Forest Health Assessment and Treatment Framework

RCW 76.06.200

December 2024

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Forest Health Assessment and Treatment Framework

RCW 76.06.200

Prepared by
Washington State Department
of Natural Resources

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On the cover (clockwise from top left): Washington State Parks commercial thinning to improve forest health at Squilchuck State Park in the Stemilt Priority Planning Area, photo by John Marshall Photography; Restored dry mixed conifer forest on the Okanogan-Wenatchee National Forest in the Upper Swauk Priority Planning Area near the town of Liberty ten years after it had been thinned and broadcast burned, photo by DNR; Confederated Tribes of the Colville Reservation Twisp River large wood placement project in the Twisp Priority Planning Area, photo by Matt Young, Confederated Tribes of the Colville Reservation; TREX prescribed fire training on the Roslyn Community Forest in the Cle Elum Priority Planning Area, photo by John Marshall Photography.

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Executive Summary

Washington's forests, encompassing over 22 million acres, are vital to our state. Our forest ecosystems, however, face significant threats from climate change, wildfire, drought, and invasive species. The Washington State Legislature recognizes these unprecedented threats and the urgent need for proactive forest health assessment, treatment, and progress review and reporting through RCW 76.06.200.

This is the fourth biennial legislative report required by amendments to RCW 76.06.200 made during the 2017 legislative session. The report summarizes the last two years of progress implementing the Forest Health Assessment and Treatment Framework and the 20-Year Forest Health Strategic Plan: Eastern Washington. This report is a critical component of Washington State Department of Natural Resources (DNR) work to execute legislative direction regarding utilization of funds from the Wildfire Response, Forest Restoration, and Community Resilience Account established by HB 1168 in 2021. This report also complements the DNR legislative report on progress to implement RCW 79.10.530.

During the past two years, DNR and our partners have made substantial progress in response to our shared forest health and wildfire crisis in eastern Washington through implementation of the core components of RCW 76.06.200:

Scientific Assessments: To date, DNR scientists have assessed forest conditions across 45 priority planning areas covering more than 5,026,895 acres, vastly exceeding the statutory requirement of analyzing 200,000 acres each biennium. In the next biennium, DNR plans to complete an additional ten priority planning area evaluations in geographies at risk of wildfire and climate change impacts. Landscape assessments for the first 45 priority planning areas identified a restoration need of between 1,120,270 and 1,616,770 footprint acres. These analyses also prioritize treatments spatially for the dual benefits of forest health and wildland fire operations. In partnership with fire districts and wildland fire fighters, DNR has identified potential control lines and potential operational delineations to aid in future fire management planning across the 45 priority planning areas.

Treatments: Forest ecosystems are dynamic and the total need for treatment across eastern Washington is expected to change as conditions change in existing planning areas and new planning areas are analyzed and monitored. Since 2017, landowners and agency partners have invested in 962,292 acres of total treatment across 441,253 footprint acres in eastern Washington and 533,812 acres of total treatment acres across 251,455 footprint acres in priority planning areas. DNR tracks completed forest health treatments and active forest management that changes forest condition across all land ownerships using public data, voluntary reporting, and remote sensing. Routine treatment tracking updates, including spatial information, are publicly available. Each individual acre may require multiple treatments to become resilient to wildfire and other natural disturbances. For example, a typical sequence of treatments could include thinning overstory trees and pile burning heavy fuels, followed by broadcast burning shrubs and surface vegetation. Due to fuels growing over time, treatments require maintenance to remain effective. DNR publishes a treatment tracking memo every six months that outlines progress in each priority planning area as well across eastern Washington. Treatment tracking memos and DNR's treatment tracking methodology can be found here.

Progress Review and Reporting: DNR developed a comprehensive monitoring framework to address two overarching questions: *How are forest health conditions and associated forest health indicators changing over time, and what are the outcomes of forest health treatments?* DNR scientists and research partners use cutting-edge techniques to monitor forest health and treatment outcomes across multiple scales and geographies. Methods include remote sensing utilizing satellite imagery, machine learning, and drones. New tools, such as remote change detection monitoring, are providing land managers with a holistic picture of how treatments and natural disturbances like wildfire and insects are influencing the health and resilience of our forests. In 2024, DNR published its first stand-alone 20-Year Forest Health Strategic Plan Monitoring Report to summarize recent progress and outcomes associated with shared monitoring efforts. The report can be found here.

During this reporting period, DNR initiated collaboration to extend implementation of this RCW into western Washington. DNR developed a pilot western Washington forest health assessment framework methodology that was tested in two priority planning areas. These methods are under review and validation to inform a final approach. DNR also worked with partners during this biennium to plan and implement timely and necessary forest health treatments in western Washington.

Successful implementation of RCW 76.06.200 would not be possible without the coordination and engagement of local government, state and federal agencies, tribes, non-profit organizations, forest products industry and businesses, and private landowners. This report highlights numerous success stories across public and private lands, and the spirit and fortitude of community partners working to create healthy and resilience forests and landscapes. DNR is committed to continued evolution in how we implement this RCW with partners in shared stewardship.

DNR developed and published an *Environmental Justice Implementation Plan for Forest Resilience* in 2023, the first of its kind for the agency. It was developed to address the disproportionate impacts of forest health issues on vulnerable communities. Implementing forest health treatments has the potential to support numerous core values for Washingtonians. By listening, learning, and working together with indigenous communities and people, Latinx forest workers and their families, and across urban and rural forested communities, we can collectively restore ecosystem health and improve outcomes for people.

This report demonstrates the substantial progress made and the ongoing commitment to increase forest health and resilience statewide while also reducing impacts from wildfire and other natural disturbances. DNR, along with legislative, scientific, and collaborative support, is dedicated to fully implementing RCW 76.06.200 and achieving the goals of the 20-Year Forest Health Strategic Plan: Eastern Washington.

Appropriations Request

State and federal investments are essential to continuing progress towards the goals established in RCW 76.06.200. The state's strong commitment to funding proactive assessment, treatment, and monitoring has leveraged $117,194,560 in federal funding in this reporting period to support DNR and our partners. These public investments are critical for reducing wildfire risk, mitigating the impacts of drought, and adapting our forest ecosystems for climate change.

For the 2025-2027 biennium, DNR requests the following to implement RCW 76.06.200 and the strategic plans effectively:

(1) DNR requests full funding of $125 million to the Wildfire Response, Forest Restoration, and Community Resilience Account to fully implement Washington's Wildland Fire Protection 10-Year Strategic Plan, 20-Year Forest Health Strategic Plan: Eastern Washington, and State Forest Action Plan.
(2) DNR requests $1.877 million in re-appropriation of Post-Wildfire Reforestation Grants made in fiscal year 2024 that require additional time for grantees to fully implement, as well as $2.5 million in new capital funding for additional awards to respond to the scale of the reforestation needs following wildfires in Washington.
(3) Partner State Agency Requests: DNR supports the requests of our state agency partners including the Washington Conservation Commission, Washington Department of Fish and Wildlife, and Washington State Parks to plan, implement, and monitor wildfire risk reduction and forest health projects that help to fulfill RCW 76.06.200.

Washington State Department of Commerce is requesting a budget proviso to support Chelan County's efforts to establish a wood biomass facility. The project would utilize small-diameter trees thinned during forest health treatments to create value added products. The request amount is $1.425 million. This investment will support efforts in North Central Washington to fully implement the 20-Year Forest Health Strategic Plan: Eastern Washington.

Virginia Ridge Forest Health Treatment, DNR State Trust Lands. Unit was thinned in 2019 and then burned in the Cedar Creek Fire in 2021. Photo was taken in Spring 2022. Photo by John Marshall Photography.

Acknowledgments

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Introduction

The purpose of this report is to summarize progress toward meeting the direction of RCW 76.06.200, which requires DNR "to proactively and systematically address the forest health issues facing the state," and to assess, treat, and track progress. The 20-Year Forest Health Strategic Plan: Eastern Washington serves as the high-level framework guiding implementation of the forest health assessment and treatment framework in eastern Washington. The 2020 State Forest Action Plan provides a framework and goals to support the implementation of the RCW in western Washington.

Wildfires are becoming increasingly complex, costly, and impart landscape-shifting impacts each year across Washington. Risk factors for severe wildfires are growing due to a combination of factors, including climate change and drought, human ignitions, and a history of fire suppression that led to uncharacteristic fuel build-up in fire dependent forests. Our success in addressing the wildfire crisis is linked to our abilities to restore healthy forest ecosystems and aid our forests and communities against existential threats, including climate change.

The Washington State Legislature provides leadership in advancing forest health policy, as well as funding for the development and implementation of the 20-Year Forest Health Strategic Plan: Eastern Washington, an ambitious strategy that is producing unprecedented results. The Legislature passed House Bill 1168 in 2021, which created a new account and dedicated funding to fully implement the 20-Year Forest Health Strategic Plan and State Forest Action Plan. This report complements the RCW 76.04.516 report submitted by DNR, meets legislative requirements for RCW 76.06.150 (4), and provides an overview of Washington's progress in implementing the forest health assessment and treatment framework required by RCW 76.06.200.

Information and updates provided herein build on the three previous Forest Health Assessment and Treatment Framework biennial reports to the Legislature:

- 2022 Forest Health Assessment and Treatment Framework Report
- 2020 Forest Health Assessment and Treatment Framework Report
- 2018 Forest Health Assessment and Treatment Framework Report

This report complements other reports requested by the Legislature that are being implemented by the Washington State Department of Natural Resources, including:

- RCW 76.04.516 Report to the Governor and the Legislature: HB 1168
- Forest Health Treatment Prioritization and Implementation on State Trust Lands in Eastern Washington (E2SHB 1711)

Overview of Report Content

The content of the report is organized to give the reader the ability to review the document from cover-to-cover or to read individual sections of the report. While each section builds on the previous one, those who choose to review individual sections will find that the content stands on its own and is clear and accessible, regardless of the order the content is read.

The first section of this report is focused on **priority planning areas** at the center of the 20-Year Forest Health Strategic Plan: Eastern Washington. It provides an overview of the geographic focus of efforts by DNR and our partners to accelerate the implementation of forest health treatments across ownership boundaries.

The next section provides a summary of the **Forest Health Assessment and Treatment Framework methodology**. This is the fourth legislative report as required by RCW 76.06.200. Previous reports provide greater detail on the Forest Health Assessment and Treatment Framework methodology and priority planning area selection process. All previous legislative reports can be found in the DNR Forest Resilience Digital Library.

The **methods section** of the report also describes a pilot effort by DNR scientists and partners to develop a landscape assessment tool for forests in western Washington. This new approach will expand the Forest Health Assessment and Treatment Framework state-wide. Forests in western Washington, and the communities that depend on them, differ significantly from the fire-prone forests of eastern Washington. The methods for western Washington reflect these differences and provide a new tool for land managers to evaluate how changes in forest structural patterns, climate change, wildfire, drought, and aquatic conditions may influence forest health in western Washington.

The next section of the report summarizes **the forest health treatment need, notable results, and overall progress** made towards improving forest health and reducing wildfire risk across all ownerships in eastern Washington. This section highlights new and innovative approaches to tracking treatment activity over time through both landowner-reported data and satellite-based change detection monitoring.

Successful implementation of the Forest Health Assessment and Treatment Framework is not possible without partnerships and collaboration with agencies, tribes, local governments, community-based organizations and non-profits, and the timber industry. The **partnerships section** of the report highlights stories from across the state, showcasing the incredible work of individuals and partner organizations committed to making our forest ecosystems more resilient while improving the health and safety of the communities that rely on them. This section includes examples of the increasing need to act in western Washington, including investments to accelerate work on federal lands through the Good Neighbor Authority and DNR Building Forest Partnerships Grant Program. This section of the report highlights the intersection of forest health and **rural economic development**, highlighting stories and entrepreneurs who are restoring forests and creating jobs.

There is a brief section of the report focused on **aquatic restoration and resilience**, which highlights progress in high priority watersheds in western Washington, and an on-going partnership in central Washington to restore forest and aquatic system health. The aquatics section is followed by a new section detailing establishment of a statewide post-fire recovery and restoration program.

The report ends with more details about implementing the 20-Year Forest Health Strategic Plan: Eastern Washington Monitoring Framework and a **summary of key challenges and opportunities** associated with continued implementation of the strategic plan. The final section summarizes the appropriations request to the legislature, as required in RCW 76.06.200.

20-Year Forest Health Strategic Plan: Eastern Washington

The 20-Year Forest Health Strategic Plan: Eastern Washington was developed in 2017 in partnership with more than 30 organizations and agencies. These collaborative efforts resulted in a shared set of objectives to guide investments in the fire-prone forested landscapes of eastern Washington. The following vision statement, mission statement, and list of goals were developed through the strategic planning process and are memorialized in the strategic plan. These statements continue to guide the work of DNR and our partners in advancing this critical 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 State.*

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.

Forest Health is defined as the condition of a forested ecosystem reflecting its ability to:

- sustain characteristic structure, function, and processes;
- be resilient to fire, insects, and other disturbance mechanisms;
- adapt to changing climate and increased drought stress;
- have capacity to provide ecosystem services to meet landowner objectives and human needs.

Enabling Legislation and Related Strategic Initiatives

The 20-Year Forest Health Strategic Plan is supported by numerous pieces of legislation and is being implemented concurrent with related efforts by DNR and partner agencies. Previous legislative reports have outlined the relationship among these enabling policies and plans including RCW 76.06.200, Senate Bill 5546 (2017), House Bill 1784 (2019), and House Bill 1168 (2021) as well as the HEAL Act and the DNR Environmental Justice Plan for Forest Resilience. The 2022 Forest Health Assessment and Treatment Framework Legislative Report describes each of these pieces of legislation and how they relate to the 20-Year Forest Health Strategic Plan: Eastern Washington.

Alignment between Washington's State 20-Year Forest Health Strategic Plan for Eastern Washington and the USDA Forest Service Wildfire Crisis Strategy

Across the Western United States, unprecedented legislative and financial support at both the state and federal levels have improved forest health and reduced wildfire risk. The 20-Year Forest Health Strategic Plan: Eastern Washington (FHSP) is the primary strategy guiding the state's forest health investments east of the Cascade crest. The Wildfire Crisis Strategy (WCS) is the core document guiding USDA Forest Service investments in the western United States. The two strategies provide high-level frameworks that include spatially explicit prioritization of areas to implement forest health and fuels treatments. While both strategies call for interagency cooperation and cross-boundary work, each is based upon different scales, frameworks, and prioritization metrics. Managers are interested in understanding these differences and are working proactively to identify opportunities to align management direction.

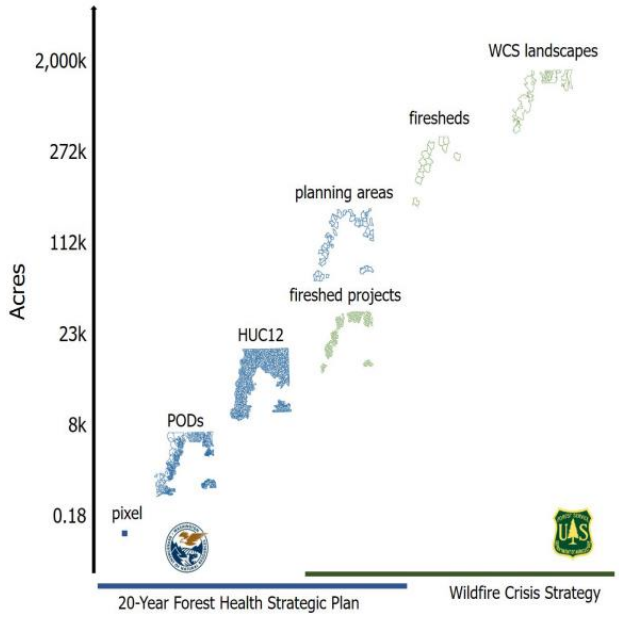


Figure 1. Nested scales of the different forest health policies in eastern Washington. The Y axis shows the average size of each prioritization unit, but distances in the axis are not true to scale. The 20-Year Forest Health Strategic Plan: Eastern Washington produces prioritization products that vary from pixel scale (landscape evaluation, landscape treatment priority) to the scale of the planning area. PODs and PCLs summarize products of the dual benefit analysis in FHSP landscape evaluations. The WCS prioritization starts with fireshed projects that are nested into firesheds and firesheds are used to inform the delineation of WCS landscapes.

DNR and Forest Service scientists authored a white paper to help managers and partners understand how the two strategies were created, what goals they aim to achieve, how they prioritize areas for investments, and how they are being operationalized in Washington. The publication also provides context about the public policies and scientific research that led to their development and how those products are informing implementation in Washington. Despite their differences, the WCS and the FHSP share a fundamental common denominator: the need to implement fuels reduction and forest health treatments at the landscape scale. Further, both plans identify similar geographies as high priorities for treatment despite utilizing different methods and approaches to delineate these areas, suggesting that there is shared agreement and multiple lines of evidence about the landscapes that require immediate attention.

The WCS and the FHSP identify more than 2.5 million acres of co-located landscapes for fuels reduction and forest health treatments. This strong alignment and synergy will help DNR and the Forest Service leverage additional resources and ultimately accomplish more together than each agency can on its own. These strategies are the culmination of decades of science, policy, land management, and broad public recognition of the wildland fire problem. They present a unique opportunity to change the forest health paradigm by acting with urgency and at a scale commensurate with the problem. Click here to read the white paper and to learn more about the relationship between these two strategies.

Okanogan-Wenatchee National Forest, Upper Wenatchee Priority Planning Area. Photo by DNR.

20-Year Forest Health Strategic Plan: Priority Planning Areas

Forest health and wildfire risks in eastern Washington are so widespread that it is logistically impossible to address them all at once. A prioritization process is essential to focus state and partner resources in high-priority landscapes, and to successfully implement the treatment framework.

Every two years since the adoption of the 20-Year Forest Health Strategic Plan: Eastern Washington, DNR and partners have identified priority planning areas to conduct forest health assessments that inform the scale and prioritization of collective investments and management actions necessary to move towards more resilient forest landscapes.

The first step of the framework is to select which watersheds will form the priority planning areas to analyze forest health treatment needs. This section of the report describes how priorities planning areas are defined, the methodological approach used to identify them, and how they relate to the State Lands prioritization required under E2SHB 1711.

Priority Planning Area Definition

A priority planning area is one or more HUC 6 watersheds that contain high priority state, federal, tribal, and/or local forest health needs. DNR identifies priority planning areas through a data driven prioritization process at the HUC 6 watershed scale, followed by stakeholder feedback and engagement. Once a priority planning area is selected, DNR commits to conducting a forest health assessment across all land ownerships in that landscape, as well as to partner with other stakeholders to implement and monitor forest health treatments and forest conditions over time. Priority planning areas are also sometimes referred to as priority landscapes.

Priority Planning Area Selection

In March of 2018, DNR finished identifying the first set of priority planning areas to evaluate for forest health treatment needs under the treatment framework in the 2018 and 2020 planning cycles. Additional planning areas were identified in each biennium.

To guide this process, DNR first completed a data-driven prioritization of watersheds. Watersheds were scored based on a variety of forest health, wildfire risk, and value-based variables. Scores for each metric were derived from one or more datasets representing the best available, current science. A detailed description of the methodology and results of the watershed prioritization process are available in Appendix 1, pages 42-52, of the 20-Year Forest Health Strategic Plan and Appendix A of the 2018 Forest Health Assessment and Treatment Framework Report.

Robust stakeholder feedback and engagement built off the watershed prioritization process to identify state and local high-priority forest health needs and opportunities. The watershed prioritization

informed boundaries of priority planning areas, but community and resource managers in each landscape ultimately determined final lines on the map. Ongoing collaboration and planning may adjust the priority planning areas boundaries as needed over time.

RCW 76.06.200 requires DNR to assess a minimum of 200,000 acres of fire-prone lands each biennium to identify forest health treatment needs. DNR recognized that providing these assessments would be key to catalyzing action in each priority planning area. Through 2024, 45 priority planning areas were assessed to focus all-lands forest health analysis, treatment, monitoring, and coordination efforts. The 45 priority planning areas comprise 5,026,895 acres, greatly exceeding the minimum required by the legislature. DNR chose to assess more than the minimum acreage required by the legislature early on to reflect the urgency for strategic, proactive action guided by science. The information provided in these assessments is catalyzing change by providing communities and landowners in these priority landscapes with data-driven tools and resources to address the crisis.

New Priority Planning Areas for 2026

Applying previous watershed prioritization work, ongoing collaboration, and focused stakeholder outreach, DNR has identified eight new priority planning areas to be assessed by December 2026. The new priority planning areas identify forests 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 resources.

For 2026, the eight new priority planning areas for the 20-Year Forest Health Strategic Plan were selected based on outreach conducted to the USDA Forest Service, DNR Service Forestry, DNR State Lands, Washington Department of Fish and Wildlife, Washington State Parks, tribes and the Forest Health Advisory Committee. New priority planning areas include:

1. Upper Yakima: Priority for the Okanogan-Wenatchee National Forest; restoration project is planned for a decision in 2024-2028.
2. Entiat: Priority for the Okanogan-Wenatchee National Forest; restoration project is planned for a decision in 2024-2028.
3. Conconully: Priority for the Colville National Forest and DNR State Lands. Colville National Forest restoration project is planned for a decision in 2028.
4. Curlew: Priority for the Colville National Forest and DNR Northeast Region Service Forestry Program. Colville National Forest restoration project is planned for a decision in 2028.
5. Orient: Priority for DNR Northeast Region Service Forestry Program and Colville National Forest. Colville National Forest has several restoration projects in the area.
6. Kettle: Priority for DNR Northeast Region Service Forestry Program and Colville National Forest. Colville National Forest has several restoration projects in the area.
7. Usk: Priority for the Colville National Forest. Colville National Forest restoration project is planned for a decision in 2029.

8. Spokane North: Priority for DNR Northeast Region Service Forestry Program.

The Asotin and Tucannon planning areas were moved to the 2026 assessment cycle as well to account for changed structure conditions following recent wildfires and refinement of landscape evaluation methods in the Blue Mountains. In total there will be ten additional priority planning areas analyzed for forest health treatment needs by December 2026. The ten planning areas encompass 997,226 acres in eastern Washington.

To date, DNR has selected a total of 55 priority planning areas representing more than 6,024,121 acres to focus forest health assessments and investments (see Tables 1 and 2). The priority planning areas provide a powerful footprint across eastern Washington to continue implementing the forest health plan with partners.

Mt. Hull Priority Planning Area, Okanogan County. Photo by DNR.

Figure 2. Priority Planning Areas for 20-Year Forest Health Strategic Plan: Eastern Washington

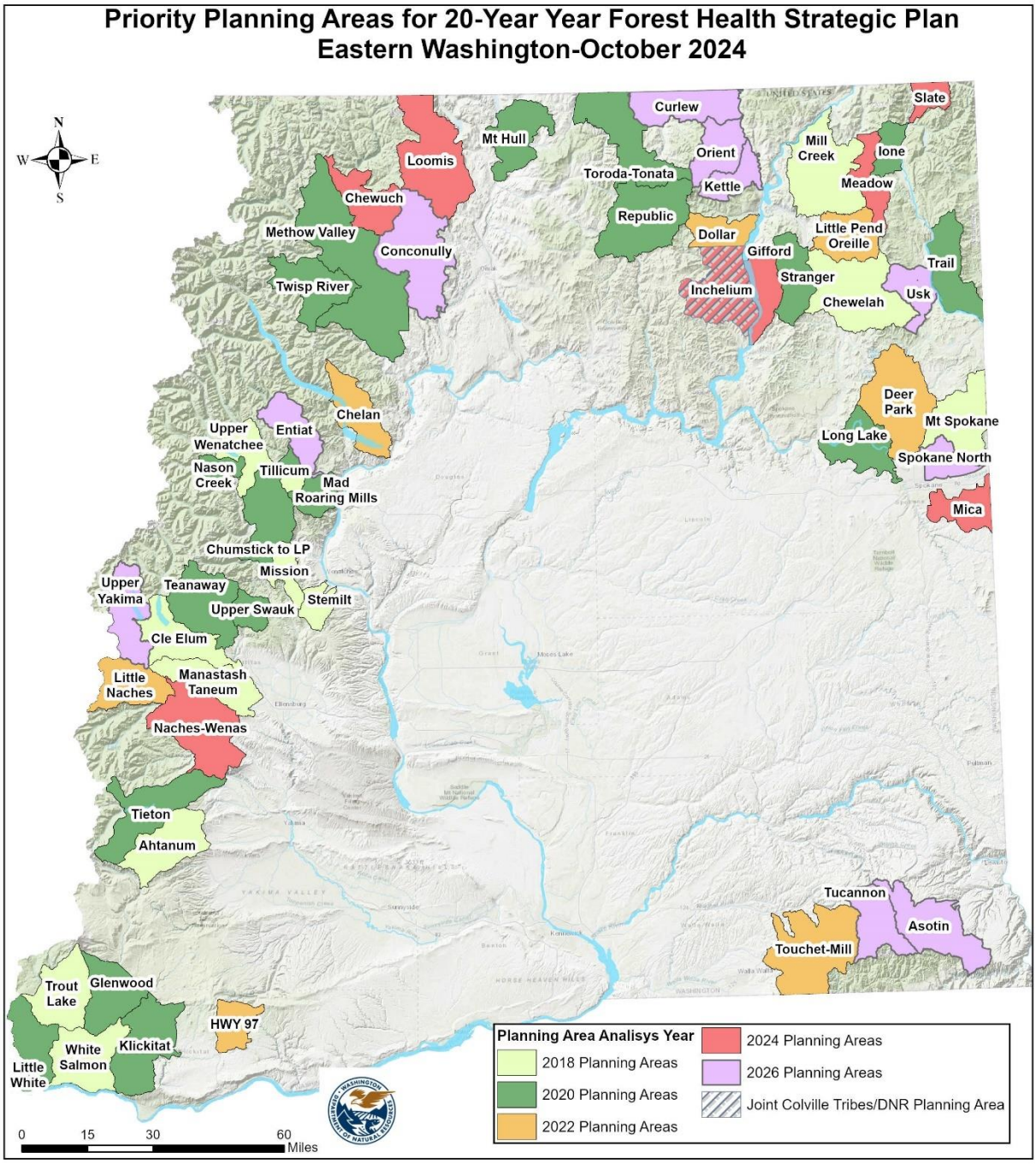


Table 1. 20-Year Forest Health Strategic Plan: Eastern Washington Priority Planning Areas (2018-2022)

Priority Landscape	Year	Total Acres	Forested Acres	Total Forested Acres by Ownership Class				
				Federal	State	Private	Tribal	Municipal or NGO
Ahtanum	2018	120,477	89,217	722	54,671	8,090	22,905	2,783
Chewelah	2018	195,408	158,352	83,667	7,068	67,026	145	387
Cle Elum	2018	109,396	80,300	20,608	6,298	39,307	0	13,243
Manastash Taneum	2018	104,072	65,833	25,272	31,312	2,019	0	7,228
Mill Creek	2018	186,306	162,060	50,337	18,477	93,112	0	0
Mission	2018	49,121	32,743	21,353	859	10,356	0	125
Mt Spokane	2018	121,767	95,814	0	19,463	75,873	0	353
Stemilt	2018	38,961	22,613	2,463	9,648	7,665	0	2,828
Tillicum	2018	14,326	11,241	9,190	145	1,906	0	0
Trout Lake	2018	117,153	105,015	65,443	18,290	21,278	4	0
Upper Wenatchee	2018	74,777	66,277	56,254	862	8,900	0	0
White Salmon	2018	126,688	104,022	6,260	27,174	69,822	164	181
Chumstick to LP	2020	115,333	84,216	50,092	4,716	29,278	0	13
Glenwood	2020	104,501	83,758	2,439	35,401	38,064	7,736	118
Ione	2020	44,248	41,784	28,407	3,729	9,424	0	0
Klickitat	2020	149,649	103,274	2,205	19,962	78,128	1,576	1,403
Little White	2020	95,750	84,705	65,764	3,955	14,632	0	330
Long Lake	2020	103,291	41,253	275	7,602	32,365	7	648
Mad Roaring Mills	2020	65,008	33,325	24,340	3,129	5,796	0	0
Methow Valley	2020	338,246	182,937	147,457	16,699	18,722	0	3
Mt Hull	2020	105,431	34,809	18,248	1,347	14,757	201	4
Nason Creek	2020	31,679	29,243	17,640	491	10,976	0	0
Republic	2020	180,553	144,350	92,220	6,394	34,975	10,631	17
Stranger	2020	89,904	72,061	547	17,798	53,696	0	0
Teanaway	2020	132,120	111,696	56,024	46,130	6,749	0	2,738
Tieton	2020	148,634	117,781	100,139	12,618	4,449	106	446
Toroda-Tonata	2020	153,611	117,345	82,816	8,361	26,068	45	0
Trail	2020	105,242	94,948	40,033	8,400	41,596	3,728	1,140
Twisp River	2020	111,918	82,349	78,623	826	2,697	0	0
Upper Swauk	2020	39,175	35,450	34,524	31	747	0	0
Chelan	2022	98,051	31,342	26,390	409	4,326	0	0
Deer Park	2022	181,171	90,497	0	5,014	82,795	0	2,436
Dollar	2022	61,238	50,767	45,873	442	4,326	117	0
Highway 97	2022	60,398	37,415	12	116	35,760	423	1,104
Little Naches	2022	95,433	92,914	87,238	0	21	0	5,653
Little Pend Oreille	2022	92,994	81,148	38,921	14,720	27,408	0	0
Touchet-Mill	2022	203,750	110,794	39,354	1,486	59,987	8,669	1,298
Total	2018-2022	4,165,780	2,983,648	1,421,150	414,043	1,043,096	56,457	44,479

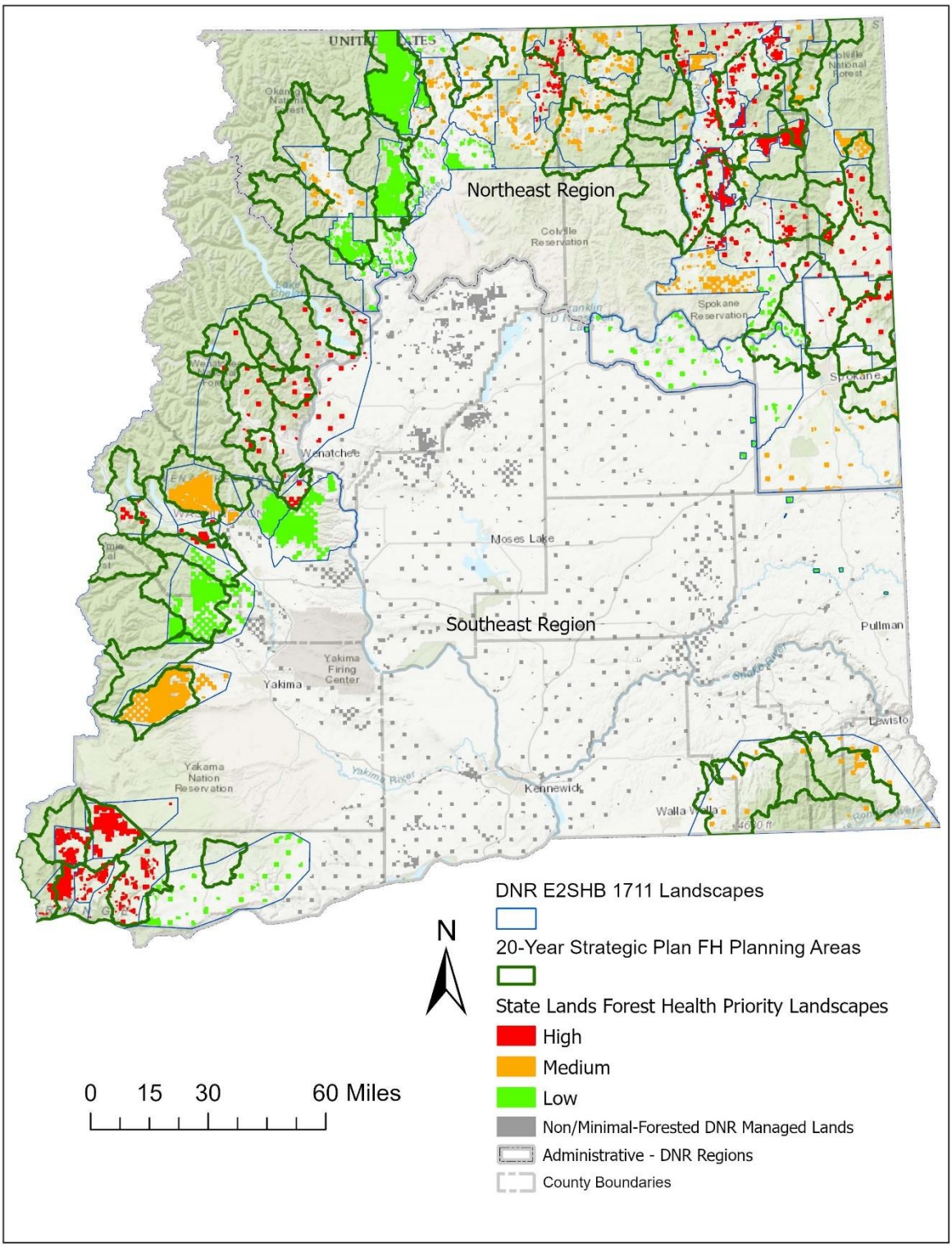
Table 2. 20-Year Forest Health Strategic Plan: Eastern Washington Priority Planning Areas (2024-2026)

Priority Landscape	Year	Total Acres	Forested Acres	Total Forested Acres by Ownership Class				
				Federal	State	Private	Tribal	Municipal or NGO
Chewuch	2024	94,250	91,668	91,070	538	60	0	0
Gifford	2024	71,962	39,016	1,336	4,182	33,457	10	0
Inchelium	2024	146,263	121,779	742	0	20,441	100,566	0
Loomis	2024	198,991	170,701	22,400	130,773	17,168	0	0
Meadow	2024	60,235	59,050	42,391	11,260	5,272	0	0
Mica	2024	72,608	39,178	0	1,222	31,845	0	5,974
Naches-Wenas	2024	180,858	121,981	61,097	50,108	10,165	0	346
Slate	2024	35,948	34,905	32,598	0	2,146	0	113
Asotin	2026	149,152	93,329	61,444	7,327	24,547	0	10
Tucannon	2026	98,616	80,099	63,108	6,122	10,869	0	0
Conconully	2026	198,243	150,201	92,698	44,840	12,357	105	0
Curlew	2026	113,401	89,967	68,679	4,109	17,068	51	0
Entiat	2026	80,936	56,583	54,061	79	2,310	0	0
Kettle	2026	58,330	51,799	42,783	328	8,677	1	0
Orient	2026	82,590	79,955	76,853	766	2,336	0	0
Spokane North	2026	51,656	14,685	0	69	13,563	0	1,014
Upper Yakima	2026	98,825	89,279	65,182	5,381	4,439	0	14,177
Usk	2026	65,477	50,827	18,526	3,479	27,820	251	722
Total	2024-2026	1,858,341	1,435,002	794,968	270,583	244,540	100,984	22,356

DNR State Trust Lands Priority Landscapes

The all-lands process that led to the identification of priority planning areas for implementation of RCW 76.06.200 is different from DNR state trust lands' prioritization process to implement E2SHB 1711. Under Engrossed Second Substitute House Bill (E2SHB) 1711, DNR's obligation is to prioritize state trust lands for forest health treatment according to its values and goals related to timber production, wildlife habitat, and wildfire risk, among other values. E2SHB 1711 prioritization identifies high, medium, and low priority landscapes for forest health treatment to inform treatment needs for the next two, six and 20 years. Many of the state trust lands priority treatments occur in the forest health plan's priority planning areas, ensuring that DNR's work to fulfill legislative direction is done in concert with landscape-level change. For details on the prioritization process and treatments on DNR state trust lands, see the E2SHB 1711 legislative report.

Figure 3: Map of DNR State Trust Lands Priority Landscapes and 20-Year Forest Health Strategic Plan: Eastern Washington Priority Planning Areas



Forest Health Assessment and Treatment Framework Methodology

Following the identification of priority planning areas, DNR assesses the current condition of each landscape and its level of resilience to future disturbances and climatic change using a terrestrial landscape evaluation, hereafter referred to as a landscape evaluation. The landscape evaluation serves as the assessment component of the Forest Health Assessment and Treatment Framework outlined in RCW 76.06.200.

A landscape evaluation is a data-driven approach to understanding the current condition of a landscape, its level of resilience to disturbances and climate change, and its ability to provide an array of ecosystem services over time (Hessburg et al. 2015). Ecosystem services are commonly defined as the benefits people obtain from ecosystems, including cultural values, regulation of climate, and provision of food, freshwater, fuel, fiber, and other goods. A landscape evaluation includes detailed information about vegetation departure from historic conditions, fire risk, projected climate change effects and associated drought stress, wildlife habitat, and other resources. Evaluations are first conducted without consideration of land ownership or road access to fully assess landscape condition and forest health treatment needs. Management objectives of different public and private landowners, as well as road access, are later incorporated into the evaluation process.

DNR defines resilience as the ability of a landscape to sustain desired ecological functions, associated human needs, and critical landscape processes over time and under changing conditions. In terms of wildfire, a resilient landscape can adapt to a warming, drying climate and increases in wildfire by shifting to tree species that are more tolerant of drought and wildfire, as well as incorporating fuel structures and landscape patterns that are aligned with future climate and fire regimes. A resilient landscape is resistant to large-scale, high-severity fires, and drought-induced tree mortality that can lead to rapid, destabilizing shifts in conditions that make adaptation much more challenging.

The primary outputs of landscape evaluations are an estimate of overall treatment need and spatial prioritization of treatment locations. Evaluations include assessments of fire risk to forest ecosystems, current and future drought vulnerability due to climate change, forest structure types that are overabundant relative to desired reference conditions, and wildlife habitat needs. Landscape patterns are also analyzed to assess whether vegetation is overly fragmented or aggregated in ways which affect habitat suitability, and fire and insect behavior.

This information and data are synthesized to quantify the shifts in vegetation conditions and patterns needed to create a landscape that is resilient to wildfire, drought, and drought-related insect outbreaks, while also sustaining closed-canopy forests (Hessburg et al. 2015). Overall treatment needs are estimated in the landscape prescription and then broken down by specific forest types (e.g., cold, moist, or dry), structure (tree size and density), and species composition in some cases.

Locations within the target landscape are then prioritized for treatment based on the same data sources. Wildfire transmission to homes is added to highlight locations where fire starts pose the highest risk to homes. The goal of the landscape treatment prioritization is to identify where treatments will

accomplish the greatest amount of fire risk reduction and climate adaptation work, while also reducing fire risk to communities. In addition, locations best suited to sustain large tree, closed canopy forests over time are identified in a companion layer to help managers meet wildlife habitat, timber production, and carbon storage objectives.

An aquatic evaluation may also be conducted along with one of terrestrial conditions to better summarize conditions of watershed function, including the stream network and associated fish habitat, riparian vegetation, and sediment flows. Restoration opportunities to reduce road-related effects, reconnect floodplains, or enhance in-stream habitat are identified and prioritized. DNR does not currently have the expertise or resources to conduct aquatic evaluations in all priority planning areas. For a summary of an aquatic evaluation methodology developed in partnership with Yakama Nation please visit the 2022 Forest Health Assessment and Treatment Framework Legislative Report.

The landscape evaluation process is utilized by DNR to assess and prioritize forest health treatment needs in priority planning areas as required by RCW 76.06.200. This process provides a common scientific basis, set of data products, and a language for landowners to understand current conditions, risks to different resources, and anticipated climate impacts. It further encourages cross boundary coordination and builds consensus around treatment targets. Evaluations provide a benchmark for tracking progress towards desired forest health conditions.

It is important to note that landscape evaluations are living documents – wildfires and other major natural disturbances will occur in priority planning areas. Wildfires have affected several priority planning areas since the adoption of the 20-Year Forest Health Strategic Plan in 2017. It is expected that wildfires will burn more acres than can be treated over the life of the forest health strategic plan and will thus shift vegetation conditions over hundreds of thousands of acres in both positive and negative directions. Given the dynamic nature of landscapes and the timeframe of the 20-Year Forest Health Strategic Plan, updates to landscape evaluations will occur as treatments and natural disturbances change conditions on the ground, input datasets for current conditions are improved, and methodologies are refined based on new science and monitoring results.

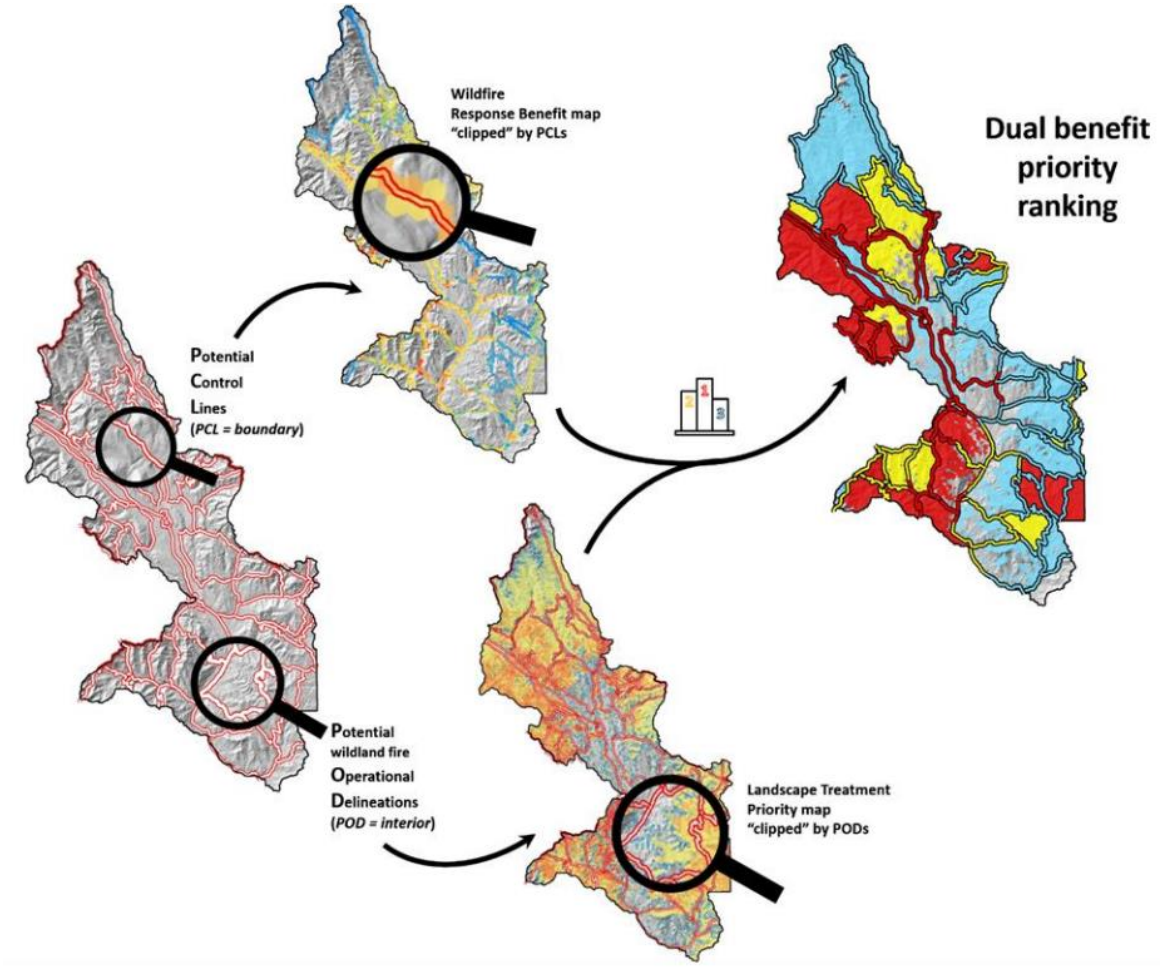
Landscape Evaluation Methodology

The methods used to conduct landscape evaluations and prescriptions in eastern Washington are based on the best available science regarding landscape restoration (Hessburg et al. 2015, Spies et al. 2018), quantitative wildfire risk assessment (Scott et al. 2013), analysis of cross-boundary wildfire transmission (Ager et al. 2019a) and climate change adaptation strategies (Halofsky et al. 2016, Littell et al. 2016). The approach utilizes the framework for landscape evaluations developed for the Okanogan-Wenatchee National Forest (OWNF) Restoration Strategy (Hessburg et al. 2013). In addition, input from local land managers and stakeholders is incorporated at various stages of the process for specific planning areas. A summary of the core components is provided below.

1. Identify ownership types and management objectives.
2. Map vegetation and forest types.
3. Map current forest structure and species composition.
4. Assess departure from reference conditions.
5. Assess wildfire risk.

6. Analyze drought vulnerability.
7. Map habitat for focal wildlife species.
8. Evaluate aquatic function.
9. Estimate treatment targets.
10. Evaluate operational feasibility and economics.
11. Map dense forest, large tree sustainability.
12. Prioritize landscape treatment.
13. Prioritize wildfire response benefit.

Figure 4. From Potential Operational Delineations (PODs) to priority rankings of dual benefit. PODs correspond to large landscape areas surrounded by potential control lines (PCLs, shown in red with white fill). PCLs can be ridgelines, roads, old fire scars or treatments and correspond to locations where firefighters have potential for fire control. PODs were ranked based on the landscape treatment priority metric, and PCLs were ranked based on the wildfire response benefit priority metric. The dual benefit priority map shows PCL priorities and POD priorities combined in the same map to highlight opportunities for treatments that provide a dual benefit of forest health and wildfire response benefit. Red areas show first priority, yellow areas show second priority, and blue areas show third priority.



Landscape evaluations are updated over time as new data becomes available. In 2024, new wildfire risk analytics were integrated into landscape evaluations. This includes updates to key data layers including wildfire risk to people and property, forests, timber, infrastructure, and drinking water.

Dual benefit calculations in 2024 Landscape Evaluations stayed consistent with previous versions except for removing Crown Fire Potential calculations from the Wildfire Response Benefit metric and using the latest data available on risk products. This decision is based on the improved fire modeling analytics associated with the 2023 Quantitative Wildfire Risk Assessment that precludes the need for the Crown Fire Potential data.

Click here to view a more detailed description of the methodology and products associated with Forest health Assessment and Treatment Framework data.

Assessing Forest Health in Western Washington: A Pilot Effort to Explore Methodologies for Aquatic and Terrestrial Landscape Evaluations

This report highlights new approaches to evaluating aquatic and terrestrial restoration in western Washington, a priority identified in Washington's State Forest Action Plan and aligned with the intent of RCW 76.06.200. DNR scientists are working with partners to pilot a new approach to restoring forest health on the west side of the Cascades. This work emphasizes the critical relationship between forests and water – one inherently linked to salmon recovery, drinking water, agriculture, recreation, and a host of other resource values.

Recognizing the importance of maintaining and improving forest health and resilience statewide, the Washington Legislature directed DNR to establish a forest health assessment and treatment framework to proactively and systematically address the forest health issues facing the state (RCW 76.06.200). In 2017, the DNR collaboratively developed the 20-Year Forest Health Strategic Plan with an initial focus on eastern Washington. The strategic plan defined a process and methodology for informing investments in treatments by first identifying priority landscapes and then assessing the condition of the landscapes using a process referred to as a landscape evaluation.

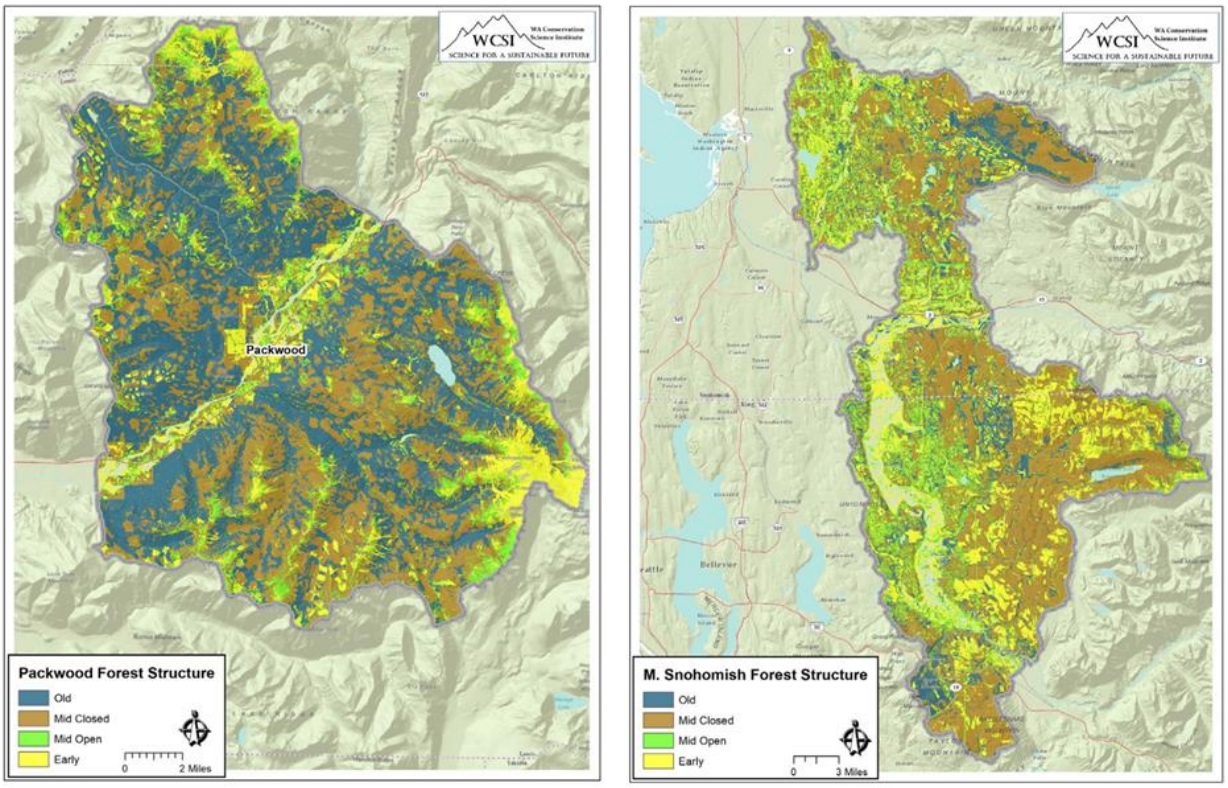
Forest ecosystems of western Washington face unprecedented issues as a result of climate change, challenging communities and society to find ways to address them (Haugo et al. 2015, 2018; Halofsky et al. 2018a, 2018b, Donato et al. 2019, Reilley et al. 2022). The State Forest Action Plan commits to "work internally across DNR divisions, 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." While landscape evaluation processes and indicators are well developed for eastern Washington, the differences in vegetation types, fire regimes, ownership patterns, and socio-economic conditions require a different set of indicators in western Washington.

The following landscape objectives guide landscape evaluations in western Washington:

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

DNR scientists and external partners drafted a report to document the technical process used to establish a preliminary set of ecological and social indicators, along with assessment tools, which will inform discussions and planning for future landscape evaluations in western Washington. These preliminary indicators and evaluation tools were applied to assess conditions within two pilot landscape planning areas, the Middle Snohomish area and Packwood area. Each planning area provides a unique range of ownerships and forest types in western Washington, ideal for providing place-based assessment results that partners can use to inform management planning.

Figure 5. Forested structure classes within the Packwood planning area (left) and the Middle Snohomish planning area (right).



The pilot landscape evaluations are the first step in developing a forest health assessment framework for western Washington. The indicators and evaluation tools will need to be modified to address the local needs within individual landscapes and as the science evolves. The landscape evaluation pilot is

being developed concurrently with broader regional planning informed by the Forest Health Advisory Committee to create an all-lands western Washington forest health strategy. Click here to learn more about landscape evaluations in western Washington.

Buckshoot Timber Sale on the Okanogan-Wenatchee National Forest, Fall 2024. This commercial forest health thinning was administered by the DNR Federal Lands Program and is the last component of the Buck Forest and Fuels Project in the Cub Creek and Eightmile Creek watersheds. Methow Valley Priority Planning Area. Photos by DNR.

Forest Health Treatment Need Assessment Results

The purpose of this section is to describe the relationship between the various methods and approaches used to evaluate and report on forest health treatment needs and implementation progress over time. This includes forest health restoration needs from published literature, Goal 1 of the 20-Year Forest Health Strategic Plan, forest health treatment needs identified in the Forest Health Assessment and Treatment Framework, also known as landscape evaluations, and forest health treatment activities reported via the Forest Health Tracker and change detection monitoring.

What is the forest health treatment need in eastern Washington?

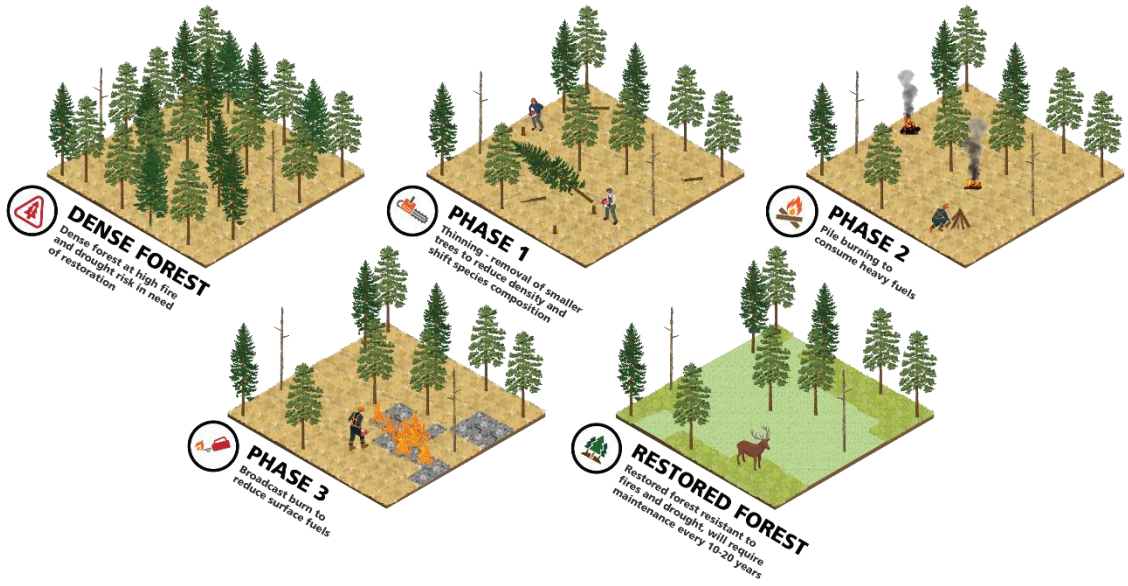
Forests in eastern Washington cover approximately 10 million acres and due to a wide variety of natural disturbances and forest management activities, are very dynamic. Previous analyses and published research found that about 3 million of acres need some type of active management or disturbance to sustain forests that are more resilient to wildfire, drought, and other stressors (Haugo et al. 2015, Laughlin et al. 2023).

The Washington State Legislature passed ESHB 2376 in 2016, directing the Washington State Department of Natural Resources (DNR) to develop the 20-Year Forest Health Strategic Plan: Eastern Washington to address this forest health need. The Legislature amended RCW 76.06 in 2017 to require DNR to "establish a forest health assessment and treatment framework designed to proactively and systematically address the forest health issues facing the state. Specifically, the framework must endeavor to achieve an initial goal of assessing and treating one million acres of land by 2033" (RCW 76.06.200).

The 20-Year Forest Health Strategic Plan was released in October 2017. Plan authors tiered Goal 1 of the strategic plan with the goal of 1 million acres set by the Legislature by prorating the Legislature's goal to 1.25 million acres to account for the additional four years captured by the plan outside the language in the RCW. While the initial acreage goal was a bold, initial step, the actual treatment needs are to be determined by forests health assessments, making for a dynamic goal based on changing conditions and our collective progress made over time.

All forest treatment needs are set in footprint acres. Each forested acre will likely require two to three treatments (i.e. two to three activity acres) to restore one footprint acre. Thus, the totality of the treatments required to "restore" 1 million acres of land is likely to require 2 to 3 million acres of total activity treatments. These treatments include use of a combination of treatment tools.

Figure 6. Potential treatment sequence to restore drought and fire-resistant forests. One footprint acre of dense forest will often require multiple treatments (activity acres) over several years to achieve a restored forest condition that is resistant to drought and wildfire. The sequence illustrated in this figure is one of several potential treatment pathways that could lead to a restored forest condition. Often some combination of thinning, prescribed fire and/or wildfire will be needed over several years to reduce overstory, understory, and surface fuels to achieve forest conditions that are drought and wildfire resistant.



Commercial and non-commercial mechanical treatments are generally the most effective and predictable tools for reducing canopy density and fire risk, provided that follow up surface and ladder fuel reduction treatments are completed using prescribed fire or mechanical methods. However, it will not be possible in most planning areas to achieve the targets with mechanical treatments alone due to limitations such as lack of access. It is critical that we significantly increase the use of prescribed fire on these landscapes. Managed wildfire is another important tool that can be used to accomplish needed work when used in appropriate locations under the right circumstances. Managed wildfire is anticipated to play an important role in maintaining treatments over time, especially on National Forest System lands.

Forest Health Treatment Need Assessment Results

To date, DNR scientists have assessed forest conditions across 45 priority planning areas, covering 5,026,895 acres. Landscape assessments for the first 45 priority planning areas have identified a restoration need between 1,120,270 and 1,616,770 footprint acres.

The purpose of a landscape assessment, also referred to as a landscape evaluation, is to set high-level forest health treatment target recommendations for each planning area so that DNR, landowners, and

other stakeholders understand the level and types of treatments needed to create forest conditions that are resilient to large-scale disturbances such as wildfire and climate change. Landscape evaluations serve as the "assessment" component of the Forest Health Assessment and Treatment Framework (RCW 76.06.200).

The results in Table 3 below shows the total treatment need, expressed in footprint acres, across all 45 assessed planning areas as of December 1, 2024.

Table 3. Forest Health Treatments Needs for Priority Planning Areas Assessed (2018-2024)

Planning Area	Forest Structure Class (acres)			
	Small Dense[1]	Medium-Large Dense[2]	Medium-Large Open[3]	Total treatment need
2018 Structure Class Total	**10,000 - 17,000**	**240,700 - 342,900**	**33,000 - 63,700**	**283,700 - 423,600**
2020 Structure Class Total	**17,750 - 30,900**	**378,500 - 516,100**	**113,250 - 177,500**	**509,500 - 724,500**
2022 Structure Class Total	**4,500 - 7,750**	**118,500 - 168,000**	**27,850 - 43,950**	**150,850 - 219,700**
2024 Structure Class Total	**22,250 - 26,750**	**102,200 - 151,300**	**33,750 - 52,900**	**158,200 - 230,950**
Structure Class Total	**54,500 - 82,400**	**839,900 - 1,178,300**	**207,850 - 338,050**	**1,102,250 - 1,598,750**
Grand Total (2018, 2020, 2022, and 2024 planning areas)	**1,120,270 - 1,616,770 acres**			
Anticipated Treatment Type	[1] Noncommercial thin plus fuels treatment. May be fire only (prescribed or managed wildfire).			
	[2] Commercial thin plus fuels treatment if access exists. May be noncommercial, fire only (prescribed or managed wildfire), or regeneration treatment.			
	[3] Maintenance treatment: prescribed fire, managed wildfire, or mechanical fuels treatment. Target range corresponds to 50-75% of dry open and 25-50% of moist open forests.			
Notes	Grand Total includes acres from planned US Forest Service treatments in the Tillicum and Mission Maintenance planning areas that are not in the Structure Class Total.			

Forest health treatment needs in landscape evaluations are expressed as ranges of acres because there is no single structural condition that represents a resilient landscape. These ranges are dynamic due to a combination of disturbances that are anticipated to shift over time. The treatment ranges also provide options for landowners to manage for and balance different objectives, while still meeting the overall goal of a resilient landscape that is more adaptable to a changing climate. For example, managing for the high end of treatment needs will emphasize fire risk reduction, increased resistance to drought and related insect outbreaks, higher water yield potential, and more habitat for wildlife species that use open canopy forests. Conversely, managing for the lower end of treatment need will emphasize habitat for closed-canopy dependent species, timber production, carbon storage, and reduction of road system effects on aquatic systems.

Table 4. Forest Health Treatments Needs for Priority Planning Areas Assessed (2024)

Planning Area (2024)	Forest Structure Class (acres)			
	Small Dense[1]	Medium-Large Dense[2]	Medium-Large Open[3]	Total treatment need
Chewuch	1,500 - 2,000	1,000 - 2,500	3,250 - 5,000	5,750 - 9,500
Gifford	3,450 - 3,800	7,250 - 10,000	2,550 - 4,100	13,250 - 17,900
Inchelium	1,500 - 1,750	15,000 - 24,250	6,000 - 10,000	22,500 - 36,000
Loomis	11,250 - 12,750	17,750 - 29,000	9,000 - 13,500	38,000 - 55,250
Meadow	50 - 200	21,200 - 26,800	1,600 - 2,800	22,850 - 29,800
Mica	2,250 - 2,500	9,000 - 12,250	2,100 - 3,250	13,350 - 18,000
Naches-Wenas	2,250 - 3,750	18,000 - 30,500	8,500 - 13,000	28,750 - 47,250
Slate	-	13,000 - 16,000	750 - 1,250	13,750 - 17,250
2024 Structure Class Total	22,250 - 26,750	102,200 - 151,300	33,750 - 52,900	158,200 - 230,950

Anticipated Treatment Type	[1] Noncommercial thin plus fuels treatment. May be fire only (prescribed or low/moderate-severity wildfire).
	[2] Commercial thin plus fuels treatment if access exists. May be noncommercial, fire only (prescribed or low/moderate-severity wildfire), or regeneration treatment.
	[3] Maintenance treatment: prescribed fire, low/moderate-severity wildfire, or mechanical fuels treatment. Target range corresponds to 50-75% of dry open and 25-50% of moist open forests.

Table 4 summarizes the results of priority planning areas assessed in 2024. Across the eight priority planning areas assessed in 2024, a total treatment need of 158,200 to 230,950 footprint acres were identified. The landscape evaluation summaries for each of the eight planning areas can be found in the Appendix of this report.

The landscape evaluations establish clear targets for shifts in vegetation conditions required to create a resilient landscape. The scale of these shifts may seem difficult to achieve in some priority planning areas. The goal of having landscape evaluations within the forest health plan, however, is to provide land managers and partners with a data-driven blueprint to empower a common vision of treatment need.

Pre-treatment (left) and post-treatment (right) photos of a commercial treatment unit on the Okanogan-Wenatchee National in the Libby Creek watershed. Project is located in the Methow Valley Priority Planning Area. Photos were taken in 2023 and 2024. Photos by John Marshall Photography.

Tracking Forest Health Treatment Accomplishments and Changed Forest Conditions

DNR has developed two complementary products to track treatments and other causes of forest structure change: a user-reported forest health treatment database and satellite-based change detection. Each product has unique benefits and constraints, but together they represent a nearly comprehensive dataset of forest change across eastern Washington. The combination of the two data sets provides the most complete view of forest management activities and natural disturbances that move forest conditions towards or away from the resilience goals established in the landscape evaluations.

User Reported Forest Health Treatment Database

DNR collects reported forest health treatments from public, private, and tribal partner organizations. The treatment data is maintained in a forest health treatment database. This database, covering 2017 to 2024, consists of user-reported forest health treatments and is updated twice each year. Data is made publicly available through memos, display dashboards, and in DNR's Open GIS Portal indicating treatment details such as landowner, type of activity, and treatment completion date.

The primary limitation of the forest health treatment database product is that the treatments are user-reported and may be incomplete. DNR is reliant on land managers to report and maintain their own data, so this database is not yet a census of treatment activity occurring on the landscape. However, lower-intensity treatments not captured in the change detection product, as described below, may be captured in this database because they are reported by the landowner.

Satellite-Based Change Detection

The change detection product uses annual satellite data to identify areas of likely forest mortality and to determine the causal agent using machine learning. This product aims to provide an unbiased, wall-to-wall view of areas of forest change across eastern Washington. However, due to the satellites' resolution and analytical limitations, some understory management activities may be missed or only partially captured; examples include prescribed fire, pre-commercial thinning, and mastication. Despite these limitations, this change detection information is very successful at spatially identifying overstory forest management activities that might be missing from user-reported databases.

The change detection product enables DNR to capture additional forest management activities not reported by landowners. However, change detection does not ensure the forest management activity is motivated by a forest health objective. For example, change detection may identify areas that are primarily managed for economic objectives and timber production.

Figure 7. Forest health treatment toolbox. Examples from eastern Washington (clockwise from top left): two images of commercial thinning on DNR state trust lands in the Methow Valley planning area; landscape view of the 2018 Crescent Fire in the Twisp planning area; Washington Department of Fish and Wildlife's wildlife area after thinning (2017) and prescribed fire treatments in the Methow Valley (2019); 2020 prescribed burn treatment in the Stemilt planning area; non-commercial thinning of young forest stand. Photos courtesy of John Marshal Photography, DNR, and Chelan County.

Reported Forest Health Treatment Accomplishments

Tables 5, 6, 7 and Figures 8 and 9 below provide a summary of reported forest health treatments between January 1, 2017, and October 31, 2024. The data for these tables is derived from the forest health treatment database described above. This information is also published twice each year as part of the 20-Year Forest Health Strategic Plan: Eastern Washington Treatment Tracking Progress Memo. It is important to note that reported treatment data may change over time as landowners improve reporting methods and/or share additional treatment data and information with DNR.

Table 5. Reported forest health treatments across eastern Washington by calendar year (2017-2024) and organized by treatment type (Total Treatment Acres).

Treatment Type	2017	2018	2019	2020	2021	2022	2023	2024	Grand Total
	All numbers below represent "Total Treatment Acres"								
Commercial Vegetation	16,307	18,130	17,403	17,431	14,978	15,647	15,360	8,368	123,623
Non-Commercial Vegetation	49,854	75,392	71,211	84,390	69,903	88,481	104,766	85,010	629,006
Prescribed Fire	26,885	26,301	31,376	14,486	31,905	16,537	45,227	16,944	209,663
Grand Total	93,046	119,823	119,990	116,307	116,786	120,664	165,354	110,322	**962,292**

Since 2017, a total of **962,292 acres of forest health treatments** have been reported to DNR across eastern Washington. The values in Table 5 are total treatment acres which includes every reported forest health treatment conducted, including those that occurred in sequence on the same acre over time.

Table 6 expands on this data and shows the progress landowners are making in each of the priority planning areas in eastern Washington by calendar year. Significant progress is being made in many priority planning areas; however, treatment progress can be uneven. Focused investments by Washington State, federal agencies, private landowners, tribes, and others have accelerated project planning and implementation, yet treatment activity will take time to fully implement and is dependent on available workforce, wood products markets, and adequate financial resources. Table 7 summarizes reported forest health treatment information by landowner and treatment type.

Key Terms

This section of the report includes key terms that are important for interpreting results.

Forest Health Treatment: an action taken in a forest ecosystem aimed to improve forest health and resiliency.

Total treatment acres: every forest health treatment conducted, including those that occurred in sequence on the same acre over time. For example, a commercial thinning may have been conducted on an acre prior to a prescribed burn.

Footprint acres: calculated through spatial analysis to ensure one acre that experienced one or more forest health treatments is only counted once.

Forest health treatment data is reported in two ways. Total treatment acres allow us to track individual actions invested in and implemented at a point in time, while footprint acres allow us to track the spatial scale of impact over time.

Table 6. Reported forest health treatment acres completed by calendar year (2017-2024) by priority planning area (Total Treatment Acres).

Priority Planning Area	2017	2018	2019	2020	2021	2022	2023	2024	Grand Total
Ahtanum	91	685	32	2,033	6	1,503		66	4,417
Asotin	2,616	1,346	2,863	1,288	1,957	832	5,718	2,593	19,214
Chelan	41	59	345	68	46	30	75	38	703
Chewelah	2,124	3,675	2,971	3,193	2,061	1,032	2,051	647	17,754
Chewuch	96		225		117	217	72		727
Chumstick to LP	4,138	706	528	1,393	1,096	641	804	421	9,726
Cle Elum	2,016	2,406	1,291	2,399	863	2,894	2,466	1,458	15,792
Deer Park	940	2,976	2,569	1,577	1,316	1,935	1,891	1,945	15,148
Dollar	196	10	140	47	113	6	86		599
Glenwood	1,076	1,129	542	773	47	1,312	1,338	1,129	7,346
HWY 97	160	18	153	213	28	47	70	282	971
Ione	61	1	307	207	124	57	796	508	2,060
Klickitat	81	287	385	374	836	81	278	594	2,916
Little Naches			708	364	817	6,425	6,006	9,531	23,850
Little Pend Oreille	803	1,777	2,950	2,095	1,444	1,327	1,985	2,610	14,990
Little White	271	107	239		33	331	92		1,073
Long Lake	2,020	1,228	1,437	1,130	1,293	1,550	2,065	994	11,715
Mad Roaring Mills	1,383	1,776	332	386	607	2,388	475		7,347
Manastash Taneum	3,362	1,838	2,067	656	243	1,386	1,639	522	11,713
Methow Valley	2,849	7,271	4,569	3,943	4,018	6,907	6,356	6,957	42,870
Mill Creek	1,461	5,314	7,949	10,021	5,719	7,546	5,856	499	44,365
Mission		365	244	3,051	2,508	2,705	2,487	0	11,360
Mt Hull	290	661	764	845	584	891	3,369	264	7,669
Mt Spokane	339	2,116	2,679	1,539	2,082	1,605	1,943	1,995	14,297
Nason Creek	7	284	498	33	114	82	439	152	1,610
Republic	3,336	1,598	3,529	3,369	3,741	2,348	912	2,200	21,032
Stemilt		376	1,184	1,130	738	354	691	727	5,200
Stranger	867	805	2,045	749	787	1,480	2,569	876	10,179
Teanaway	257	132	1,500	1,218	520	958	1,415	648	6,648
Tieton	113	8	179	945		872	64		2,181
Tillicum		1,554	581	2,634	373	573	15,682		21,397
Toroda-Tonata	1,999	949	1,509	278	298	477	480	273	6,264
Touchet-Mill	181	33	754	112	1,192	1,084	1,553	644	5,552
Trail	1,568	833	796	361	789	1,248	1,152	973	7,719
Trout Lake	527	1,069	1,592	2,472	771	566	965	1,082	9,044
Twisp River	35	1,384	125	170	363	502	28	3,721	6,328
Upper Swauk	594	358	123	130	0	3	2,062	86	3,356
Upper Wenatchee	897	343	791	516	791	215	214	136	3,903
White Salmon	185	149	927	685	1,394	1,744	1,460	407	6,950
Meadow	1,069	540	420	817	17	159	126	185	3,332
Naches-Wenas	399	3,682	3,776	948	546	1,419	3,160	1,730	15,662
Tucannon	72		978	0	6	349	645	491	2,542
Slate	242		241	151		4	18		655
Loomis	3,891	3,421	3,681	2,705	4,065	2,735	4,144	3,628	28,269
Mica	863	476	794	1,106	561	985	495	365	5,643
Gifford	109	129	413	486	212	291	530	103	2,273
Inchelium	890	482	116	182	569	32	1		2,272
Usk	291	304	215	388	337	644	1,151	760	4,090
Spokane North	54	204	158	75	288	335	199	498	1,810
Entiat	460	7,432	879	4	32	1,289	24	118	10,237
Curlew	420	572	963	187	77	161	441	392	3,214
Conconully	3,279	3,774	2,308	1,539	1,835	3,537	3,816	4,262	24,351
Upper Yakima	158	8	129	33		79	65	8	481
Orient	300	1,161	2,760	5,005	2,887	1,332	4,310	84	17,838
Kettle	2,265	1,488	45	2	94	249	1,009		5,152
Grand Total	**51,742**	**69,302**	**70,296**	**66,022**	**51,356**	**69,755**	**97,737**	**57,602**	**533,812**

Table 7. Reported forest health treatment acres in eastern Washington by calendar year (2017-2024), organized by lead implementer and forest health treatment type (Total Treatment Acres).

Landowner	2017	2018	2019	2020	2021	2022	2023	2024	Grand Total
DNR State Trust Lands	**23,372**	**30,031**	**27,892**	**27,302**	**23,228**	**23,208**	**28,907**	**18,785**	**202,724**
Commercial Vegetation	6,833	7,004	5,652	6,096	5,434	9,571	7,826	3,136	51,551
Non-Commercial Vegetation	9,287	17,710	15,576	18,095	14,431	11,175	13,500	15,108	114,883
Prescribed Fire	7,252	5,317	6,663	3,111	3,363	2,463	7,581	540	36,289
State Parks	**71**	**252**	**1,461**	**446**	**169**	**595**	**906**	**149**	**4,049**
Commercial Vegetation	62	97				415	625	39	1,237
Non-Commercial Vegetation	9	155	1,461	369	169	161	68	110	2,503
Prescribed Fire				77		20	213		309
WDFW	**5,363**	**4,082**	**6,699**	**1,506**	**2,242**	**2,861**	**2,191**	**2,821**	**27,767**
Commercial Vegetation	2,018	1,483	580	430	240	1,426	958	1,421	8,554
Non-Commercial Vegetation	490	97	4,093	762	539	432		849	7,263
Prescribed Fire	2,856	2,502	2,026	314	1,463	1,003	1,233	551	11,949
USFS	**41,239**	**58,449**	**53,052**	**51,000**	**56,269**	**52,722**	**90,112**	**55,574**	**458,419**
Commercial Vegetation	7,136	8,109	9,744	10,039	7,103	3,797	5,704	3,460	55,092
Non-Commercial Vegetation	17,897	32,935	21,109	30,671	22,817	37,064	49,580	42,211	254,283
Prescribed Fire	16,207	17,406	22,200	10,290	26,349	11,861	34,829	9,903	149,044
USFWS	**549**	**779**	**1,041**	**2,344**	**1,336**	**1,590**	**2,387**	**10,306**	**20,334**
Commercial Vegetation			493	572					1,065
Non-Commercial Vegetation		26	105	1,090	730	720	1,804	4,704	9,180
Prescribed Fire	549	753	444	682	606	870	583	5,602	10,089
NRCS	**4,104**	**4,781**	**5,640**	**5,128**	**2,578**	**12,081**	**11,124**	**3,776**	**49,210**
Non-Commercial Vegetation	4,104	4,781	5,640	5,128	2,578	12,081	11,124	3,776	49,210
Kalispel Tribe of Indians	**82**	**97**	**103**	**116**	**166**	**396**	**539**		**1,497**
Commercial Vegetation	82	97	103	116	119	70			586
Non-Commercial Vegetation					47	265	161		472
Prescribed Fire						61	378		439
Colville Confederated Tribes	**7,300**	**8,546**	**7,298**	**4,200**	**9,881**	**4,976**			**42,201**
Commercial Vegetation	178	1,089	790	178	1,622				3,856
Non-Commercial Vegetation	7,122	7,456	6,508	4,022	8,259	4,976			38,345
DNR Service Forestry	**10,772**	**12,480**	**16,566**	**23,763**	**19,984**	**20,852**	**25,431**	**16,700**	**146,548**
Non-Commercial Vegetation	10,750	12,210	16,523	23,751	19,984	20,770	25,241	16,600	145,828
Prescribed Fire	22	270	44	12		82	190	100	720
BLM					**223**	**585**	**2,804**	**710**	**4,322**
Commercial Vegetation					223	369			592
Non-Commercial Vegetation						216	2,804	710	3,730
Other NGOs	**79**	**305**	**123**	**471**	**431**	**592**	**879**	**1,450**	**4,329**
Commercial Vegetation		252					236	311	799
Non-Commercial Vegetation	79		123	471	336	430	472	942	2,853
Prescribed Fire		53			95	162	170	197	676
Confederated Tribes of the Umatilla Indian Reservation			**41**	**29**	**266**	**207**	**12**		**555**
Commercial Vegetation			41		237		12		290
Non-Commercial Vegetation				29		191			219
Prescribed Fire					29	17			45
WACC	**115**	**21**	**72**	**3**	**14**		**12**		**236**
Non-Commercial Vegetation	115	21	72	3	14		12		236
Private							**51**	**51**	**102**
Prescribed Fire							51	51	102
Grand Total	**93,046**	**119,823**	**119,990**	**116,307**	**116,786**	**120,664**	**165,354**	**110,322**	**962,292**

Figure 8. Reported Forest Health Treatments by Landowner (2017-2024). The map displays the location of reported treatments across eastern Washington.

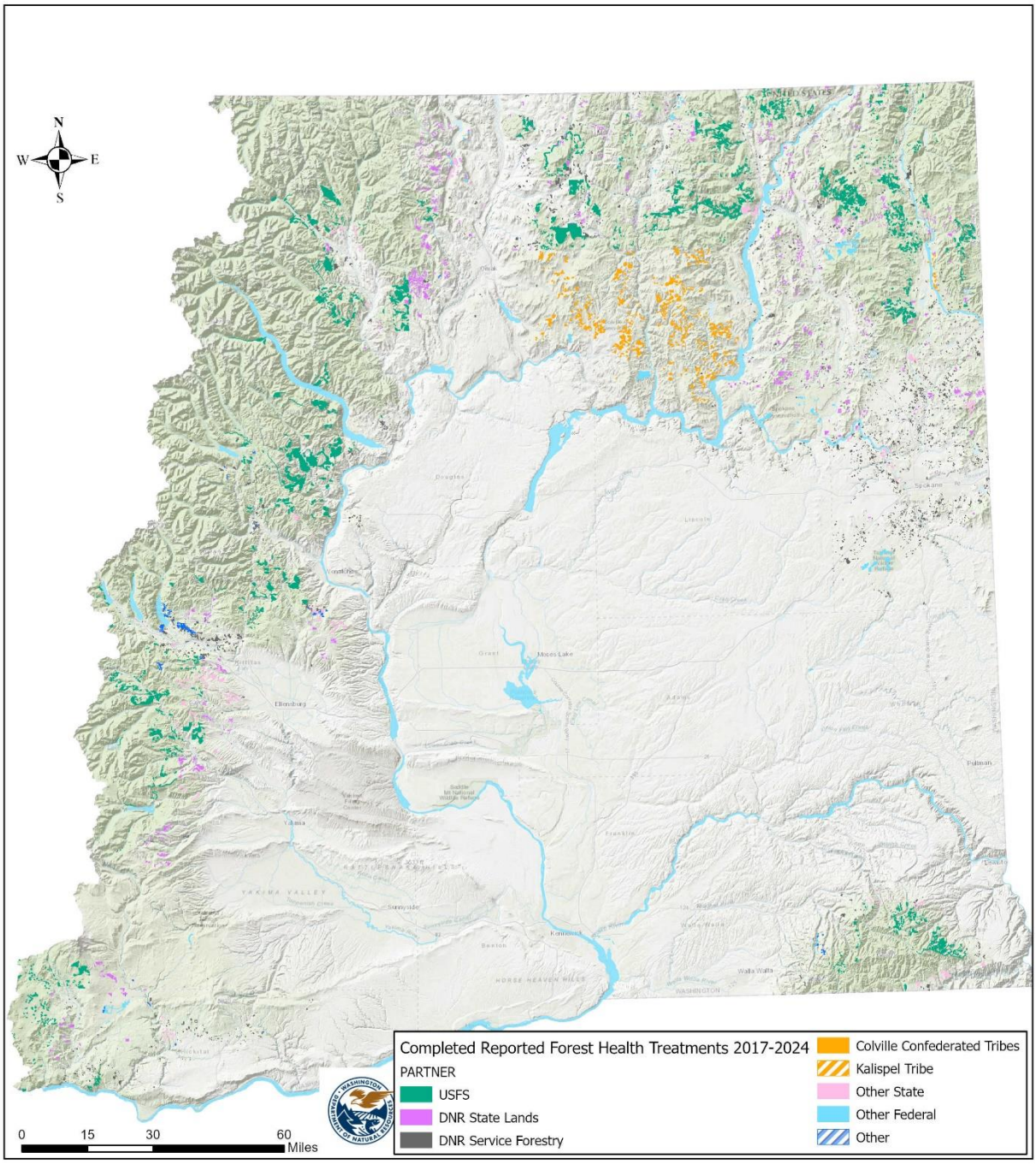


Figure 9. Reported treatment tracking acres and change detection by year (2017-2023).

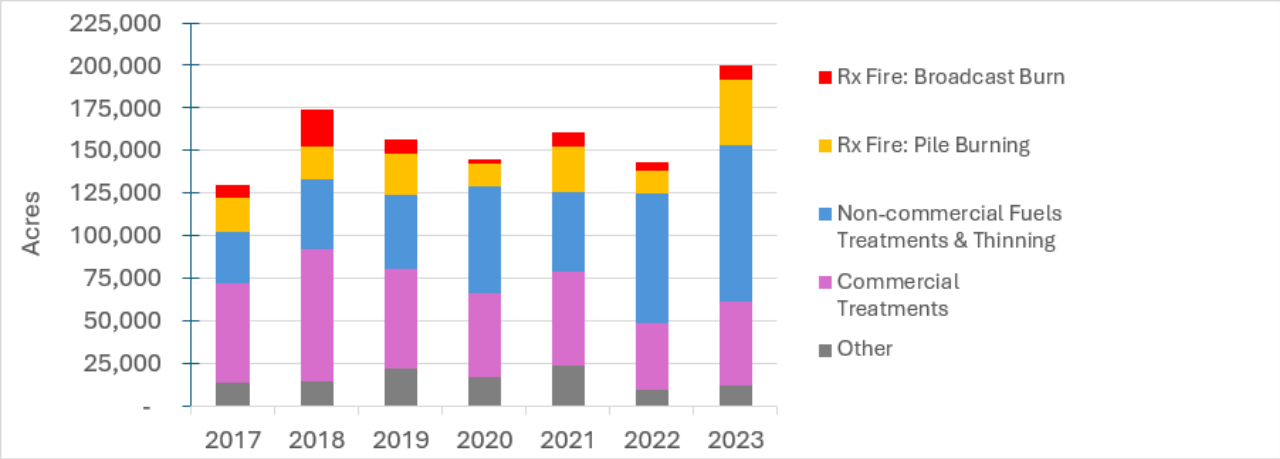


Figure 9 shows the relative amount of different forest health treatment types reported to DNR from 2017 to 2023. The number of acres of reported treatments varies each year but increased in 2023 relative to all previous reporting years. This likely reflects progress in planning treatments, especially on federal lands in Washington State, which often takes years to complete environmental review. Increases in treatment activity are also a result of historic federal and state investments, which accelerated implementation of non-commercial fuels treatments.

Key Terms

This section of the report includes key terms that are important for interpreting results.

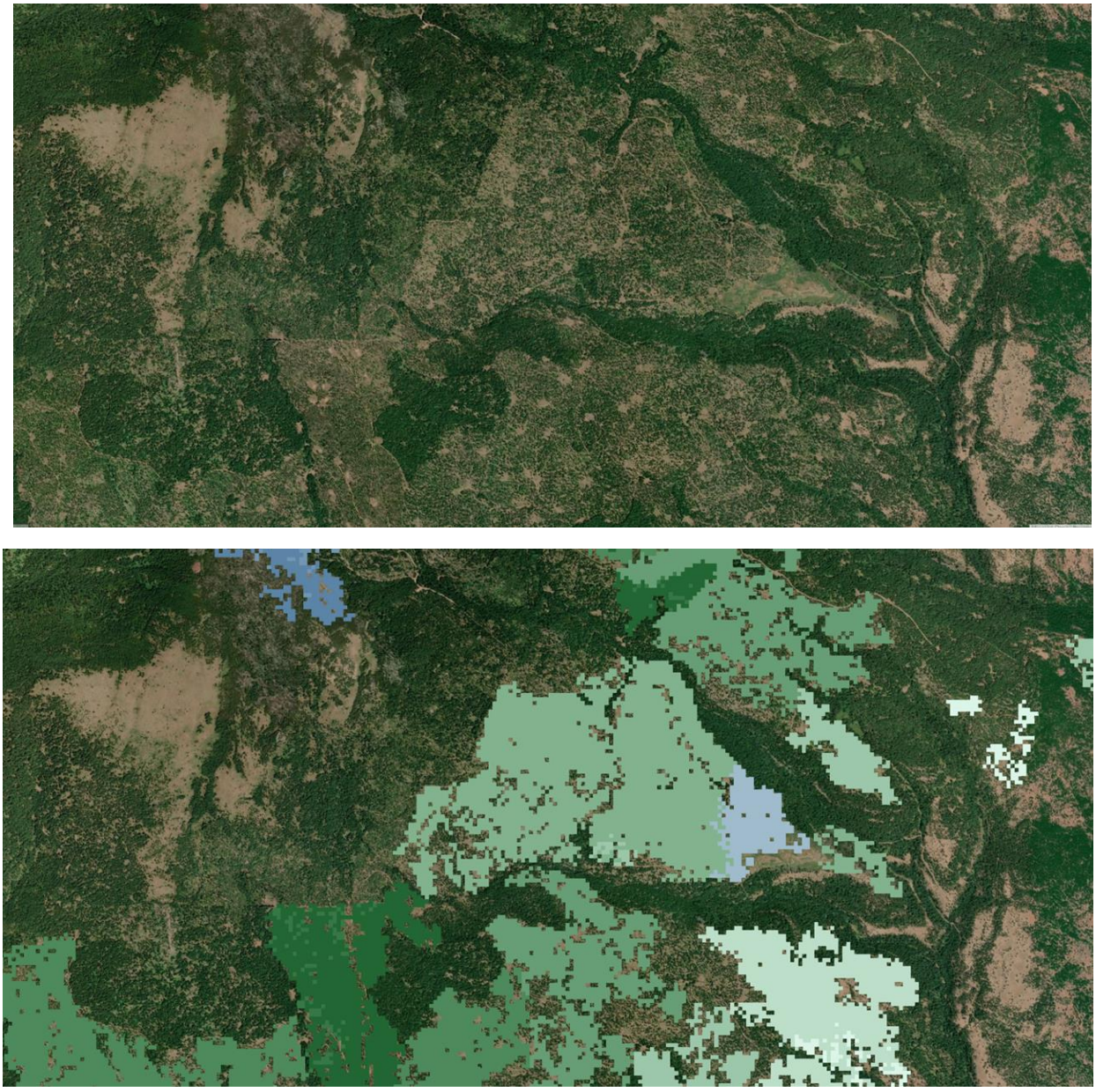
Reported Forest Health Treatment: an action taken in a forest ecosystem aimed to improve forest health and resilience. Treatment is voluntarily reported to DNR.

Unreported Forest Management Activity: additional active management captured via satellite-based change detection that is not reported to DNR. These activities may or may not be motivated by forest health.

Low- and Mixed-Severity Wildfire: areas where fuels were reduced, and forest structural changes occurred because of wildfire. Severity is assigned to wildfire change detection polygons using the DNR fire severity annual mosaics, which are calculated using Landsat data in Google Earth Engine and classified into categories based on basal area mortality.

Satellite-Detected Forest Change

Tables 8 and 9 and Figure 10 include the results of satellite-based change detection monitoring. The combination of reported forest health treatments and change detection provide the most comprehensive accounting of changes in forest conditions for eastern Washington and across each priority planning area. Change detection acres, described in the tables below as "additional unreported forest management" and "low and moderate severity wildfire" provide insights into additional changes occurring on the landscape that may or may not be motivated by forest health or are not being reported to DNR as a forest health treatment. These changes, however, do influence forest structure and landscape resilience over time. The values in Table 8 and Table 9 are footprint acres.



Satellite imagery of commercial thinning on industrial land (top) and change detection polygons (bottom) in Hwy 97 planning area. These are an example of "unreported forest management activities" captured.

Table 8. Assessed forest health treatment need, reported forest health treatment footprint acres, and satellite change detection footprint acres by priority planning area.

Priority Landscape	Total Area (Acres)	Forested Acres	Assessed Treatment Need (As of October 2024)	A. Reported Forest Health Treatments (2017 - Oct 2024)	B. Additional Unreported Forest Management Activities* (2017-2023)	C. Reported + Unreported Activities (Column A + B)	D. Acres of Low-Moderate Severity Wildfire	E. Total Acres Changed Condition (Column C + D)
All numbers below represent "Footprint Acres"								
All Eastern Washington	-	9,646,123	3,070,000	**441,293**	250,956	692,249	559,619	1,251,868
All Priority Landscapes	6,024,121	4,418,650	1,120,270 - 1,616,770	251,455	117,178	368,633	227,593	596,226
Ahtanum	120,477	89,217	19,000 - 29,000	3,878	1,294	5,172		5,172
Asotin	149,152	93,329	Analysis in 2026	10,115	1,613	11,728	36,338	48,066
Chelan	98,051	31,342	7,500 - 12,500	215		215	253	468
Chewelah	195,408	158,352	59,000 - 80,000	7,178	6,523	13,701	88	13,790
Chewuch	94,250	91,668	5,750 - 9,500	347	7	354	17,683	18,036
Chumstick to LP	115,333	84,216	36,500 - 53,000	3,791	2,146	5,936	252	6,188
Cle Elum	109,396	80,300	22,000 - 35,500	6,335	850	7,185	1,646	8,830
Conconully	198,243	150,201	Analysis in 2026	15,063	480	15,543	6,671	22,213
Curlew	113,401	89,967	Analysis in 2026	1,869	1,105	2,974	64	3,038
Deer Park	181,171	90,497	36,000 - 49,000	4,609	6,204	10,814	1,526	12,339
Dollar	61,238	50,767	18,600 - 27,700	325	393	718		718
Entiat	80,936	56,583	Analysis in 2026	8,829	20	8,849	2,429	11,278
Gifford	71,962	39,016	13,250 - 17,900	835	2,638	3,473	435	3,908
Glenwood	104,501	83,758	23,500 - 32,000	4,641	4,463	9,105	18	9,122
Highway 97	60,398	37,415	11,000 - 16,500	295	6,271	6,566		6,566
Inchelium	146,263	121,779	22,500 - 36,000	1,899	3,842	5,741	20,674	26,414
Ione	44,248	41,784	16,500 - 21,000	1,494	749	2,244		2,244
Kettle	58,330	51,799	Analysis in 2026	2,298	1,092	3,390	1,339	4,729
Klickitat	149,649	103,274	43,000 - 55,000	1,578	9,241	10,819	74	10,892
Little Naches	95,433	92,914	25,500 - 43,000	7,158	457	7,615	4,858	12,473
Little Pend Oreille	92,994	81,148	30,250 - 43,500	8,119	3,344	11,463	53	11,516
Little White	95,750	84,705	17,750 - 27,500	953	1,450	2,403	157	2,560
Long Lake	103,291	41,253	14,000 - 20,000	4,615	1,656	6,271	1,817	8,088
Loomis	198,991	170,701	38,000 - 55,250	11,611	304	11,915	4,412	16,327
Mad Roaring Mills	65,008	33,325	13,500 - 20,000	4,367	85	4,452	4,094	8,546
Manastash Taneum	104,072	65,833	16,500 - 29,500	6,399	190	6,589	73	6,661
Meadow	60,235	59,050	22,850 - 29,800	2,330	1,004	3,334		3,334
Methow Valley	338,246	182,937	49,500 - 75,000	24,317	639	24,956	30,687	55,642
Mica	72,608	39,178	13,350 - 18,000	1,507	1,859	3,366		3,366
Mill Creek	186,306	162,060	57,000 - 80,000	16,732	11,813	28,545	205	28,750
Mission	49,121	32,743	10,406	3,060	878	3,938	120	4,058
Mt Hull	105,431	34,809	12,000 - 18,500	3,196	2,280	5,476	127	5,603
Mt Spokane	121,767	95,814	29,000 - 42,000	5,757	6,990	12,747	1,248	13,995
Naches-Wenas	180,858	121,981	28,750 - 47,250	10,520	131	10,651	12,660	23,311
Nason Creek	31,679	29,243	6,750 - 11,500	555	542	1,098		1,098
Orient	82,590	79,955	Analysis in 2026	6,467	1,320	7,787	5,964	13,752
Republic	180,553	144,350	46,500 - 64,000	9,186	3,684	12,869	22	12,892
Slate	35,948	34,905	13,750 - 17,250	424	306	730	1,340	2,070
Spokane North	51,656	14,685	Analysis in 2026	555	373	928	12	941
Stemilt	38,961	22,613	9,200 - 13,600	3,170	253	3,422		3,422
Stranger	89,904	72,061	30,000 - 38,000	3,392	8,596	11,988		11,988
Teanaway	132,120	111,696	38,500 - 60,000	4,040	363	4,403	18,797	23,199
Tieton	148,634	117,781	38,000 - 60,500	1,880	6	1,886	427	2,314
Tillicum	14,326	11,241	7,614	5,455	204	5,658	46	5,704
Toroda-Tonata	153,611	117,345	51,000 - 66,000	2,829	2,359	5,189	68	5,257
Touchet-Mill	203,750	110,794	22,000 - 27,500	1,857	1,018	2,875	11	2,886
Trail	105,242	94,948	32,500 - 44,000	4,721	2,893	7,614	7	7,621
Trout Lake	117,153	105,015	18,500 - 33,000	7,377	1,919	9,296	0	9,297
Tucannon	98,616	80,099	Analysis in 2026	1,626	466	2,092	29,237	31,329
Twisp River	111,918	82,349	26,000 - 36,500	3,405	264	3,669	19,263	22,931
Upper Swauk	39,175	35,450	14,000 - 22,000	1,367	689	2,056	36	2,092
Upper Wenatchee	74,777	66,277	15,500 - 27,000	1,761	318	2,080	1,802	3,881
Upper Yakima	98,825	89,279	Analysis in 2026	393	174	567		567
Usk	65,477	50,827	Analysis in 2026	1,959	1,905	3,864		3,864
White Salmon	126,688	104,022	38,000 - 54,000	2,801	7,516	10,316	562	10,878

Table 9. Reported forest health treatment footprint acres, change detection footprint acres and low- and mixed-severity wildfire footprint acres by landowner.

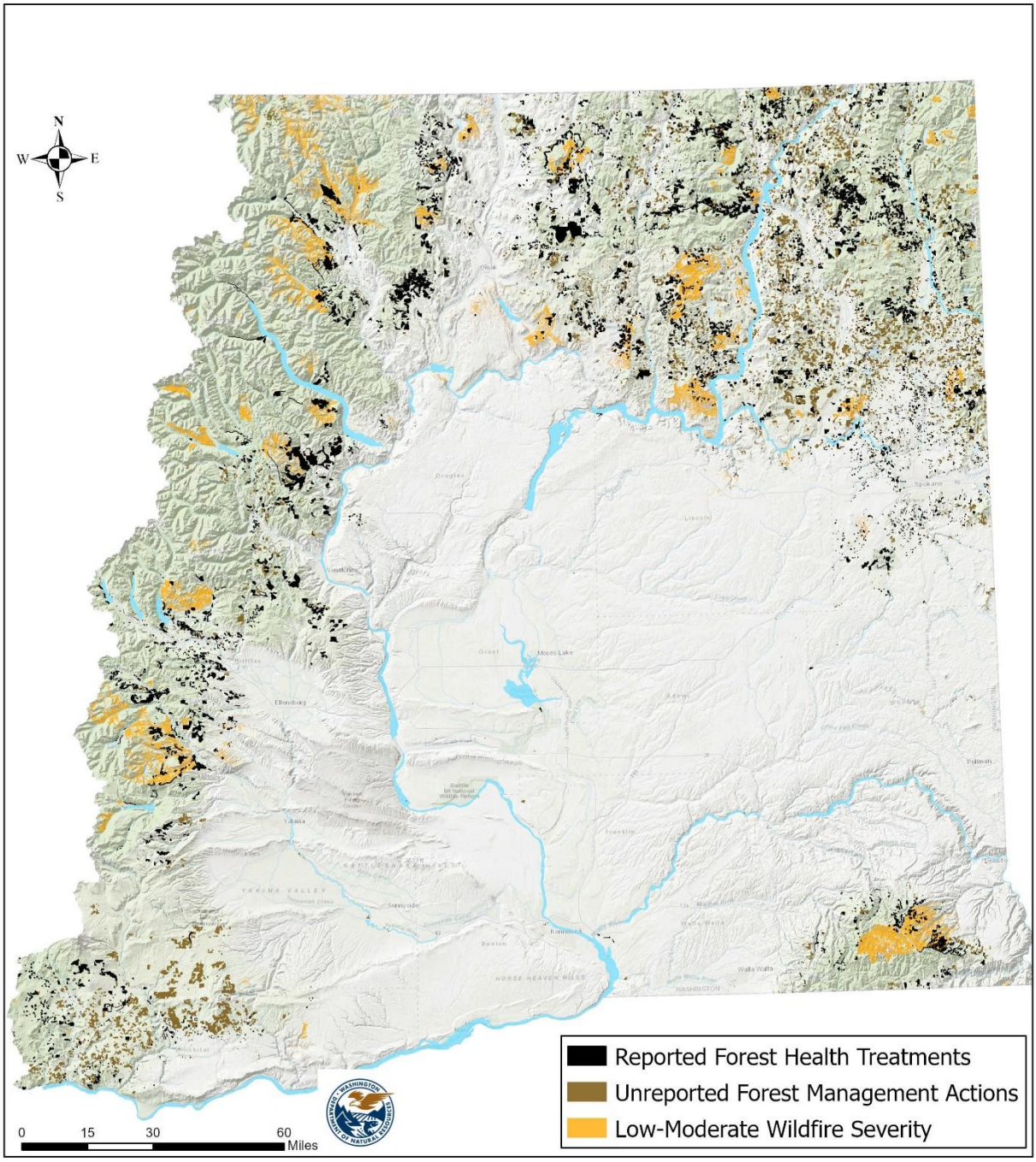
Ownership	Reported Forest Health Treatments (2017-Oct 2024)	Additional Unreported Forest Management Activities* (2017-2023)	Reported + Unreported Treatments & Activities	Wildfire: low - moderate severity	Total treatments, activities & low-mod wildfire
All numbers below represent "Footprint Acres"					
Federal	225,854	20,263	246,117	377,882	623,999
Tribal	47,078	41,064	88,142	102,312	190,454
Private	45,735	182,891	228,626	41,334	269,959
State	119,855	4,540	124,395	33,163	157,558
City-County	1,016	778	1,794	0	1,794
Other-Unknown	1,755	1,420	3,175	4,928	8,103
Total	441,293	250,956	692,249	559,619	1,251,868

Table 8 summarizes the footprint acres of treatment for each priority planning area alongside additional change detection acres that were not reported to DNR as forest health treatments. The estimated total treatment need across all lands in eastern Washington is 3,070,000 acres (Laughlin et al. 2023). The combination of reported treatment activity, additional forest changes detected via satellite imagery, and wildfire provide the most complete accounting of the changes occurring in any given priority planning area over time.

Table 9 summarizes footprint acres by landowner based on the current landownership data layer available to DNR. In general, most treatments on public lands are reported to DNR. A significant portion of low and moderate severity wildfire occurred on public lands in eastern Washington since 2017. Wildfire influences forest structure and fuels and may influence future management actions in each priority planning area.

The map below (Figure 9) displays the locations of forest health treatments and changed forest conditions. Specifically, the map shows where the treatments and changes outlined in Table 8 and Table 9 occurred in eastern Washington. The map includes reported forest health treatments, forest management actions identified through change detection, and low- and mixed-severity wildfire. Severity is assigned to wildfire change detection polygons using the DNR fire severity annual mosaics, which are calculated using Landsat data in Google Earth Engine and classified into categories based on basal area mortality from the Brian Harvey lab at the University of Washington.

Figure 10. Forest Health Treatments and Changed Forest Conditions. The map displays the location of reported forest health treatments, unreported forest management actions identified through change detection monitoring, and low- and moderate-severity wildfire.



Summary of Forest Health Treatment Accomplishments and Changed Forest Conditions: Eastern Washington and Priority Planning Areas

DNR has developed a two-pronged approach to track forest health treatment accomplishments and changed forest conditions through a user reported forest health treatment database and satellite-based change detection. Both tools provide a way to summarize and understand progress towards our shared forest health goals outlined in the 20-Year Forest Health Strategic Plan: Eastern Washington. Table 10 below summarizes reported forest health treatments (total treatment acres) across eastern Washington and in priority planning areas. Table 11 summarizes footprint acres of assessed forest health treatment need, reported forest health treatments, unreported forest management activities and low and mixed severity fire across eastern Washington and in priority planning areas to provide the best understanding of the spatial progress being made towards addressing the forest health treatment need.

Table 10: 2017-2024 Reported Forest Health Treatments in Eastern Washington and Priority Planning Areas.

2017-2024 Reported Forest Health Treatments Eastern Washington and Priority Planning Areas (Total Treatment Acres)					
Reported treatment acres	**Eastern Washington**	**Priority Planning Areas**	**Unit**	**Data Source**	**Time Period**
Reported forest health total treatment acres	962,292	533,812	total treatment acre	DNR Forest Health Treatment Database	2017-2024

Table 11: Assessed Forest Health Treatment Need, Reported Forest Health Treatments, Unreported Forest Management Activities and Low/Mixed Severity Wildfire in Eastern WA and Planning Areas (footprint acres).

Assessed Forest Health Treatment Need, Reported Forest Health Treatments, Unreported Forest Management Activities, and Low and Mixed Severity Wildfire Eastern Washington and Priority Planning Areas (Footprint acres)					
Treatment Need and Activities	**Eastern Washington**	**Priority Planning Areas**	**Unit**	**Data Source**	**Time Period**
Assessed forest health treatment need (footprint acres)	3,070,000	1.1 to 1.6 million	footprint acres	E. WA: Laughlin et al 2023 Planning Areas: DNR Forest Health Assessment	E. WA: 2017 Planning Areas: 2014-2023
Reported forest health treatments (footprint acres)	441,293	251,455	footprint acres	DNR Forest Health Treatment Database	2017-2024
Unreported forest management activities (footprint acres)	250,956	117,178	footprint acres	Satellite Change Detection	2017-2023
Low and mixed severity wildfire (footprint acres)	559,619	227,593	footprint acres	Satellite Change Detection	2017-2023
Total treatments, activities and wildfire	1,251,868	596,226	footprint acres	See above	See above

Treatment data is publicly available on the Forest Resilience Division DataViewer, DNR's Open GIS webpage, and Forest Health Tracker. Methodology for this treatment tracking is available in the DNR public box folder here. More detailed treatment tracking and change detection results are available upon request. To learn more, contact the DNR Forest Resilience Division.

Implementation Plans

DNR is coordinating the collaborative all-lands implementation of the 20-Year Forest Health Strategic Plan across 55 priority planning areas covering more than 6 million acres. Planning and implementing forest health treatments takes years and often involves numerous steps from identifying landowner objectives to environmental review and contracting. To coordinate activities across multiple landowners and agencies, DNR is exploring the development of shared implementation plans for a number of high priority planning areas.

The purpose of an implementation plan is to identify and track the necessary coordinated actions, strategies, partners, and resources needed to meet the treatment need and sustain results over time in each priority planning area. Landscape evaluations are the primary guides for defining the forest health treatment need. The land management partners engaged in the planning area are the primary planners and implementers of locally identified and prioritized activities. The implementation plan is the evolution of assessment documenting who, what, when, and how partners will take actions to restore and increase forest, aquatic and wildland urban interface resiliency to drought, wildfire, and other disturbances in a place and over time.

Treatment sequence to restore healthy forest conditions. Clockwise from top left: Dense dry mixed conifer forest on the Colville Reservation in the Inchelium Priority Planning Area scheduled for a forest health treatment to thin the overstory and reduce understory fuels; dry mixed conifer forest on DNR State Trust Lands in the Methow Priority Planning Area that had been thinned and slash piled; dry mixed conifer forest on Chelan County land in the Stemilt Priority Area that had been thinned, slash pile and burned and broadcast burned to reduce surface fuels (three different treatments that occurred over several years, broadcast burn was completed in Fall 2024); restored Dry mixed conifer forest on the Okanogan-Wenatchee National Forest 10 years after it had been thinned and broadcast burned in the Upper Swauk Priority Planning Area near the town of Liberty. Photo Credits: Clockwise from top left: John Marshall Photography, DNR, Chelan County, and DNR.

The Cle Elum Implementation Plan was the first developed by DNR and is available online. Visit the Cle Elum Implementation Plan web page to learn more: Collaborative Planning: Cle Elum Priority Landscape (google.com) This example page is not owned by DNR, but DNR plans to update current implementation plans to relevant Priority Planning Area pages in Forest Health Tracker as they are developed.

Forest Health Restoration Need and Maintenance

Forest health restoration needs, and acreage treatment targets are dynamic and will change over time as the forest changes due to growth, mortality and natural and human disturbances. In other words, treatment need, goals and targets are not static.

The forest health treatment needs identified in the Forest Health Assessment and Treatment Framework report are based on forest conditions as captured by forest inventory data utilized in landscape evaluations for each priority planning area at the time of assessment. This is a snapshot in time and will change over time as forests grow and disturbances such as wildfires, timber harvesting, insect and disease outbreaks, and drought contribute to tree mortality.

Implementation of forest health treatments identified through the landscape evaluation process will take several biennia to accomplish in any given priority planning area. The pace and scale of forest health treatment implementation will be driven by common and unique factors for each priority planning area, such as the capacity of land managers and contractors to plan and implement treatments, ratio of commercial versus non-commercial treatments, ability to conduct prescribed fire treatments, forest products markets and mill capacity, road access, public support, ability to manage wildfires for resource benefits, funding levels for non-commercial treatments, and budget levels for public land management agencies. Achieving landscape restoration goals in each priority planning area will require local solutions as well as systematic support. Further, vegetation will continue to grow; thus, maintenance of treatments is critical to ensuring their effectiveness over time. Maintenance needs will vary by forest type, site productivity, landowner objectives, and other factors.

Landscape evaluations will be updated as treatments, fires, other disturbances, and growth significantly change forest conditions. Input datasets for current conditions will also be improved and methodologies will be refined based on new science, monitoring results, and adaptive management.

The monitoring section of this report and the 2024 Monitoring Report for the 20-Year Forest Health Strategic Plan showcase several research efforts focused on evaluating treatment effectiveness and longevity. The results of those studies will also inform anticipated maintenance needs and targets over time.

Partnerships: Advancing Collaborative Solutions Across All-Lands

Successfully implementing RCW 76.06.200 requires cooperative partnerships. The 20-Year Forest Health Strategic Plan and Forest Action Plan were crafted with input from tribes, conservation groups, timber industry representatives, county governments, federal agencies, and state agencies. This collaborative approach remains a signature theme of DNR's forest health and resilience work.

This collaboration is predicated on the idea that wildfire knows no boundaries, thus we must work with our neighbors to reduce our collective risk. Implementing partners and stakeholders remain involved at every level of the process, from the statewide Forest Health Advisory Committee to individual landowners. Collaboration is also facilitated by critical investments like the Building Forest Partnerships Grant Program, which supports diverse interests working together towards shared forest health goals.

Partnerships and collaboration are key drivers of success. Our partners remain a critical part of the strategy moving forward. This section of the report highlights investments and case studies made through partnerships across all land ownerships to increase forest health and watershed resilience in both eastern and western Washington.

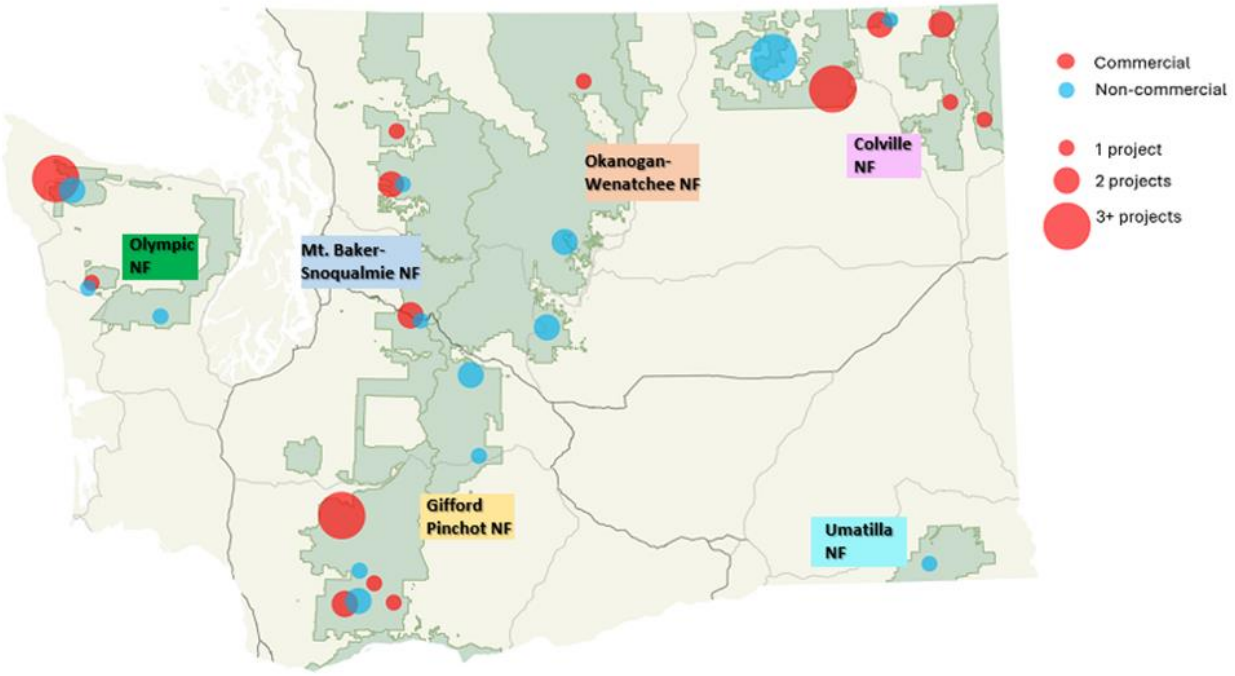
In the spirit of collaboration and partnerships, this section of the report includes updates and success stories from numerous contributing authors, representing a diverse range of agencies and organizations.

Federal Agency Partnerships

Roughly half of all forestlands in eastern Washington are owned and managed by the federal government. Successful partnerships with the USDA Forest Service are critical to meeting the goals of the 20-Year Forest Health Strategic Plan. Therefore, DNR established a state program centered on these partnerships utilizing the Good Neighbor Authority (GNA). DNR staff are supporting federal partners at a broad level and help propel projects on federal lands forward, including providing a robust interdisciplinary workforce that helps with NEPA planning, operational capacity for restoration project implementation, and deep expertise on federal road issues to help design and implement everything from fuels reduction to culvert replacements and aquatic restoration.

Current conversations around the federal Farm Bill include important updates to the GNA, including the proposed expansion of GNA to tribal and county partners, which could provide much more flexibility in project workforce and implementation for these potential partners. In 2023, GNA authorization was expanded to allow agreements on several additional federal land ownerships, including land managed by the National Park Service and the U.S. Fish and Wildlife Service. The DNR Federal Lands Program currently has active projects on the six national forests in Washington, as well as Bureau of Land Management lands.

Figure 11. Location of DNR projects administered through the Good Neighbor Authority on federal lands in Washington State.



Since 2019, DNR has implemented 25,300 acres of restoration work on federal lands utilizing GNA agreements, including 345 miles of forest road improvements, 24 NEPA planning support projects, and 68 aquatic improvement projects with seven bridge installations on federal lands. In the 2023-2025 biennium, DNR worked to complete an additional 4,050 commercial acres, 12,100 non-commercial acres, 22 aquatic improvement projects, 75 miles of deferred maintenance on roads, 10 miles of unnecessary roads decommissioned, and 12 NEPA planning support projects.

Interdisciplinary NEPA Team Propels Implementation on Federal Lands

The environmental reviews that precede treatments on federal lands can be extremely lengthy, slowing or halting project timelines for months or years, especially if the right technical expertise is in short supply. In response to this need, DNR introduced the Environmental Planning Program in October 2022 to assist federal agencies conducting environmental reviews, an action required under the National Environmental Policy Act (NEPA).

DNR's Federal Lands Environmental Planning Program (FLEPP) is an interdisciplinary team of seven specialists with technical expertise in archaeology, wildlife biology, geology and environmental coordination. Team members follow an interdisciplinary approach by converging on a planning area and collectively working to complete surveys. Program members also have experience with Washington State's contracting practices, which allows them to fill voids on federal interdisciplinary teams to help reduce project delays.

DNR staff and partners getting oriented to the Nason Creek Priority Planning Area. Photo by DNR.

Currently, the FLEPP team is involved in ten planning projects across all of Washington's six national forests and BLM land. To highlight the variety of actions and roles the environmental planning team takes on as a partner in environmental reviews, we're sharing some examples of recent and current work in the Nason Creek Priority Planning Area. Nason Creek encompasses over 49,500 acres of forest and is a part of the DNR and Forest Service Central Washington Initiative (CWI) area of focus to implement shared goals of the 20-Year Forest Health Strategic Plan and Wildfire Crisis Strategy. Roughly 72% of the Nason Creek Priority Planning Area is owned by USFS, with the remaining ownership split between Washington State and private landowners. Key focus areas for environmental planning include:

- habitat management for threatened and endangered species,
- defining geologic hazards,
- identifying locations for potential control lines and potential operational delineations (PCLs and PODs), to aid in reducing the wildfire threat across ownership boundaries,
- cultural resource management, and
- analysis of the existing transportation network.

This year, DNR worked across programs and with partners to standardize digital maps with over 190 layers of geospatial data to create a common operating picture of the Nason Creek landscape, created

an interactive surveying application using ArcGIS field maps, and gained right of way permits through private parcels of land to facilitate field surveys for efficient landscape project planning. During field season, staff established a field camp at Lake Wenatchee State Park to conduct field verification of the in-depth GIS spatial analysis, with a particular focus on identifying local geologic hazards, ground-truthing locations for PODs and PCLs, and determining opportunities to reduce negative effects of soil erosion and vehicle impacts on aquatic resources on over 300 miles of forest roads requiring maintenance or decommissioning.

As Nason Creek provides important habitat recognized by federal habitat and species recovery plans for the Northern Spotted Owl (NSO), DNR also developed surveys in collaboration with USFS Wildlife Biologist and received approval from the U.S. Fish and Wildlife Service for the Northern Spotted Owl survey design. NSOs are one of the federally listed species known to reside within the Okanagan-Wenatchee National Forest. Early data on their presence is critical to allow for efficient and effective planning at landscape scales. These surveys included the deployment of 90 autonomous recording units (ARUs). ARUs are acoustic recording devices used to passively verify potential NSO presence and Barred Owl encroachment across highly suitable habitat over the course of six weeks. Staff hiked roughly 700 miles over two months to deploy and then retrieve ARUs.

DNR staff and partners installing ARU monitoring devices on the Okanogan-Wenatchee National Forest. Photo by DNR.

Central Washington Initiative

Write-up developed through content provided by Seth Kammer, Partnership Coordinator, Okanogan-Wenatchee National Forest.

The Central Washington Initiative is one of ten initial investment landscapes for the national Wildfire Crisis Strategy released in 2022. Covering more than 3.1 million acres, DNR and the USDA Forest Service (USFS) are committed to advancing shared goals in the landscape through a memorandum of understanding.

While 2.1 million of this area is National Forest land, the remaining one million is owned and/or managed by tribes, state agencies, private landowners, and other groups. For the CWI to hit its targets, partners need to work collaboratively, and across ownership boundaries. This approach comes with a host of additional benefits, including an improved, shared understanding of individual landowner goals, missions, and capacities.

“The focus on partnerships in recent years has led to better understanding of what staff within the Okanogan-Wenatchee National Forest (OWNF) are communicating to partners and the public and has allowed the OWNF to think more strategically about how it can work in partnerships, given their interests and structures,” said Seth Kammer, Partnerships Coordinator for the Okanogan-Wenatchee National Forest.

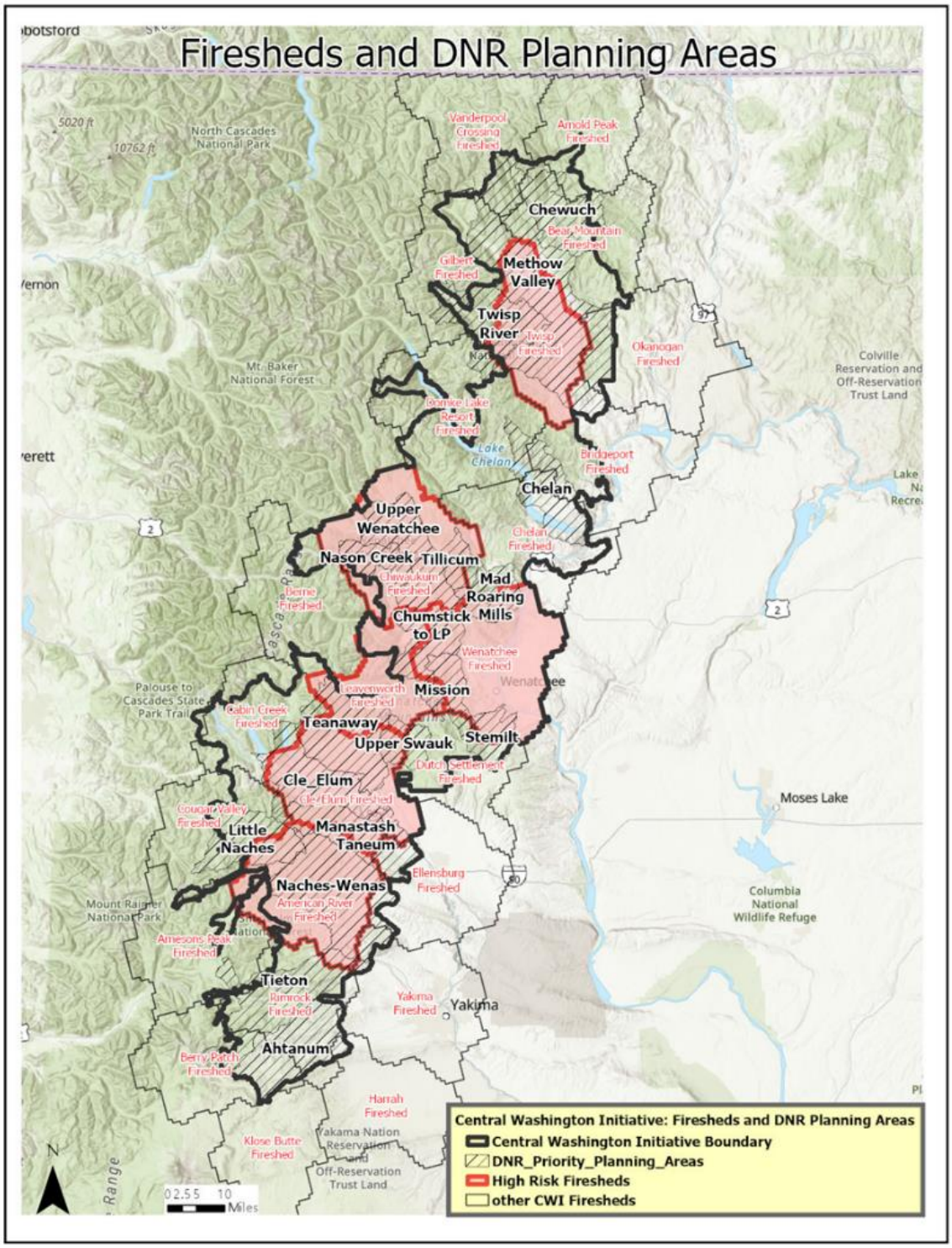
Given the ten-year timeline, partnerships have been key drivers for creatively thinking through various ways to implement projects, such as potential operational delineation units, or PODS, to cross-boundary prescribed burns.

“The number of creative insights shared by partners with the Forest Service about tackling landscape level projects has been noticeably appreciated,” Kammer said. “Our partners present promising stopgaps in funding, resources, and capacity issues.”

Focusing on the strengths, interests, and capacities of partners across the forest has already shown itself to be successful on the ground. Since 2022, partners have thinned 80,000 acres across the landscape and have conducted prescribed burns on 17,000 acres. This work has occurred across a variety of land ownerships within the CWI footprint.

Developing this trust and relationship building has taken time, though, and each region of the CWI footprint had a different starting point. Acknowledging and accounting for these differences has been a challenge. “Each district has had a unique relationship with partners given the resources on the district and local partner interests,” Kammer explained. “Each district also differs in its staff capacity to host standing engagements with partners. Without attention to the partnership strategies, the USFS might overlook this trust-building and more efficient approach with its resources and personnel.”

Figure 12. Central Washington Initiative geography including DNR priority planning areas and high risk firesheds identified by USDA Forest Service.



Approximately 30 percent of the CWI landscape has burned during the past two decades. Additional issues such as staff turnover, detail assignments for USFS staff who are temporarily moved to other forests, and the number of resources required for active wildfire support have challenged some interagency relationships.

The Okanogan-Wenatchee National Forest hopes to continue to more deeply implement its partnerships and build on successes into the future. Forest-wide engagement around fuel break placement, timing, and collaboration within the CWI landscape has helped partners to understand how to better coordinate other CWI activities. Kammer said the OWNF "hopes to use larger forums in the future for information sharing with partners where there is an interest to learn about policies and practices that impact multiple districts or the forest as a whole."

Colville National Forest Vision and Approach Centered on Community Connection

Story developed through interview with Luke Decker, Deputy Forest Supervisor, Colville National Forest.

It is no secret that landscape-scale wildfires have been increasing in number and size for years. The Colville National Forest (CNF) knows that addressing wildfire risk is the highest priority for long-term health of our forests and the communities around the CNF.

Lack of natural fire has created decades upon decades of fuel accumulations on these landscapes, with many of them now categorized as "departed landscapes" – landscapes that are so far away from what they looked like historically, they may have a different classification.

The goal of restoring these landscapes is at the center of the CNF land management plan, which outlines twenty landscape units for fuel reduction and forest health implementation projects. While the management plan outlines the *what*, the often-complementary Colville National Forest Vision centers on the *how* and *who* of implementing the CNF strategic plan.

The vision is about the qualitative, with the interests, concerns, and needs of the tribes and communities that live in and around the forest at the center. Coupling the strategic plan and vision goals together on the ground often starts with community connection. CNF staff have broken the forest into landscapes of acreages ranging between 20,000 to 100,000 acres, with the goal of prescribing treatments for 20-40 percent of each landscape to increase their health, productivity, and their resilience to wildfire and other threats.

Within each of these landscapes, CNF staff have also made it a priority to talk with tribes, community organizations, residents, and local businesses to decide where management in the priority landscapes is most important, how it should be completed, and by whom. Community and tribal goals around connecting people and lands, forest health, economic opportunities, wildlife habitat, and recreation are all discussion areas during this process.

"Our vision doesn't change, but the terminology and partners involved evolve as we move between landscapes," said Colville National Forest, Deputy Forest Supervisor Luke Decker. "The vision is really the collaboration with communities, and making sure the work we do is relevant to our local communities

while treating our departed landscapes to create healthy ecosystems and reduce the risks of landscape scale wildfire." Here are a few examples of the Vision and Strategic Plan in action:

The Sxwuytn – Kaniksu Connections (Trail) Project

The Sxwuytn Project was prompted by concerns shared by the Kalispel Tribe about wildfire risks on national forest lands surrounding their reservation. Sxwuytn is the Salish word for trail or connection. Covering more than 90,000 acres, the project includes a mix of U.S. Forest Service, Kalispel Tribe, Washington Department of Natural Resources, private, and Washington Department of Fish and Wildlife ownership. The project plan was designed by the Kalispel Tribe and includes several forest resiliency treatments to reduce disturbances from wildfire, insects, and diseases, improve aquatic and terrestrial habitat for wildlife, provide local economic opportunities, and create additional opportunities for the people to contribute to the effort. The first such project designed by a tribe, it has since been repeated with additional designs across the forest occurring collaboratively or led by staff from both the Kalispel Tribe and the Confederated Tribes of the Colville Reservation.

Following the Kalispel's lead on the project has led the Forest to consider how to better protect various interests on Forest Service land and has helped develop and strengthen relationships between the tribe and forest. "The partnerships we have with the tribes and the support we have to get that critical work on the ground, we couldn't do it without them," Decker said.

Colville National Forest Kalispel Moon timber sale pre-treatment stand condition in the Trail Priority Planning Area. Photo by John Marshall.

Chewelah A to Z

The Chewelah A to Z Project was primarily driven by members and interests of its namesake community. Input for the project goals and management drivers were shaped by everyone from local timber companies to Chewelah's mayor, to the 49 North Mountain Resort. Forest health treatments for Chewelah A to Z are focused on advancing symbiotic goals, such as rural economic development and recreation opportunities. For example, a lot of implementation work was contracted out to local company Vaagen Brothers, which was willing to take on the NEPA planning requirements. The Vaagen Brothers operation can take on the smaller-diameters trees thinned out for the treatments, which is an integral component for CNF to be successful in fuels reduction goals.

Several community meetings provided space for an array of community voices share their opinions on how the project should be implemented. "The collaborative approach has really impacted how the community feels about the Forest Service, but also the support we get, even outside of the area," Decker said. "There is a sense here, overall, that the communities value having the Forest Service here."

The CNF only hopes to continue to evolve and expand collaborative efforts in the future. Cross-boundary prescribed fire is a hopeful next avenue, with much more to come.

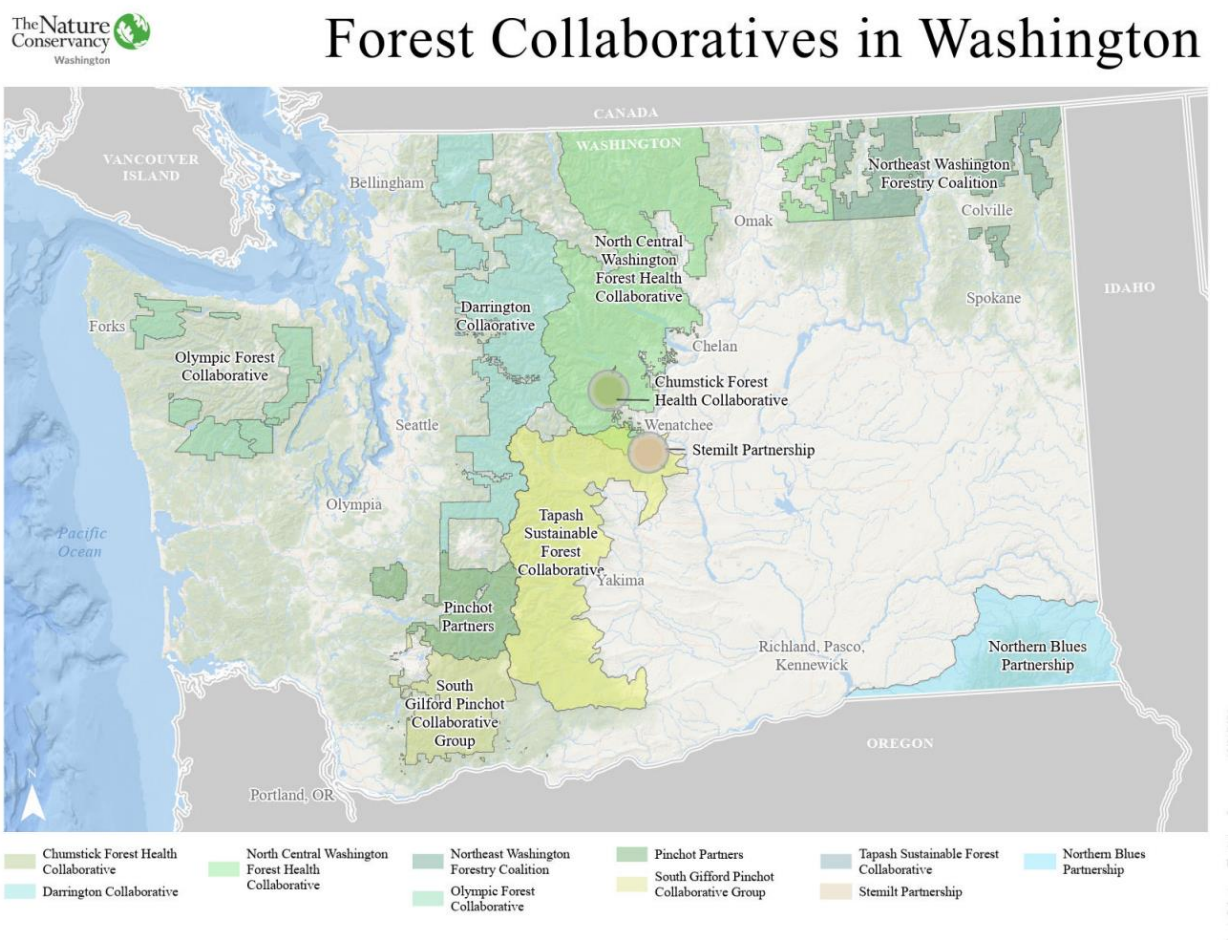
Building Forest Partnerships

Washington's forests are the backbone of our state's culture, social and recreation activities, as well as an economic lifeline for many communities. Forest collaboratives bring together diverse interests who work together to find common ground for more sustainable paths forward. There are ten forest collaboratives in Washington State, including at least one for each National Forest.

Forest collaboratives often support planning, facilitate educational tours, and coordinate implementation and monitoring activities with an overarching goal of accelerating implementation of forest stewardship activities. Many of these collaboratives are supported in part by the Building Forest Partnerships Grant Program, which helps to fund collaborative capacity.

This section of the report highlights recent collaborative progress from around the state, including success stories from groups working in both eastern and western Washington. The highlights were provided by the collaborative partnerships. Local partners provide critical support towards the goals identified in the State Forest Action Plan and 20-Year Forest Health Strategic Plan: Eastern Washington.

Figure 13. Map of forest collaboratives in Washington State. Map provided by The Nature Conservancy.



Darrington Collaborative (Mount Baker-Snoqualmie National Forest)

The Darrington Collaborative was founded in the wake of the 2014 Oso landslide. The collaborative includes members from environmental organizations, local timber companies, youth education outposts, and government agencies representing communities in Snohomish, Skagit, and Whatcom counties.

The collaborative has completed two forest stewardship projects – Segelsen 1 and Segelsen 2 – and continues to work on the North Fork Stillaguamish and Texas Pond projects. Collectively, these projects will restore thousands of acres of National Forest System lands and contribute to forest restoration and economic development in the area.

In 2024, Darrington Collaborative worked with Glacier Peak Institute youth crew members. Crew members learn about various career opportunities in forestry and natural resources by engaging with Forest Service employees. The youth crew also collected data and stream typing information for Darrington's upcoming North Fork Stillaguamish (Stilly) sale.

Northern Blues Restoration Partnership (Umatilla National Forest)

The Northern Blues Restoration Partnership is a diverse coalition of partners working to coordinate and implement restoration projects aimed at achieving forest, watershed, and fire resilience on public, private and tribal forestland across the Northern Blue Mountains landscape in Oregon and Washington.

Nearly 100 years of effective fire suppression, coupled with past management practices, have altered the Blue Mountain forest ecosystems. Forest densities have increased, forest composition has shifted toward fewer drought-and-fire-resistant species, and forests have encroached upon historical meadows and grasslands important for wildlife. This has increased the risk of catastrophic fire across the landscape, elevated risk to valued resources and has made wildland firefighting more dangerous.

The Washington State Department of Natural Resources has served as a member of the Northern Blues Restoration Partnership since its inception in 2022. Key accomplishments include:

- The Wallowa-Whitman and Umatilla National Forest were awarded a Collaborative Forest Landscape Restoration Program grant for 10 years of dedicated funding to accelerate forest health treatments and implementation of hazardous fuels reduction projects. The National Forests anticipate receiving $30 million over the 10 years and aim to treat 523,800 acres (including 223,800 acres of active treatments and 300,000 of passive wildfire acres). This is the third CFLRP award granted in Washington State.
- Accelerated planning of the Tiger-Mill Project, which is restoring the forests within the City of Walla Walla source area for drinking water on the Umatilla National Forest. DNR provided $78,540 in funding and in-kind project management support to conduct 11.55 miles of stream surveys.
- Implementation funding for hazardous fuels reduction projects within the Upper Touchet planning area on the Umatilla National Forest near Ski Bluewood, south of Dayton, Washington. DNR provided a total of $262,335 to accomplish 346 acres, including:
    - $27,825 to complete the 35-acre Upper Touchet mechanical fuels reduction contract.
    - $81,510 to complete the 117-acre North Touchet fuel break contract.
    - $153,000 to complete 194-acre Upper Blue non-commercial thinning contract.
- Partnered with the Confederated Tribes of the Umatilla Indian Reservation to conduct 200 acres of thinning and mastication at the Rainwater Wildlife Area to promote wildfire risk reduction, habitat enhancement, and First Foods. DNR provided the Tribe with $350,000 to implement the project and to conduct cultural resource surveys to prepare an additional 675 acres for forest health and restoration treatments.
- Supported public outreach and community engagement through direct technical assistance, site visits, and educational events hosted throughout the region.

The Northern Blues Restoration Partnership is an exceptional example of working together across public, private and tribal boundaries to restore, create, and sustain healthy, fire resilient landscapes. To learn more visit: https://www.northernblues.org/

Umatilla National Forest. Photo by DNR.

Olympic Forest Collaborative (Olympic National Forest)

The Olympic Collaborative has helped facilitate the harvest of more than 12.1 MMBF and assisted on projects covering more than 1,400 acres. The Olympic Peninsula Resource Advisory Council awarded the Olympic Collaborative $50,000 in partnership with American Whitewater for forest thinning and monitoring work. The additional funds will allow the collaborative to expand its pre-and post-harvest monitoring for stewardship sale sites to evaluate prescription effectiveness. The Olympic Collaborative is currently working on the Tiger Tail project, a 170-acre project within the Wynoochee watershed. The collaborative has partnered with consultancy, Resilient Forestry, to complete boundary flagging, pre-sale monitoring, stand exams, and sale area data collection.

Northeast Washington Forest Coalition (Colville National Forest)

The Northeast Washington Forest Coalition (NEWFC) celebrated its 20th anniversary with a community open house. This event featured a mill tour of the Vaagen Brothers Lumber facility and included guest speakers such as former and current forest supervisors and founding members of the collaborative. As one of the oldest forest collaboratives in the country, the group reflected on what has made it successful, which has significantly reduced litigation and improved forest restoration efforts. Looking forward, NEWFC recognizes the need to broaden the focus beyond forest management to include how

people relate to and understand forest activities and their regional impacts. Key accomplishments include:

- Support for Regional Efforts: NEWFC has extended its support to various regional initiatives. The group wrote letters of support for the Confederated Tribe of the Colville's Native ACT grant awarded for developing interpretive trails within the Colville National Forest. Advocacy also included support for conservation easements around Mount Spokane for the Trust for Public Land, as well as the Washington Department of Fish and Wildlife and Kalispel Tribe of Indian's bull trout reintroduction efforts.
- Strengthening Communication and Outreach: NEWFC hired a new facilitator in 2024 with a strong background in communications and outreach, enhancing the ability of the group to connect with key audiences and communities in Northeast Washington. This has led to more effective email campaigns, social media posts, and information sharing in partnership with the Colville National Forest.
- Focus on Ecological Health and Forest Management: long-term ecological health and responsible management of the Colville National Forest remains the core mission of NEWFC. Over the past two years, NEWFC strengthened the relationship with decision-makers on the Colville National Forest through regular leadership meetings with the Forest Supervisor and interactions with district rangers and agency specialists. NEWFC submitted numerous scoping letters and comments on forest projects, using these opportunities to enhance project outcomes for community and conservation benefits without diminishing project scopes.
- Increased Stakeholder Participation: NEWFC's investment in community outreach and engagement led to increased stakeholder participation in NEWFC meetings. These meetings feature presentations by agency specialists on specific management programs and methodologies, such as snowpack forecasting. NEWFC shared these resources with the public through revitalized social media pages, amplifying communication efforts in the rural region.

Over the past two years, NEWFC has made significant progress in forest management, community engagement, and organizational growth. The group looks forward to continuing its mission of fostering a collaborative approach to forest health and sustainability, ensuring that the Colville National Forest remains a valuable resource for all.

South Gifford Pinchot Collaborative (Gifford Pinchot National Forest, South Zone)

The South Gifford Pinchot Collaborative has focused on the Little White Salmon Forest Resiliency and Wildfire Risk Reduction Project on the Mount Adams Ranger District for the last several years. The group led the planning and facilitation of a multi-stakeholder process to capture consensus and provide recommendations to the Gifford Pinchot National Forest. The group also planned and facilitated several field trips to showcase important restoration work being conducted on the ground related to topics such as early seral habitat, landscape-scale restoration and wildfire risk mitigation, mature stand management, post-fire salvage logging, OHV access, and others.

South Gifford Pinchot Collaborative field tour of the Little White Restoration Project in the Little White Priority Planning Area. Photo by DNR.

Stemilt Partnership (Okanogan-Wenatchee National Forest)

Partners involved in the collaborative have implemented nearly 1,000 acres of treatments over the last two years across ownerships within the Stemilt Planning Area. The Stemilt Partnership helped draft a successful grant application for Community Wildfire Defense Grant, which will be used to implement additional forest health treatments on county, private, and Washington Department of Fish and Wildlife lands within the Stemilt Planning Area.

Over the last two years, DNR funding has supported the partnership's work with the Washington Conservation Science Institute to expand the DNR Landscape Evaluation for the Nason Watershed. Expansion of the landscape evaluation homed in on priority treatment areas and developed a landscape restoration prescription that could help partners determine a NEPA approach. The program also supported development of more than 100 acres of forest health treatments on the Nason Ridge Community Forest, as well as development of a proposal to implement a fuel break treatment along Coulter Creek Road, which is a high priority Potential Control Line (PCL) under the DNR Dual Benefit Analysis for Nason Watershed.

Prescribed Fire: Working Across All-Lands

Prescribed fire – sometimes called prescribed burn fire or controlled fire, is defined as fire intentionally applied by trained practitioners to vegetation to improve forest ecosystem health and resiliency. This includes two primary types of prescribed fire: broadcast burning and pile burning.

Prescribed fire is a necessary tool to improve the health of Washington's forest lands and natural habitats for plants and animals, as well as a tool to reduce the risk of catastrophic wildfires and improve community resilience. While managers have several options when it comes to altering overstory forest structure, prescribed fire is one of the few tools that land managers can efficiently utilize to reduce surface fuels and subsequent impacts of wildfires. A significant increase in ecologically appropriate prescribed fire is needed to meet and maintain ecosystem health and fuels reduction goals.

Prescribed Fire Training Exchange (TREX) hosted in Washington State in 2024. Photo by DNR.

In 2023, DNR convened partners for a prescribed fire strategic planning workshop. Workshop objectives were informed by an advisory committee, which also informed translation of workshop outcomes into a strategic action plan. During the workshop, participants discussed and identified specific barriers to implementing prescribed fire at a landscape-scale in Washington, as well as strategies and near-term actions to overcome barriers.

The primary outcome of the workshop includes a barriers assessment and strategic action plan to serve as a common starting point for DNR and other statewide prescribed fire partners working to meet forest health and wildfire risk reduction goals. The plan recommends more than 60 near-term actions. The Washington Prescribed Fire Council (WPFC) is facilitating a process for organizations to identify near-term actions they can lead or financially support. WPFC will develop and maintain a living implementation plan to track assignments and progress on the recommended near-term actions.

The workshop and resulting plan were made possible through the leadership of an advisory committee that included representation from the Bureau of Indian Affairs, The Nature Conservancy, USDA Forest Service, Washington Resource Conservation & Development Council, WPFC, and the Washington Department of Fish and Wildlife. More than 60 individuals representing two dozen federal, state, local, and tribal government and non-profit entities contributed to the development of the plan.

Prescribed Fire Training Exchange (TREX) in central Washington. Photo by John Marshall.

DNR has identified action items from the barriers assessment report that can be accomplished internally and are being addressed by a multi-divisional working group at DNR. Completed and in-progress actions includes:

- DNR updated the agency's internal prescribed fire policy and procedures.
- Expansion of the prescribed fire workforce by utilizing qualified crews and capacity traditionally utilized in wildland fire management.
- Creation of a living, annual, all-lands statewide prescribed fire workplan for tracking, planning and prioritization of prescribed burns and resources.

- Development of cooperative prescribed fire agreements between DNR and the USDA Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, Washington State Parks, Washington Department of Fish and Wildlife and Joint Base Lewis-McChord to facilitate sharing of resources when conducting prescribed fires.
- Partnering with the National Interagency Prescribed Fire Training Center and the Prescribed Fire Training Exchange programs to send DNR staff to annual training programs to increase the number of staff with needed prescribed fire qualifications.

Click here to learn more about Washington's Prescribed Fire Barriers Assessment Report and Strategic Action Plan.

Cascadia Prescribed Burn Association

Story by Colin Sternagel, Cascadia Prescribed Burn Association (PBA)

The fall 2024 prescribed burn season has ended. The year provided a great weather window for prescribed fire, and the dry summer weather stuck around into late September, providing managers with opportunities to get fire on the ground. The Cascadia Prescribed Burn Association (PBA) worked with numerous landowners in 2024 to prep burn units and secure necessary permits.

The best weather windows for each property consider fire intensity, fire effects, smoke mitigation and personnel coordination. To start the season off, Cascadia PBA hosted a one day "Learn and Burn" event on September 28th. There were 18 participants who were able to get exposed to the prescribed fire process. Participants learned everything from burn planning, weather, firing techniques, and unit preparation.

The first burn for the PBA was on October 5th. A small one-acre unit was picked by the burn leadership team. Although small, it was no simple burn. The unit had all the elements of burning in the Chumstick. Relatively steep terrain and a once overstocked Douglas fir forest that had been thinned out by the landowner utilizing a DNR cost-share grant. Twelve participants came out to help implement the burn and the burn boss was a community member who was using the burn as an opportunity to get certified through the WA DNR Certified Burn Manager program. Beautiful blue skies and a slight breeze helped clear smoke from the unit and Chumstick valley. The burn went very well, and participants all got opportunities to light fire as well as hold and prevent the fire from crossing its containment line.

The second burn was the next level up from the first burn. The property was similar in terrain and forest treatment practices, but the unit was about three acres in size. The unit was in Spromberg canyon, and served as a great example of how fire can be safely implemented in more complex conditions. Fifteen participants came to help implement the burn.

Community members conduct prescribed burns to improve forest health and reduce wildfire risk on small private forest parcels in the Leavenworth area. These burns were coordinated by the Cascadia Prescribed Burn Association and conducted in Fall 2024. Photos by Cascadia Prescribed Burn Association.

The third and final burn this fall was the culmination of this year's efforts and relationships coming together. The host was Camp Camrec up the Little Chumstick Road. The unit was nine acres of forestland that had been thinned and masticated in 2018. Camp Camrec has hosted two learn and burn events this year for the PBA and it was a great honor to organize and pull off the largest burn of the year for them. On a lovely Sunday morning, 33 people came out to assist with the prescribed fire. The Camrec burn was well executed with multiple organizations coordinating efforts. Lake Wenatchee Fire and Rescue provided 1000' of hose that was used for the burn operation. Hose lays and pumps for this unit were provided by the Washington Department of Natural Resources.

With each burn, more knowledge and experience get shared, and systems and procedures reviewed and improved. Community participation in 2024 allowed for the PBA to be successful. Cascadia PBA is excited about the first full year of prescribed burning and is looking forward to another successful year in 2025.

State Agency Partnerships

Riverside State Park: Shovel-Ready Projects Abound; Partnerships Make it Happen

Story developed through interview and content provided by Zach St. Amand, Eastern WA Forester for Washington State Parks and Recreation Commission.

Washington has more than 140 state parks across the state. Riverside State Park is Washington's second largest – a stunning 9000 acres of Ponderosa pine forests, cascading river and waterways, peaceful trails, and rocky outcrops. Riverside also directly borders Spokane, the state's second largest metropolis, and the park provides a wealth of recreational opportunities for the more than one million visitors that park receives each year.

For decades, Riverside State Park had seen a growing accumulation of vegetation, which acts as fuel during a wildfire. Ponderosa pine forests in the park historically saw wildfire return every 10 to 15 years, but decades of fire suppression and lack of purposeful burning helped the forests accumulate ladder fuels and inches of pine needle accumulation, also known as duff. Additionally, the park now features acres of "doghair" stands. Doghair stands are dense accumulations with spindly trees that have suffered years of underdevelopment due to an overabundance of trees all vying for the same limited nutrients and water on that landscape.

"You can't walk a trail without finding an area that needs treatment," said Zach St. Amand, Eastern Washington Forester for the Washington State Parks and Recreation Commission.

The sheer size of the park and associated work warrants a variety of partnerships and approaches for Riverside. Hundreds of acres have been treated using correctional camp crews based out of the Airway Heights Correctional Center, located about a fifteen-minute drive from the park. Correctional crews are ten-person crews of incarcerated individuals from minimum- to medium-level security facilities led by DNR supervisors for work on forest-related projects such as removing invasive weeds, planting trees, and reducing fuels in wildfire-prone areas. There are currently six crews based out of Airway Heights.

This partnership has generated numerous success stories. In 2019, one of the Airway Heights hand crews began working on a 140-acre thinning project in Riverside. The unit was one of the "doghair" stands of trees. The crew removed a whopping 3,000 trees per acre by hand working through the spring of 2020.

Then came the 2020 Labor Day fires, which collectively burned 330,000 acres across the state – a larger one-day total than the past twelve fire seasons. The Pheasant Way Fire, one of the Labor Day fires, started from a power line that ran through the forest health treatment unit. Remarkably, only one-third of an acre burned. Even with strong easterly winds, the treatment worked.

Riverside State Park during a recent thinning project. Photo by Washington State Parks.

Since the beginning of this partnership, the camp crew program in Spokane has expanded in size and scope, leading to an increase in the pace and scale of fuels reduction and forest health projects. The crews have accomplished approximately 2000 acres of non-commercial thinning since 2011 across Riverside. Increased capacity means that more complex projects such as prescribed fire and cross boundary work can become a reality for State Parks and other partnering agencies in the Spokane area. The crews have most recently been working on a large, cross-boundary fuels reduction project involving State Parks and the City of Spokane Fire Department.

The spirit of partnership has expanded across the city's wildfire workforce. Partners local to Spokane, including DNR, County Parks, the Conservation District, local fire departments, and other citywide organizations, started a city-wide wildfire mitigation coalition pilot. The coalition works to bring together community voices to better understand the challenges around wildfire preparedness for all members of the greater Spokane area.

WDFW: Partnerships Provide Adaptive Restoration Necessary for Specialized Habitat

Story created through interview and content provided by Richard Tveten, WDFW.

Washington Department of Fish and Wildlife (WDFW) has focused recent treatment activity on the West Rocky Prairie Wildlife Area Unit near Tenino. Prairie and oak woodland-savannah ecosystems like West Rocky Prairie are extremely rare. An estimated ten percent of the historical acreage of this ecosystem currently remains on the landscape. This ecosystem is important habitat for several threatened and endangered species. There are 260 different floral and faunal species that reside in and rely on oak woodland-savannah ecosystems. In addition to heavy development and land use change in western Washington, a lack of fire in recent decades has been a huge culprit in the demise of this ecosystem.

Oak restoration project on WDFW lands in Washington State. Photo by WDFW.

"There has always been a tug of war between prairies and conifer forests with oak woodlands in the middle," said Richard Tveten, Forest Management Team Lead for the Washington Department of Fish and Wildlife. "Conifer trees are constantly trying to invade prairies, but frequent fires used to hold them back. Oak woodlands used to thrive in that tug of war zone where squirrels and birds frequently bury acorns."

The oaks, which are fire-resistant, historically thrived under regular low-severity burns, which were stewarded by the Indigenous People of what is now Washington State. The fires helped to keep the conifers under control. Because of a lack of fire management, these oak ecosystems have seen decades of encroachment by conifers. This has led to many oaks dying, as well as a loss of understory diversity and many wildlife species losing habitat.

To restore the oak and prairie habitats, and to determine the extent of conifer encroachment at West Rocky Prairie, Tveten used soil maps (which often provide indicators of historic vegetation), historic photos, and General Land Office survey maps from the 1800s to determine where prairies and oak woodlands were historically at this site.

As Tveten developed a restoration plan, he realized that some of the Forest Practice Rules (FPR) could inadvertently interfere with his ability to achieve some of the restoration goals for the site. At West Rocky Prairie, some of the largest old-growth oaks dying in the shade of conifers sat within wetland buffers, which cannot be thinned under current FPR regulations enforced by DNR. One of the main reasons for these thinning restrictions is to maintain shade so that adjacent waters remain cold for important species, like salmon.

The wetlands at West Rocky Prairie do not contain salmon, but rather Olympic mud minnows (a state sensitive species) and sticklebacks, two fish species that thrive in warmer waters. The wetlands also contain Oregon spotted frogs (state endangered and federally threatened), which can only successfully reproduce in sunny spots. If the water is too shady and cold, their eggs can't develop into tadpoles. At this site, it seemed thinning out the conifer along the buffer could help improve the habitat for these species.

After sharing his findings with DNR, the agency granted WDFW the option to develop an alternate plan for the site, given its unique species needs and habitat concerns. It took about four years from the original planning efforts to actual implementation, but the ability for the two state agencies to find the best management approach paid off. Thinning work took place in fall 2023. Within eight months, federally listed mazama pocket gophers (one of the target species for the habitat) started moving into treated areas. This isn't uncommon – during restoration of a similar site, pocket gophers started moving into treated areas within six months. "As soon as you give them a little breathing room, they fill that space," said Tveten.

The site will continue to undergo maintenance and monitoring for several years. Additional planned work includes pile burning, invasive species removal, and understory seeding and plantings to bring back native herbaceous plants. The hope is that West Rocky Prairie will become suitable for two other listed species – western gray squirrels and Taylor's Checkerspot Butterflies – soon.

Partnerships to Support Private Landowners

Utilizing Collective Benefits: Different Agencies and Organizations Work Together to Increase Forest Resilience in Central Washington

Story developed through interview with Joe Hill, Forest and Community Resource Specialist, Cascadia Conservation District.

Forest and fire resilience have been top priorities for decades in central Washington. For most of this time, natural resources organization and agency staff have worked with private landowners largely on an individual basis; a "divide and conquer" model.

Three years ago, folks in Chelan County took a chance and changed this model in earnest. Today, staff from the Natural Resource Conservation Service (NRCS), Cascadia Conservation District, DNR, and Chelan Public Utility District all work together in Chelan County to make sure they are complementing each other's programs.

The partnership originated out of a need to develop more sustainable methods of delivering projects with private landowners. Staff from the different agencies and organizations realized that they were often having the same conversations with the same landowners, and so were not utilizing outreach and staff expertise as efficiently as possible.

This cooperation helps the county to get the most acres treated for forest and fire resilience, as well as figure out the best program fit for each landowner. "Ultimately, the landowners are the ones volunteering for this service, so we want to keep them at the center," said Joe Hill, Forest and Community Resource Specialist for Cascadia Conservation District.

The process starts when a landowner reaches out to one of the partner agencies. At that point, staff from the associated agency will do an initial review and assess what program might be the best fit. All partnering staff meet monthly to discuss potential project details, including project locations and treatment types. The planning process includes time for all staff to learn the ins and outs of not only their own cost share programs, but also the cost share programs and opportunities provided by partner agencies.

Landowners have access to a range of possible treatment options through this partnership, and the collaborative process has meant more acreage and more landowners coming into the fold. The multi-agency and organization collaboration has also prompted additional partnership opportunities.

In late July 2024, staff from the partnering agencies and organizations went on a field trip with USFS staff to visit a private parcel within Forest Service land. While 'landlocked' inholdings like this are often seen by the Forest Service as "untreatable" due to access constraints, however the group used the parcel as an opportunity to talk about better ways of communicating these perceived barriers across agencies. They also discussed the importance of more complementary, targeted outreach when certain areas are being targeted for treatment. This would help increase that treatment footprint onto private land. "It makes for better outcomes, because treatments aren't stopping at those property lines," further explains Hill.

Partnerships at the center of 2024 Washington Tree Farm of the Year's Success

Story created through interview and content provided by Becky and Lynn Miner, small forest landowners, and Andy Perleberg, Extension Forester, WSU Extension.

As high school sweethearts, Becky and Lynn Miner were brought together because of their mutual yearning to escape the rolling hills and flatlands of their native Iowa.

"When I first met her, one of the first questions she asked was, 'do you want to move away when you finish high school?'" Lynn said. After saying yes, Becky agreed to go on a date with Lynn. They've been together ever since.

Becky had gone on a trip to Washington as a young teenager and fallen in love with the area. Serendipitously, Lynn ended up being stationed at Fairchild Air Force Base in Spokane. On a trip to Canada, the young couple drove through Chewelah and were instantly wowed. Their dream to retire there was solidified, and over the next twenty years, through job changes and moves to several states, the couple continued to save and plan. They finally bought their property – called Casa Becca del Norte (which translates to Becky's House in the North) – in 1992.

While the Miners fell in love with their property at first sight, they quickly realized how out-of-shape their land was. In the spring of 1993, the Miners received a letter from the county weed board, telling them their knapweed was in violation of a county ordinance. Lynn remembers sheepishly sharing that he thought knapweed was a beautiful flower and asked the weed board for help. They told him to contact the Washington State Department of Natural Resources.

The small forest landowner forester at the time, Brian Vrablick, walked the property with the Miners, sharing his advice for how to make the property healthier. He thought the 100 acres would be a great spot for birding habitat, and noted several places for perch poles, potential snags, and nest boxes.

The Miners took the advice to heart and quickly got to work. Today, the couple has built and installed more than 700 nest boxes across their 100 acres and have recorded more than 60 different species of birds on the property. Their property includes a three-quarter mile bluebird trail, where bluebirds have inhabited slot box-type nest boxes purposefully placed along the corridor by the couple.

While some of these habitat improvements take time, some show results within days. "We would build a nest box on a Saturday morning, hang it on Saturday afternoon, and by Sunday, it would have birds in it," Lynn said.

Partnerships have proved to be integral for the Miners. During their 30-plus years of owning Casa Becca del Norte, the couple has worked with DNR, NRCS, their local conservation district, and the Washington State University Extension Office. They have attended dozens upon dozens of workshops across the area and are members of both the Washington Farm Forestry Association and American Tree Farm System.

The cost share programs that DNR and NRCS support have been a huge help to improving the health and associated habitats of the Miner's land. Since 1993, the couple has participated in numerous cost share projects to directly improve the property, including planting more than 11,000 native trees.

Another key to their success has been consistent work on the property. Becky and Lynn knew turning their land into something beautiful and healthy would take decades. Planning and biting off little chunks every day has been integral and one of the many reasons Casa Becca del Norte is this year's Washington Tree Farm of the Year.

Beyond birds, the Miners have turned Casa Becca del Norte into healthy habitat for a bevy of other species. Wildlife cameras have caught bear, elk, cougar, and moose inhabiting the property. The property has even shown itself to be a healthy, safe calving site for local elk.

The hard work and active implementation of projects is coupled with years of monitoring. This monitoring has not only shaped how they manage their own property but has also proven to be an amazing resource for land management advice and wildlife data.

"While neither of us have a PhD in wildlife, we have 30 years of field monitoring experience," Lynn said.

For decades, Becky has worked with the Cornell University Ornithology Lab, collecting data on bird habitat use on their property. Becky has implemented protocols from many PhD candidates for data collection, which is then used for academic articles and even dissertations.

Their monitoring work and data collection has adjusted habitat zones for certain species. In 2016, the couple caught what they thought was a gray wolf on their property and called Washington Department of Fish and Wildlife (WDFW). They were told that gray wolves didn't reside in their area; after they shared the photo, WDFW stated, "that's not one gray wolf. That's TWO gray wolves."

Today, the couple is often in the teaching seat, sharing their years of monitoring and forest management knowledge with elementary school teachers, to PhD-caliber scientists, and other landowners. The couple recently hosted a wildlife field day with Washington State University Extension (WSU), which they led with WSU and DNR.

"The Miners are stellar examples of forest stewardship and valuable peer to peer learning," said Perleberg, who has worked with the Miners for decades.

As one of their largest partnerships, the Miners have chosen to work with WSU to ensure a healthy future for their property. With no heirs or family to care for the tree farm, the Miners have chosen to donate Casa Becca del Norte to WSU as an educational and research facility. The facility will be used to educate students of all ages about a variety of topics, including forest health, forest insects, wildlife habitat, outdoor recreation, proper tree planting techniques, and more.

Washington's Service Forestry Program

Success Story: Ahtanum Fuel Break Project

Story developed through interview and content provided by Ben Hartmann, Kittitas Service Forester and Ali Martin, Service Forestry Coordinator, Southeast Region, Washington State Department of Natural Resources (DNR)

On a hike a few years ago through Conrad Meadows, DNR Service Forester Ben Hartmann remembers walking through the area, and thinking, "this forest isn't doing great." Looking at his GPS, he was

surprised to see that the area was privately owned, surrounded by public land. As a forester, Hartmann knew the challenges of working in “donut hole” private land ownerships that occur over decades of land ownership changes. He wondered, “who is going to do something about it?”

A few years later, it ended up being Hartmann himself. Before Hartmann, Yakima County had never had a DNR Service Forester who lived in the county. The opportunity to work on the property in Conrad Meadows was a bit of stars-aligning moment, with the right places and people at the right time. Hartmann and Service Forestry Coordinator, Ali Martin, ended up meeting the nephew of the landowner at the Yakima Sportsman Days in 2023. He introduced them to primary landowner Mark Herke. While talking to the nephew, it clicked for Hartmann that the nephew was talking about the property Hartmann had noted during his hike a few years prior. With the state and location of the land already known and the funds available, the project quickly began to take shape.

During the project planning phase with the Herkes, Hartmann’s local status made a huge difference. When Mark Herke called Hartmann on a whim, Hartmann jumped into his truck to find Mark talking with representatives from another neighboring private landowner in the area, Ahtanum Irrigation District (AID). Connections were quickly made, and the cost share project expanded to include both the Herkes’ and AID lands as part of a larger fuel break treatment.

Ahtanum Fuel Break showing the completed treatment (right) and pre-treatment condition (left) in a portion of the project area. Photo by DNR Service Forestry.

Hartmann's years of working as a volunteer for the West Valley Fire District gave him connections, he needed to host a local community meeting at the firehouse to share more about the project and DNR Service Forestry cost-share financial assistance.

Under family ownership since 1929, the Herke property is collectively owned by about a dozen different descendants of the original purchasers, which required Mark to get signatures from family members as far away as California and Germany before the project could commence.

"On DNR's end, contracting can be very simple." Hartmann said. "For private landowners, it can be complicated. Other projects can have 30 heads at the table." By June 2024, the project was able to cover fuel break treatments across 67 of private land that otherwise would have gone untouched. While the acres treated have been a good boost for fire resilience in the Ahtanum area, one of the lasting successes has been the improvement of community relationships.

Photo of Ahtanum Fuel Break. Photo by DNR Service Forestry Program.

"Sometimes it's not just about the acres that you have on the ground, but the positive message that you're able to get out," Martin said. "The successes ripple out into the public in ways that are sometimes hard to quantify," added Hartmann.

One of those successes has been the ability to provide more of a "show and tell" for the community of what a fuel break looks like on the ground by providing a localized, physical example in the Ahtanum area. The Ahtanum work has reinforced the idea that connections can happen anywhere – the important thing is to provide communities the facetime and space for them to build trust and translate our shared concerns over forest health and wildfire into coordinated actions on the ground.

A Multi-Pronged Approach: Western WA Small Forest Landowner Shares Insight into the Nuances of Wildfire Preparedness

Story developed through interview and content provided by Karen Palmer, small forest landowner. Recommendation for story from Don Meeks, Service Forester, Pacific Cascade Region.

Like many small forest landowners in western Washington, Karen Palmer and her husband, John Emmett, didn't think much about wildfire danger to their property until it came for them. "The Eagle Creek Fire was the one that got my full attention," Palmer said. "But Nakia Creek was even closer. We were evacuated during Nakia."

After returning home with their pets, their house and property luckily unscathed, Palmer and Emmett knew they needed to do something. As a master gardener, Palmer started learning more about fire resistant plants and how plant spacing could make an impact on her home's ability to withstand a fire.

Palmer was also able to take advantage of the DNR Service Forestry Program, which grew and expanded to work with landowners west of the Cascades in 2022. Palmer heard about the program from one of her neighbors, who had recently had a property assessment with a local forester.

Like in eastern Washington, Service Forestry staff in western Washington provide a one-stop shop for small forest landowners, providing assessments and forest management planning during on-site visits, as well as assistance and connections to various regional specialists and programs. Service Forestry also offers cost-share support for landers to implement forest health treatments.

Palmer worked with Service Forestry to improve her property. By walking her property with DNR, she realized that her property required more of a two-pronged approach. For the home hardening (work to make her structure and the immediate surrounding area more fire-resilient), Palmer needed to continue to remove vegetation and increase the horizontal and vertical spacing between plants, trees, and shrubs. This included limbing up and removing certain trees, while also removing some vegetation within the first five feet around her house.

"The biggest challenge personally was having to remove some trees and shrubs that were near and dear to my heart," Palmer said. "Gardeners always say, 'when a plant dies, it's a new planting opportunity'. And in this case, we can choose much more wisely what to put in its place." Palmer has also focused on replacing certain flammable plants with species that are both drought-tolerant and great pollinators.

For her five acres further away from her house, though, Palmer learned through DNR that she'd need to take a different approach. While Palmer thought originally that she'd have to clear out most, if not all, trees on her property to limit fire danger, she learned that it was much better to have a healthy forest. Instead, she worked on removing the flammable invasive shrubs and trees, including acres of blackberries, and replaced them shade-tolerant, native species. Palmer also learned more about some of

the native edible species she has on her property, including several beaked hazelnut (Corylus cornuta) trees and elderberry (Sambucus canadensis) bushes.

In addition to learning a lot about forest health through DNR, Palmer was surprised by the speed and variety of offerings available via the Service Forestry Program. Palmer was able to schedule a site visit within weeks of her first phone call. As a smaller forest landowner with smaller acreage, Palmer was also pleasantly surprised to find out that the program was even available to her.

"We have five acres, and we thought, 'that's not going to be enough,'" Palmer said. "A lot of people think you have to be a large landowner to be part of the program." Palmer shared that she is now thinking more about fire preparedness for her small community in Hockinson. Like many rural neighborhoods, Palmer and her neighbors have one paved road to travel in and out on. Palmer said the community has started to think more critically about a community trail, which can be used by ATVs in case of emergency. Having already evacuated once, Palmer and Emmett are also keenly aware of the challenges and need for solutions surrounding animal evacuation.

"Some hotels weren't flexible with having animals, even for extra fees," Palmer said. "For evacuation on a community-wide level, we need accommodations for the whole family." With many western Washington landowners and communities still early in their wildfire preparedness journey, Palmer advised folks to prioritize and to know that this is a journey. Palmer also shared that some decisions would feel hard at first but can have a range of additional benefits that landowners might not realize before they embark on this process.

Workforce Development and Rural Economic Development

Developing Markets for Forest Residuals and Biomass

In fire-dependent ecosystems burdened by more than a century of fire exclusion, there has been an incredible accumulation of biomass. These overabundant small- and medium-sized trees are contributing to extreme wildfires, drought-related mortality, and insect and disease outbreaks. Creating markets for small-diameter logs and restoration byproducts can improve the economic viability of forest health treatments and create jobs in formerly timber-dependent, rural communities.

The Washington State Department of Natural Resources (DNR) is working to support industry partners by providing an adequate and reliable supply of forest products available to wood products businesses. Through investments from the Wildfire Response, Forest Restoration, and Community Resilience account, DNR is increasing the use of Good Neighbor Authority agreements with the USDA Forest Service and Washington State Department of Fish and Wildlife. To date, Good Neighbor Authority projects in Washington State have sold 109 MMBF of commercial timber, conducted 23,500 acres of thinning and hazardous fuels reduction, and 345 miles of road repair and maintenance.

Commercial forest health thinning at Squilchuck State Park near Wenatchee, WA in the Stemilt Priority Planning Area. Photo by John Marshall, photo taken in December 2022.

Biomass, or the non-merchantable part of the tree, is low-value and often costs more to transport than the value of the material. Slash piles, which include limbs and tops of trees, are often mixed with dirt, rocks, and other material, making it too expensive to clean and process into a value-added product. Numerous studies and pilot efforts have attempted to utilize slash to create sustainable aviation fuel, biochar, and pellets to replace coal; however, the use of these technologies remains relatively nascent, with little overall business activity associated with the use of slash in Washington State.

Washington is fortunate to have a robust forest products infrastructure in many regions, including numerous global and regional leaders in forest management and restoration. Innovation in forest products, including the establishment of multiple mass timber production and manufacturing facilities in recent years, represents an important investment in the future of the industry.

Significant public and private investments will be required to maintain and upgrade Washington's wood products infrastructure over time, and to establish wood products infrastructure in north-central Washington, where a lack of wood utilization capacity is making it difficult to restore landscape health and reduce wildfire risk to communities. There is a high concentration of forested watersheds and communities at risk of catastrophic wildfire in north-central Washington. The area also has no mills and very little wood products infrastructure, meaning that small logs and biomass from thinning projects are piled and burned in the forest.

Washington State Department of Natural Resources staff, in partnership with Chelan County, Washington State Department of Commerce, and the USDA Forest Service are working to establish a forest products campus near Wenatchee, Washington. Partners envision a wood products campus that produces a suite of value-added products, optimizing the value of restoration by-products while supporting existing wood products businesses, creating jobs, and spurring local economic activity.

Grant funding provided by the USDA Forest Service Wood Innovations Program and matched with Chelan County resources resulted in a wood supply assessment produced by consulting firm Mason, Bruce, & Girard. The funds also paid for a site feasibility study led by infrastructure consulting firm Perteet Inc. to evaluate potential locations. The results show there is a long-term, sustainable supply of forest products associated with restoration needs and found that local zoning rules would allow for the citing of a wood products facility.

Project partners have attracted an entrepreneur who specializes in low-value wood utilization, with existing operations in Oregon and California, to evaluate the potential of establishing a new facility in Chelan County. The facility would serve as the anchor tenant at the campus and produce a suite of potential products such as posts and poles, bundled firewood, wood straw, and biochar.

DNR is investing state funds, matched with federal, county, and private investments, to conduct a market assessment that will inform the potential product lines associated with the forest products campus and to develop a business plan that will inform capital requirements and funding and financing needs.

Forest Resilience Bond: Upper Wenatchee Pilot Project Launch

The Okanogan-Wenatchee National Forest, Chelan County and other partners in Washington State took a pioneering step in wildfire risk mitigation by launching the first Forest Resilience Bond (FRB) in state history in 2024. The historic effort aims to safeguard communities north of Leavenworth from the growing threat of catastrophic wildfires.

Chelan County ranks highest in wildfire risk to homes in Washington and contains four of the state's top ten communities most vulnerable to wildfire exposure. The area faces a critical need for proactive measures to protect people, infrastructure, and landscapes. These communities in the wildland-urban interface are surrounded by dense forests abundant with ladder fuels, leaving them highly susceptible to catastrophic wildfire.

Blue Forest, a non-profit conservation finance organization working in collaboration with the USDA Forest Service, Washington State Department of Natural Resources (DNR), Chelan County, and Chelan Public Utility District (Chelan PUD), proudly announced the launch of the first Forest Resilience Bond (FRB) in the Evergreen state. The Upper Wenatchee I FRB is dedicated to funding fuel reduction activities on the Okanogan-Wenatchee National Forest, alongside crucial aquatics work. The project is financed by mission-driven investors through Blue Forest's FRB Catalyst Facility.

"Collaboration is at the heart of everything we do and instrumental to the success of our Forest Resilience Bond model," said Kim Seipp, Blue Forest's Managing Director of Science and Research. "That is one reason why we, along with our partners, are excited to launch the Upper Wenatchee I FRB. Through this collaborative effort, we are catalyzing the funds necessary to ensure wildfire mitigation

work starts now, not in a decade. Together, we are creating a more resilient landscape and safeguarding communities."

The FRB, co-developed by Blue Forest, the World Resources Institute, USDA Forest Service, and National Forest Foundation, is an innovative financing mechanism that taps into private capital to finance forest restoration projects on public lands to protect communities, ecosystem benefits, and rural livelihoods.

Funding contributions from the USDA Forest Service, DNR, Chelan County, and Chelan PUD will accelerate the pace and scale of wildfire mitigation efforts in these high-risk areas, completing activities that would have otherwise likely faced delays of eight to ten years.

Upper Wenatchee Pilot Project, before thinning (left) and after thinning (right). Okanogan-Wenatchee National Forest, Fall 2024. Photo by Chelan County.

Chelan County is the FRB implementation coordinator for the project and the first county in the Pacific Northwest to be operating under a Good Neighbor Authority Agreement with the USDA Forest Service. Project work began in spring 2024, and over the course of five years, the county will implement approximately 5,200 acres of terrestrial thinning in addition to culvert improvements, road decommissioning, and stream restoration work. This work is anticipated to lead to an 80 percent reduction in susceptibility to high-intensity wildfire on acres treated, increase 16,520 acre-feet in water yield from forest thinning over the next ten years, and sustain 34 to 54 jobs a year over the next five years.

"We live in a special place here in Chelan County, and we want to ensure we are safeguarding our communities and the landscape we cherish," said Chelan County Commissioner Shon Smith. "The Upper Wenatchee FRB will be a statewide model for how creative partnerships from the private and public sector can come together to bring a goal to fruition, in this case, building upon forest resilience and doing our best to prevent catastrophic fires. If, by building a more resilient landscape we create jobs, that's even better."

The FRB project area is within the broader Upper Wenatchee Pilot Project (UWPP) area, a 75,000-acre forested area north of Leavenworth. This broader UWPP area is a priority for the North Central Washington Forest Health Collaborative, a diverse group of local stakeholders working to accelerate landscape-scale forest restoration on the Okanogan-Wenatchee National Forest. The FRB project complements fuels reduction efforts being implemented by the USDA Forest Service and DNR elsewhere in the UWPP landscape.

This collaborative endeavor underscores Washington state's commitment to innovative solutions for wildfire risk mitigation, safeguarding communities, ecosystems, and livelihoods from the ever-increasing threat of catastrophic wildfires.

Workforce Development: A case study from Northeast Region

DNR recognizes that successful implementation of both the 20-Year Forest Health Strategic Plan and Washington's Forest Action Plan requires people collaborate, execute, monitor, and adaptively manage each priority action and goal. Direct and leveraged funding from the Wildfire Response, Forest Restoration, and Community Resilience account has allowed DNR to create new positions while investing in efforts to train, sustain, and retain a viable workforce to implement our work at an increased pace and scale today and into the future. This includes adding support to existing programs to catalyze two new program areas specifically directed by House Bill 1168: Post-Fire Recovery and Federal Lands Environmental Planning (NEPA).

Northeast Region staff piloted a project known as Arcadia to provide year-round work opportunities for wildland firefighters to increase the pace and scale of forest health work. This pilot project, a collaboration between DNR and the City of Spokane, aimed to reduce hazardous fuels and protect communities from wildfires. Non-permanent fire staff employed in the off-season treated 217 acres across various land ownerships. The project resulted in a high staff return rate (90% returned to the Arcadia work crews) and provided continuous employment.

This pilot built upon previous successes and emphasized the need for creative solutions to accelerate forest health and fuels reduction efforts across Washington State. The project highlighted the importance of non-permanent fire staff, noting their familiarity with local terrain and forest conditions as significant advantages. One of these projects was tested in 2024 by the Upper Cemetery Wildfire. Staff who completed the fuels reduction also responded to fight the fire, and experienced improved safety and familiarity with the landscape while engaging the fire.

Using direct investment funds from House Bill 1168, Northeast Region staff plan to replicate the pilot with two ten-person crews focused on forest health and resilience projects outside of wildfire season. This approach aims to treat at least 2,200 acres of land annually. The prioritization for these positions includes wildfire response, mandatory training, and various forest resilience activities. The overarching goal is to meet the objectives of the 20-Year Forest Health Strategic Plan and the Wildland Fire Protection 10-Year Strategic Plan.

Arcadia Fuels Crew thinning forest in Spokane County. Photo by Chris Randall.

The Arcadia 2023-2024 Fuels Reduction Pilot Project demonstrated significant early success, achieving its objectives of reducing hazardous fuels and protecting communities from potential wildfires. More concrete and stable funding is crucial to sustain and expand on these efforts. The positions involved in this project are presently funded via House Bill 1168 direct investments allocated by the Forest Resilience Division. While the Northeast Region is actively seeking additional funding sources, such as the FEMA Hazard Mitigation Grant Program (HMGD), a more consistent financial commitment from the state is a critical need. This would not only ensure the continuity of employment for these critical positions but also bolster both wildfire response capabilities, successional planning, and long-term forest health improvement initiatives.

DNR's Community-Based Affordable Housing Pilot Takes Shape

Story developed through interview with Krosbie Carter, Housing Policy Advisor for Dept. of Natural Resources.

For the past year, DNR has turned its attention to a new way to fulfill trust mandates: leasing lands for affordable housing. It's not new information to most people that Washington currently has a housing crisis. Housing is particularly sparse for those who make 30 percent of the average income for their region; data from the National Low Income Housing Coalition shows that 75% of these low-income

families have severe cost burdens for housing, which equates to these families utilizing at least half of their income to cover housing costs. The 2023-2028 Housing Advisory Plan: Affordable Housing Needs in Washington report shows the state must add more than one million new homes over the next twenty years to meet current needs.

The housing crisis also impacts DNR staff and other natural resource agency personnel across the state. In regions where rental units are few and far between, many seasonal employees cannot find housing and must rent, sometimes moving multiple times throughout their employment.

DNR currently owns approximate 8,000 acres of what are called 'transition lands," which are lands that are no longer feasible for timber production. These properties include a wide range of land types, from old parking lots, to fields, to small, forested parcels surrounded by development.

"These are properties that are currently vacant, and do not generate revenue for DNR or help fulfill the trust mandate," said DNR Housing Policy Advisor Krosbie Carter.

The DNR Trust Mandate provides a unique opportunity for the agency. While other state agencies can donate or sell their transitional lands, DNR must fulfill the constitutional mandate for its lands to make minimum rates to support funding for state schools and other public institutions across Washington.

Efforts to create affordable housing through the DNR program got a large boost from the 2024 Washington State Legislature, which passed House Bill (HB) 2003. HB 2003 creates a leaseholder exemption process for excise tax, but only when public lands are used for affordable housing. Through the bill, leases can be developed for periods of 20 to 99 years without excise tax ever being collected. The bill received bipartisan support in both chambers of the legislature.

Of the 8,000 transitional acres currently owned by DNR, the agency can only look at the subsection of these acres that could feasibly be developed for affordable housing and residential use. One of the biggest barriers to using those lands for affordable housing is utility access; many properties do not have easy, inexpensive paths to adding add water or sewer access, or the current infrastructure on-site would not support the demands of a multi-unit housing development.

"A lot of sites, especially in eastern Washington, are not easy to develop," Carter said. "We are not the developer, so one question we need to ask is, 'how are we making sure that the properties are feasible from a developer's perspective?'"

While developing properties for housing is new to DNR, the agency has a long history of renting out and leasing lands. The Product Sales and Leasing Office currently manages several rental agreements for different properties, including leases to commercial businesses with brick-and-mortar operations on DNR-owned land.

The process will look a little different for affordable housing. Lessees will enter into an agreement to become the primary leaseholder for the given parcel, while DNR will still retain ownership of the underlying ground. The lessee can then develop units on these properties with the option to either sell or rent the units. The agency is working with a contractor to develop an affordable lands portfolio. Staff and consultants are assessing over 3,000 acres across the state, in over 19 counties, many of which are in rural communities where infrastructure access pose the greatest barrier to affordable housing development. A key element of the lands study is to assess which parcels are most viable for affordable

housing, specifically ensuring to exclude any properties that are actively managed for forestry or agriculture. The identified parcels are vacant, residentially zoned, and where local jurisdictions have planned for future development.

“We are looking at all these lands and asking, ‘what are the barriers to development, what are the challenges, what are the environmental impacts?’” Carter said. After assessing the pros and cons for each parcel, Carter and staff on the Environmental Justice and Equity team will take housing variables such as the number of units and specific infrastructure changes needed to the proposed communities for feedback, to better understand if housing would work, and if so, what types of housing needs the community has. “This can’t be a one-size fits all approach,” Carter said.

As part of these ground-truthing efforts, DNR is currently conducting a pilot with Habitat for Humanity to assess what this process could look like for two Washington cities: Lacey and Pasco. Through this pilot, DNR and Habitat for Humanity are assessing different pathways for these parcels to be developed into homeowner units to then be sold to first-time homebuyers making less than 80 percent of that area’s median income. The homeowners would then gain equity of the property over time, while DNR retains land ownership. To keep these units as affordable housing, homeowners will be required to sell their unit to another low-income, first-time buyer when they decide to sell their residence.

Aquatic Restoration and Watershed Resilience

The Forest Action Plan and 20-Year Forest Health Strategic Plan call for an increase in the health and resilience of both forest and aquatic ecosystems for a changing climate. The health and function of our forests and watersheds are interrelated. Addressing forest and watershed resilience will aid in reducing risk of uncharacteristic wildfire, mitigate the impacts of future drought, and improve habitat for fish and wildlife species.

Advancing Salmon Recovery and Forest Health at a Landscape-Scale

Forests and fish are at the heart of Washington's culture and economy, and our state sits in the heart of Pacific salmon country. These anadromous fish migrate to the ocean from freshwater systems as juveniles and return to their home rivers and streams to reproduce, or spawn. Many salmon species die after spawning. Their decomposing bodies are an important source of marine-derived nutrients that help grow the big trees Washington is known for. Put more simply – these fish are fertilizer from the ocean swimming upstream. Researchers estimate that up to 60 percent of the nitrogen found in riparian vegetation comes from salmon. Streamside Sitka spruce have been found to grow three times faster along salmon-bearing streams (Mathewson et al. 2023, Naiman et al. 2002).

This ancient cycle is in trouble due to huge declines in salmon populations because of overfishing, habitat loss, and pollution. The anticipated impacts of climate change only add to the sense of urgency – we must do more if we want future generations to see wild salmon in our waters.

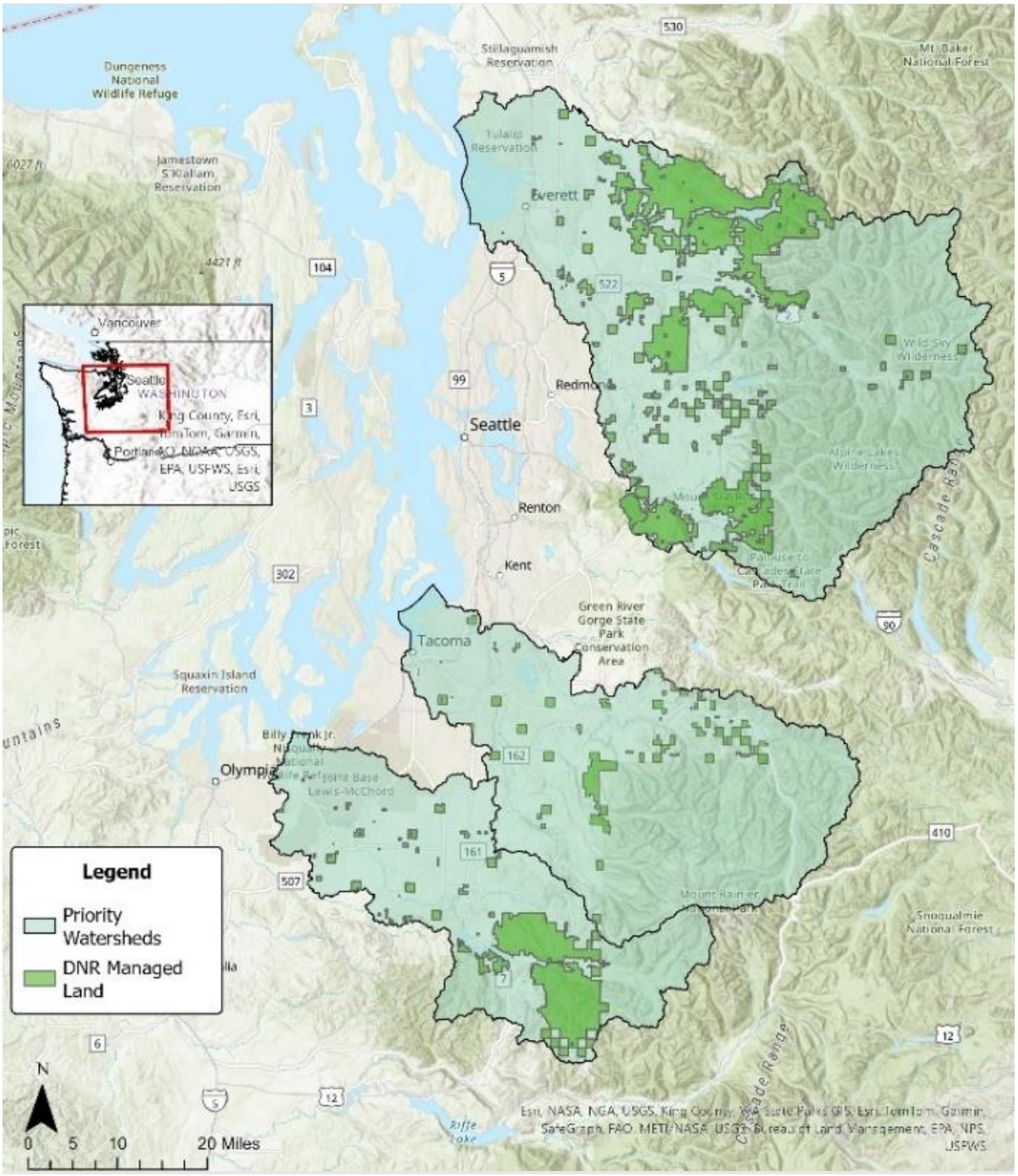
As the natural resource and state lands manager for Washington State, DNR has a long-standing commitment to supporting regional salmon recovery efforts. Work to fulfill this commitment is guided by five overall goals:

1. Protect and clean up aquatic habitat.
2. Restore, conserve and connect forests and riparian habitat.
3. Revitalize urban forests and streams.
4. Engage and invest in communities.
5. Reduce and combat climate impacts.

As reported in our previous legislative reports, DNR launched the Snohomish Watershed Resilience Action Plan, or WRAP, in March of 2022. This comprehensive plan outlined a ten-year roadmap for how to advance salmon recovery, climate resilience, and the health of our human communities across the Snohomish Basin. WRAP takes advantage of DNR's unique perspective as a land management agency with important roles around urban, forest and aquatic lands at the landscape scale. The plan is science-

based and strategic, applying a place-based and partnership-focused approach from “trees to seas” to amplify and build upon the good work of local salmon recovery communities.

Figure 14. DNR Watershed Resilience Program: Priority Watersheds and DNR Managed Lands



More than 70 percent of the 112 implementation actions outlined in the plan are underway, and DNR has invested in staff capacity to develop partnerships, plan for, and implement restoration and resilience projects. An initial investment of $250,000 from by the Washington Legislature has been leveraged into an additional $2.8 million in proviso funds from the 2025-2027 biennium and $865,025 in local, state, and federal grants.

The Snohomish WRAP was envisioned as a pilot project to demonstrate the value of DNR participating in salmon recovery efforts. The intent was always to scale up these strategies to other priority watersheds in the state. In 2023, the Legislature provided DNR with funding to expand this approach to two new watersheds: the Puyallup and Nisqually.

Work in the Puyallup and Nisqually watersheds will focus on the same primary areas of action as the Snohomish WRAP:

1. Amplifying and expanding existing DNR work that supports healthy watersheds
2. Coordinating and supporting the work of partners
3. Identifying recovery gaps that DNR may be uniquely positioned to address.

The health of watersheds and forests are intrinsically linked, and several programmatic priorities of DNR's watershed resilience work reflect this symbiosis. Key initiatives of the Watershed Resilience Program that help to promote forest health in Washington include:

- Keeping our forest lands forested: the avoided conversion project
- Engaging forest landowners in watershed restoration and resilience projects
- Supporting salmon restoration partners through the Large Wood Supply Initiative
- Promoting aquatic and forest health on state trust lands through restoration and resilience projects

Restoration and Resilience Projects with Forest Landowners

DNR is working across program areas to accomplish shared goals to promote riparian and forest health across Washington's forested landscapes. A particular focus of this work is on the state's 218,000 small forest landowners, generally defined as those that harvest fewer than two million board feet per year or steward at least one acre of forest. While helping landowners promote the health of their forests, there are opportunities to broaden technical assistance and training to share options for willing landowners to include a more diverse suite of aquatic and riparian health outcomes. These include promoting beaver coexistence, restoring native riparian vegetation, identifying opportunities for aquatic habitat restoration, and connecting landowners with local resources and partners that can help achieve these outcomes.

One example is the Forest Landowner Fish Passage Initiative (FloFish), a new effort to identify, assess, prioritize, and remove barriers to fish migration on private forest landowner property in the Snohomish Watershed. While most fish passage barriers on public roadways have been assessed and prioritized, the extent and impact of potential barriers on private crossings is generally unknown. Given that DNR works with private forest landowners to promote stewardship of forested lands throughout Washington, the agency is uniquely suited to engage forest landowners in this region-wide effort to promote habitat accessibility for salmon.

The Large Wood Supply Initiative

The Large Wood Supply Initiative (LWSI) is an innovative new effort to help address supply chain challenges that make it difficult for salmon recovery partners to procure wood for river and stream restoration projects. DNR is piloting the LWSI in the Snohomish Watershed to develop a proof of concept and a model for expansion. This initiative is working to identify ways to source and provide trees from DNR-managed lands to salmon recovery partners for use in habitat restoration projects.

Large wood within Washington's rivers and streams has historically been a ubiquitous and multifunctional aspect of healthy watersheds, providing a multitude of benefits to our state's salmon and trout populations. The existence of woody material within Washington's freshwater systems is an indicator of healthy, functional forests. Sources of large wood within our streams and rivers are deposited from adjacent forested uplands from natural events such as landslides, windstorms, and erosion. Large wood can also drive floodplain dynamics through erosion prevention and stabilization, providing sites for trees to mature and contribute to future wood deposition. These stabilized floodplain patches can divert water flow into branching patterns, creating greater aquatic diversity and resiliency through surface and groundwater exchanges.

Due to historical land use practices, many of our watersheds lack the necessary thresholds of in-stream wood, limiting salmonid population recovery. As DNR works to sustain and protect the health and productivity of Washington's forests and waters, we are uniquely positioned to address both the ecological and logistical bottlenecks associated with the lack of wood in our watersheds and the urgent need of these supplies to restore freshwater habitat.

Restoration and Resilience Projects on DNR-Managed Lands

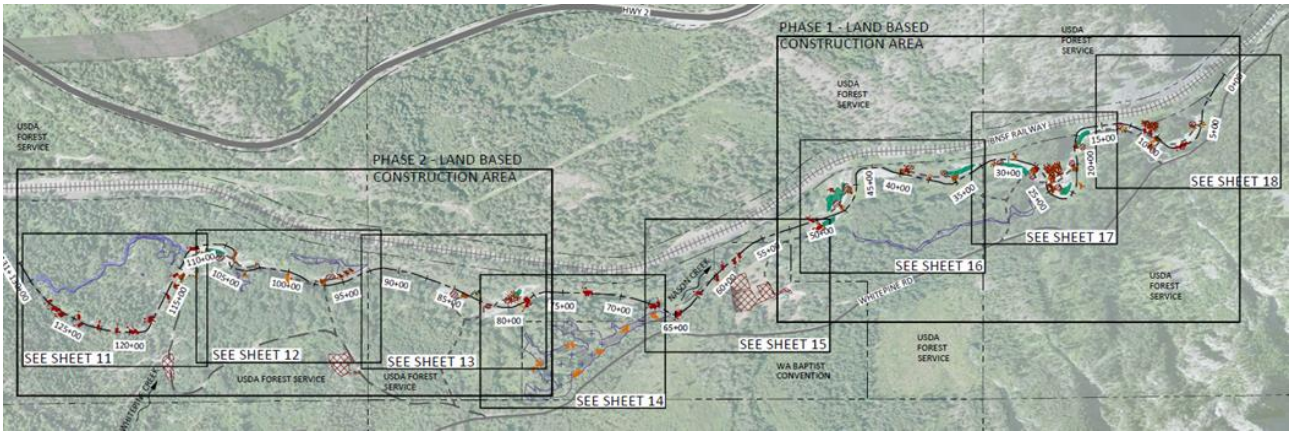
DNR manages almost 6 million acres of public uplands and aquatic lands in Washington, including approximately 175,000 acres in the Snohomish Watershed alone. Most of these lands throughout the Puget Sound region are forested, including thousands of miles of headwater and tributary streams that provide important salmon habitat. The potential for restoration across this landscape is mostly untapped, representing a huge opportunity to implement large-scale projects that can help to achieve landscape-scale restoration objectives.

Identifying opportunities for large-scale restoration on DNR lands has been a key priority, leveraging watershed-scale planning by the local salmon recovery community to zero in on where DNR managed lands overlapped with priority subbasins for restoration. Two project sites emerged as early priorities, resulting in successful local and state salmon recovery grants: one in the Woods Creek subbasin in Snohomish County, and one in Cherry Creek, a tributary to the Snoqualmie River.

Upper Nason Creek: Fish Habitat Enhancement Project

In 2019, Yakama Nation identified reach-based indicators associated with priority ecological concerns impairing salmonid productivity and survival in Nason Creek. These indicators included reduced floodplain connectivity, reduced off-channel habitat availability, lack of pools, marginal channel substrate quality, and low presence of large woody debris in the aquatic environment.

Figure 15. Upper Nason Creek Habitat Restoration Project, River Mile 13.6 to River Mile 16.6. Courtesy Yakama Nation.



In 2023-24, Yakama Nation led the improvement of three miles of Nason Creek to enhance habitat for Upper Columbia Spring Chinook, steelhead, bull trout and other resident species. The project included placement of 1100 pieces of large wood, five cover habitat structures, 1350 channel bar plantings, eleven apex structures, 26 deflector structures, 65 tipped trees and other improvements.

Yakima Nation Fisheries Upper Nason Creek Phase 1 and 2 Fish Habitat Enhancement Project. Photos by Yakama Nation.

Post-Fire Management and Restoration

Post-Fire Recovery Program

Washington's forests evolved with fire. Legislative direction to proactively and systematically address the forest health issues facing the state must consider forest health issues that occur or are amplified after a wildfire. DNR's Post-Fire Recovery Program supports communities and landscapes as they recover from increasingly severe wildfires across Washington. The program emphasizes cross-programmatic and cross-boundary coordination working at all levels of the disaster recovery cycle to support post-fire recovery in affected areas, and in coordination with impacted communities, through a network of professionals and resources across the agency and federal, state, local, and tribal partners.

Forest Service personnel assess the damage of a recent wildfire. Large patches of high-severity wildfire in dry forests were historically uncommon. Overstocked forests and climate change are leading to increased incidence of high severity wildfire across eastern Washington. Photo by DNR.

The Post-Fire Recovery Program supports activities aimed at stabilizing and preventing the degradation of natural and cultural resources, minimizing threats to life and property, and increasing the resilience of landscapes and communities against future disturbances. The program has invested more than two million dollars over the past biennium to improve communication tools, facilitate a coordinated statewide recovery network, and support long-term recovery efforts and training for natural resource professionals.

In 2023 and 2024, DNR took significant steps forward by organizing a series of all-hands post-fire recovery workshops. These workshops, designed to foster collaboration, share knowledge, and develop strategies, brought together more than 80 participants from a diverse array of agencies and organizations.

The workshops were a platform for participants to discuss the unique challenges faced by different communities in the aftermath of wildfires. By bringing together local leaders, agency representatives from state and federal levels, emergency management personnel, elected officials, and members of non-governmental organizations (NGOs), the program facilitated a rich exchange of ideas and experiences. This diversity of perspectives was crucial in identifying gaps in the current recovery processes and generating innovative solutions tailored to the specific needs of each community.

One key outcome of these workshops was the development of strategies to improve coordination between various entities involved in post-fire recovery. Participants worked together to draft and test strategies to enhance the alignment of efforts between state and federal agencies, providing more substantial support for local response initiatives. These strategies were tested during the 2024 fire season and refined based on real-world experience.

Another critical focus of the workshops was empowering communities to take an active role in their recovery. The program's commitment to providing guidance and resources to help communities develop customized post-fire readiness and resilience plans is inspiring and offers hope for the future.

Through these workshops, the Post-Fire Recovery Program has strengthened its own capacity to respond to wildfires and built a network of informed and engaged partners across the state. This network is now better equipped to support rapid and effective recovery efforts, helping to ensure that Washington's communities and ecosystems bounce back more quickly and sustainably from the devastating impacts of wildfires.

Reforestation Support

Washington's forests are increasingly unable to regenerate naturally due to long-term drought and degraded site conditions. In response, the Post-Fire Recovery Program launched a post-fire reforestation grant program to facilitate climate-informed reforestation of lands affected by wildfires. Supported by a $2.5 million state appropriation, these grants focus on replanting trees and native vegetation while also strengthening the reforestation pipeline to ensure a steady supply of climate-resilient seedlings. In September 2024, DNR announced approximately $1 million in grant awards to private forestland managers, NGOs, and state entities. Additional direct grants of seedling and technical assistance for planting are planned to complement the financial assistance grants. Monitoring protocols have been developed to gain insight into reforestation efforts, and a database is in development to track and manage reforestation needs statewide to enhance the long-term sustainability of forest recovery.

Reforestation example in eastern Washington. Photo by DNR.

Wildfire Interactions with Treatments and Suppression (WITS)

What is WITS?

RCW 76.06.200 directs DNR to prioritize investing in and implementing forest health treatments that have a dual benefit of (1) improving forest health and (2) providing strategic opportunities for fire suppression. There are datasets to help describe and measure forest health, but data is lacking on when, where, and how treatments are integrated into wildfire suppression planning and operations across all jurisdictions. Tactical decisions are often made quickly during fire response, and it can be difficult to connect management actions with ecological outcomes after the fact. To compound the issue, the "success" of a treatment is often subjective and based on individual perspectives, the organization's mission, and management goals for the site. If a treated forest around a home has high tree mortality but provides a safe place for firefighters to protect the home, was the treatment a success? How do we reliably know when a treated area burned under extreme fire weather conditions or when weather was a stronger predictor of ecological outcome than forest structure?

The DNR's first effort to measure how forest health treatments provide strategic opportunities for fire suppression was included in the 2021 Work of Wildfire Report as "the Cedar Creek Diaries". The diaries were narrative-style account of how wildfire and suppression tactics interacted with treatments on the 2021 Cedar Creek Fire. The project looked at four treatment units across USDA Forest Service and DNR-managed land and included fire progression, fire weather and first-hand accounts of firefighters and agency administrators collected several months after the fire. While helpful for explaining the connection between suppression actions and ecological outcomes at a small scale, DNR wanted to explore a repeatable process for collecting data on fire-treatment interactions from a fire operations perspective.

The *Wildfire Interaction with Treatments and Suppression (WITS)* survey was born out of the need to collect data on firefighters' perceptions of treatment impacts more consistently, timely and efficiently. The survey is intended to capture an individual firefighter's perception of the utility of specific forest treatments during suppression operations. The survey includes questions about the respondent, the impacts of treatments on fire behavior, resources assigned to the area where the interaction occurred, the ability to stop the fire, safety and working conditions, among other potential impacts. The survey also includes sections for describing values at risk beyond the treatment.

WITS is to be deployed by as many firefighters as possible whenever a wildfire interacts with a known forest treatment. Tracking the utility of these treatments can be difficult due to unique geography and weather conditions, the fast and often unspoken pace of decision-making, and frequent staff changes. WITS aims to provide a tool to collect these data quickly and efficiently. As immediate data collection is not always feasible, it is also acceptable for individuals with a strong fire background who are familiar with the site to complete these surveys days, weeks, or even months after the interactions.

WITS Goals

The WITS survey collects data as a first step in a framework to address the following goals:

1. Define and communicate the dual benefit of forest health work – to the legislature and the public – as part of DNR's commitment to monitoring the progress of our investments. WITS data will help define what constitutes a "fire operations benefit" and begin to quantify how often that benefit is delivered.

2. Elevate operational perspectives and tell the "success" stories of forest and fire management. There are many ways to define the "success" of forest health treatment, but from a dual-benefit standpoint, it all starts with a forester who planned a treatment that a firefighter could later utilize during suppression. Collecting the first-person accounts from fire staff allows us to share stories about first responders, communities, and valuable resources protected.

3. Understand the strengths and limitations of fuel treatments under specific conditions: Treatments may improve forest health, reduce the odds of negative fire impacts, and expand the fire manager's decision space, but they are not fail-safe solutions. Relating data from WITS with fire progression, resource availability, and fire weather information over time and across multiple interactions will strengthen our understanding of fuel treatments' strengths and limitations.

4. Integrate this information into our management, research, and monitoring: Collecting data over time and over different fires will lead to a robust dataset that fire managers can use to prioritize treatments for both ecological and tactical benefit (dual benefit). Fire managers use local knowledge to gain insight into the location and design of treatments on the landscape. Providing fire management staff with a user-friendly, accurate map of these treatments, and a summary of their limits of use could increase their utility during suppression activities. This can also be integrated into the Incident Strategic Alignment Process (ISAP).

2023 Wildfire Season: Wildfire x Treatment Interactions Pilot

WITS was piloted in the DNR's Northeast Region during the 2023 Wildfire season. Three fires – West Hallet, Gray and Oregon Road in Spokane County – generated 57 surveys reported by five wildland firefighters. Finalized data have yet to be released, but key takeaways include:

- Overwhelmingly, the treatments were believed to have benefited suppression operations.
- More benefits were listed for an interaction maintained through mechanical means or grazing.
- Extreme fire weather conditions can result in extreme fire behavior, such as observed uncharacteristic intense downhill fire behavior, highlighting that treatments cannot reduce or change fire behavior 100% of the time.
- Treatments do not guarantee ecological or tactical advantages but increase opportunities for reducing fire intensity and protecting at-risk values.

Figure 16. WITS survey deployments for the Gray fire in Spokane County, 2023.

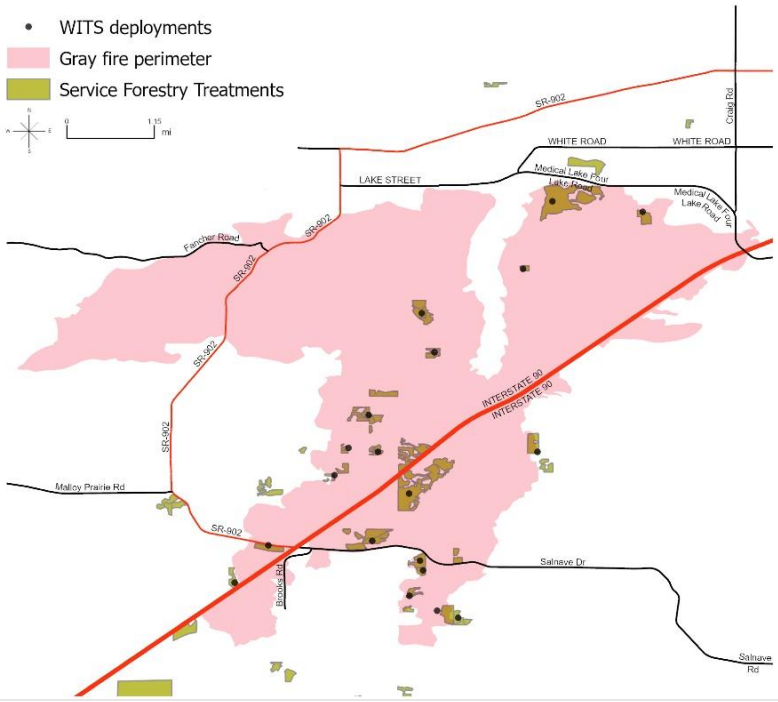
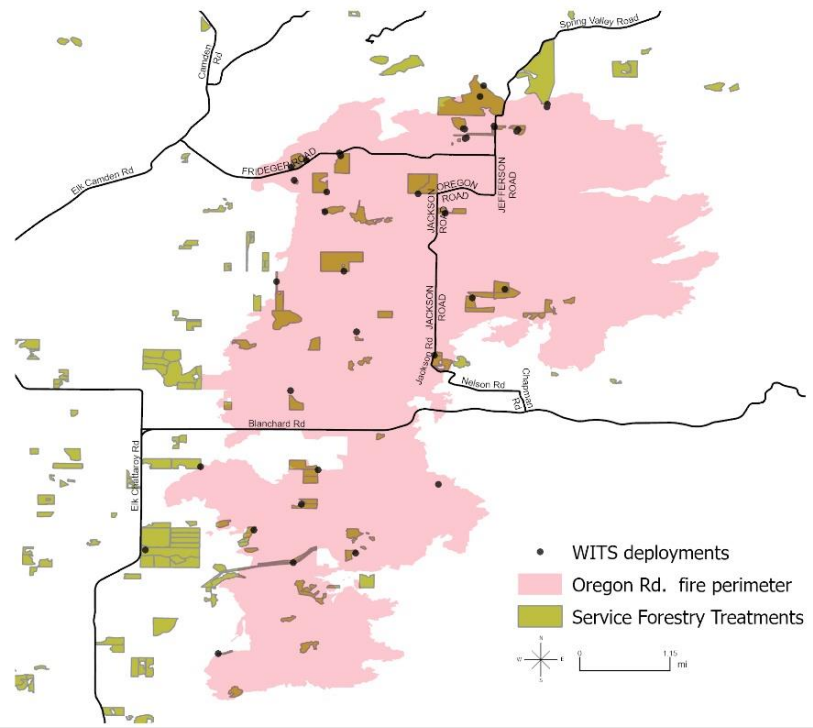


Figure 17. WITS survey deployments for the Oregon Road fire in Spokane County, 2023.



New Pilot Program Helps Restore Family Forests After Fire

By Steve Harris, NE Region Regulation and Resilience Assistant Region Manager, Department of Natural Resources. Story originally published in Forest Stewardship Notes, DNR's small forest landowner newsletter. Story re-published here with permission from editor and writer.

The Oregon Road and Gray Fires devastated the communities of Elk and Medical Lake in Spokane County. Over 20,000 acres of primarily private forest land burned in a matter of days. More than 700 structures, including many primary residences, were destroyed. Large swaths of area burned with such intensity that many landowners suffered complete tree loss in their forests.

Historically, DNR provided millions of dollars in financial assistance annually to help forest owners manage their forests for wildfire resilience, but the agency was never funded to assist forest landowners with catastrophic wildfire damage. DNR Service Foresters could provide a post-fire site visit and consultation regarding salvage logging options and reforestation recommendations but there was no funding available to implement post-fire restoration projects. That all changed with the passage of Washington House Bill 1168, "Concerning long-term forest health and the reduction of wildfire risk." This legislation provided a limited amount of funding to the DNR to establish a post-fire restoration program.

Private lands impacted by Oregon Fire in Spokane County. Photo by DNR (September 2023).

The Oregon and Gray Fires, along with a few other previous wildfires, provided the perfect opportunity to build a post fire restoration program in DNR's Northeast Region. DNR partnered with several other agencies to sponsor outreach meetings in the Medical Lake and Elk communities. Through the meetings and by word of mouth, over 250 landowners signed up for DNR post fire assistance. The current focus for DNR Service Foresters is to help forest landowners with reforestation, sediment management, invasive species mitigation and road repair.

To help mitigate invasive weeds and soil erosion, DNR distributed several tons of native grass seed to forest landowners in ten-pound bags. The idea was to establish native seed on freshly disturbed soil to beat out invasive weeds and help control erosion. DNR foresters are currently happy to report that the native seed sprouted in the spring, and native plants are already getting established in the fire-scarred landscape.

DNR's Northeast Region staff also reached out to multiple forest seedling nurseries last winter and were able to purchase over 66,000 tree seedlings appropriate for the seed zones and elevations of the major burn areas. On a "first come, first served" basis, the seedlings were shared amongst 70 different forest landowners throughout Northeast Region. This required a lot of coordination to ensure careful transportation, refrigerated storage, distribution, and, finally, planting.

Native seed mix sprouting after the Gray Fire while a tree planter is hard at work. Photo by DNR.

Several landowners chose to plant the seedlings themselves, so DNR foresters provided instruction and handouts to help landowners be successful. As anyone who has planted trees knows, this was not easy work. Some landowners lacked the ability to handle such a big task, so DNR foresters were able to secure help from DNR wildland fire crews. Many of these crews worked on the Oregon and Gray fires and saw the devastation firsthand. Six of the crews that helped with the tree planting are based out of the Airway Heights Correction Center and are typically made up of one DNR supervisor and ten incarcerated individuals. The Airway Heights Crews have planted trees for DNR Trust Lands and other agencies for decades, so their expertise came in handy.

Northeast Region ran the 2024 tree planting operation as a pilot project to see if this service could successfully be offered to family forest landowners. By the first week of May, all the seedlings were distributed and planted. It appears the program has been successful, but we won't be sure for a couple of years as the seedlings battle the elements, drought, vegetative competition, and animal browsing. There are dozens of landowners on the list for tree seedlings in 2025 and there will be demand with the heart of fire season quickly approaching.

20-Year Forest Health Strategic Plan Monitoring Framework

2024 Monitoring Report Summary

Significant progress has been made in restoring forests across the region, both through active management and natural disturbances including wildfires. Monitoring this progress is a critical component of the 20-Year Forest Health Strategic Plan. In 2024, DNR released the first stand-alone monitoring report summarizing how forests are changing across eastern Washington and how those changes impact current and future forest health and resilience.

The 20-Year Plan Forest Health Strategic Plan Monitoring Framework identified three primary levels for monitoring: region, priority planning area, and treatment unit. The regional level covers eastern Washington or larger sub-regions such as northeastern Washington (millions of acres). The planning area level addresses questions within 20-Year Forest Health Strategic Plan priority planning areas (hundreds of thousands of acres). Finally, the treatment unit or stand level monitors individual treatment projects or changes within stands ranging from less than an acre to several hundred. In this section, efforts are summarized across three scales: eastern Washington broadly, by planning area, and at the project-level.

Monitoring across Eastern Washington

The following totals are from January 2017 to October 31, 2024 for reported forest health treatments; and 2017-2023 for unreported forest management activities, wildfires, and insect activity detected through satellite-based change detection. Collectively, management activities, wildfires, and insects affected an estimated 1,873,148 footprint acres, or 19% of the forested area, in eastern Washington. Reported forest health treatments and other unreported forest management activities accounted for 692,249 acres. Wildfires and insect activity accounted for the additional 1,180,899 footprint acres.

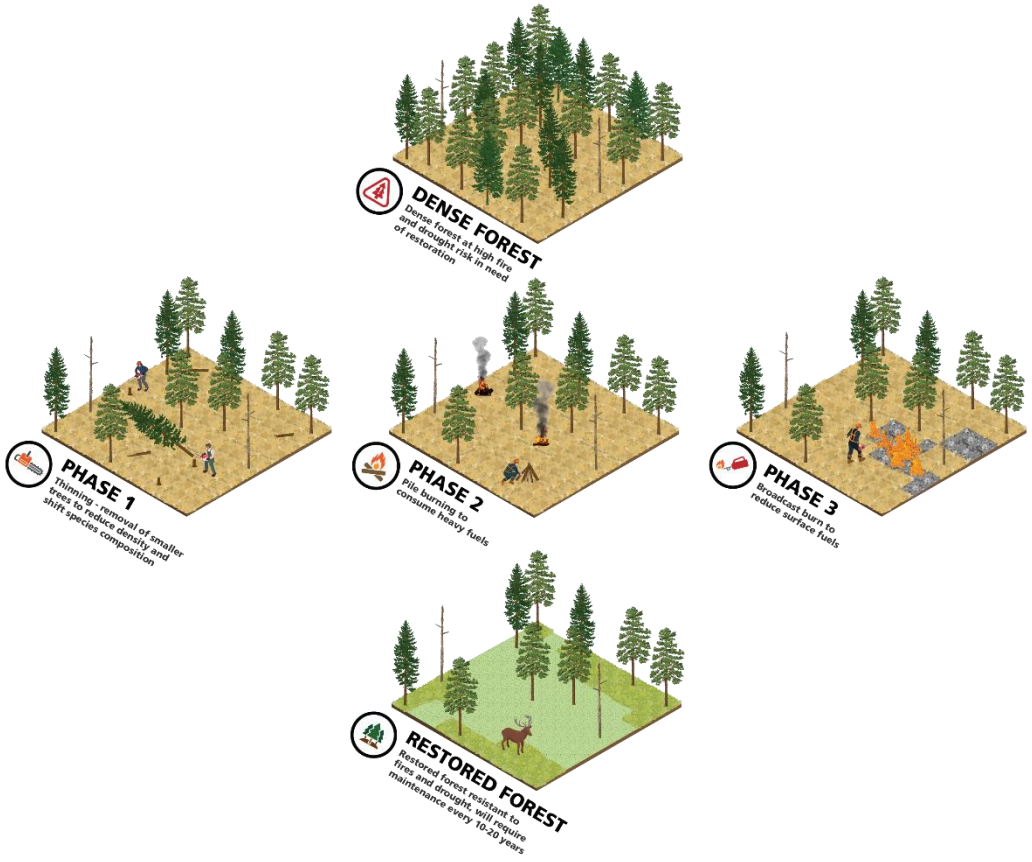
A total of 962,292 acres of implemented treatments were reported to DNR, and an additional 257,926 acres of unreported forest management activities were detected using satellite-based change detection. These total acres include cases where multiple disturbances occurred on the same acre (e.g. thinning followed by piling, and pile burning), and thus the treatment total (962,292 +257,926 = 1,220,217 acres) is higher than the footprint acres for treatments (692,249 acres). The most common treatment types are summarized in the table below.

Treatment Type	Acres
Fuels rearrangement	344,405 acres
Commercial treatment	396,818 acres
Pile burning	161,663 acres
Non-commercial thinning	100,026 acres
Prescribed fire – broadcast burning	60,475 acres
Other treatment type	144,457 acres

Other treatment types included in the table summarize noxious weed removal and spraying, site prep, planting, re-seeding, wildlife habitat improvement, and other unknown treatments.

Additional analysis of treatment tracking and monitoring work is needed, along with field-based monitoring, to better understand and map which treated areas are in a fire-resistant condition and which acres need additional surface fuels treatment such as broadcast burning or piling and burning of piles.

Figure 18. Potential treatment sequence to restore drought and fire-resistant forests. One footprint acre of dense forest will often require multiple treatments (activity acres) over several years to achieve a restored forest condition that is resistant to drought and wildfire. The sequence illustrated in this figure is one of several potential treatment pathways that could lead to a restored forest condition. Often some combination of thinning, prescribed fire and/or wildfire will be needed over several years to reduce overstory, understory, and surface fuels to achieve forest conditions that are drought and wildfire resistant.



Planning Area Monitoring

DNR scientists have conducted detailed planning area monitoring studies in three priority planning areas in eastern Washington. Substantial progress towards landscape restoration goals has been made in the Cle Elum, Glenwood, and Mill Creek priority planning areas, where detailed analyses were conducted. The rates of treatment and total footprint acres completed in these landscapes are on track to achieve treatment targets identified in the landscape evaluations. Many treatments were in locations with moderate to high treatment priority. In all three planning areas, treatments have increased the likelihood of positive, complementary outcomes when a wildfire does occur. Additional prescribed fire and other surface fuels treatments will greatly increase the odds of positive wildfire outcomes.

It is critical to understand, however, not only the rates and location of different treatments, but also their effects on key attributes, including forest structure, fuels, and wildlife habitat. To assess these treatment effects, we estimated changes in forest structure from 2015 to 2021 using forest structure data from National Agriculture Imagery Program (NAIP) imagery generated from digital aerial photogrammetry. Across the three planning areas, treatments, wildfires, and insect disturbances increased open-canopy forest with large and medium trees by 6-25 percent. This led to significant increases in the amount and patch size of White-headed Woodpecker habitat. Northern Goshawk habitat remained abundant and well distributed. However, 45-70 percent of the forested area remains closed canopy (>60 percent cover). Open-canopy forests with large, fire-resistant trees are still in short supply in all three planning areas.

Especially in the Cle Elum and Glenwood planning areas, more treatments to significantly lower canopy cover on dry forest sites are needed to make faster progress towards forest structure restoration goals that will create more fire- and drought-resistant landscapes. For new treatments, this can be accomplished by modifying existing non-commercial fuels treatment approaches to remove more trees, including those larger than eight inches in diameter. For areas that have already been treated, follow-up broadcast burning, or beneficial wildfire can lower tree density. Time and tree growth are also needed in many areas for medium-sized trees to progress into larger, more fire-resistant size classes.

Treatment Unit and Stand-level Monitoring

Over the past three years, more than 35 stand-level monitoring projects and plots have been initiated across eastern Washington with the involvement of the Department of Natural Resources. These projects encompass a variety of partners and treatment types. There is a gradual shift towards using the DNR monitoring protocol, specifically the Forest Health Treatment Effectiveness Survey123, as outlined in the Monitoring Framework. Survey123 is designed as a standalone tool for conducting stand-level monitoring across multiple partnerships. It is both flexible to accommodate diverse partner needs and standardized enough to support a robust statewide monitoring database. A complementary written protocol is available to provide additional clarity on using the Survey123 tool.

The protocol offers three levels, allowing users to tailor their monitoring efforts based on their available resources. The first level, **Opportunistic**, enables users to conduct geospatial photo monitoring with sufficient detail to replicate the photos over time. This method is becoming increasingly popular, especially among partners with heavy workloads such as the DNR Service Forestry Program. The other two levels, **Simple** and **Moderate**, offer varying degrees of data collection. The **Simple** protocol is relatively quick to complete and provides more qualitative data, while the **Moderate** protocol is more time-intensive but yields more quantitative data.

An interactive dashboard is being developed to enhance the efficiency and scalability of stand-level monitoring. This dashboard will allow users to access data, generate basic summaries, high-level statistics, and template reports for individual monitoring projects. The goal is to make monitoring data more accessible and reduce barriers for partners. DNR is also working to develop more detailed monitoring reports at the project level. Two of these reports are included as appendices in the full 2024 monitoring report, which can be accessed online at this link. So far, partnerships collecting monitoring data with DNR's support include a wide range of internal and external state partners (Service Forestry, State Lands, WDFW, and State Parks), federal agencies (Colville and Okanogan-Wenatchee National Forests), Tribes (Kalispel Tribe), non-governmental organizations (Cascade Forest Conservancy), universities (Gonzaga University and Eastern Washington University), municipalities (City of Spokane), and more. These diverse partnerships for stand-level monitoring are fostering increased collaboration in other areas of forest health and fuels reduction, ultimately improving opportunities for large scale forest management.

DNR Research Highlights: Northern Spotted Owl Habitat Sustainability in a Fire-dependent Forest Landscape

In 2024, DNR scientists along with colleagues at University of Washington, USDA Pacific Northwest Research Station, Oregon State University, and Washington Conservation Science Institute published new research on an approach to evaluate habitat sustainability for Northern Spotted Owl (NSO) in fire-frequent forests in a leading journal, *Forest Ecology and Management*.

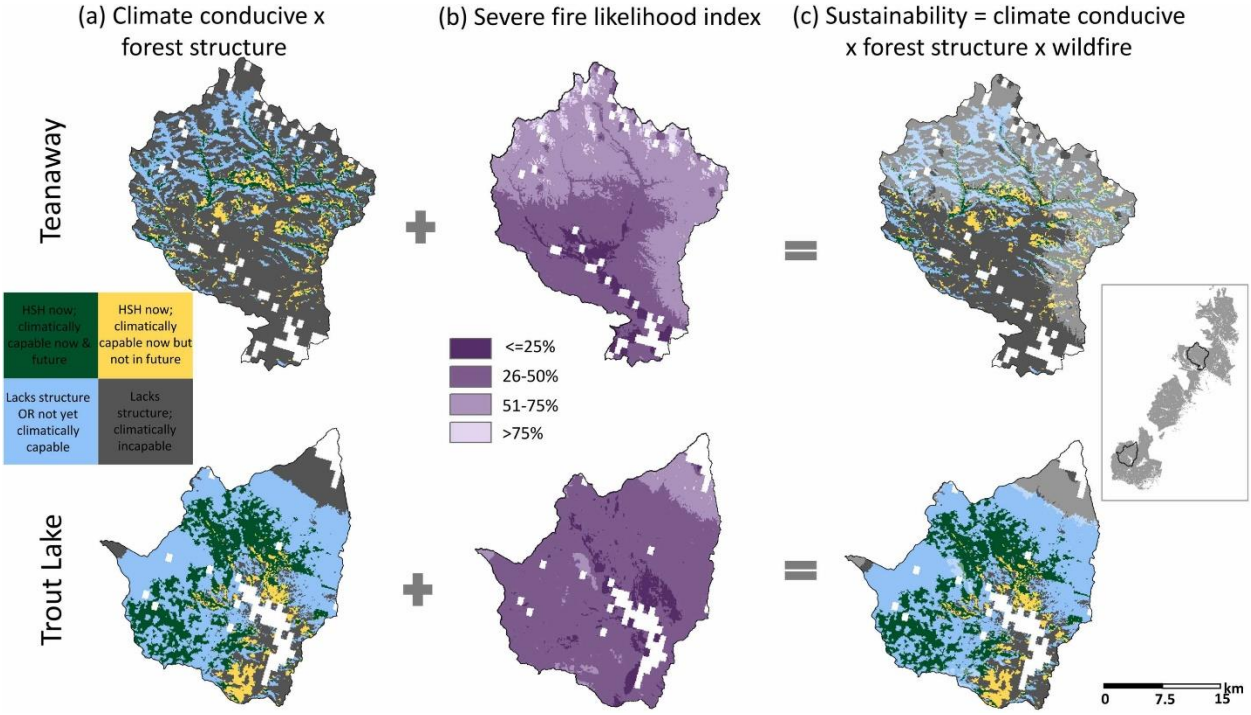
Dense forest habitats, often preferred by NSO, are challenging to maintain in frequent-fire landscapes historically dominated by open-canopy forests with large, fire-tolerant tree species. Numerous studies have found that these forests are significantly departed from historical conditions due to fire exclusion and past forest management practices and are not resilient in the face of climate change. Restoring these forests with thinning and prescribed fire, however, can conflict with objectives associated with species conservation for NSO.

The research developed a new approach to evaluating NSO habitat sustainability, which includes:

1. Quantifying the structure of high suitability habitat (HSH) associated with NSO using two remotely sensed platforms.
2. Estimating current and historical HSH abundance.
3. Identifying HSH locations more likely to persist given current and future forest-zone climate projections and increasing risk of severe wildfire.

While highly correlated with other structural attributes associated with NSO habitat, tall, closed-canopy conditions effectively comprised the key structural features of HSH, providing a means to map habitat through time. Both historical amounts and contemporary spatial patterns of HSH and other forest and non-forest conditions around occupied NSO sites indicated that HSH and forest resilience goals can be congruent at multiple scales. Independent lines of evidence suggest HSH historically composed about 18-28 percent of the dry and moist mixed-conifer landscape – considerably lower levels than current management goals in many areas.

Figure 19. Example of two watersheds with different amounts and configurations of (a) current NSO HSH climatically conducive and forest structure area and (b) Severe Fire Likelihood Index values (SFLI). SFLI values depict lower to higher likelihoods of severe wildfire. For Sustainability (c), SFLI categories were aggregated such that SFLI values ≥50% (higher fire risk) are displayed as lighter shades of a given color and values ≤50% (lower fire risk) as darker shades. Depending on the broader landscape context (e.g., habitat adjacency and connectivity in other watersheds), managers in the Teanaway watershed (top row) may pursue NSO HSH goals in areas with lower SFLI in the southern portion because options are limited at higher elevations. In contrast, very little of the Trout Lake watershed (lower row) has high SFLI, affording managers greater flexibility in managing current and future NSO HSH.



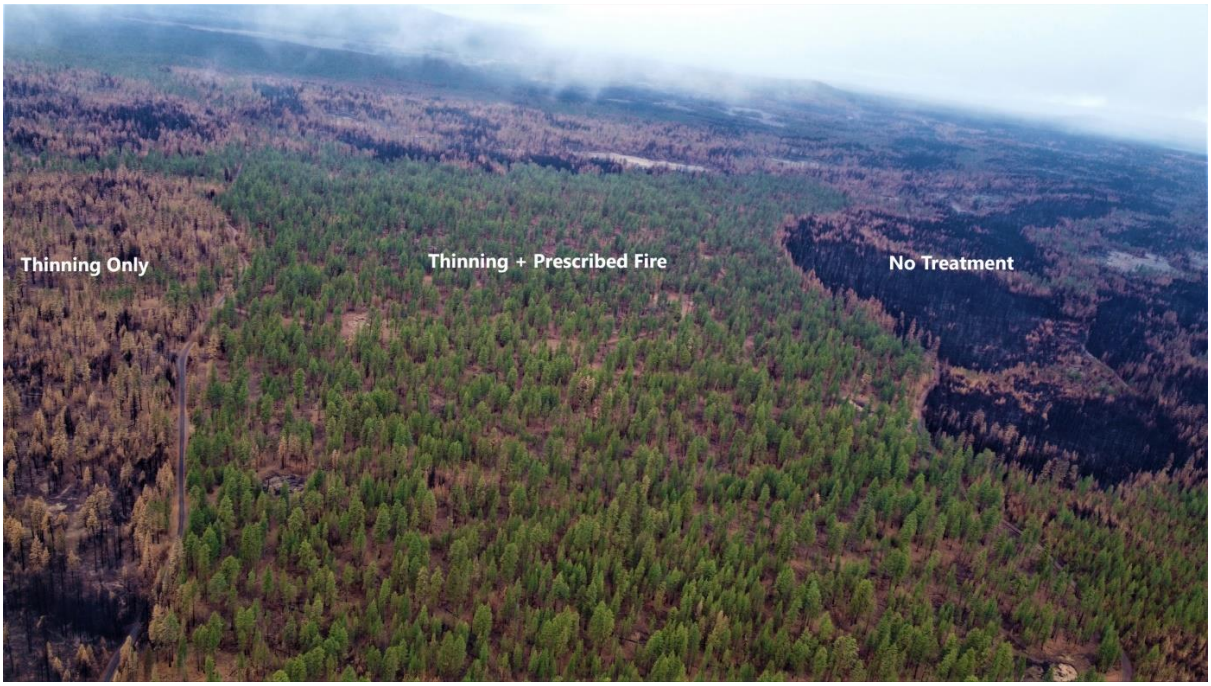
Projected shifts in climate and the likelihood of severe fire suggest substantial spatial and temporal shifts where HSH will be sustainable into the future – mainly in currently moist, as well as some cold forest types. These findings can inform the potential convergence and trade-offs of species conservation and disturbance resilience goals across local and regional landscapes, based on the inherent capacity of the landscape to support both goals under projected shifts in climate and wildfire. The full journal article is available here.

Treatment Effectiveness Monitoring

Meta-analysis of thinning, prescribed fire, and wildfire effects on subsequent wildfire severity in conifer dominated forests

Leading scientists from USDA Forest Service, University of Montana, and The Nature Conservancy conducted a meta-analysis of 40 studies spanning eleven western States focused on fuels treatment effectiveness. The study was motivated by the significant increase in high-severity wildfire occurring in the western United States, and a desire among research scientists to evaluate more than a decade of research on the topic.

The research review found that treatments, including thinning, prescribed burning, and past wildfire were all effective at reducing the severity of later wildfires. The most effective treatments include the combination of thinning and prescribed burning. The researchers also emphasize that the maintenance of treatments is critical to increasing the likelihood of the treatment remaining effective over time.



"Thin only" treatments are less effective at reducing wildfire severity than treatments that also utilize prescribed burning, with 68% of thin only treatments experiencing high severity in Oregon's 2021 Bootleg Fire. This photo shows a mixed conifer forest where the Klamath Tribes, The Nature Conservancy, and Lomakatsi Restoration Project worked with the US Forest Service to thin trees and apply prescribed burning as part of the climate adaptive 'Black Hills Project' where, in some areas, prescribed burning had not been applied yet. Thinning only was not as effective at reducing wildfire severity as combining thinning with prescribed burning. Photo used with permission from Steve Rondeau, Klamath Tribes Natural Resources Director. Reproduced from Davis et al. (2024), an open access publication shared under creative commons license 4.0: https://creativecommons.org/licenses/by/4.0/.

Evaluating fuel treatment effectiveness and impacts on large trees following the Schneider Springs Fire

Building on the 2021 Work of Wildfire assessment, DNR worked with research partners at the University of Washington to evaluate fuel treatment effectiveness on two large 2021 wildfires: Schneider Springs Fire that burned in Washington and the Bootleg Fire that burned in Oregon. Key findings from the work led by Chamberlain et al. (in press) include that those treatments generally reduced burn severity, particularly under moderate fire weather conditions; treatments that included prescribed fire were particularly effective; and that a consistent, scalable workflow that accounts for fire weather, fuels, and topography is essential to quantify drivers and effects at the scale of individual fires and to compare across multiple fires.

Within the Schneider Springs Fire, areas that were previously treated with thinning and prescribed fire (right) tended to have lower-severity outcomes than similar untreated areas (left) according to the analysis by Chamberlain et al. (in press). Photo by DNR.

As climate change brings increased uncertainty to dry forest ecosystems, this framework can support more strategic management actions to reduce wildfire risk and foster resilience. Another extension of the 2021 Work of Wildfire assessment is an in-depth investigation of fire effects on mature and old-growth forests in both open- and closed-canopy conditions and across multiple forest types within the Schneider Springs Fire. DNR scientists and partners evaluated burn severity across forest types and

structure classes based on pre-fire DAP, LiDAR, and Landsat imagery. Key findings included that burn severity proportions generally aligned with historical estimates across forest types, despite several very large patches (≥400 ha) of high-severity fire that resulted in the mortality of many large, old trees, and that burn severity was disproportionately higher in locations with large trees in closed canopy conditions compared to large trees in open canopy conditions.

Burn severity tended to be lower within recent treatments than outside of treatments in both large-open- and large-closed forests. In addition, large-closed forests had lower severity closer to treated areas, indicating a shadow effect of recent treatments. These results highlight the vulnerability of mature and old-growth forests to increasing fire activity as well as the value of strategic implementation of treatments for sustaining diverse late-successional forests.

Assessing the Work of Wildfire

Wildfire plays a major role in influencing forest conditions. In 2021, DNR scientists developed a methodological approach to monitor and assess the Work of Wildfire, defined as "the degree to which fire effects are consistent with landscape resilience and wildfire risk reduction objectives." In eastern Washington, low- and moderate-severity fire effects generally play a positive role in reducing hazardous fuels and restoring forest health and resilience. At the same time, large patches of high-severity fire have become more common in eastern Washington. These large, high-severity patches in dry forest make it difficult for trees to regenerate and can have detrimental effects on soils, hydrologic conditions, and wildlife habitat, and can lead to increased risk of landslides and debris flows. Following each fire season, DNR scientists publish a report describing the outcomes of wildfire as it relates to forest health and resilience.

2023 Work of Wildfire Assessment

In 2023, wildfire extent was relatively low compared to recent years, but there were substantial impacts on social, economic, and ecological values throughout Washington state. As in 2022, the socio-economic effects of the 2023 fires were in many ways more significant than the ecological effects. Smoke impacted air quality across the Pacific Northwest, affecting health, livelihoods and outdoor activities. Structure losses, evacuations, and road closures impacted communities, especially in the Columbia Gorge and Spokane County.

Across Washington, large fires affected 174,300 total acres and 44,000 forested acres. These totals are relatively low compared to recent record-breaking years, including 2015 and 2021, as well as the most recent ten-year average of 470,000 total acres (198,000 forested acres). The majority of fire extent (both total and forested acres) occurred in eastern Washington; only 13,800 acres burned in western Washington. Wildfires affected more acres of dry forest and cold forest than moist forest in eastern Washington and more cold forest than moist forest in western Washington. As in 2021 and 2022, burn severity was relatively evenly mixed among low, moderate, and high severity across all forest types.

These findings and other recent studies highlight potential management implications:

1. In eastern Washington, years with limited wildfire acres represent opportunities to accomplish positive work through prescribed fire and wildfire management operations. Assessing how to increase this beneficial fire is critical to achieving risk reduction and restoration goals.
2. Throughout western Washington, fire prevention and suppression remain important strategies. Landscape-scale fuels treatments are not likely to reduce wind-driven fire behavior in western Washington, although treatments may be warranted near communities, infrastructure, and vulnerable habitats.
3. The continuing risk of large fires in eastern and western Washington underscores the importance of emergency preparedness, including evacuation planning for communities, home hardening and defensible space treatments, utility infrastructure management, and establishment of potential control lines along key roads and other features.

In addition to these key results and implications, the 2023 wildfire season demonstrated multiple lessons for ongoing and future work. Given recent trends and climate projections, wildfire will continue to be a major disturbance agent shaping forest health and landscape resilience. Evaluating the positive and negative effects of wildfires will become increasingly important for conservation planning and adaptive management.

2024 Wildfire Season

In 2024, wildfires affected 304,181 total acres with 299,372 of those acres in eastern Washington. These totals are nearly double the number of acres burned in 2023, however they are still relatively low compared to many recent, historic wildfire seasons in Washington. In western Washington in 2024 there were 4,809 acres of forest burned.

DNR scientists will evaluate the work of wildfire for both eastern Washington and western Washington during the winter of 2024-25. The 2024 Work of Wildfire Assessment Report will be published on the DNR website. In addition, DNR will be evaluating how treatments affected 2024 wildfire outcomes as described in the treatment effectiveness section above.

Rapid Evaluation of Treatment Effectiveness for 2024 Wildfires

The extent to which treatments reduce wildfire intensity and severity is a central monitoring question of the 20-Year Forest Health Strategic Plan. DNR scientists have partnered with research teams at the University of Montana and University of Washington to develop a toolset to rapidly assess treatment outcomes after each wildfire season. This project builds off recent analysis of treatment effects on the Schneider Springs Fire described above and is funded by the Joint Fire Science Program. The team has worked over the last year to build out robust methods and datasets to statistically analyze how treatments change burn severity compared to similar untreated areas, while accounting for fire weather, topography, vegetation type, and other factors that influence fire behavior. Additionally, the research team is examining how treatments affect untreated areas outside of treatment footprints by modifying fire flow.

Table 12. 2024 wildfires in eastern Washington that overlapped prior treatments and wildfires. The 2024 Work of Wildfire report will investigate the influence of treatments and past wildfire on fire severity for a subset of these fires. Total area is based on preliminary fire perimeters from the DNR Wildland Fire Division. Forested area is based on a forest mask covering eastern Washington. Treatment footprint is based on reported treatments and remotely sensed change detection spanning 2000-2023. Past wildfire extent is based on fire perimeter data spanning 1984-2023.

Fire name	Extent (acres [%])			
	Total Area	Forested Area	Treatment Footprint	Past Wildfire
Swawilla I	53,723	23,369 [43]	1,482 [3]	14,363 [27]
Retreat	45,601	27,313 [60]	4,100 [9]	401 [1]
Pioneer	38,730	30,495 [79]	21 [0]	25,227 [65]
Cougar Creek	24,091	15,845 [66]	5,137 [21]	25 [0]
Williams Mine	13,092	12,930 [99]	1,438 [11]	10,742 [82]
Bridge Creek	3,998	2,781 [70]	209 [5]	2,440 [61]
Goosmus	1,735	889 [51]	218 [13]	0 [0]
Swauk Creek	348	299 [86]	9 [3]	0 [0]
Upper Ruby	280	281 [100]	99 [35]	0 [0]

In 2024, wildfires in eastern Washington burned in areas previously treatment with a range of outcomes (Table 10), offering an excellent opportunity to utilize these new tools. The research team will be analyzing treatment effects for 2024 fires that had a significant number of treatment interactions. This analysis will allow DNR to determine statistically what types and combinations of treatments were effective at reducing fire severity and under which conditions. This information will complement field-based assessments of treatment effects conducted by the Forest Service and DNR. Together, this monitoring work will help partners better understand the likely effects of different kinds of treatments and associated tradeoffs. This knowledge will improve our ability to prioritize, plan, and implement landscape-scale wildfire risk reduction and restoration treatments and increase the effectiveness of the major investments being put into implementing the 20-Year Forest Health Strategic Plan.

DNR has conducted a Work of Wildfire assessment each fire season since 2021. Low- and mixed-severity wildfire can have similar beneficial effects as prescribed fire. Those wildfires present a unique opportunity to utilize a pre-existing ignition under burning conditions to achieve our landscape resilience goals. As more treatments are implemented across the landscape, we anticipate managed wildfires serving as an important cost-effective tool to assisting land managers, especially the Forest Service, to increase the use of “good fire” on the landscape and to achieve the restoration needs identified in the DNR Forest Health Assessment and Treatment Framework.

Williams Mine Fire, Gifford Pinchot National Forest (2024). Photo by John Marshall.

Visit this link to learn more about the Work of Wildfire publication series.

2024 Fire-Science Field Workshop

In June 2024, DNR in partnership with the Northwest Fire Science Consortium to convene a workshop on the Colville National Forest focused on "Leveraging the Work of Wildfires Before, During, and After Fires". The workshop brought together a diverse group of researchers, managers, and practitioners to visit sites that had burned in different fire events over time to observe a wide range of post-fire effects and management outcomes.

The group had productive discussions around the objectives and tradeoffs of different post-fire management approaches, as well as wildfire management strategies to achieve wildfire risk reduction and landscape restoration goals. The group identified an extensive set of priorities for future research, management, and collaboration.

Key recommendations included:

- Developing research papers and outreach materials to improve understanding of the effects of green/dead post-fire thinning treatments in areas that moderately burn;

- Better define and articulate where high-severity fire can have positive effects, especially related to restoration and maintenance of non-forest patches within a landscape mosaic;

- Assess policy barriers to implementing ecologically based, rapid post-fire management at scale that is integrated with green restoration work; and,

- Meaningfully engage communities and the public around topics of post-fire ecology and treatments, including reburn risk management and climate adaptation.

DNR is applying the insights and conclusions from the workshop to its analysis of the work of the 2024 wildfires and where post-fire management could enhance the positive work of wildfires or mitigate the negative effects. Participants recommended replicating the workshop annually in different parts of the state, with a variety of partners in attendance to highlight different work of wildfire themes.

Participants discuss post-fire management options at a recently burned site on the Colville National Forest during a field-based workshop in June 2024. Photo by DNR.

Swawilla Fire StoryMap - Living with Fire: Revitalizing Traditional Practices

The Swawilla Fire started on July 17, 2024, as the result of a lightning storm. The fire started in grass and brush, but quickly moved into more complex, forested terrain. Fire suppression efforts were difficult due to limited resource availability. The fire threatened structures near Mount Tolman and Keller. Colville Confederated Tribes Natural Resources staff produced a StoryMap detailing the fire and how treatments were utilized to support more effective and safe fire management.

Smokey the Bear was wrapped in a protective layer of fire wrap during the Swawilla fire. Photo courtesy of the Confederated Tribes of the Colville Reservation.

Future Monitoring Efforts

More than 30 contracts and projects related to monitoring have been completed or initiated since 2020. These projects have been critical in advancing the science behind landscape evaluations and monitoring across scales, as well as in effectively communicating the goals of the 20-Year Forest Health Plan. Highlighted projects include the Work of Wildfire reports introduced following the 2021 fire season, improvements to insect activity mapping, assessing the impacts of forest cover and topography on snowpack, and evaluating treatments and wildfire operations.

Building on that momentum, DNR will continue to collaborate with partners to develop and implement the monitoring framework. There are several priorities for current and future efforts, including:

- Additional analyses of treatment tracking, change detection, and forest structure data are needed to better understand and map which treated areas are meeting landowner objectives and resilience goals. Combining field-based monitoring with GIS datasets will be necessary for this effort. These analyses will help inform where additional treatments are needed in the short-term, as well as help estimate long-term treatment and maintenance needs.
- DNR will continue to increase resources and reduce barriers to implementing stand-level monitoring efforts. Increasing the pace and scale of stand-level monitoring and integrating it with planning area and regional monitoring efforts.
- Incorporating improvements, such as insect activity and tree mortality mapping, to change detection products will help provide a more complete view of forest changes from stand to regional scales.
- Improving burn severity mapping approaches and datasets will support both rapid and long-term fire mapping. DNR scientists are working with partners at the University of Washington to assess the accuracy of various burn severity maps in forests with differing pre-fire composition and structure and implementing best practices for future fire seasons.
- Accurate maps of species composition remain a major missing dataset for evaluating treatment need, climate adaptation planning, and overall monitoring. Ongoing projects will continue to move DNR towards this essential dataset.
- Structure class mapping will be refined using additional LiDAR and field plot datasets. With better structure class data, DNR anticipates being able to track growth in addition to treatments and disturbances.

For a complete list of monitoring projects see Appendix A at the end of this report.

Appropriations Request and Recommendations to Address Barriers to Framework Implementation

Restoring our forests following more than a century of fire exclusion, and in the face of a changing climate, is a herculean task. Significant progress is being made, but continued investment will be required to maintain momentum and sustain the gains made by DNR and our partners.

State and federal investments are essential to continuing progress towards the goals established in RCW 76.06.200. For the 2025-2027 biennium, DNR requests the following to implement RCW 76.06.200 and the strategic plans effectively:

- DNR requests full funding of $125 million to the Wildfire Response, Forest Restoration, and Community Resilience account to fully implement Washington's Wildland Fire Protection 10-Year Strategic Plan, 20-Year Forest Health Strategic Plan, and Forest Action Plan.
- DNR requests $1.877M in re-appropriation of Post-Wildfire Reforestation Grants made in fiscal year 2024 that require additional time for grantees to fully implement, as well as $2.5M in new capital funding for additional awards to respond to the scale of the reforestation needs following wildfires in Washington.
- Partner State Agency Requests: DNR supports the requests of our state agency partners including the Washington Conservation Commission, Washington Department of Fish and Wildlife, and Washington State Parks to plan, implement, and monitor wildfire risk reduction and forest health projects that help to fulfill RCW 76.06.200.

Chelan County Biomass Utilization and Forest Products Campus Request

Washington State Department of Commerce is requesting a budget proviso to support Chelan County's efforts to establish a wood biomass facility. The project would utilize small-diameter trees thinned during forest health treatments to create value added products. The request amount is $1.425 million. This investment will support efforts in North Central Washington to fully implement the 20-Year Forest Health Strategic Plan: Eastern Washington.

Lessons Learned & Looking Ahead

In addition to these appropriations, lessons learned over seven years of implementing the forest health assessment framework have informed timely recommendations to ensure Washington's forests and communities become healthy and resilient and remain that way into the future:

- Fuels continue to accumulate and grow over time, and treatment maintenance is a critical component of landscape resilience. Once initially completed, treatments should be effective at reducing impacts of climate change and natural disturbances for several years. Maintaining stand structure and reduced surface fuel levels will be essential to ensuring long-term forest health and resilience. Sustained investments to complete initial forest health treatments at the scale of the need and provide ongoing maintenance over time to sustain resilient conditions is crucial.

This will be aided by efforts to address barriers to utilize prescribed fire at the scale necessary to meet our initial treatment goals and support long-term maintenance.

- Prescribed fire is a necessary tool to improve the health of Washington's forests and natural habitats for plants and animals and is one of our few tools to reduce surface fuels that contribute to the risk of catastrophic wildfires. In addition to its ecological benefits, prescribed burning is a proven community protection practice that indigenous people have used for centuries to shape our landscapes. There are well-documented barriers associated with implementing prescribed fire in Washington, including strict regulatory process, lack of qualified and experienced personnel, lengthy planning timelines, and fluctuating public support for prescribed fire. In 2023, DNR convened state, federal, tribal, local government, and non-profit partners to evaluate these barriers and develop strategies to address these challenges. The plan identified more than 60 near-term actions that are in the process of being implemented. The 2023 Washington Prescribed Fire Barriers Assessment Report and Strategic Action Plan can be found here.

- Housing shortages are impacting nearly all industries in the state, including natural resources, which are especially impacted by the lack of quality and affordable housing in rural communities in Washington. Creative approaches to support affordable housing at DNR, including through leases and partnership on DNR managed lands, represent an important but small fraction of the overall housing need. In 2024, DNR was successful in creating the first ever tax incentive to build affordable housing on public lands, thanks to broad bipartisan support. HB2003 amended the Leasehold Excise Tax code (RCW82.29A) to create an exemption for leases on public land when used for the placement of affordable housing. As the state contemplates opportunities to address the housing affordability crisis and the forest health crisis, opportunities to build with wood, especially in multi-family units where innovative wood products like mass timber reduce construction times and contribute to our ecological and social needs.

- Maintaining and expanding the existing forest products infrastructure in the state is essential to addressing forest health and wildfire risks in Washington. Efforts to support sustainable management of public, private, and tribal lands will be essential to maintaining this critical infrastructure and our wood products businesses. In North Central Washington, where the state lacks infrastructure to process restoration by-products, efforts to establish a Forest Products Campus will be important to ensure forest health treatments are economically viable, reduce human health impacts such as smoke, and support local economic activity. There is strong alignment and investment from federal, state, and county government towards this end.

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Appendix A: List of DNR Forest Resilience Monitoring Projects

Completed or ongoing projects with external partners related to monitoring within the DNR Forest Resilience Division (FRD). Projects with no budget amount listed did not require FRD funding, but DNR-FRD scientists and planners are leading or co-leading.

Biennium	Topic	Project Lead	DNR-FRD Funding	Status and/or Outcome
2024-2025	Rapid Analysis of Fuel Treatment Effectiveness: Joint Fire Science Program	Alina Cansler (University of Montana)		Project is ongoing
2024-2025	3P: Design & simulation of treatment scenarios	Ana Barros (DNR) & Michelle Day (USFS Rocky Mountain Research Station)		Project is ongoing
2024-2025	Improvements in fire severity mapping	Susan Prichard (U. Washington)	$157,254	Project is ongoing. Drought workshop completed in May 2024
2024-2025	Drought vulnerability science workshop	Climate Impacts Group (USFS) & Climate Hub (U. Washington)		
2024-2025	Managing for resilience and Northern Spotted Owl habitat in fire dependent landscapes	Josh Halofsky, Dan Donato, Derek Churchill, Garrett Meigs (DNR)	$3,799	Journal article
2024-2025	Fire science workshop: "Leveraging the Work of Wildfire" conducted in June 2024 on the Colville National Forest with 40 participants	Garrett Meigs & Derek Churchill (DNR), Emily Jane Davis & Patrick Shults (NW Fire Science Consortium)	$1,900	Workshop summary
2024-2025	Focal wildlife species mapping & habitat framework for NE Washington	Bill Gaines (Washington Conservation Science Institute)	$26,000	Project nearing completion
2024-2025	Photo treatment monitoring	John Marshall	$39,500	Project is ongoing
2024-2025	Little White Treatment Monitoring	Cascade Forest Conservancy	$30,000	Project is ongoing
2024-2025	Northern Blue Stand-Level Monitoring	Wallowa Resources	$30,000	Project is ongoing
2024-2025	Effects of 2022 Thor fire on landscape restoration goals	Charlotte Milling (Eastern Washington University)		Project is ongoing
2024-2025 & 2022-2023	Species composition mapping	Jacob Strunk (USFS)	$85,000	Project nearing completion
2024-2025 & 2022-2023	Treatment monitoring of forest structure, large trees, and pattern using lidar and DAP	Miles LeFevre & Sean Jeronimo (Resilient Forestry)	$69,000	Project nearing completion
2024-2024	Analyze landscape change from treatments, disturbances, and growth with LiDAR and DAP on the Colville National Forest	Derek Churchill (DNR) & James Pass (USFS)		Project is ongoing
2023-2024	Literature Review of Drivers of Wildfire Suppression Costs	Ana Barros (DNR) and Institute for Natural Resources at OSU	$19,584	Final report
2024-2025	Updating the wildfire transmission to structures layer for WA	Ana Barros (DNR) & Ken Bunzel (KingBird Software)	$22,000	Project is ongoing
2024-2025	Social analysis of the public engagement component of the People, Places, and Priorities (3P) project	Ana Barros (DNR) & Josh Petit (SERC)	$18,712	Final report
2022-2023	Social dimensions of 20-Year Plan: Stakeholder/Partner Assessment	Josh Petit (Socio-Eco Research Consultants)	$30,000	Final Report
2022-2023	Ecological silviculture in frequent fire forests	Derek Churchill (DNR) & Andrew Larson (U. Montana)		Book Chapter

2022-2023	Landscape effects of wildfire and treatments on snowpack and streamflow	Paul Hessburg (USFS) & Mark Wigmosta (PNNL)	$140,000	Final Report
2022-2023	Fuels treatment effectiveness in the 2021 Schneider Springs Fire	Van Kane & Alina Cansler (University of Washington)	$93,580	Journal article in press
2022-2023	Improvements to FconstMTT to classify fire severity	Ana Barros (DNR) & Altura Solutions	$9,450	Data products
2022-2023	Update of WA hazard mapping	Ana Barros (DNR) & Pyrologix		Data products
2022-2023	Treatment monitoring analysis and report	Miles LeFevre (Resilient Forestry)	$39,000	Reports
2022-2023	Integrating fire refugia into landscape restoration	Meg Krawchuk (Oregon State University)	$30,000	Online toolbox
2022-2023	Role of fuel breaks in landscape restoration	Chuck Hersey (DNR)		DNR Report
2022-2023	Literature review of treatment impacts on carbon storage	Keala Hagmann (University of Washington)	$10,000	Final Report
2022-2023	Structure Class monitoring and plot database	Kevin Ceder (Woodland Creek Consulting)	$38,000	Results
2022-2023	Summary of North Central Washington fires and fuelbed emissions analysis	Susan Prichard (University of Washington)	$51,021	StoryMap
2022-2023 & 2020-2021	Comparing contemporary and historical rates of wildfire	Dan Donato (DNR)		Journal Article
2022-2023 & 2020-2021	Fire Generator WA – a spatiotemporal model of fire occurrence and spread – part 1	Ana Barros (DNR) & Haiganoush Preisler (USFS)	$32.100	Data products
2022-2023 & 2020-2021	Logging system and operational feasibility GIS tool	Sean Jeronimo (Resilient Forestry) & Kevin Ceder (Woodland Creek Consulting)	$65,000	Final Report
2022-2023 & 2020-2021	Forest conversion from climate change in the eastern Cascades	Garrett Meigs (DNR)		Journal Article
2022-2023 & 2020-2021	Insect disturbance mapping	Robert Kennedy (Oregon State University)	$70,000	Final Report
2022-2023 & 2020-2021	Effects of treatments on snowpack	Jessica Lundquist (University of Washington) & Susan Dickerson-Lange (Natural Systems Design)	$50,000	Journal Article Final Report
2020-2021	Wildfire transmission by ownership in WA	Ana Barros (DNR) & KingBird Software	$4,960	Data products
2020-2021	Focal wildlife species habitat classification and mapping	Bill Gaines (Washington Conservation Science Institute)	$27,900	Final Report
2020-2021	Forest structure mapping with Digital Aerial Photography	Van Kane (University of Washington)	$93,580	Journal Article in preparation
2020-2021	Fuels treatment longevity	Brian Harvey & Jon Bakker (University of Washington)	$188,000	Journal Article
2020-2021	Assessing restoration need in Eastern Washington	Brian Harvey & Jon Bakker (University of Washington)	$89,000	Journal Article
2020-2021	Mapping species composition	David Bell & Matt Gregory (USFS)	$55,433	Journal Article
2020-2021	Science basis for dry forest restoration and common misconceptions	Susan Prichard & Keala Hagmann (University of Washington)	$10,000	Journal Articles
2020-2021	Plot database and inventory mapping	Luke Rogers (University of Washington)	$143,373	Data products
2020-2021	Drone monitoring of fuels	Sean Jeronimo (Resilient Forestry)	$38,000	Report
2020-2021	Northern Spotted Owl and Large tree closed forest sustainability	Dan Donato & Josh Halofsky (DNR)		Journal article

2020-2021 & 2018-2019	Postfire landscape management and treatments	Derek Churchill (DNR), Andrew Larson (University of Montana), & Paul Hessburg (USFS)		Journal Articles

Appendix B: Landscape Treatment Priority for Forest Service Lands and Priority Planning Areas

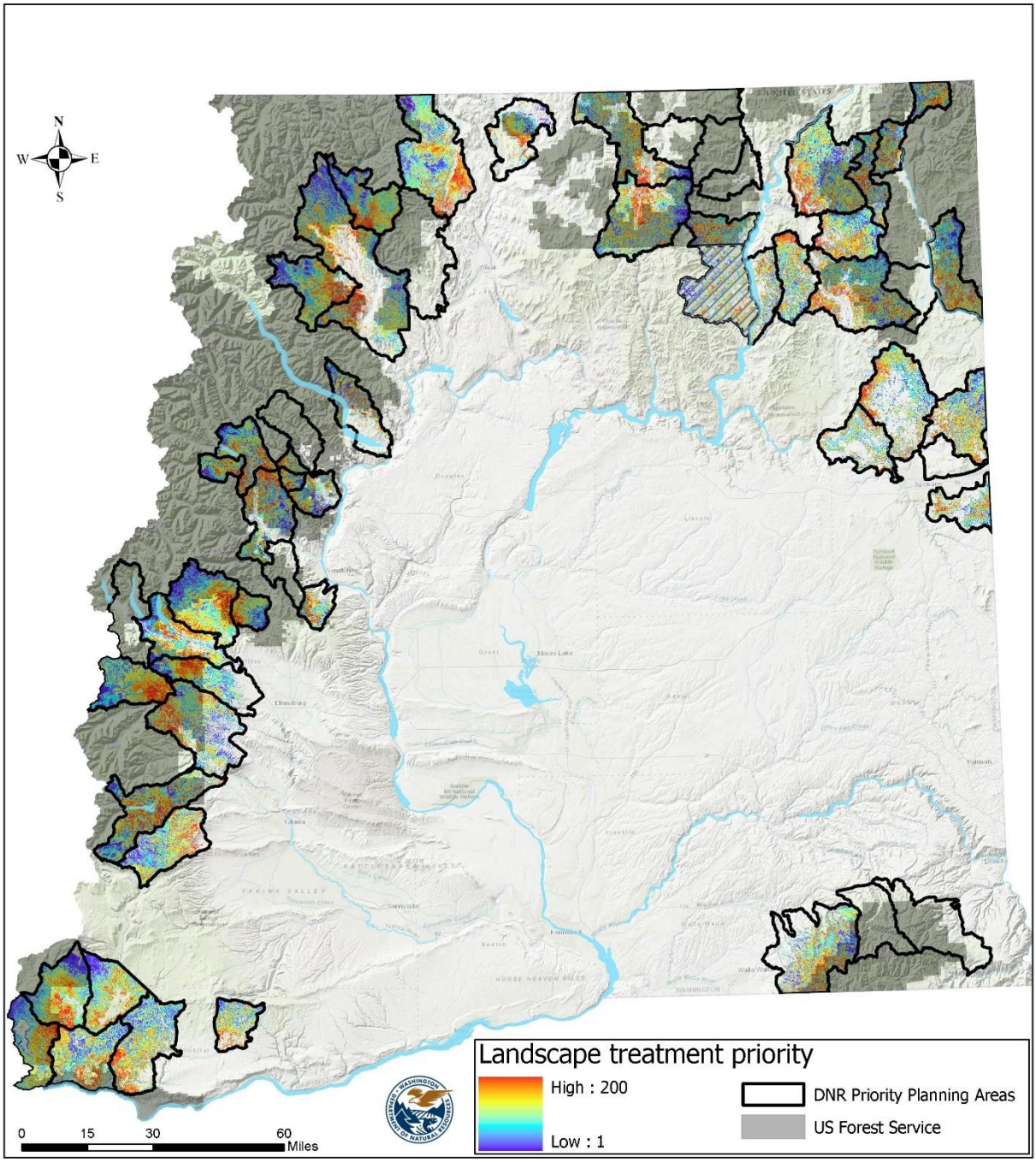
RCW 76.06.150 directs DNR to consider the acres of at-risk forests on Washington's national forest lands as well as the number of acres treated. In 2020, DNR reported to the legislature that a University of Washington analysis found that the active forest restoration needs (disturbance only and disturbance plus growth) in eastern Washington was 3.07 million acres – of which 1,330,000 acres were on federal land. Each biennium, DNR's Forest Health Assessment and Treatment Framework conducts assessments that identify treatment needs in specific priority planning areas. The methodology for this assessment is presented in this report and includes wildfire risk as one component to prioritize the scale and location of forest health treatments. Primary goals of the 20-Year Forest Health Strategic Plan: Eastern Washington include reduce risk to values from wildfire, increase forest health and resilience, and provide dual benefits for wildfire operations.

Data products from the 2017 Pacific Northwest Quantitative Wildfire Risk Assessment (Gilbertson-Day et al. 2018) are used to quantify fire risk across each priority planning area. DNR staff calculate fire risk (expected net value change) by combining annual fire or burn probability, expected fire intensity as measured by flame -length, and the response of different resources to flame length (Scott et al. 2013). Risk to homes, infrastructure, and forest (overstory tree mortality) is calculated and then combined. Risk levels are placed in six categories based on relative values across all planning areas: extreme, very high, high, moderate, low, and beneficial. Maps of conditional net value change – the risk of loss or benefit without fire probability factored in – are generated to examine expected loss or gain irrespective of fire probability in each planning area. Burn probability and intensity were derived from large-fire simulator FSim models that used patterns of fire weather, ignitions, and large fire spread from 1992-2015. The risk assessment does not directly include fire effects on wildlife habitat, watershed function, or other resources. Fire risk in non-forested shrub-steppe areas was only calculated for homes and infrastructure.

This risk information is then combined with other factors and datasets to drive landscape treatment prioritization to help inform forest owners and managers in planning and implementation treatments. The map displays landscape treatment priority for DNR priority planning areas in eastern Washington overlayed with National Forest System lands.

Completed forest health treatment data for Forest Service lands was reported in the treatment tracking section of the report, while spatial data from this tracking is available to download by National Forest on Forest Health Tracker.

The map (below) displays National Forest System lands (gray), DNR priority planning areas (black outline), and landscape treatment priority (high to low) across all-lands in priority planning areas with completed landscape evaluations. Additional Forest Service lands will be analyzed as landscape evaluations are completed.



Appendix C: Landscape Evaluation Summaries

The following Landscape Evaluation Summaries are included as part of this report:

- Chewuch
- Gifford
- Inchelium
- Loomis
- Meadow
- Mica
- Naches-Wenas
- Slate

CHEWUCH PLANNING AREA
LANDSCAPE EVALUATION SUMMARY (2024)

Total Acres	Forested Acres	Treatment Goal (Acres)
94,250	91,668	5,750 - 9,500

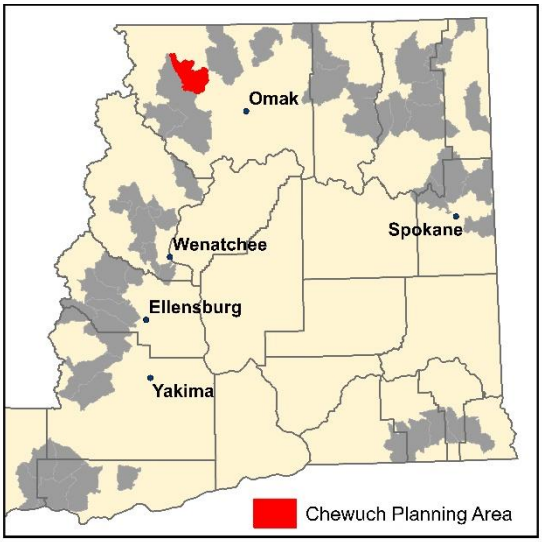


Figure 1. Planning area location in eastern WA.

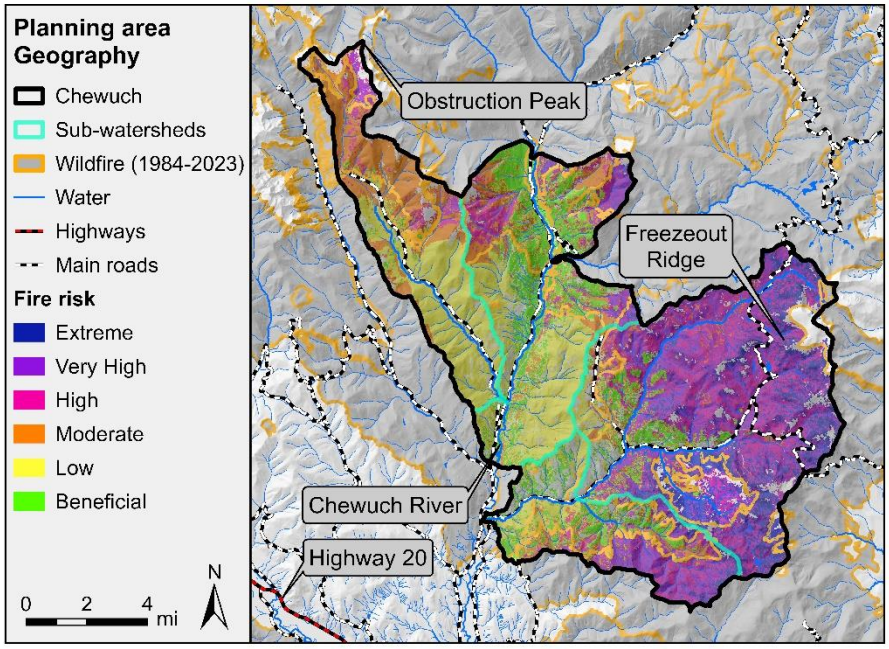


Figure 2. Planning area geography and fire risk, which integrates burn probability, fire intensity, and fire susceptibility of forests, infrastructure, and homes.

Planning Area Highlights

- Since 2006, wildfires have burned 97% of the planning area. An estimated 55% burned at high severity, often in large patches. The primary events were the 2006 Tripod Fire in the eastern half and 2021 Cub Creek 2 Fire in the western half.
- Ownership is nearly all US Forest Service (99%).
- Fire risk to forests is highest in the eastern portion of the planning area that burned in the 2006 Tripod Fire (Fig. 2). Fire risk is relatively low in the central portion due the effects of the 2021 Cub Creek 2 Fire on surface fuels.
- Projected warming over the next 20-40 years will likely shift climate conditions suitable for much of the moist and cold forest to conditions suitable for dry forest.
- Treating 6-10% of forested acres with mechanical and/or prescribed fire treatments is recommended to reduce fire and drought risk for the remaining medium and large tree structure, thin dense small diameter forest, and help protect adjacent homes and communities. High-priority areas for treatment are concentrated in the south-central portion.
- Post-fire planting and fuel reduction treatments may also be beneficial in the Cub Creek 2 Fire footprint. An analysis to prioritize planting locations was added to this landscape evaluation.

LEARN MORE

This landscape evaluation was completed in 2024.
For more details about DNR's priority planning areas please see: **https://www.dnr.wa.gov/ForestHealthPlan**
For data products and methods see: **https://bit.ly/ForestHealthData**

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Overarching Goals

Reduce wildfire risk and protect communities

Fire risk is high to very high in the eastern portion due to high burn probability (3% annual probability) and widespread young, lodgepole forests that established after the 2006 Tripod Fire (Fig. 2). Mechanical, prescribed fire, and/or managed wildfire treatments are recommended over time to break up large patches of this structure type and reduce the risk of a large, high-severity reburn. Fire risk is low in the central portion where the Cub Creek 2 Fire burned at low-moderate severity, and fire effects are predicted to be beneficial due to low flame lengths that will consume small trees and surface fuels. Burn probability and risk are low in the western portion where Cub Creek 2 burned at high severity, but moderate to high in older burned areas in the northwest portion. Maintaining control lines established during the Tripod and Cub Creek 2 Fires will help protect the Winthrop community.

Increase resilience and prepare for climate change

By mid-century, most of the planning area is projected to have moisture stress levels that are currently associated with dry forest (Fig. 3). Some areas near the southern edge may no longer support forest cover, particularly at lower elevations and on south-facing slopes. Moderate and low moisture stress levels are projected to remain at higher elevations and on north-facing slopes, especially in the eastern portion. Treatments that reduce density and favor drought-tolerant species will help current forest persist into the future. The high-severity portions of the Cub Creek 2 Fire provide an opportunity to plant drought-tolerant species, with a portion of seedlings from drier seed zones, to enhance adaptation to future climates (Page 5).

Sustain wildlife habitat

Habitat for dry forest, large tree, open-canopy species (e.g. White-Headed Woodpecker) is abundant in the central third of the planning area where fires burned mostly at low to moderate severity. Habitat for species that depend on dry and moist, closed-canopy forest with large trees (e.g. Northern Goshawk) is low in abundance and concentrated in small patches along the Chewuch River. Habitat for cold forest, large-tree, closed-canopy species (e.g. American Marten) has been eliminated by high-severity fire, with only a few small patches remaining. Federally listed Canada lynx is another species of interest. Some of the lodgepole forests that regenerated after the Tripod Fire are now tall enough to provide lynx foraging habitat where snowshoe hare persist. Remnant older forest patches may also provide lynx denning habitat. Research into how lynx are using this landscape is ongoing.

Enhance rural economic development

This planning area supports the recreation-based tourism economy of the Methow Valley. The large extent of high-severity fire has greatly reduced opportunities for wood production over the next 20 years.

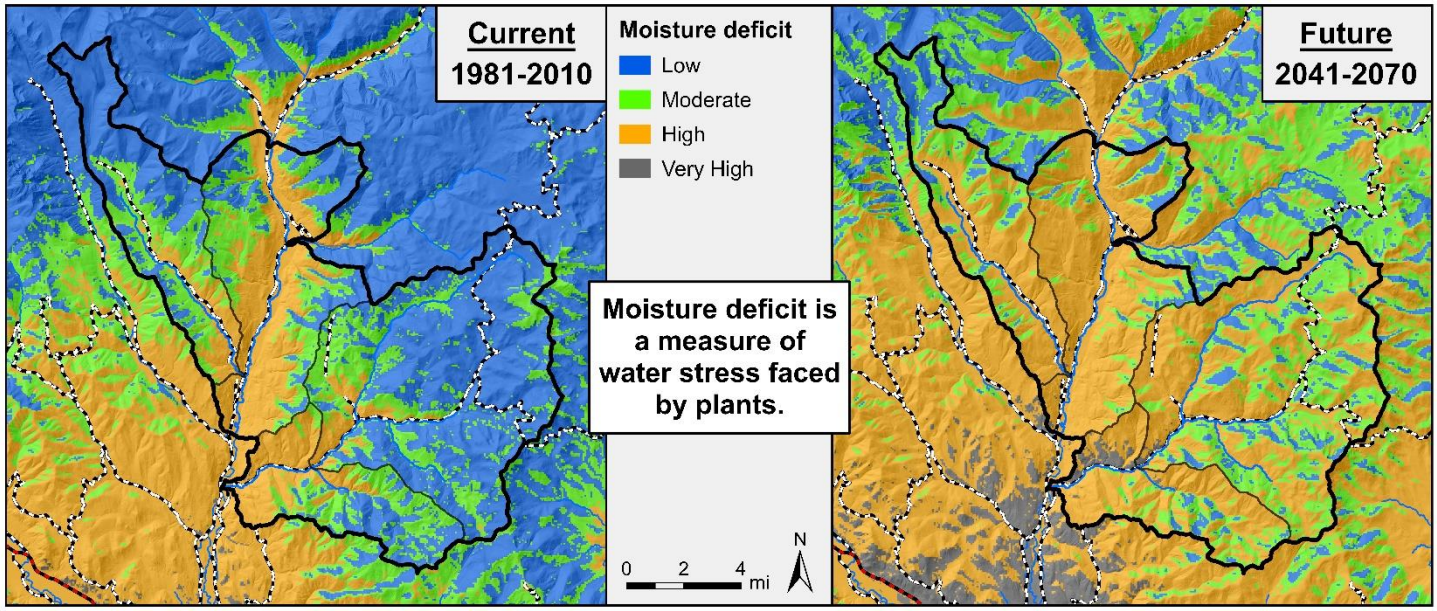


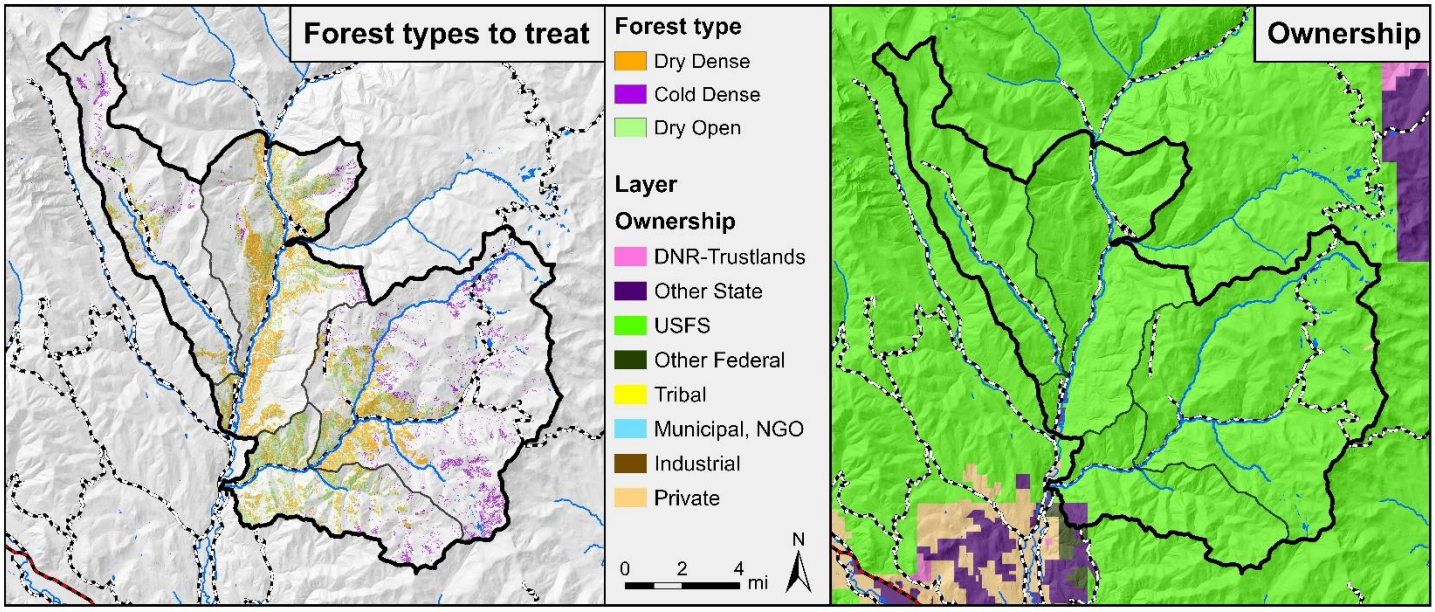
Figure 3. Current (left) and future (right) moisture stress levels based on water balance deficit. Low levels are associated with moist and cold forests, moderate with dry and moist forests, high with dry forests, and very high with woodland and shrub-steppe. Future climate is based on relatively high greenhouse gas emissions scenario (RCP 8.5).

Forest Health Treatment Needs

Treating 5,750 to 9,500 acres is recommended to enhance landscape resilience (6-10% of forested acres; Table 1). This total includes an estimated 2,500-4,500 acres to shift dense to open forest and 3,250-5,000 acres of maintenance treatments in existing open forest, based on forest structure data derived from 2022 aerial imagery. Meeting this target range will require multiple treatment types (Table 1) that will depend on stand conditions, access, capacity, markets, and other factors. Some of the density reduction treatments may be commercially viable. Planting may be warranted in the Cub Creek Fire 2 footprint in addition to the 1,687 acres that the USFS has planned within this planning area during Fiscal Year 2025. Further treatments to reduce density and post-fire fuels in portions of the Tripod and Cub Creek 2 Fires may also be needed to reduce risk of high-severity reburns (Page 5). Wildfires and other disturbances will likely accomplish some of the treatment need over time but may also have negative forest health effects. Managed wildfire may be an effective treatment option under safe conditions.

Table 1. Summary of forest health treatment needs. ***See methods for details on how the treatment need range is derived.***

Forest conditions to treat		Treatment need (footprint acres)	Current acres by major landowner*		
Type	**Size class**		**USFS**	**WDFW**	**Other**
Dry Dense	Small	1,500 - 2,000	2,666	23	6
	Medium-Large	750 - 2,000	6,452	105	34
Cold Dense	Medium-Large	250 - 500	3,009	0	0
Dry Open	Medium-Large	3,250 - 5,000	6,396	137	7
Total		**5,750 - 9,500**	*These are current acres, not targets		
Anticipated treatment type		Noncommercial thin + fuels treatment. May be prescribed fire or low/mod-severity wildfire.			
		Commercial thin plus fuels treatment if access exists. May be noncommercial, regeneration treatment, or fire only (prescribed fire or low/moderate-severity wildfire).			
		Maintenance treatment: mechanical thinning and fuels reduction, Rx fire, or low/moderate-severity wildfire. *Targets correspond to 50-75% of dry open and 25-50% of moist open forests.*			



Left: Figure 4. Forest structure types that are overabundant relative to targets for a resilient landscape, as well as potential maintenance treatments. Only a portion of the areas shown need to be treated. Right: Figure 5. Current land ownership.

Forest Health Treatment Needs (continued)

Dry dense forest treatment need

On dry sites, small-tree dense forests are over-represented, primarily within the footprint of the 2006 Tripod Fire where dense regeneration has created closed-canopy conditions, often across large patches. Thinning and fuel-reduction on 1,500-2,000 acres of this type (Table 1) is recommended to increase resistance to drought, insects, and fire by reducing competition and shifting species composition. Additional acres may need treatment as young trees grow and canopies close. Dense, medium-tree structure is also over-represented, although substantially less than in most other planning areas. Treating 750-2,000 acres of this type is recommended, primarily in the central portion. Most of these areas burned at low to moderate severity in the Cub Creek 2 Fire. Thus fire-based treatments, as well as potentially mechanical, are recommended to address post-fire fuel accumulation over time, further reduce density where needed, and maintain large patches (~100-1000 ac) of fire- and drought-resistant forest with low fuel loading and large trees (Fig. 4).

Moist and cold dense forest treatment need

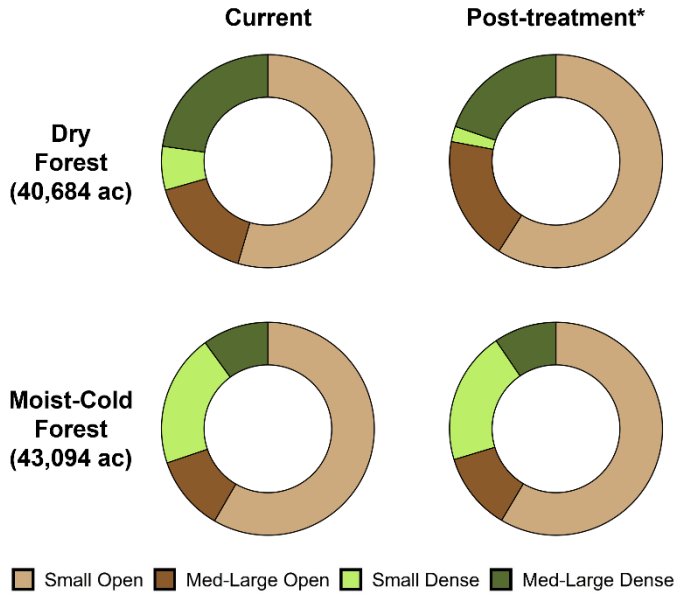
On cold sites, dense mixed-conifer forests dominated by medium trees are modestly over-represented. Treating 250-500 acres (Table 1, Fig. 4) is recommended to reduce risk of mortality of medium and large trees from future fire and drought. Although not currently over-represented relative to historical ranges, small-tree forest on sites that are projected to shift to climate conditions associated with dry forest (Fig. 3) may warrant density and fuel reduction in some areas to shift species composition and adapt to a warming climate. Much of the regeneration in the Tripod Fire that is still relatively open will grow into large patches of dense forest over the next 20 years, increasing susceptibility to reburn and drought. It is challenging to balance objectives to enhance disturbance resilience by reducing tree density and to sustain sufficient lynx habitat as dense forest over space and time.

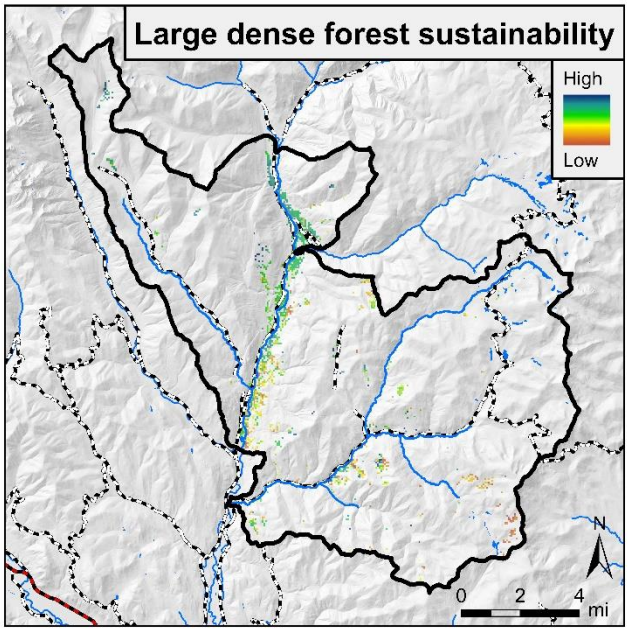
Open forest maintenance treatment need

Over the next 10-20 years, an estimated 3,250-5,000 acres of currently open forests with medium and large trees on dry sites will need prescribed fire, managed wildfire, or mechanical methods to maintain open conditions by reducing surface fuels and small trees. These sites include recently burned areas, as well as some forested areas that are more open due to poor soils, where fire is currently predicted to have beneficial effects (Fig. 2). A portion of open, cold forests may also benefit from maintenance treatments. Specific maintenance strategies will depend on landowner objectives and time since treatment.

Sustainable locations for dense forest with large trees

Locations with low to moderate current and future moisture deficits (Fig. 3) and low fire risk (Fig. 2) offer the most sustainable locations to maintain sufficient area and patch sizes of this forest habitat type. Sustainable locations that have large-tree structure are limited to low-elevation valley bottoms in the Chewuch River corridor and a few other sites (Fig. 7)





Left: Figure 6. Current and post-treatment proportions of forest types and structure classes. * mid-point of range in Table 1.
Right: Figure 7. Sustainability of current and potential large tree, dense forest based on fire risk and drought vulnerability.

Post-fire Assessment and Prioritization

Figure 8. Stand conditions three years following the 2021 Cub Creek 2 Fire. Large swaths are currently dominated by standing dead trees and herbaceous understory vegetation.

Post-fire conditions in high-severity burn areas

The Chewuch planning area is unique because 97% of the area has burned since 2006, with an estimated 55% burning at high severity. The 2006 Tripod Fire and subsequent regeneration transformed much of the eastern portion of the planning area into young forest dominated by lodgepole pine. The 2021 Cub Creek 2 Fire affected the western part of the planning area, including some very large patches of high severity (>5,000 acres; Fig. 9). These patches are now primarily early-seral vegetation with limited tree regeneration and few surviving seed trees (Fig. 8).

Post-fire treatment needs in high-severity burn areas

Density and/or surface fuel reductions are recommended in a portion of high-severity burn areas, including maintaining non-forest shrub and herbaceous vegetation on some south-facing slopes and wet meadows. Natural regeneration is abundant on most high-severity areas in the Tripod Fire. In high-severity patches of the Cub Creek 2 Fire, large patches have high dead-fuel density and are vulnerable to conversion to non-forest, especially in locations with projected high moisture stress (Fig. 3). Planting seedlings in relatively low-deficit areas (e.g. north-facing slopes) is more likely to restore forest patches in next 20-50 years. The planting prioritization map (Fig. 9) integrates moisture stress, distance to seed source, and soil burn severity. Potential USFS planting areas encompass high-severity patches throughout the Cub Creek 2 Fire, including first-priority locations (Fig. 9). Planting a variety of densities and species from future climate-informed seed zones will increase adaptive capacity and management options. Prescribed fire to protect planted areas from reburns is also recommended.

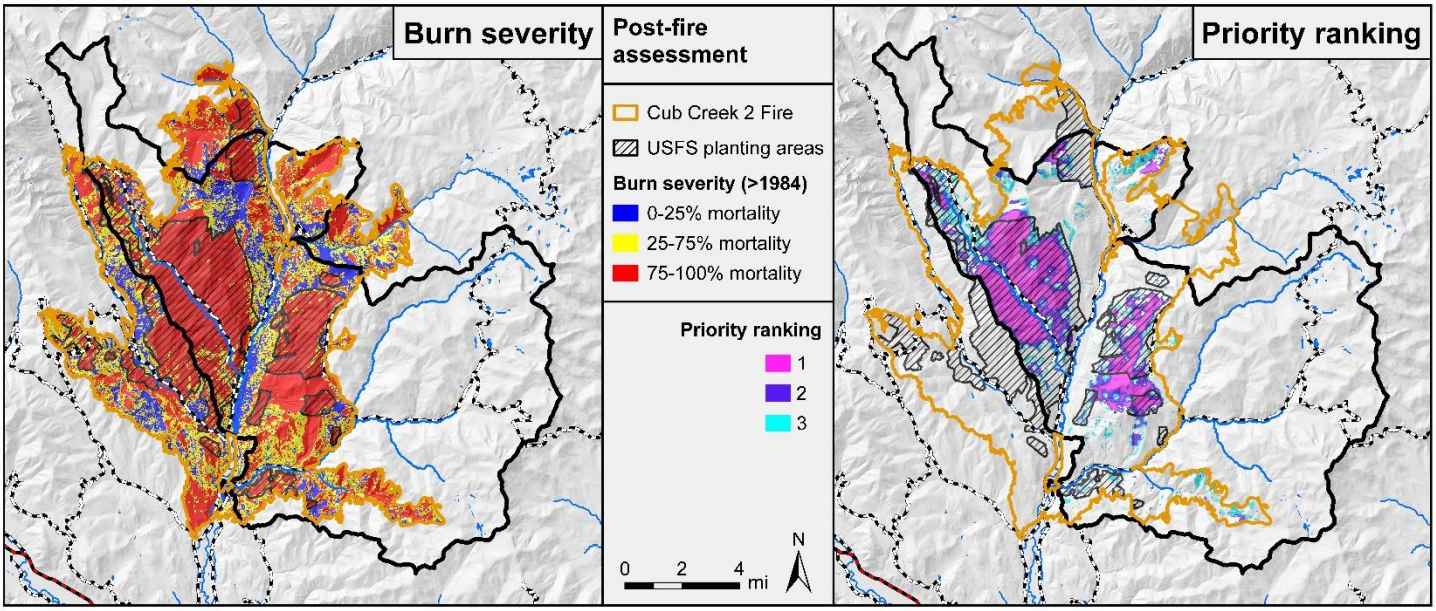


Figure 9. Prioritization for planting in high-severity areas of the 2021 Cub Creek 2 Fire. The prioritization is based on projected mid-century moisture stress (Fig. 3), distance to seed source (unburned, low, or moderately burned areas), and soil burn severity. First-priority locations (priority ranking 1) represent the highest priority. See methods for details.

Landscape Treatment Prioritization

Prioritizing for forest health & to reduce fire exposure of homes

Landscape treatment priority integrates fire risk to forests (Fig. 2), drought vulnerability (Fig. 3), and presence of overabundant forest structure types (Fig. 4) with wildfire transmission to homes (Fig. 10). We also recommend incorporating the large dense forest sustainability layer (Fig. 7) as an overlay when selecting treatment locations to manage for this habitat type vs. open-canopy forest. Fire transmission is very high in the southern portion, indicating that wildfires starting in these areas are expected to expose homes in Winthrop and communities along the Highway 20 corridor. See previous section for post-fire planting prioritization.

Treatment priorities

Landscape treatment priority is highest in the southern portion of the planning area (Fig. 11). These high-priority locations exhibit moderate fire risk, high drought vulnerability, high fire transmission to homes, and departed forest structure. Medium-priority areas occur in eastern parts the planning area. The western half is mostly low-priority, but some of these areas may need post-fire planting and other treatments (Fig. 9) to address species composition, reduce future surface fuels, maintain control lines, and achieve other objectives.

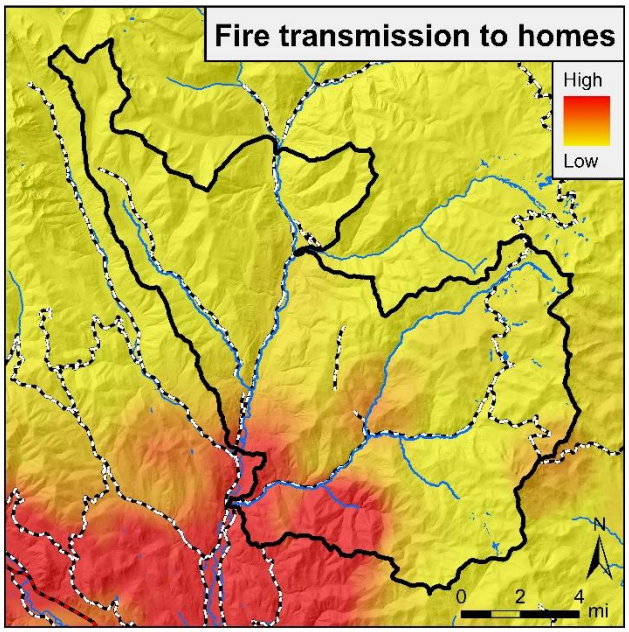


Figure 10. Fire transmission to homes shows where fires that expose structures are most likely to originate. It is based on simulated fire perimeters given contemporary patterns of fuels, topography, and wind.

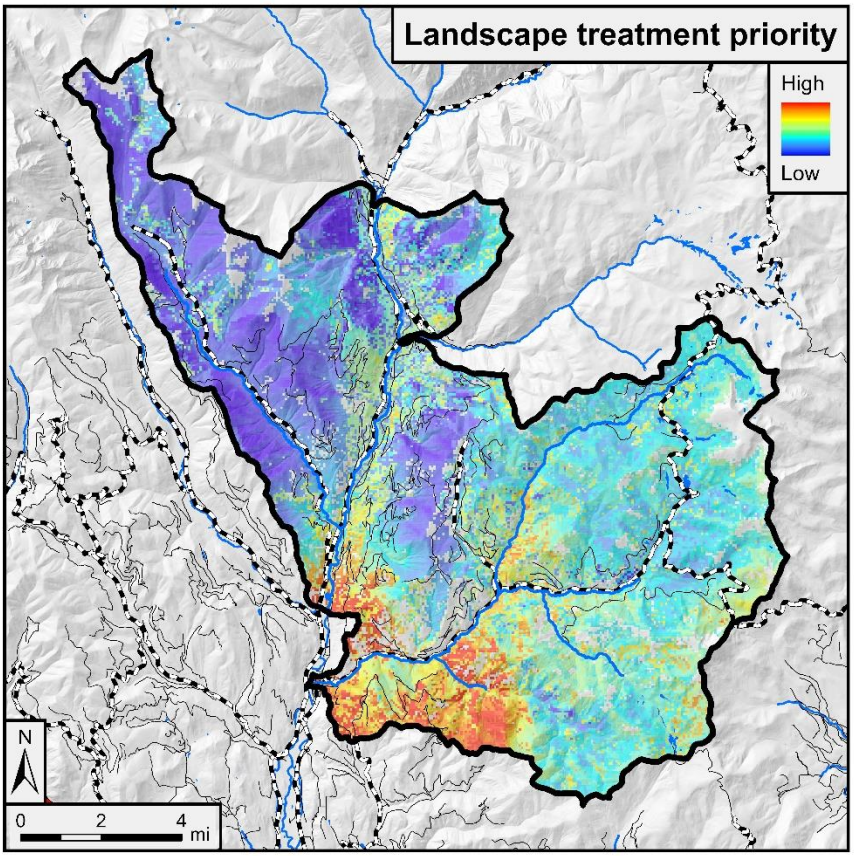


Figure 11. Landscape treatment priority is based on three metrics of forest health – forest fire risk (Fig. 1), drought vulnerability (Fig. 3), overabundant forest structure (Fig. 4) – as well as wildfire transmission to homes (Fig. 10).

Definitions

Vegetation Types

Cold forest: Upper elevation mixed-conifer forests with high-severity fires every 80-200+ years.

Dry forest: Ponderosa pine and Douglas-fir dominated forests that historically had surface fires every 5-25 years.

Moist forest: Forests that historically had mixed-severity fires every 30-100 years and were composed of fire-resistant (western larch, Douglas-fir) and fire-intolerant (Engelman spruce) trees.

Woodland/Steppe: Grass and shrub lands that may have oak woodlands or ≤ 10% conifer cover.

Forest structure

Large tree: Overstory diameter > 20 inches.

Medium tree: Overstory diameter 10-20 inches.

Small tree: Overstory diameter < 10 inches.

Dense canopy: Greater than 40% tree canopy.

Open canopy: Less than 40% tree canopy.

***Fuels*:** Shrubs, grasses, small trees, litter, duff, and dead wood.

Fuels treatments: some combination of mechanical density reduction (commercial or non-commercial) and surface and ladder fuel reduction (prescribed fire, piling & burning, etc.).

Managed wildfire: where consistent with regulations, naturally ignited fire is managed for multiple goals, including resource benefits, firefighter safety, community protection, and suppression.

Wildfire Response Benefit Prioritization

Dual benefits for forest health and wildfire response

It is necessary to conduct treatments to both improve forest health and reduce fire risk to communities as well as provide conditions where firefighters can safely and efficiently conduct wildfire and prescribed fire operations. The wildfire response benefit metric (WRB; Fig. 12) identifies and prioritizes locations where values at risk that are more likely to be the focus of fire operations (homes, infrastructure, sources of drinking water, and commercially managed lands) coincide with areas likely to transmit wildfire to homes and generate severe fire behavior. Because there are positive feedbacks between healthy, resilient forests and safe, effective fire operations, the WRB metric also integrates the landscape treatment priority map (Fig. 9).

Where WRB is highest, actions may be needed to create and maintain conditions that provide a tactical advantage for fire operations. These actions will vary with the local context and can include landscape-level forest health and fuel treatments, treatments along fire control lines and escape routes, resident and community fire mitigation activities (e.g. defensible space, home hardening), and improving signage and road conditions. The WRB metric provides a high-level prioritization, and additional work at the local level is required to identify appropriate actions and assess their feasibility. WRB is useful for prioritizing Potential Control Lines (PCLs) for fire operations (Fig. 13). PCLs are a part of Potential Operational Delineations (PODs); see page 7.

In the Chewuch planning area, high wildfire response benefit is heavily concentrated in the southern portion at relatively low elevations (Fig. 12). WRB is also high in the eastern part of the planning area. These areas of high WRB are due to a combination of high wildfire transmission to housing units in the community of Winthrop (Fig. 10) and high landscape treatment priority (Fig. 11).

Definitions (continued)

Wildfire response benefit: Any tactical advantage gained for wildfire response activities from actions on the landscape, including, but not restricted to, identifying and consolidating existing anchor points and control lines and reduction of potential fire behavior. Wildfire response benefit is not restricted to any specific wildfire management strategy and instead is centered on conditions that improve fire operations safety and effectiveness.

Potential Control Lines (PCLs): Boundaries of Potential Operational Delineations (PODs) relevant to fire control operations (e.g. roads, ridgetops, and water bodies).

Potential Operational Delineations (PODs) for wildland fire: Landscape containers whose boundaries are potential control lines (PCLs). PODs are useful for planning strategic response to unplanned ignitions, strategic fuel planning, and prioritizing fuel treatments within PODs.

Commercially managed lands: Commercially managed forestlands include: DNR Trustlands, Tribal forests, industrial forests, non-industrial private forests, and US Forest Service forests where timber is a primary management objective.

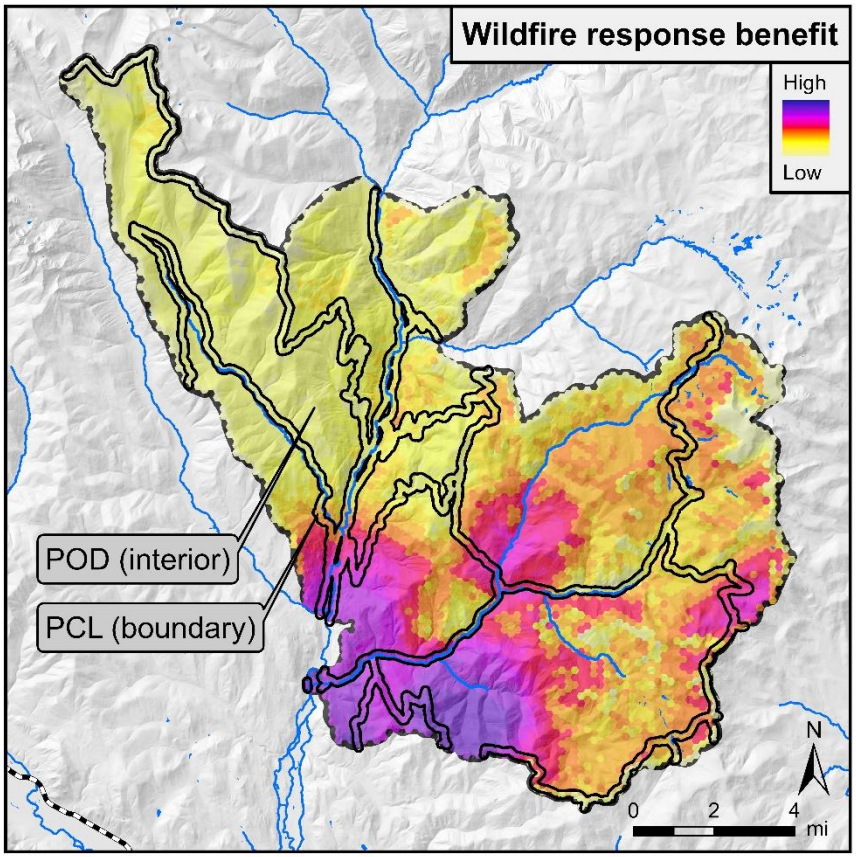


Figure 12. Wildfire response benefit (WRB) integrates multiple fire risk and forest health components. It includes four fire risk metrics representing highly valued resources – risk to homes, infrastructure, drinking water, commercially managed lands – and wildfire transmission to homes (Fig. 8). Combined, these account for 75% of the wildfire response benefit. Landscape treatment priority (Fig. 9) accounts for the remaining 25%. Also shown are PODs: units bounded by PCLs (open black lines). One use of the WRB metric is to prioritize Potential Control Lines (PCLs) for fire operations (Fig. 11).

Prioritizing Landscape Treatments for Dual Benefits

Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for wildfire and prescribed fire operations, delineated by fire operations personnel, delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and managers to identify, at a high level, locations where forest health or fuels treatments can be connected to a high-priority PCL that will support firefighter operations (e.g. ingress/egress route or opportunity for engagement).

Achieving forest health and wildfire response goals will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs.

There is important work to do in all Chewuch PODs to achieve the forest health treatment targets in Table 1. First-priority PODs correspond to areas with high and moderate landscape treatment priority (Fig. 11) in southern and eastern portions of the planning area (Fig. 13). All of the first-priority PODs are associated with first- and second-priority PCLs, enhancing opportunities for dual benefit treatments. Further work is needed to assess PCLs locally for their condition and detailed treatment needs, which will depend on management goals and values at risk. Ideally, landscape treatments will be implemented adjacent to priority PCLs where feasible to maximize both forest health and wildfire response goals.

Achieving forest health and wildfire response dual benefits will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs. These two approaches combined will contribute to restoring and maintaining large portions of the landscape in a resilient condition while providing safe and effective areas for firefighter engagement during suppression, prescribed fire, or managed wildfire operations.

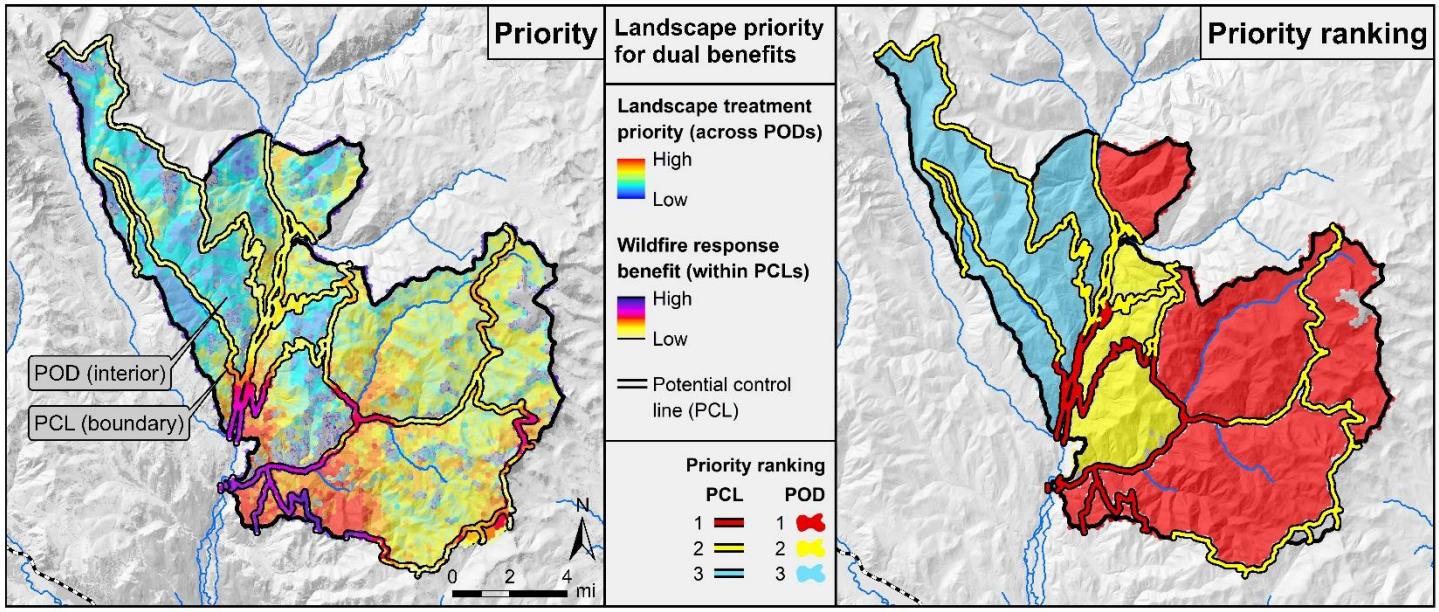


Figure 13. Landscape prioritization of dual benefits using PODs as a spatial framework to summarize treatment priorities. Both maps display landscape treatment priority within PODs and wildfire response benefit within PCLs. The map on the left shows the datasets at the raster level, while the map on the right shows the same information summarized and ranked within PODs and PCLs. PCL width is inflated to display spatial patterns. *PODs shown here are part of an ongoing process towards an all-lands delineation; POD boundaries are subject to change following on-the-ground vetting and continued dialogue among wildfire agencies and stakeholders.*

GIFFORD PLANNING AREA
LANDSCAPE EVALUATION SUMMARY (2024)

Total Acres	Forested Acres	Treatment Goal (Acres)
71,962	39,016	13,250 - 17,900

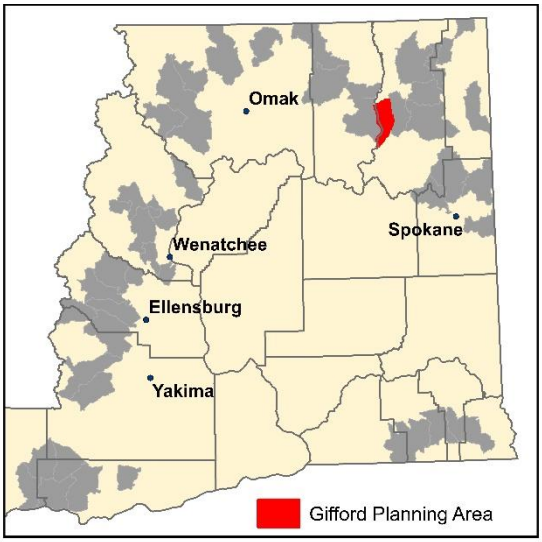


Figure 1. Planning area location in eastern WA.

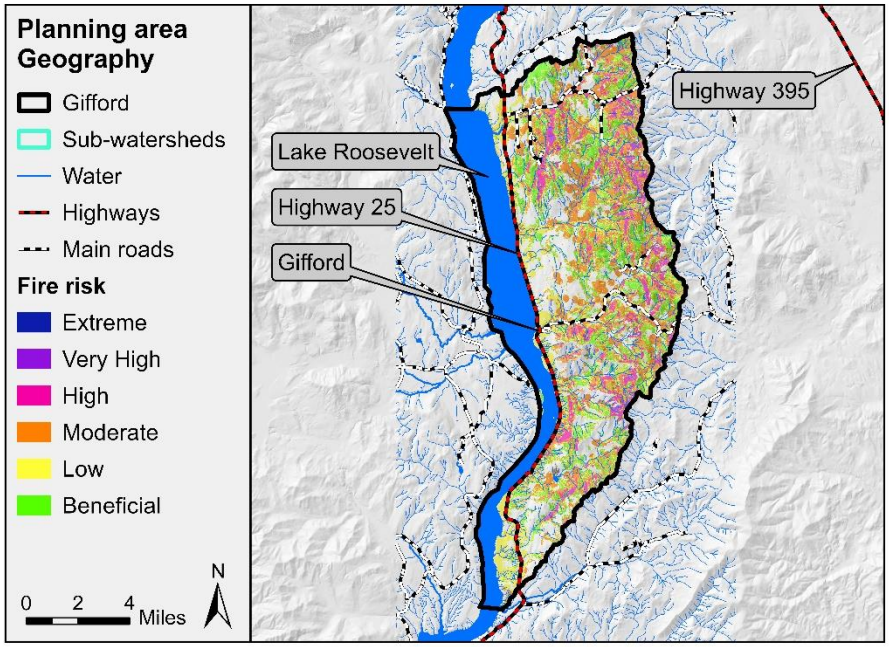


Figure 2. Planning area geography and fire risk, which integrates burn probability, fire intensity, and fire susceptibility of forests, infrastructure, and homes.

Planning Area Highlights

- Ownership is predominately small private (58%), along with industrial timberland (15%) and DNR Trustlands (7%). The Lake Roosevelt National Recreational Area occupies 20% of the area, but most of this is lakebed. Approximately half of small private ownership is forested, with the remainder in agriculture, shrub-steppe, and low-density pine woodland.
- Burn probability and fire risk are highest in the northeastern portion of the planning area and in scattered patches with high fuel loads throughout the rest of the area. Fire risk to homes and structures is moderate throughout.
- Much of the planning area is projected to shift towards hotter and drier climate conditions that support pine-woodlands and shrub-steppe and not forest. North-facing slopes and higher elevations will likely still support dry forest.
- Mechanical and prescribed fire treatments are recommended on 34-46% of forested acres to reduce fire risk to homes, other structures, infrastructure, and forested areas.
- High-priority locations for treatments that maximize forest health and wildfire response benefit are concentrated in the northern half of the planning area. These areas will require a mix of fuel reduction and defensible space treatments, as well as home hardening, to protect homes and restore resilient forests.

LEARN MORE

This landscape evaluation was completed in 2024.
For more details about DNR's priority planning areas please see: **https://www.dnr.wa.gov/ForestHealthPlan**
For data products and methods see: **https://bit.ly/ForestHealthData**

CONTACT

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Overarching Goals

Reduce wildfire risk and protect communities

Fire risk is variable throughout most of the planning area, with scattered patches of high to very high risk (Fig. 2). Forest structure, fuel types, and associated fire risk are highly fragmented due to the patchwork of shrub-steppe, agricultural land, woodlands, and forest stands that range from recently harvested young forest to dense, multi-story forest with mid-sized and large trees. Annual burn probability is low along the western edge (<0.5%) but increases to just over 1% from west to east as elevation and forest productivity increase. If multiple fires start during a period of hot, dry weather with windy conditions, suppression resources may be unable to contain rapid fire spread and protect the many homes distributed across the eastern and central portions. Treatments that integrate risk reduction for communities and forests will reduce the potential for large, destructive fires and increase firefighter safety. This should include treatments around homes and establishing potential control lines.

Increase resilience and prepare for climate change

By mid-century, much of the planning area is projected to have moisture stress levels currently associated with pine woodlands and shrub-steppe (Fig. 3). In these areas, treatments that significantly lower forest density, favor drought-tolerant species, and reduce surface fuels will reduce vulnerability to fire and drought mortality that may lead to conversion to non-forest. North-facing slopes and higher elevations along the eastern edge will likely still support dry forest. Very few sites are projected to have climate conditions that can support moist forest.

Sustain wildlife habitat

Habitat for dry forest, large tree, open-canopy species (e.g. White-headed Woodpecker) is abundant along the shore of Lake Roosevelt, but uncommon in the rest of the planning area. Treatments that decrease crown fire potential and drought vulnerability by reducing tree density and fuels, as well as creating variable spatial patterns, will expand this habitat type, especially where larger ponderosa pine exist or will develop over time. Habitat for species that depend on dry to moist, closed-canopy forest with large trees (e.g. Northern Goshawk) exists in small, but well distributed patches on north-facing slopes throughout the central portion. Given projections for hotter and drier conditions and the need to reduce fire risk, opportunities to expand this habitat type are limited to some north-facing slopes. Habitat for cold forest, large-tree, closed-canopy species (e.g. American Marten) is very limited due to the low elevation of this planning area. Habitat layers are available in the data products.

Enhance rural economic development

Almost all of the planning area has road access, and much of it has been managed for timber production. Meeting treatment needs will produce significant volumes of forest products and economic activity. Although warming trends will necessitate managing for lower densities and fuel loads, long-term timber production will likely be possible on industrial forestland and DNR Trustlands. In contrast, most of the small-private forest land is unlikely to support long term timber production due to doughtier conditions.

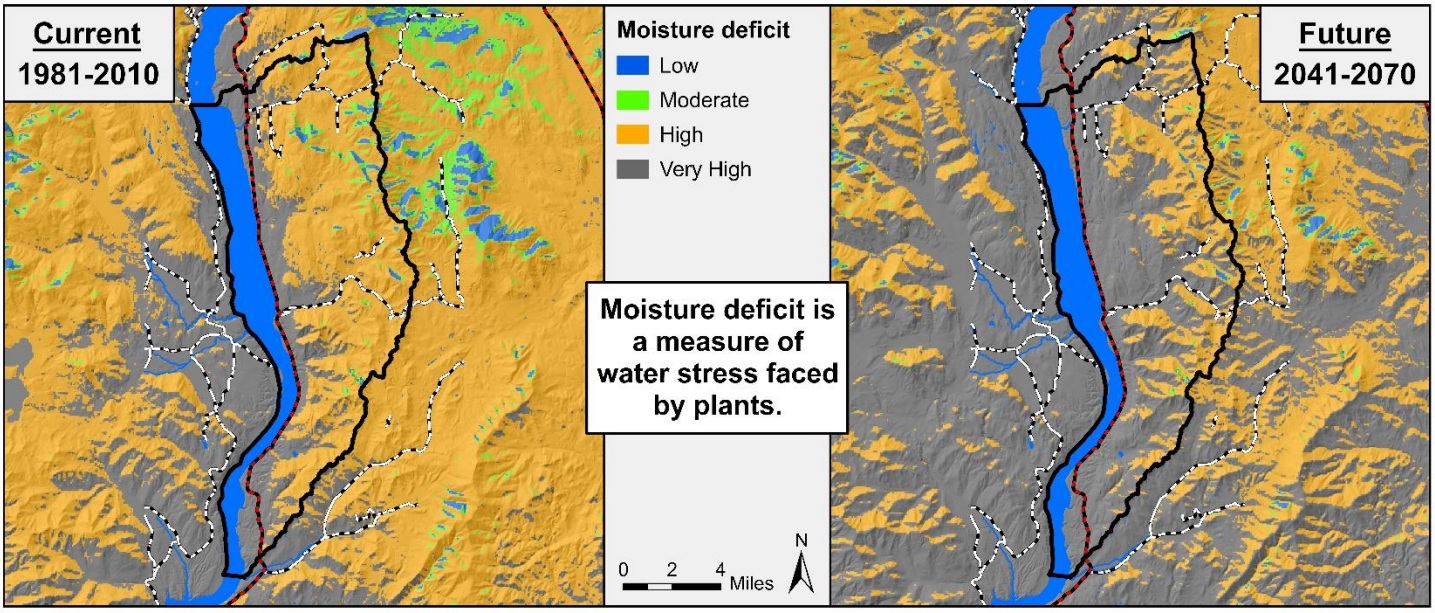


Figure 3. Current (left) and future (right) moisture stress levels based on water balance deficit. Low levels are associated with moist and cold forests, moderate with dry and moist forests, high with dry forests, and very high with woodland and shrub-steppe. Future climate is based on relatively high greenhouse gas emissions scenario (RCP 8.5).

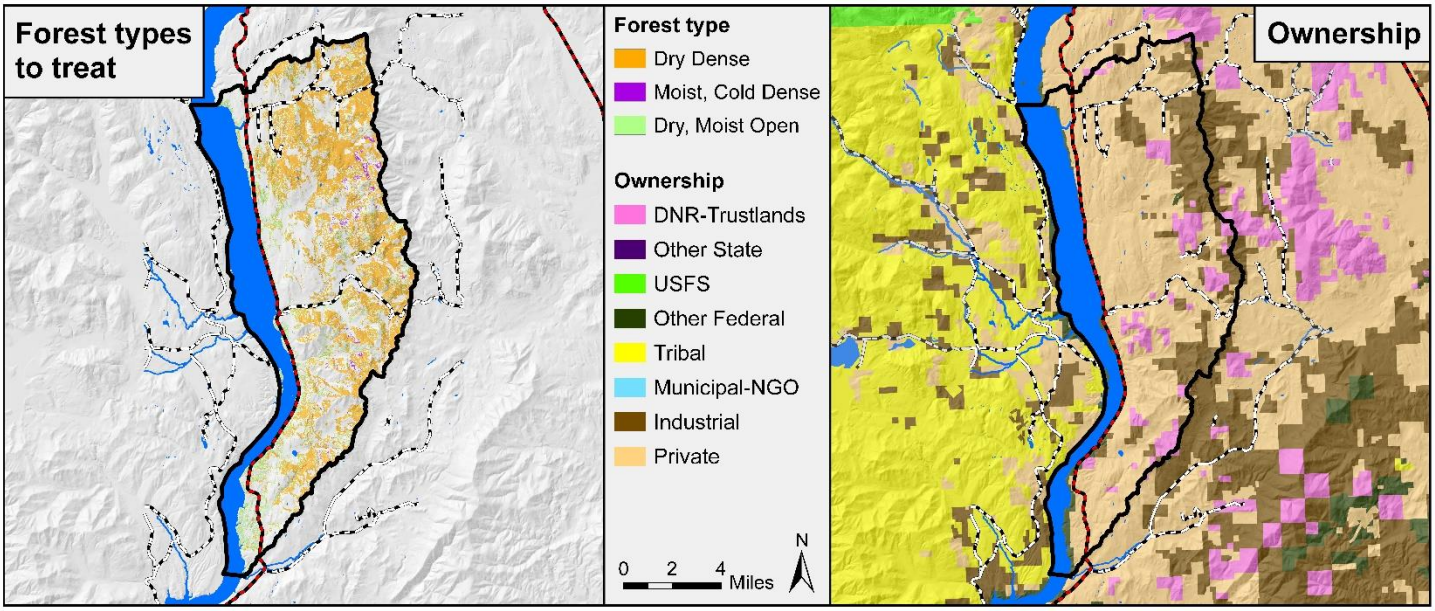
Forest Health Treatment Needs

Treating 13,250-17,900 acres is recommended to move the landscape into a resilient condition (34-46% of forested acres). This includes an estimated 3,450-3,800 acres of small-diameter thinning and 7,250-10,000 acres of treatments in commercial size classes. An estimated 2,550-4,100 acres of maintenance treatments in existing open forest will be needed over the next 10-20 years. These estimates are based on forest structure data from 2016 LiDAR imagery. Treatment need exists on private, DNR, and Federal land (Lake Roosevelt Recreation Area).

Meeting treatment needs will require multiple treatment types, including treating surface fuels with piling and burning or prescribed fire. Most treatments are likely commercially viable based on tree size, although treatments on small private parcels and around homes will generally not pay for themselves. Individual owners will determine treatment locations and type based on their objectives, as well as access, logging systems, markets, regulatory requirements, and the landscape-level wildfire risk reduction and forest health needs outlined here.

Table 1. Summary of forest health treatment needs. *See methods for details on how the treatment need range is derived.*

Forest conditions to treat		Treatment need (footprint acres)	Current acres by major landowner*				
Type	**Size class**		**Private**	**Federal**	**Industrial**	**DNR-Trust**	**Other**
Dry Dense	Small	3,250 - 3,500	1,784	1	1,994	260	0
	Medium-Large	7,250 - 10,000	10,375	162	3,126	2,156	19
Moist + Cold Dense	Small	200 - 300	145	0	249	19	0
Dry + Moist Open	Medium-Large	2,550 - 4,100	3,513	582	821	466	1
Total		**13,250 -17,900**	*These are current acres, not targets				
Anticipated treatment type		Noncommercial thin + fuels treatment. May be prescribed fire or low/mod-severity wildfire.					
		Commercial thin plus fuels treatment if access exists. May be noncommercial, regeneration treatment, or fire only (prescribed fire or low/moderate-severity wildfire).					
		Maintenance treatment: mechanical thinning and fuels reduction, Rx fire, or low/moderate-severity wildfire. *Targets correspond to 50-75% of dry open and 25-50% of moist open forests.*					



Left: Figure 4. Forest structure types that are overabundant relative to targets for a resilient landscape, as well as potential maintenance treatments. Only a portion of the areas shown need to be treated. Right: Figure 5. Current land ownership.

Forest Health Treatment Needs (continued)

Dry dense forest treatment need

On dry sites, dense forests of all size classes are currently over-represented. These forests are vulnerable to uncharacteristic levels of high- and moderate-severity fire, as well as a combination of drought stress, insect mortality and root disease. Treating 10,500-13,500 acres of dry, dense forest (Table 1) is recommended to shift the majority of dry forest to of open-canopy forest (Fig. 6) in larger patches (~100-1000+ ac). Larger patches of dense forest should be broken up in the northern half of the planning area (Fig. 4) to create a mix of small to medium patches of open (<40% cover), moderately closed (40-60% cover), and closed-canopy (>60% cover) forest, along with patches of woodland and shrub-steppe. This mosaic of forest structure will reduce risk of large-scale, high-severity fire or insect outbreaks. Thinning treatments plus subsequent growth will increase the amount of large tree, open forest, which is currently very low. Managing for low densities (~10-30 trees per acre) is recommended on sites that are projected to shift to woodland or shrub-steppe over time. In addition, shifting composition toward ponderosa pine will be needed in many locations, and planting may be necessary after treatments or fires.

Moist and cold dense forest treatment need

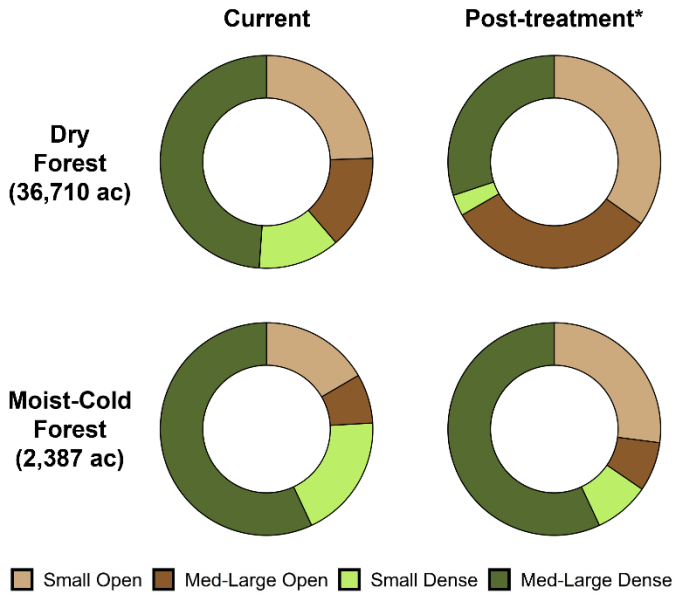
On moist sites, small-tree, dense forest exceeds desired ranges, although the total area of moist and cold forest is less than 2,400 acres. Treating 200-300 acres of this type (Table 1, Fig. 4) is recommended to reduce density and increase the relative composition of western larch and ponderosa pine. As almost all of the current moist forest area is projected to shift to climatic conditions currently associated with dry forests (Fig. 3), treating some medium and large sized moist forest may also be advisable.

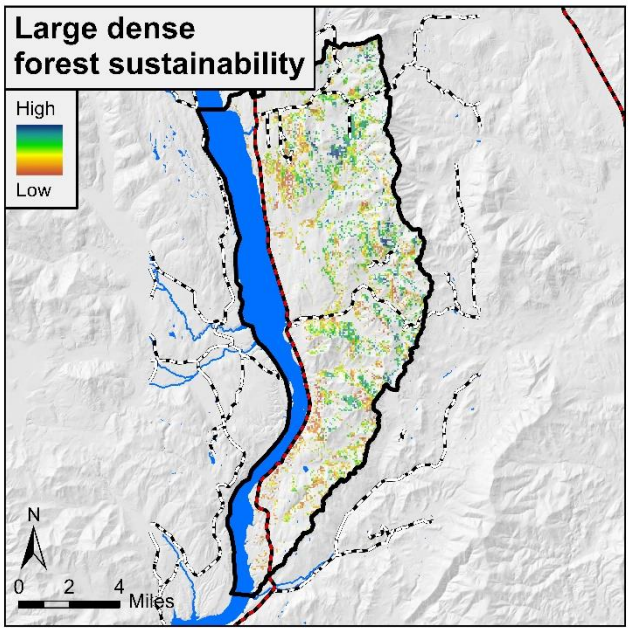
Open forest maintenance treatment need

Over the next 10-20 years, an estimated 2,550-4,100 acres of currently open forests on dry sites will need maintenance treatments to prevent increases in fire risk. These sites are mostly areas that have been treated, but also include some low-density woodlands. Maintenance treatments include prescribed fire, mechanical thinning and fuel reduction, or potentially wildfire where it can be managed to safely achieve landowner objectives. Specific maintenance strategies will depend on landowner objectives and time since treatment. Wildfires can also maintain low densities and surface fuels.

Sustainable locations for dense forest with large trees

Locations with low to moderate current and future moisture deficits (Fig. 3) and low fire risk (Fig. 2) offer the most sustainable locations to maintain sufficient area and patch sizes of this habitat type. Sustainable locations are concentrated in the northeastern portions (Fig. 7). This sustainability map can be used in conjunction with treatment priority (Fig. 9) to select where to shift large tree-dense forest to fire- and drought-resistant, open-canopy large-tree forest vs. where to maintain this habitat type.





Left: Figure 6. Current and post-treatment proportions of forest types and structure classes. * mid-point of range in Table 1.
Right: Figure 7. Sustainability of current and potential large tree, dense forest based on fire risk and drought vulnerability.

Landscape Treatment Prioritization

Prioritizing for forest health & to reduce fire exposure of homes

Landscape treatment priority integrates three metrics of forest health – forest fire risk (Fig. 2), drought vulnerability, and presence of overabundant forest structure types (Fig. 4) – with wildfire transmission to homes (Fig. 8). We also recommend incorporating the large dense forest sustainability layer (Fig. 7) as an overlay when selecting treatment locations. Wildfire transmission is moderate to high in the northern portion, indicating that wildfires starting in these locations are predicted to expose homes within and beyond the planning area.

Treatment priorities

Areas with high to moderate treatment priority are concentrated in the northern half, but also exist throughout the planning area (Fig. 9). High- to moderate-priority treatment locations occur on all ownerships. However, the majority is located on small-private parcels that will typically require a mix of fuel reduction and defensible space treatments, as well as home hardening, to restore resilient forests and protect communities. Low-priority areas may need treatment in some cases to shift composition to fire- and drought-tolerant species, reduce insect and disease risk, meet financial objectives, and/or address other issues.

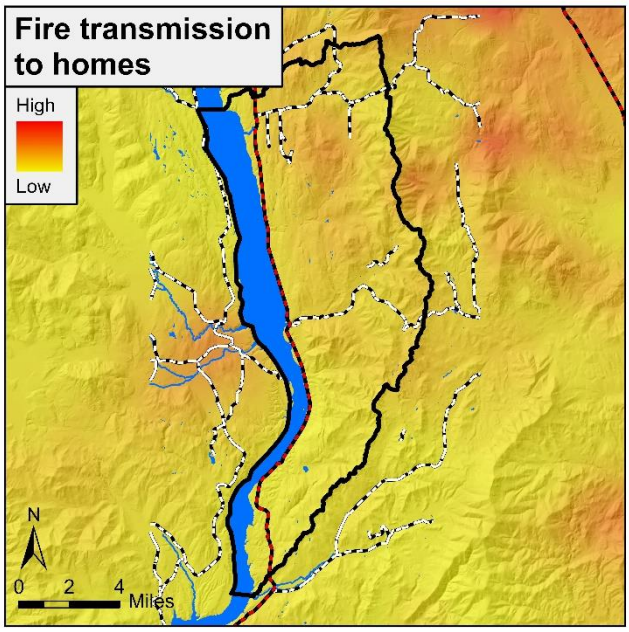


Figure 8. Fire transmission to homes shows where fires that expose structures are most likely to originate. It is based on simulated fire perimeters given contemporary patterns of fuels, topography, and wind.

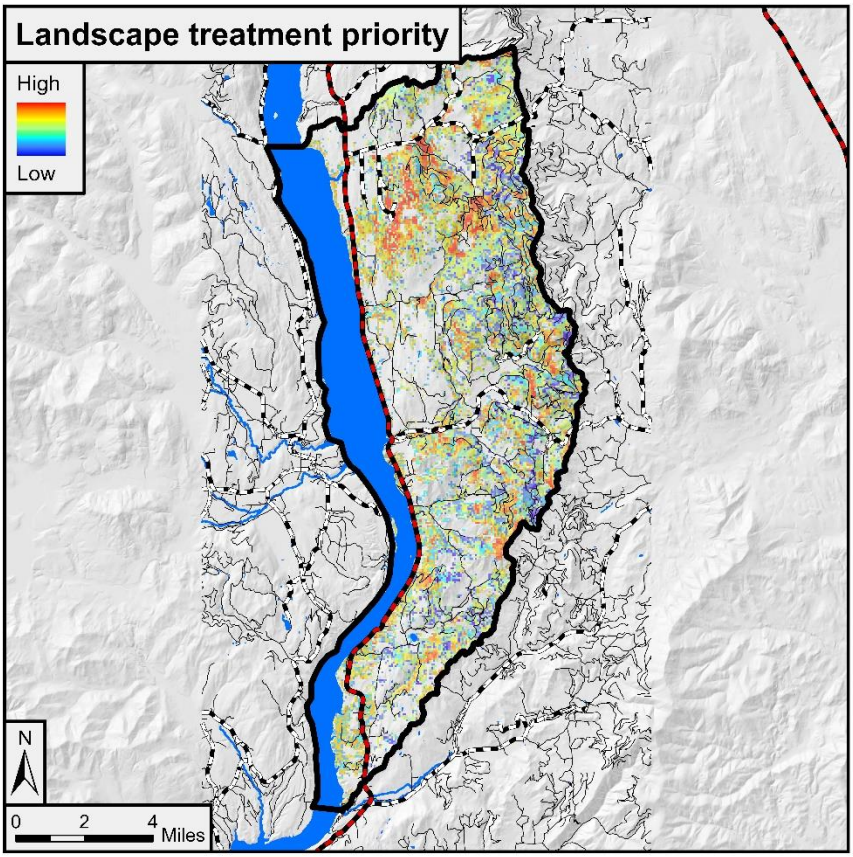


Figure 9. Landscape treatment priority is based on three metrics of forest health – forest fire risk (Fig. 1), drought vulnerability (Fig. 3), overabundant forest structure (Fig. 4) – as well as wildfire transmission to homes (Fig. 8).

Definitions

Vegetation Types

Cold forest: Upper elevation mixed-conifer forests with high-severity fires every 80-200+ years.

Dry forest: Ponderosa pine and Douglas-fir dominated forests that historically had surface fires every 5-25 years.

Moist forest: Forests that historically had mixed-severity fires every 30-100 years and were composed of fire-resistant (western larch, Douglas-fir) and fire-intolerant (grand fir) trees.

Woodland/Steppe: Grass and shrub lands that may have oak woodlands or ≤ 10% conifer cover.

Forest structure

Large tree: Overstory diameter > 20 inches.

Medium tree: Overstory diameter 10-20 inches.

Small tree: Overstory diameter < 10 inches.

Dense canopy: Greater than 40% tree canopy.

Open canopy: Less than 40% tree canopy.

***Fuels*:** Shrubs, grasses, small trees, litter, duff, and dead wood.

Fuels treatments: some combination of mechanical density reduction (commercial or non-commercial) and surface and ladder fuel reduction (prescribed fire, piling & burning, etc.).

Managed wildfire: where consistent with regulations, naturally ignited fire is managed for multiple goals, including resource benefits, firefighter safety, community protection, and suppression.

Wildfire Response Benefit Prioritization

Dual benefits for forest health and wildfire response

It is necessary to conduct treatments to both improve forest health and reduce fire risk to communities as well as provide conditions where firefighters can safely and efficiently conduct wildfire and prescribed fire operations. The wildfire response benefit metric (WRB; Fig. 10) identifies and prioritizes locations where values at risk that are more likely to be the focus of fire operations (homes, infrastructure, sources of drinking water, and commercially managed lands) coincide with areas likely to transmit wildfire to homes and generate severe fire behavior. Because there are positive feedbacks between healthy, resilient forests and safe, effective fire operations, the WRB metric also integrates the landscape treatment priority map (Fig. 9).

Where WRB is highest, actions may be needed to create and maintain conditions that provide a tactical advantage for fire operations. These actions will vary with the local context and can include landscape-level forest health and fuel treatments, treatments along fire control lines and escape routes, resident and community fire mitigation activities (e.g. defensible space, home hardening), and improving signage and road conditions. The WRB metric provides a high-level prioritization, and additional work at the local level is required to identify appropriate actions and assess their feasibility. WRB is useful for prioritizing Potential Control Lines (PCLs) for fire operations (Fig. 11). PCLs are a part of Potential Operational Delineations (PODs); see page 7.

In the Gifford planning area, wildfire response benefit is highest in the northern half of the planning area (Fig. 10). High WRB values are associated with high risk to people and property and commercially managed lands throughout the planning area, as well as high wildfire transmission in northern portions, including the small communities scattered throughout the area (Fig. 8).

Definitions (continued)

Wildfire response benefit: Any tactical advantage gained for wildfire response activities from actions on the landscape, including, but not restricted to, identifying and consolidating existing anchor points and control lines and reduction of potential fire behavior. Wildfire response benefit is not restricted to any specific wildfire management strategy and instead is centered on conditions that improve fire operations safety and effectiveness.

Potential Control Lines (PCLs): Boundaries of Potential Operational Delineations (PODs) relevant to fire control operations (e.g. roads, ridgetops, and water bodies).

Potential Operational Delineations (PODs) for wildland fire: Landscape containers whose boundaries are potential control lines (PCLs). PODs are useful for planning strategic response to unplanned ignitions, strategic fuel planning, and prioritizing fuel treatments within PODs.

Commercially managed lands: Commercially managed forestlands include: DNR Trustlands, Tribal forests, industrial forests, non-industrial private forests, and US Forest Service forests where timber is a primary management objective.

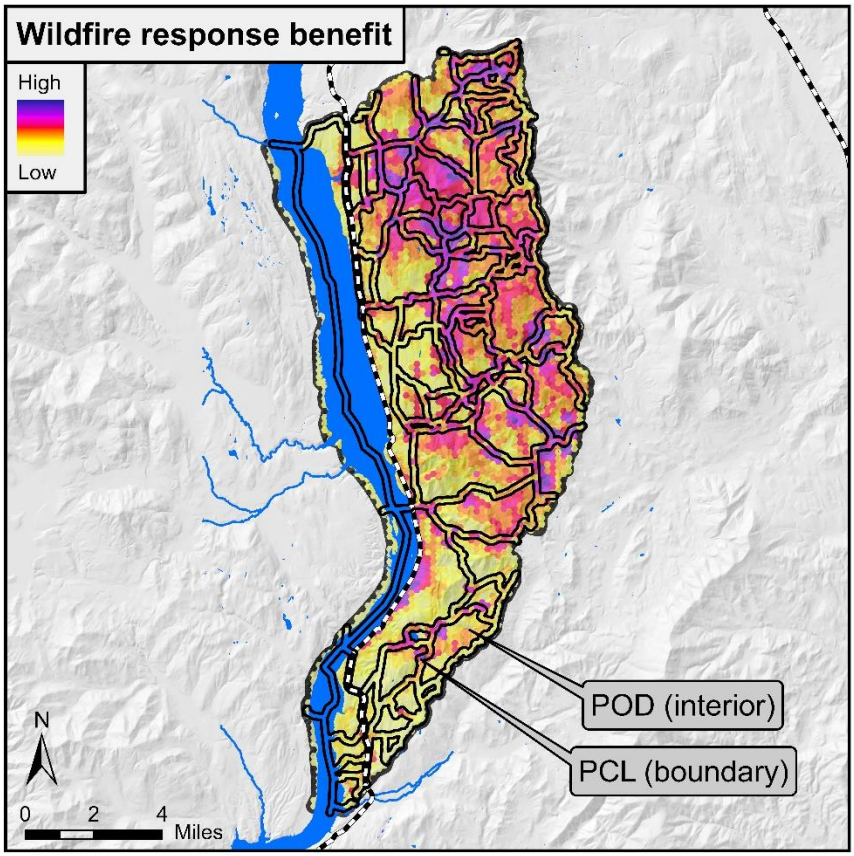


Figure 10. Wildfire response benefit (WRB) integrates multiple fire risk and forest health components. It includes four fire risk metrics representing highly valued resources – risk to homes, infrastructure, drinking water, commercially managed lands – and wildfire transmission to homes (Fig. 8). Combined, these account for 75% of the wildfire response benefit. Landscape treatment priority (Fig. 9) accounts for the remaining 25%. Also shown are PODs: units bounded by PCLs (open black lines). One use of the WRB metric is to prioritize Potential Control Lines (PCLs) for fire operations (Fig. 11).

Prioritizing Landscape Treatments for Dual Benefits

Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for wildfire and prescribed fire operations, delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and managers to identify, at a high level, locations where forest health or fuels treatments can be connected to a high-priority PCL that will support firefighter operations (e.g. ingress/egress route or opportunity for engagement).

Achieving forest health and wildfire response goals will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs.

There is important work to do in all Gifford PODs to achieve the forest health treatment targets in Table 1. First-priority PODs correspond to areas with moderate to high landscape treatment priority (Fig. 9), especially in northern half of the planning area (Fig. 11). Most of the first-priority PODs are associated with first-priority PCLs, enhancing opportunities for dual benefit treatments. Further work is needed to assess PCLs locally for their condition and detailed treatment needs, which will depend on management goals and values at risk. Ideally, landscape treatments will be implemented adjacent to priority PCLs where feasible to maximize both forest health and wildfire response goals.

Achieving forest health and wildfire response dual benefits will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs. These two approaches combined will contribute to restoring and maintaining large portions of the landscape in a resilient condition while providing safe and effective areas for firefighter engagement during suppression, prescribed fire, or managed wildfire operations.

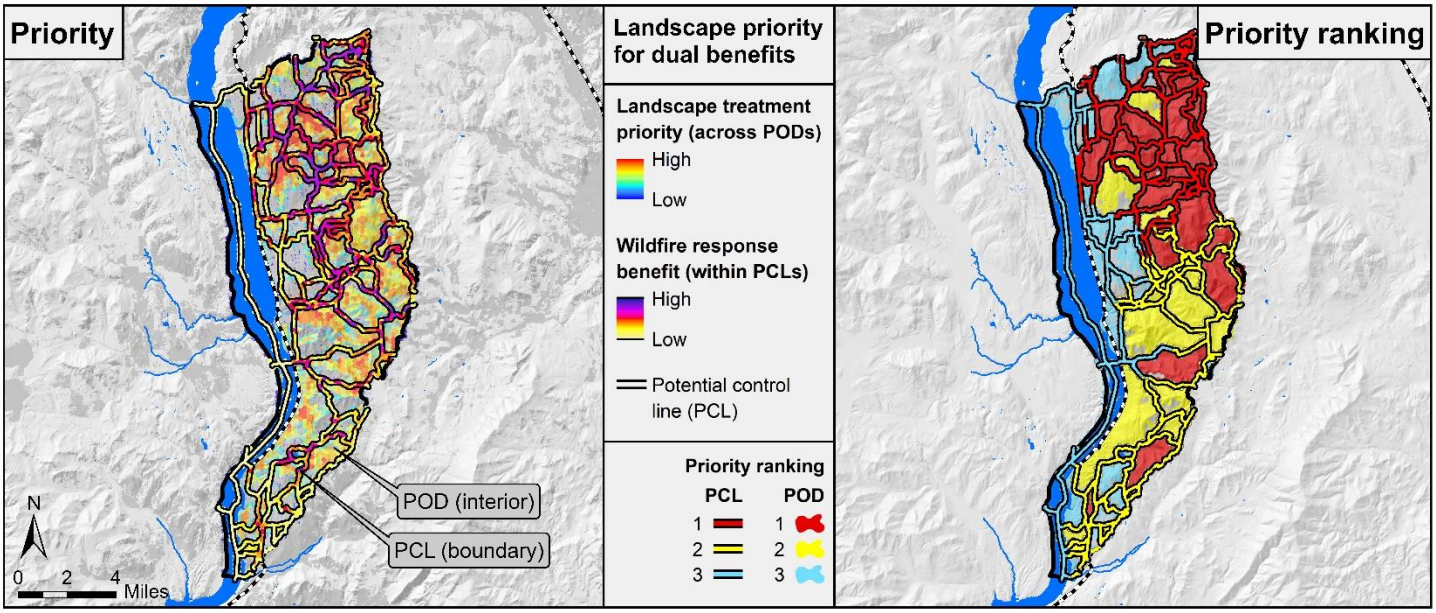


Figure 11. Landscape prioritization of dual benefits using PODs as a spatial framework to summarize treatment priorities. Both maps display landscape treatment priority within PODs and wildfire response benefit within PCLs. The map on the left shows the datasets at the raster level, while the map on the right shows the same information summarized and ranked within PODs and PCLs. PCL width is inflated to display spatial patterns. *PODs shown here are part of an ongoing process towards an all-lands delineation; POD boundaries are subject to change following on-the-ground vetting and continued dialogue among wildfire agencies and stakeholders.*

INCHELIUM PLANNING AREA
LANDSCAPE EVALUATION SUMMARY (2024)

Total Acres	Forested Acres	Treatment Goal (Acres)
146,263	121,779	22,500 - 36,000

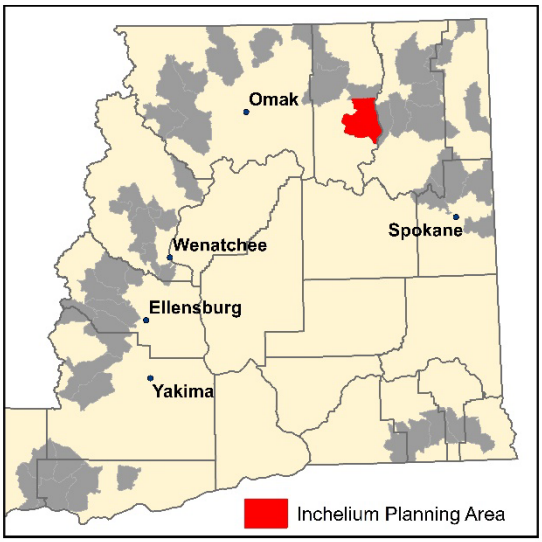


Figure 1. Planning area location in eastern WA.

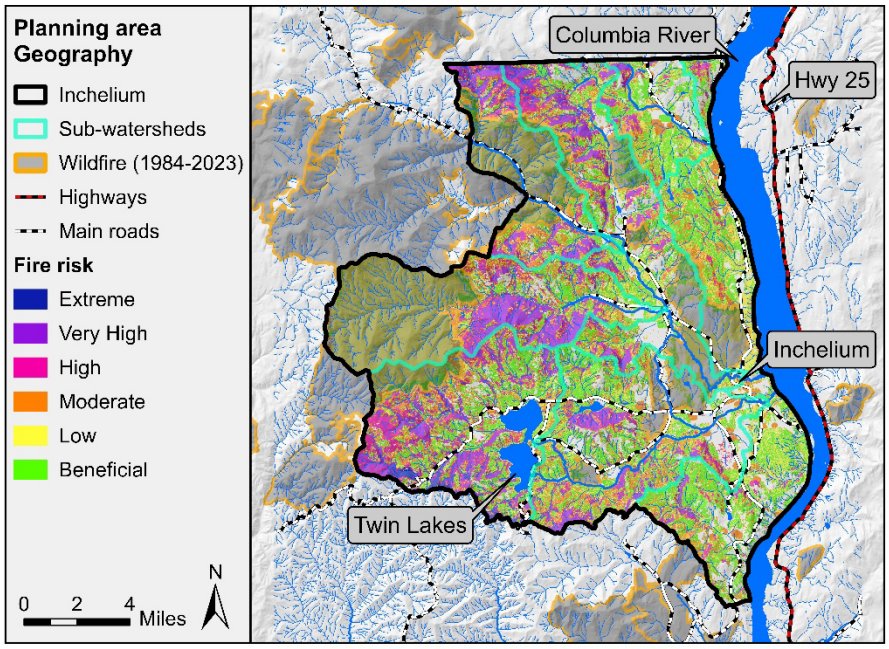


Figure 2. Planning area geography and fire risk, which integrates burn probability, fire intensity, and fire susceptibility of forests, infrastructure, and homes.

Planning Area Highlights

- This planning area is part of the Colville Tribal Reservation. 77% is reservation land, while 18% is private land belonging both to Tribal and non-Tribal individuals, and 5% is Tribal allotments.
- Burn probability and fire risk are high in the western two-thirds of the planning area, except within recent fire-footprints. Much of the eastern third and southern portion of the planning area where dry forests are more prevalent are projected to have lower flame lengths and thus low to moderate risk, as well as beneficial effects to fuels in some places.
- Much of the existing moist and cold forests are projected to shift towards climate conditions that support dry forest.
- Treating 18-30% of forested acres is recommended to increase resilience and reduce fire risk.
- High-priority locations for potential treatments that maximize forest health and wildfire response existing throughout the planning area but are concentrated in the western and southern portions.
- The Colville Tribe has completed planning for extensive treatments in this planning area that address much of the treatment need and priority locations. Implementation of these projects has begun. Additional projects are being planned.

LEARN MORE

This landscape evaluation was completed in 2024.
For more details about DNR's priority planning areas please see: **https://www.dnr.wa.gov/ForestHealthPlan**
For data products and methods see: **https://bit.ly/ForestHealthData**

CONTACT

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Overarching Goals

Reduce wildfire risk and protect communities

Fire risk is high to very high across much of the western two-thirds of the planning area where dense moist and cold forest occur (Fig. 2). This is driven by a combination of high fuel loads and annual burn probabilities of 1-2%. In contrast, much of the eastern third and southern portion have lower fuel loads and are projected to have lower flame lengths and burn probability, which results in low to moderate risk, as well as beneficial fire effects from fuel consumption. A mosaic of dry forests, shrub-steppe, and agricultural land occurs in this area. In addition, fire risk is low within the two large patches of the 2021 Summit Trail Fire that burned along the eastern edge. The planned treatments will reduce the risk of large, high-severity fires. Finally, fire risk to homes and structures is significant, and thus implementing defensible space and home hardening treatments, as well establishing potential control lines, will reduce risk and increase firefighter safety.

Increase resilience and prepare for climate change

By mid-century, much of the current moist and cold forests are projected to have moisture stress levels currently associated with dry forest (Fig. 3). Treatments that reduce density and favor drought-tolerant species will reduce vulnerability to drought mortality. These treatments are especially important on south-facing slopes in the northern and western portions of the planning area. North-facing slopes at moderate to higher elevations are projected to still support moist and cold forest. Most of the eastern third and south-facing slopes in the central portion are likely to shift to woodland or shrub-steppe.

Sustain wildlife habitat

Habitat for dry forest, large tree, open-canopy species (e.g. White-Headed Woodpecker) is somewhat abundant in the eastern third of the area, as well as on some south-facing slopes within the Summit Trail Fire that burned at moderate severity. Habitat for species that depend on dry to moist, closed-canopy forest with large trees (e.g. Northern Goshawk) is abundant in the western two-thirds. Planned treatments will likely expand White-Headed Woodpecker habitat in dense forests on dry sites, while also reducing risk of large crown fire that would reduce dry and moist forest large tree habitat. Habitat for cold forest, large-tree, closed-canopy species (e.g. American Marten) is relatively abundant within draws and north-facing slopes at higher elevations. Habitat for the many species that utilize post-fire, early-seral habitats is also abundant within the high-severity patches of the Summit Trail Fire. Habitat layers are available in the data products.

Enhance rural economic development

Meeting treatment needs will produce a large volume of forest products and economic activity. Although warming trends will necessitate managing for more drought-tolerant species and lower densities and fuel loads on current and future dry sites, long-term timber production will likely be possible on most of the western portion of the planning area. North-facing slopes and areas with ash-capped soils are likely to maintain high productivity levels and ability to support higher stocking. In contrast, much of the eastern third is unlikely to support stocking levels that are needed for even low-productivity timberlands.

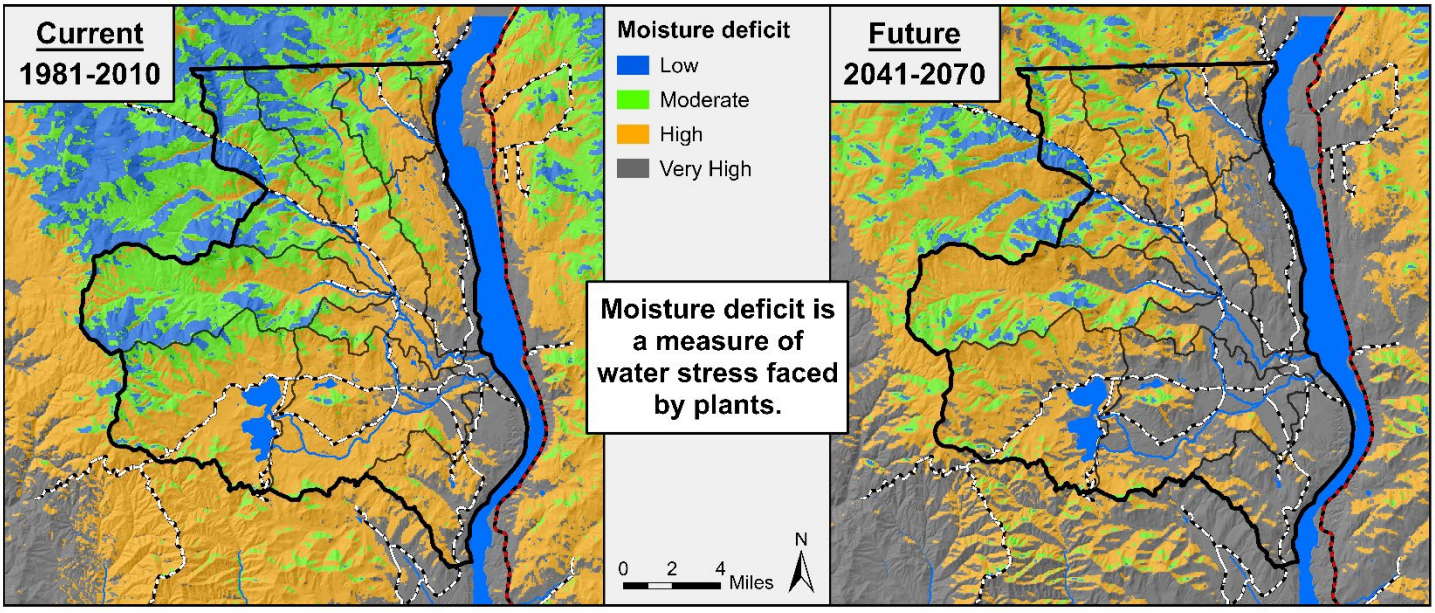


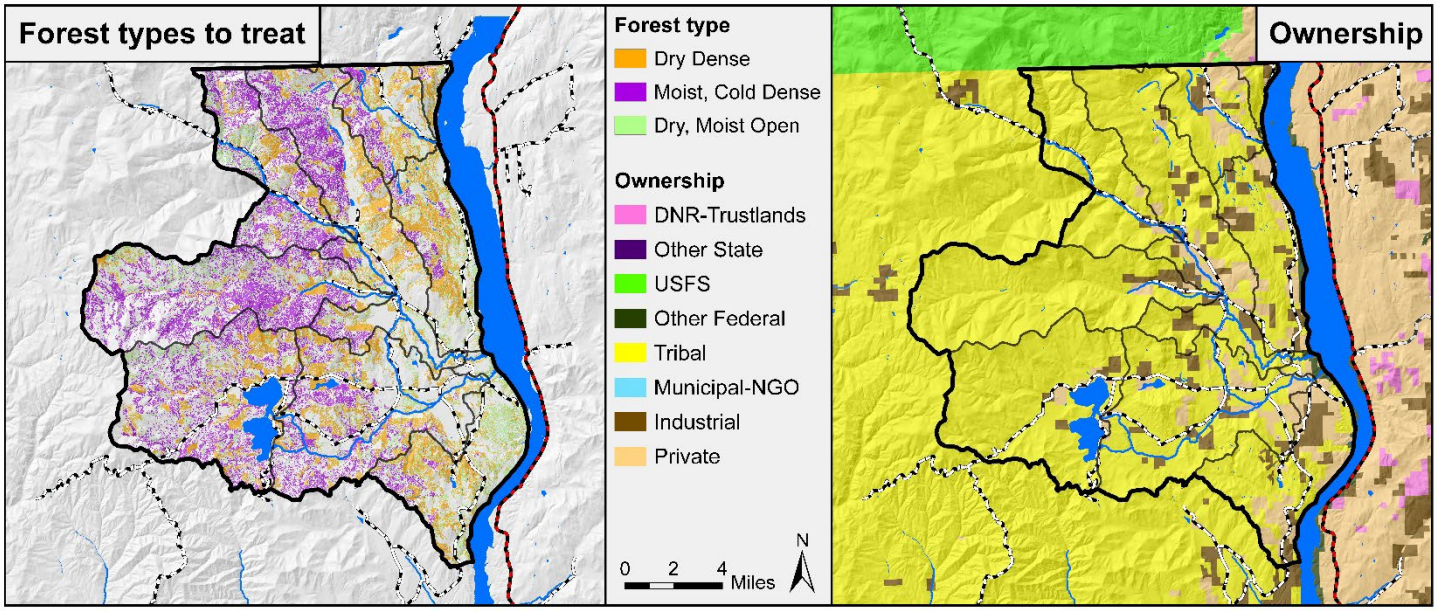
Figure 3. Current (left) and future (right) moisture stress levels based on water balance deficit. Low levels are associated with moist and cold forests, moderate with dry and moist forests, high with dry forests, and very high with woodland and shrub-steppe. Future climate is based on a relatively high emissions scenario. Note that these maps do not capture areas with ash capped soils that decrease deficit, such as east of Twin Lakes.

Forest Health Treatment Needs

Treating 22,500 to 36,000 acres is recommended to move the landscape into a resilient condition (18-30% of forested acres; Table 1). This total includes an estimated 16,500-26,000 acres to shift dense to open forest and 6,000-10,000 acres of maintenance treatments in existing open forest. Treatment needs are based on forest structure information from 2021 NAIP stereo-imagery. The Colville Tribe Department of Natural Resources has completed planning for extensive commercial, non-commercial, and surface fuels treatments within this planning area. A significant portion of these treatments have already been implemented. Additional projects are in the planning phase. Note that this analysis does not fully capture the need for future treatments to reduce surface fuel build up and thin dense regeneration within portions of the Summit Trail Fire, as well dense regeneration in current shelterwood harvests. Future monitoring analysis can assess how treatments have affected landscape resilience and if additional treatments are warranted to meet resilience, social, and economic objectives.

Table 1. Summary of forest health treatment needs. ***See methods for details on how the treatment need range is derived.***

Forest conditions to treat		Treatment need (footprint acres)	Current acres by major landowner*				
Type	**Size class**		**Tribal**	**Private**	**Industrial**	**Federal**	**Other**
Dry Dense	Small	1,500 - 1,750	1,452	484	507	1	0
	Medium-Large	10,000 - 15,000	15,613	3,452	3,294	86	8
Moist + Cold Dense	Medium-Large	5,000 - 9,250	25,625	69	60	0	0
Dry + Moist Open	Medium-Large	6,000 - 10,000	5,095	2,145	1,815	321	13
Total		**22,500 - 36,000**	**These are current acres, not targets*				
Anticipated treatment type		Noncommercial thin + fuels treatment. May be prescribed fire or low/mod-severity wildfire.					
		Commercial thin plus fuels treatment if access exists. May be noncommercial, regeneration treatment, or fire only (prescribed fire or low/moderate-severity wildfire).					
		Maintenance treatment: mechanical thinning and fuels reduction, Rx fire, or low/moderate-severity wildfire. *Targets correspond to 50-75% of dry open and 25-50% of moist open forests.*					



Left: Figure 4. Forest structure types that are overabundant relative to targets for a resilient landscape, as well as potential maintenance treatments. Only a portion of the areas shown need to be treated. Right: Figure 5. Current land ownership.

Forest Health Treatment Needs (continued)

Dry dense forest treatment need

Large- and medium-tree, dense forest structure is over-represented in dry forest relative to estimates from historical forests with active fire regime. Large patches are present (Fig. 4). These forests are vulnerable to uncharacteristic levels of high- and moderate-severity fire, as well as a combination of drought stress and insect mortality. Treating 10,000-15,000 acres of medium- and large-tree, dense dry forest (Table 1) to reduce tree density and surface fuels is recommended to create large patches (~100-1000+ ac) of open forest and shift the majority of dry sites to open forest (Fig. 6). Treatments that retain the larger trees and reduce surface fuels will create large-tree, open, fire-resistant forest over time, which is currently low. Shifting composition toward ponderosa pine and western larch is also needed in some locations through species preferences and/or planting. In addition, 1,500-1,750 acres of small-tree thinning is also recommended in young plantations or shelterwoods, although this estimate may be low.

Moist and cold dense forest treatment need

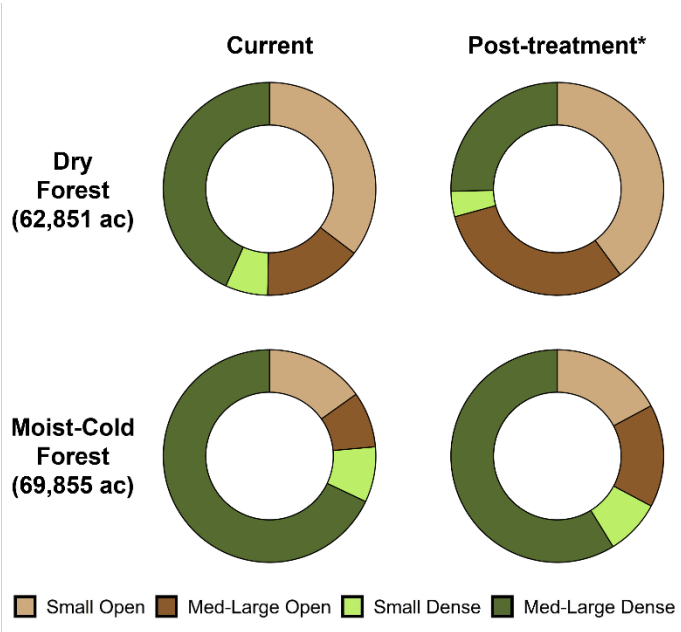
Medium-tree, dense forest on moist sites exceeds desired ranges. Patch sizes are large, especially as they are often connected with large-tree, dense patches. Large-tree, open- and moderate-canopy cover (40-60%) is below desired ranges. Treating 5,000-9,250 acres of this type (Table 1, Fig. 4) is recommended, especially in larger patches that are predicted to support dry forest in the future (Fig. 3). This will enhance the mosaic of open, moderate, and dense patches and reduce risks of large crown fire and insect outbreaks. Increasing the relative composition of western larch and ponderosa pine is also needed, especially on sites projected to shift to dry forest (Fig. 3). If the midpoint of landscape treatment targets are achieved, over 65% of the total moist and cold forest area will remain dense (>40% canopy cover) (Fig. 6) to meet habitat, wood production, and other objectives.

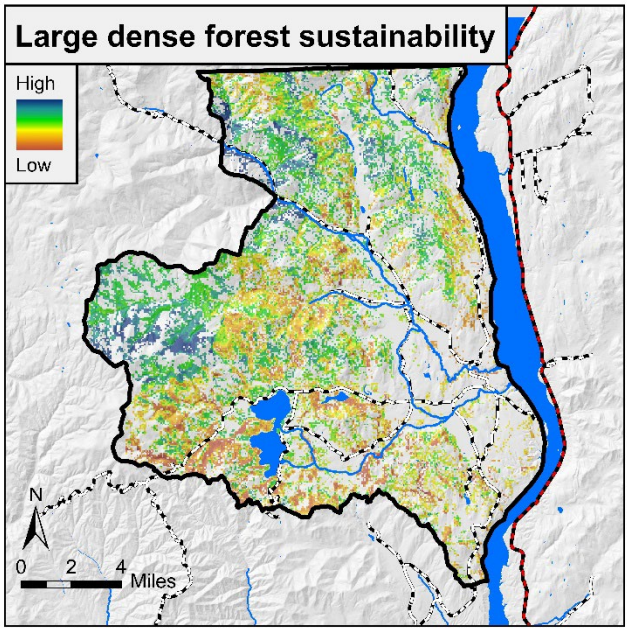
Open forest maintenance treatment need

Over the next 15 years, an estimated 6,000-10,000 acres of currently open forests on dry and moist sites will need maintenance treatments. These sites are mostly areas that have been treated, as well as within past fires. Maintenance treatments include non-commercial thinning, mechanical fuel reduction, or prescribed fire. Wildfires can also maintain low densities and surface fuels. These estimates do not fully account for treatments to reduce surface fuel build up and thin dense regeneration within portions of the Summit Trail Fire.

Sustainable locations for dense forest with large trees

Locations with low to moderate current and future moisture deficits (Fig. 3) and low fire risk (Fig. 2) offer the most sustainable locations to maintain sufficient area and patch sizes of this habitat type. Sustainable locations are concentrated in the western portion and on north-facing slopes (Fig. 7). This sustainability map can be used in conjunction with treatment priority (Fig. 9) to select areas to shift to open forest vs. where to maintain this habitat type.





Left: Figure 6. Current and post-treatment proportions of forest types and structure classes. * mid-point of range in Table 1.
Right: Figure 7. Sustainability of current and potential large tree, dense forest based on fire risk and drought vulnerability.

Landscape Treatment Prioritization

Prioritizing for forest health & to reduce fire exposure of homes

Landscape treatment priority integrates three metrics of forest health – forest fire risk (Fig. 2), drought vulnerability (Fig. 3), and presence of overabundant forest structure types (Fig. 4) – with wildfire transmission to homes (Fig. 8). We also recommend incorporating the large dense forest sustainability layer (Fig. 7) as an overlay when selecting treatment locations. Wildfire transmission is moderate to high in southeastern portion, indicating that wildfires starting in these locations are predicted to expose homes in and around the Inchelium community (Fig. 2).

Treatment priorities

Landscape treatment priority is high throughout central and western portions of the planning area (Fig. 9). These high-priority locations exhibit high fire risk, drought vulnerability, fire transmission to homes, and departed forest structure. The Colville Tribe has completed planning for extensive treatments that address much of the treatment need in high-priority areas. Additional projects are in the planning phase. Future monitoring analyses will examine how these treatments have enhanced landscape resilience and if additional treatments may be warranted. Some low-priority areas may need treatment to address species composition, insect and disease risk, or to meet other objectives.

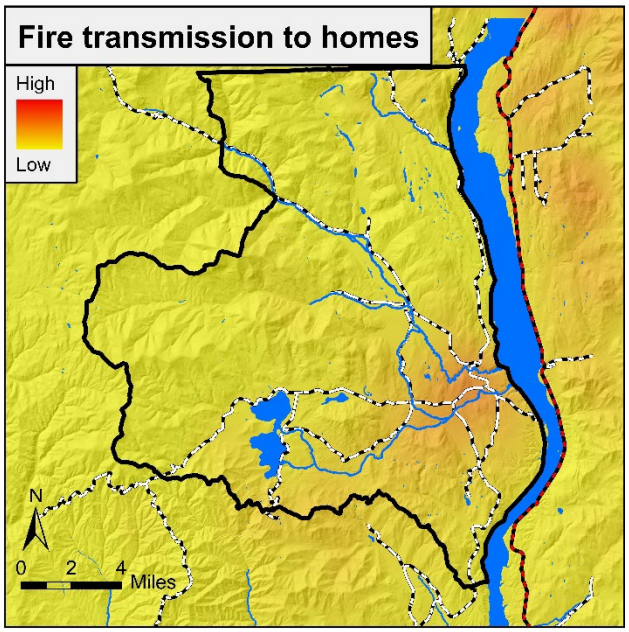


Figure 8. Fire transmission to homes shows where fires that expose structures are most likely to originate. It is based on simulated fire perimeters given contemporary patterns of fuels, topography, and wind.

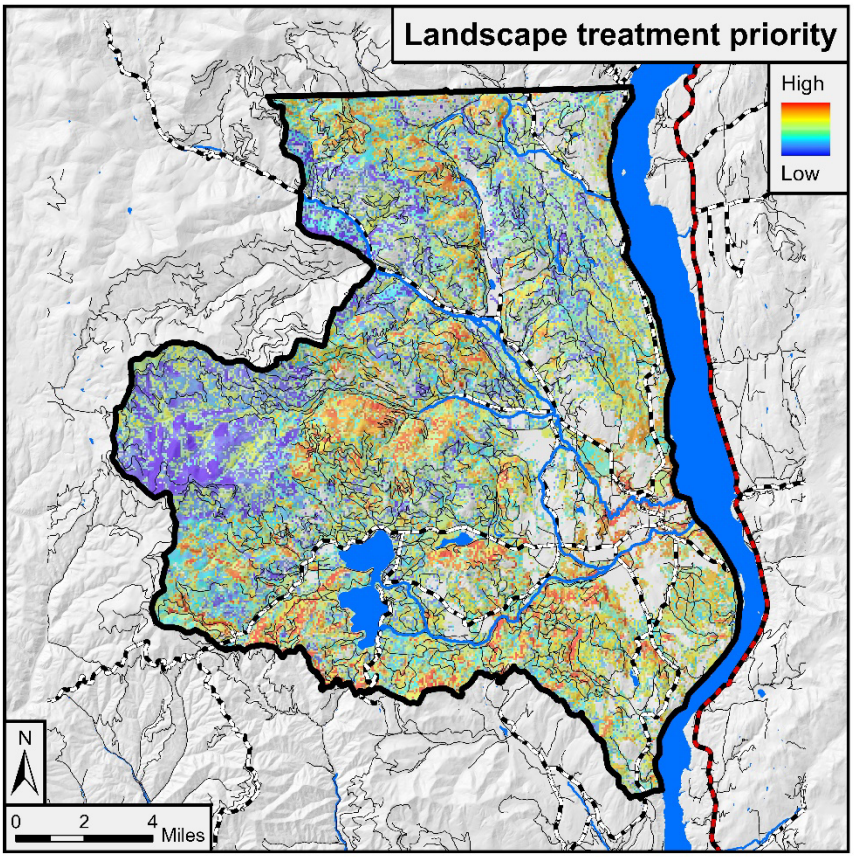


Figure 9. Landscape treatment priority is based on three metrics of forest health – forest fire risk (Fig. 1), drought vulnerability (Fig. 3), overabundant forest structure (Fig. 4) – as well as wildfire transmission to homes (Fig. 8).

Definitions

Vegetation Types

Cold forest: Upper elevation mixed-conifer forests with high-severity fires every 80-200+ years.

Dry forest: Ponderosa pine and Douglas-fir dominated forests that historically had surface fires every 5-25 years.

Moist forest: Forests that historically had mixed-severity fires every 30-100 years and were composed of fire-resistant (western larch, Douglas-fir) and fire-intolerant (grand fir) trees.

Woodland/Steppe: Grass and shrub lands that may have oak woodlands or ≤ 10% conifer cover.

Forest structure

Large tree: Overstory diameter > 20 inches.

Medium tree: Overstory diameter 10-20 inches.

Small tree: Overstory diameter < 10 inches.

Dense canopy: Greater than 40% tree canopy.

Open canopy: Less than 40% tree canopy.

***Fuels*:** Shrubs, grasses, small trees, litter, duff, and dead wood.

Fuels treatments: some combination of mechanical density reduction (commercial or non-commercial) and surface and ladder fuel reduction (prescribed fire, piling & burning, etc.).

Managed wildfire: where consistent with regulations, naturally ignited fire is managed for multiple goals, including resource benefits, firefighter safety, community protection, and suppression.

Wildfire Response Benefit Prioritization

Dual benefits for forest health and wildfire response

It is necessary to conduct treatments to both improve forest health and reduce fire risk to communities as well as provide conditions where firefighters can safely and efficiently conduct wildfire and prescribed fire operations. The wildfire response benefit metric (WRB; Fig. 10) identifies and prioritizes locations where values at risk that are more likely to be the focus of fire operations (homes, infrastructure, sources of drinking water, and commercially managed lands) coincide with areas likely to transmit wildfire to homes and generate severe fire behavior. Because there are positive feedbacks between healthy, resilient forests and safe, effective fire operations, the WRB metric also integrates the landscape treatment priority map (Fig. 9).

Where WRB is highest, actions may be needed to create and maintain conditions that provide a tactical advantage for fire operations. These actions will vary with the local context and can include landscape-level forest health and fuel treatments, treatments along fire control lines and escape routes, resident and community fire mitigation activities (e.g. defensible space, home hardening), and improving signage and road conditions. The WRB metric provides a high-level prioritization, and additional work at the local level is required to identify appropriate actions and assess their feasibility. WRB is useful for prioritizing Potential Control Lines (PCLs) for fire operations (Fig. 11). PCLs are a part of Potential Operational Delineations (PODs); see page 7.

In the Inchelium planning area, wildfire response benefit is highest in pockets throughout the eastern half (Fig. 10). High WRB values are associated with high risk to people and property and commercially managed lands, as well as relatively high wildfire transmission around the community of Inchelium (Fig. 8).

Definitions (continued)

Wildfire response benefit: Any tactical advantage gained for wildfire response activities from actions on the landscape, including, but not restricted to, identifying and consolidating existing anchor points and control lines and reduction of potential fire behavior. Wildfire response benefit is not restricted to any specific wildfire management strategy and instead is centered on conditions that improve fire operations safety and effectiveness.

Potential Control Lines (PCLs): Boundaries of Potential Operational Delineations (PODs) relevant to fire control operations (e.g. roads, ridgetops, and water bodies).

Potential Operational Delineations (PODs) for wildland fire: Landscape containers whose boundaries are potential control lines (PCLs). PODs are useful for planning strategic response to unplanned ignitions, strategic fuel planning, and prioritizing fuel treatments within PODs.

Commercially managed lands: Commercially managed forestlands include: DNR Trustlands, Tribal forests, industrial forests, non-industrial private forests, and US Forest Service forests where timber is a primary management objective.

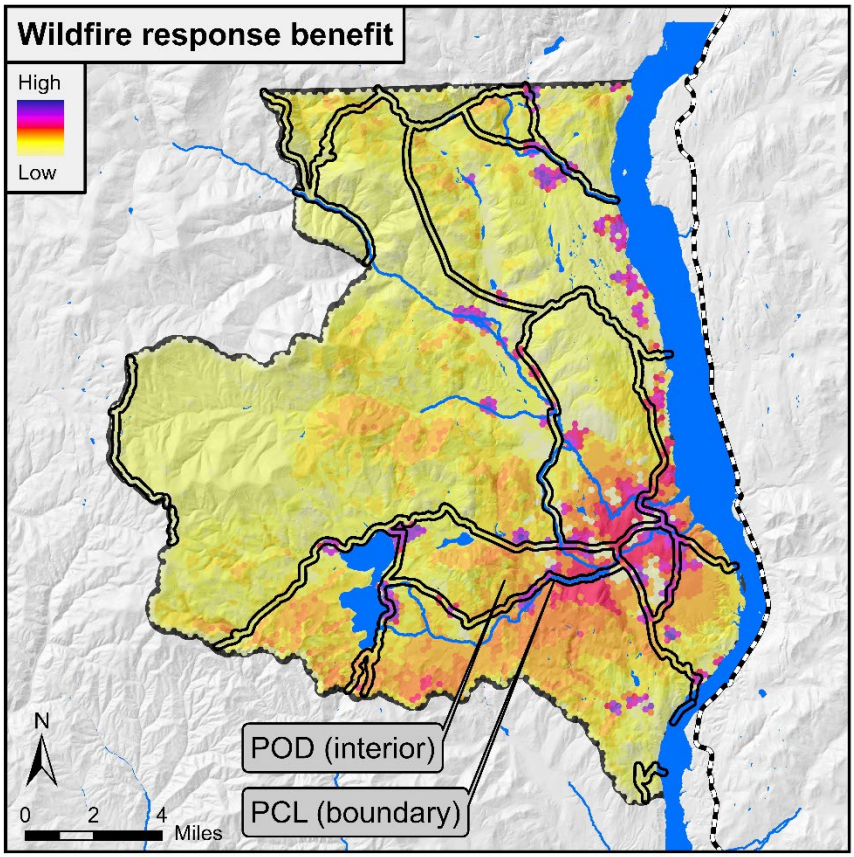


Figure 10. Wildfire response benefit (WRB) integrates multiple fire risk and forest health components. It includes four fire risk metrics representing highly valued resources – risk to homes, infrastructure, drinking water, commercially managed lands – and wildfire transmission to homes (Fig. 8). Combined, these account for 75% of the wildfire response benefit. Landscape treatment priority (Fig. 9) accounts for the remaining 25%. Also shown are PODs: units bounded by PCLs (open black lines). One use of the WRB metric is to prioritize Potential Control Lines (PCLs) for fire operations (Fig. 11).

Prioritizing Landscape Treatments for Dual Benefits

Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for wildfire and prescribed fire operations, delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and managers to identify, at a high level, locations where forest health or fuels treatments can be connected to a high-priority PCL that will support firefighter operations (e.g. ingress/egress route or opportunity for engagement).

Achieving forest health and wildfire response goals will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs.

There is important work to do in all Inchelium PODs to achieve the forest health treatment targets in Table 1. First-priority PODs correspond to areas with moderate to high landscape treatment priority (Fig. 9) in western and southern parts of the planning area (Fig. 11). Most of the first-priority PODs are associated with first-priority PCLs, enhancing opportunities for dual benefit treatments. Further work is needed to assess PCLs locally for their condition and detailed treatment needs, which will depend on management goals and values at risk. Ideally, landscape treatments will be implemented adjacent to priority PCLs where feasible to maximize both forest health and wildfire response goals.

Achieving forest health and wildfire response dual benefits will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs. These two approaches combined will contribute to restoring and maintaining large portions of the landscape in a resilient condition while providing safe and effective areas for firefighter engagement during suppression, prescribed fire, or managed wildfire operations.

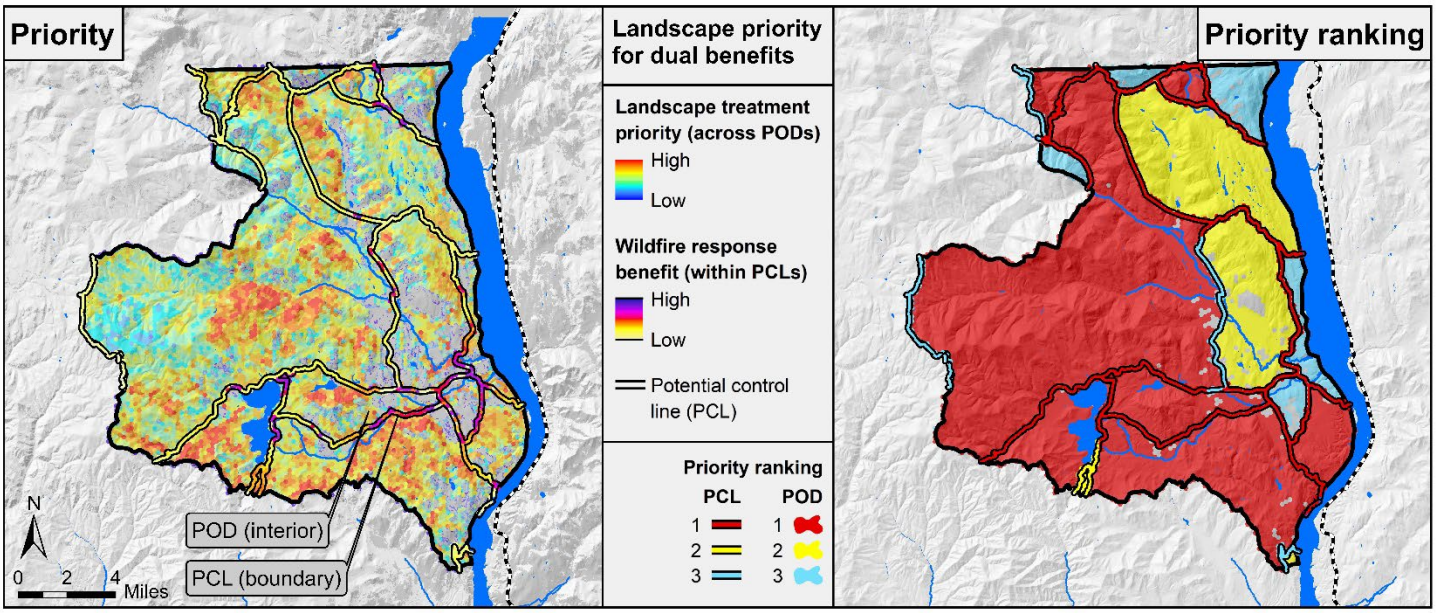


Figure 11. Landscape prioritization of dual benefits using PODs as a spatial framework to summarize treatment priorities. Both maps display landscape treatment priority within PODs and wildfire response benefit within PCLs. The map on the left shows the datasets at the raster level, while the map on the right shows the same information summarized and ranked within PODs and PCLs. PCL width is inflated to display spatial patterns. *PODs shown here are part of an ongoing process towards an all-lands delineation; POD boundaries are subject to change following on-the-ground vetting and continued dialogue among wildfire agencies and stakeholders.*

LOOMIS PLANNING AREA
LANDSCAPE EVALUATION SUMMARY (2024)

Total Acres	Forested Acres	Treatment Goal (Acres)
198,991	170,701	38,000 - 55,250

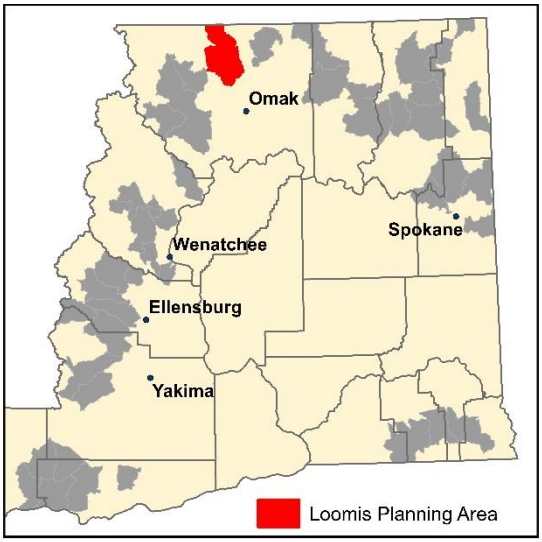


Figure 1. Planning area location in eastern WA.

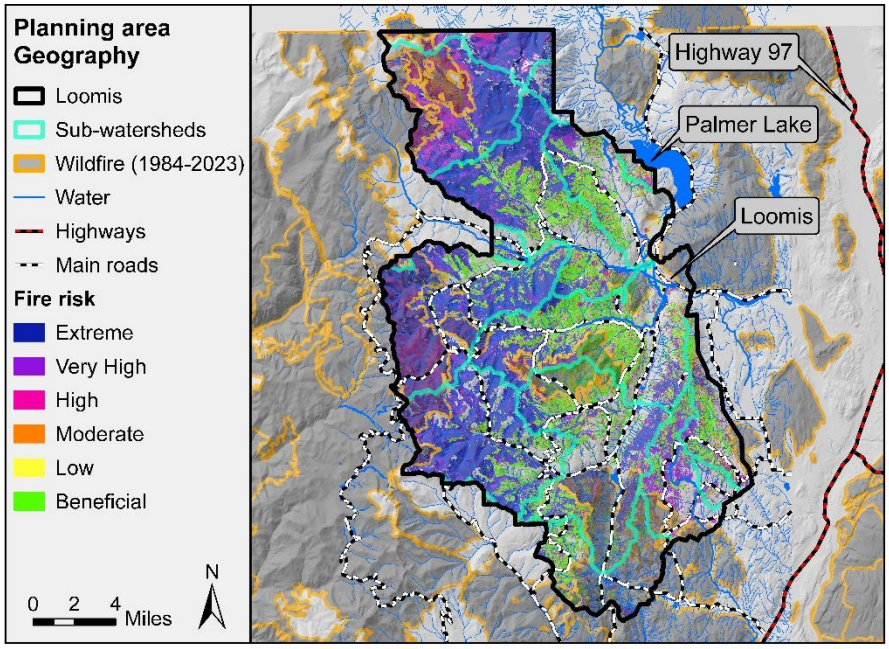


Figure 2. Planning area geography and fire risk, which integrates burn probability, fire intensity, and fire susceptibility of forests, infrastructure, and homes.

Planning Area Highlights

- The Loomis State Forest occupies 68% of this planning area, with 54% in DNR-managed Trustlands and 14% in DNR-Natural Resources Conservation Area or DNR-Natural Area Preserve (NRCA/NAP). Small-private landowners (14%), the US Forest Service (10%), and WA Department of Fish and Wildlife (4%) comprise the remainder.
- Fire risk is highest in the western and northern portions of the planning area. The eastern portion has lower risk, except for private land where risk to homes is high. Burn probability is very high in most of the planning area.
- Much of the existing moist and cold forests are projected to shift towards climate conditions that support dry forest.
- Treating 22-32% of forested acres is recommended to increase resilience to wildfire and drought and reduce fire risk to timberlands and communities using a combination of mechanical and prescribed fire treatments.
- High-priority locations for potential treatments that maximize forest health and wildfire response benefit are concentrated in southeast and central portions of the planning area on private, DNR, and WDFW land. Moderate-priority locations occur across much of the planning area.
- Increasing landscape resilience to wildfire and future climate while meeting the needs and requirements of the Loomis State Forest management plan and DNR Trust land obligations will require ongoing analysis and adaptive management.

LEARN MORE

This landscape evaluation was completed in 2024.
For more details about DNR's priority planning areas please see: **https://www.dnr.wa.gov/ForestHealthPlan**
For data products and methods see: **https://bit.ly/ForestHealthData**

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Overarching Goals

Reduce wildfire risk and protect communities

Predicted burn probability is very high (4-7% annual probability) in most of the planning area. Burn probabilities are based on the extensive fire that has occurred to the west and south of the planning area from 1992-2021. Fire risk is high to extreme in the western and northern portions of the planning area (Fig. 2), where fuel loading and burn probability are high. Areas that burned in the 2006 Tripod Fire along the western edge of the planning area now have dense, young forests with relatively high risk. Reducing tree density and surface fuels in a portion of mid- to high-elevation forests will reduce the likelihood of a large, high-severity fire. The lower-elevation, eastern portion has low fire risk due to different fuel types, past treatments, and greater likelihood of suppression, which has kept past fires small within the planning area and to the east. However, fire risk is high on private land with homes. Implementing treatments around homes and maintaining potential control lines will increase firefighter safety and help protect private property.

Increase resilience and prepare for climate change

By mid-century, most of the areas that currently support moist and cold forest are projected to have moisture stress levels currently associated with dry forest (Fig. 3). Treatments that reduce density and favor drought-tolerant species will reduce vulnerability to drought and are especially important on south-facing slopes and areas with droughty soils in the eastern portion. North-facing slopes and higher elevation areas in the western half are projected to still support moist and cold forest.

Sustain wildlife habitat

Habitat for species that depend on dry forest with large trees and open canopies (e.g. White-Headed Woodpecker) is abundant in the eastern half, but patch sizes are generally small. Managing for open-canopy forests with large and medium ponderosa pine will increase this habitat type. Habitat for species that depend on dry to moist, closed-canopy forest with large trees (e.g. Northern Goshawk) occurs in the central portion. Habitat for cold forest, large-tree, closed-canopy species (e.g. American Marten) is moderately abundant on north-facing slopes at mid-to-high elevations that did not burn in the Tripod Fire. Significant blocks of habitat for Canada lynx exist on the Loomis State Forest. The mosaic of high-quality denning and foraging habitat, as well as connectivity for travel, is rare in North-Central Washington due to multiple extensive high-severity fires to the north, west, and south. Sustaining Lynx habitat in the face of warming temperatures will require increasing resilience to wildfire and drought.

Enhance rural economic development

Management on the Loomis State Forest provides significant wood volume, revenue, and employment to communities in Northeast Washington. Revenue produced on the Loomis also helps fund forest health treatments. Although warming trends will necessitate managing for lower densities and fuel loads, as well as drought-tolerant species, on current and future dry sites, long-term timber production will likely be possible at mid-to-upper elevations, especially on more productive soils. Lower elevations may not support forests.

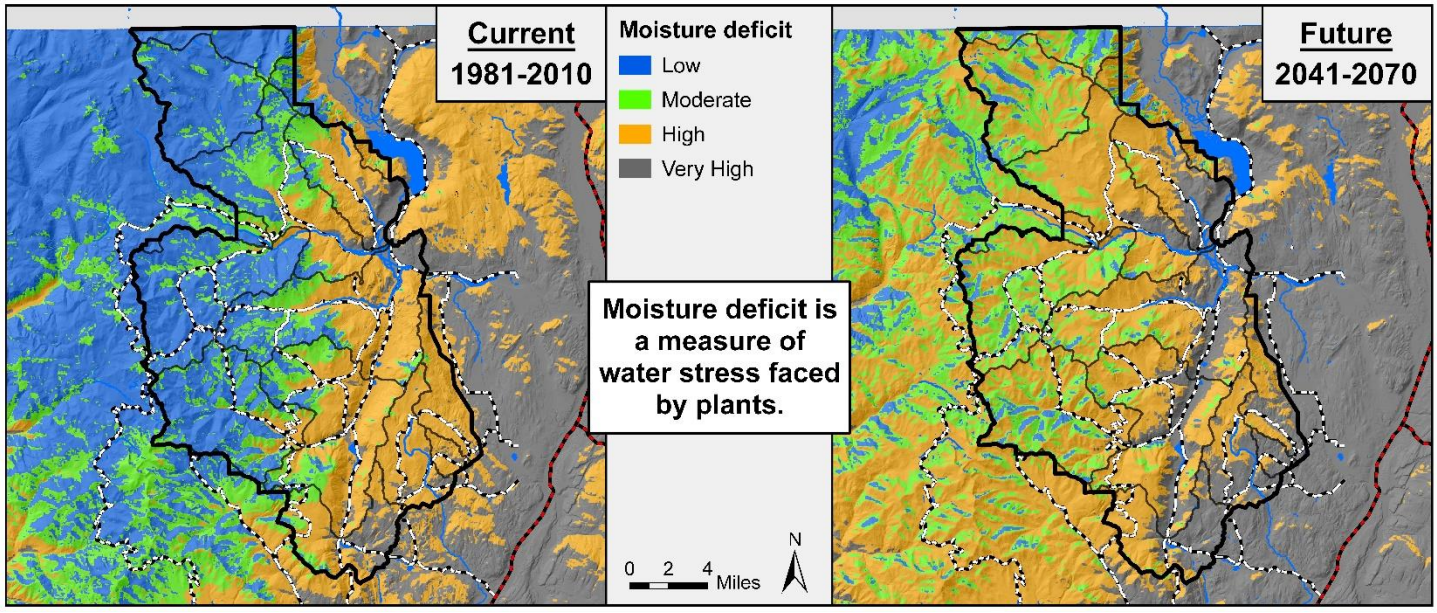


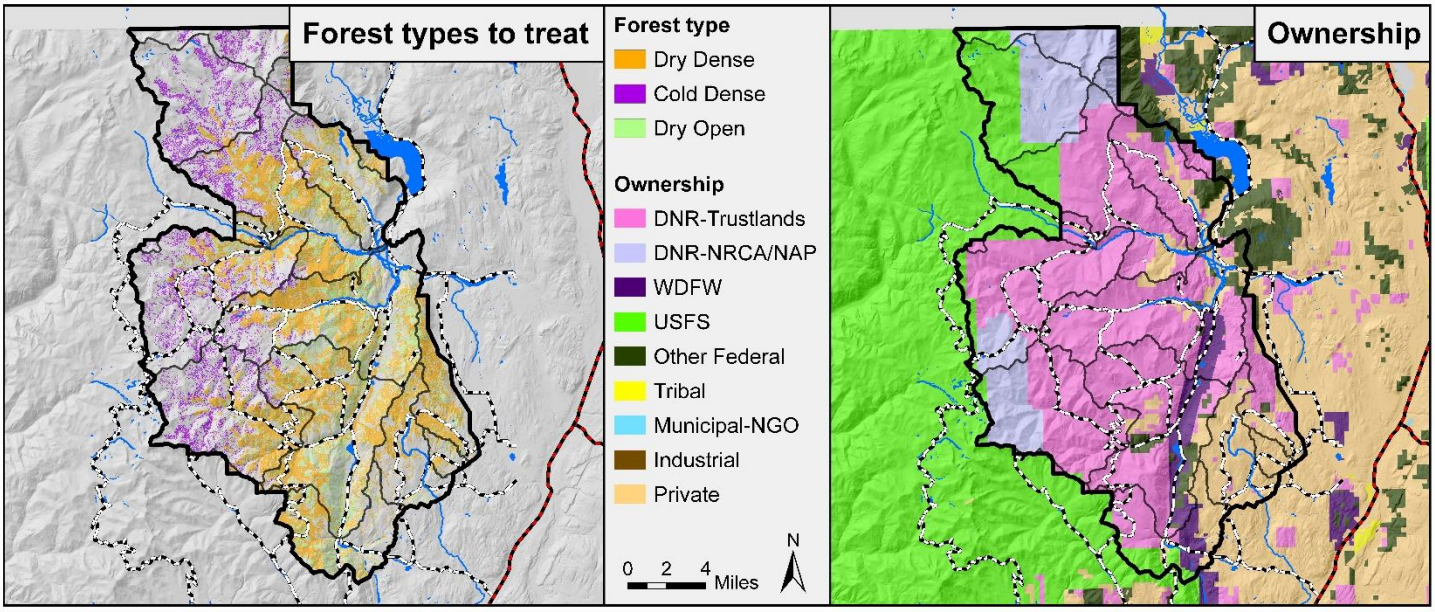
Figure 3. Current (left) and future (right) moisture stress levels based on water balance deficit. Low levels are associated with moist and cold forests, moderate with dry and moist forests, high with dry forests, and very high with woodland and shrub-steppe. Future climate is based on relatively high greenhouse gas emissions scenario (RCP 8.5).

Forest Health Treatment Needs

Treating 38,000 to 55,250 acres is recommended to move the landscape into a resilient condition (22-32% of forested acres; Table 1). This total includes an estimated 11,250-12,750 acres of density and fuels reduction in small-tree forest; 17,750-29,000 acres of density and fuels reduction in medium- and large-tree forest; and 9,000-13,500 acres of maintenance in open forest. These estimates are based on forest structure data derived from 2023 stereo aerial imagery. Treatment needs in dry forests exist on DNR-Trustlands and private land, with moist and cold forest needs on DNR-Trustlands, DNR-NRCA/NAP, and USFS land. Meeting this target range will require multiple treatment types (Table 1). Treatment type will depend on access, costs, markets, and other considerations. Individual landowners will determine how to achieve landscape goals while meeting their own objectives and regulatory requirements, including guidelines and constraints of the Loomis State Forest management plan for DNR managed lands. Wildfire may accomplish some of the treatment need over time but may also have negative forest health effects. DNR is required to suppress wildfires on state and private land under current state regulations.

Table 1. Summary of forest health treatment needs. ***See methods for details on how the treatment need range is derived.***

Forest conditions to treat		Treatment need (footprint acres)	Current acres by major landowner*				
Type	**Size class**		**DNR-Trustland**	**Private**	**DNR-NRCA/NAP**	**USFS**	**WDFW**
Dry Dense	Small	11,250 - 12,750	7,472	2,936	251	257	771
	Medium-Large	13,750 - 22,500	29,490	5,108	555	1316	974
Moist + Cold Dense	Medium-Large	4,000 - 6,500	6,760	0	5,266	2,963	0
Dry + Moist Open	Medium-Large	9,000 - 13,500	13,345	1790	86	653	1214
Total		**38,000 - 55,250**	*These are current acres, not targets				
Anticipated treatment type		Noncommercial thin + fuels treatment. May be prescribed fire or low/mod-severity wildfire.					
		Commercial thin plus fuels treatment if access exists. May be noncommercial, regeneration treatment, or fire only (prescribed fire or low/moderate-severity wildfire).					
		Maintenance treatment: mechanical thinning and fuels reduction, Rx fire, or low/moderate-severity wildfire. *Targets correspond to 50-75% of dry open and 25-50% of moist open forests.*					



Left: Figure 4. Forest structure types that are overabundant relative to targets for a resilient landscape, as well as potential maintenance treatments. Only a portion of the areas shown need to be treated. Right: Figure 5. Current land ownership.

Forest Health Treatment Needs (continued)

Dry dense forest treatment need

Medium-tree, dense forest structure (>40% canopy cover) is over-represented on dry sites and occurs in large patches (Fig. 4). Large-tree forest with >60% canopy cover is also over-represented. Reducing density and fuels across 13,750-22,500 acres (Table 1) is recommended to create larger patches (~100-1000+ ac) of medium- and large-tree open forest and shift the majority of dry sites to open forest (Fig. 6). Compared to most other planning areas, however, treatment need is low due to past management and wildfires. In addition, small-tree dense forests are over-represented. Non-commercial thinning and fuel-reduction on 11,250-12,750 acres is recommended to increase resistance to drought, insects, and fire by reducing competition and shifting species composition towards resilient species. Additional acres may need treatment as young trees grow and canopies close.

Moist and cold dense forest treatment need

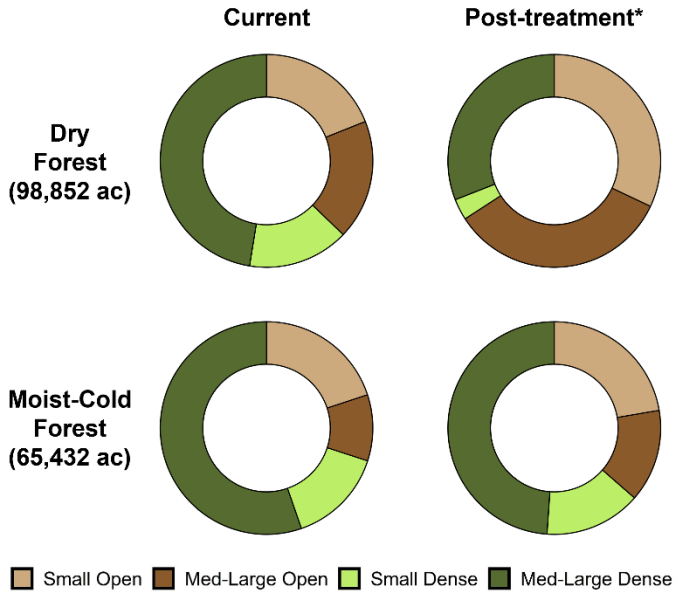
On moist and cold sites, dense mixed-conifer forests dominated by medium trees are modestly over-represented. Treating 4,000-6,500 acres (Table 1, Fig. 4) is recommended to reduce risk of mortality of medium and large trees from future fire and drought. This will enhance the mosaic of open, moderate, and dense patches and reduce risks of large crown fire and insect outbreaks. Increasing the relative composition of western larch, ponderosa pine, and Douglas-fir is also needed, especially on sites projected to shift to dry forest (Fig. 3). If landscape treatment targets are achieved, >60% of the total moist and cold forest area will remain dense (Fig. 6) to meet habitat, wood production, and other objectives. Although not currently over-represented relative to historical ranges, small-tree forest on sites that are projected to shift to dry forest (Fig. 3) may warrant density and fuel reduction in some areas to shift species composition and adapt to a warming climate. It is challenging to balance objectives to enhance resilience to future climate and fire and to sustain sufficient lynx foraging habitat.

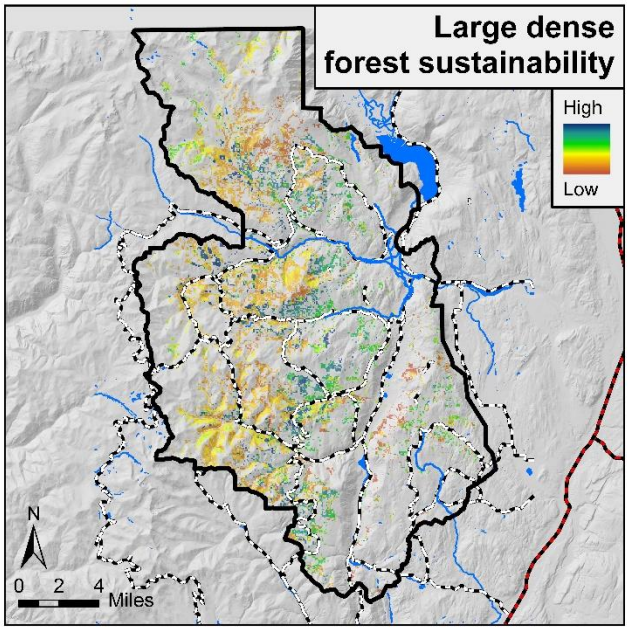
Open forest maintenance treatment need

Over the next 15 years, an estimated 9,000-13,500 acres of currently open forests on dry and moist sites will need maintenance treatments. These sites are mostly areas that have been treated. Maintenance treatments include non-commercial thinning, mechanical fuel reduction, or prescribed fire. Specific maintenance strategies will depend on landowner objectives and time since treatment. Wildfires can also maintain low densities and surface fuels.

Sustainable locations for dense forest with large trees

Locations with low to moderate current and future moisture deficits (Fig. 3) and low fire risk (Fig. 2) offer the most sustainable locations to maintain sufficient area and patch sizes of large tree, dense forest. These locations are concentrated in the central portion (Fig. 7). This sustainability map can be used in conjunction with treatment priority (Fig. 9) to select areas to shift to open forest vs. where to most effectively maintain this habitat type.





Left: Figure 6. Current and post-treatment proportions of forest types and structure classes. * mid-point of range in Table 1.
Right: Figure 7. Sustainability of current and potential large tree, dense forest based on fire risk and drought vulnerability.

Landscape Treatment Prioritization

Prioritizing for forest health & to reduce fire exposure of homes

Landscape treatment priority integrates three metrics of forest health – forest fire risk (Fig. 2), drought vulnerability (Fig. 3), and presence of overabundant forest structure types (Fig. 4) – with wildfire transmission to homes (Fig. 8). We also recommend incorporating the large dense forest sustainability layer (Fig. 7) as an overlay when selecting treatment locations. Wildfire transmission is moderate to very high in the eastern portion, indicating that wildfires starting in these locations are predicted to expose homes in and around the Loomis community (Fig. 2).

Treatment priorities

High-priority locations for potential treatments that maximize forest health and wildfire response benefit are concentrated in southeastern and central portions of the planning area on private, DNR, and WDFW land (Fig. 5) where wildfire transmission is high. Private land will require a mix of fuel reduction and defensible space treatments, as well as home hardening, to reduce forest fire risk and protect homes. Moderate-priority locations occur across much of the planning area (Fig 9) where high fire risk, projected increases in drought stress, and overabundant dense forests occur. Low-priority areas may need treatment to address species composition, insect and disease risk, or other issues.

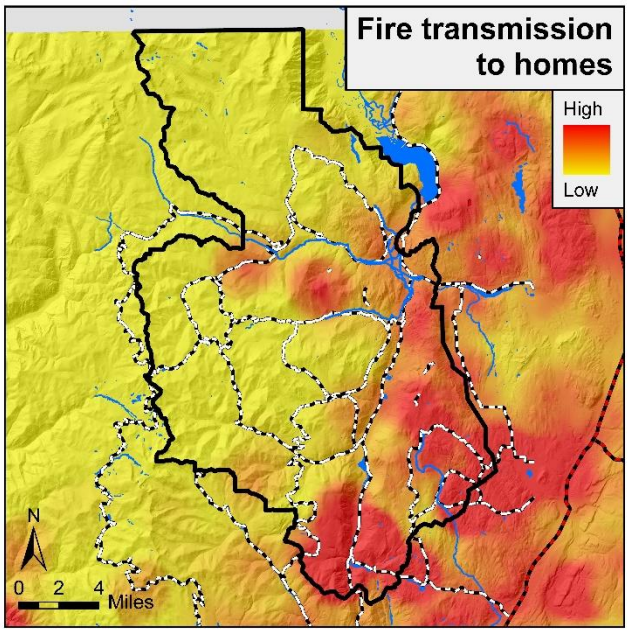


Figure 8. Fire transmission to homes shows where fires that expose structures are most likely to originate. It is based on simulated fire perimeters given contemporary patterns of fuels, topography, and wind.

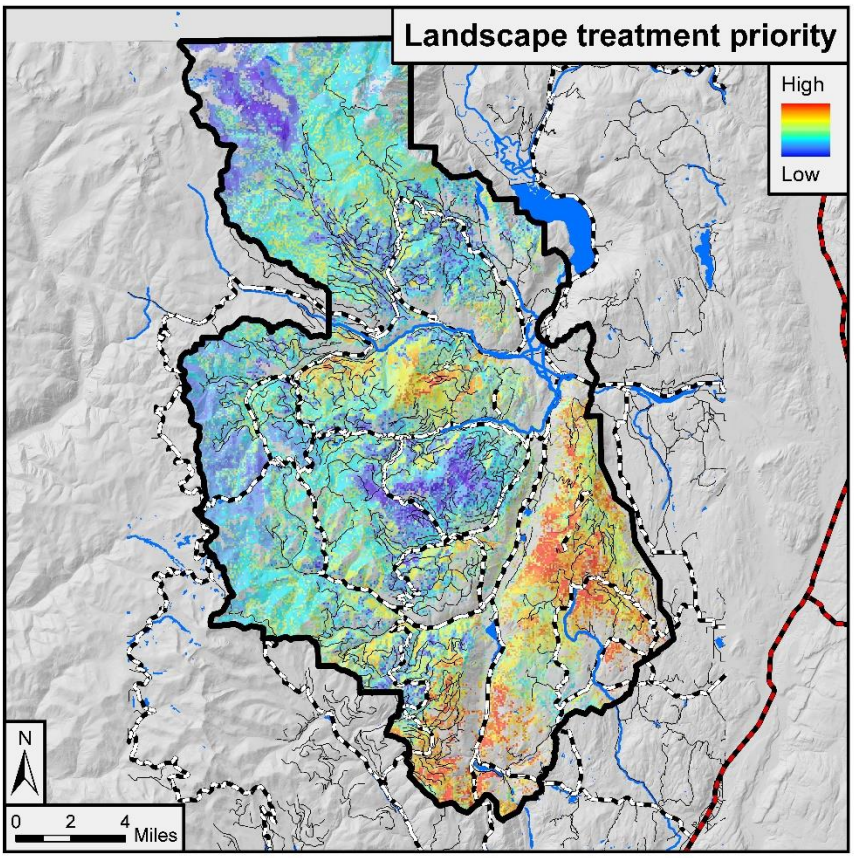


Figure 9. Landscape treatment priority is based on three metrics of forest health – forest fire risk (Fig. 1), drought vulnerability (Fig. 3), overabundant forest structure (Fig. 4) – as well as wildfire transmission to homes (Fig. 8).

Definitions

Vegetation Types

Cold forest: Upper elevation mixed-conifer forests with high-severity fires every 80-200+ years.

Dry forest: Ponderosa pine and Douglas-fir dominated forests that historically had surface fires every 5-25 years.

Moist forest: Forests that historically had mixed-severity fires every 30-100 years and were composed of fire-resistant (western larch, Douglas-fir) and fire-intolerant (Engelman spruce) trees.

Woodland/Steppe: Grass and shrub lands that may have oak woodlands or ≤ 10% conifer cover.

Forest structure

Large tree: Overstory diameter > 20 inches.

Medium tree: Overstory diameter 10-20 inches.

Small tree: Overstory diameter < 10 inches.

Dense canopy: Greater than 40% tree canopy.

Open canopy: Less than 40% tree canopy.

***Fuels*:** Shrubs, grasses, small trees, litter, duff, and dead wood.

Fuels treatments: some combination of mechanical density reduction (commercial or non-commercial) and surface and ladder fuel reduction (prescribed fire, piling & burning, etc.).

Managed wildfire: where consistent with regulations, naturally ignited fire is managed for multiple goals, including resource benefits, firefighter safety, community protection, and suppression.

Wildfire Response Benefit Prioritization

Dual benefits for forest health and wildfire response

It is necessary to conduct treatments to both improve forest health and reduce fire risk to communities as well as provide conditions where firefighters can safely and efficiently conduct wildfire and prescribed fire operations. The wildfire response benefit metric (WRB; Fig. 10) identifies and prioritizes locations where values at risk that are more likely to be the focus of fire operations (homes, infrastructure, sources of drinking water, and commercially managed lands) coincide with areas likely to transmit wildfire to homes and generate severe fire behavior. Because there are positive feedbacks between healthy, resilient forests and safe, effective fire operations, the WRB metric also integrates the landscape treatment priority map (Fig. 9).

Where WRB is highest, actions may be needed to create and maintain conditions that provide a tactical advantage for fire operations. These actions will vary with the local context and can include landscape-level forest health and fuel treatments, treatments along fire control lines and escape routes, resident and community fire mitigation activities (e.g. defensible space, home hardening), and improving signage and road conditions. The WRB metric provides a high-level prioritization, and additional work at the local level is required to identify appropriate actions and assess their feasibility. WRB is useful for prioritizing Potential Control Lines (PCLs) for fire operations (Fig. 11). PCLs are a part of Potential Operational Delineations (PODs); see page 7.

In the Loomis planning area, wildfire response benefit is moderate to high in the southeastern portion (Fig. 10) due to high risk to people and property and associated higher wildfire transmission to homes (Fig. 8). Additional pockets of high wildfire response benefit occur west of Loomis (Fig. 2), with generally lower WRB values across the rest of the planning area.

Definitions (continued)

Wildfire response benefit: Any tactical advantage gained for wildfire response activities from actions on the landscape, including, but not restricted to, identifying and consolidating existing anchor points and control lines and reduction of potential fire behavior. Wildfire response benefit is not restricted to any specific wildfire management strategy and instead is centered on conditions that improve fire operations safety and effectiveness.

Potential Control Lines (PCLs): Boundaries of Potential Operational Delineations (PODs) relevant to fire control operations (e.g. roads, ridgetops, and water bodies).

Potential Operational Delineations (PODs) for wildland fire: Landscape containers whose boundaries are potential control lines (PCLs). PODs are useful for planning strategic response to unplanned ignitions, strategic fuel planning, and prioritizing fuel treatments within PODs.

Commercially managed lands: Commercially managed forestlands include: DNR Trust lands, Tribal forests, industrial forests, non-industrial private forests, and US Forest Service forests where timber is a primary management objective.

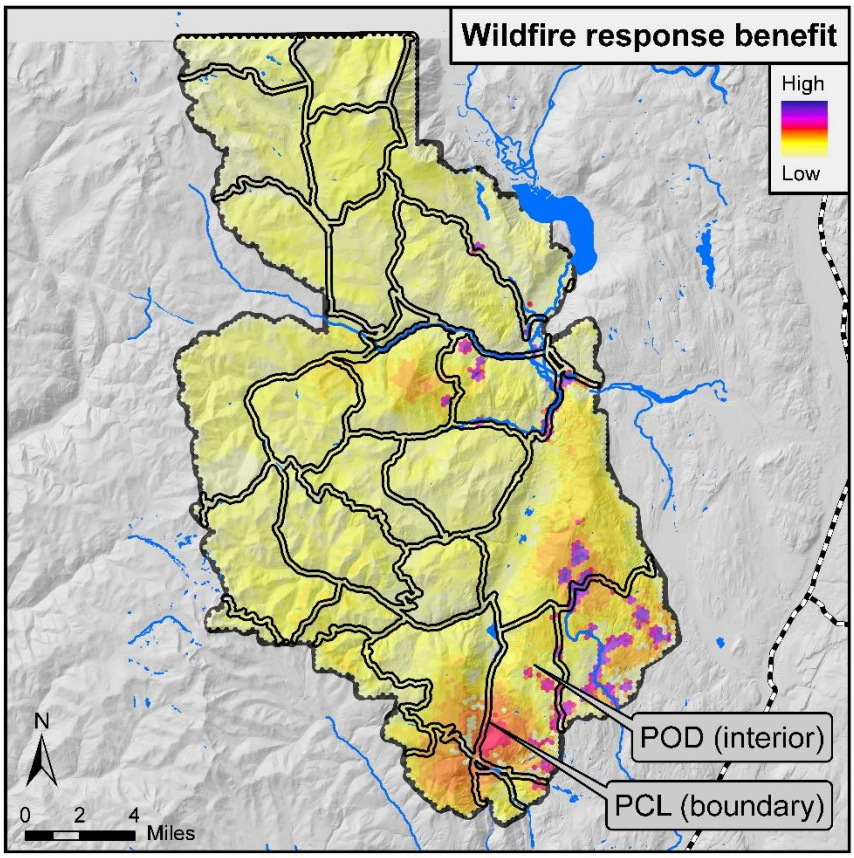


Figure 10. Wildfire response benefit (WRB) integrates multiple fire risk and forest health components. It includes four fire risk metrics representing highly valued resources – risk to homes, infrastructure, drinking water, commercially managed lands – and wildfire transmission to homes (Fig. 8). Combined, these account for 75% of the wildfire response benefit. Landscape treatment priority (Fig. 9) accounts for the remaining 25%. Also shown are PODs: units bounded by PCLs (open black lines). One use of the WRB metric is to prioritize Potential Control Lines (PCLs) for fire operations (Fig. 11).

Prioritizing Landscape Treatments for Dual Benefits

Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for wildfire and prescribed fire operations, delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and managers to identify, at a high level, locations where forest health or fuels treatments can be connected to a high-priority PCL that will support firefighter operations (e.g. ingress/egress route or opportunity for engagement).

Achieving forest health and wildfire response goals will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs.

There is important work to do in all Loomis PODs to achieve the forest health treatment targets in Table 1. First-priority PODs correspond to areas with moderate to high landscape treatment priority (Fig. 9) throughout the planning area (Fig. 11). Most of the first-priority PODs are associated with first- and second-priority PCLs, enhancing opportunities for dual benefit treatments. Additional first-priority PCLs occur around the community of Loomis. Further work is needed to assess PCLs locally for their condition and detailed treatment needs, which will depend on management goals and values at risk. Ideally, landscape treatments will be implemented adjacent to priority PCLs where feasible to maximize both forest health and wildfire response goals.

Achieving forest health and wildfire response dual benefits will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs. These two approaches combined will contribute to restoring and maintaining large portions of the landscape in a resilient condition while providing safe and effective areas for firefighter engagement during suppression, prescribed fire, or managed wildfire operations. Landowners will determine how to achieve dual benefit goals while meeting regulatory requirements, including guidelines and constraints of the Loomis State Forest management plan.

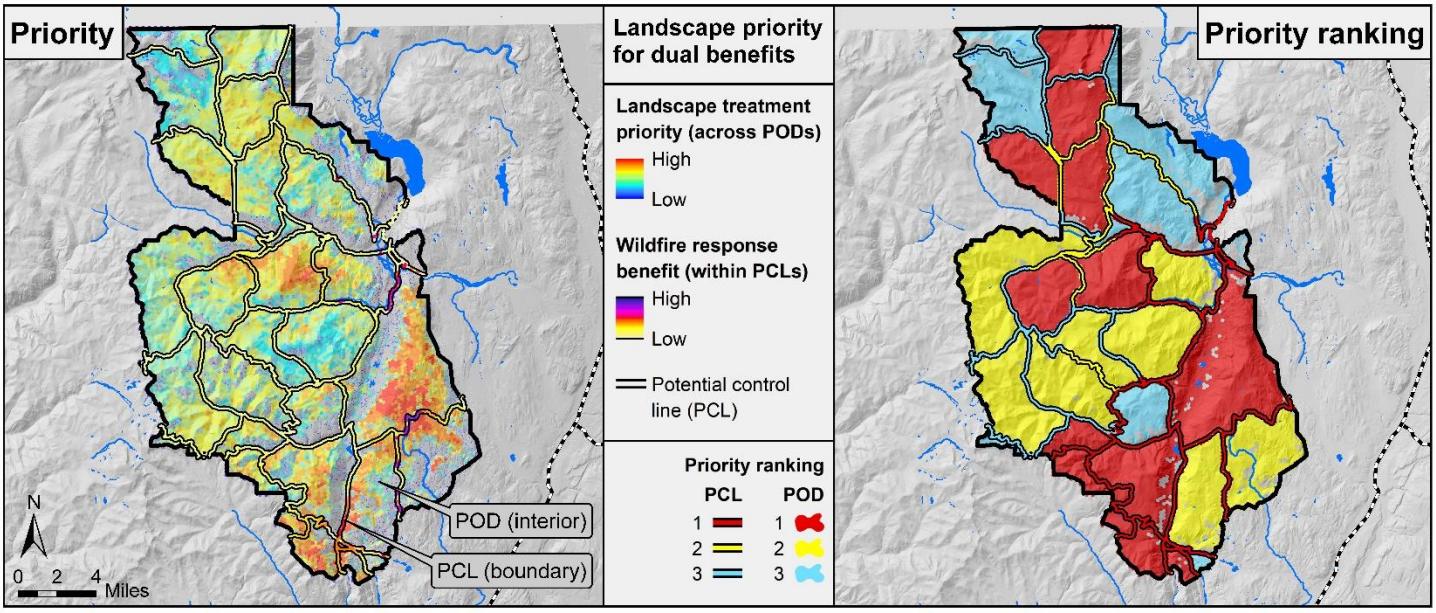


Figure 11. Landscape prioritization of dual benefits using PODs as a spatial framework to summarize treatment priorities. Both maps display landscape treatment priority within PODs and wildfire response benefit within PCLs. The map on the left shows the datasets at the raster level, while the map on the right shows the same information summarized and ranked within PODs and PCLs. PCL width is inflated to display spatial patterns. *PODs shown here are part of an ongoing process towards an all-lands delineation; POD boundaries are subject to change following on-the-ground vetting and continued dialogue among wildfire agencies and stakeholders.*

MEADOW PLANNING AREA
LANDSCAPE EVALUATION SUMMARY (2024)

Total Acres	Forested Acres	Treatment Goal (Acres)
60,215	59,047	22,850 - 29,800

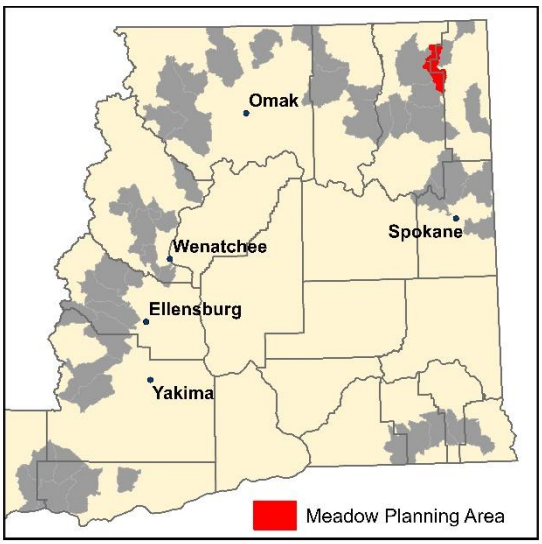


Figure 1. Planning area location in eastern WA.

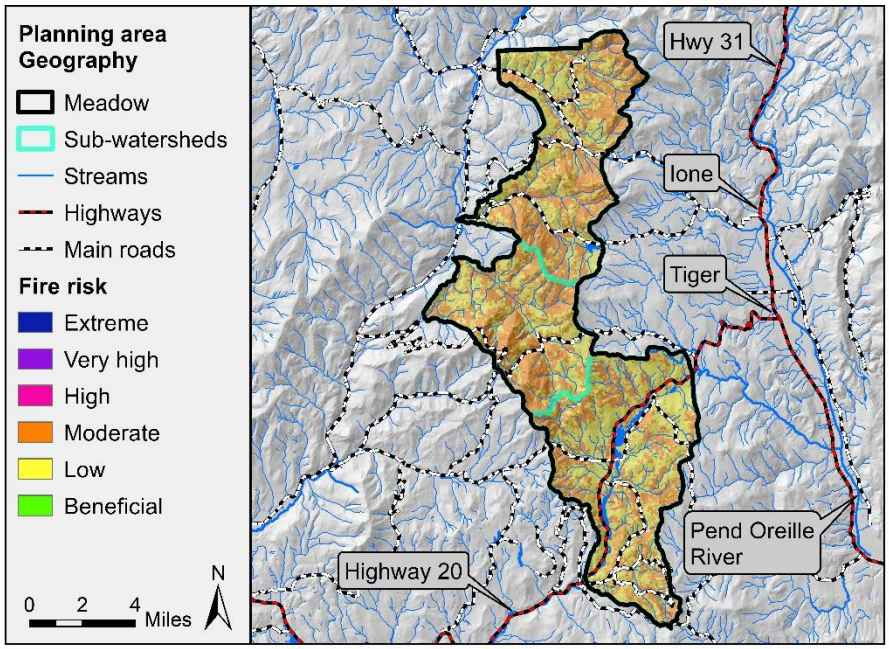


Figure 2. Planning area geography and fire risk, which integrates burn probability, fire intensity, and fire susceptibility of forests, infrastructure, and homes.

Planning Area Highlights

- Ownership is Colville National Forest (73%), DNR-Trustlands (19%), small-private (8%), and other ownerships (<1%).
- Fire probability and risk is moderate throughout most of the planning area, with areas of lower risk interspersed. Burn probability is increasing in northeast Washington due to warming temperatures, which is elevating risk.
- Much of the existing moist forests are projected to shift towards climate conditions that support dry forest.
- Treating 39-50% of forested acres is recommended to increase resilience and reduce fire risk to communities using a combination of mechanical and prescribed fire treatments.
- Treatment-priority is highest in the central and southern portions, with moderate-priority areas scattered throughout.
- The Colville National Forest (CNF) is planning a large landscape restoration project in this planning area. Data developed for this Landscape Evaluation was provided to the Colville National Forest in 2022.
- DNR staff and researchers from the USFS Rocky Mountain Research Station are working with local partner organizations, community members, and CNF staff to identify high-priority treatment locations based on a range of values.

LEARN MORE

This landscape evaluation was completed in 2022.
For more details about DNR's priority planning areas please see: **https://www.dnr.wa.gov/ForestHealthPlan**
For data products and methods see: **https://bit.ly/ForestHealthData**

CONTACT

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Forest Health Strategic Plan Coordinator
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Overarching Goals

Reduce wildfire risk and protect communities

Although fuel loads are moderate to high across most of the planning area, fire risk to forests and homes is moderate to low (Fig. 2) due to low burn probability, which is based on large fires from 1992-2015. If a fire does occur, however, predicted fire intensity is high in most locations. Burn probability is increasing substantially as fire activity increases in NE Washington due to warming trends. Landscape treatments will help reduce the risk of large, high-severity fire and restore conditions conducive to a more characteristic balance of low- and mixed-severity fire with some high-severity patches. Over time, a restored landscape will provide managers more flexibility to utilize wildfire to maintain these fire-dependent ecosystems and thus harness the predicted increase in burn probability. In addition, implementing fuel reduction treatments around homes and establishing potential control line will increase firefighter safety and help protect communities.

Increase resilience and prepare for climate change

By mid-century, the majority of the planning area is projected to shift from climate conditions that currently support moist and cold forest to dry forest (Fig. 3). Dense forests, especially on south-facing slopes and sites with droughty soils, are increasing vulnerable to drought and insect outbreaks. Moist and cold forests are projected to persist on north-facing slopes, valley bottoms, higher elevations, and on sites with more productive soils. Treatments and wildfires that reduce density and favor drought-tolerant species will enhance resistance.

Sustain wildlife habitat

Habitat for species that depend on dry forest with large trees and open canopies (e.g. White-Headed Woodpecker; WHWP) is limited, but significant patches occur in the southern portion around Meadow Lakes. Habitat for species that depend on moist, closed-canopy forest with large trees (e.g. Northern Goshawk) is moderately abundant, with medium to large patches well distributed across the planning area. Opportunities exist to expand WHWP habitat by treating dense forests in locations with high drought vulnerability, which will also lower risk of large crown fires and loss of large tree habitat in all forest types. Habitat for cold forest, large-tree, closed-canopy species (e.g. American Marten) is also moderately abundant and well distributed. Early-seral habitat is relatively scare, except for in the southern portion where recent harvests on DNR-Trustlands have occurred. Meadow habitats have also experienced significant tree encroachment.

Enhance rural economic development

Almost all of the planning area has road access, and most of the areas needing treatment will support commercial treatments. Meeting restoration treatment needs will produce a large amount of forest products and related economic activity. Although warming trends will necessitate managing for more drought-tolerant species and lower densities and fuel loads on current and future dry sites, long-term timber production should be possible where compatible with landowner objectives. Reducing fire risk will help sustain recreation and tourism while reducing the potential of smoke affecting communities.

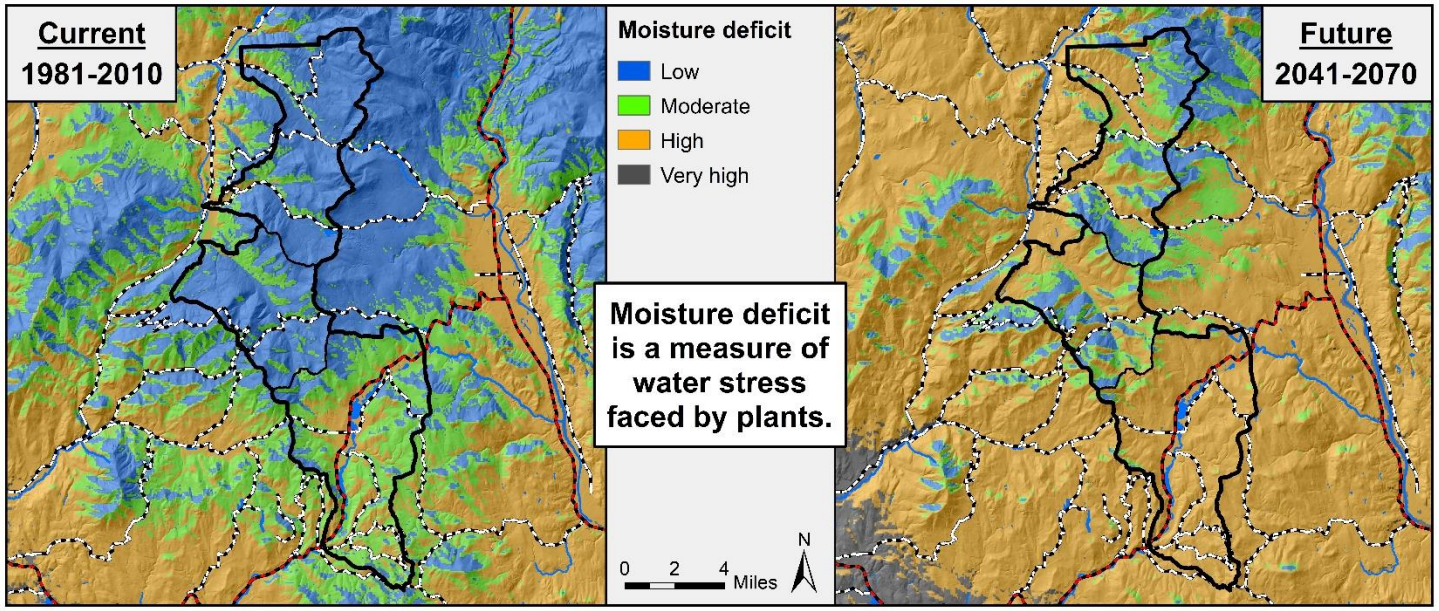


Figure 3. Current (left) and future (right) moisture stress levels based on water balance deficit. Low levels are associated with moist and cold forests, moderate with dry and moist forests, high with dry forests, and very high with woodland and shrub-steppe. Future climate is based on relatively high greenhouse gas emissions scenario (RCP 8.5).

Forest Health Treatment Needs

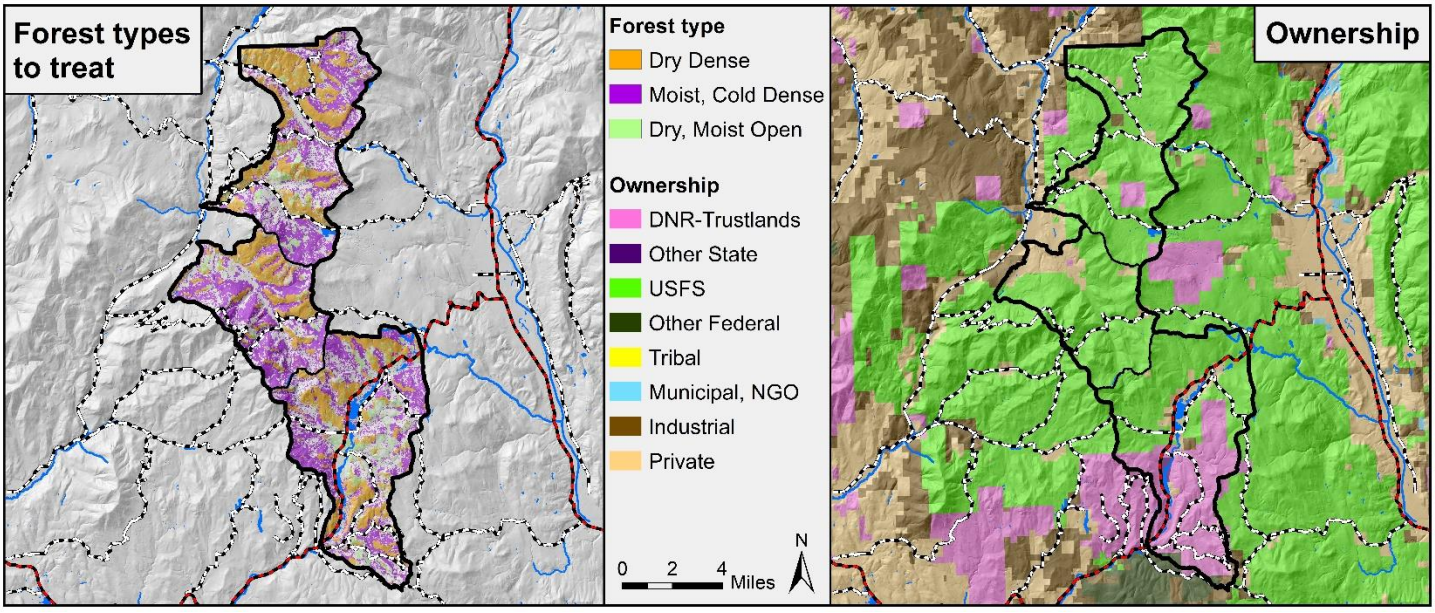
Treating 22,850 to 29,800 acres is recommended to move the landscape into a resilient condition (39-50% of forested acres; Table 1). This total includes an estimated 21,250-27,000 acres to shift dense to open forest and 1,600-2,800 acres of maintenance treatments in existing open forest, based on forest structure data from 2015 and 2016 LiDAR. The majority of treatment need is located on USFS land, but substantial needs exist on DNR-Trustlands and small-private ownerships. Meeting this target range will require multiple treatment types (Table 1).

Most treatments are commercially viable based on tree size. Treatment type, however, will depend on road access, markets, costs, and other considerations. Individual landowners will conduct their own planning to determine how to achieve landscape goals while meeting their objectives and regulatory requirements. Wildfires will likely accomplish some of the treatment need over time but may also have negative forest health effects. Managed wildfire may be an effective treatment option on remote USFS lands under safe conditions and consistent with regulations.

Table 1. Summary of forest health treatment needs. ***See methods for details on how the treatment need range is derived.***

Forest conditions to treat		Treatment need (footprint acres)	Current acres by major landowner*				
Type	**Size class**		**USFS**	**DNR-Trustlands**	**Private**	**Industrial**	**Other**
Dry Dense	Small	50 - 200	463	47	49	4	0
	Medium-Large	11,000 - 13,000	11,269	2,283	1,516	135	125
Moist + Cold Dense	Medium-Large	10,200 - 13,800	17,163	3,580	1,293	135	170
Dry + Moist Open	Medium-Large	1,600 - 2,800	2,341	1,283	556	90	61
Total		**22,850 - 29,800**	*These are current acres, not targets				

Anticipated treatment type	
	Noncommercial thin + fuels treatment. May be prescribed fire or low/mod-severity wildfire.
	Commercial thin plus fuels treatment if access exists. May be noncommercial, regeneration treatment, or fire only (prescribed fire or low/moderate-severity wildfire).
	Maintenance treatment: mechanical thinning and fuels reduction, Rx fire, or low/moderate-severity wildfire. *Targets correspond to 50-75% of dry open and 25-50% of moist open forests.*



Left: Figure 4. Forest structure types that are overabundant relative to targets for a resilient landscape, as well as potential maintenance treatments. Only a portion of the areas shown need to be treated. Right: Figure 5. Current land ownership.

Forest Health Treatment Needs (continued)

Dry dense forest treatment need

Currently, dense forest structure of all size classes is over-represented on dry sites. Medium-tree dense forest is especially overabundant. Patch sizes are large and aggregated. Much of the dry forest is also dominated by Douglas-fir. Due to warming trends, these forests are increasingly vulnerable to large high-severity fires, as well as drought stress and related insect outbreaks. Treating 11,050-13,200 acres of dry dense forest (Table 1) is recommended to create large patches (~100-1000 ac) of open forest and shift the majority of dry sites to open forest (Fig. 6). while retaining the larger trees. As the retained trees grow over time, much of the dry forest will shift to large-tree, open forest, which is currently very low. Shifting composition toward ponderosa pine and western larch is also needed. In places where these species are poorly represented, planting may be needed after gap creation, variable retention harvests, or high-severity fire.

Moist and cold dense forest treatment need

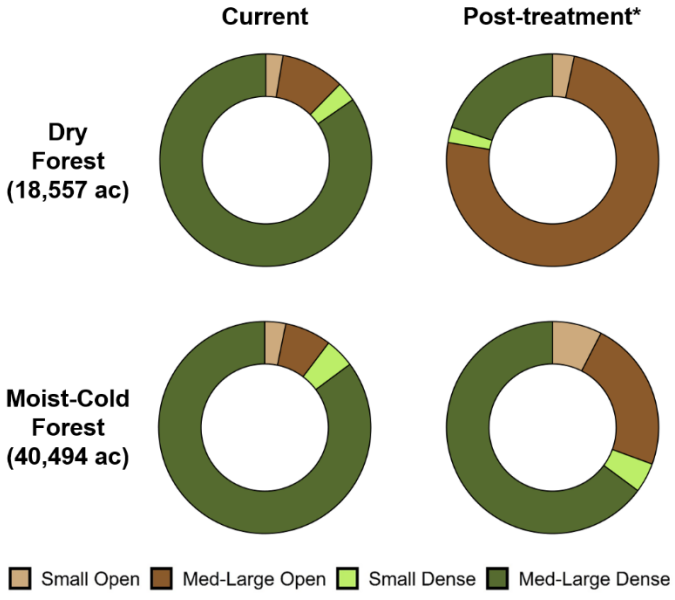
Extensive patches of dense, medium-tree forest exist that significantly exceed desired ranges. This is due to large, high-severity fires in the 1920s and 1930s and subsequent fire suppression. Significant decline of western white pine has occurred due to white pine blister rust, past harvest, and lack of fire. Large-tree, open (0-40%) and moderate canopy cover (40-60%) structures are below desired ranges, as is small open forest. Treating 10,200-13,800 acres of this type (Table 1, Fig. 4) is recommended, especially on sites projected to shift to dry forest (Fig. 3). Increasing the relative composition of western larch, western white pine, Douglas-fir and ponderosa pine is needed. In places where these species are limited, planting may be necessary after treatments or wildfires. A range of treatment types will be needed, including thinning, regeneration treatments, mechanical fuel reduction, and prescribed fire. Treatments will increase the likelihood that wildfires will have beneficial effects. Together, treatments and fire can restore a mosaic of open, moderate, and dense patches with a backbone of large-trees that will be more resilient to high-severity fire and drought. If landscape treatment targets are achieved, over 65% of the total moist and cold forest area will remain dense (Fig. 6) to meet habitat, wood production, and other objectives.

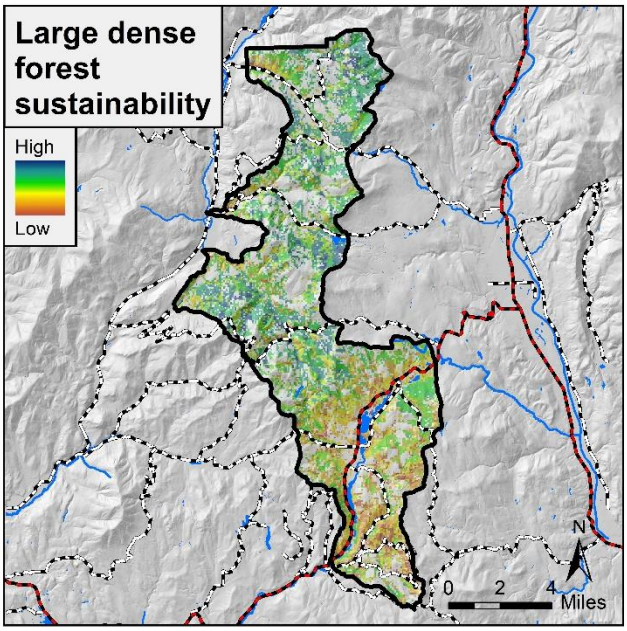
Open forest maintenance treatment need

Over the next 15 years, an estimated 1,600-2,800 acres of currently open forests on dry and moist sites (Fig. 4) will need prescribed fire, mechanical treatments, and/or wildfire to maintain open conditions by reducing surface fuels and small trees. Specific maintenance strategies will depend on landowner objectives, policies, site conditions, and time since treatment.

Sustainable locations for dense forest with large trees

Locations with low to moderate current and future moisture deficits (Fig. 3) and low fire risk (Fig. 2) offer the most sustainable locations to maintain sufficient area and patch sizes of this habitat type and associated ecosystem functions. These locations occur primarily in the northern two-thirds (Fig. 7). This sustainability map can be used in conjunction with treatment priority (Fig. 9) to select areas to shift to open forest vs. where to maintain and increase large-tree, closed-canopy patches.





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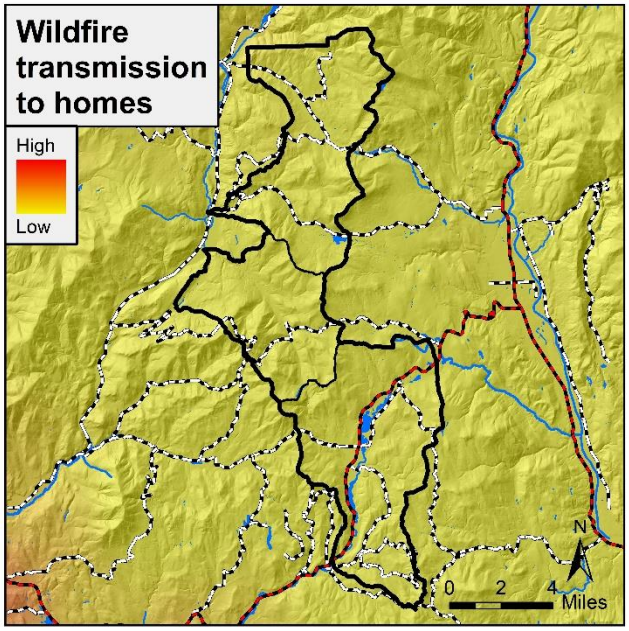
Prioritizing for forest health & to reduce fire exposure of homes

Landscape treatment priority integrates three metrics of forest health – forest fire risk (Fig. 2), drought vulnerability (Fig. 3), and presence of overabundant forest structure types (Fig. 4) – with wildfire transmission to homes (Fig. 8). We also recommend incorporating the large dense forest sustainability layer (Fig. 7) as an overlay when selecting treatment locations. Wildfire transmission is relatively low throughout the planning area due to low density of structures. Risk to homes is still significant, however. Fuel reduction treatments, defensible space, and home hardening are recommended on private parcels with homes.

Treatment priorities

Landscape treatment priority is highest in the central and southern portions, with moderate-priority areas scattered throughout (Fig. 9). Medium-priority areas are present throughout the planning area. Medium- and high-priority areas are concentrated on USFS land, but also occur on private land in the Meadow Lakes area and to a lesser extent on DNR-Trustlands. Some low-priority areas may need treatment to address species composition, insect and disease risk, or to meet other landowner objectives.



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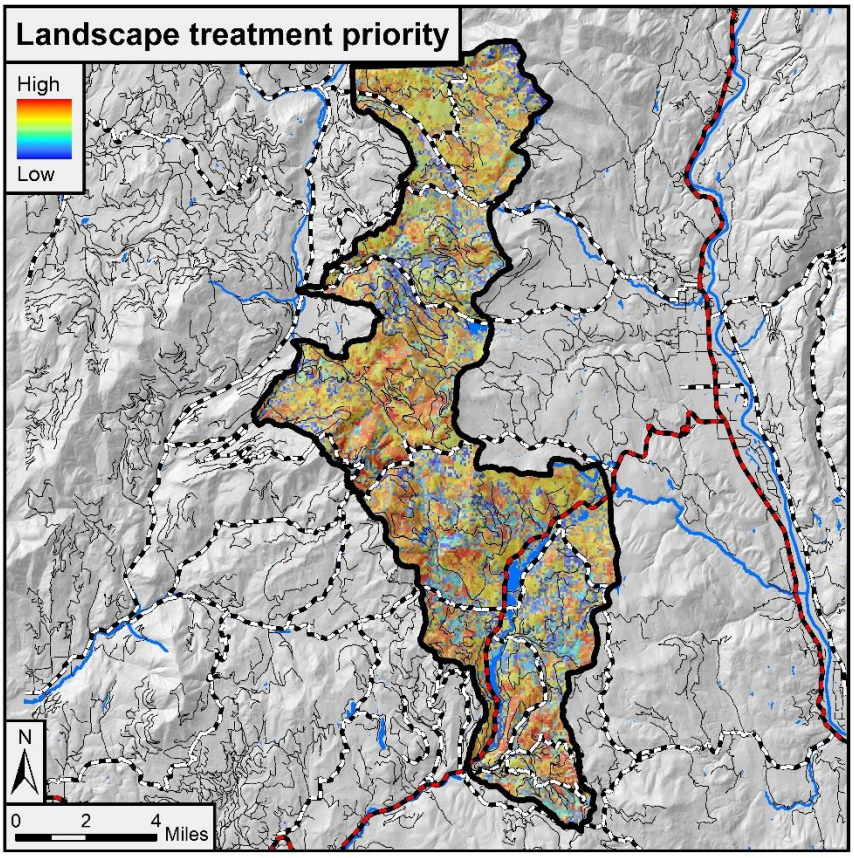

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Woodland/Steppe: Grass and shrub lands that may have oak woodlands or ≤ 10% conifer cover.

Forest structure

Large tree: Overstory diameter > 20 inches.

Medium tree: Overstory diameter 10-20 inches.

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Dense canopy: Greater than 40% tree canopy.

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Where WRB is highest, actions may be needed to create and maintain conditions that provide a tactical advantage for fire operations. These actions will vary with the local context and can include landscape-level forest health and fuel treatments, treatments along fire control lines and escape routes, resident and community fire mitigation activities (e.g. defensible space, home hardening), and improving signage and road conditions. The WRB metric provides a high-level prioritization, and additional work at the local level is required to identify appropriate actions and assess their feasibility. WRB is useful for prioritizing Potential Control Lines (PCLs) for fire operations (Fig. 11). PCLs are a part of Potential Operational Delineations (PODs); see page 7.

In the Meadow planning area, wildfire response benefit is high in the northwest portion and along the Highway 20 corridor in the southeastern portion (Fig. 10), due to adjacent homes, infrastructure, and commercially managed lands (Fig. 5). Crown fire potential is high throughout the planning area in locations with dense, multi-layered forest structure.

Definitions (continued)

Wildfire response benefit: Any tactical advantage gained for wildfire response activities from actions on the landscape, including, but not restricted to, identifying and consolidating existing anchor points and control lines and reduction of potential fire behavior. Wildfire response benefit is not restricted to any specific wildfire management strategy and instead is centered on conditions that improve fire operations safety and effectiveness.

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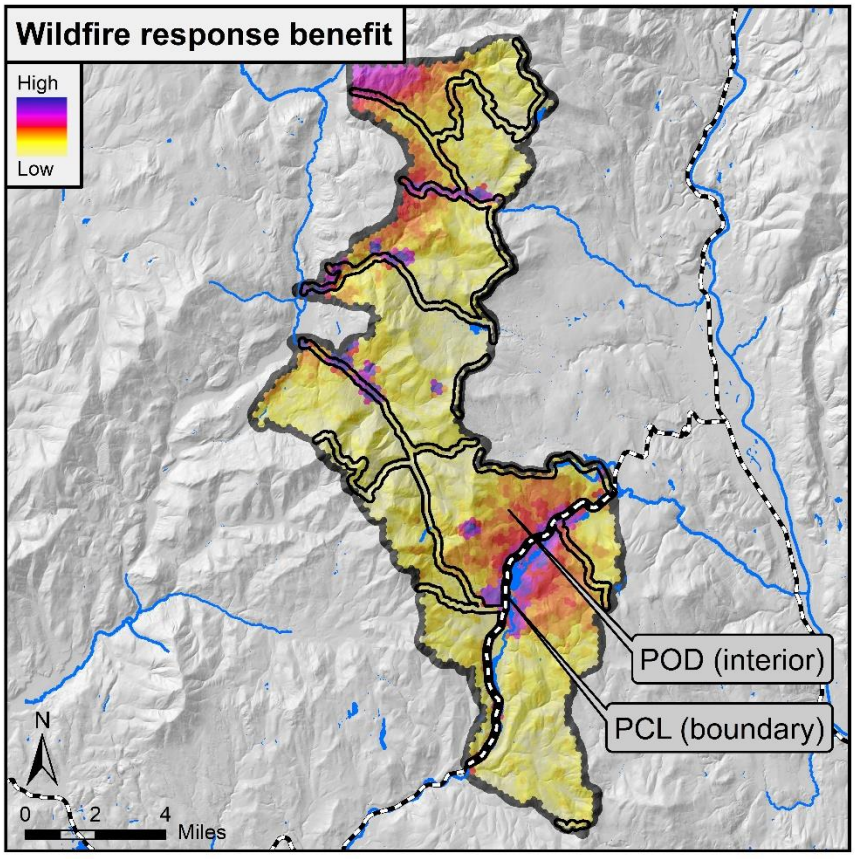

Figure 10. Wildfire response benefit (WRB) integrates multiple fire risk and forest health components. It includes four fire risk metrics representing highly valued resources – risk to homes, infrastructure, drinking water, commercially managed lands – as well as crown fire potential and wildfire transmission to homes (Fig. 8). Combined, these account for 75% of the wildfire response benefit. Landscape treatment priority (Fig. 9) accounts for the remaining 25%. Also shown are PODs: units bounded by PCLs (open black lines). One use of the WRB metric is to prioritize Potential Control Lines (PCLs) for fire operations (Fig. 11).

Prioritizing Landscape Treatments for Dual Benefits

Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for wildfire and prescribed fire operations, delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and managers to identify, at a high level, locations where forest health or fuels treatments can be connected to a high-priority PCL that will support firefighter operations (e.g. ingress/egress route or opportunity for engagement).

Achieving forest health and wildfire response goals will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs.

There is important work to do in all Meadow PODs to achieve the forest health treatment targets in Table 1. First-priority PODs correspond to areas with relatively high landscape treatment priority (Fig. 9) in central and northeastern portions of the planning area (Fig. 11). Most of the first-priority PODs are associated with first-priority PCLs, enhancing opportunities for dual benefit treatments. Further work is needed to assess PCLs locally for their condition and detailed treatment needs, which will depend on management goals and values at risk. Ideally, landscape treatments will be implemented adjacent to priority PCLs where feasible to maximize both forest health and wildfire response goals.

Achieving forest health and wildfire response dual benefits will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs. These two approaches combined will contribute to restoring and maintaining large portions of the landscape in a resilient condition while providing safe and effective areas for firefighter engagement during suppression, prescribed fire, or managed wildfire operations.

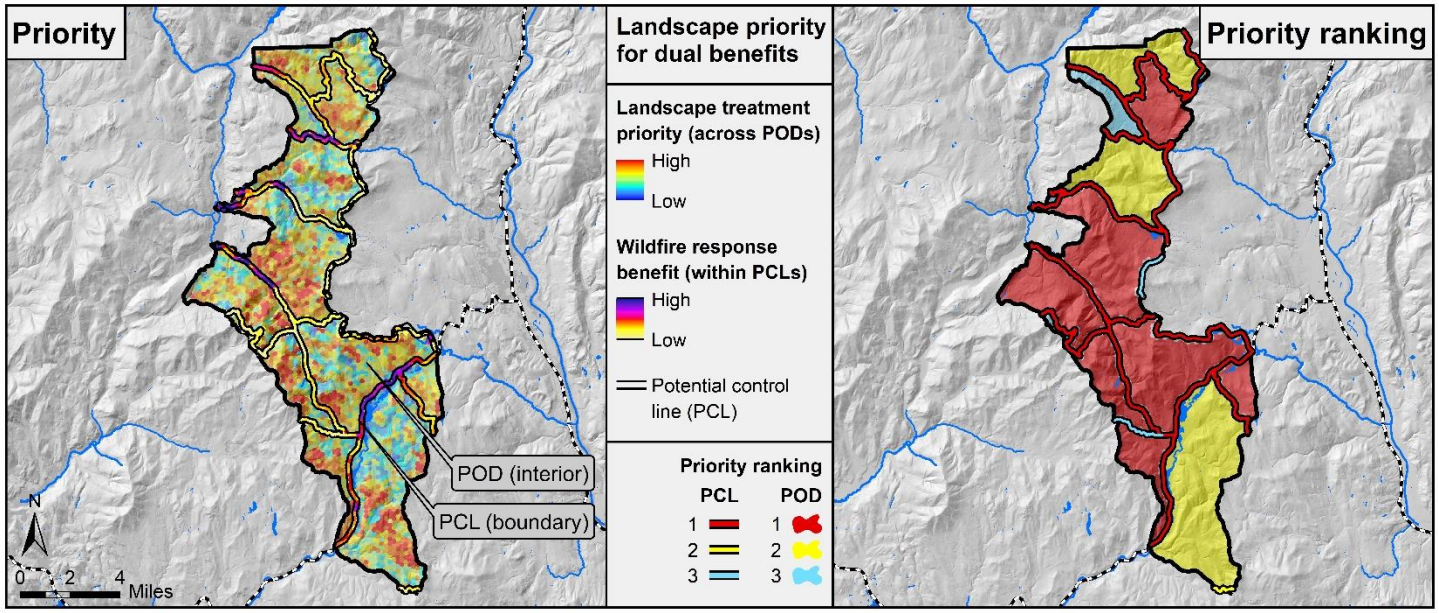

Figure 11. Landscape prioritization of dual benefits using PODs as a spatial framework to summarize treatment priorities. Both maps display landscape treatment priority within PODs and wildfire response benefit within PCLs. The map on the left shows the datasets at the raster level, while the map on the right shows the same information summarized and ranked within PODs and PCLs. PCL width is inflated to display spatial patterns. *PODs shown here are part of an ongoing process towards an all-lands delineation; POD boundaries are subject to change following on-the-ground vetting and continued dialogue among wildfire agencies and stakeholders.*

MICA PLANNING AREA
LANDSCAPE EVALUATION SUMMARY (2024)

Total Acres	Forested Acres	Treatment Goal (Acres)
72,608	39,178	13,350 - 18,000

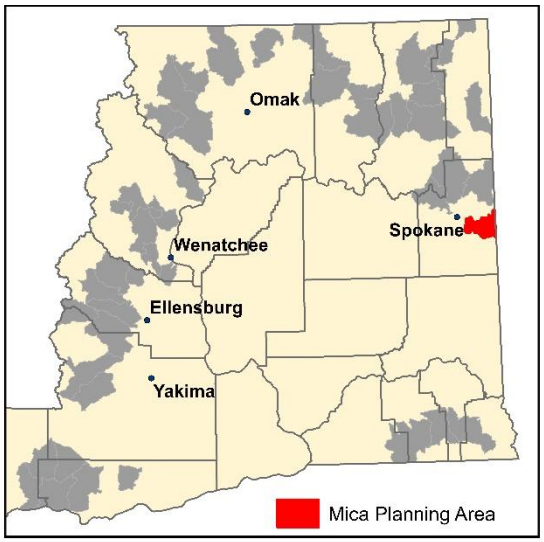

Figure 1. Planning area location in eastern WA.

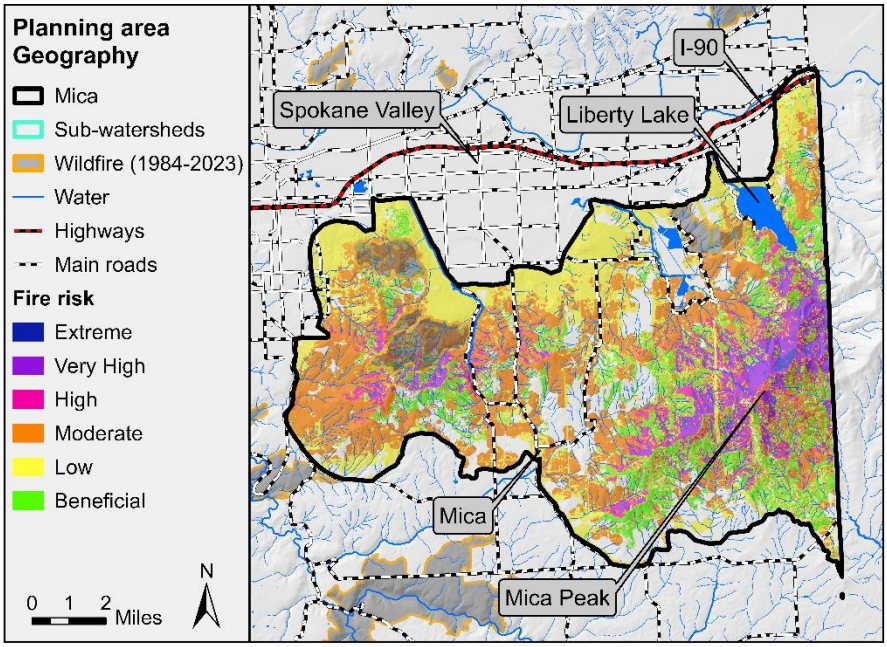

Figure 2. Planning area geography and fire risk, which integrates burn probability, fire intensity, and fire susceptibility of forests, infrastructure, and homes.

Planning Area Highlights

- This planning area extends from the Idaho border to Spokane Valley and other communities near Spokane. Ownership is mostly private non-industrial (78%), with important components of County (11%) and industrial forestland (9%).
- Fire risk to forests is highest in densely forested areas in both the eastern and western portions of the planning area. Fire risk to homes is highest where homes and forests co-occur in the wildland-urban interface.
- By mid-century, areas that currently support dry forest, which make up most of the planning area, are projected to become hotter and drier but still be able to support forest in most places. Much of the existing moist and cold forests are projected to shift towards climate conditions that support dry forest.
- Mechanical and prescribed fire treatments are recommended on 34-46% of forested acres to reduce fire risk to homes, other structures, infrastructure, and forested areas.
- High-priority locations for potential treatments that maximize forest health and wildfire response benefit are concentrated in eastern and western portions of the planning area. These areas will require a mix of fuel reduction and defensible space treatments, as well as home hardening, to protect homes and restore resilient forests.

LEARN MORE

This landscape evaluation was completed in 2024.
For more details about DNR's priority planning areas please see: **https://www.dnr.wa.gov/ForestHealthPlan**
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Overarching Goals

Reduce wildfire risk and protect communities

Fire risk is moderate to high across most of the planning area (Fig. 2). If multiple fires start during a period of hot, dry weather and overwhelm suppression resources, risk is high for private property in the extensive areas of wildland-urban interface. High-density housing exists in the north, and much of the planning area is a patchwork of agricultural land and forest with generally low to moderate fuel loading. In addition, larger patches of dense forest in the eastern and western portions have high fire risk. Without treatments, fire risk is predicted to rise as burn probability increases with projected climate warming. Finally, fire risk to homes and structures is significant, and implementing defensible space and home hardening treatments, as well establishing potential control lines, will reduce risk and increase firefighter safety.

Increase resilience and prepare for climate change

By mid-century, almost the entire planning area is projected to have moisture stress levels that are currently associated with dry forest (Fig. 3). Most areas that currently support dry forest should still be able to support forest but at lower densities due to increasing drought stress. In addition, most of the areas that currently support moist and cold forest are projected to have moisture stress levels currently associated with dry forest. Higher elevation areas in the eastern portion are projected to support moist and cold forest. Treatments that reduce density and favor drought-tolerant species, such as ponderosa pine and western larch, will enhance resilience and persistence of forests into the future.

Sustain wildlife habitat

Habitat for species that depend on dry forest with large trees and open canopies (e.g. White-Headed Woodpecker) occurs primarily in isolated patches to the northwest and southeast of Mica Peak in the eastern portion (Fig. 2). Opportunities exist for expanding White-Headed Woodpecker habitat in dense forests with high drought vulnerability and fire risk. By reducing the risk of large crown fires, these treatments would also help sustain all habitat types. Habitat for species that depend on dry to moist, closed-canopy forest with large trees (e.g. Northern Goshawk) is abundant at higher elevations in the eastern portion, with moderate to large patches. Habitat for cold forest, large-tree, closed-canopy species (e.g. American Marten) is limited to the highest elevation areas around Mica Peak. Given climate change projections and the need to reduce fire risk, maintaining and expanding moist and cold habitat types will be limited to high-elevation forests. Habitat layers are available in the data products.

Enhance rural economic development

Much of the planning area has road access, and many of the areas needing treatment will likely support commercial treatments and important recreational opportunities. Meeting treatment needs could produce a large amount of forest products and related economic activity. Although warming trends will require managing for more drought-tolerant species and lower densities and fuel loads on relatively dry sites, long-term timber production and recreation should be possible throughout the planning area.

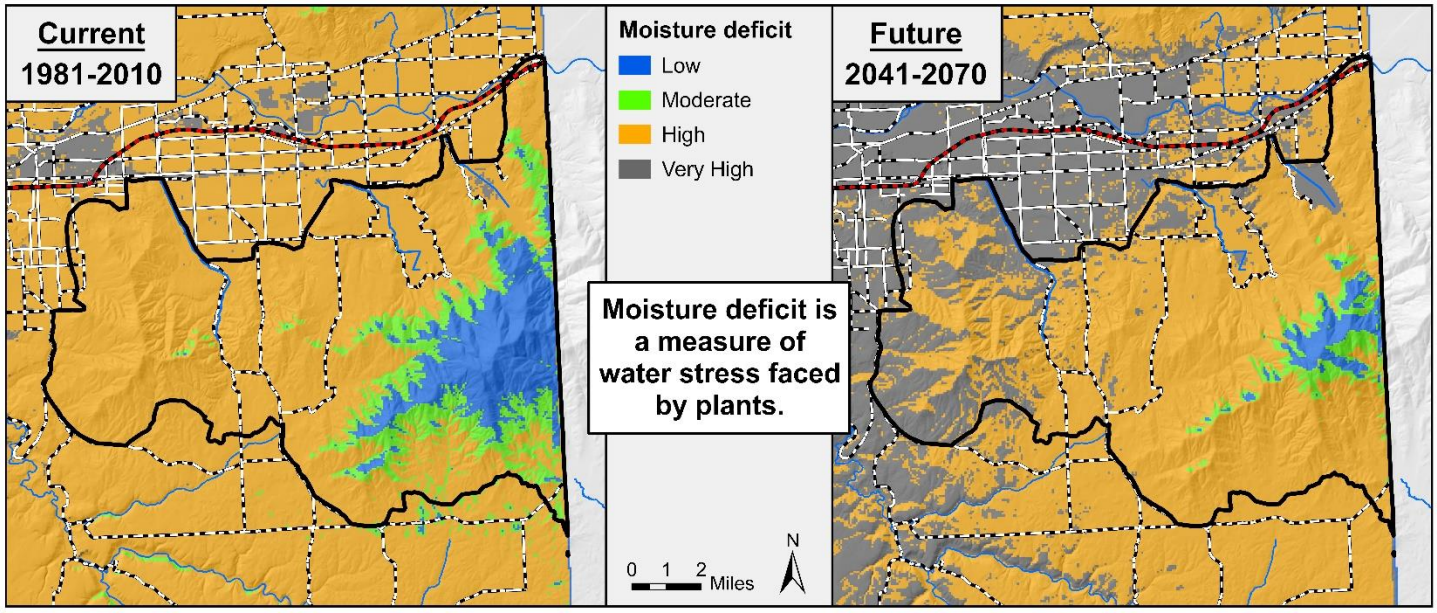


Figure 3. Current (left) and future (right) moisture stress levels based on water balance deficit. Low levels are associated with moist and cold forests, moderate with dry and moist forests, high with dry forests, and very high with woodland and shrub-steppe. Future climate is based on relatively high greenhouse gas emissions scenario (RCP 8.5).

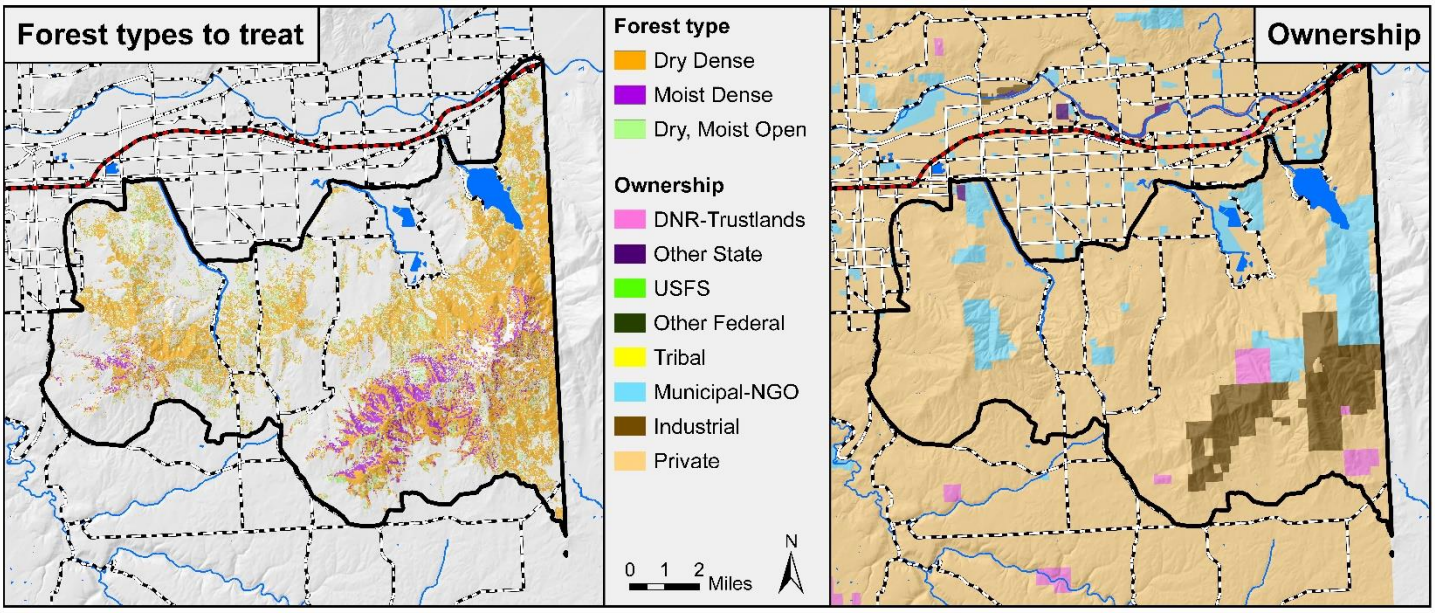
Forest Health Treatment Needs

Treating 13,350 to 18,000 acres is recommended to move the landscape into a resilient condition (34-46% of forested acres; Table 1). This total includes an estimated 11,250-14,750 acres to shift dense to open forest and 2,100-3,250 acres of maintenance treatments in existing open forest, based on forest structure data derived from 2021 aerial imagery. The majority of treatment need is on private land, but opportunities exist on other ownerships, especially Spokane County lands. Meeting this target range will require multiple treatment types (Table 1).

Many treatments are likely commercially viable based on tree size, but the small size of ownerships will increase costs in many places. Treatments around homes and in the wildland-urban interface may often be non-commercial. Treatment type will depend on road access, logging systems, markets, and other considerations. Individual landowners will conduct their own planning and decision-making processes to determine acres and types of treatments to achieve the landscape goals while meeting their own objectives and regulatory requirements.

Table 1. Summary of forest health treatment needs. ***See methods for details on how the treatment need range is derived.***

Forest conditions to treat		Treatment need (footprint acres)	Current acres by major landowner*				
Type	**Size class**		**Private**	**City-County**	**Industrial**	**DNR-Trust**	**Other**
Dry Dense	Small	2,250 - 2,500	1,980	446	595	52	5
	Medium-Large	8,250 - 11,000	10,396	3,158	2,601	396	68
Moist + Cold Dense	Medium-Large	750 - 1,250	1,261	393	1,043	173	0
Dry + Moist Open	Medium-Large	2,100 - 3,250	3,126	399	439	172	27
Total		**13,350 - 18,000**	*These are current acres, not targets				
Anticipated treatment type		Noncommercial thin + fuels treatment. May be prescribed fire or low/mod-severity wildfire.					
		Commercial thin plus fuels treatment if access exists. May be noncommercial, regeneration treatment, or fire only (prescribed fire or low/moderate-severity wildfire).					
		Maintenance treatment: mechanical thinning and fuels reduction, Rx fire, or low/moderate-severity wildfire. *Targets correspond to 50-75% of dry open and 25-50% of moist open forests.*					



Left: Figure 4. Forest structure types that are overabundant relative to targets for a resilient landscape, as well as potential maintenance treatments. Only a portion of the areas shown need to be treated. Right: Figure 5. Current land ownership.

Forest Health Treatment Needs (continued)

Dry dense forest treatment need

On dry sites, dense forest structure of all size classes is currently over-represented. Although some large patches are present in the northern and western areas (Fig 4), most forest areas are a mix of small to medium patches of open (<40% cover), moderately closed (40-60% cover), and closed-canopy (>60% cover) forest. Many dry forest areas are dominated by Douglas-fir, which are vulnerable to uncharacteristic levels of high-severity fire, as well as drought stress, root disease, and Douglas-fir beetle. Treating 10,500-13,500 acres of dry dense forest (Table 1) is recommended to create large patches (~100-1000+ ac) of open forest and shift the majority of dry sites to open forest (Fig. 6). Thinning treatments in large tree, dense forests will create large tree, open forest, which is currently very low. In dense forests with medium trees, treatments plus subsequent growth will increase large tree, open forest. Shifting composition toward ponderosa pine is also needed in some locations; planting may be needed after treatments or high-severity fire.

Moist and cold dense forest treatment need

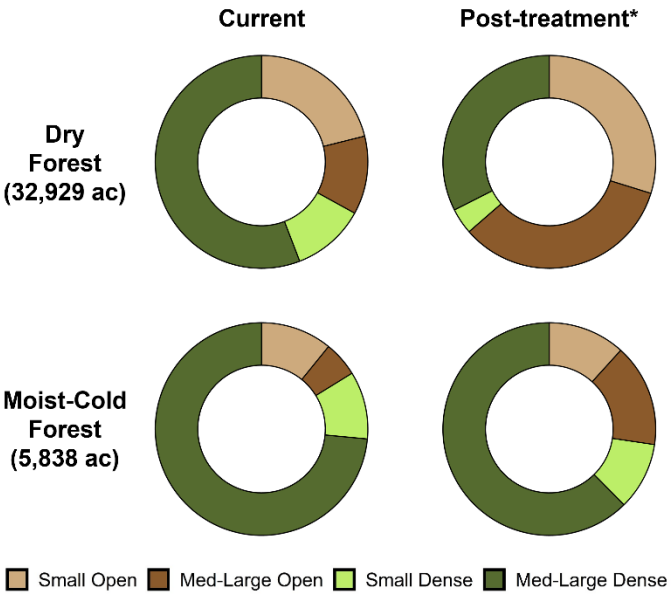
On moist sites, medium tree, dense forest is currently over-represented. Patch sizes are moderate to small, but are often connected with dense, dry forest patches. Large tree, open (<40%) and moderate canopy cover (40-60%) is below desired ranges. Treating 750-1,250 acres of this type (Table 1, Fig. 4) is recommended, especially in locations that are projected to support dry forest in the future (Fig. 3). This will enhance the mosaic of open, moderate, and dense patches and reduce risks of large crown fire and insect outbreaks. Increasing the relative composition of western larch and ponderosa pine is also needed, especially on sites projected to shift to dry forest (Fig. 3). If landscape treatment targets are achieved, over 70% of the total moist and cold forest area will remain dense (>40% canopy cover) (Fig. 6) to meet habitat, wood production, and other objectives.

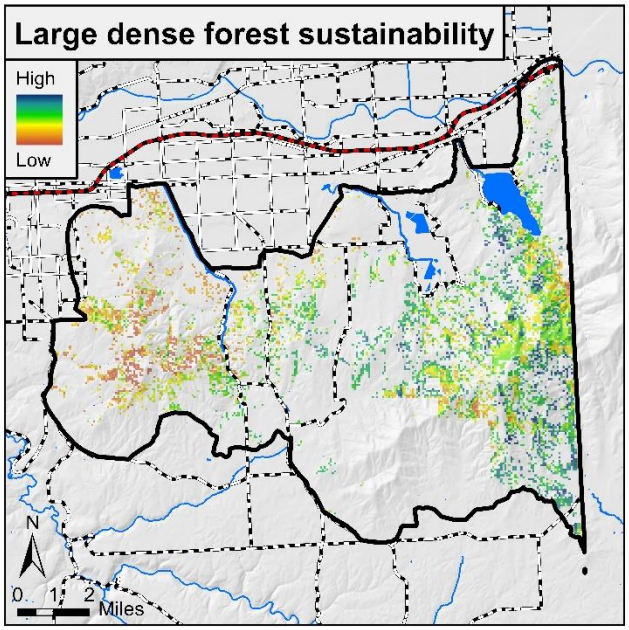
Open forest maintenance treatment need

Over the next 15 years, an estimated 2,100-3,250 acres of currently open forests on dry and moist sites will need prescribed fire or mechanical methods to maintain open conditions by reducing surface fuels and small trees. These sites include recently treated areas and forested areas that are more open due to poor soils where fire is currently predicted to have beneficial effects (Fig. 2). Specific maintenance strategies will depend on landowner objectives and time since treatment.

Sustainable locations for dense forest with large trees

Locations with low to moderate current and future moisture deficits (Fig. 3) and low fire risk (Fig. 2) offer the most sustainable locations to maintain sufficient area and patch sizes of this habitat type. Sustainable locations are concentrated in the eastern portions (Fig. 7). This sustainability map can be used in conjunction with treatment priority (Fig. 9) to identify areas to shift to open forest vs. where to maintain and foster large tree, closed-canopy patches.





Left: Figure 6. Current and post-treatment proportions of forest types and structure classes. * mid-point of range in Table 1.
Right: Figure 7. Sustainability of current and potential large tree, dense forest based on fire risk and drought vulnerability.

Landscape Treatment Prioritization

Prioritizing for forest health & to reduce fire exposure of homes

Landscape treatment priority integrates three metrics of forest health – forest fire risk (Fig. 2), drought vulnerability (Fig. 3), and presence of overabundant forest structure types (Fig. 4) – with wildfire transmission to homes (Fig. 8). We also recommend incorporating the large dense forest sustainability layer (Fig. 7) as an overlay when selecting treatment locations to manage for this habitat type vs. open-canopy forest. Fire transmission is relatively high in western portions, indicating that wildfires starting in these areas are expected to expose homes in Spokane Valley, Mica, and nearby communities (Fig. 2).

Treatment priorities

Landscape treatment priority is highest in the western and eastern portions of the planning area (Fig. 9). These high-priority locations exhibit high fire risk, drought vulnerability, fire transmission to homes, and departed forest structure. Medium-priority areas occur throughout the planning area. Some low-priority areas may need treatment to address species composition, insect and disease risk, or other issues. In addition, fuel reduction treatments, defensible space, and home hardening are needed on private parcels with homes or other structures throughout the planning area.

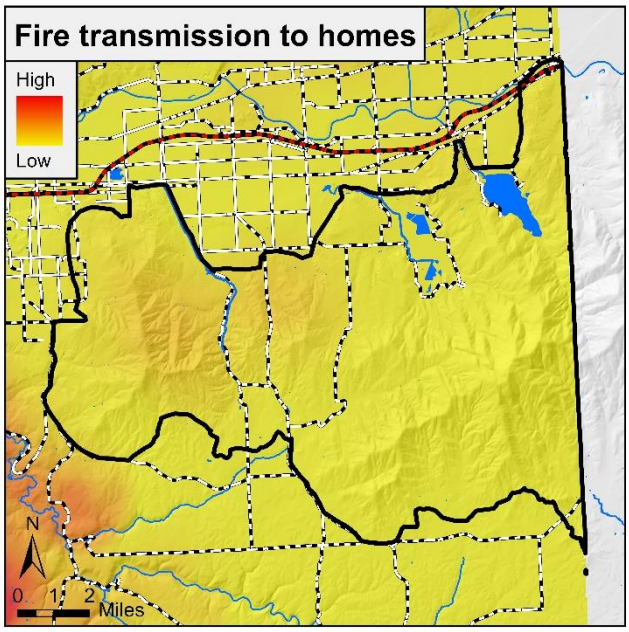


Figure 8. Fire transmission to homes shows where fires that expose structures are most likely to originate. It is based on simulated fire perimeters given contemporary patterns of fuels, topography, and wind.

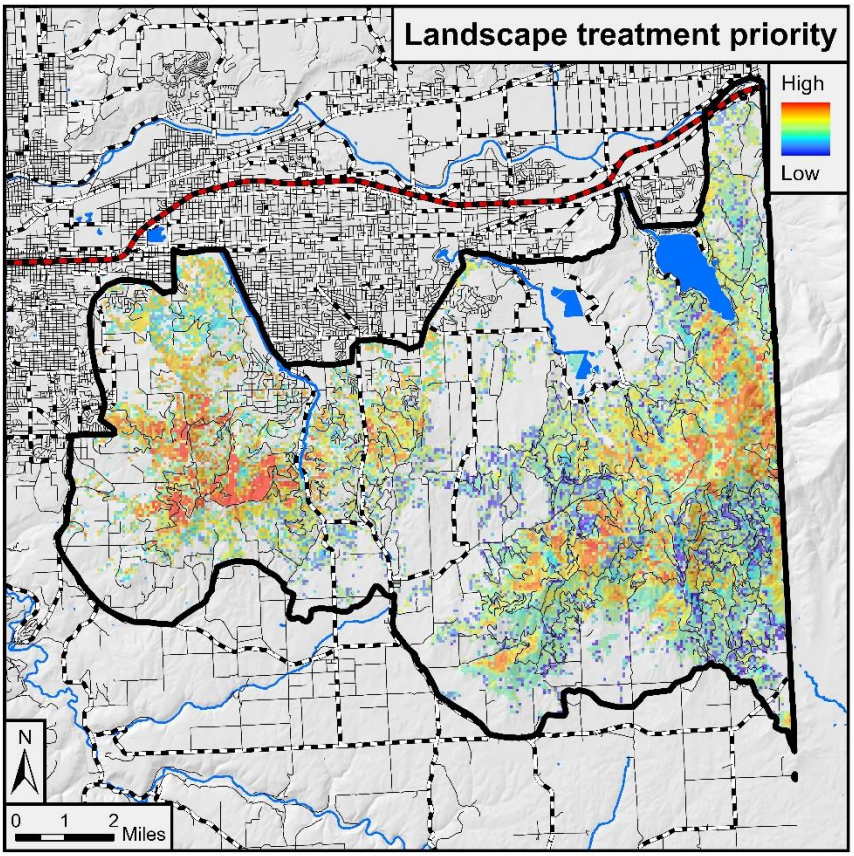


Figure 9. Landscape treatment priority is based on three metrics of forest health – forest fire risk (Fig. 1), drought vulnerability (Fig. 3), overabundant forest structure (Fig. 4) – as well as wildfire transmission to homes (Fig. 8).

Definitions

Vegetation Types

Cold forest: Upper elevation mixed-conifer forests with high-severity fires every 80-200+ years.

Dry forest: Ponderosa pine and Douglas-fir dominated forests that historically had surface fires every 5-25 years.

Moist forest: Forests that historically had mixed-severity fires every 30-100 years and were composed of fire-resistant (western larch, Douglas-fir) and fire-intolerant (grand fir) trees.

Woodland/Steppe: Grass and shrub lands that may have oak woodlands or ≤ 10% conifer cover.

Forest structure

Large tree: Overstory diameter > 20 inches.

Medium tree: Overstory diameter 10-20 inches.

Small tree: Overstory diameter < 10 inches.

Dense canopy: Greater than 40% tree canopy.

Open canopy: Less than 40% tree canopy.

***Fuels*:** Shrubs, grasses, small trees, litter, duff, and dead wood.

Fuels treatments: some combination of mechanical density reduction (commercial or non-commercial) and surface and ladder fuel reduction (prescribed fire, piling & burning, etc.).

Managed wildfire: where consistent with regulations, naturally ignited fire is managed for multiple goals, including resource benefits, firefighter safety, community protection, and suppression.

Wildfire Response Benefit Prioritization

Dual benefits for forest health and wildfire response

It is necessary to conduct treatments to both improve forest health and reduce fire risk to communities as well as provide conditions where firefighters can safely and efficiently conduct wildfire and prescribed fire operations. The wildfire response benefit metric (WRB; Fig. 10) identifies and prioritizes locations where values at risk that are more likely to be the focus of fire operations (homes, infrastructure, sources of drinking water, and commercially managed lands) coincide with areas likely to transmit wildfire to homes and generate severe fire behavior. Because there are positive feedbacks between healthy, resilient forests and safe, effective fire operations, the WRB metric also integrates the landscape treatment priority map (Fig. 9).

Where WRB is highest, actions may be needed to create and maintain conditions that provide a tactical advantage for fire operations. These actions will vary with the local context and can include landscape-level forest health and fuel treatments, treatments along fire control lines and escape routes, resident and community fire mitigation activities (e.g. defensible space, home hardening), and improving signage and road conditions. The WRB metric provides a high-level prioritization, and additional work at the local level is required to identify appropriate actions and assess their feasibility. WRB is useful for prioritizing Potential Control Lines (PCLs) for fire operations (Fig. 11). PCLs are a part of Potential Operational Delineations (PODs); see page 7.

In the Mica planning area, wildfire response benefit is high in both western and eastern portions (Fig. 10). In the western half, high WRB reflect high risk to people and property and wildfire transmission to homes and other structures (Fig. 8), and high landscape treatment priority (Fig. 9). In more rugged portions of the eastern half, high WRB values reflect high risk to people and property, high risk to commercially managed land, and high landscape treatment priority (Fig. 9).

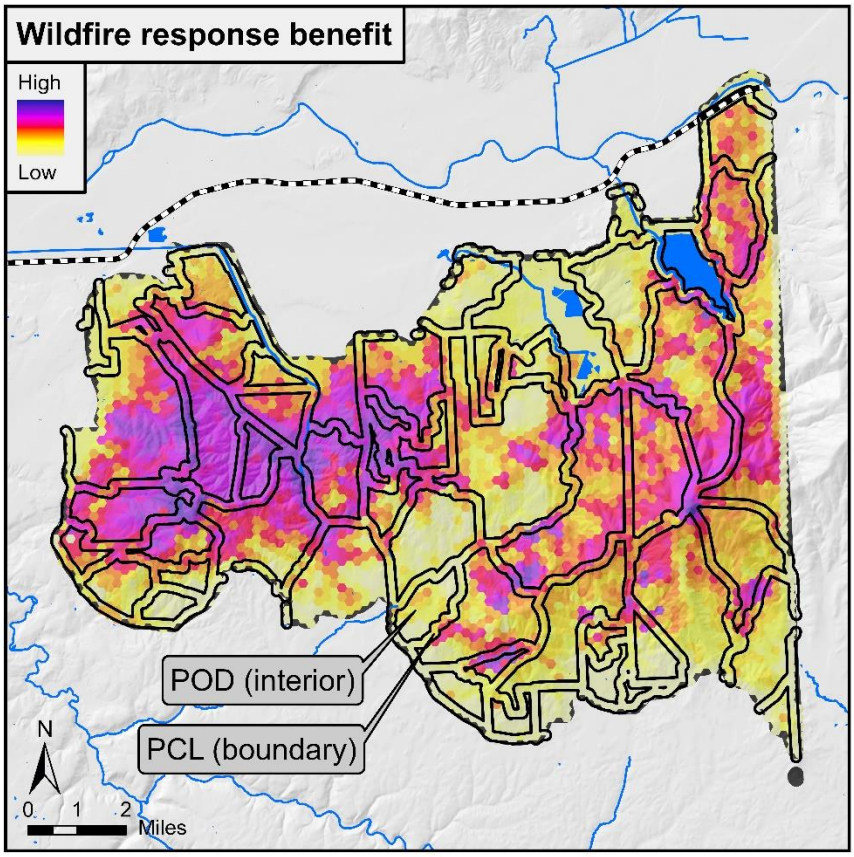
Definitions (continued)

Wildfire response benefit: Any tactical advantage gained for wildfire response activities from actions on the landscape, including, but not restricted to, identifying and consolidating existing anchor points and control lines and reduction of potential fire behavior. Wildfire response benefit is not restricted to any specific wildfire management strategy and instead is centered on conditions that improve fire operations safety and effectiveness.

Potential Control Lines (PCLs): Boundaries of Potential Operational Delineations (PODs) relevant to fire control operations (e.g. roads, ridgetops, and water bodies).

Potential Operational Delineations (PODs) for wildland fire: Landscape containers whose boundaries are potential control lines (PCLs). PODs are useful for planning strategic response to unplanned ignitions, strategic fuel planning, and prioritizing fuel treatments within PODs.

Commercially managed lands: Commercially managed forestlands include: DNR Trustlands, Tribal forests, industrial forests, non-industrial private forests, and US Forest Service forests where timber is a primary management objective.



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Prioritizing Landscape Treatments for Dual Benefits

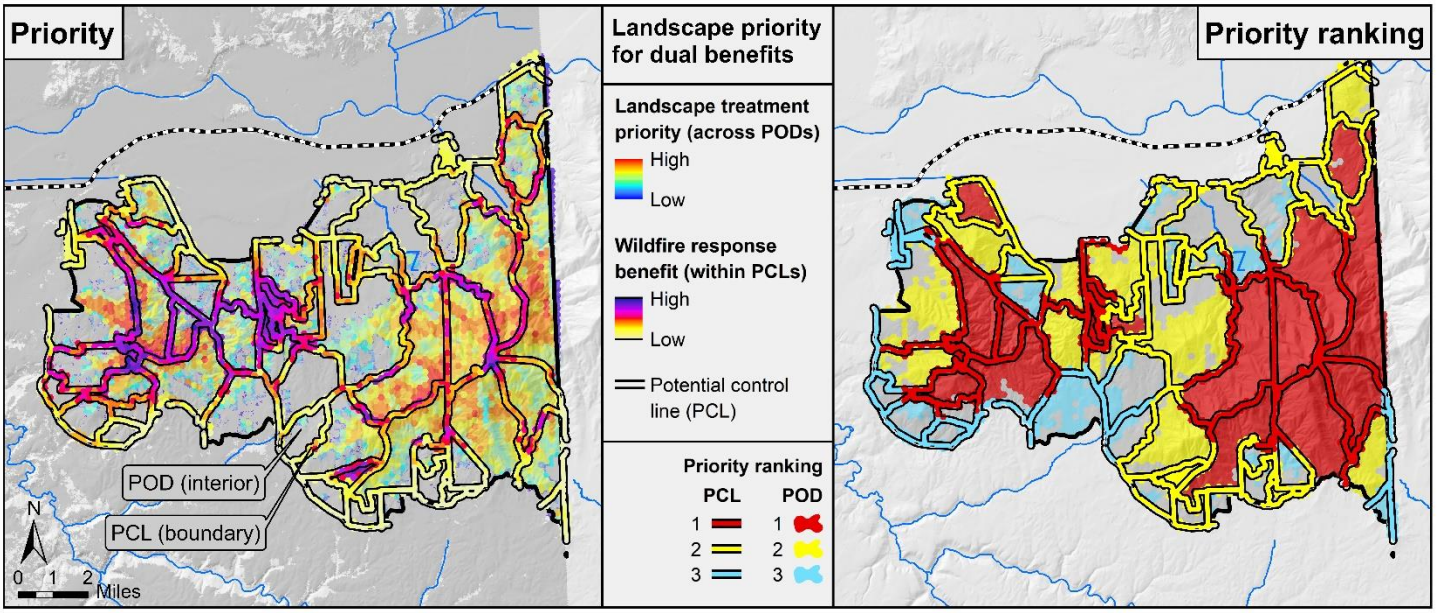
Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for wildfire and prescribed fire operations, delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and managers to identify, at a high level, locations where forest health or fuels treatments can be connected to a high-priority PCL that will support firefighter operations (e.g. ingress/egress route or opportunity for engagement).

Achieving forest health and wildfire response goals will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs.

There is important work to do in all Mica PODs to achieve the forest health treatment targets in Table 1. First-priority PODs correspond to areas with relatively high landscape treatment priority (Fig. 9) in western and eastern parts of the planning area (Fig. 11). Most of the first-priority PODs are associated with first-priority PCLs, enhancing opportunities for dual benefit treatments. Additional first- and second-priority PCLs occur in the central portion between Spokane Valley and Mica, as well as next to Liberty Lake (Fig. 2). Further work is needed to assess PCLs locally for their condition and detailed treatment needs, which will depend on management goals and values at risk. Ideally, landscape treatments will be implemented adjacent to priority PCLs where feasible to maximize both forest health and wildfire response goals.

Achieving forest health and wildfire response dual benefits will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs. These two approaches combined will contribute to restoring and maintaining large portions of the landscape in a resilient condition while providing safe and effective areas for firefighter engagement during suppression, prescribed fire, or managed wildfire operations.



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NACHES-WENAS PLANNING AREA LANDSCAPE EVALUATION SUMMARY (2024)

Total Acres	Forested Acres	Treatment Goal (Acres)
180,858	121,981	28,750 - 47,250

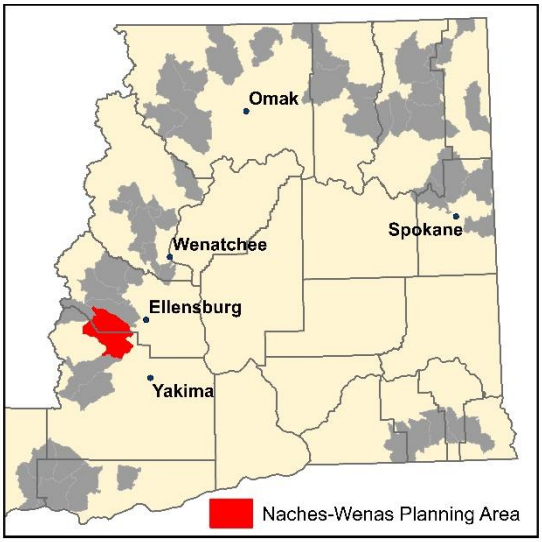

Figure 1. Planning area location in eastern WA.

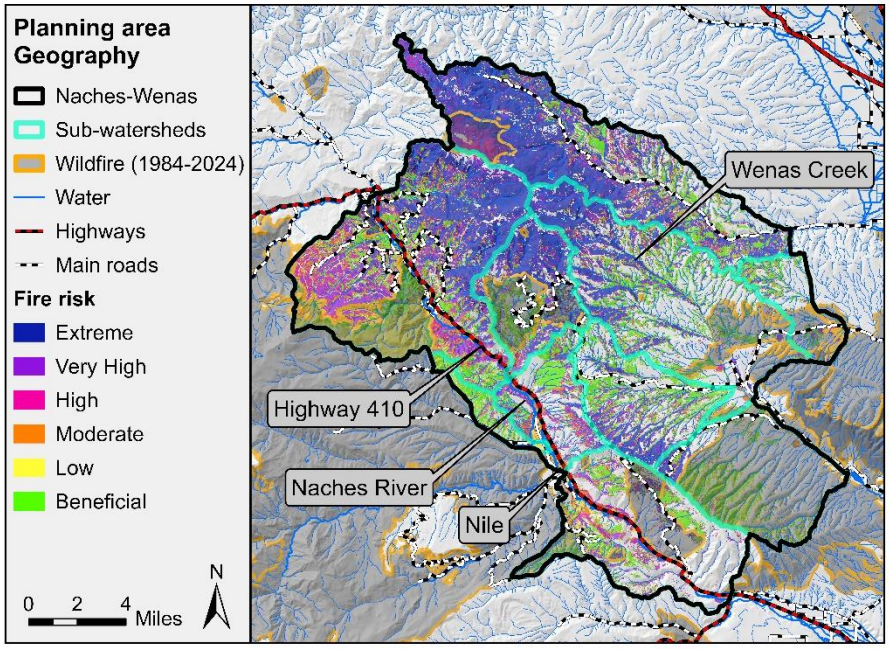

Figure 2. Planning area geography and fire risk, which integrates burn probability, fire intensity, and fire susceptibility of forests, infrastructure, and homes.

Planning Area Highlights

- This planning area is based on the Naches and Wenas watersheds and is adjacent to the 2021 Schneider Springs Fire.
- Ownership is mixed among US Forest Service (38%), DNR-Trustlands (31%) and WDFW (18%), and private (12%). The WDFW land is former industrial forestland that was transferred to public ownership in the last 20 years.
- Fire risk to forests is highest in the northern portion of the planning area (Fig. 2). Fire effects are predicted to be beneficial in the southern and eastern portions due to low flame lengths that will consume small trees and surface fuels.
- Projected warming over the next 20-40 years will likely shift climate conditions suitable for much of the moist and cold forest to conditions suitable for dry forest. The eastern part may no longer support forest outside of north-facing draws.
- Treating 24-39% of forested acres is recommended to increase resilience and reduce fire risk to both forests and communities using mechanical and prescribed fire treatments. Managing wildfires to reduce fuels under safe conditions can also help achieve treatment needs. Recent wildfires in the planning area have reduced fuels and fire risk.
- High-priority areas for potential treatments that maximize forest health and wildfire response benefit include locations throughout the western and northern portions of the planning area.

LEARN MORE

This landscape evaluation was completed in 2024.
For more details about DNR's priority planning areas please see: **https://www.dnr.wa.gov/ForestHealthPlan**
For data products and methods see: **https://bit.ly/ForestHealthData**

CONTACT

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Overarching Goals

Reduce wildfire risk and protect communities

Fire risk is high to extreme in western and northern portions of the planning area due to high fuel loads and burn probability (Fig. 2). Fuels treatments are needed to break up large patches of dense forest to reduce the likelihood of large crown fire and to facilitate protection of private property, especially in the Highway 410 corridor and nearby communities. In addition, implementing fuel reduction treatments around homes and establishing potential control lines will increase firefighter safety and help protect communities. Fire effects are predicted to be beneficial in the southern and eastern portions due to low flame lengths that will consume small trees and surface fuels, including areas that burned in recent wildfires.

Increase resilience and prepare for climate change

By mid-century, most of the planning area is projected to have moisture stress levels that are currently associated with dry forest or non-forest (Fig. 3). Extensive areas in the eastern portion may no longer support forest cover, particularly at lower elevations outside of north-facing draws. Moderate and low moisture stress levels are projected to remain at higher elevations and on north-facing slopes. Treatments that reduce density and favor drought-tolerant species will support forest persistence into the future.

Sustain wildlife habitat

Habitat for species that depend on dry forest with large trees and open canopies (e.g. White-Headed Woodpecker) occurs in isolated patches in the southwestern portion. Habitat for species that depend on dry and moist, closed-canopy forest with large trees (e.g. Northern Goshawk) is concentrated in medium patches at intermediate elevations and north-facing slopes in the western half. In dry forest locations with high fire risk, reducing tree density and canopy cover will reduce crown fire potential and drought vulnerability, help maintain closed-canopy habitat in sustainable locations (Fig. 7), and broaden the distribution of open-canopy habitat. Habitat for cold forest, large-tree, closed-canopy species (e.g. American Marten) occurs in large patches at higher elevations in the northwest. Habitat layers are available in the data products.

Enhance rural economic development

Reducing fire risk will help sustain recreation and tourism, particularly along highway 410, while reducing the potential of smoke affecting nearby communities. Most of the higher-priority areas for commercial treatments have road access and are capable of producing significant timber volume. Although warming trends and high fire risk will necessitate managing for lower densities and drought-tolerant species, long-term timber production will likely be possible on lands where that is an objective.

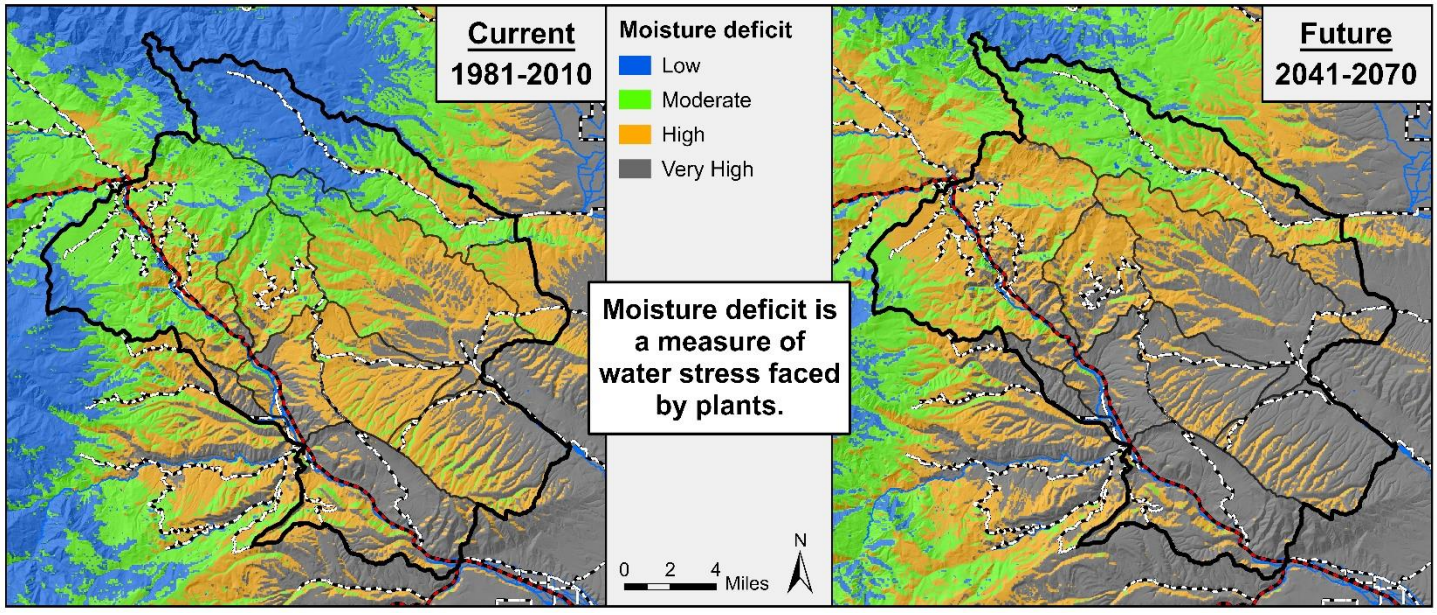


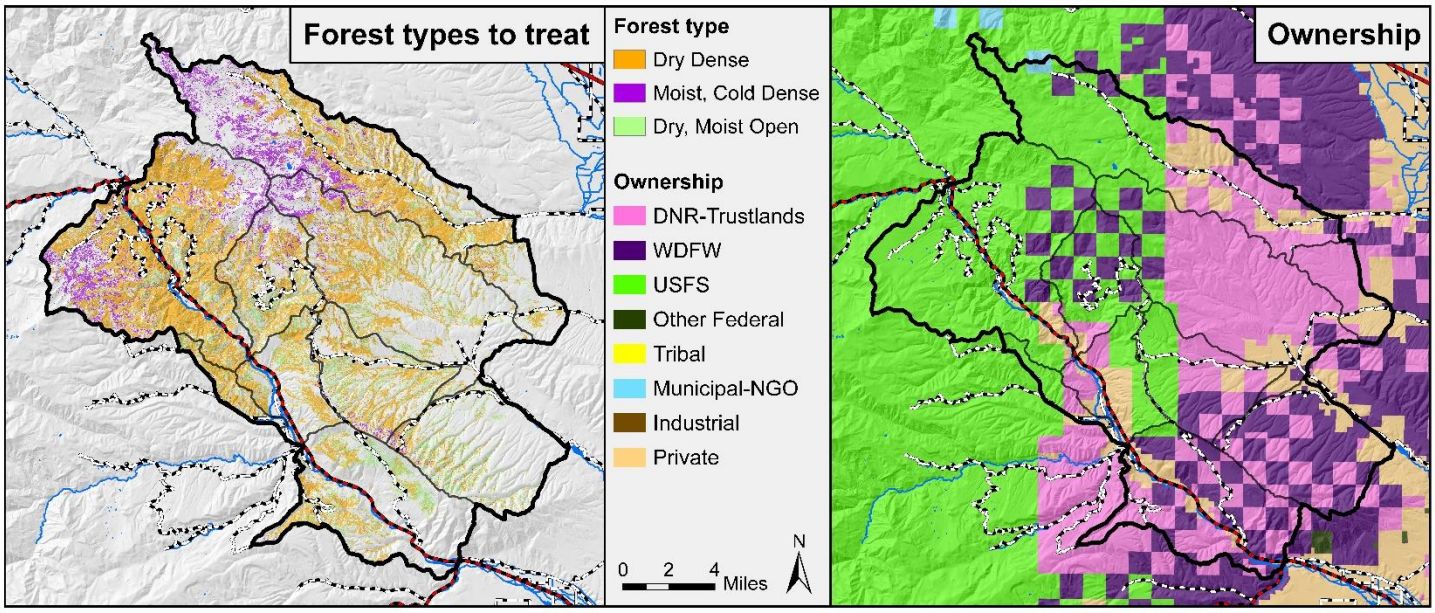
Figure 3. Current (left) and future (right) moisture stress levels based on water balance deficit. Low levels are associated with moist and cold forests, moderate with dry and moist forests, high with dry forests, and very high with woodland and shrub-steppe. Future climate is based on relatively high greenhouse gas emissions scenario (RCP 8.5).

Forest Health Treatment Needs

Treating 28,750 to 47,250 acres is recommended to move the landscape into a resilient condition (24-39% of forested acres; Table 1). This total includes an estimated 20,250-34,250 acres to shift dense to open forest and 8,500-13,000 acres of maintenance treatments in existing open forest, based on forest structure data derived from 2021 and 2022 aerial imagery. Meeting this target range will require multiple treatment types (Table 1). Most treatments are estimated to be commercially viable based on tree size. Treatment type will depend on road access, logging systems, markets, and other considerations. Individual landowners will conduct their own planning and decision-making processes to determine acres and types of treatments to achieve the landscape goals while meeting their own objectives and regulatory requirements. Wildfires and other disturbances will likely accomplish some of the treatment need over time but may also have negative forest health effects. Managed wildfire may be an effective treatment option on remote USFS lands under safe conditions and consistent with regulations.

Table 1. Summary of forest health treatment needs. ***See methods for details on how the treatment need range is derived.***

Forest conditions to treat		Treatment need (footprint acres)	Current acres by major landowner*				
Type	**Size class**		**USFS**	**DNR-Trust**	**WDFW**	**Private**	**Other**
Dry Dense	Small	2,250 - 3,750	1,975	1,996	1,200	690	15
	Medium-Large	16,000 - 27,000	24,008	12,391	4,496	4,542	235
Moist + Cold Dense	Medium-Large	2,000 - 3,500	7,531	456	1,002	196	32
Dry + Moist Open	Medium-Large	8,500 - 13,000	5,264	7,160	3,479	1,653	111
Total		**28,750 - 47,250**	*These are current acres, not targets				
Anticipated treatment type		Noncommercial thin + fuels treatment. May be prescribed fire or low/mod-severity wildfire.					
		Commercial thin plus fuels treatment if access exists. May be noncommercial, regeneration treatment, or fire only (prescribed fire or low/moderate-severity wildfire).					
		Maintenance treatment: mechanical thinning and fuels reduction, Rx fire, or low/moderate-severity wildfire. *Targets correspond to 50-75% of dry open and 25-50% of moist open forests.*					



Left: Figure 4. Forest structure types that are overabundant relative to targets for a resilient landscape, as well as potential maintenance treatments. Only a portion of the areas shown need to be treated. Right: Figure 5. Current land ownership.

Forest Health Treatment Needs (continued)

Dry dense forest treatment need

On dry sites, dense forests dominated by small and medium trees are over-represented on dry sites. The large, numerous patches of this forest type (Fig. 4) create high susceptibility to defoliating insects, bark beetles, and high-severity crown fire. Treating 18,250-34,750 acres of this type (Table 1) is recommended to create large patches (~100-1000 ac) of open forest with a component of large trees (Fig. 4), shifting a substantial portion of dry sites from closed to open forest (Fig. 6). Shifting composition toward ponderosa pine and reducing Douglas-fir is also recommended.

Moist and cold dense forest treatment need

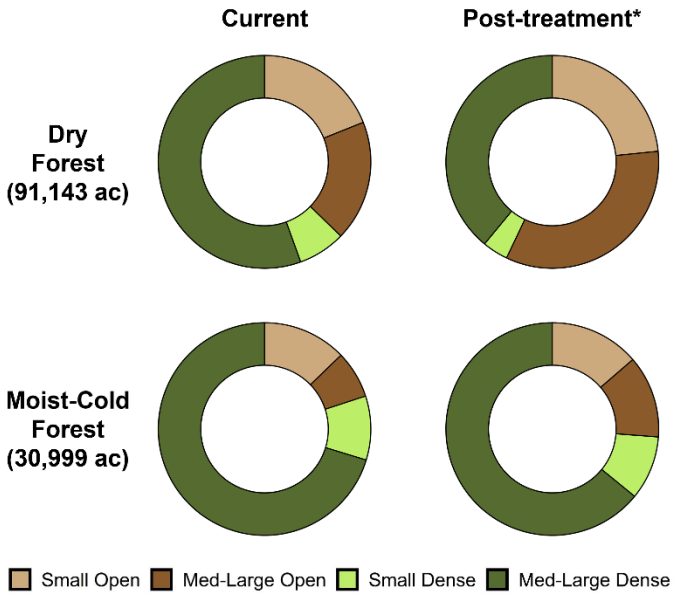
On moist and cold sites, dense mixed-conifer forests dominated by medium trees exceed or are at the upper end of desired ranges at higher elevations of the planning area. In contrast, open-canopy forest with medium to large trees are below or at the low end of desired ranges. Treating 2,000-3,500 (Table 1, Fig. 4) is recommended to create a mosaic of open and dense forest that will reduce the risk of large crown fires and insect outbreaks. A range of treatment types will be needed, including thinning, regeneration treatments, and managed wildfire in remote areas. Increasing the relative composition of ponderosa pine and western larch is also recommended to help these sites adapt to a warming climate. If landscape treatment targets are achieved, over 70% of the total moist and cold forest area will remain dense (>40% canopy cover) (Fig. 6) to meet habitat, wood production, and other objectives.

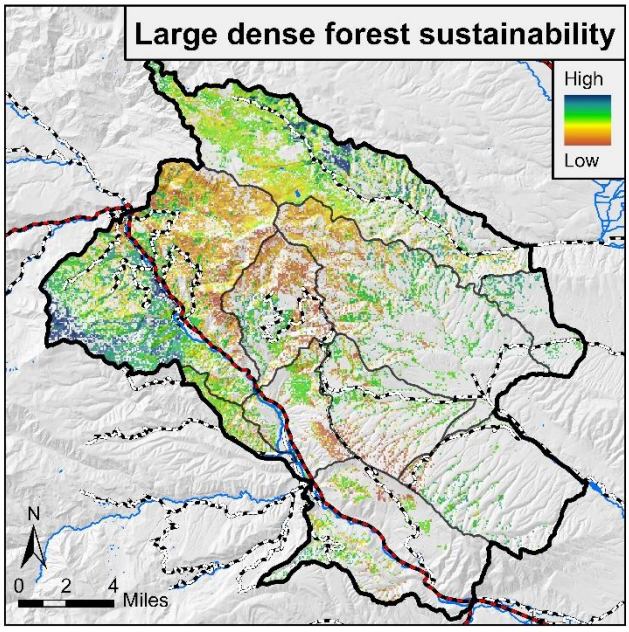
Open forest maintenance treatment need

Over the next 10-20 years, an estimated 8,500-13,000 acres of currently open forests on dry and moist sites will need prescribed fire, managed wildfire, or mechanical methods to maintain open conditions by reducing surface fuels and small trees. These sites include recently treated areas and forested areas that are more open due to poor soils where fire is currently predicted to have beneficial effects (Fig. 2). Specific maintenance strategies will depend on landowner objectives and time since treatment. Wildfires can also maintain low densities and surface fuels.

Sustainable locations for dense forest with large trees

Locations with low to moderate current and future moisture deficits (Fig. 3) and low fire risk (Fig. 2) offer the most sustainable locations to maintain sufficient area and patch sizes of this forest habitat type and associated ecosystem functions. Sustainable locations include relatively high elevations and north-facing slopes in western and northern portions of the planning area (Fig. 7). The large tree, dense forest sustainability map can be used in conjunction with treatment priority (Fig. 9) to select areas to promote open forest vs. where to maintain and foster large tree closed-canopy patches.





Left: Figure 6. Current and post-treatment proportions of forest types and structure classes. * mid-point of range in Table 1.
Right: Figure 7. Sustainability of current and potential large tree, dense forest based on fire risk and drought vulnerability.

Landscape Treatment Prioritization

Prioritizing for forest health & to reduce fire exposure of homes

Landscape treatment priority integrates three metrics of forest health – forest fire risk (Fig. 2), drought vulnerability (Fig. 3), and presence of overabundant forest structure types (Fig. 4) – with wildfire transmission to homes (Fig. 8). We also recommend incorporating the large dense forest sustainability layer (Fig. 7) as an overlay when selecting treatment locations to manage for this habitat type vs. open-canopy forest. Fire transmission is very high in western portions and around the eastern edge, indicating that wildfires starting in these areas are expected to expose homes in the Highway 410 corridor and nearby communities (Fig. 2).

Treatment priorities

Landscape treatment priority is highest in western and northern portions of the planning area (Fig. 9). These high-priority locations exhibit high fire risk, drought vulnerability, fire transmission to homes, and departed forest structure. Medium-priority areas occur throughout the planning area. The eastern half is mostly low priority, but some of these areas may need treatments to address species composition other landowner objectives. In addition, fuel reduction treatments, defensible space, and structure hardening are needed on private parcels throughout the planning area.

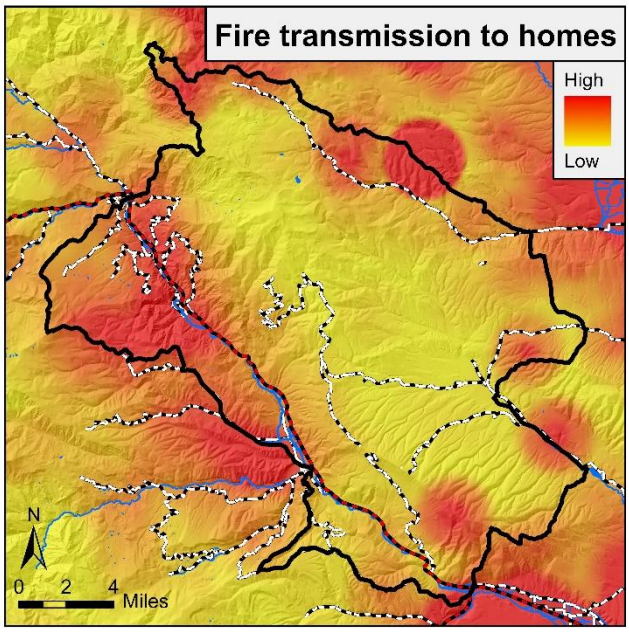


Figure 8. Fire transmission to homes shows where fires that expose structures are most likely to originate. It is based on simulated fire perimeters given contemporary patterns of fuels, topography, and wind.

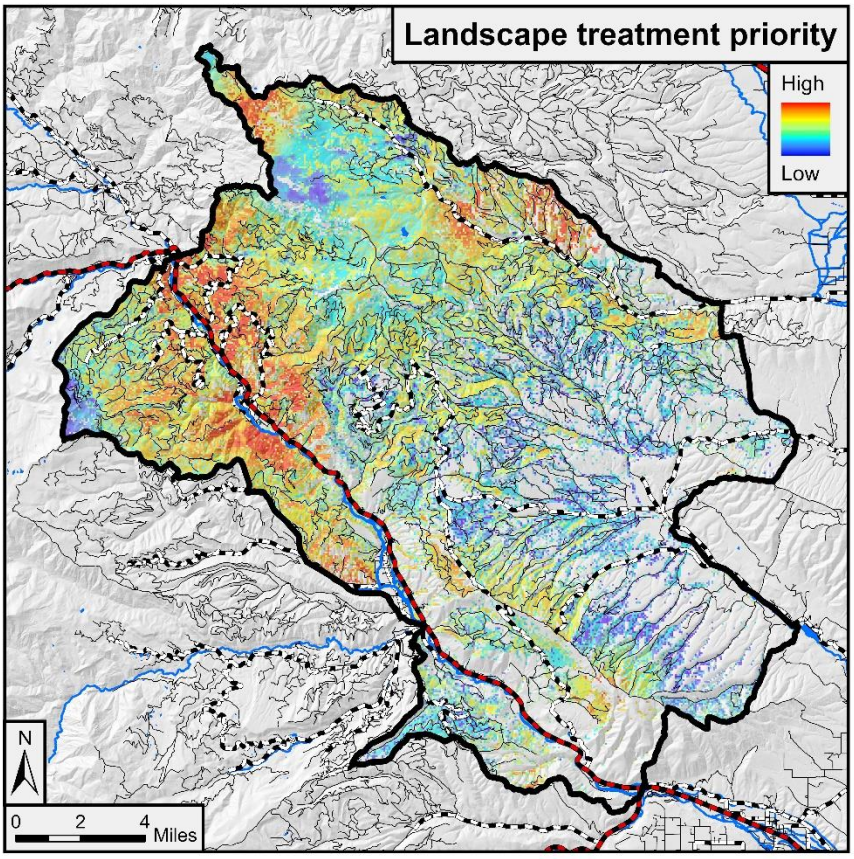


Figure 9. Landscape treatment priority is based on three metrics of forest health – forest fire risk (Fig. 1), drought vulnerability (Fig. 3), overabundant forest structure (Fig. 4) – as well as wildfire transmission to homes (Fig. 8).

Definitions

Vegetation Types

Cold forest: Upper elevation mixed-conifer forests with high-severity fires every 80-200+ years.

Dry forest: Ponderosa pine and Douglas-fir dominated forests that historically had surface fires every 5-25 years.

Moist forest: Forests that historically had mixed-severity fires every 30-100 years and were composed of fire-resistant (western larch, Douglas-fir) and fire-intolerant (grand fir) trees.

Woodland/Steppe: Grass and shrub lands that may have oak woodlands or ≤ 10% conifer cover.

Forest structure

Large tree: Overstory diameter > 20 inches.

Medium tree: Overstory diameter 10-20 inches.

Small tree: Overstory diameter < 10 inches.

Dense canopy: Greater than 40% tree canopy.

Open canopy: Less than 40% tree canopy.

Fuels: Shrubs, grasses, small trees, litter, duff, and dead wood.

Fuels treatments: some combination of mechanical density reduction (commercial or non-commercial) and surface and ladder fuel reduction (prescribed fire, piling & burning, etc.).

Managed wildfire: where consistent with regulations, naturally ignited fire is managed for multiple goals, including resource benefits, firefighter safety, community protection, and suppression.

Wildfire Response Benefit Prioritization

Dual benefits for forest health and wildfire response

It is necessary to conduct treatments to both improve forest health and reduce fire risk to communities as well as provide conditions where firefighters can safely and efficiently conduct wildfire and prescribed fire operations. The wildfire response benefit metric (WRB; Fig. 10) identifies and prioritizes locations where values at risk that are more likely to be the focus of fire operations (homes, infrastructure, sources of drinking water, and commercially managed lands) coincide with areas likely to transmit wildfire to homes and generate severe fire behavior. Because there are positive feedbacks between healthy, resilient forests and safe, effective fire operations, the WRB metric also integrates the landscape treatment priority map (Fig. 9).

Where WRB is highest, actions may be needed to create and maintain conditions that provide a tactical advantage for fire operations. These actions will vary with the local context and can include landscape-level forest health and fuel treatments, treatments along fire control lines and escape routes, resident and community fire mitigation activities (e.g. defensible space, home hardening), and improving signage and road conditions. The WRB metric provides a high-level prioritization, and additional work at the local level is required to identify appropriate actions and assess their feasibility. WRB is useful for prioritizing Potential Control Lines (PCLs) for fire operations (Fig. 11). PCLs are a part of Potential Operational Delineations (PODs); see page 7.

In the Naches-Wenas planning area, wildfire response benefit is highest in the western portion at relatively high elevations and along Highway 410 (which overlaps WRB data in Fig. 10). These areas of high wildfire response benefit are due to a combination of high risk to people and property, drinking water, and commercially managed lands, high landscape treatment priority (Fig. 9), and high wildfire transmission to homes and structures (Fig. 8).

Definitions (continued)

Wildfire response benefit: Any tactical advantage gained for wildfire response activities from actions on the landscape, including, but not restricted to, identifying and consolidating existing anchor points and control lines and reduction of potential fire behavior. Wildfire response benefit is not restricted to any specific wildfire management strategy and instead is centered on conditions that improve fire operations safety and effectiveness.

Potential Control Lines (PCLs): Boundaries of Potential Operational Delineations (PODs) relevant to fire control operations (e.g. roads, ridgetops, and water bodies).

Potential Operational Delineations (PODs) for wildland fire: Landscape containers whose boundaries are potential control lines (PCLs). PODs are useful for planning strategic response to unplanned ignitions, strategic fuel planning, and prioritizing fuel treatments within PODs.

Commercially managed lands: Commercially managed forestlands include: DNR Trustlands, Tribal forests, industrial forests, non-industrial private forests, and US Forest Service forests where timber is a primary management objective.

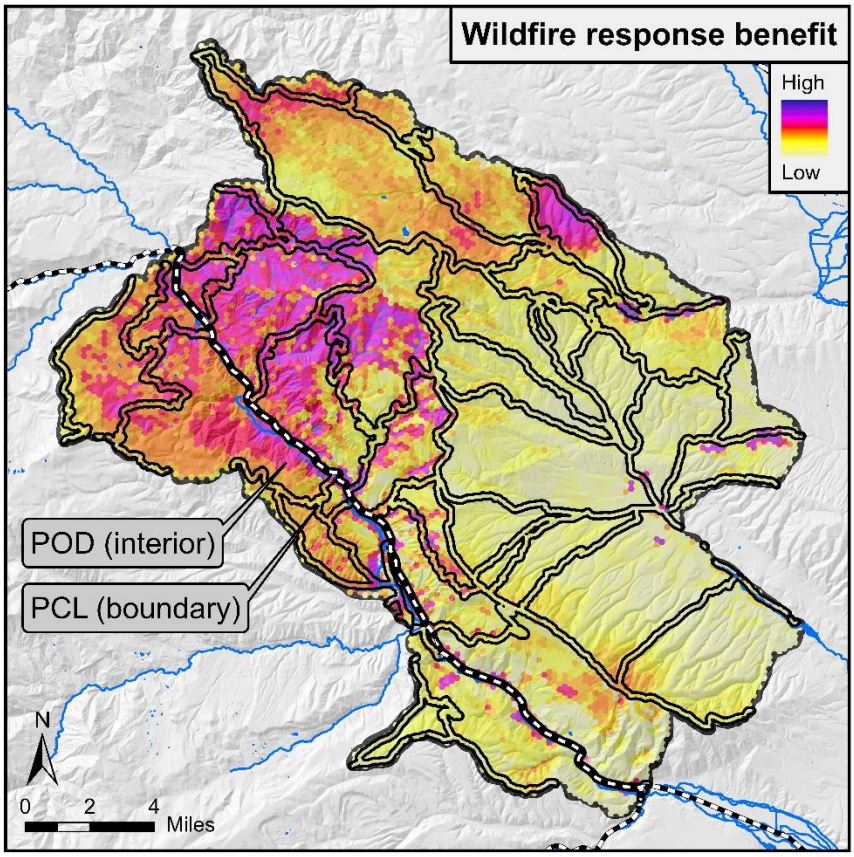


Figure 10. Wildfire response benefit (WRB) integrates multiple fire risk and forest health components. It includes four fire risk metrics representing highly valued resources – risk to homes, infrastructure, drinking water, commercially managed lands – and wildfire transmission to homes (Fig. 8). Combined, these account for 75% of the wildfire response benefit. Landscape treatment priority (Fig. 9) accounts for the remaining 25%. Also shown are PODs: units bounded by PCLs (open black lines). One use of the WRB metric is to prioritize Potential Control Lines (PCLs) for fire operations (Fig. 11).

Prioritizing Landscape Treatments for Dual Benefits

Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for wildfire and prescribed fire operations, delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and managers to identify, at a high level, locations where forest health or fuels treatments can be connected to a high-priority PCL that will support firefighter operations (e.g. ingress/egress route or opportunity for engagement).

Achieving forest health and wildfire response goals will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs.

There is important work to do in all Naches-Wenas PODs to achieve the forest health treatment targets in Table 1. First-priority PODs correspond to areas with high and moderate landscape treatment priority (Fig. 9) in western and northern portions of the planning area (Fig. 11). Most of the first-priority PODs are associated with first- and second-priority PCLs, enhancing opportunities for dual benefit treatments. First-priority PCLs also occur in northeastern portions and throughout the Highway 410 corridor. Further work is needed to assess PCLs locally for their condition and detailed treatment needs, which will depend on management goals and values at risk. Ideally, landscape treatments will be implemented adjacent to priority PCLs where feasible to maximize both forest health and wildfire response goals.

Achieving forest health and wildfire response dual benefits will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs. These two approaches combined will contribute to restoring and maintaining large portions of the landscape in a resilient condition while providing safe and effective areas for firefighter engagement during suppression, prescribed fire, or managed wildfire operations.

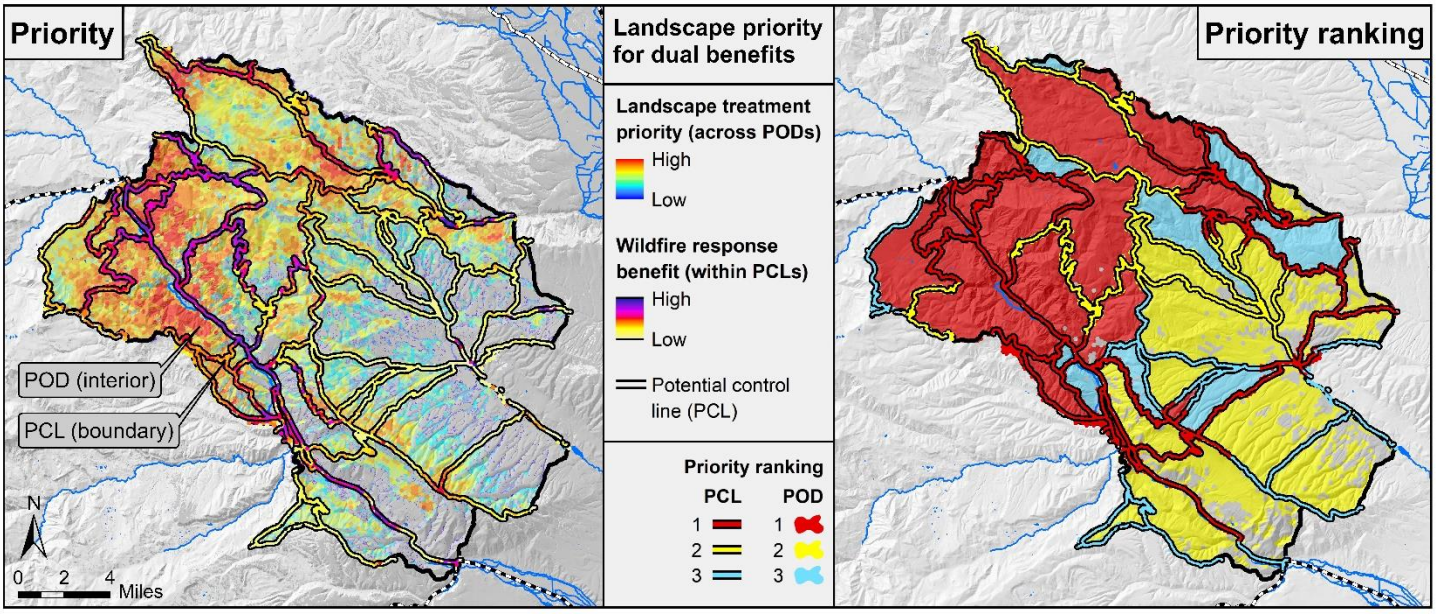


Figure 11. Landscape prioritization of dual benefits using PODs as a spatial framework to summarize treatment priorities. Both maps display landscape treatment priority within PODs and wildfire response benefit within PCLs. The map on the left shows the datasets at the raster level, while the map on the right shows the same information summarized and ranked within PODs and PCLs. PCL width is inflated to display spatial patterns. *PODs shown here are part of an ongoing process towards an all-lands delineation; POD boundaries are subject to change following on-the-ground vetting and continued dialogue among wildfire agencies and stakeholders.*

SLATE PLANNING AREA
LANDSCAPE EVALUATION SUMMARY (2024)

Total Acres	Forested Acres	Treatment Goal (Acres)
35,858	34,826	13,750 - 17,250

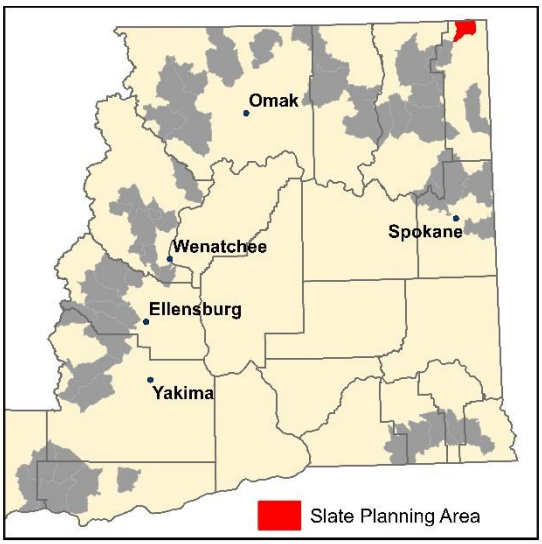


Figure 1. Planning area location in eastern WA.

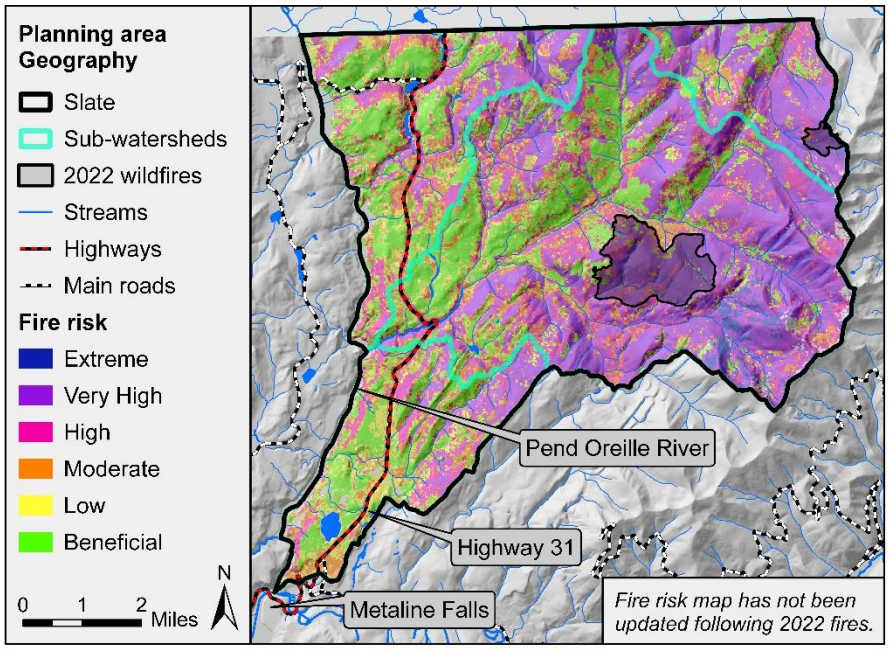


Figure 2. Planning area geography and fire risk, which integrates burn probability, fire intensity, and fire susceptibility of forests, infrastructure, and homes.

Planning Area Highlights

- Ownership is primarily Colville National Forest (92%), with the Salmo-Priest Wilderness Area and wilderness-recommended areas covering most of the south half. Small-private (6%) and other ownerships (2%) comprise the remainder.
- Fire risk is highest in the eastern half of the planning area, as well as on north-facing slopes in the western half. Risk to homes near Metaline Falls and along Highway 31 is moderate. Burn probability is moderate to low, although it has increased significantly as fire frequency and extent have increased in recent years in northeast Washington.
- Much of the moist forest in the western half is projected to shift towards climate conditions that support dry forest.
- Treating 39-50% of forested acres is recommended to increase resilience and reduce fire risk to communities using a combination of mechanical, prescribed fire, and managed wildfire treatments in roadless and other remote areas.
- High-priority locations for treatments that maximize forest health and wildfire response benefit are concentrated in the southern half of the planning area, as well as in smaller patches across the northern half.
- The Colville National Forest is planning a large landscape restoration project in this planning area. A scoping notice was released in 2023. Data developed for this Landscape Evaluation was provided to the Colville National Forest in 2022.

LEARN MORE

This landscape evaluation was completed in 2024.
For more details about DNR's priority planning areas please see: **https://www.dnr.wa.gov/ForestHealthPlan**
For data products and methods see: **https://bit.ly/ForestHealthData**

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Overarching Goals

Reduce wildfire risk and protect communities

Fire risk is high to very high across much of the eastern half of the planning area where large patches of dense, moist and cold forest occur (Fig. 2), as well as on north-facing slopes in the western half. This is driven by a combination of high fuel loads and annual burn probabilities (1-2.5%) that have increased substantially in recent years as fire frequency and extent have grown in NE Washington. In contrast, much of the dry forests in the western half have lower fuel loads and burn probabilities, and thus lower predicted risk as well as beneficial fire effects. Landscape treatments will help reduce the risk of large, high-severity fire and restore conditions conducive to a more characteristic mix of fire severity. Over time, a restored landscape will provide managers more flexibility to utilize wildfire to maintain these fire-dependent ecosystems and thus harness the predicted increase in burn probability. In addition, implementing fuel reduction treatments around homes and establishing potential control lines will increase firefighter safety and help protect communities.

Increase resilience and prepare for climate change

By mid-century, most of the moist forest in the western portion, as well south-facing slopes in the eastern half, are projected to shift towards climate conditions that support dry forest (Fig. 3). Treatments, as well as wildfires, that reduce density and favor drought-tolerant species will reduce vulnerability to drought and related insect outbreaks. Most of the eastern half is projected to still support moist and cold forests, especially on sites with more productive soils.

Sustain wildlife habitat

Habitat for species that depend on dry forest with large trees and open canopies (e.g. White-Headed Woodpecker) is scarce, but significant patches occur in the western third. Habitat for species that depend on moist, closed-canopy forest with large trees (e.g. Northern Goshawk) is moderately abundant with a few large patches. Habitat for cold forest, large-tree, closed-canopy species (e.g. American Marten) is also moderately abundant.. Large trees are a limiting factor for all three habitat types, as the planning area is dominated by dense, medium-tree forest (Fig. 4). Opportunities exist to expand White-Headed Woodpecker habitat by treating dense forests in locations with high drought vulnerability, which will also lower risk of crown fire and loss of large-tree habitat in all forest types. Early-seral habitat is also in short supply. Grizzly bear and Canada lynx are other important species in this planning area.

Enhance rural economic development

Meeting treatment needs will produce a large volume of forest products that will support local economies. Treatments in most of the dense, medium-tree forest where road access exists are commercially viable. Although warming trends will necessitate managing for more drought-tolerant species and lower densities and fuel loads on current and future dry sites, long-term timber production should be possible where compatible with landowner objectives. Reducing fire risk will help sustain recreation and tourism while reducing potential smoke impacts to communities.

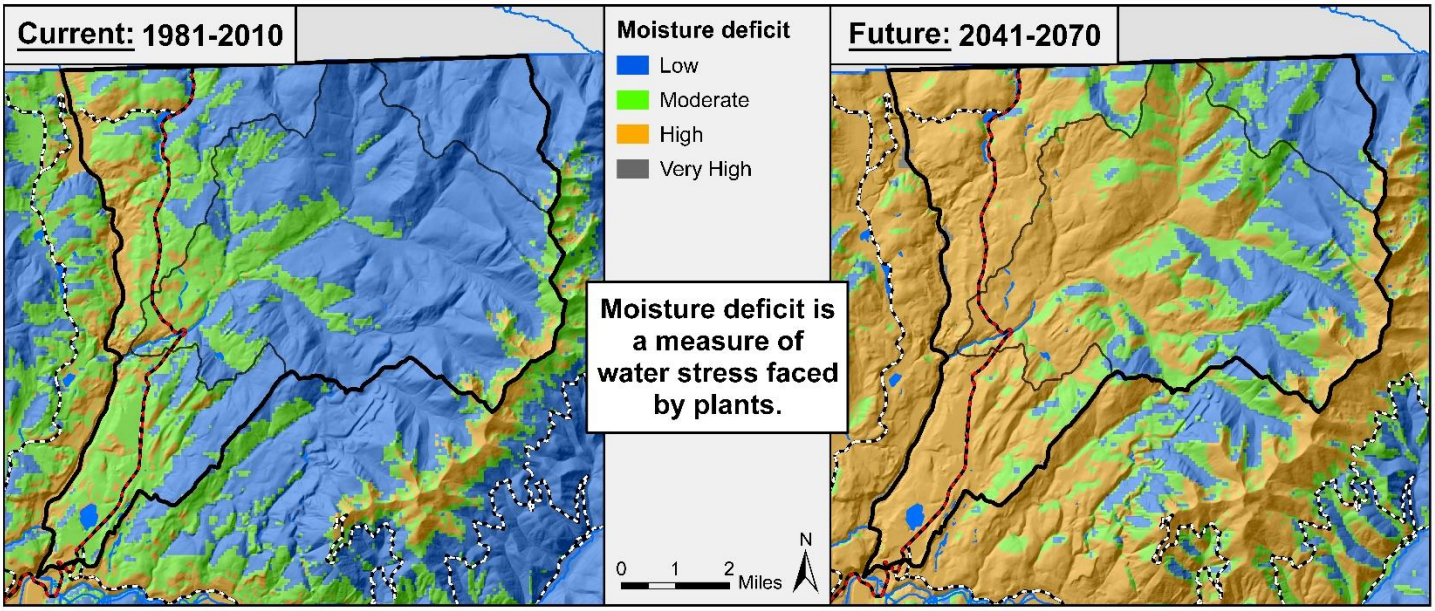


Figure 3. Current (left) and future (right) moisture stress levels based on water balance deficit. Low levels are associated with moist and cold forests, moderate with dry and moist forests, high with dry forests, and very high with woodland and shrub-steppe. Future climate is based on relatively high greenhouse gas emissions scenario (RCP 8.5).

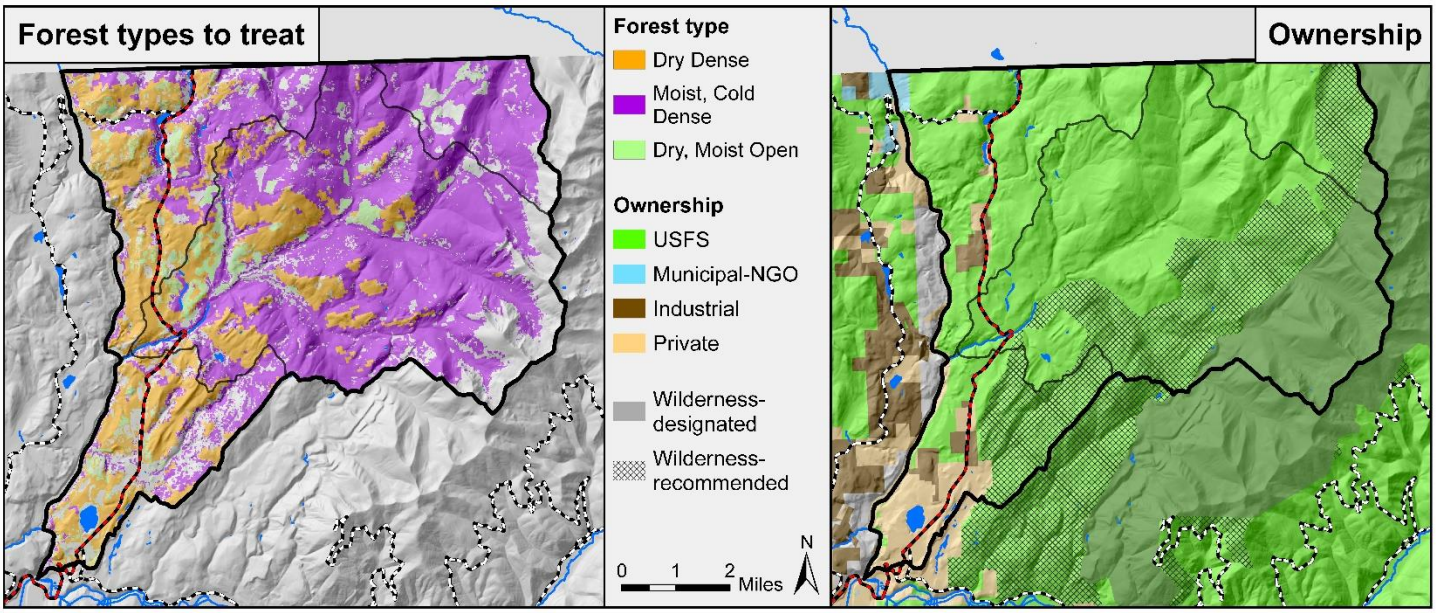
Forest Health Treatment Needs

Treating 13,750 to 17,250 acres is recommended to move the landscape into a resilient condition (39-50% of forested acres; Table 1). This total includes an estimated 13,000-16,000 acres to shift dense to open forest and 750-1,250 acres of maintenance treatments in existing open forest, based on forest structure data from 2016 LiDAR. The 2022 Slate Creek and Gypsy Ridge Wildfires (Fig. 2), as well as significant mountain pine beetle mortality at higher elevations, that occurred after the 2016 LiDAR acquisition have likely affected treatment needs. The great majority of treatment need is located on USFS land, but opportunities also exist on other ownerships (Table 1).

Meeting this target range will require multiple treatment types (Table 1). Most treatments are commercially viable based on tree size. Treatment type, however, will depend on road access, markets, costs, and other considerations. Individual landowners will conduct their own planning to determine how to achieve landscape goals while meeting their objectives and regulatory requirements. Wildfires and other disturbances will likely accomplish some of the treatment need over time but may also have negative forest health effects. Managed wildfire is the primary treatment option in the large block of wilderness in the southern portion (Fig. 4) that has no roads.

Table 1. Summary of forest health treatment needs. ***See methods for details on how the treatment need range is derived.***

Forest conditions to treat		Treatment need (footprint acres)	Current acres by major landowner*				
Type	**Size class**		**USFS**	**Private**	**Industrial**	**City-County**	**Other**
Dry Dense	Medium-Large	5,000 - 6,000	6,745	811	258	64	29
Moist Dense	Medium-Large	8,000 - 10,000	18,050	177	40	21	4
Dry + Moist Open	Medium-Large	750 - 1,250	1,335	170	137	7	7
Total		**13,750 - 17,250**	*These are current acres, not targets				
Anticipated treatment type		Commercial thin plus fuels treatment if access exists. May be noncommercial, regeneration treatment, or fire only (prescribed fire or low/moderate-severity wildfire).					
		Maintenance treatment: mechanical thinning and fuels reduction, Rx fire, or low/moderate-severity wildfire. *Targets correspond to 50-75% of dry open and 25-50% of moist open forests.*					



Left: Figure 4. Forest structure types that are overabundant relative to targets for a resilient landscape, as well as potential maintenance treatments. Only a portion of the areas shown need to be treated. Right: Figure 5. Current land ownership.

Forest Health Treatment Needs (continued)

Dry dense forest treatment need

Extensive high-severity fires in the early 1900s led to the development of large patches of dense ~100-year-old forest that covers most of the planning area. Wildfires that would have subsequently created greater landscape diversity were suppressed, and past harvesting removed many of the surviving old trees. Currently, medium-tree, dense forest is highly over-represented on dry sites, and patch sizes are large and aggregated. Due to warming trends, these forests are increasingly vulnerable to large, high-severity fires, as well as drought stress and related insect outbreaks. Large-tree, dense forest is also modestly over-represented. Treating 5,000-6,000 acres of dry, dense forest (Table 1) is recommended to shift the majority of dry forest to more open conditions, while retaining the larger trees (Fig. 6). As the retained trees grow, the amount and patch sizes of fire-resistant, large-tree open forest will increase. Shifting composition toward drought-resistant species is also needed.

Moist and cold dense forest treatment need

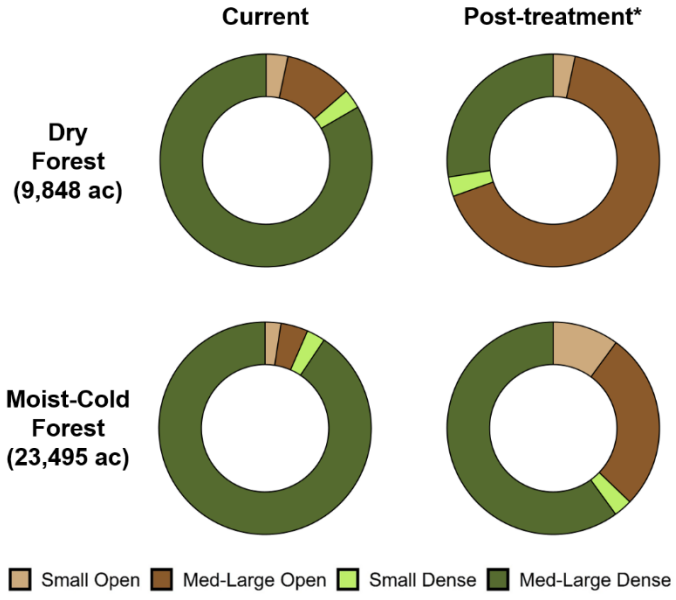
Dense, medium-tree forest is even more over-abundant on moist forest sites, and to a lesser extent on cold forest sites. The eastern half of the planning area contains an almost continuous patch of this structure type. Large-tree open and dense forest is below desired ranges, as is small open forest. Significant decline of western white pine has occurred due to white pine blister rust, past harvest, and lack of fire. Treating 8,000-10,000 acres of medium-tree forest is recommended (Table 1, Fig. 4), especially on sites projected to shift to dry forest (Fig. 3). Increasing the relative composition of western larch, Douglas-fir, western white pine, and ponderosa pine is needed. In places where these species are poorly represented, planting may be necessary after treatments or wildfires. A range of treatment types will be needed, including thinning, regeneration treatments, mechanical fuel reduction, and prescribed fire. Treatments will increase the likelihood that wildfires will have beneficial effects. Together, treatments and fire can create a resilient mosaic of open, moderate, and dense patches with a backbone of large trees. If landscape treatment targets are achieved, over 60% of the total moist and cold forest area will remain dense (Fig. 6) to meet habitat and other objectives.

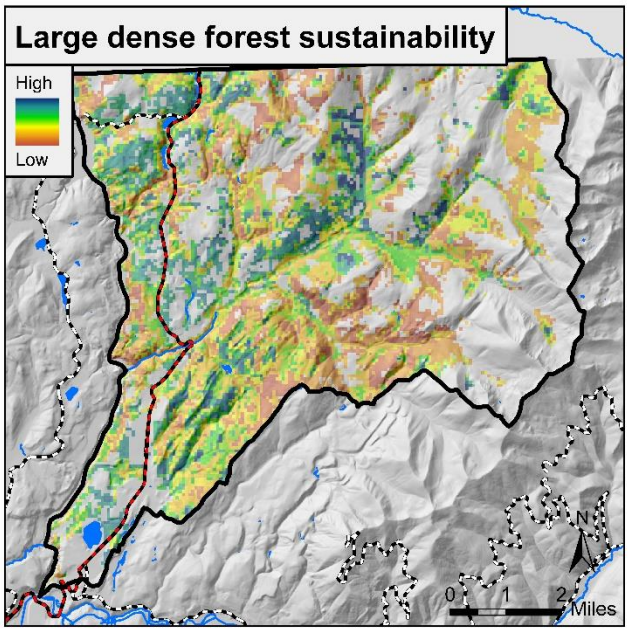
Open forest maintenance treatment need

Over the next 15 years, an estimated 750-1,250 acres of currently open forests on dry and moist sites (Fig. 4) will need prescribed fire, mechanical treatments, and/or wildfire to maintain open conditions by reducing surface fuels and small trees. Specific maintenance strategies will depend on management objectives, site conditions, and time since treatment.

Sustainable locations for dense forest with large trees

Locations with low to moderate current and future moisture deficits (Fig. 3) and low fire risk (Fig. 2) offer the most sustainable locations to maintain sufficient area and patch sizes of this habitat type. These locations occur primarily in the western half (Fig. 7). This sustainability map can be used in conjunction with treatment priority (Fig. 9) to select areas to shift to open forest vs. where to maintain and increase large tree, closed-canopy patches.





Left: Figure 6. Current and post-treatment proportions of forest types and structure classes. * mid-point of range in Table 1.
Right: Figure 7. Sustainability of current and potential large tree, dense forest based on fire risk and drought vulnerability.

Landscape Treatment Prioritization

Prioritizing for forest health & to reduce fire exposure of homes

Landscape treatment priority integrates three metrics of forest health – forest fire risk (Fig. 2), drought vulnerability (Fig. 3), and presence of overabundant forest structure types (Fig. 4) – with wildfire transmission to homes (Fig. 8). We also recommend incorporating the large dense forest sustainability layer (Fig. 7) as an overlay when selecting treatment locations. Wildfire transmission is relatively low throughout the planning area due low density of structures. Risk to homes is still present, however. Fuel reduction treatments, defensible space, and home hardening are recommended on private parcels with homes.

Treatment priorities

Landscape treatment priority is high across most of the southern half of the planning area (Fig. 9), which is predominantly roadless and recommended for wilderness designation in the Colville National Forest Management plan (Fig. 5). Treatment priority is also high in patches across the northern half. Low-priority areas that are also high-sustainability locations for large-closed forest are concentrated along Slate and Styx creeks, as well as other areas in the western portion (Figs. 7 and 9). Some low-priority areas may need treatment to address species composition, insect and disease risk, or to meet other objectives.

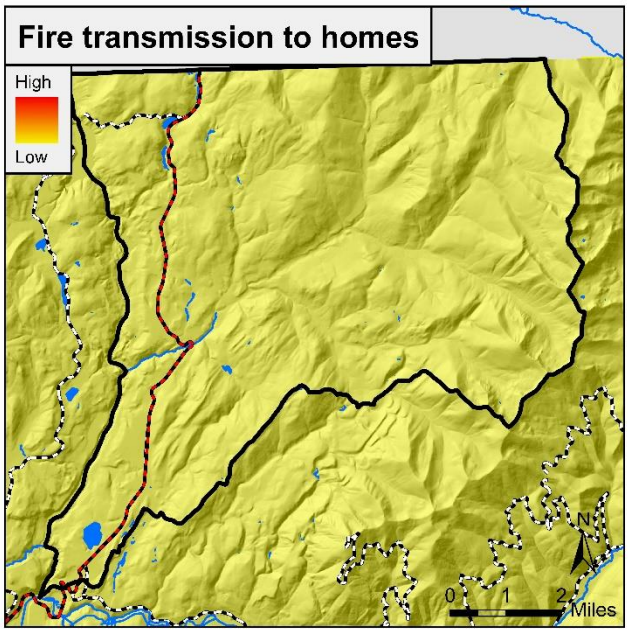


Figure 8. Fire transmission to homes shows where fires that expose structures are most likely to originate. It is based on simulated fire perimeters given contemporary patterns of fuels, topography, and wind.

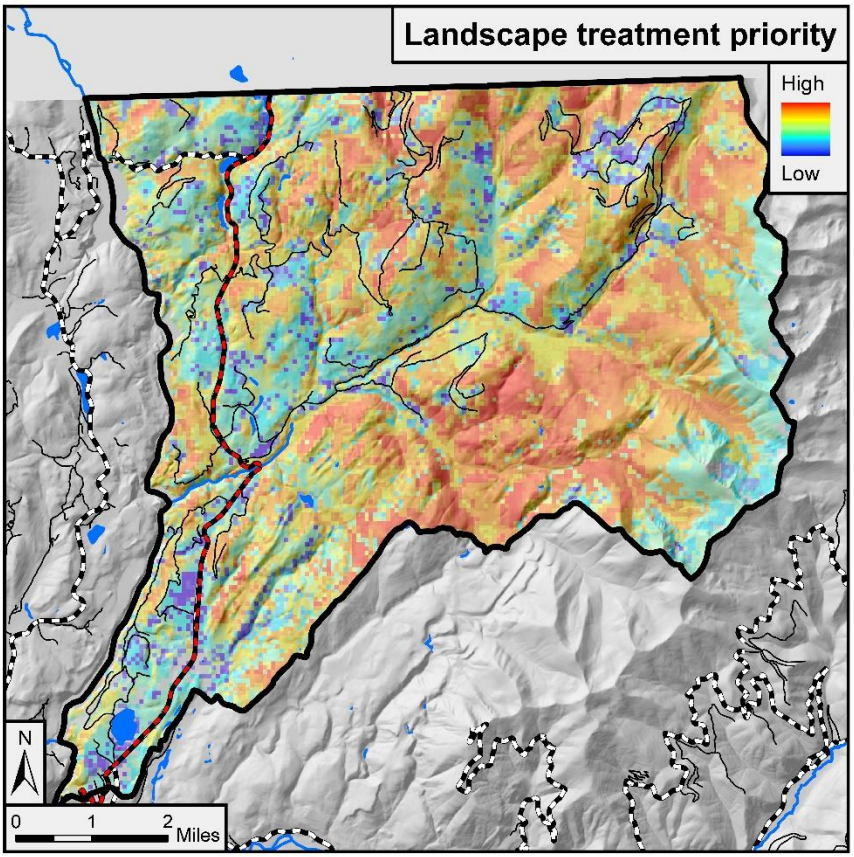


Figure 9. Landscape treatment priority is based on three metrics of forest health – forest fire risk (Fig. 1), drought vulnerability (Fig. 3), overabundant forest structure (Fig. 4) – as well as wildfire transmission to homes (Fig. 8).

Definitions

Vegetation Types

Cold forest: Upper elevation mixed-conifer forests with high-severity fires every 80-200+ years.

Dry forest: Ponderosa pine and Douglas-fir dominated forests that historically had surface fires every 5-25 years.

Moist forest: Forests that historically had mixed-severity fires every 30-100 years and were composed of western larch, Douglas-fir, western white pine, lodgepole pine, grand fir, Engleman spruce, sub-alpine-fire, and broadleaf species.

Woodland/Steppe: Grass and shrub lands that may have oak woodlands or ≤ 10% conifer cover.

Forest structure

Large tree: Overstory diameter > 20 inches.

Medium tree: Overstory diameter 10-20 inches.

Small tree: Overstory diameter < 10 inches.

Dense canopy: Greater than 40% tree canopy.

Open canopy: Less than 40% tree canopy.

Fuels: Shrubs, grasses, small trees, litter, duff, and dead wood.

Fuels treatments: some combination of mechanical density reduction (commercial or non-commercial) and surface and ladder fuel reduction (prescribed fire, piling & burning, etc.).

Managed wildfire: where consistent with regulations, naturally ignited fire is managed for multiple goals, including resource benefits, firefighter safety, community protection, and suppression.

Wildfire Response Benefit Prioritization

Dual benefits for forest health and wildfire response

It is necessary to conduct treatments to both improve forest health and reduce fire risk to communities as well as provide conditions where firefighters can safely and efficiently conduct wildfire and prescribed fire operations. The wildfire response benefit metric (WRB; Fig. 10) identifies and prioritizes locations where values at risk that are more likely to be the focus of fire operations (homes, infrastructure, sources of drinking water, and commercially managed lands) coincide with areas likely to transmit wildfire to homes and generate severe fire behavior. Because there are positive feedbacks between healthy, resilient forests and safe, effective fire operations, the WRB metric also integrates the landscape treatment priority map (Fig. 9).

Where WRB is highest, actions may be needed to create and maintain conditions that provide a tactical advantage for fire operations. These actions will vary with the local context and can include landscape-level forest health and fuel treatments, treatments along fire control lines and escape routes, resident and community fire mitigation activities (e.g. defensible space, home hardening), and improving signage and road conditions. The WRB metric provides a high-level prioritization, and additional work at the local level is required to identify appropriate actions and assess their feasibility. WRB is useful for prioritizing Potential Control Lines (PCLs) for fire operations (Fig. 11). PCLs are a part of Potential Operational Delineations (PODs); see page 7.

In the Slate planning area, wildfire response benefit is highest in the southwestern portion due to interspersed homes, infrastructure, and commercially managed lands to the west of the planning area (Fig. 5). The Highway 31 corridor in the northwestern portion (Fig. 2) also has relatively high wildfire response benefit. Crown fire potential is high throughout the planning area in locations with dense forest structure with high fuel loading.

Definitions (continued)

Wildfire response benefit: Any tactical advantage gained for wildfire response activities from actions on the landscape, including, but not restricted to, identifying and consolidating existing anchor points and control lines and reduction of potential fire behavior. Wildfire response benefit is not restricted to any specific wildfire management strategy and instead is centered on conditions that improve fire operations safety and effectiveness.

Potential Control Lines (PCLs): Boundaries of Potential Operational Delineations (PODs) relevant to fire control operations (e.g. roads, ridgetops, and water bodies).

Potential Operational Delineations (PODs) for wildland fire: Landscape containers whose boundaries are potential control lines (PCLs). PODs are useful for planning strategic response to unplanned ignitions, strategic fuel planning, and prioritizing fuel treatments within PODs.

Commercially managed lands: Commercially managed forestlands include: DNR Trustlands, tribal forests, industrial forests, non-industrial private forests, and US Forest Service forests where timber is a primary management objective.

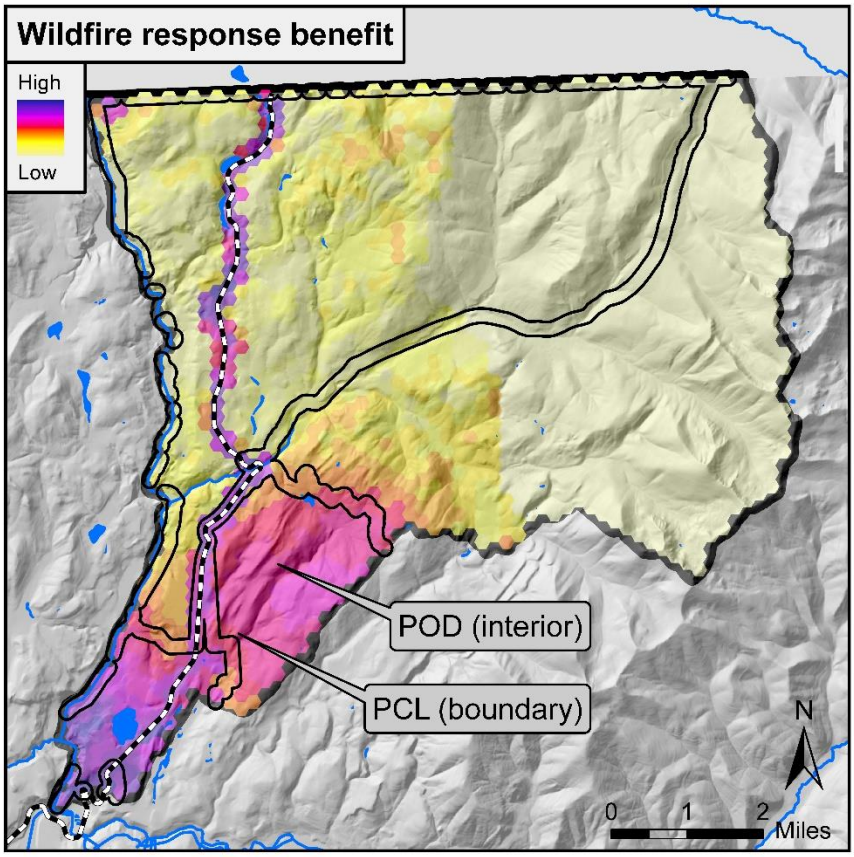


Figure 10. Wildfire response benefit (WRB) integrates multiple fire risk and forest health components. It includes four fire risk metrics representing highly valued resources – risk to homes, infrastructure, drinking water, commercially managed lands – as well as crown fire potential and wildfire transmission to homes (Fig. 8). Combined, these account for 75% of the wildfire response benefit. Landscape treatment priority (Fig. 9) accounts for the remaining 25%. Also shown are PODs: units bounded by PCLs (open black lines). One use of the WRB metric is to prioritize Potential Control Lines (PCLs) for fire operations (Fig. 11).

Prioritizing Landscape Treatments for Dual Benefits

Integration of forest health and wildfire response benefit using PODs

Potential Operational Delineations (PODs) provide a powerful spatial framework to communicate and identify locations that will deliver dual benefits for forest health and wildfire response at the landscape scale. PODs are large landscape areas delimited by Potential Control Lines (PCLs) for wildfire and prescribed fire operations, delineated by fire operations personnel. PCLs can be roads, ridgelines, or any artificial or natural fuelbreak that provides a strategic opportunity for fire operations. Summarizing landscape treatment priorities (Fig. 9) within PODs and wildfire response benefit priorities (Fig. 10) within PCLs enables planners and managers to identify, at a high level, locations where forest health or fuels treatments can be connected to a high-priority PCL that will support firefighter operations (e.g. ingress/egress route or opportunity for engagement).

Achieving forest health and wildfire response goals will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs.

There is important work to do in all Slate PODs to achieve the forest health treatment targets in Table 1. First-priority PODs correspond to areas with relatively high landscape treatment priority (Fig. 9) in southeastern portions of the planning area (Fig. 11). All of the PCLs are first priority due to the size of the planning area, reflecting widespread opportunities for dual benefit treatments. Further work is needed to assess PCLs locally for their condition and detailed treatment needs, which will depend on management goals and values at risk. Ideally, landscape treatments will be implemented adjacent to priority PCLs where feasible to maximize both forest health and wildfire response goals.

Achieving forest health and wildfire response dual benefits will require primarily large, landscape-level treatments across PODs (~100's-1,000's of acres) and, to a lesser extent, targeted treatments along PCLs. These two approaches combined will contribute to restoring and maintaining large portions of the landscape in a resilient condition while providing safe and effective areas for firefighter engagement during suppression, prescribed fire, or managed wildfire operations.

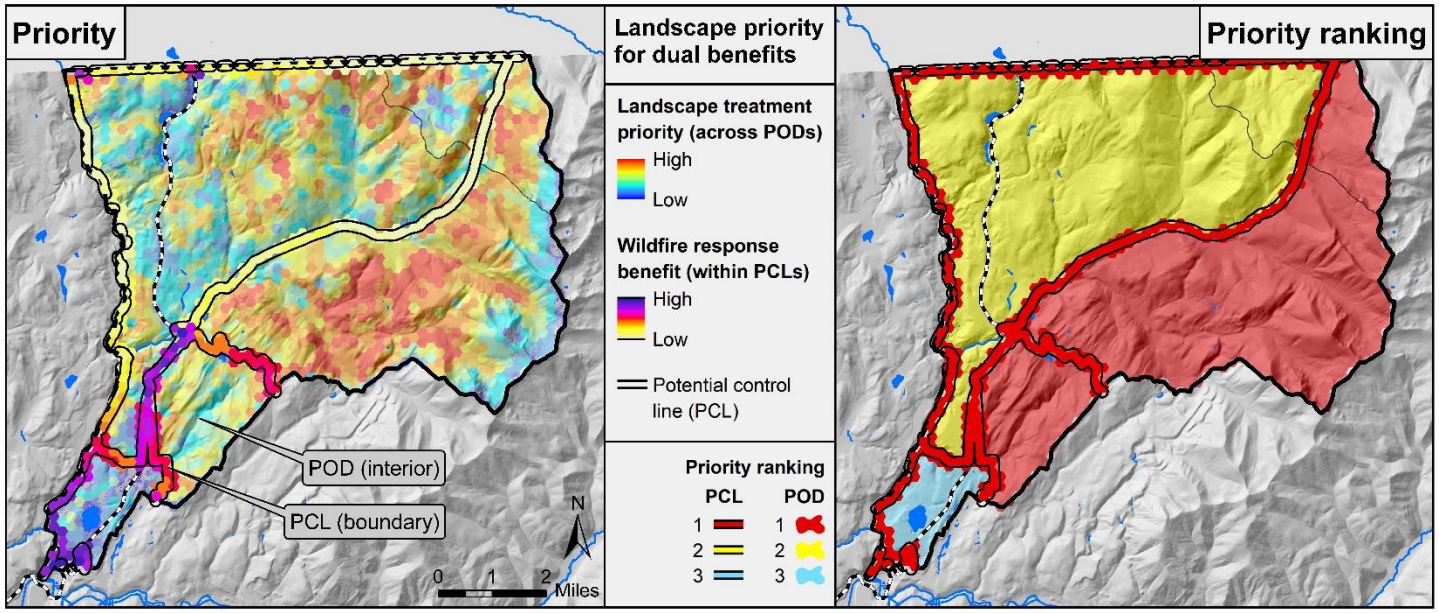


Figure 11. Landscape prioritization of dual benefits using PODs as a spatial framework to summarize treatment priorities. Both maps display landscape treatment priority within PODs and wildfire response benefit within PCLs. The map on the left shows the datasets at the raster level, while the map on the right shows the same information summarized and ranked within PODs and PCLs. PCL width is inflated to display spatial patterns. *PODs shown here are part of an ongoing process towards an all-lands delineation; POD boundaries are subject to change following on-the-ground vetting and continued dialogue among wildfire agencies and stakeholders.*