, highlights include multi-year projects funded in 2017 and 2020 that moved forward coordinated all-lands forest health and resilience work in two priority planning areas in the 20-Year Forest Health Strategic Plan, the Manastash-Taneum and Stemilt-Squilchuck areas. The LSR Program also funded a 2016 project that developed a collaborative landscape scale Forest Stewardship Master Plan and increased landowner educational programs in the high priority Chehalis River Basin.

The LSR Program will continue to provide important financial support to leverage resources and achieve the goals and priority actions identified in this Forest Action Plan on non-industrial private and state forestland in priority landscapes.

**FROM 2015-2019, THE VFA PROGRAM PROVIDED 628 GRANTS TO 227 FIRE DISTRICTS TOTALING \$2,187,640 IN FEDERAL INVESTMENTS. A THIRD-PARTY ANALYSIS FOUND THAT 87 PERCENT OF WASHINGTON'S PROGRAM INVESTMENTS HAVE BEEN IN MEDIUM- AND HIGH-RISK AREAS—ONE OF THE HIGHEST RATES IN THE COUNTRY.**

**Facing page, top: Pend Oreille Fire District 4 covers 96 square miles in northeast Washington. A Volunteer Fire Assistance grant provided resources to retrofit this tender acquired through the Firefighter Property program.**

**Facing page, bottom: Washington's Volunteer Fire Assistance provided financial resources to help the Roslyn Fire District retrofit this utility task vehicle (UTV). The equipment will provide local volunteer firefighters with the tools to respond to wildfire starts in the area's rugged terrain.**



PHOTO BY KEN BEVIS / DNR

DNR Landowner Assistance Forester Dan Lennon points out a cavity in a snag that will be preserved for wildlife habitat in a forest slated for fuels-reduction thinning near Goldendale.





**THE FOREST ACTION PLAN IS A ROADMAP FOR HOW DNR WILL WORK WITH PARTNERS TO IMPLEMENT SHARED PRIORITY ACTIONS AND ADVANCE THE SHARED STEWARDSHIP INVESTMENT STRATEGY ACROSS WASHINGTON.**

## STRATEGIES

The purpose of the Forest Action Plan is to provide a roadmap for how DNR will work with partners to advance the Shared Stewardship Investment Strategy across Washington and implement priority actions identified by the department and our partners. In that spirit, this Forest Action Plan highlights the connections between existing plans and strategies and identifies the missing links and additional priority actions and goals that will contribute to both near-term and ongoing success.

DNR is working on a broad suite of forest management, restoration, and climate resilience-related activities. Collectively, the actions being taken are addressing many of the pressing threats facing forest ecosystems, and establish a solid foundation for more focused and coordinated planning and implementation in the future.

This section of the action plan identifies priority actions that address threats facing forests. Priority actions are organized by theme, and when brought together in this document, clearly outline DNR's goals and objectives, and chart a path toward actions at a scale commensurate with the challenges facing forests and communities in the state.

**The themes in this section are:**

- **Landscape Resilience**
- **Community Wildfire Preparedness and Wildfire Suppression**
- **Keeping Forests as Forest: Risk of Conversion to Non-Forest Uses**
- **Urban and Community Forest Resilience**
- **Rural Economic Development**
- **Stewardship of Family and Working Forests**
- **Wildlife and Salmon Recovery**
- **Water Quality and Quantity**

Working at a statewide-scale requires collaboration by diverse landowners, agencies, tribes and stakeholders, all with unique and independent management philosophies, organizational cultures, policies, practices, and expectations. Because the field of natural resources landscape-scale collaboration continues to emerge and evolve, each will need to pay close attention to addressing organizational, operational, regulatory, and human resource challenges to ensure that opportunities for working effectively across landownership boundaries are not only achievable but also successful.

Given the scale of the threats facing our state's forests and the need for active forest management to address these issues, the long-term success of this plan will largely depend on the extent to which many forest landowners can meet their financial objectives while implementing priority actions recommended in this plan. DNR, private timber companies, and some tribes have a responsibility to generate revenue in their forest management activities; therefore, the ability to generate revenue will be an essential component of addressing priority actions in this planning effort.



## Landscape Resilience

The DNR Forest Health and Resiliency Division defines landscape resilience as the ability of a landscape to sustain desired ecological functions, robust native biodiversity, and critical landscape processes over time and under changing conditions. Actions in this Forest Action Plan specifically focus on forest health and resilience at a landscape scale. The goals and priority actions identified throughout this section seek to integrate actions from existing plans and strategies that were collaboratively developed. This section begins with an overview of statewide priority actions focused on addressing landscape resilience, wildfire risk, and forest health, then addresses issues specific to central and eastern Washington and western Washington.

	<b>PRIORITY ACTIONS FOR STATEWIDE LANDSCAPE RESILIENCE</b>	<b>Referenced Strategies</b>
<p><b>1</b></p>	<p><b>Work with partners, including landowners,</b> agencies, tribes, forest collaboratives, conservation districts, and landowners to build social license, address barriers, and leverage resources to enhance forest health and resilience through active management practices</p>	FHSP 1.6 DNR C1.2 PCR
<p><b>2</b></p>	<p><b>Enhance watershed health and implement drought mitigation strategies</b> such as continued investments in redesigning roads to reduce the velocity of downstream drainage, using biochar to improve soil water infiltration and retention, and restoring wet meadows and riparian areas.</p>	FHSP USDA* PCR  *USDA 2017 Drought Report
<p><b>3</b></p>	<p><b>Expand programs and practices</b> to manage fuels and vegetation, and establish dedicated funding for forest health and wildfire and strengthen existing federal funding to leverage implementation.</p>	WF S.5 PCR S.4
<p><b>4</b></p>	<p><b>Increase DNR capacity to plan, implement, and monitor</b> landscape-scale, cross-boundary management approaches through existing authorities and programs, and fully utilize Cooperative Forestry Act and Farm Bill tools, such as the Good Neighbor Authority.</p>	FHSP 1.7 DNR C3.2 PCR
<p><b>5</b></p>	<p><b>Integrate carbon sequestration policies and investments</b> into forest health priorities and strategies where appropriate and in ways that advance statewide carbon sequestration goals per 2019 House Bill 2311. Conduct carbon inventories to improve understanding of carbon stocks, flux, trends, emissions, and sequestration across forestlands, including carbon stored in harvested wood products.</p>	PCR



DNR's forest health team monitors and analyzes the state's forests and collaborates with numerous landowner partners to achieve landscape resilience in the face of both longtime and emerging challenges.



**LANDSCAPE RESILIENCE IS THE ABILITY OF A LANDSCAPE TO SUSTAIN DESIRED ECOLOGICAL FUNCTIONS, ROBUST NATIVE BIODIVERSITY, AND CRITICAL LANDSCAPE PROCESSES OVER TIME AND UNDER CHANGING CONDITIONS.**

**KEY TO REFERENCED STRATEGIES**

The following icons represent existing regional, state, and national strategies referenced in the 2020 Forest Action Plan's priority actions. The letter or number under an icon points to the specific section or goal referenced in that strategy.

- |   |   |   |  |   |   |  |  |
|---|---|---|--|---|---|--|--|
| <br>FHSP | DNR Forest Health Strategic Plan  | <br>SAL  | <a href="#">Statewide Strategy to Recover Salmon</a>                               | <br>PSP  | <a href="#">Puget Sound Partnership Implementation Plan</a> | <br>NAT | <a href="#">WA Natural Heritage Plan</a>   |
| <br>DNR  | <a href="#">WA Dept. of Natural Resources Strategic Plan</a>  | <br>SWAP | WA State Wildlife Action Plan  | <br>PCR  | DNR Plan for Climate Resilience                             | <br>BOR | Bipartisan Outdoor Recreation Confluence Accord  |
| <br>HAB  | <a href="#">WA Wildlife Habitat Connectivity Working Group Statewide Analysis</a>                                 | <br>WF   | DNR Wildfire Strategic Plan  | <br>USDA | Potential Drought Impacts in the Pacific Northwest          | <br>LDC | <a href="#">Puget Sound Partnership Land Development and Cover Implementation Strategy</a> |
| <br>ECO  | <a href="#">Dept of Ecology Preparing for a Changing Climate: WA State's Integrated Climate Response Strategy</a> | <br>ORCA | <a href="#">Southern Resident Orca Task Force Final Report and Recommendations</a> |   |   |  |  |



# RESILIENT FORESTS IN WASHINGTON STATE

## RURAL ECONOMIC DEVELOPMENT

Forest restoration can generate wood as well as non-timber forest by-products that support local and state economies.

## FOREST DIVERSITY

Resilient forests have diverse compositions and structures across a landscape, such as different tree species of varying ages.

## MECHANICAL TREATMENTS

Thinning of dense, overgrown forests through removal of trees can restore forest structure and reduce risk.

## PRESCRIBED FIRE

A controlled reintroduction of fire in forests that evolved with fire is a critical tool to restoring healthy and resilient forests across the state.

## AQUATIC RESTORATION

Enhancing aquatic habitat and riparian restoration (such as through the placement of large woody debris) is critical to improving landscape resilience.





**MANAGED WILDFIRE**  
Letting remote wildfires burn while monitoring them can restore forests and reduce fuel loads.

**WILDLIFE**  
Healthy forest ecosystems support a diverse range of species.

**WILDLAND URBAN INTERFACE (WUI)**  
People who live near or in wildfire-prone areas understand potential ignition sources and are prepared for wildfire situations.

**RECREATION**  
Healthy forests support numerous outdoor recreation activities.

















**DEFENSIBLE SPACE**  
Homes and structures with reduced combustible material both on and immediately around them improves safety.

5 FT



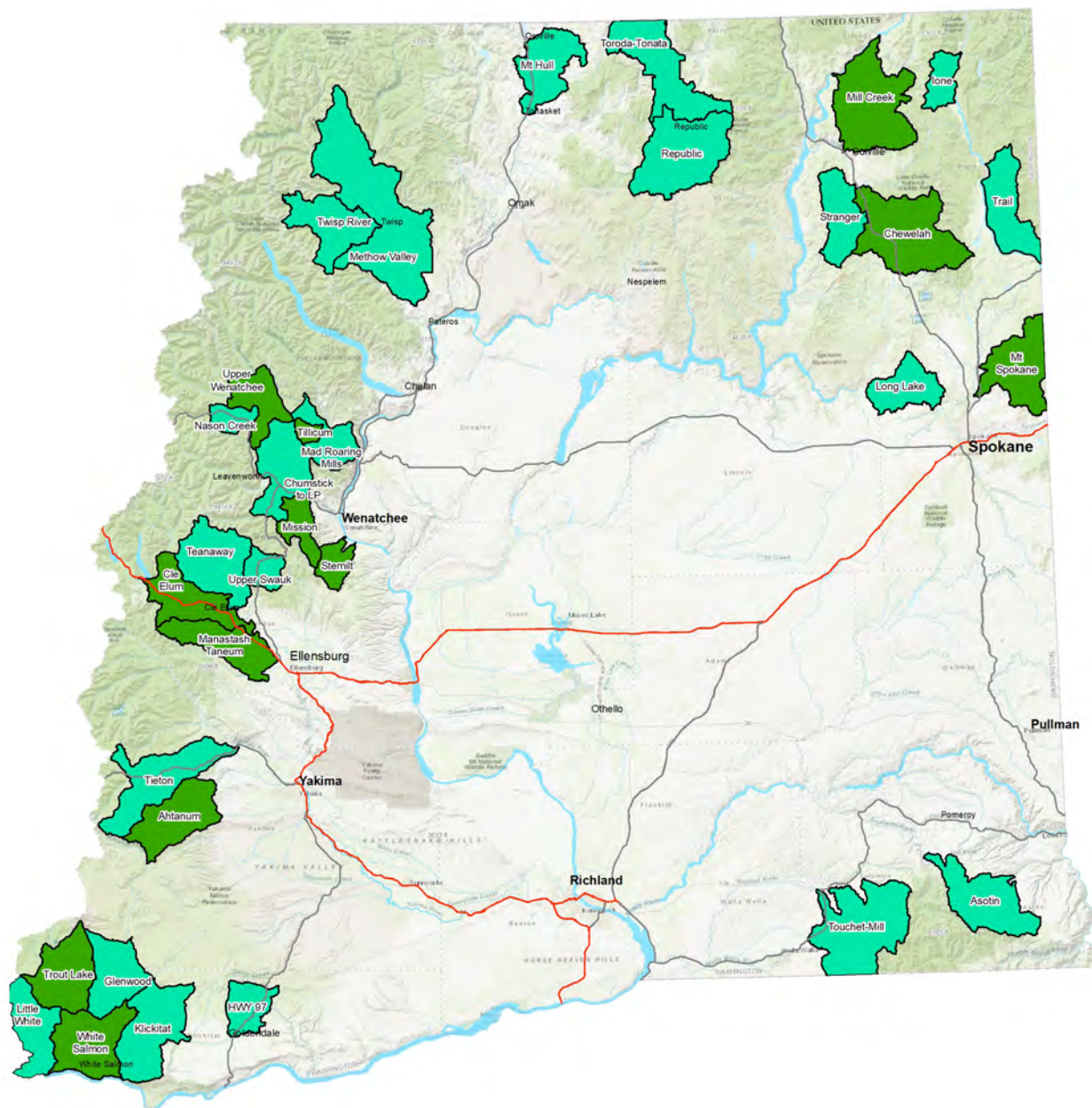
## Landscape Resilience in Central & Eastern Washington

Adopted in 2017, the 20-Year Forest Health Strategic Plan: Eastern Washington established a vision that forested landscapes are in an ecologically functioning and resilient condition and meet the economic and social needs of present and future generations. While detailed goals, strategies, and actions are identified in this plan to achieve this vision, there are common and complementary priority actions with other plans that align to set shared priority actions.

 <b>PRIORITY ACTIONS FOR CENTRAL AND EASTERN WASHINGTON</b>		Referenced Strategies
<b>Landscape Resilience Goal:</b> Conduct 1.25 million acres of scientifically sound, landscape-scale, cross-boundary management and restoration treatments in priority watersheds to increase forest and watershed resilience by 2037.		   FHSP Goal 1    DNR Goal C1    WF Goal C2
1	<b>Prioritize forest health treatments</b> in landscapes with the highest need and relative risk. Use risk assessment to inform mitigation and protection planning and to establish priorities.	   FHSP 1.1    DNR C1.1    WF S.2
2	<b>Conduct landscape evaluations</b> that use the best available science and tools to prioritize and design forest health treatments to improve forest conditions, enhance ecosystem values across landscapes, and reduce risk to communities and infrastructure as described in House Bill 1784.	  FHSP 1.2    WF S.2.2
3	<b>Implement a wide range of treatment types</b> to increase tree vigor and reduce vulnerability to uncharacteristic levels of insects, diseases, drought, and wildfire.	   FHSP 1.3    DNR C1.1    PCR
4	<b>In priority landscapes, work with landowners,</b> conservation districts, fire districts, partner organizations, and agencies to coordinate activities across borders and select the most effective treatment approaches to meet the needs of the landscape and landowner objectives.	   FHSP 1.5    DNR C1.2    PCR
5	<b>Explore options for safely and proactively</b> managing natural fires where applicable to support forest health goals.	 PCR
6	<b>Work with the Carbon Sequestration Advisory Group</b> to evaluate the long-term carbon storage and sequestration potential associated with landscape resilience in fire-prone forests, including the role of restoring large, old fire-tolerant species at a landscape scale and through sequestration in manufactured wood products pools.	



Many dry forest ecosystems in eastern Washington evolved to thrive when experiencing low severity fires every decade or so. Those fires would limit vegetation on the forest floor, reduce the overstocking of trees, and help cycle nutrients back into the soil.



- Analyzed 2018
- Analyzed 2020

### EASTERN WASHINGTON FOREST HEALTH PRIORITY HUC 6 WATERSHEDS

The 33 priority landscapes identified by DNR and partners through the development of the 20-Year Forest Health Strategic Plan. It is anticipated that additional planning areas will be identified during the life of this Forest Action Plan.



## Prescribed Fire: A Tool for Landscape Resilience

Prescribed fire is identified in a number of strategic plans and agency and scientific reports as an important tool to improve landscape resilience, especially in the fire-prone forests and ecosystems. Priority actions are identified in the strategic plans referenced previously as well as the Forest Resiliency Burning Pilot Project report that was submitted to the Legislature in December 2018. Recommendations from the report identify solutions to smoke management and air quality challenges that support restoring forest health, improving community safety, and protecting natural resources. More recent legislation, passed in the 2019 session (House Bill 1784), also focuses on broadening the use of prescribed fire.

✚	PRIORITY ACTIONS FOR PRESCRIBED FIRE
1	<b>Work with the Washington Prescribed Fire Council</b> to identify and remove obstacles to greater use of prescribed fire.
2	<b>Facilitate the statewide interagency prescribed fire training</b> program to accelerate large landscape restoration, increase training opportunities, and accelerate the attainment of prescribed fire qualifications and expertise.
3	<b>Establish a Certified Prescribed Burn Manager Program.</b> This program would include training on all relevant aspects of prescribed fire in Washington.
4	<b>Review state agency-prescribed burn programs</b> and fund development of DNR and WDFW prescribed fire programs. Fund expansion of DNR and WDFW prescribed fire participation with the USDA Forest Service and other partners.
5	<b>Work with agency partners, stakeholders, and air quality regulators</b> to implement recommendations from the Forest Resiliency Burning Pilot Project Report (2018) to adjust burning regulations to improve the ability to implement prescribed burning.
6	<b>Advance prescribed burning projects</b> in western Washington to restore native prairie, oak, and other habitat types.



**PRESCRIBED FIRE IS AS AN IMPORTANT TOOL TO IMPROVE LANDSCAPE RESILIENCE, ESPECIALLY IN FIRE-PRONE FORESTS AND ECOSYSTEMS.**




## Landscape Resilience in Western Washington

Scientists have helped establish a baseline for understanding historic landscape conditions that sustained native biodiversity and aquatic functions and were resilient to a range of disturbances and climatic fluctuations in western Washington. This data is critical to defining the need for potential forest health treatments.

Currently, western Washington forests are significantly departed from historic conditions. Landscape-scale analyses show there is an overabundance of middle-age forest, many of which lack species diversity historically present on the landscape. The analyses also showed that across western Washington there are low levels of both mature forest conditions and complex young, or early seral, forest types (Donato, Halofsky, and Reilley 2019). This is the result of past management activities and changes in historic cycles of disturbance, including large wildfires that burned intermittently in western Washington.

Climate change is increasing vulnerabilities to western Washington forest health and resilience. This is expected to shift fire frequencies and increase risk of drought, and insect and pathogen outbreaks. Actions taken today can prepare western Washington landscapes for the effects of climate change, but will require new partnerships and approaches. Landownership and management goals are diverse across western Washington, and with a growing human population placing increasing demands on forestlands and forest resources, partnerships with private landowners, public land resource managers, tribes, stakeholders, and other agencies will be essential to preserving wildlands and working forests. The goals and priority actions in this section seek to identify common goals that meet landowner objectives and foster landscape resilience in western Washington.

 <b>PRIORITY ACTIONS FOR WESTERN WASHINGTON</b>	
<b>1</b>	<b>Work internally across DNR divisions</b> , with the Forest Health Advisory Committee, the Timber, Fish, and Wildlife Policy Committee, and other partners to lay the scientific, social, cultural, and economic framework for an all-lands forest health and resilience vision and approach for western Washington forestlands, building off of existing plans and strategies.
<b>2</b>	<b>Increase understanding</b> of current and future fire regimes and risks to communities and infrastructure in western Washington to inform management and planning.
<b>3</b>	<b>Work with the USDA Forest Service and forest collaboratives</b> to accelerate planning and implementation of five-year work plans and priority landscapes identified in this action plan. Implement activities that accelerate the development of mature forest characteristics, create high-quality young, or early seral, forest habitat, and increase drought resilience and watershed health.
<b>4</b>	<b>Within priority landscapes identified in this action plan</b> , work with partners to identify locally appropriate forest health and resilience activities and desired outcomes. Prioritize use of relevant DNR programs and tools, such as the Building Forest Partnerships and All-Lands Forest Restoration grant programs, to improve forest health and resilience in priority landscapes.
<b>5</b>	<b>Work with the Mt. Baker-Snoqualmie National Forest to achieve</b> the goals and address the performance gaps identified in their 2016 Restoration Memo (see Appendix), including the development of a landscape restoration strategy to restore, maintain, and develop resilient conditions.



## Priority Landscapes for Western Washington

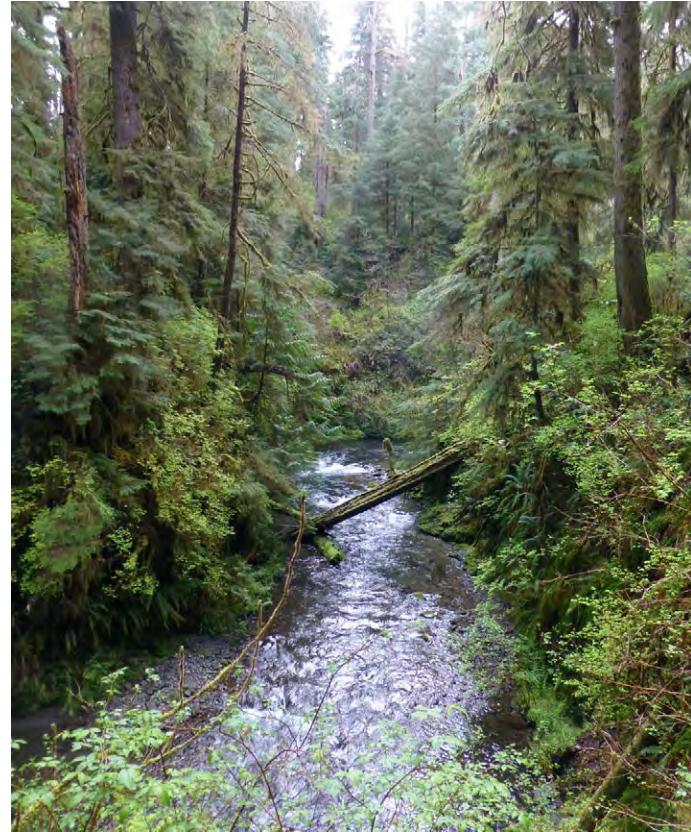
Scientists and natural resource practitioners from DNR, University of Washington, USDA Forest Service, Washington Department of Fish and Wildlife, Natural Resource Conservation Service, and U.S. Fish and Wildlife Service worked together to develop a methodology to use existing spatial datasets to map and inform a landscape prioritization process. The map provided the foundation for discussions internally at DNR and with external partners to identify priority landscapes for coordinated planning, active management, and focused investments. Focusing agency investments and collaboration in these priority landscapes will lead to increased forest health and landscape resilience in western Washington (see Appendix C for a full description of the methodology and data sets).

These priority landscapes provide a geographic focus of DNR's Shared Stewardship Investment Strategy for landscape resilience in western Washington over the life of this Forest Action Plan. Priority actions in these watersheds use existing resources and programs at DNR, such as the Good Neighbor Authority, to accelerate outcomes on federal lands; the Forest Stewardship Program, which provides assistance to non-industrial private forestland owners; and DNR's Urban and Community Forestry Program, which supports local governments and municipalities.

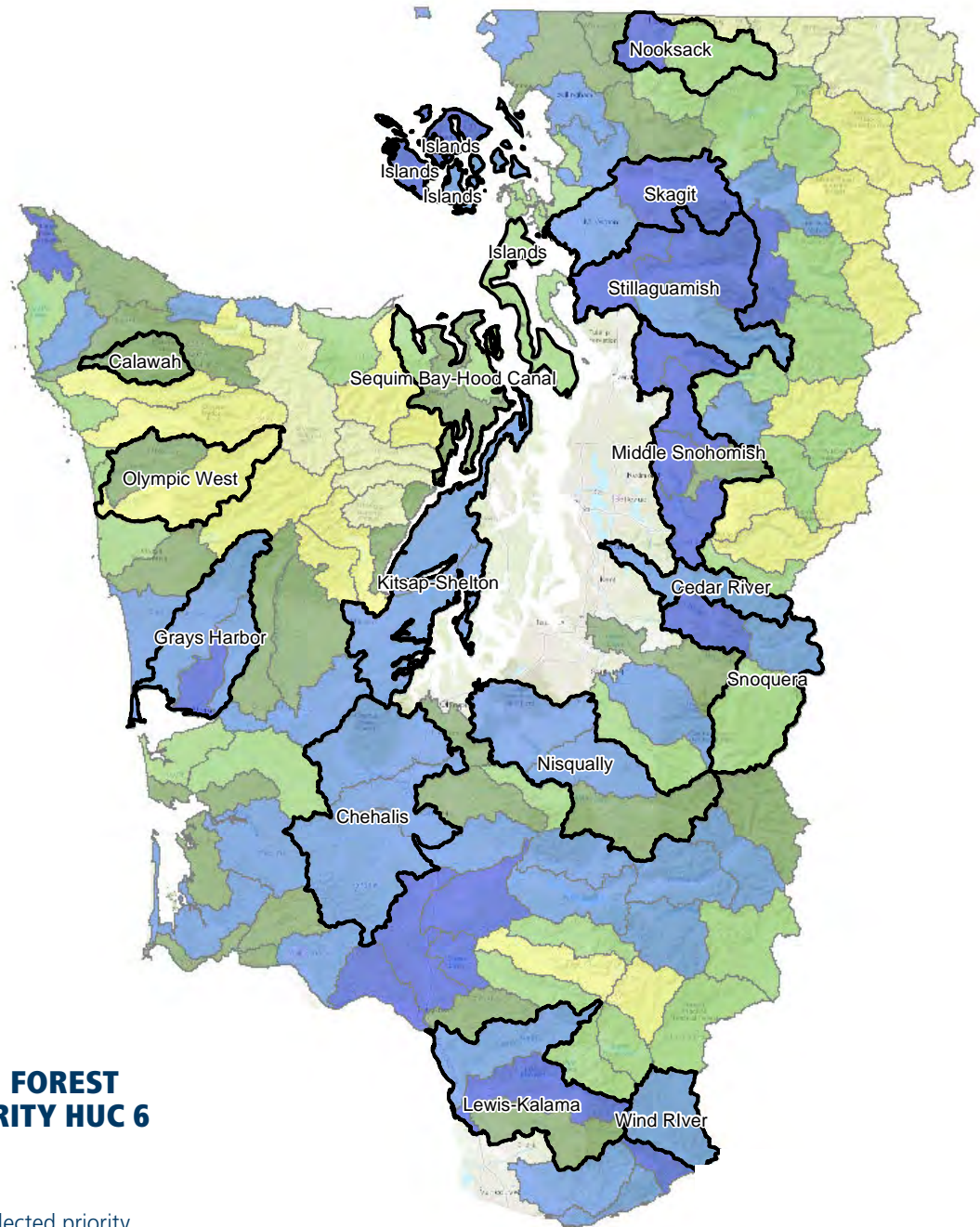
### FOREST ACTION PLAN WATERSHED PRIORITIZATION MAPPING PROCESS

Where will active management, coordinated planning and implementation, and focused investments lead to improved conditions?

Forest Health & Resilience Indicators **+** Values at Risk **=** Priority Planning Areas

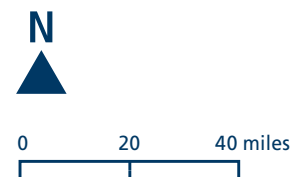
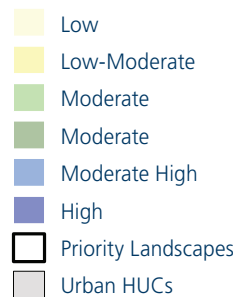


**FOCUSING AGENCY  
INVESTMENTS AND  
COLLABORATION  
IN THESE PRIORITY  
LANDSCAPES WILL  
LEAD TO INCREASED  
FOREST HEALTH  
AND LANDSCAPE  
RESILIENCE  
IN WESTERN  
WASHINGTON.**



### WESTERN WASHINGTON FOREST HEALTH PRIORITY HUC 6 WATERSHEDS

DNR and partners selected priority landscapes to focus implementation of Shared Stewardship Investment Strategy and forest health and resilience work in western Washington. The selection was based on an analysis of 12 different data layers, such as fish and wildlife, drinking water, climate change, and timber production. Each of these priority landscapes face a unique set of threats and challenges that will require collaboration and coordination among partners. For a full description of the methodological approach and data sets used in the western Washington Landscape Resilience effort please see the Appendix.





## Strengthening the Role of Community-Based and Collaborative Partners In An Era of Shared Stewardship

The Forest Action Plan seeks to foster deeper engagement and partnerships between state and federal land management agencies and community-based and collaborative organizations in the implementation of the Shared Stewardship Investment Strategy. DNR will work to conduct the following in line with that goal:

**Clarify Terms:** Align language used by federal and state agencies and create venues to engage partners and share information.

**Improve Transparency:** Establish decision-making processes with clear decision space and instructions for how partners can participate.

**Dedicate Capacity:** Dedicate coordinators to serve as “boundary spanners” who serve as a liaison to partners and coordinate work across agencies and land ownership boundaries.

**Clarify the Role for Community-Based and Collaborative Groups:** Provide opportunities for engagement and share updates and information about planning and implementation.

**Ask What Partners Can Offer:** Leverage the knowledge, outreach capacity, and funding of partners to accomplish shared goals.

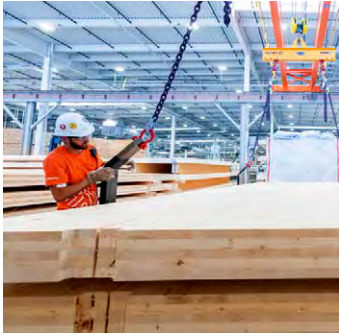
**Build on the Success of Collaboration:** Continue to work collaboratively with a diverse range of partners and integrate local priorities into statewide action plans.

**Measure Outcomes:** Establish metrics to evaluate outcomes, institutionalize partnership-oriented approaches to natural resource management, and be accountable for the goals of shared stewardship.

Reference: [Rural Voices for Conservation Coalition \(2020\)](#).

The recommendations embody many of the core tenets of Washington's Shared Stewardship MOU and have been put into practice through the planning process and development of this action plan. Collaborative and community-based partners contributed to success stories highlighted in this report, informed the development of priority actions, and contributed to identifying priority landscapes and integrating local priorities into the landscape resilience assessment. These partners, among others, will continue to play a critical role as DNR works to implement this action plan.





▲ Cross-laminated timber products, like the panels shown above, are part of an emerging mass timber industry in which smaller diameter trees — long considered less merchantable — are made into construction materials for high-rise buildings. This industry has the potential to support local, rural timber economies while providing innovative building materials that could help address the affordable housing crisis.

## Landscape Resilience at the Regional Scale

Threats facing Washington forests, including drought and wildfire, require us to look beyond our state's border and to coordinate with regional partners. Existing regional agreements and efforts recognize this need and provide a venue for DNR to contribute to and benefit from coordination with partners across state and provincial lines.

Examples of these opportunities include:

**Pacific Coast Forest Memorandum of Understanding (MOU)**: Signed by Washington Commissioner of Public Lands Hilary Franz, leaders from British Columbia, Washington, Oregon, and California pledged to share and explore information regarding forest management under changing climate conditions, including:

1. Fuel management methods.
2. Climate-informed reforestation.
3. Accounting for changes in forest carbon.
4. Science and data collection regarding how forests are responding to changes in climatic conditions.
5. Utilization of harvested wood products.
6. Reducing conversion of forestland and promoting carbon-rich, climate-resilient forests.
7. Investments in natural and working lands that increase carbon sequestration, enhance forest resilience, encourage multi-benefit forest uses, and support natural resource-dependent communities.

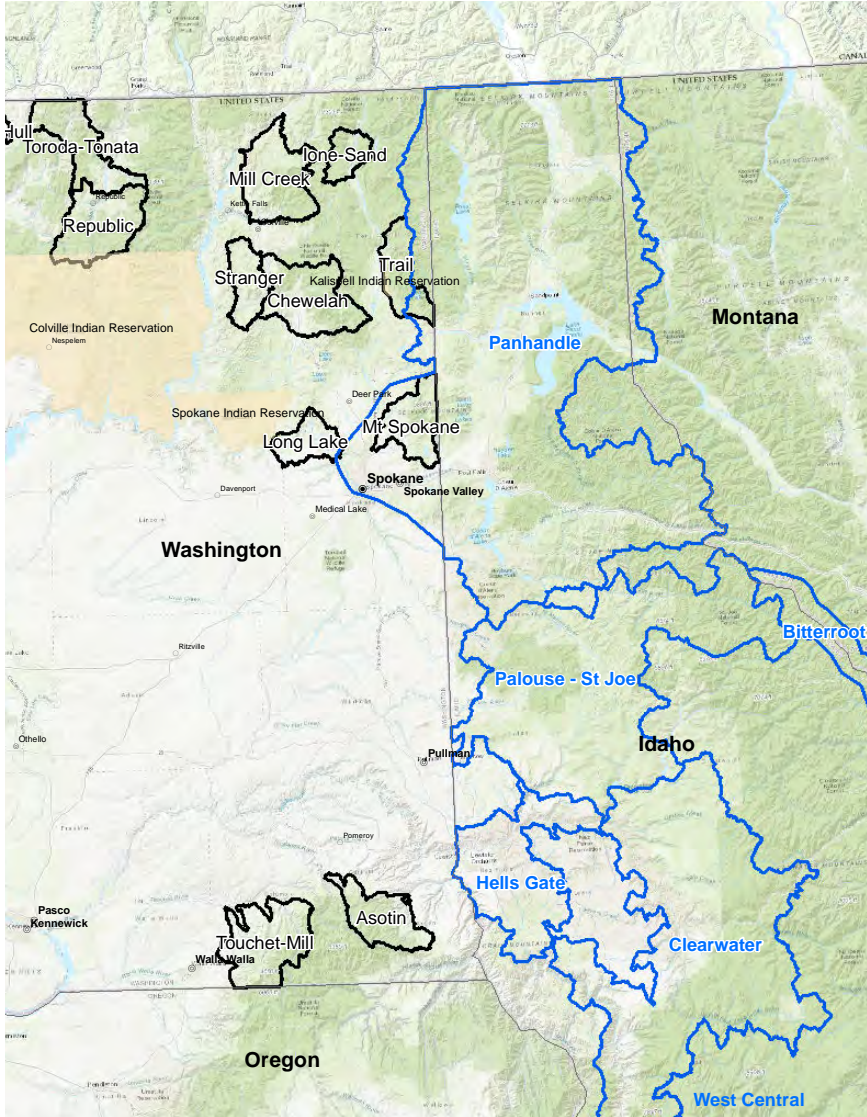
DNR programs will contribute to and benefit from this ongoing information exchange to inform implementation of strategies in this plan.

**Council of Western State Foresters**: A nonpartisan, nonprofit membership organization composed of state, territorial, and commonwealth foresters whose role is to protect, conserve, and enhance Western and Pacific Island forests. DNR will continue engagement in this organization with its state forester as lead and relevant program-level staff on specific issues being addressed by the council workgroups.

**Cascadia Partner Forum**: Established in 2012, the forum fosters a network of natural resource practitioners from Washington and British Columbia working with partner entities to build the adaptive capacity of the landscape and species living within it. Through development of a regional climate adaptation strategy, a spatial tool is being created to inform resilience planning and facilitate regional-scale monitoring. DNR program staff participate in the forum to inform planning, co-develop applied science on priority issues in this Forest Action Plan, and use the spatial tool to monitor progress toward specific goals of this plan.

**Cascades to Coast Landscape Collaborative**: A diverse group of partners that seek to create landscapes and ecosystems that represent commonly held community values, use the best available science and knowledge, with a goal for a connected, resilient region spanning Oregon and Washington for years to come. DNR participates in this collaborative to implement and monitor progress toward goals in this Forest Action Plan in southwest and coastal Washington.

Additionally, neighboring states are identifying priority landscapes through their Forest Action Plans that align with DNR strategies. Strengthening coordination of relevant forest health and wildfire activities with Idaho, Oregon, and California is an important opportunity to accelerate implementation and for the states to invest in science and monitoring activities that answer and track relevant forest health and wildfire questions that span the entire region. The priority areas identified in this section will serve as the focus for multi-state priority landscapes, and serve as venues through which to coordinate shared investments in science and monitoring between states.



**FIREFIGHTER DOING PRESCRIBED BURNING**



**UMATILLA NATIONAL FOREST IN THE BLUE MOUNTAINS OF NE OREGON AND SE WASHINGTON**

## Washington-Idaho Priority Landscapes

The Idaho Department of Lands State Forest Action Plan identifies priority landscape areas that align with priority landscapes identified in Washington's 20-Year Forest Health Strategic Plan and this action plan. Priority actions focus on coordinated planning with the Forest Service, Natural Resource Conservation Service, and non-industrial private forestland owners to conduct forest health treatments. Activities seek to address the goals and strategies in these priority areas and will be a focus of state and federal grant program applications.



## Washington-Oregon Priority Landscapes

The Oregon Department of Forestry is planning to develop a 20-Year Forest Health and Wildfire Plan, as described in the Oregon State Forest Action Plan. Priority landscapes in the Blue Mountains of Southeast Washington are anticipated to align with Washington's 20-Year Forest Health Strategic Plan priority areas of Asotin and Touchet-Mill. These planning areas cover the northern portions of the Umatilla National Forest, which spans the Oregon-Washington border. Landscape evaluations have determined that up to 40 percent of the Asotin and Touchet-Mill priority areas require forest health treatments to create a more resilient landscape condition. Treatments are anticipated primarily on Forest Service lands and non-industrial private forestlands.

## Integrating Tribal Sovereignty, Interests, Culture, and Values

Tribes maintain deep spiritual and cultural connections to forested landscapes and play a critical role in addressing the threats facing forest ecosystems today. Threats facing forests pose risks to traditional values, culture, and the way of life of many tribes. These effects are especially pronounced on first foods and medicines — salmon and other aquatic species, wild stock, and plants — as well as a host of economic, cultural, and spiritual ties to the land. The first people of Washington hold traditional knowledge and provide crucial scientific and cultural perspectives that support, enhance and sustain cooperative natural resource management. It is DNR's intention to strengthen government-to-government relationships with tribal partners by implementing several key strategies such as:

- Develop strategic partnerships and leverage funding to support planning and implementation of projects that are important to tribal sovereigns. These include projects that may benefit or affect tribal resources on all forested landscapes.
- Promote government-to-government relationships between tribes and the agency.
- Support and initiate activities that increase the capacity of tribal governments to respond to extreme events such as wildfires. Implement practices they deem critical to the protection of resources.
- Invest in meaningful engagement with tribes through relationship building that integrates and respects tribal values and tribal sovereignty.
- Respect tribal traditional knowledge to deepen understanding of place and the threats facing forest ecosystems. Integrate seventh-generation thinking into resource assessments and priority actions.
- Refer to existing tribal sovereign resource plans and analyses.
- Apply indigenous knowledge and approaches to promote climate adaptation and landscape resilience.



NATURAL  
RESOURCES  
TRIBAL SUMMIT

PHOTO BY LUIS PRADO / DNR



## Community Wildfire Preparedness and Wildfire Suppression

Western states, including Washington, have experienced devastating wildfire seasons in recent years. Record numbers of wildfires, acres burned, suppression costs, and associated loss of life, homes, and infrastructure are resulting in tremendous suffering and billions of dollars in direct costs and damages. Damage to fish and wildlife habitat, working forests, and other natural and cultural resources, including agriculture and tourism, affect quality of life in the state and put some of Washington's greatest assets at risk.

In 2014 and 2015 Washington's back-to-back severe wildfire seasons catalyzed the development of long-term strategic plans and state investments to address the forest health and wildfire crisis in the state. The Wildland Fire Protection 10-Year Strategic Plan in particular represents a fundamental shift in the nature of the state's response to and relationship with fire — setting the stage for resilient landscapes, fire-adapted communities, and safe, effective wildfire response. The plan is rooted in the National Cohesive Wildland Fire Management Strategy, and outlines priority actions related to wildfire prevention, reducing human-caused ignitions, and post-fire recovery.
















Pateros High School student Ruby Germaine's logo was chosen for the 2018 North Central Washington Community Success Summit in 2018, an event focused on community resilience, including to wildfire. Like most of her classmates, Germaine and her family were affected by the 2014 wildfire season.

PHOTO COURTESY OF ANDREW PHAY



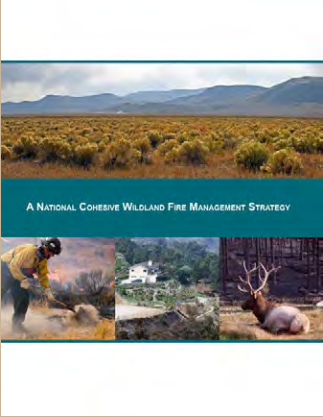
**THE WILDLAND  
FIRE PROTECTION  
10-YEAR STRATEGIC  
PLAN REPRESENTS A  
FUNDAMENTAL SHIFT IN  
THE NATURE OF THE  
STATE'S RESPONSE TO  
AND RELATIONSHIP  
WITH FIRE.**



	<b>PRIORITY ACTIONS FOR WILDFIRE</b>	<b>Referenced Strategies</b>
	<b>WILDFIRE GOAL 1</b> Reduce risk of wildfire to lives, communities, property, ecosystems, and working forests and ensure wildfire suppression response is safe and effective.	   FHSP Goal 2    DNR C4    WF Goal 4
<b>1</b>	<b>Conduct cross-boundary "pre-fire response" analysis</b> and planning, including evacuation planning..	 WF 10.1
<b>2</b>	<b>Increase use of prescribed fire and mechanical fuels treatments</b> , targeting high-risk wildland-urban interface areas and associated access roads and highways to increase firefighter and public safety and protect communities in line with House Bill 1784.	   DNR C4.3    PCR    FHSP 2.3
<b>3</b>	<b>Increase funding for wildfire prevention</b> , preparedness, and response, including funding to reduce human-caused fires and acquire necessary firefighting equipment.	 PCR
<b>4</b>	<b>Enhance and sustain a wildfire workforce</b> to support increased fire response. Increase the permanent wildland fire workforce to complement and supplement the existing volunteer-based model.	 PCR
<b>5</b>	<b>Improve retention of entry-level firefighters</b> ; enhance seasonal capacity; establish two additional hand crews; encourage development and basing of private vendor hand crews and engines; and strengthen partnerships with the Washington State Department of Corrections and other state agencies that can provide trained fire personnel.	 PCR
<b>6</b>	<b>Support interagency initiatives</b> to provide succession planning for Incident Management Teams and overhead positions identified as "critical shortage" positions. Standardize training, qualifications, and certifications across local and state agencies and response organizations.	 PCR
<b>7</b>	<b>Partner with DNR regions and conservation districts</b> to develop western Washington wildfire risk assessment maps that better integrate wildfire management expertise and can be used to inform hazard mitigation planning and community preparedness efforts.	 WF 5.5

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.



STRATEGIES



**NATIONAL COHESIVE WILDLAND FIRE MANAGEMENT STRATEGY**

The cohesive strategy explores four challenges facing wildland fire managers: managing vegetation and fuels; protecting homes, communities, and other values at risk; managing human-caused ignitions; and effectively and efficiently responding to wildfire. The strategy was released in April 2014 and has served as an overarching framework to guide wildland fire management and risk reduction strategies across the United States, for example as the State of Washington developed the Wildland Fire Protection 10-Year Strategic Plan. The goals and purpose of the cohesive strategy align with Washington’s holistic approach to fire management and the priority actions identified in this Forest Action Plan.



	<b>PRIORITY ACTIONS FOR WILDFIRE</b>	<b>Referenced Strategies</b>
	<b>WILDFIRE GOAL 2</b> Communities are prepared and adapted for wildfire.	 WF Goal 3
<b>1</b>	<b>Work with partners such as conservation districts</b> to engage and educate the public on the risk of living in the wildland-urban interface; and enhance, expand, and align education programs, messaging, and regulations.	  DNR C4.5    WF 7.3
<b>2</b>	<b>Support Firewise USA®, Washington Fire Adapted Communities Learning Network,</b> and other community-level organizations to build capacity to coordinate and implement defensible space and pre-fire planning.	    PCR    DNR C4.2    FHSP 2.1    WF 6.3
<b>3</b>	<b>Support the development and integration</b> of Community Wildfire Protection Plans (CWPP) with state and federal resources and priorities.	 FHSP 2.2
<b>4</b>	<b>Fully fund and integrate the work</b> of a coordinator position to facilitate community assistance programs, coordinate with and support partner efforts in community preparedness, and enhance engagement with limited English proficiency communities.	  PCR    WF 6.2
<b>5</b>	<b>Reduce human-caused wildfire ignitions</b> and address increasing wildfire risk in the wildland-urban interface.	  PCR    WF S.7
	<b>WILDFIRE GOAL 3</b> Washington's wildfire preparedness, response, and recovery systems are fully capable, integrated, and sustainable.	 WF Goal 1
<b>1</b>	<b>Establish effective fire suppression protection</b> for all lands, including forestlands not currently protected in the state.	 WF S.9
<b>2</b>	<b>Address under-protected lands by exploring opportunities</b> to consolidate or regionalize fire services in eastern Washington, supporting the establishment of Rangeland Fire Protection Associations (RFPAs) and annexation/creation of new fire districts as options.	  WF 9.1, 9.2 PCR
<b>3</b>	<b>Establish a Wildland Fire Risk Management, Mitigation, and Protection</b> Planning program at DNR.	  WF 2.3 PCR

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.



	<b>PRIORITY ACTIONS FOR WILDFIRE</b>	<b>Referenced Strategies</b>
	<b>WILDFIRE GOAL 4</b> Develop post-wildfire recovery and restoration strategies. Assess high-risk burned areas for risks to public safety and adverse impacts to public resources.	 PCR  SWAP  WF 6.8
<p>1</p>	<b>Work with the Federal Emergency Management Agency (FEMA)</b> and the Emergency Management Division to develop a statewide post-fire resilience and recovery plan.	 WF 8.1  PCR
<p>2</p>	<b>Monitor to identify post-fire events</b> where the fire was beneficial to forest health and resilience goals, versus where it harmed values at risk. Follow with communications that interpret and explain the findings to enhance public understanding.	 PCR
<p>3</p>	<b>Establish interagency state and private lands Burned Area Emergency Response (BAER) team(s)</b> to assess non-federal lands post-fire. Fund and implement post-fire forest restoration on state and private lands to improve ecological recovery and reduce sediment transport to streams.	 WF 8.3  PCR
<p>4</p>	<b>Develop tools to identify and prioritize</b> post-fire recovery strategies and activities for areas with disproportionate environmental health risks.	 PCR
<p>5</p>	<b>Explore opportunities to use post-fire landscapes</b> to support goals within the Wildland Fire Protection 10-Year Strategic Plan and 20-Year Forest Health Strategic Plan and contribution toward maintaining fire-adapted ecosystems.	 PCR
<p>6</p>	<b>Work with the Washington State Conservation Commission, Washington Fire Adapted Communities (WAFAC) Learning Network,</b> and other partners to establish a post-fire technical assistance program, housed within the DNR Forest Health and Resiliency Division, to support communities' long-term recovery efforts.	
<p>7</p>	<b>Increase public awareness of risks post-wildland fire</b> and facilitate access to resources to mitigate those risks.	 WF 8.2

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.



## How Will Climate Change Affect Wildfire Management In Washington State?

Climate change is increasing wildfire risk across the state, including western Washington, which historically experienced infrequent fires. In the last decade, the state has seen a dramatic increase in the amount of uncharacteristic wildfires, sometimes referred to as mega-fires, which are more severe than what naturally occurred in fire-prone forests. While a multi-agency scientific analysis found that less acreage is burning compared with historic events, the severity of contemporary fires is increasing (Haugo et al. 2019). The growing wildland-urban interface is putting more people, homes, and infrastructure at risk, and resulting in increasing costs of fire suppression and more risks to firefighters. Human-caused wildfires now make up 70 percent of all fire starts in the state, and the capacity to respond to fires during the season's peak is putting a strain on firefighting capacity.

“More people are moving to areas adjacent to wildlands, resulting in more communities, homes, and values at risk. Washington state has over 7,400 square miles of wildland-urban interface — a land area almost the size of New Jersey. Approximately 1.4 million homes have been built in this area, each with an average lot size of 0.9 acre. The potential for continued development of the wildland-urban interface is significant; approximately 71 percent of Washington state's private forestland within 0.3 miles of public forestland has yet to be developed.”

**WASHINGTON STATE  
WILDLAND FIRE PROTECTION  
10-YEAR STRATEGIC PLAN**

Expansion of the wildland-urban interface, often referred to as the WUI, increases wildfire suppression costs; puts more lives, property, and infrastructure at risk; and results in the loss and degradation of wildlife habitat, which once lost may never regain functionality. A number of strategic plans — from the National Cohesive Wildland Fire Management Strategy to DNR's Wildland Fire Protection 10-Year Strategic Plan and its 20-Year Forest Health Strategic Plan — provide guidance to reduce risk within the WUI. The next section highlights priority actions to stem the loss of forestlands, a complementary, but distinct set of strategies to wildfire community preparedness.

PHOTO (TOP TO BOTTOM): DON SEABROOK; WENATCHEE WORLD; KARI GREER / USFS; JAKE KNAPP





PHOTO BY KARI GREER / USFS

STRATEGIES



## Keeping Forests as Forests: Risk of Conversion to Non-Forest Uses

Forest conversion, or loss of forests, not only increases the costs and risks of fire suppression, but also results in loss of wildlife habitat, affects water quality, and reduces the forestland base that is necessary to support milling infrastructure and forest industry jobs.

Forest fragmentation is primarily caused by parceling large expanses of contiguous forestland, transportation corridors, land development, and other land-use changes such as converting a forest to an agricultural pasture. Reducing the risk of conversion and stemming the loss of forests is a complex and multi-faceted challenge that will require discussions with state and county planners, new partnerships, and the development of new incentive programs or land-use regulations to stem the loss of forests.

The priority actions described below draw from strategic plans referenced throughout this section as well as the [Puget Sound Partnership Land Development and Cover Implementation Strategy \(2018\)](#).

### PUGET SOUND PARTNERSHIP: LAND DEVELOPMENT AND COVER IMPLEMENTATION STRATEGY (2018)

Implementation strategies are designed to help inform Puget Sound recovery in a strategic, targeted and coordinated way across local, state, federal, tribal, and non-governmental partners. The Land Development and Cover Implementation Strategy tackles complex challenges to protecting ecologically important lands from development through three strategies:

**1. Protect and restore ecologically important lands.** The primary purpose of this strategy is to develop regional definitions of, standards for, and metrics on ecologically important lands to assist decision makers throughout Puget Sound to protect and restore ecologically important lands both proactively and opportunistically.

**2. Reduce barriers to infill and redevelopment in Urban Growth Areas.** The primary goal of the strategy is to reduce the barriers to urban living, simplify the permitting process, and promote growth in areas deemed more suitable for development because of their lack of ecological or agricultural possibilities.







**3. Support working lands.** The primary purpose of this strategy is to make progress toward preserving working lands and their ecological function.

	PRIORITY ACTIONS FOR FOREST CONSERVATION	Referenced Strategies
	<b>FOREST CONSERVATION GOAL 1</b> Expand efforts to ensure sustainable food and fiber production by conserving working farms and forests, securing water resources, and protecting high-productivity soils in the face of population growth.	 DNR D1.3
1	<b>Support a collaborative process</b> to prioritize geographic locations to restore or protect ecologically important areas. Support acquisition of unique and important habitats in partnership with other entities including WDFW, State Parks, and others in line with the relevant authorities and processes, such as those described in WDFW's Lands 20/20 report.	 SWAP   LDC 1, 2.1
2	<b>Collaborate with local governments</b> and other partners in priority landscapes to provide incentives to discourage conversion of existing forests to non-forest uses.	 FHSP 2.4, 4.6
3	<b>Work with relevant partners</b> including the Washington Association of Land Trusts and Washington State Association of Counties to expand use of the Forest Legacy Program and ensure Washington continues to be highly competitive for federal funding available to conserve working forests.	
4	<b>Partner with the Washington Association of Land Trusts and Northwest Community Forest Coalition</b> to implement recommendations associated with the community forest legislative budget proviso and economic impacts report. Work with partners to ensure continued competitiveness of federal investments in community forests.	
5	<b>Evaluate existing programs that support</b> acquisition and easement of forestlands. Identify potential gaps and opportunities to strategically align and support conservation of forests at risk of development. Work with counties and municipalities to understand trade-offs and address revenue considerations.	



Working with willing private landowners to use voluntary conservation programs will be critical to stemming the loss of forests. Small forest landowners are an especially important part of the solution. Collectively they own 3.2 million acres of Washington’s privately managed forests. A number of priority actions focused on supporting small forest landowners are included in this section of the report. In recognition of the important role of small forest landowners, additional priority actions are also included in the Working Lands section on page 82.

DNR administers two programs that address forest conversion: the Community Forest and Open Space Conservation Program and the Forest Legacy Program funded through USDA State and Private Forestry. Specific program goals and priority actions are included in the Cooperative Forestry Programs Section.

	<b>PRIORITY ACTIONS FOR FOREST CONSERVATION</b>	<b>Referenced Strategies</b>
	<b>FOREST CONSERVATION GOAL 2 Enhance retention of working forestland held by small forest landowners.</b>	 PCR
1	<b>Expand existing programs that support</b> conservation of working forestland including the Family Forest Fish Passage Program and the Forestry Riparian Easement Program.	
2	<b>Create additional tools as may be suggested</b> by a forthcoming assessment requested by the 2019 Legislature (ESSB 5330).	 PCR
3	<b>Increase the number of landowner assistance forest experts</b> at DNR (particularly in western Washington), conservation districts, and in the Cooperative Forestry Programs Section. Extension to provide on-the-ground support to non-industrial forest owners. Work with WSU Extension and conservation districts to identify capacity needs and support future funding requests to secure necessary resources.	
4	<b>Implement recommendations from the Carbon Sequestration Advisory Group</b> to address ways in which carbon and incentive programs for landowners and harvested wood products can support the retention of working forests.	
5	<b>Partner with the Washington Farm Forestry Association</b> and Northwest Natural Resource Group to conduct outreach and share education and technical information with small forest landowners.	
	<b>FOREST CONSERVATION GOAL 3 Enhance and develop incentives, ensure effective administration of regulations, and foster sharing of information among relevant agencies and partners that protect and restore ecologically important forestlands.</b>	 LDC 2.2, 3.1
1	<b>Increase human and technical capacity of staff</b> for planning, implementation, and enforcement of the Growth Management Act, especially as it relates to potential loss of forests.	 LDC 1.4
2	<b>Work with partners to reduce barriers</b> to infill, incentivize infill to support more high- and medium-density development, and reduce risk of conversion within rural areas outside of Urban Growth Areas.	 LDC

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.



## SUCCESS STORY

### King County Land Conservation Initiative Forest Carbon Program

By Kathleen Farley Wolf,  
King County Department of Natural Resources

The Forest Carbon Program was developed to incentivize protection and enhanced management of forests in King County. It includes an urban program developed under City Forest Credits (CFC), which created a new protocol for conserving urban forests, and a rural program developed under the Verified Carbon Standard (VCS), a well-established international standard for forest carbon projects.

The program produces carbon credits by permanently protecting threatened forests and tree canopy in both urban and rural parts of the county that would otherwise have been used for development or intensive timber harvest. The urban program began selling carbon credits in 2019, while the rural program is in the third-party audit process and will begin selling credits in 2020. Once the project has been validated, the county will work to include private forest landowners in the project, providing a potential opportunity for them to

generate income by increasing carbon stored in their forests. Funds generated through the sale of carbon credits will support acquisition of forestlands that are among the most critical conservation priorities of the region, identified through the collaborative [Land Conservation Initiative](#). In addition to providing climate benefits, protection of these forests provides critical salmon habitat protection, water quality and air quality benefits, and recreational opportunities.

King County 30-Year Forest Plan: King County's 2015 Strategic Climate Action Plan (SCAP) called for a 30-year plan to maintain and enhance the county's forest cover. The purpose of the 30-Year Forest Plan is to develop a shared vision of priorities and goals associated with rural and urban forest cover and forest health in King County to be achieved over the next 30 years. The plan will help ensure that county forests continue to play a role in mitigating the effects of climate change, while also helping to guide the county toward strategies that meet multiple goals. The plan will be finalized in December 2020.




**...It is the policy of the state to promote the removal of excess carbon from the atmosphere through voluntary and incentive-based sequestration activities in Washington including, but not limited to, on natural and working lands and by recognizing the potential for sequestration in products and product supply chains. It is the policy of the state to prioritize carbon sequestration in amounts necessary to achieve the carbon neutrality goal established in RCW 70.235.020, and at a level consistent with pathways to limit global warming to one and one-half degrees.”**

**[HOUSE BILL 2311](#)**

## The Role of Conservation Finance Tools to Address Forest Loss

Numerous efforts and reports have addressed the role of ecosystem service markets and conservation finance in stemming forest loss. As the effects of climate change become more severe, and human population continues to increase, the need to develop creative tools and mechanisms to conserve forests seems likely to continue to increase. Recent public policies, including the 2019 House Bill 1109 Sec. 308(24) and House Bill 2311, set the stage for DNR-led efforts to create tools and incentives that provide willing landowners with opportunities to maintain forests at risk of development.

The design of any new programs or incentives needs to be based in a rigorous analysis of political realities and feasibility, ability to address conversion risk at a meaningful scale, responsiveness and flexibility to meet landowner objectives, and the ability to work with existing landowner assistance and cost-share programs..

 <b>PRIORITY ACTIONS FOR CONSERVATION FINANCE</b>	
<b>1</b>	<b>Work with the Carbon Sequestration Advisory Group</b> to evaluate the role of carbon storage in harvested wood product pools and product substitution effects.
<b>2</b>	<b>Partner with the Carbon Sequestration Advisory Group</b> and University of Washington (see <a href="#">Senate Bill 5330</a> ) to evaluate conversion risk as it relates to existing carbon stocks and future productivity of forestlands. Based on the results of that analysis, leverage existing DNR tools and programs, such as the Forest Legacy Program, Community Forest and Open Space Conservation Program, and Forest Stewardship Program to prioritize actions with willing landowners that have the potential to protect working lands and long-term sequestration and storage potential of forests.
<b>3</b>	<b>Expand use of the Clean Water State Revolving Loan Fund</b> to pay for acquisition or easement of forestlands in drinking water source areas or other critical water bodies.
<b>4</b>	<b>Explore expansion or creation of additional programs</b> such as conservation tax incentives, forestland mitigation banks, improved forest management carbon offset, avoided conversion carbon funding for acquisition (landowner incentives to increase carbon storage and reduce forest conversion), and the transfer of development rights with interested counties.



## Urban and Community Forest Resilience

Strong and vibrant communities are an important part of our landscapes. They are the center of social, cultural, and economic life. Cities and towns provide diverse types of habitats for wildlife, and they serve as incubators to test new and innovative approaches to green living. The way municipalities design, govern, and manage activities within their boundaries also affect a range of diverse natural resource values — from water and air quality to the social values and public policies that influence the management of surrounding forests.

The priority actions identified in this section of the report focus on building and maintaining the social, cultural, and economic links between communities and forests. The urban and community forest resilience goals and priority actions build on research in this field that demonstrates the important links between access to nature and human health and societal benefits, such as improved mental health and social cohesion (USDA 2018). The priority actions identified below speak to the role of urban centers and towns, as well as the role of forest-based outdoor recreation. This section also builds on the goals and priority actions for DNR’s Urban and Community Forestry Program (see the Cooperative Forestry Programs Section) and integrates key strategies identified in the [Bipartisan Outdoor Recreation Confluence Accord \(BOR\)](#), [Forest Service Framework for Sustainable Recreation](#), and [Washington State Comprehensive Outdoor Recreation Plan \(SCORP\)](#).

Today, recreation is the primary way that Washingtonians experience forests. National forests, national parks, DNR lands, WDFW water access sites and wildlife areas, state parks, and a host of other county and city parks provide residents and visitors access to a range of world-class outdoor activities. DNR’s Recreation Program alone manages over 160 recreation sites, more than 70 campgrounds, and over 1,200 miles of trail statewide. Outdoor recreation also contributes to local economic activity and statewide is estimated to contribute \$26.5 billion to the economy each year (RCO 2020). From hiking to horseback riding, outdoor enthusiasts are connecting with nature, and Washington’s forests, in greater numbers than ever before.

	PRIORITY ACTIONS FOR URBAN & COMMUNITY FOREST RESILIENCE	Referenced Strategies
	<b>URBAN &amp; COMMUNITY FOREST RESILIENCE GOAL 1</b> Promote and enhance the health and resilience of forests in urban centers to be prepared for climate change and help support environmental justice.	
1	<b>Fund and implement the Urban Forestry Restoration Project</b> and focus activities within prioritized communities and watersheds to mitigate risk and restore functioning natural areas.	 PCR
2	<b>Develop urban and community education materials</b> and engagement opportunities, and guide volunteer efforts to assist with climate-informed natural area restoration and maintenance.	 PCR
3	<b>Foster new funding opportunities</b> to support the use of urban forestry and green infrastructure as a workforce development and job creation strategy as well as a critical therapeutic tool for reducing inequity and improving community health and quality of life.	 PCR
4	<b>Hire additional DNR urban forest specialists</b> to provide technical assistance in priority watersheds and support increases in local capacity.	 PCR
5	<b>Support the development and implementation</b> of language access plans for limited English proficiency communities, working with partners and local emergency management organizations.	 PCR  WF 6.2

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.



## State Recreation and Conservation Plan

The Washington State Recreation and Conservation Office provides strategic direction for how local, regional, state, and federal agencies, together with tribal governments, and private and nonprofit partners, can assure the effective and adequate provision of outdoor recreation and conservation to meet the needs of Washington state residents. The 2018-2022 State Recreation and Conservation Plan lays the foundation that will help guide decisions and determine how to invest limited funding in the most important recreation and conservation needs.

“Washington state’s excellent interconnected systems of parks, trails, natural areas, and waterways equitably provide for diverse recreation pursuits while conserving critical landscapes for the benefit of people, plants, and animals that live here. This statewide system is supported by public and private partners and is a driving factor in Washington state’s economic success, human and ecological health, and overall quality of life.” — Vision 2040, Washington State Recreation and Conservation Office

### GOALS AND PRIORITIES FOR OUTDOOR RECREATION AND CONSERVATION

- Sustain and grow the legacy of parks, trails, and conservation lands.
- Improve equity of parks, trails, and conservation lands.
- Get youth outside.
- Plan for culturally relevant parks and trails to meet changing demographics.
- Assert recreation and conservation as a vital public service.

	PRIORITY ACTIONS FOR URBAN & COMMUNITY FOREST RESILIENCE	Referenced Strategies
	<b>URBAN &amp; COMMUNITY FOREST RESILIENCE GOAL 2</b> Work with partners to increase forest-based outdoor recreation opportunities and investments while respecting the land's purpose and cultural uses.	
1	<b>Regularly assess the health of trees and large vegetation</b> in and around areas of heavy use such as campgrounds and trails. Consider climate-resilient vegetation in recreation planning efforts.	
2	<b>Address climate-change related risks</b> posed to DNR recreation infrastructure including potential evacuation due to climate-related storm events and emergency management planning. Enhance public outreach and signage at trailheads and campgrounds to include information regarding wildfire and storm safety.	
3	<b>Strengthen resilience to infrastructure damage</b> through climate-informed design of recreation infrastructure. Assess climate-related risks to DNR’s existing facilities, roads, trails, and other infrastructure. Determine whether infrastructure can remain in place, be hardened, or must be relocated.	
4	<b>Consider recreation-related development</b> on wildlife. Design trails that protect habitat and reduce risk of negative human-wildlife interactions.	
5	<b>Increase access to forest-based outdoor recreation</b> opportunities for people of all backgrounds and abilities.	

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.




## Rural Economic Development

Rural communities are on the front lines of climate change, and their economies are disproportionately affected by changes in natural resource management. Investing in rural communities and the strategies that support the development of 21st century natural resource economies provides multiple public benefits. Rural communities are a central part of solving the forest health and wildfire crisis. The following goals and priority actions represent an important step in strengthening the role of rural communities and supporting economic development.

	<b>PRIORITY ACTIONS FOR RURAL ECONOMIC DEVELOPMENT</b>	<b>Referenced Strategies</b>
	<b>RURAL ECONOMIC DEVELOPMENT</b> Strengthen and build partnerships with federal, state, and local stakeholders and tribes in order to help address community economic development issues.	 DNR B2.2
1	<b>Enhance economic development through implementation of</b> forest restoration and management strategies that maintain and attract private sector investments and employment in rural communities.	 DNR B2.2  FHSP Goal 3
2	<b>Support efforts to secure a reliable timber supply</b> to increase the forest products industry infrastructure to levels required to meet forest health goals.	 DNR C2.1  FHSP Goal 3.1
3	<b>Assess forest management contracting capacity and infrastructure</b> required to meet forest health objectives. Support investments in worker training for forest health treatment and prescribed fire crews.	 FHSP 3.3
4	<b>Optimize the DNR property portfolio</b> to grow revenue from public lands for the trust beneficiaries, communities, and Washington.	 DNR B.1
5	<b>Develop climate-resilient seed management and reforestation approaches.</b> Ensure ongoing diversity of seeds and species collected, stored, and managed by DNR.	 PCR
6	<b>Assess reforestation requirements in current forest practices regulations.</b> Create a pathway for determining any reforestation adjustments in those areas that aren't likely to be commercial forests in the future.	 PCR
7	<b>Support innovation in the forest products industry</b> that increases the use of forest health treatment byproducts such as small-diameter wood, and support development of markets for mass timber, biochar, and biofuels.	 DNR C2.2  FHSP 3.2
8	<b>Implement a local wood marketing campaign</b> to connect urban and rural communities to address forest health issues.	 FHSP 3.4

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.



Increased harvest of unhealthy timber from overstocked forests, as well as innovations in small-diameter wood products, can contribute to rural and state economies.

## Wood Utilization and Emerging Market Opportunities

Forest health treatments often require a host of activities that do not generate revenue — harvesting small-diameter trees, slash and brush removal, pile burning, invasive species treatments, and riparian restoration, among others. Developing markets to reduce costs associated with forest health treatments will accelerate implementation of these critical non-commercial activities and support forest management, restoration, and landscape resilience outcomes.

Entrepreneurs, agencies, academic institutions, and others are piloting and evaluating wood utilization technologies in Washington — wood energy, pellet manufacturing, small-diameter sawmills, wood stove switch-out programs, biofuels, biochar, and mass timber. The Washington State Forest Biomass Coordination Group, along with others, has identified recommendations to accelerate adoption of these technologies:

- Support development of wood energy systems at meaningful and appropriate scales.
- Evaluate the potential for a public-private partnership that could enhance milling capacity to meet forest health and wildfire risk reduction goals in north-central Washington.
- Evaluate the potential to create a tax credit for use of Washington wood in mass timber manufacturing, building projects, and small-scale pellet manufacturing.
- Leverage state and federal funding to support conversion from fuel oil to wood energy in public facilities. Study the potential for a wood energy system at Central Washington University.
- Partner with the state Department of Ecology to expand wood stove switch-out programs that convert inefficient wood stoves to cleaner-burning and low-emission pellet stoves.
- Partner with academic institutions and businesses to support the development of biochar markets including agricultural applications and stormwater filtration. Support demonstration projects that can be scaled commercially and support development of new small businesses in the state.



## Stewardship of Family and Working Forests

Working forests are forests that are actively managed for a diverse suite of values — wildlife habitat, aesthetics, privacy, sustainable timber production, carbon sequestration, and water filtration and flood mitigation. Preserving working forests is critical to maintaining overall ecological function of forested landscapes, and the state's economic, social, and cultural values.

Working forests are largely privately owned and managed and play an important role in the economic vitality of Washington communities. Engaging the timber industry and forestland owners in identifying and addressing barriers to their ability to successfully meet their land management objectives and needs is critical to preserving working lands, and thus maintaining the land base and infrastructure necessary to support forest management in the state.

These issues are arguably more important today than ever in Washington's history. Washington is one of the fastest-growing states in the country, and development pressure in forested areas is high. Climate change, and the anticipated shifts in precipitation patterns, forest productivity, and drought, will make the business of growing and managing trees more difficult and risky in the future.

	PRIORITY ACTIONS FOR WORKING LANDS	Referenced Strategies
	<b>WORKING LANDS GOAL 1</b> Plan and implement coordinated landscape-scale forest restoration and management treatments in a manner that integrates landowner objectives and responsibilities.	 FHSP Goal 4
1	<b>Respect the management responsibilities</b> and trust mandates on federal and state lands. Support sustainable forestry on industrial and private forestland.	 FHSP 4.2
2	<b>Where ecologically appropriate, continue to promote</b> more species that are resilient to drought, disease, and fire by thinning less resilient species and replanting with more resilient species.	 PCR
3	<b>Provide technical assistance, financial resources,</b> and education and outreach in priority landscapes to encourage the adoption of voluntary forest health treatments with willing private landowners.	 FHSP 4.5
4	<b>Work with the Forest Practices Division to address</b> stakeholder concerns associated with riparian buffers, fuels, and wildfire risk in eastern Washington. Establish clear regulatory and scientific basis for potential alternate harvest plans.	
5	<b>Work with landowners and agencies</b> to ensure land management activities align with federal and state laws and regulations (e.g. Endangered Species Act). Increase WDFW capacity to work with landowners to develop management plans that protect species and their habitats and the goals of the landowners.	 SWAP
6	<b>Review landowner access to markets for forest products.</b> Ensure timber-processing infrastructure is capable of processing large-diameter trees for landowners who choose to manage on longer rotations.	

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.



## Role of Conservation Districts

There are 45 conservation districts in Washington, and 33 have identified forest health or wildfire resilience as a priority resource concern in their current long-range plans. Conservation districts serve a critical function: connecting landowners with, and providing technical and financial assistance and support that leads to important outcomes on working forests. Through this action plan, DNR seeks to bolster working relationships and partnerships with conservation districts.

The following conservation districts identified forest health and wildfire resilience as a priority resource concern: Asotin County, Cascadia, Central Klickitat, Clallam, Clark, Columbia, Cowlitz, Eastern Klickitat, Ferry, Grays Harbor, Jefferson County, King, Kittitas, Lewis, Lincoln County, Mason, North Yakima, Okanogan, Pacific, Pend Oreille, Pierce, San Juan Islands, Skagit, Snohomish, South Douglas, Spokane, Stevens County, Thurston, Underwood, Wahkiakum, Walla Walla County, Whatcom, and Whidbey Island.

Conservation district long-range plans can be found at: <https://scc.wa.gov/plans-reports/>



	PRIORITY ACTIONS FOR WORKING LANDS	Referenced Strategies
	<b>WORKING LANDS GOAL 2</b> Explore regulatory and financial incentives to support small forest landowners.	
1	<b>Increase funding for the Forestry Riparian Easement Program, Family Forest Fish Passage Program, and Small Forest Landowner Office</b> to ensure adequate resources and capacity to assist landowners.	
2	<b>Hire additional landowner assistance foresters</b> and train landowner assistance foresters on relevant climate effects and adaptation strategies; coordinate training with other extension forestry services such as WSU Extension and Washington conservation districts.	 PCR
3	<b>Explore opportunities to create</b> alternative harvest prescriptions for non-industrial private landowners that reduce the need for technical assistance.	
4	<b>Explore the development of</b> Safe Harbor Agreements that encourage small forest landowners to take actions that promote forest health and resilience.	
5	<b>Implement recommendations from the Carbon Sequestration Advisory Group</b> to address forest carbon and incentive programs for landowners and harvested wood products. Maintain consistency with the policy of the state, per 2019 legislation House Bill 2528, to “support the contributions of all working forests and the synergistic forest products sector to the state’s climate response” and to “support the participation of working forests in current and future carbon markets, strengthening the state’s role as a valuable contributor to the global carbon response while supporting one of its largest manufacturing sectors.” Develop carbon incentive programs that are well suited to small forest landowners.	
6	<b>Retain and seek to improve</b> the current land use taxation system that encourages long-term forest management. Create tax incentives for inter-generational transfers or transfers to tree farmers that qualify under certain conditions.	



PHOTO BY JEROME CHARAOUI

## Priority Actions for Invasive Species

The Washington Invasive Species Council (WISC) coordinates with 22 partner agencies and organizations to address threats posed by invasive species in the state. Efforts to prevent, manage, or remove invasive species can contribute to many forest health objectives including supporting habitat for salmon and other species. Specific priority actions related to forest health and resilience include:

1. Support WISC and partner efforts to secure financial resources and statutory authority to effectively prevent and manage invasive species, such as English ivy, Himalayan blackberry, and Scotch broom.
2. Work with agencies and organizations to prevent the establishment of new invasive species, such as the emerald ash borer.
3. Investigate and respond to the effects of invasive species as a result of large-scale disturbances of forest ecosystems such as severe storms, wildfires, and drought as they relate to the spread, distribution, and effect of invasive species.
4. Support baseline assessments and enhance citizen science monitoring and data collection through reporting tools such as the Washington Invasives mobile app. Develop a statewide database that includes the distribution of current invasive species in Washington.

Reference: <https://invasivespecies.wa.gov/wp-content/uploads/2019/07/WISCStrategicPlan.pdf>

## Wildlife and Salmon Recovery

“Washington is home to more than 3,100 vascular plant species, 140 mammals, and numerous species of freshwater and marine fish, birds, amphibians, reptiles, mosses, lichens, liverworts, fungi, and invertebrates. Some of these species occur nowhere else on Earth. For example, 86 plant species are unique to Washington. The state also harbors more than 400 at-risk species, including 43 animal species and more than 360 plant species that are listed or considered Endangered, Threatened, or Sensitive under the federal Endangered Species Act, state criteria, or the Washington Natural Heritage Program. These include salmonids, orcas, northern spotted owls, marbled murrelets, lynx, and sage grouse.”

—State Wildlife Action Plan 2015

Conservation and protection of fish and wildlife is a priority identified in the state’s Shared Stewardship Investment Strategy, and a common theme in numerous strategic plans and reports that guide agency action related to forest conservation and management. The Washington Department of Fish and Wildlife (WDFW) identified 268 species of greatest conservation need that are forest-dependent. Priority actions identified in this report seek to support WDFW and partners engaged in efforts to protect and restore habitat, maintain and improve habitat connectivity, and address emerging threats to fish and wildlife posed by climate change. Climate change is anticipated to lead to shifts in species distributions and abundances, increased presence of invasive species, and the emergence of novel ecological communities.

Commissioner of Public Lands Hilary Franz has expressed a strong commitment to protecting Washington’s wildlife, with a focus on salmon recovery as a strategic priority. DNR’s role as a major landowner and statewide leader provide an opportunity to make meaningful contributions to salmon recovery in key watersheds, through targeted use of DNR programs and advocating for new resources and policy solutions. Because DNR’s forest and aquatic lands provide essential habitat for salmon across landscapes, it is essential to ensure plans for Washington’s forests contribute to salmon recovery.










## Pilot Projects for Salmon Recovery

Salmon live in and rely on habitat across our state: from mountain headwaters to forests, cities, and the Puget Sound. Partners in the state must implement a “tree to sea” mindset that works cross-sector and recognizes that it will take everyone — government agencies, tribes, private industry, and community leaders — working together to improve salmon habitat and contribute meaningfully to salmon recovery. The aim of this action plan is to leverage DNR’s relationships and role as the second-largest public landowner in the state to make meaningful contributions to salmon recovery in targeted watersheds. Targeting salmon recovery efforts within key watersheds will lead to more effective, large-scale change. DNR and partners are identifying priority watersheds to pilot this idea. The pilot projects will include reviewing limiting factors for salmon, identifying and mapping the projects that will mitigate or address these factors, building off statewide plans and successes, researching best practices from other regions that have effective approaches, and contributing to a clear vision for salmon recovery in this watershed.

	PRIORITY ACTIONS FOR WILDLIFE AND SALMON RECOVERY	Referenced Strategies
	<b>WILDLIFE &amp; SALMON RECOVERY GOAL 1</b> Restore and protect ecosystem health to support fish and wildlife habitat and biodiversity.	
1	<b>Develop incentives to encourage</b> voluntary actions to protect forest ecosystems that provide rare or high-quality habitat. Secure full funding to implement shovel-ready projects identified through opportunities like the Family Forest Fish Passage Program.	
2	<b>Significantly increase state and federal investments</b> in restoration and acquisition of habitat in areas where Chinook stocks most benefit Southern Resident Orcas.	
3	<b>Implement the Statewide Strategy to Recover Salmon</b> to keep salmon from becoming extinct in Washington. Focus on the four main areas of recovery emphasis — habitat, harvest, hatcheries, and hydropower — while focusing on those most within DNR’s authority, which is largely habitat. Appropriately integrate and support the coordination of salmon recovery goals at the federal, state, regional, and watershed levels.	
4	<b>Seek to maintain, restore, and conserve</b> habitat connectivity in Washington state and bordering areas. Addressing fragmentation and habitat linkages based on the landscape-scale patterns identified in the Washington Connected Landscapes Project analyses and supported through continued ongoing regional planning efforts such as the Cascades to Coast Landscape Collaborative (HAB).	
5	<b>Adopt and implement policies, incentives,</b> and regulations for future growth and development to prevent further degradation of critical forest habitat and sensitive ecosystems; enable and channel human population growth in ways that result in net ecological gain; evaluate and report outcomes for all jurisdictions at the state, county, tribal, and municipal level.	
6	<b>Use innovative tools</b> such as the Good Neighbor Authority to generate revenue through forestry management and invest in habitat recovery projects on federal lands, in partnership with the Forest Service.	
7	<b>Improve interagency and partner collaboration</b> around project planning for fish and wildlife and habitat restoration.	



	<b>PRIORITY ACTIONS FOR WILDLIFE AND SALMON RECOVERY</b>	<b>Referenced Strategies</b>
	<b>WILDLIFE &amp; SALMON RECOVERY GOAL 2</b> Enhance climate resilience for the state's plants, animals, and ecosystems, prioritizing immediate action and assessments on public forestlands.	
1	<b>Partner with WDFW, State Parks, and others</b> to assess vulnerability and enhance monitoring of DNR natural areas. Fund and complete management plans for DNR Natural Areas to provide guidance for long-term management actions including consideration of potential climate change effects.	  PCR NAT
2	<b>For potential new protected lands</b> , such as natural areas, explicitly consider the potential effects of climate change in identifying acquisition targets and the sustainability of the site.	  PCR NAT
3	<b>Provide core funding for Natural Heritage Program staff</b> to plan and implement species and ecosystem inventory efforts. Partner with WDFW and others to complete Climate Change Vulnerability Index evaluations for rare species and ecosystems to determine risks to key species and habitats.	 NAT
4	<b>Promote climate-suitable strategies</b> for at-risk species, with a focus on public forests. For example, thin low-quality or non-habitat areas for northern spotted owls to accelerate the development of older forests, where consistent with other objectives.	 PCR
5	<b>Engage in regional climate resilience planning efforts</b> to inform and complement implementation of DNR programs.	

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.

PHOTO BY ROBERT PITTMAN / NOAA



## Governor Inslee's Southern Resident Orca Task Force (2019)

In March of 2018, Gov. Jay Inslee signed Executive Order 18-02, establishing the Southern Resident Orca Task Force to address the threats facing local orca populations in the Puget Sound. The task force published a set of 36 recommendations in 2018, and then an updated report made additional recommendations in November 2019.

There are four overarching goals:

- 1 Increase Chinook abundance.
- 2 Decrease disturbance and risk to Southern Resident Orcas from vessels and noise and increase their access to prey.
- 3 Reduce the exposure of Southern Resident Orcas and their prey to contaminants.
- 4 Ensure that funding, information, and accountability mechanisms are in place to support effective implementation.

Relevant strategies that can be influenced and supported by DNR and its partners are integrated into the priority actions focused on Wildlife and Salmon Recovery.



	<b>PRIORITY ACTIONS FOR WILDLIFE AND SALMON RECOVERY</b>	<b>Referenced Strategies</b>
	<b>WILDLIFE &amp; SALMON RECOVERY GOAL 3</b> Assesses species and landscape conservation needs using species recovery and management plans, habitat conservation plans, biodiversity conservation frameworks, habitat connectivity analyses, and other data.	
<b>1</b>	<b>Develop a DNR salmon strategy to identify</b> specific activities and actions DNR will take to support statewide salmon recovery efforts and identify high-priority watersheds for DNR-focused recovery efforts.	
<b>2</b>	<b>Partner with WDFW and others to secure funding</b> and implement a statewide inventory of rare species and ecosystems. Support WDFW’s work to update and maintain the Species of Concern on the Washington state list of Endangered, Threatened, or Sensitive species.	
<b>3</b>	<b>Work with WDFW to ensure adequate support,</b> decision-support tools, funding, and integration of direct conservation actions related to forest management including law enforcement, habitat assessments, and conservation education.	
<b>4</b>	<b>Support research on and monitoring of the forest conditions</b> that will support northern spotted owls and remain resilient in a changing climate, in collaboration with tribal governments and federal, state, local, and academic partners.	

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.

## Investing in Salmon Habitat and Washington’s Infrastructure

A host of factors have contributed to reduced salmon populations in Washington. Changing ocean conditions and overfishing, floods and drought, development of land and water resources, urbanization, water diversion and hydropower, diminished water quality (pollutants, temperature changes), and hatchery practices. Increasingly, warmer and drier summers and more intense wildfires effect hydrologic and aquatic systems. More severe and frequent wildfires also increase sediment loads in streams due to erosion and surface runoff, burying spawning habitat.

One of the most effective ways to increase salmon production in

freshwater systems is through the removal of fish passage barriers. Removing barriers, such as inadequate culverts beneath roads or ineffective fish ladders, allows salmon to return to historic spawning grounds. These projects also improve climate resilience of road- and water-related infrastructure, a critical investment as the state anticipates more severe weather and storm events as a result of climate change.

Since 2001, private landowners and state forestland managers have removed more than 7,400 fish passage barriers, opening more than 5,000 miles of fish habitat. The Family Forest Fish Passage

Program, administered jointly by several natural resource agencies, has removed or addressed more than 400 barriers, opening over 1,000 miles of habitat in small non-industrial private forests. DNR has addressed barriers on 97 percent of culverts on state lands, providing strong leadership in investing in high-quality habitat. Despite these impressive accomplishments of private landowners, DNR the Forest Service, State Parks, WDFW, and others, more work is still to be done. It is estimated there are approximately 20,000 barriers to salmon and steelhead remaining in the state across forests and other lands (State of Salmon in Watersheds 2018).



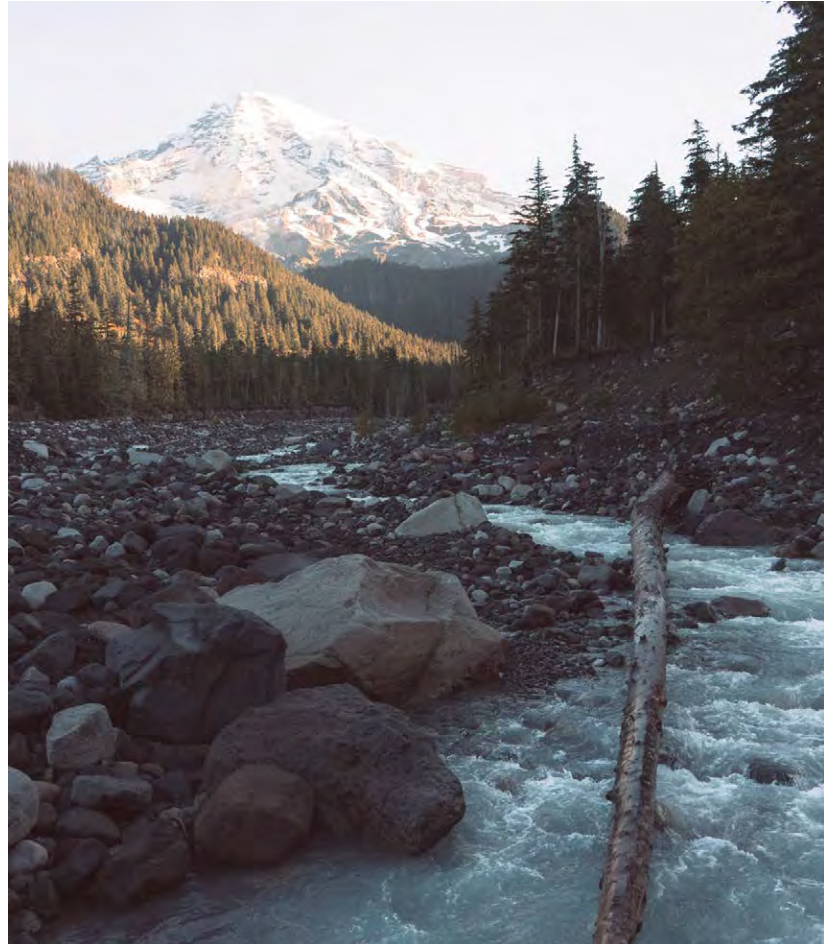
## Water Quality and Quantity

Water is one of the most important resources on the planet. Forests naturally filter water and regulate flow, supporting municipalities, farms, and fish and wildlife. Forest management, including the building of forest roads and changes in vegetation cover, have the potential to affect hydrologic and aquatic systems. Management and conservation efforts focused on increasing the pace of aquatic restoration are critical to addressing threats posed by climate change and drought, and ensuring forests continue to provide clean water.

There is a long history of collaboration and partnerships in Washington focused on maintaining and improving roads to protect fish habitat and water quality. The Road Maintenance and Abandonment Plan (RMAP), a result of the 1999 Salmon Recovery Act, requires state and private forest landowners to inventory roads and upgrade those that affect hydrologic and aquatic systems. Since 2000, more than 40 large forest landowners collectively invested more than \$300 million in road improvements, supporting sustainable fisheries, outdoor recreation opportunities, and ongoing forest management activities.

This section of the action plan focuses on highlighting priority actions that build on previous investments of private landowners and public agencies to protect and enhance the health of aquatic systems and the quality and quantity of water that forests produce. Priority actions are organized by key issues associated with drought, climate change and extreme weather events, and stormwater management.

PHOTO BY ADRIAN / UNSPLASH.COM



### THE WASHINGTON STATE DEPARTMENT OF ECOLOGY'S INTEGRATED CLIMATE RESPONSE STRATEGY 2012 IDENTIFIED EFFECTS OF CLIMATE CHANGE ON WATER RESOURCES IN THE STATE:











- Declining snowpack and loss of natural water storage.
- Changes in seasonal streamflow.
- Higher drought risk and more competition for scarce water resources.
- More severe winter flooding.
- Declining water quality.



	<b>PRIORITY ACTIONS FOR WATER QUALITY AND QUANTITY</b>	<b>Referenced Strategies</b>
	<b>WATER QUALITY AND QUANTITY GOAL 1</b> Enhance watershed health and forest drought mitigation. Develop drought mitigation strategies at the landowner and landscape scales to reduce forest health vulnerabilities.	   
<p>1</p>	<p><b>Participate in the Washington Drought Resilience Partnership</b>, in coordination with the Department of Ecology and the Executive Water Emergency Committee, to foster long-term landscape-scale drought resilience among state agencies and partners.</p>	
<p>2</p>	<p><b>Support drought mitigation efforts</b> and management response actions across all lands through DNR programs. Coordinate with Department of Ecology on basin planning and restoration to increase natural water storage on the landscape.</p>	
<p>3</p>	<p><b>Address priority watershed drought vulnerabilities</b> by developing plans and implementation strategies and coordinating with Department of Ecology’s watershed planning efforts.</p>	
<p>4</p>	<p><b>Identify drought mitigation strategies</b> for areas with disproportionate environmental health risks.</p>	
<p>5</p>	<p><b>Improve water supply through forest management and restoration practices</b> that improve water-holding capacity in watersheds and help protect water quality from increased temperature, erosion, and associated pollutants.</p>	
<p>6</p>	<p><b>Invest in scientific research to better understand</b> the interactions between forest vegetation conditions and water to improve our understanding of how forests can be managed to increase water quantity in rivers and streams.</p>	

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.



	<b>PRIORITY ACTIONS FOR WATER QUALITY AND QUANTITY</b>	<b>Referenced Strategies</b>
	<b>WATER QUALITY AND QUANTITY GOAL 2</b> Lands and waters remain productive and adapt to changing conditions, including climate change and a growing population. Expand efforts to use natural systems to buffer against floods, stormwater, sea level rise, and droughts stemming from changing conditions.	  DNR Goal D1, D1.4    PSP
1	<b>Implement Integrated Water Resources Management approaches</b> in highly vulnerable basins including the Columbia, Yakima, and Walla Walla river basins. Support expansion of the integrated approach to other vulnerable basins.	 ECO
2	<b>Expand capacity to analyze, plan, and coordinate</b> aquatic restoration activities across all lands.	
3	<b>Design and maintain forest roads</b> to be resilient under current and projected climate conditions.	   SWAP    PCR    PSP
4	<b>Develop a climate-informed culvert evaluation model</b> that builds on the WDFW and UW Climate Impacts Group approach to climate-informed culvert and water-crossing structure design. Identify climate-related culvert risk using existing spatial analysis tools.	 PCR
5	<b>Support the development and scaling of emerging funding mechanisms</b> to accelerate forest and aquatic restoration treatments to reduce risk and support sustained provision of ecosystem services from forestlands.	 DNR 4.4
6	<b>Engage with private landowners, businesses, local government, tribes, and communities</b> about landslide preparedness and the risks posed by steep slopes.	 DNR Goal D3.3

SEE PAGE 55 FOR KEY TO REFERENCED STRATEGIES.

**MANY OF THE ACTIVITIES DESCRIBED IN THIS SECTION HAVE CO-BENEFITS ASSOCIATED WITH THEM, INCLUDING TREMENDOUS ECONOMIC BENEFITS.**

**Recent analysis found that every \$1 million spent on forest and watershed restoration generates between 15.7 and 23.8 jobs and \$2.2 million to \$2.5 million in economic activity.**

Reference: State of Salmon in Watersheds 2018, <https://stateofsalmon.wa.gov/exec-summary>



	<b>PRIORITY ACTIONS FOR WATER QUALITY AND QUANTITY</b>	<b>Referenced Strategies</b>
	<b>WATER QUALITY AND QUANTITY GOAL 3</b> Address water quality threats associated with forest management and conversion of forests. Invest in natural solutions and infrastructure to mitigate threats and monitor progress.	
<b>1</b>	<b>Prioritize and address the backlog of maintenance of forest roads</b> on federal lands. Reduce the financial burden and ecological effects of forest roads by strategically decommissioning redundant and unnecessary roads from the landscape. This plan recognizes the need established by the Forest Service in their analyses resulting from the Travel Management Rule and ongoing planning. The Forest Service Legacy Roads and Trail Remediation program is one tool that directs funding with an emphasis where Forest Service roads may contribute to water quality problems in streams and water bodies that support threatened, endangered, and sensitive species or community water sources.	
<b>2</b>	<b>Reduce contaminants from DNR-managed facilities</b> entering state waters and remove sources of toxic materials (e.g. creosote) from our waters.	

▲ Forest roads can cause fine sediment to enter streams through muddy runoff water in the wet season. The mixture of fine sediment and water is also known as “turbidity.” High turbidity levels can cause stress to fish, affect fish feeding rates, impair their homing instincts, and reduce growth rates. Sediment also can smother fish eggs and affect aquatic insect life.



PHOTO BY KEN BEVIS / DNR

Steve Harris and Michelle Ensminger, both of DNR, look over maps for an upcoming landowner-assistance, fuels reduction project near Kettle Falls.



**THE ACTIONS  
OUTLINED IN  
THIS PLAN ARE  
FOUNDED ON THE  
PRINCIPLE OF  
COLLABORATION.  
THIS EFFORT  
REQUIRES  
AN ALL LANDS,  
ALL HANDS  
APPROACH.**

## PLAN IMPLEMENTATION

Washington's 2020 Forest Action Plan identifies dozens of goals and priority actions through June 30, 2025. A number of the priority actions are already underway, and significant progress is being made to address threats and issues facing forests. For some recent and newly identified priority actions, work is just beginning and will require dedicated resources and DNR staff capacity to implement.

Implementation of this plan is founded on the principle of collaboration. This action plan is intended to foster deeper collaborative engagement and partnerships across a diverse range of interests. Climate change is exacerbating the threats and issues facing forests, and addressing them will undoubtedly require government and public agencies, non-profit organizations, industry, tribes, and others to continue to work together. Numerous partner plans and strategies were referenced throughout this report to help partners recognize the important role they play in achieving landscapes scale objectives and forest health and resilience for Washington. In the same vein that we developed this plan in a collaborative spirit, we must implement in one. At DNR, we'll collaborate internally across programs, divisions, and regions as well as with partner organizations and individuals, and through our advisory committees.

### Key components of plan implementation include:

- Identify priority actions in the plan that are already underway through existing plans, and those that require new resources to implement.
- Identify the lead entity and points of contact for each goal and priority action identified in this plan, including both internal DNR programs and external partner organizations.
- Cultivate partnerships that help leverage the necessary capacity and resources to accomplish the goals and priority actions outlined in this report. Secure additional resources as necessary.
- Annually, monitor and report Forest Action Plan progress in partnership with the USDA Forest Service, Washington Department of Fish and Wildlife, and other implementing partners.
- Communicate the vision of this plan, the story of our collective effort to implement the plan, and lessons learned over time.

The first two components listed above will be initiated immediately following the adoption of the Forest Action Plan by staff in the Forest Health and Resiliency Division and in coordination with the State Forester. These next steps will also be based on knowledge gained in writing this plan, and with additional conversations with DNR staff and external partners.



## Leveraging Resources to Support Priority Actions

Public funding is required to address the issues and threats facing forests. Forests provide innumerable public services and benefits, and there is a strong case to be made, even in challenging economic times, that it is necessary to invest in the life giving forest ecosystems that all Washingtonians rely on. Clean water and air, outdoor recreation, sustainable timber and building products, and carbon sequestration and storage become seemingly more important every year. Implementing this action plan will help ensure that forests continue to provide these essential services.

Dedicated public funding and capacity will increase the likelihood that DNR and partners will be able to implement the Forest Action Plan and the important strategies that provide the basis of this report: the 20-Year Forest Health Strategic Plan, Wildland Fire Protection 10-Year Strategic Plan, and the Plan for Climate Resilience, among others. Without dedicated funding and capacity, the state will lack adequate resources to effectively address the forest health crisis and prepare forests for a changing climate. Even under some of the most aggressive treatment and restoration scenarios, the impacts of drought, insects and diseases, and wildfires are anticipated to cost the state billions of dollars in the coming decades. The more we invest in preventative maintenance today, the more we will reduce the risk of having to pay for future catastrophic events.

While dedicated public funding is critical to the success of this action plan, and getting ahead of the issues and threats facing forests, there is also an important role for entrepreneurs and industry partners to play. Local and regional economies — including contractor and milling capacity and markets for restoration byproduct like biochar and mass timber — support local jobs and help reduce the costs of implementing forest health treatments. The goals and priority actions identified in the Rural Economic Development section of this report lay the groundwork for a 21st century natural resource economy in Washington that is a critical link in ensuring this overall plan is successful. Ultimately, a strong natural resources economy leads to more restoration and management outcomes across the state.

In addition to traditional and emerging market opportunities, stakeholders will need to work together to support the development of ecosystem service markets for resource values such as water and carbon storage. While carbon and water markets are not a panacea that can address all resource concerns, they can meaningfully contribute to statewide goals when implemented at appropriate scales in the right forest types. Working to ensure markets for carbon and water are appropriately aligned with the goals of this action plan and the ongoing management needs and opportunities in the state will be critical to ensuring balanced, long-term solutions that support multiple public benefits.



**// MANAGE,  
SUSTAIN, AND  
PROTECT THE HEALTH  
AND PRODUCTIVITY  
OF WASHINGTON'S  
LANDS AND WATERS  
TO MEET THE NEEDS  
OF PRESENT  
AND FUTURE  
GENERATIONS."**

**MISSION STATEMENT,  
DNR STRATEGIC PLAN  
2018-2021**

PHOTO BY KEN BEVIS / DNR



DRN forester  
Matt Provencher, left,  
reviews maps and planning  
documents with the caretaker  
of a large forested tract on  
San Juan Island.





## Multi-party Monitoring of Forest Action Plan Progress

A primary goal of the 2020 Forest Action Plan revision is to enable DNR to track implementation of this plan and be accountable for the commitments made throughout this report. The purpose of this section of the action plan is to establish and describe the framework that will be used to identify monitoring metrics at various scales, and to set the stage for more public facing monitoring and reporting that will increase access to information on key indicators of success. While implementation and monitoring of the Forest Action Plan will rely on a large network of people and organizations, tracking progress for annual reporting will be conducted by the Forest Health and Resiliency Division at DNR.

The Forest Action Plan monitoring framework builds on the monitoring priorities identified in the 20-Year Forest Health Strategic Plan and 10-Year Wildland Fire Protection Strategic Plan, which states that DNR will “develop and implement a forest health resilience monitoring program that establishes criteria, tools, and processes to monitor forest and watershed conditions, assess progress, and reassess strategies over time” and that DNR will “monitor and evaluate the effectiveness of wildland fire protection.”

At DNR, monitoring of these forest health and wildfire strategies is being led by the Forest Health and Resilience Division and Wildfire Division, respectively. Additional monitoring efforts are led by the Natural Heritage, Aquatics, Forest Practices, and State Lands divisions, among other divisions and partner agencies.





**Key components of the overall monitoring strategy, and specific monitoring tools and efforts led by DNR to monitor this Forest Action Plan, include:**

### **FOREST HEALTH TREATMENT TRACKER**

a tool to gather and compile forest health treatment information across all-lands in Washington from landowners that can be organized and displayed in an interactive online format. DNR and willing landowners submit data about each of their planned and completed projects that had forest health and resilience as a primary objective. Information submitted will include a spatial layer, such as the treatment type, objectives, and completion date. The data will then be compiled and displayed in a publicly available online portal, where it can be viewed within the context of priority landscapes identified in this Forest Action Plan.

Over time, the Forest Health Treatment Tracker is intended to include comprehensive forest health and resilience treatment data for all of Washington. Treatment data in the system could be supplemented with ongoing treatment monitoring data collected, including through a multi-party forest-stand monitoring protocol and application developed by DNR. As financial data including federal grants and state investments are entered into the system, funding sources for each treatment can be tied to project information. The tool will empower more strategic planning and awareness of forest health treatments across land ownership boundaries while facilitating a transparent and timely information exchange. The treatment information could also be supplemented with ongoing monitoring data collected through a Survey123 app developed by DNR. Over time, the Forest Health Treatment Tracker will enable the state to evaluate trends in the number of treatments, a capability that no one landowner or agency has been able to accomplish to date.

### **WILDFIRE AND FOREST HEALTH MULTI-PARTY MONITORING FRAMEWORK**

There are three levels of analysis for forest health monitoring in Washington: regional level, priority planning-area level, and treatment and stand level. Regional level monitoring occurs at the scale of millions of acres, such as large landscapes like the eastern Cascades, and is intended to assess and compare risks and evaluate trends and progress towards overall landscape resilience goals identified in the action plan. Planning area level monitoring occurs at the scale of 10,000 to 150,000 acres and seeks to evaluate how forest health treatments and disturbances, such as wildfire, affect key objectives such as fire spread,

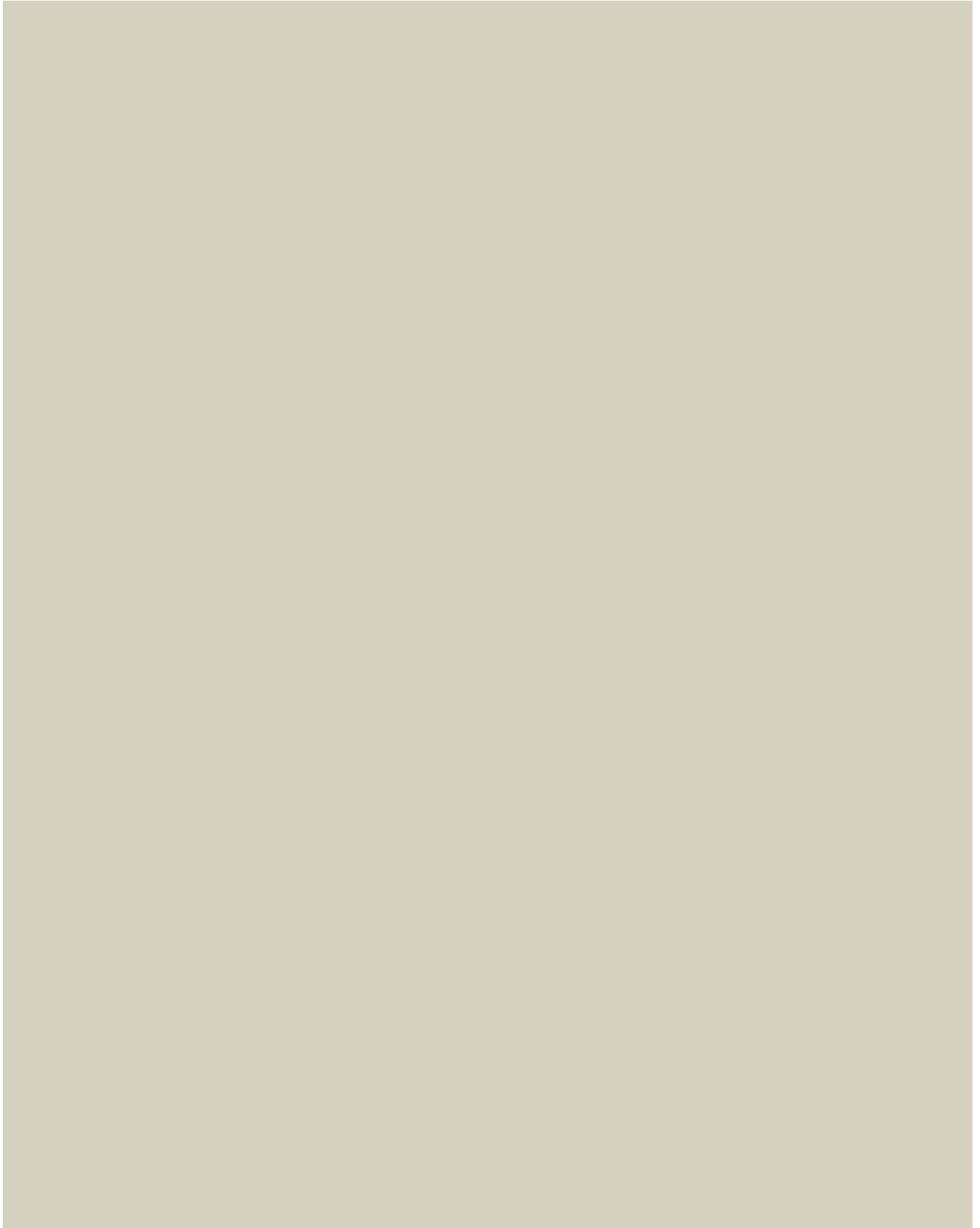
risk to communities, and habitat. The treatment and stand level monitoring is looking at areas of 10s to 100s of acres and focuses on understanding whether prescription targets were met and how those influence finer scale objectives such as fuel loading and tree response.

At each monitoring level, DNR and partners have identified indicators, goals, response variables, and methods and timing to collect data. The data from the forest health monitoring work will be made available to the public and included in the biennial forest health reports to the Legislature. These new monitoring tools being developed at DNR are anticipated to support other scientific analyses and publications related to forest health and wildfire, including extension of multi-party forest health monitoring at multiple scales in western Washington.

### **ECOLOGICAL INTEGRITY ASSESSMENT (EIA)**

An approach to provide a standard "biophysical exam" that assesses how well an ecosystem is doing, including its component vegetation, soil and hydrology, as well as its size and interactions with the surrounding landscape. The EIA is designed to document and provide land and resource managers with critical information on factors that may be degrading, maintaining or helping to restore an ecosystem. Through a standardized scoring system based on a series of metrics, the results can be communicated in a simple scorecard representing a wealth of data. This information can then be used for setting conservation priorities, identifying restoration strategies, and monitoring the effectiveness of actions.

Additional monitoring tools and performance measures, such as the National Association of State Foresters National Performance Measures, will be identified and incorporated into tracking the progress of the Forest Action Plan as they become available. A review and update of this Forest Action Plan is required in five years. An annual progress report each June (beginning in 2021) will provide a brief update on progress toward the goals and priority actions of this Forest Action Plan including a summary of successes and challenges, as well as changed conditions.





# Appendix A

## Public Survey Results



## Partner Survey Summary Results

Between Oct. 15 and Dec. 31, 2019, Washington State Department of Natural Resources (DNR) staff conducted a poll of partners and the public to gather input and advice on the Forest Action Plan revision. Department staff used a snowball sampling method, sending the online survey link directly to a broad suite of partners and encouraging those partners to share the survey with their constituents and colleagues. DNR also shared the survey multiple times on its social media channels. In total, 361 people completed the survey and shared their insights and advice with the department.

Survey responses are summarized on the next pages. The results highlight the important role of a number of actions funded through USDA State and Private Forestry, and reinforce that partners remain concerned about pressing threats and challenges facing forest ecosystems in the state.

Respondents identified wildfire as the issue they are most concerned about, followed by fragmentation and conversion of forests to non-forest uses. In total, 94 percent of respondents indicated they were highly concerned or somewhat concerned about wildfire, and 94 percent indicated the same level of concern about the conversion of forests. The majority of respondents also indicated that they are highly concerned about loss of wildlife habitat, climate change, and insect and disease outbreaks as threats facing forests.

In response to the threats facing forests in Washington, respondents expressed support for a range of actions: conducting restoration activities such as thinning unnaturally dense forests, providing technical assistance to small and family forestland owners, helping communities prepare for future wildfire events, and partnering with fire districts to ensure safe and effective fire suppression response.

Survey responses capture a snapshot in time and are not intended to be interpreted as representing any particular group. Rather, the results give DNR a sense of how partners are currently thinking about forest-related issues and opportunities, and the state's role in responding to those challenges. Throughout revising the Forest Action Plan, DNR staff have attempted to integrate and address the public feedback received through the survey.

# 94%

**Percentage of respondents highly concerned or somewhat concerned about wildfire, and conversion of forests.**

**THE MAJORITY OF RESPONDENTS INDICATED THAT THEY ARE HIGHLY CONCERNED ABOUT LOSS OF WILDLIFE HABITAT, CLIMATE CHANGE, AND INSECT AND DISEASE OUTBREAKS AS THREATS FACING FORESTS.**



**SURVEY QUESTION 1**

Scientists and policy makers have identified the following threats facing forests in the western United States. Of those, please indicate your level of concern.

**Wildfire**



**Drought**



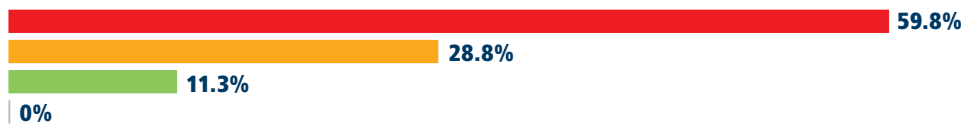
**Insects and disease outbreaks**



**Fragmentation and conversion of forests to non-forest uses**



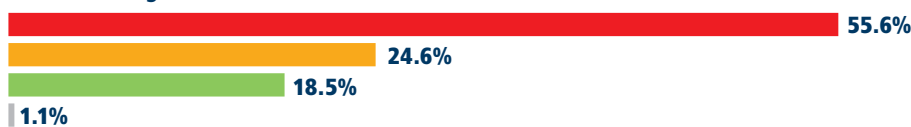
**Loss of wildlife habitat, especially for endangered and threatened species**



**Spread of invasive species**



**Climate change**





## SURVEY QUESTION 2

To overcome the threats facing our forests, indicate which of the following actions Washington DNR should prioritize.

## Conduct scientific research



## Convene and host informational and educational events with the public



## Conduct restoration activities such as thinning unnaturally dense forests



## Provide technical support to private and family forestland owners



## Fund land conservation efforts such as paying for conservation easements



## Help prepare communities for future wildfire events



## Partner with state and local fire districts to ensure safe and effective fire suppression



## Plant and manage trees in urban and community settings



## Implement current plans (20-Year Forest Health Strategic Plan, etc.)





# Appendix B

## Forest Legacy Program



# Washington DNR Forest Legacy Program Scoring Guidance

Adapted from National Core Criteria  
(July 2017 version)

**The Forest Legacy Program is a USDA Cooperative Forestry Program administered by the Washington State Department of Natural Resources. The following scoring criteria are used by the USDA Forest Service, Washington DNR, and review committee members to rank applications in the State of Washington.**

## HOW ARE CRITERIA SCORED?

Scoring consists of evaluating a project for the attributes below and identifying a point score. More points will be given to projects that demonstrate multiple public benefits of significance. Significance is demonstrated by the quality and scope of attributes.

## EVALUATION OF CRITERIAS

### Importance

50 points possible  
35-50 = high importance

### Threatened

20 points possible  
11-20 = high threat

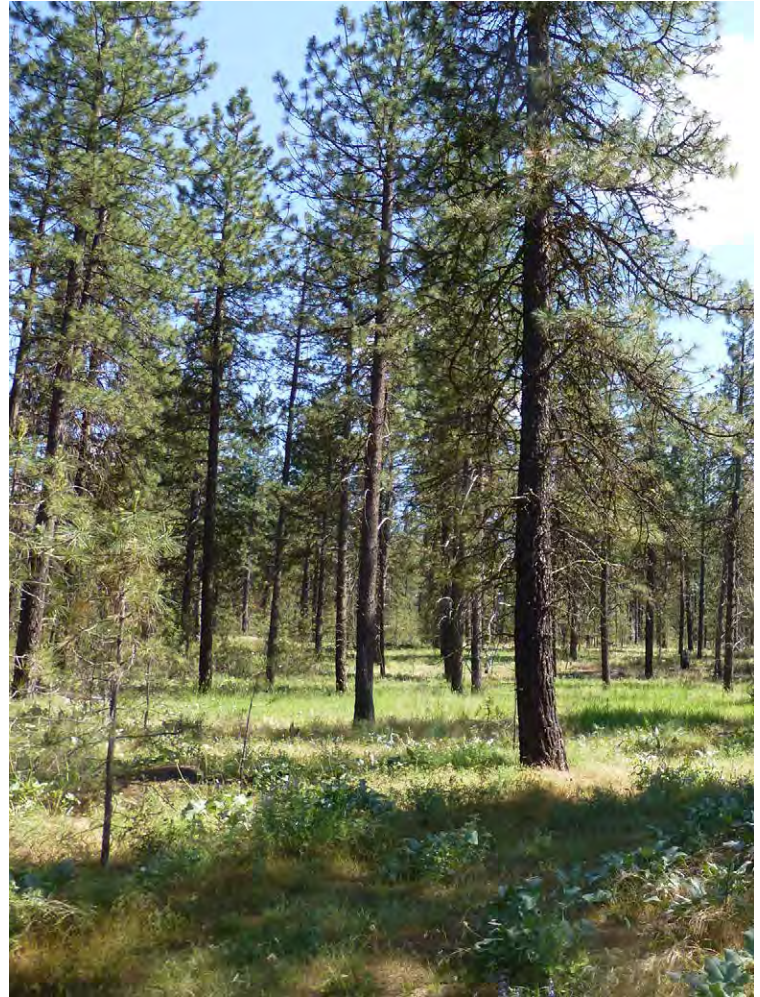
### Strategic

30 points possible  
21-30 = high strategic importance

### Readiness

7 points possible  
(these are typically tie-breaker points)

To rank high in the national competition, this proposal should have points within the "high" zone of each area.



Read and download  
the 2004 Forest Legacy  
Program Assessment of  
Need online, at:

[https://www.dnr.wa.gov/  
publications/amp\\_fl\\_  
aon2004.pdf](https://www.dnr.wa.gov/publications/amp_fl_aon2004.pdf)



## Importance Criteria

This criterion focuses on the attributes of the property and the environmental, social, and economic public benefits gained from the protection and management of the property and its resources. This criterion reflects the ecological assets and the economic and social values conserved by the project and its level of significance.

### NATIONAL SIGNIFICANCE OF A PROJECT IS DEMONSTRATED IN TWO WAYS

1. A project that solidly represents a majority of the attributes outlined is viewed as nationally significant because of its strong alignment with the purposes and strategic direction of the Forest Legacy Program.
2. A project that supports Federal laws, such as the Endangered Species Act, Safe Drinking Water Act, and Clean Water Act, contributes to federal initiatives, or contains or enhances federal designations such as wild and scenic Rivers, national scenic byways, national recreation trails, and cultural resources of national importance. When determining federal importance, also consider interstate and international resources, such as migratory species, or trails and waterways that cross state or international boundaries.

1	ECONOMIC BENEFITS FROM TIMBER AND POTENTIAL FOREST PRODUCTIVITY	High 8-10	Medium 4-7	Low 0-3
	<b>(1a) Landowner demonstrates sustainable forest management in accordance with a management plan.</b> Add one extra point if the land is third party certified (such as Sustainable Forestry Initiative, Forest Stewardship Council, and American Tree Farm System).			
	<b>(1b) Forestry activities contribute to the resource-based economy for a community or region.</b>			
	<b>(1c) The property contains characteristics (such as highly productive soils) to sustain a productive forest.</b>			

2	ECONOMIC BENEFITS FROM NON-TIMBER PRODUCTS	High 4-5	Medium 2-3	Low 0-1
	<b>Provides non-timber revenue to the local or regional economy through activities such as hunting leases, ranching, non-timber forest products (maple syrup, pine straw, ginseng collection, etc.), guided tours (fishing, hunting, birdwatching, etc.), and recreation and tourism (lodging, rentals, bikes, boats, outdoor gear, etc.).</b>			

**High:** Attribute is clearly present, is of high quality, and is a significant component of the project.

**Medium:** Attribute is present or partially present and contributes to project importance.

**Low:** Attribute is not present or contributes to project importance in a limited or marginal way.

50 points possible  
35-50 = high importance



## Importance Criteria

3	THREATENED OR ENDANGERED SPECIES HABITAT	High 4-5	Medium 2-3	Low 0-1
<p>The site has documented threatened or endangered plants and animals or designated habitat. Documented occurrence and use of the property should be given more consideration in point allocation than if it is habitat without documented occurrence or use. Federally listed species should be given more consideration than state-only listed species when evaluating the significance of this attribute.</p>				

**High:** Attribute is clearly present, is of high quality, and is a significant component of the project.

**Medium:** Attribute is present or partially present and contributes to project importance.

**Low:** Attribute is not present or contributes to project importance in a limited or marginal way.

50 points possible  
35-50 = high importance

4	FISH, WILDLIFE, PLANTS, UNIQUE FOREST COMMUNITIES	High 4-5	Medium 2-3	Low 0-1
<p>The site contains unique forest communities and/or important fish or wildlife habitat as documented by a formal assessment or wildlife conservation plan or strategy developed by a government or a non-governmental organization. The importance of habitat to an international initiative to support and sustain migratory species can be viewed as national importance if conserving the property will make a significant contribution. The mere occasional use of the property or a modest contribution to an international initiative does not raise the property to national importance.</p>				



## Importance Criteria

5	WATER SUPPLY, AQUATIC HABITAT, WATERSHED PROTECTION	High 4-5	Medium 2-3	Low 0-1
	Property has a direct relationship with protecting the water supply or watershed, such as provides a buffer to public drinking water supply, contains an aquifer recharge area, or protects an ecologically important aquatic or marine area.			
	The property contains important riparian areas, wetlands, shorelines, river systems, or sensitive watershed lands. When allocating points, consider the importance of the resource, the scope and scale of the contribution, the magnitude of benefits that will result from protection of the property. Merely being located within an aquifer recharge area or in a water supply area should not be given the same consideration as a project that makes a significant conservation contribution to a high-quality project of high value.			

6	PUBLIC ACCESS	High 4-5	Medium 2-3	Low 0-1
	Protection of the property will maintain or establish access by the public for recreation; however, restrictions on specific use and location of recreational activities may exist.			

7	SCENIC	High 4-5	Medium 2-3	Low 0-1
	The site is located within a viewshed of a government designated scenic feature or area (such as trail, river, or highway). Federal designation should be given more consideration than state-only designations when evaluating the significance of this attribute.			

**High:** Attribute is clearly present, is of high quality, and is a significant component of the project.

**Medium:** Attribute is present or partially present and contributes to project importance.

**Low:** Attribute is not present or contributes to project importance in a limited or marginal way.

50 points possible  
35-50 = high importance



## Importance Criteria

8	HISTORIC/CULTURAL/TRIBAL	High 8-10	Medium 4-7	Low 0-3
<p>The site contains features of historical, cultural and/or tribal significance, formally documented by a government or a non-governmental organization. A federal designation should receive greater consideration. .</p>				

**High:** Attribute is clearly present, is of high quality, and is a significant component of the project.

**Medium:** Attribute is present or partially present and contributes to project importance.

**Low:** Attribute is not present or contributes to project importance in a limited or marginal way.

---

50 points possible  
35-50 = high importance

## Threatened Criteria

This criterion estimates the likelihood for conversion. More points will be given to projects that demonstrate multiple conditions; however, a project need not have all the conditions listed to receive maximum points for this category.

During the evaluation of threat, a landowner interested in conserving land should not be penalized because they are not actively marketing or subdividing the property. An approved subdivision plan alone does not justify high points; other conditions must also exist that make conversion likely.

1	LACK OF PROTECTION	Likely 4-5	Possible 1-3	Unlikely 0
<p>There are no temporary or permanent protections on the property, such as: current zoning, temporary or permanent easements, moratoriums, and encumbrances that limit subdivision or conversion.</p>				

**Likely:** Condition exists, makes conversion to non-forest uses likely.

**Possible:** Condition exists, makes conversion possible.

**Unlikely:** Condition not present, or present but conversion is unlikely.

---

20 points possible  
11-20 = high threat



## Threatened Criteria

2	LAND AND LANDOWNERS CIRCUMSTANCES	Likely 4-5	Possible 1-3	Unlikely 0
	Land and landowner circumstances contribute to conversion risk, such as: property held in an estate, aging landowner, future ownership or management by heirs is uncertain, property is up for sale or has a sale pending, landowner anticipates owning property for a short duration, landowner has received purchase offers, land has an approved subdivision plan, landowner has sold subdivisions of the property, etc.			

3	ADJACENT LAND USE	Likely 4-5	Possible 1-3	Unlikely 0
	Adjacent land use characteristics contribute to conversion risk, such as: existing land status, rate of development growth and conversion in the area, rate of population growth (percent change), rate of change in ownership, etc.			

4	ABILITY TO DEVELOP	Likely 4-5	Possible 1-3	Unlikely 0
	Physical attributes of the property facilitate conversion, such as: access, buildable ground, zoning, slope, water/sewer, electricity, etc.			

**Likely:** Condition exists, makes conversion to non-forest uses likely.

**Possible:** Condition exists, makes conversion possible.

**Unlikely:** Condition not present, or present but conversion is unlikely.

20 points possible  
11-20 = high threat



## Strategic Criteria

This criterion reflects the project’s relevance or relationship to conservation efforts on a broader perspective. When evaluating strategic, four considerations should be made: 1) the scale of a conservation initiative, strategy or plan, 2) the scale of the project’s contribution to that initiative, strategy or plan, 3) the placement of the parcel within the area of the initiative, strategy or plan and 4) how the project complements protected lands.

1	CONSERVATION INITIATIVE, STRATEGY OR PLAN	Likely 10–15	Average 5–9	Low 0–4
How the project fits within a larger conservation plan, strategy, or initiative as designated by either a government or non-governmental entity.				

2	COMPLEMENT PROTECTED LANDS	Likely 10–15	Average 5–9	Low 0–4
How the project is strategically linked to enhance already protected lands including past FLP projects, already protected federal, state, or non-governmental organization lands, or other federal land protection programs (NRCS, NOAA, etc).				

**High:** The property significantly advances a conservation initiative, strategy, or plan and complements protected lands.

**Average:** The property makes a modest contribution to a conservation initiative, strategy or plan and is near already protected lands.

**Low:** The property is not part of a conservation initiative, strategy or plan, but will lead to locally-focused conservation efforts.

---

30 points possible  
21-30 = high strategic importance



## Readiness Criteria

Project readiness is defined as the degree of due diligence completed. To demonstrate project readiness, completed items need to be specified (including completion date) and credit will only be given to those items completed. Projects with multiple tracts will need to have completed the task for the majority of the tracts before a point is given.

1	<b>READINESS</b> 1 Point for each item completed	Points
	1. Documented support for the cost estimate, such as completed market analysis or preliminary appraisal.	
	2. Landowner and state have general agreement on conservation easement or fee acquisition conditions.	
	3. Cost share commitment has been obtained from a specified source.	
	4. A signed option or purchase and sales agreement is held by the state or at the request of the state. OR, at the request of the state, conservation easement or fee title is held by a third party.	
	5. Title search is completed, including identifying any temporary or permanent protections.	
	6. Minerals determination is completed.	
	7. For conservation easement properties, a stewardship plan or multi-resource management plan is completed.	

7 points possible  
(these are typically tie-breaker points)





# Appendix C

## Western Washington Landscape Resilience Prioritization Process

DESCRIPTION OF DATA SETS  
AND METHODS



## Western Washington Landscape Resilience Prioritization Process

### DESCRIPTION OF DATA SETS AND METHODS

The 2020 Forest Action Plan provides a road map for implementation of Washington's Shared Stewardship Investment Strategy and identifies priority landscapes for landscape resilience in western Washington. This appendix describes the methodology and data sets that were used to inform the prioritization process.

**A PRIMARY  
PURPOSE OF THIS  
MAPPING EFFORT  
IS TO IDENTIFY  
THE PLACES TO  
STRATEGICALLY  
FOCUS DNR AND  
PARTNER TOOLS,  
RESOURCES, AND  
AUTHORITIES.**



Read and download  
the Washington  
Conservation Science  
Institute's  
methodology for the  
habitat connectivity  
layer associated with  
this action plan at :

<https://bit.ly/2N80BP1>



## Western Washington Landscape Resilience

The western Washington landscape resilience mapping and prioritization process focuses on addressing a key question that guides the implementation of the shared stewardship investment strategy:

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

In other words, a primary purpose of the western Washington landscape resilience prioritization mapping effort is to identify places to more strategically focus the use of Washington State Department of Natural Resources (DNR) and partner tools, resources, and authorities. Focused planning, implementation, and investments are intended to accomplish forest health and resilience at a scale commensurate with the threats facing forests described in this action plan, including:

- Preparing the landscape for the anticipated effects of future drought.
- Restoring the landscape scale structure and pattern of forests 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.
- Addressing aquatic restoration needs and ensuring forests continue to provide clean and cold water.
- Increasing the understanding of the changing dynamics of fire regimes in light of climate change.
- Supporting rural economic development including sustainable timber production.

Specific tools, resources, and authorities that DNR and partners will use in priority landscapes vary by landownership. For example, projects on federal lands are anticipated to use Good Neighbor Authority agreements, the All-Lands Forest Restoration Grant Program, the Building Forest Partnerships Grant Program, science and monitoring technical assistance, Prescribed Fire Program resources and capacity, and planning support. On small non-industrial private forestlands, it is anticipated that DNR will work with willing private landowners to use voluntary programs and incentives, such as the Forest Stewardship Program, Family Forest Fish Passage Program, Forestry Riparian Easement Program, and Small Forest Landowner Office Assistance staff expertise. Additional partnerships in priority landscapes, such as with conservation districts, are likely to focus on work with small forest landowners as well as community preparedness through the Volunteer Fire Assistance, Fire Adapted Communities, and Firewise USA® programs.



## Data Sources and Methodology for Prioritizing Hydrologic Unit Code (HUC) 5 Watersheds

The data used to identify priority landscapes in western Washington are organized into two categories:

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

The values at risk include fish and wildlife, drinking water, rare and unique habitats, merchantable and accessible timber volume, small forest lands, and above ground carbon stocks. Landscape resilience and forest health indicators include data that summarize anticipated effects of drought, climate change, habitat connectivity, forest productivity and site class, and water quality and fish habitat integrity. Each of the data sets are summarized below. Additional screens were used to inform the selection of priority landscapes, including highly urbanized watersheds and U.S. Department of Agriculture (USDA) Forest Service priority planning areas for vegetation management and restoration. The source data for the screens is described at the end of this appendix.

### VALUES AT RISK

#### FISH AND WILDLIFE

Source: Washington Department of Fish and Wildlife (WDFW)

WDFW produced a fish data layer and a terrestrial wildlife data layer for the purposes of the 2020 Forest Action Plan revision. The wildlife data includes Wildlife Survey Data Management (WSDM), Priority Habitats and Species (PHS), and eBird. WDFW also provided fish occurrence data, which is summarized by the number of stream miles of listed fish habitat in each Hydrologic Unit Code (HUC) 10 watershed. The number of stream miles was divided by the size of the watershed in acres to obtain a score.

The WDFW terrestrial species of concern data were combined with the habitat connectivity data layer (described below) to create a single wildlife layer for the Geographic Information System (GIS) analysis. The WDFW fish occurrence data layer was combined with the fish habitat index (described below) to create a single fish layer for the GIS analysis.

#### DRINKING WATER

Source: USDA Forest Service Forests to Faucets

The USDA Forest Service Forests to Faucets dataset was used to identify forest areas most important to surface drinking water (Wediner and Todd 2011). Scores are based on the number of people that derive water from a watershed and the amount of water supply. High scores mean that more people rely on the watershed for drinking water, and the overall amount of water supplied is higher. Scores from HUC 6 watersheds were averaged together to derive a score for each HUC 10 watershed.

**VALUES AT RISK  
INCLUDE FISH AND  
WILDLIFE, DRINKING  
WATER, RARE AND  
UNIQUE HABITATS,  
MERCHANTABLE AND  
ACCESSIBLE TIMBER  
VOLUME, SMALL  
FOREST LANDS, AND  
ABOVE GROUND  
CARBON STOCKS.**

### **RARE AND UNIQUE HABITATS**

Source: Terrestrial Ecological Systems of Concern – Washington State Wildlife Action Plan (2015) and Natural Heritage Program Data

This data represents terrestrial ecological systems — rare and unique habitats — in western Washington, as well as those especially important to species of greatest conservation need or with high vulnerability to climate change.

### **MERCHANTABLE ACCESSIBLE TIMBER VOLUME**

Source: USDA Gradient Nearest Neighbor (GNN) Data and DNR Road Layer

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 Forest Service to calculate the number of acres that meet the 25,000 board feet threshold. 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 10, divided by the total area of the HUC 10, was used as the score.

### **CARBON STOCKS**

Source: USDA 2017 GNN Data for Above Ground Biomass

The average standing biomass per HUC 10 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 (DBH) from GNN data. The average biomass of the pixels in each HUC 10 were used as the score. National parks, wilderness areas, and inventory roadless areas were excluded.

### **SMALL FOREST LANDOWNERS**

Source: 2012 Small Forest Landowner (SFLO) Acres, Luke Rogers, University of Washington

This data layer summarizes the number of acres in ownership by small forest landowners. The number of these acres, divided by the total area of the HUC 10, was used as the score.

## **LANDSCAPE RESILIENCE AND FOREST HEALTH INDICATORS**

### **CLIMATE CHANGE**

Source: Adapt West Climate Dissimilarity Index

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. The current climate period uses climate data from 1981-2010, while the projected future climate is for 2021-2040 using the average of different climate models (ensemble of global circulation models) for the Representative Concentration Pathways (RCP) 8.5 “business as usual” emissions scenario. The average dissimilarity of the pixels in each HUC 10 were used as the score.



### **DROUGHT: CLIMATE CHANGE**

Source: DNR Climatic Moisture Deficit

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 10. Climate data and climate projections from Climate North America were used. For a full description of the methods used to derived these data, see <https://bit.ly/2Z2Y924>.

### **WATER QUALITY AND AQUATIC HABITAT INTEGRITY**

Source: National Fish Habitat Assessment Habitat Condition Index (HCI)

HCI quantifies the overall level of human disturbance (e.g. road density, stream crossings, percent in agriculture, percent in developed areas, etc.) by catchment (Esselman et al. 2010). The scores of the catchments in each HUC 10 were averaged to create a score.

### **MID-SERAL, CLOSED CANOPY FOREST**

Source: Forest Service Region 6 Restoration Needs Assessment

This layer is from the most recent restoration needs assessment conducted by The Nature Conservancy and the Forest Service (DeMeo et al. 2018). It quantifies the amount of closed canopy, mid-aged forest (about 10 to 20 feet overstory DBH, with greater than 40 percent canopy cover) within a HUC 10 watershed. The source data is 2012 GNN data. 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. The total number of mid-seral, closed canopy acres across each HUC 10, divided by the total areas of the HUC 10, was used as the score.

### **SITE PRODUCTIVITY**

Source: DNR Site Class

The site class map from the DNR Forest Practices Division was used to quantify forest productivity in each HUC 10 watershed. Class 1 is the most productive and Class 5 is the least productive. 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 10 were used as the score.

## **Screens Used to Inform the Selection of Priority Landscapes**

### **DENSELY POPULATED URBAN AREAS**

Using DNR’s new wildland urban interface map layer, this screen masks watersheds that are more than 50 percent developed. For the purposes of landscape resilience, priority areas will focus on those watersheds most likely to benefit from active management and restoration of small non-industrial private lands and federal lands. DNR’s Urban and Community Forestry Program identifies high priorities for urbanized parts of the state. The conversion risk map identifies hot spots that will be the focus of reducing the risk of loss of forests.

### **FOREST SERVICE VEGETATION MANAGEMENT PRIORITY AREAS (2020-2025)**

These priority planning areas were identified by the Mt. Baker-Snoqualmie National Forest, Olympic National Forest, and Gifford Pinchot National Forest. These are the 5-year vegetation management plan priority areas as submitted to the Regional Office of the Forest Service in 2020. Source: Kevin James, Western Washington Area Ecologist, USDA Forest Service

## Combining Metrics Into Prioritization Scores

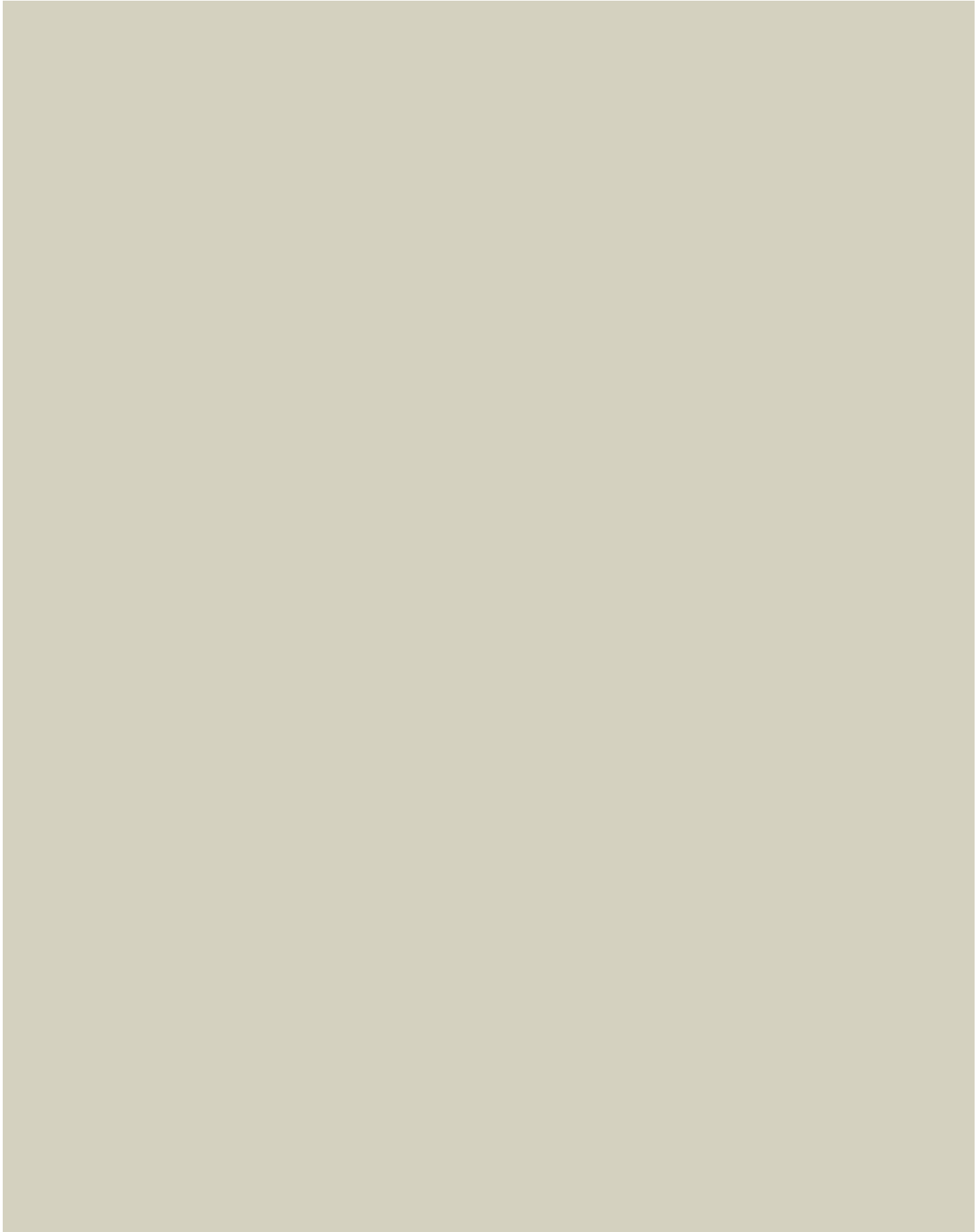
To rank and prioritize HUC 10 watersheds, the datasets making up the values at risk and the landscape resilience and forest health indicators were combined using the process described below. Note that all scores are relative. A low score does not mean that a watershed has no forest health concerns or 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. They did not apply any weights to the metrics.

**1. Derive HUC 10 scores:** For each dataset the value of pixels or smaller geospatial features (lines, polygons, etc.) across each HUC 10 were aggregated to derive a single score for each HUC 10. This was done in different ways for different datasets; see the descriptions of each dataset in this appendix. For some datasets, the mean of the pixels across each HUC 10 was derived. In others, the sum of the acres or stream miles divided by the total area of the HUC 10 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 10 scores derived for each dataset onto a standardized 0-1 scale. For each dataset or metric, values for the HUC 10 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.

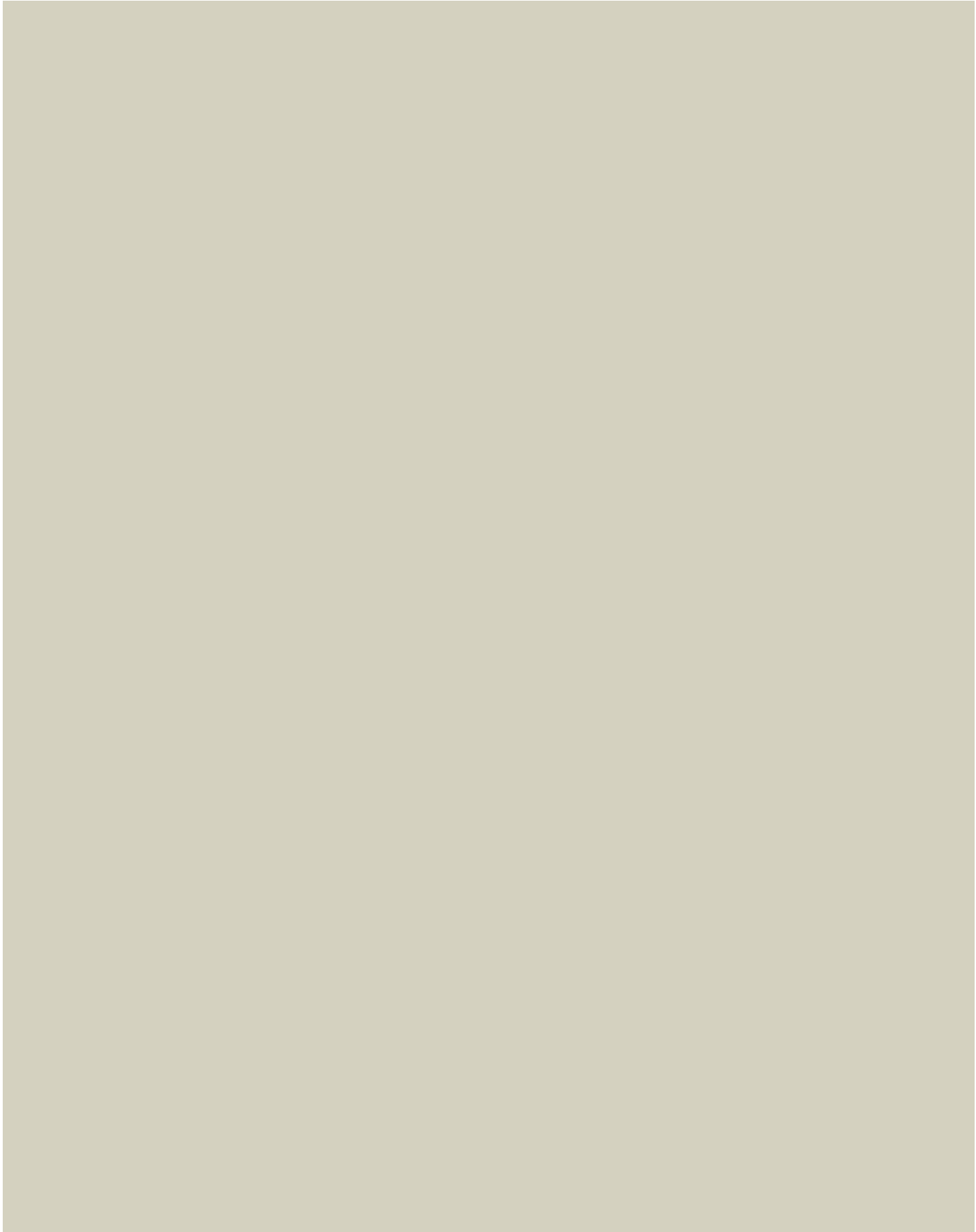
**3. Calculate composite scores and rankings:** Rankings for all metrics were added together to derive a composite score. Note that two wildlife metrics were first combined into a single averaged wildlife metric; the same was done with the two aquatic metrics. DNR scientists explored more complex approaches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





# Appendix D

## Restoration in the Mt. Baker-Snoqualmie National Forest





USDA FOREST SERVICE  
IS AN EQUAL OPPORTUNITY  
PROVIDER AND EMPLOYER.

MARCH 4, 2016

## Restoration in the Mt. Baker-Snoqualmie National Forest

The National Forest is the source of virtually all domestic water in the region and provides the headwaters for streams and rivers important to anadromous fish. Integrated management of aquatic and terrestrial systems requires a landscape approach to promote resiliency to climate change not just for the benefit of fish but also for wildlife, plants, the public forest users and our Trust responsibilities with the Tribes. One challenge on the Mt. Baker-Snoqualmie National Forest is to manage resources in order to restore, maintain and develop resilient landscapes. A resilient landscape or resilience is defined as the capacity of the natural environment to prevent, withstand, respond to, and recover from a disruption (man-made or natural). A landscape restoration strategy created with the purpose to ensure ecological processes and functions are not compromised will help managers meet this challenge. Additionally, our impending Forest Plan Revision and regional funding initiatives place an emphasis on restoration.

The MBS will further develop restoration in accordance with the U.S. Forest Service Strategic Plan: FY 2015-2020 Strategic Goals to:

### Sustain Our nation's Forests and Grasslands

Objective A. Foster resilient, adaptive ecosystems to mitigate climate change

### Deliver Benefits to the Public

Objective D. Provide abundant clean water

Objective E. Strengthen communities

### GOALS

- Develop a landscape restoration strategy to restore, maintain and develop resilient landscapes.
- Increase ecosystem resilience through a variety of multiple spatial scales, and diverse resources.

### STRATEGIC OBJECTIVES

- The public, partners and Regional Office believe the case for ecosystem maintenance on the MBS is compelling.
- Integrated restoration/maintenance strategy is the basis of future project development.
- Ensure that ecosystems are healthy, resilient, and, thus, more adaptable to changing conditions or that they can be restored to a healthy state (USDA Strategic Plan).

### PERFORMANCE GAP

- We believe ecosystem resilience and maintenance is a driver for restoration on the west side. On our forest, the major consideration toward restoration involves water (soils and hydrology) and the flora and fauna it supports.
- Lack a common vision or definition, one shared with our partners, of what we collectively believe restoration means for MBS.
- A cohesive, all lands strategy for west-side restoration is lacking. Private and state lands adjacent to the National Forest are assumed to be in need of restoration activities as part of larger efforts aimed at connectivity of salt water to headwaters. Climate change links to restoration & maintenance activities are not being incorporated into the planning process. We anticipate climate change playing an important and increasing role in guiding future restoration and maintenance activities on the Mt. Baker Snoqualmie National Forest.



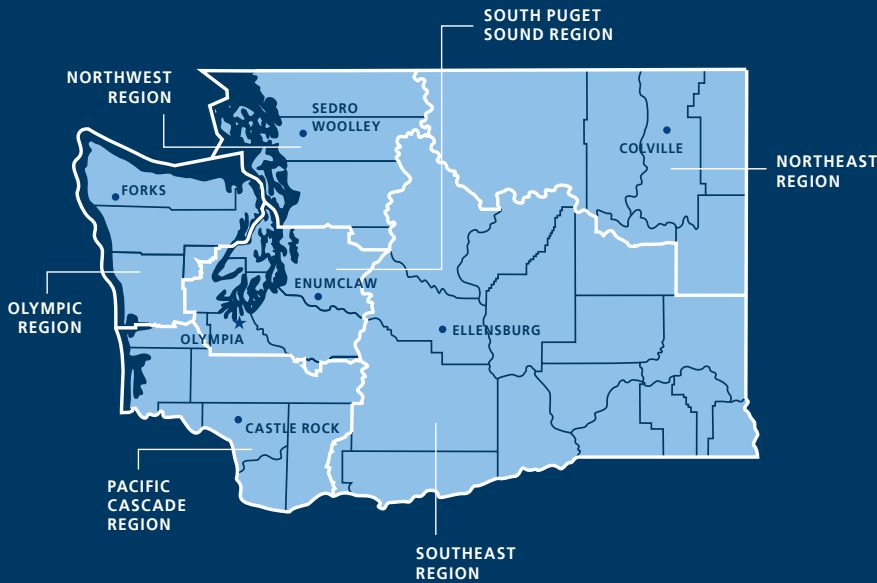
## REFERENCES

- Bentz et al. 2010.** Climate change and bark beetles of the western United States and Canada: direct and indirect effects.
- Bradley et al. 2007.** Forest land conversion in Washington state. [http://www.ruraltech.org/projects/fwaf/final\\_report/pdfs/05\\_Study4\\_LandConv.pdf](http://www.ruraltech.org/projects/fwaf/final_report/pdfs/05_Study4_LandConv.pdf)
- Butler et al. 2016.** Family forest ownerships of the United States, 2013: findings from the USDA Forest Service's national woodland owner survey. <https://www.fs.usda.gov/treesearch/pubs/50986>
- Community wildfire protection plans.** <https://www.dnr.wa.gov/programs-and-services/wildfire/wildfire-preparedness/community-wildfire-protection>
- Confluence of States. 2018.** Bipartisan outdoor recreation confluence accord. <https://www.confluenceofstates.com/our-impact>
- 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>
- Donato, Halofsky, and Reilley. 2019.** Corraling a black swan: natural range of variation in a forest landscape driven by rare, extreme events. *Ecological Applications* 30(1):e02013. 10.1002/eap.2013
- Esselman, P., D. Infante, A. Cooper, D. Wierich, L. Wang, and W. Taylor. 2010.** National Fish Habitat Action Plan (NFHAP) 2010 HCI Scores and Human Disturbance Data. National Fish Habitat Partnership Data System.
- Halofsky, Conklin, Donato, Halofsky, and Kim. 2018.** Climate change, wildfire, and vegetation shifts in a high-inertia forest landscape: western Washington, USA.
- Haugo, R. D., Kellogg, B. S., Cansler, C. A., Kolden, C. A., Kemp, K. B., Robertson, J. C., Metlen, K. L., Vaillant, N. M., and Restaino, C. M.. 2019.** The missing fire: quantifying human exclusion of wildfire in Pacific Northwest forests, USA. *Ecosphere* 10(4):e02702. 10.1002/ecs2.2702
- Kerns, B. K., et al. 2020.** Invasive grasses: a new perfect storm for forested ecosystems? *Forest Ecology and Management* 463: 117985. <https://www.sciencedirect.com/science/article/abs/pii/S0378112719322856>
- King County. 2020. 30-year forest plan.** <https://kingcounty.gov/services/environment/water-and-land/forestry/forest-policy/30-year-forest-plan.aspx>
- Littell, J.S., Oneil, E.E., McKenzie, D. et al.** Forest ecosystems, disturbance, and climatic change in Washington state, USA. *Climatic Change* 102, 129–158 (2010). <https://doi.org/10.1007/s10584-010-9858-x>
- Littke, K.M., Zabowski, D., Turnblom, E., and R.B. Harrison. 2018.** Estimating shallow soil available water supply for Douglas-fir forests of the coastal Pacific Northwest: climate change impacts. *Canadian Journal of Forest Research* 48:421-430
- Mauger, G.S., J.H. Casola, H.A. Morgan, R.L. Strauch, B. Jones, B. Curry, T.M. Busch Isaksen, L. Whitely Binder, M.B. Krosby, and A.K. Snover. 2015.** State of knowledge: climate change in Puget Sound. Report prepared for the Puget Sound Partnership and the National Oceanic and Atmospheric Administration. Climate Impacts Group, University of Washington, Seattle. doi:10.7915/CIG93777D
- Palmer, Marin; Kuegler, Olaf; Christensen, Glenn, tech. eds. 2019.** Washington's forest resources, 2007–2016: 10-year Forest Inventory and Analysis report. Gen. Tech. Rep. PNW-GTR-976. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 79 p. [https://www.fs.fed.us/pnw/pubs/pnw\\_gtr976.pdf](https://www.fs.fed.us/pnw/pubs/pnw_gtr976.pdf)
- Puget Sound Partnership. 2018.** Land development and cover implementation strategy. <https://www.psp.wa.gov/implementation-strategies.php#implementation-strategy-resources>
- Puget Sound Partnership (PSP). 2016.** Implementation strategy for Puget Sound's land development and cover recovery target: reducing the development conversion of ecologically important lands. <https://pspwa.app.box.com/s/mqzyrtt0148o0q6np86uah0iz4hs5kjh/file/103197338181?sb=/details>
- Puget Sound Partnership (PSP). 2018.** Implementation plan: 2018-2022 <https://pspwa.app.box.com/s/osxaeqq19fevXu5n3k8xnjtzkwo1512>
- Roop, H.A., G.S. Mauger, H. Morgan, A.K. Snover, and M. Krosby, 2020.** Shifting snowlines and shorelines: the intergovernmental panel on climate change's special report on the ocean and cryosphere and implications for Washington state. Briefing paper prepared by the Climate Impacts Group, University of Washington, Seattle. DOI: [doi.org/10.6069/KTVN-WY66](https://doi.org/10.6069/KTVN-WY66)
- Rural Voices for Conservation Coalition. 2020.** Shared stewardship: recommendations for partnering with community-based and collaborative groups. [https://static1.squarespace.com/static/562e839ee4b0332955e8143d/t/5e8cf40505bb9a1eed787b1c/1586295815611/2020\\_SharedStewardship\\_final-3-2020.pdf](https://static1.squarespace.com/static/562e839ee4b0332955e8143d/t/5e8cf40505bb9a1eed787b1c/1586295815611/2020_SharedStewardship_final-3-2020.pdf)
- Snover, A.K., Mauger, G.S., Whitely Binder, L.C., Krosby, M., Tohver, I. 2013.** Climate change impacts and adaptation in Washington state: technical summaries for decision makers. State of Knowledge Report prepared for the Washington State Department of Ecology. Climate Impacts Group, University of Washington, Seattle.
- Southern resident orca task force final report and recommendations (ORCA) (2019).** [https://www.governor.wa.gov/sites/default/files/OrcaTaskForce\\_FinalReportandRecommendations\\_11.07.19.pdf](https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_FinalReportandRecommendations_11.07.19.pdf)
- United States Department of Agriculture. 2018.** Urban nature for human health and well-being. [https://www.fs.usda.gov/sites/default/files/fs\\_media/fs\\_document/urbannatureforhumanhealthandwellbeing\\_508\\_01\\_30\\_18.pdf](https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/urbannatureforhumanhealthandwellbeing_508_01_30_18.pdf)
- U.S. Department of Interior. 2014.** National cohesive wildland fire management strategy. <https://www.forestsandrangelands.gov/documents/strategy/strategy/CSPhaseIIINationalStrategyApr2014.pdf>



- USDA Forest Service Mt. Baker-Snoqualmie National Forest. 2016.** Westside forest restoration strategy: a collaborative approach to defining restoration need, developing methodologies, and initiating a demonstration project in a pilot landscape on the Mt. Baker-Snoqualmie National Forest.
- USDA Forest Service. 2010.** A framework for sustainable recreation. [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5346549.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346549.pdf)
- United States Department of Agriculture. 2017.** Potential drought impacts in the Pacific Northwest. <https://www.fs.usda.gov/ccrc/sites/default/files/documents/files/r6-droughtfactsheet.pdf>
- University of Washington. 2009.** Retention of high-valued forest lands at risk of conversion to non-forest uses in Washington state. <https://www.ruraltech.org/projects/wrl/sfr/pdf/RetentionReport.pdf>
- Washington Department of Fish and Wildlife. 2015.** Washington's state wildlife action plan: 2015 Update. <https://wdfw.wa.gov/sites/default/files/publications/01742/wdfw01742.pdf>
- Washington Governor's Salmon Recovery Office. 2016.** State of salmon in watersheds. <https://www.wastormwatercenter.org/files/library/2016-state-salmon-in-watersheds-governors.pdf>
- Washington Governor's Salmon Recovery Office. 2006.** Statewide strategy to recover salmon. <https://rco.wa.gov/wp-content/uploads/2019/07/GSRO-TheWashingtonWay-2006.pdf>
- Washington Habitat Connectivity Working Group. 2010.** Statewide analysis. <https://waconnected.org/>
- Washington State Department of Ecology. 2012.** Climate plan.
- Washington State Invasive Species Council. 2019.** Urban forest pest readiness playbook. <https://invasivespecies.wa.gov/wp-content/uploads/2020/01/UrbanForestPestReadinessPlaybook.pdf>
- Washington State Invasive Species Council. 2019.** Invasive species strategic plan and 2019-2020 work plan. <https://invasivespecies.wa.gov/wp-content/uploads/2019/07/WISCStrategicPlan.pdf>
- Washington State Invasive Species Council. 2017.** Economic impact of invasive species to Washington state. <https://invasivespecies.wa.gov/wp-content/uploads/2019/07/SpeciesEconomyFactSht.pdf>
- Washington State Legislature. 2019.** Engrossed substitute senate bill 5330. <http://lawfilesexxt.leg.wa.gov/biennium/2019-20/Pdf/Bills/Session%20Laws/Senate/5330-S.SL.pdf?q=20200402141654>
- Washington State Legislature. 2020.** Engross second substitute house bill 2311. Greenhouse gas emission limits — amendment. <http://lawfilesexxt.leg.wa.gov/biennium/2019-20/Pdf/Bills/Session%20Laws/House/2311-S2.SL.pdf?q=20200414084904>
- Washington State Department of Natural Resources. 2020.** Safeguarding our lands, waters, and communities: DNR's plan for climate resilience. [https://www.dnr.wa.gov/publications/em\\_climateresilienceplan\\_feb2020.pdf](https://www.dnr.wa.gov/publications/em_climateresilienceplan_feb2020.pdf)
- Washington State Department of Natural Resources. 2018.** Forest resiliency burning pilot project. [https://www.dnr.wa.gov/publications/rp\\_2018\\_forestry\\_resiliency\\_burning\\_pilot\\_program\\_report.pdf](https://www.dnr.wa.gov/publications/rp_2018_forestry_resiliency_burning_pilot_program_report.pdf)
- Washington State Department of Natural Resources. 2019.** 10-year wildland fire protection strategic plan. [https://www.dnr.wa.gov/publications/rp\\_wildfire\\_strategic\\_plan.pdf](https://www.dnr.wa.gov/publications/rp_wildfire_strategic_plan.pdf)
- Washington State Department of Natural Resources. 2018.** Natural heritage plan. [https://www.dnr.wa.gov/publications/amp\\_nh\\_plan\\_2018.pdf](https://www.dnr.wa.gov/publications/amp_nh_plan_2018.pdf)
- Washington State Department of Natural Resources. 2019.** Forest health highlights in Washington. [https://www.dnr.wa.gov/publications/rp\\_fh\\_2019\\_forest\\_health\\_highlights.pdf](https://www.dnr.wa.gov/publications/rp_fh_2019_forest_health_highlights.pdf)
- Washington State Department of Natural Resources. 2018.** Strategic plan: 2018-2021. [https://www.dnr.wa.gov/publications/em\\_strategic\\_plan\\_2018.pdf](https://www.dnr.wa.gov/publications/em_strategic_plan_2018.pdf)
- Washington State Department of Natural Resources. 2017.** State forest action plan. <https://www.stateforesters.org/wp-content/uploads/2018/07/FINAL-Washington-State-Forest-Action-Plan-2017.pdf>
- Washington State Department of Natural Resources. 2017.** 20-year forest health strategic plan: eastern Washington. [https://www.dnr.wa.gov/publications/rp\\_forest\\_health\\_20\\_year\\_strategic\\_plan.pdf](https://www.dnr.wa.gov/publications/rp_forest_health_20_year_strategic_plan.pdf)
- Washington State Recreation and Conservation Office. 2018.** State comprehensive outdoor recreation plan. <https://www.rco.wa.gov/StateRecPlans/>
- Washington State Recreation and Conservation Office. 2020.** Update to the Economic Analysis of Outdoor Recreation in Washington State. <http://rco.wa.gov/wp-content/uploads/2020/07/EconomicReportOutdoorRecreation2020.pdf>
- Washington state shared stewardship investment strategy memorandum of understanding. 2019.** [https://www.dnr.wa.gov/publications/em\\_nr\\_mou\\_051019.pdf](https://www.dnr.wa.gov/publications/em_nr_mou_051019.pdf)
- Weidner and Todd. 2011.** From the Forest to the Faucet: Drinking Water and Forests in the US Methods Paper, USDA Forest Service, Washington DC, 2011
- Westerling. 2016.** Increasing western US. forest wildfire activity: sensitivity to changes in the timing of spring.





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