NATURAL RESOURCES

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

Washington Department of Natural Resources and USDA Forest Service
Olympia, Washington
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Alignment between state and federal forest health strategies in eastern Washington

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SUMMARY

We are witnesses to unprecedented legislative and financial support at both the state and federal levels to improve forest health and reduce wildfire risk. The primary strategy guiding the state's forest health investments in eastern Washington is the 20-Year Forest Health Strategic Plan: Eastern Washington (2017) (FHSP) put forward by the Washington Department of Natural Resources. The central strategy guiding the USDA Forest Service's investments in the Western United States is the Wildfire Crisis Strategy (2022) (WCS). 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 if these differences are resulting in duplication of efforts and inefficiencies as a result of differing policies and management direction. This paper aims 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 State. It also provides context about the public policies and scientific research that led to their development, and how those products are informing implementation in Washington State. We posit that, 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 and forest health treatments. This strong alignment and synergy will help the Washington State Department of Natural Resources and USDA 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 in the western U.S. They present a unique opportunity to change the forest health paradigm by acting with urgency and at a scale commensurate with the problem.

POLICY HISTORY LEADING TO THE FEDERAL AND STATE STRATEGIES

The policy history leading to the USDA Forest Service's Wildfire Crisis Strategy

In 1905, the USDA Forest Service (Forest Service) was established to improve and protect the condition of forested areas of the United States and to "furnish a continuous supply of timber for the use and necessities of the people of the United States"[1]. In 1910, devastating fires in Idaho and Montana led to the development of fire policy, resulting in a century of aggressive fire suppression on federal and state managed lands. Beginning in the 1960s, there was increasing recognition of the ecological role of fire as a management tool to maintain fire-adapted landscapes. In 1995, the Federal Wildland Fire Management Policy recognized the ecological role of fire in forest management and gave fire managers flexibility to pursue ecological fire management goals when appropriate. Despite policy changes in favor of ecological goals, fire suppression remains the dominant fire management strategy.

Over the past 35 years, both burned area and suppression costs have steadily increased, with a record-breaking $4.4 billion spent by the federal government in 2021[2]. In 2010, the National Cohesive Strategy[3] was released to restore and maintain resilient landscapes, create fire-adapted communities, and support safe and effective wildfire response. The three[1] goals of the Cohesive Strategy have framed subsequent policy, investment, fire management, and wildfire research.

As fire activity continued to escalate and much of the West experienced prolonged droughts, federal policymakers recognized that land managers needed to increase the pace and scale of forest treatments. The Shared Stewardship Strategy[4] was launched to focus on state and federal collaboration. Facilitated by newer science, the Strategy provided methods to map and quantify wildfire transmission, and a quantitative framework for cross-boundary planning, to increase the scale of fuel treatment projects and coordinate on landscape scale objectives. Shared Stewardship was codified in Memorandums of Understanding (MOUs) signed between the Forest Service and many state land management agencies, including the Washington Department of Natural Resources (DNR) in 2019.

Despite these and other prior policy initiatives[5] and funding for increasing the pace and scale of treatments, none directly answered a recurring question posed by congressional oversight committee members to Forest Service leadership - how much funding does the agency need for forest and fuels management programs to significantly change the trajectory of fire losses, and where in the country is that funding most needed. Addressing this issue was a frequent topic of discussion between Forest Service legislative affairs and leadership[2], and despite substantial investments in risk assessments, models to simulate national fuels investment scenarios were nonexistent in the Forest Service and its sister agencies.

This problem was of keen interest to the State and Private Forestry Deputy Chief John Phipps, who had oversight responsibilities for fire and aviation management, and in his prior capacity as Rocky Mountain Research Station (RMRS) director, was familiar with the types of operations research and planning models that could be leveraged to build national scale fuels treatment scenarios[3]. Phipps envisioned a highly focused fuel treatment scenario designed to significantly reduce wildfire impacts to communities from wildland fires igniting on national forests. The scenario was motivated by fire simulation research findings where about 80% of predicted wildfire structure exposure could be mapped to about 20% of the national forest system lands [6, 7]. What ensued over much of 2020 was a dialogue between Phipps and researchers at RMRS to build a 10-year treatment scenario, complete with a treatment schedule (where and when) to address predicted community exposure.

Three key features of the plan were that it not explicitly quantify wildfire risk to private property, thereby sidestepping issues that have emerged with risk assessments that did predict private losses[4]; that the bulk of the exposure was on non-Forest Service lands; and that areas where exposure originated encompassed a wide range of other important values (biodiversity, water, recreation, etc.) that would benefit from forest restoration activities. The "10-year plan" was developed with the ForSys scenario planning model and published as a case study to identify national scale investment strategies[6]. The "10-year plan" became the blueprint for the Wildfire Crisis Strategy (WCS)[8] and was released with the associated implementation plan in January 2022. The WCS estimated the need for treatment on approximately 20 million acres on National Forest System (NFS) land and 30 million acres on other Federal, State, Tribal, and private lands in the Western US.

The resulting WCS documents were widely circulated to key congress members and staff, where they found a highly receptive audience and an appetite for the "fireshed" concept (described in Figure 1) created as part of the plan[7]. The timing of this science-policy experiment turned out to be in perfect step with the U.S. Congress, which sought budget requests from the Forest Service to include in the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Bill (BIL)[9]. The BIL authorized over $5.5 billion in federal spending to reduce wildfire risk, restore healthy, productive forests, and improve environmental, recreation and economic infrastructure. Different provisions within the BIL describe how the funds are to be spent and have established links to the goals of the Cohesive Strategy. BIL provisions include funding for implementing the WCS, as described in the original 10-year plan, with 10 million acres of fuel treatments to improve vegetation condition and the ecological role of wildfire, provisions for improving fire detection and firefighter pay, and provisions to fund Collaborative Forest Landscape Restoration Programs and community wildfire Defense Grants, among others. The BIL also sets requirements for reporting and accountability to Congress on the work accomplished with the significant amount of funding associated with the BIL.

[1] The National Wildfire Cohesive Strategy was amended in 2023 to spotlight critical areas and challenges that were not identified or addressed in depth in the 2014 Cohesive Strategy.

[2] Personal communication, Doug Crandall, Forest Service legislative affairs lead (retired), June 20, 2023.

[3] Personal communication, John Phipps, Forest Service Deputy Chief, State and Private Forestry (retired), June 20, 2023.

[4] https://www.opb.org/article/2022/09/26/oregon-postpones-final-wildfire-risk-map-and-rules-for-one-year/

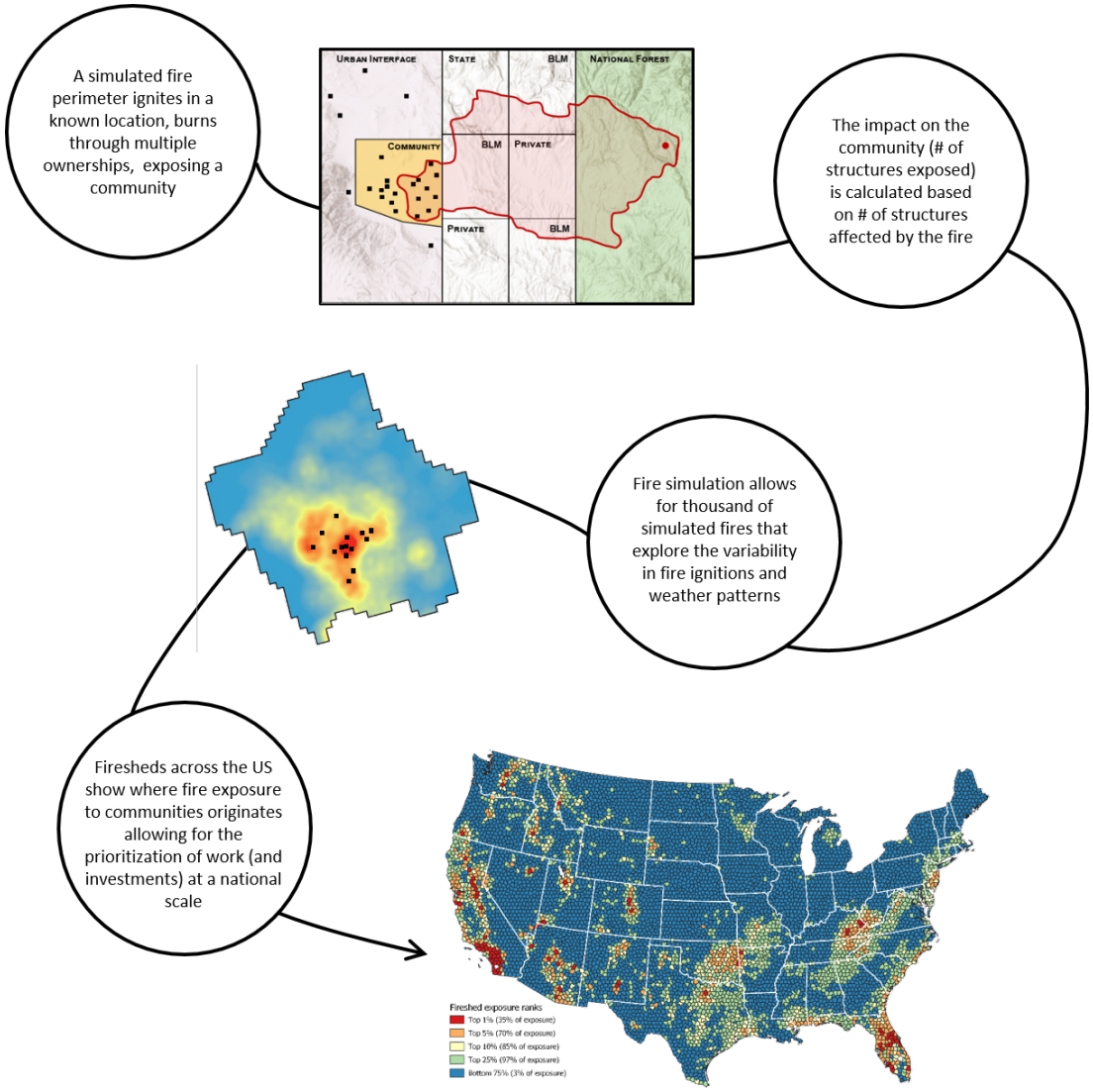

Fig. 1. Conceptual fireshed development process. The concept of wildfire transmission is exemplified by a single fire. Exposure to communities from that fire is based on the overlap between a fire perimeter and mapped structures. When thousands of fire seasons with thousands of fires are simulated, a fire transmission surface is obtained. This accounts for spatial variability of where fires start and the combination of fire weather and topography that determines how each simulated fire will spread. Wildfire transmission can then be summarized at the scale of firesheds across the continental US.

The priorities identified in the WCS were translated to on the ground investments by the Wildfire Risk Reduction Team (WRRIT) within the Washington Office of the Forest Service, under direct supervision of Forest Service leadership.

Following the release of WCS, the Forest Service partnered with the National Forest Foundation to host a series of ten roundtable discussions with the goal of collecting partner and employee input on the WCS implementation plan. Roundtables were focused on five main topic areas relevant to the implementation of WCS and organized by region, allowing for regional customization to reflect the contextual diversity and relationships associated with fuel reduction efforts across the country.

The Forest Service released a list of initial WCS landscapes in April 2022 where WCS investments should be focused. WCS landscapes focused on firesheds where wildfires are expected to lead to exposure of people and property[10]. Additional considerations included where collaborative efforts are already in place and opportunities to invest in underserved and socially disadvantaged communities.

The Inflation Reduction Act authorized additional funding in August 2022 for wildfire risk reduction and ecological resilience improvement[11]. With the Inflation Reduction Act came an additional $2 billion dollars to reduce risk and manage hazardous fuels.

In January of 2023, a new set of additional WCS landscapes were identified in response to available funding through the Inflation Reduction Act. The selection of a second set of landscapes was based on the 2022 roundtables with partners and employees and the Secretary of Agriculture's memorandum on Climate Resilience and Carbon Stewardship of America's National Forests and Grasslands, released in June 2022. Criteria for selecting these landscapes included wildfire exposure to

buildings in the wildland-urban interface (WUI), exposure to underserved communities, Indigenous peoples and lands, sources of drinking water, habitats for native fish and wildlife, critical infrastructure and utility corridors.

The policy history leading to Washington's 20-Year Forest Health Strategic Plan

In 1951, the Revised Code of Washington (RCW) 76.06 became Washington's primary forest health law. RCW 76.06 focused primarily on forest insect and disease control. Over the last 20 years, the forest health law received several amendments to broaden its scope and include a focus on wildfire and forest resilience, in addition to insects and diseases. RCW 76.06 also designates the publicly elected commissioner of public lands (CPL), who leads DNR, as the state of Washington's lead for all forest health issues across all lands.

The CPL's first all-lands forest health effort was the Forest Health Hazard Warning issued in 2012. The Forest Health Hazard Warning process established in RCW 76.06 allows the CPL to address developing or existing forest health threats by providing technical assistance and outreach to landowners in the hazard area. A technical advisory committee developed recommendations for the CPL on which areas of the state should be covered by a Forest Health Hazard Warning. The 2012 Forest Health Hazard Warning process was the state's first forest health spatial prioritization. Prioritization metrics used to select warning areas included current insect damage based on aerial survey, future insect damage (National Insect and Disease Risk), an assessment of forest structure departure from historical conditions and the ability to manage the forest to address the issue. The DNR sent over 10,000 mailings to landowners in the warning areas, which included portions of Ferry, Okanogan, and Klickitat counties. Forest health workshops were held, and state forest health treatment funding was focused in these areas.

In 2016, the Washington State Legislature directed the DNR to develop a 20-year strategic plan to treat areas of state forest land identified by the department as being in poor health. The historic 2014 and 2015 fire seasons, when over 1.4 million acres burned in Washington State, were the catalysts for the legislature to request the strategic plan. DNR interpreted the language in this request to develop a forest health strategic plan for all lands in eastern Washington. The interpretation recognizes that the scale of the forest health problem transcends land ownership. DNR chose eastern Washington because it is where the most urgent forest health needs exist, and where there is a strong scientific understanding of the need and social support for action.

Over six months, DNR engaged diverse stakeholder groups, representing over 30 different organizations, to develop the FHSP. This included a steering committee and several subcommittees that worked on developing different components of the FHSP. DNR invested in a robust stakeholder engagement process to help increase the potential of meaningful implementation by deepening collaborative relationships between stakeholders to achieve shared goals.

Released in 2017, the FHSP focuses on strategies and actions to improve forest health and community wildfire preparedness in eastern Washington. It aims to treat 1.25 million acres by 2037 in targeted geographies delineated by watershed prioritization. The FHSP also outlines a framework for a detailed forest health assessment in priority areas.

Following the release of the FHSP, several amendments were made to RCW 76.06 to codify plan elements into state law. Specifically, RCW 76.06.200 directed DNR to establish a forest health assessment and treatment framework to proactively and systematically address the forest health issues facing the state[12]. In addition, the new statute requires DNR to conduct the forest health assessment and treatment framework both on lands protected by the department, and those outside of the department's fire protection responsibilities that could pose a high risk to department-protected lands during a fire[13].

The forest health assessment and treatment framework consists of three elements: assessment, treatment and reporting[13]. This assessment materializes in DNR's landscape evaluations conducted in forest health priority planning areas in eastern Washington. DNR is required to conduct 200,000 acres of landscape evaluations for each biennium.

Treatment accomplishments are summarized in DNR's Forest Health Tracker, an online application where users can visualize completed treatments on the landscape. The Forest Health Tracker is an all-lands compilation of treatments based on actions reported by different ownerships and compiled by DNR.

Every two years, the agency reports on forest health assessments and treatment accomplishments to the Legislature. The 2022 Forest Health Assessment and Treatment Framework Report[14] is a good resource for learning about DNR's landscape evaluation results and forest health treatment accomplishments by all landowners.

In 2019, DNR released the Washington State Wildland Fire Protection 10-Year Strategic Plan[15]. This plan mirrors the National Cohesive Wildfire Strategy by focusing on suppression, resilient landscapes and communities. The Legislature passed House Bill 1784 in 2019, which amended RCW 76.06.200 in recognition that forest health and wildfire are inextricably linked in eastern Washington. An amendment in House Bill 1784 directed DNR to add a dual benefit component to the landscape evaluation process[16]. Specifically, the Legislature required DNR to prioritize forest health treatments that support the benefits of forest health while providing geographically planned tools for wildfire response[16].

In 2020, DNR conducted a pilot project to develop a collaborative framework to incorporate the dual benefit requirement into the existing landscape evaluation process. This pilot project benefited from existing social support and relationships established during the development of the FHSP. The result of the pilot is a dual benefit prioritization component of the landscape evaluation using the Potential Operational Delineations (PODs) framework[17, 18] and is now the standard output of DNR's landscape evaluation process.

In 2020, DNR released an update to the Washington State Forest Action Plan (Action Plan) to foster coordinated, cross-boundary management and planning. The Action Plan links existing strategic plans in the state, including the FHSP, the 10-Year Wildland Fire Protection Strategic Plan and the Plan for Climate Resilience[19], under one overarching strategy document. The FHSP is the blueprint for forest health in eastern Washington within the Action Plan.

In 2021, the State of Washington passed House Bill 1168[16], in which the legislature found that "increasing the pace and scale of science-based forest health activities to reduce hazardous fuels and restore fire resilient forests, including through mechanical thinning and prescribed burning, on federal, state, Tribal, and private lands, will reduce the risk and severity of wildfires, protect cultural and archaeological resources, improve fish and wildlife habitat, expand recreational opportunities, protect air and water quality, create rural economic opportunities, provide critical wood products, and increase long-term carbon sequestration on our natural resource lands."

Along with House Bill 1168 the legislature committed $125 million for the next four biennia, for a total of $500,000,000. to establish a new state Wildfire Response, Forest Restoration, and Community Resilience account that makes investments to help protect the state's people, environment, and economy by implementing actions consistent with the State's Forest Action Plan and strategies within. Like the BIL at the federal level, the funding levels and the breadth of the goals in House Bill 1168 present a watershed moment in the state's long-term commitment to forest health and community protection.

A CALL FOR ACTION

Both the WCS and the FHSP establish the need for action based on the decline of forest health for most of the western U.S., including Washington. Both strategies highlight the conditions that played out over more than a century to create the wildfire problem the western US has today – accumulation of fuels, warming climate and wildland urban interface expansion due to development in fire-prone landscapes – with past land-use practices, drought and overemphasis on fire suppression as contributing factors[8].

Overgrown forests, coupled with episodic droughts, result in increased competition among trees and loss of vigor. These overstocked, stressed forests are now facing serious threats and are at higher risk of damage by disease, insects and wildfires. There are 10 million acres of forestland in eastern Washington – nearly 2.7 million acres require some type of active management or disturbance to move the landscape to a resilient forest structure[20]. The region has experienced increasing levels of tree mortality and damage due to insects and disease[21], and these trends are expected to continue into the future[22].

A visible symptom of unhealthy forests across the West is the increase in fire size and intensity. Extended fire seasons require a year-round workforce to keep up with the extended fire suppression, pre-season planning, and post-fire recovery. Many of these landscapes have had record fires in the past 20 years; nearly a quarter of the contiguous United States is at moderate or very high risk from wildfire[23]. In 2015, more than 1,500 wildfires burned over one million acres and 230 homes across Washington State. The cost of the 2015 fires to Washington state taxpayers was $89 million, three times the 10-year annual average. Across all agencies and landowners, more than $319 million was spent on fire suppression that year.

The WCS and FHSP call for an increase in the pace and scale of fuels reduction and forest restoration treatments to address the ongoing forest health decline. While the decline in forest health across fire-adapted forests is a major contributing factor to the wildfire crisis, it also poses an opportunity for action.

SCALE AND METRICS USED TO SET PRIORITY AREAS FOR TREATMENT

Forest Service Wildfire Crisis Strategy

The WCS defines the basic spatial prioritization unit as a "fireshed." Firesheds, roughly 250,000 acres in size, are mapped based on wildfire transmission to communities (Fig. 1). Firesheds are all-lands, i.e., include all ownerships and reflect the intention to implement treatments in areas where fires are more likely to occur, grow, spread and impact communities. Firesheds were mapped as part of a spatial framework to account for the fact that wildfire risk and mitigation efforts to address that risk occur at multiple scales. Nested within the 250,000-acre firesheds are 25,000-acre fireshed project areas, much the same way a drainage is nested within a watershed. Firesheds function as the scale at which exposure is assessed, while fireshed project areas function as the implementation and treatment prioritization scale[7].

The number and spatial extent of firesheds is determined by analyzing simulated ignitions and fire perimeters relative to structures. Like hydrological basins (i.e., watersheds), the fireshed captures the source land base where fires ignite and grow to expose communities. Wildfire transmission is calculated by simulating thousands of fire seasons that explore the spatial variability in ignition location and weather patterns. Fire perimeters from these simulations are overlaid with the location of structures. Wildfire transmission, defined as the number of structures exposed by a given fire perimeter, can be calculated for each fire ignition in thousands of fire seasons. Firesheds are mapped by dividing up the landscape into regular-sized units that represent similar source levels of community exposure to wildfire (Fig. 1).

Forest Service researchers modeled the scheduling of an accelerated forest and fuel management scenario that targeted the source of wildfire exposure to developed areas within firesheds[6]. Treatments avoided protected areas such as wilderness and focused on coniferous forests. Treatments were simulated within fireshed project areas using the scale of typical fuel treatment projects. This analysis underlying the WCS shows that the bulk of community wildfire exposure originates from a relatively small number of fireshed project areas in specific locations. The WCS summarizes this information at the fireshed scale and identifies firesheds at the highest fire exposure.

In Washington, the WCS included eight high-risk firesheds, which were aggregated into groups that define WCS landscapes. The Central Washington Initiative (CWI) was the first WCS landscape selected in Washington. It covers six high-risk firesheds and 3,116,000 acres in the eastern Cascades (Fig. 2). It is located on the Okanogan-Wenatchee National Forest and is one of the WCS landscapes to receive significant investments from the BIL[9]. The second WCS landscape selected in Washington was the Colville Northeast Washington Vision (CNWV), covering four high-risk firesheds across 1.6 million acres. It is located on the Colville National Forest and is one of 11 WCS landscapes selected across the western US to leverage investments available through the Inflation Reduction Act.

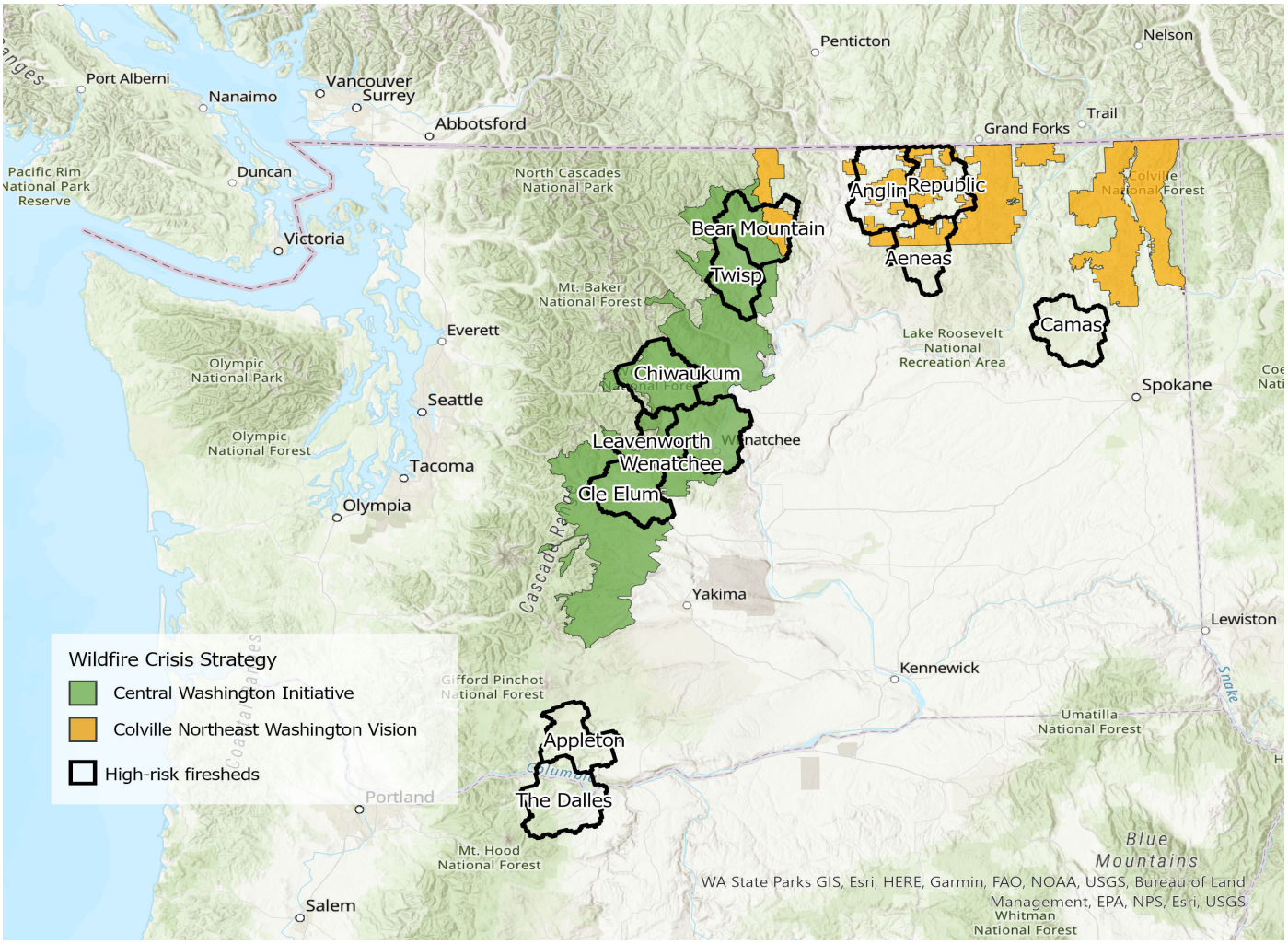

Fig. 2. The prioritization units of the WCS in eastern Washington. High-risk firesheds and WCS landscapes in eastern Washington as of July 2023.

Washington's Forest Health Strategic Plan

The FHSP prioritization occurs at two spatial scales, 12-digit Hydrologic Unit Code (HUC12) used to support the selection of planning areas and a landscape evaluation for each planning area (Fig. 3). In eastern Washington, individual HUC12s, on average 20,000 acres, were prioritized using two sets of tiers. Tier 1 included metrics that reflect current and future wildfire exposure – burn probability, fire intensity and expected future change in burn probability – combined with insect and disease risk, projected increases in climatic moisture deficit and forest departure needs. Tier 2 of the HUC12 prioritization quantified the extent of different highly valued resources and assets in each HUC12. Selected highly valued resources and assets included aquatic system health, WUI, drinking water, timber volume, large trees and wildlife[29].

Planning areas correspond to clusters of HUC12 watersheds. Landscape evaluations, the finest level of analysis in the FHSP, are conducted for planning areas (Fig. 3). Existing planning areas, between 14,326 and 338,246 acres, were selected based on the HUC12 prioritization and partner feedback. Planning areas are all-lands units of analysis, i.e., like WCS firesheds, they encompass all ownerships. As of May 2023, there are 47 selected planning areas, out of which 37 have been evaluated since 2017, when the FHSP was released. The remaining ten landscape evaluations will be completed by December 2024. As of December 2022, the DNR completed landscape evaluations for 37 planning areas in eastern Washington, comprising 4,165,780 acres of forest health assessments across all ownerships.

A landscape evaluation consists of a comprehensive assessment of the treatment needs and a spatial prioritization of treatment location for a dual benefit that is summarized using Potential Operational Delineation (PODs) and Potential Control Lines (PCLs). The assessment of forest health treatment needs is described in detail in the next section. The spatial prioritization for the dual benefit is conducted via two different, albeit connected, spatial prioritizations: the landscape treatment priority layer and the wildfire response benefit priority layer. These two layers are combined using delineated PODs and PCLs for each planning area (Fig. 4). A detailed description of this framework can be found in WADNR[29] and a brief description is provided below.

The forest health component of dual benefit is prioritized through a finer-resolution map (30 m) of landscape treatment priority. This includes layers of forest departure, moisture

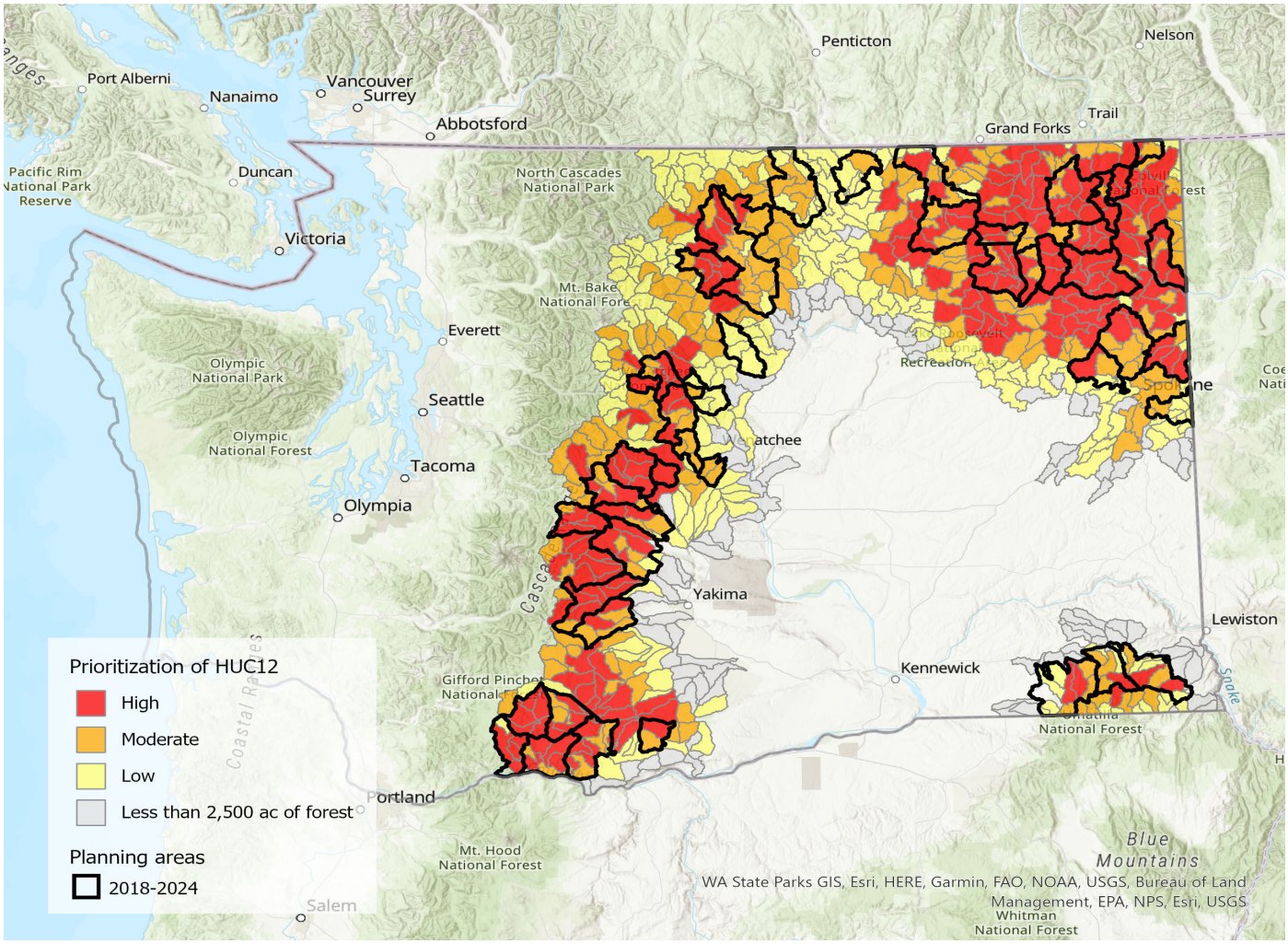

Fig. 3. Forest health HUC12 prioritization and FHSP forest health planning areas. HUC12 prioritization is color-coded and the outline of planning areas (clusters of HUC12) is shown in black. In planning areas, a comprehensive analysis of treatment needs and landscape prioritization of treatments is conducted during the landscape evaluation process. The first set of analyses was completed in 2018, and for each biennium, additional analyses are completed, and results are reported to the Washington Legislature. Reports to the legislature include the assessment of treatment needs and priorities in planning areas as well as treatment accomplishments for the biennium.

deficit, wildfire risk to the forest and wildfire transmission to communities. PODs within each planning area are prioritized into first, second and third priority based on the landscape treatment priority values for their forested land base. The landscape treatment priority map can also be used as a stand-alone dataset to identify project areas within each POD.

The fire operations component of dual benefit is accomplished via the wildfire response benefit prioritization. The prioritization integrates a combination of several wildfire risk layers (people and property, infrastructure, sources of drinking water and commercially managed lands), crown fire potential, wildfire transmission to structures and landscape treatment prioritization. Values of the wildfire response benefit prioritization are used to rank PCL segments into first, second and third priority in terms of their value for fire operations.

There is an important distinction between the two-prioritization metrics and their application to prioritize forest health treatments. The ranking of PCLs does not convey treatment priorities but rather a ranking of strategic locations for fire operations[29, 30]. Some of these locations may require forest health or fuel treatments to provide a stronger operational opportunity[30]. Many PCLs do not need any intervention. The data used in the landscape evaluations is inadequate for defining which PCLs require treatment but once PCLs are identified as strategic priorities, on-the-ground assessments can determine if additional treatment is needed.

Summary

The smallest prioritization units in the WCS are the fireshed project areas (25,000 acres) (Fig. 5). Projects were nested within firesheds (250,000-acre scale), and firesheds were used to delineate (among other considerations) the WCS landscapes for investments. There are two WCS landscapes in Washington: the CWI and the CNWV (Fig. 2).

The FHSP prioritization starts with the HUC12 watershed (~20,000-acre scale) (Fig. 3). HUC12 watersheds are ranked through a process that involves two tiers and multiple layers of fire exposure, forest health needs and the presence of highly valued

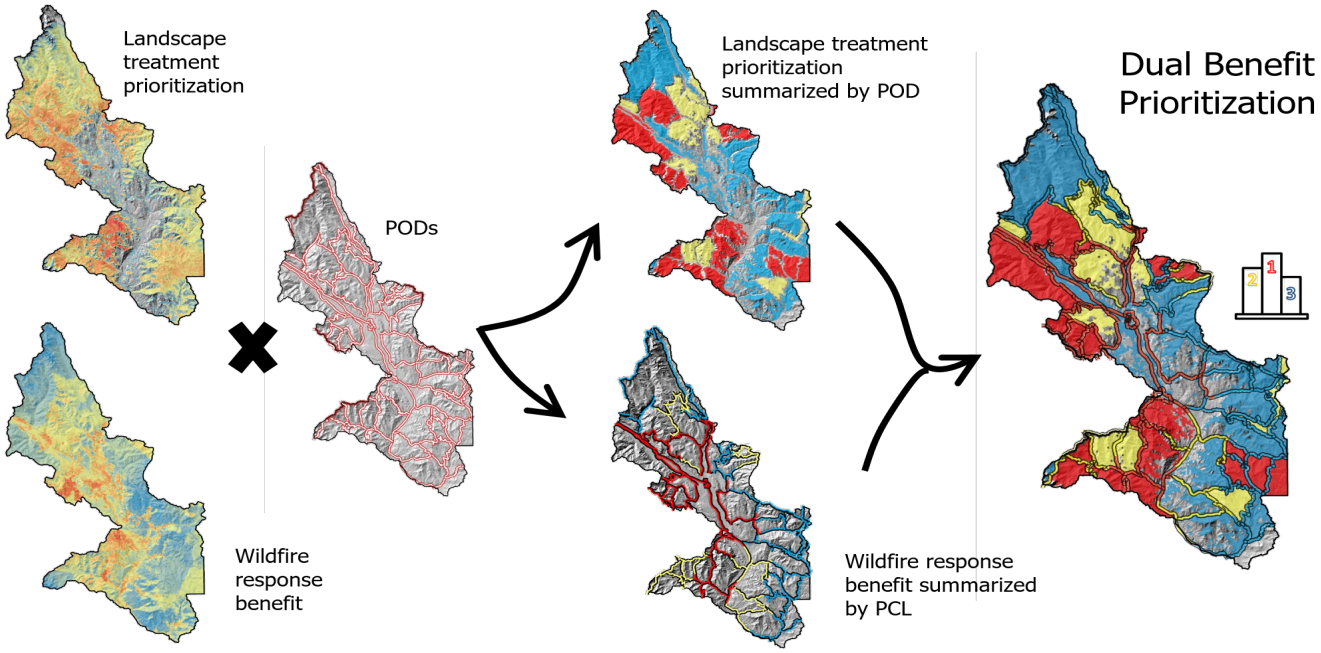

Fig. 4. Dual benefit spatial prioritization in a landscape evaluation. Spatial prioritization uses the PODs framework to summarize the two metrics in the dual benefit analysis. The landscape treatment prioritization focuses on the forest health component of dual benefit and is used to rank POD priorities. The wildfire response benefit prioritization is focused on the component of dual benefit that provides strategic locations for fire operations and is used to prioritize PCLs. The dual benefits ranking shows first (red), second (yellow) and third (blue) priorities.

resources and assets. HUC12 watersheds are then aggregated into planning areas based primarily on their ranking, their alignment with local forest health priorities and opportunities for treatment.

Within planning areas, which average about 112,000 acres in size, scientists conduct a landscape evaluation: a detailed analysis of forest health treatment needs and spatial prioritization of treatments for improving forest health and supporting fire operations for the planning area. The landscape evaluation produces a suite of products, including a spatial prioritization of forest health treatment locations for dual benefit. The landscape evaluation products have different scales varying from the 30-m pixel of the landscape treatment priority to the scale of PODs, which average 8,000 acres (Fig. 5).

Both FHSP and WCS are all-lands strategies for prioritizing assessment and investments. Both prioritizations have included non-forested lands – firesheds include rangelands and the HUC12 prioritization includes non-forested areas. However, fireshed priorities accounted for areas where treatments are not permitted (e.g., wilderness) and packaged treatments into 25,000-acre projects to focus initial treatment investments where exposure is concentrated.

Due to the nested scale of the prioritizations in both strategies, there are over 2.5 million acres of spatial overlap between WCS and FHSP (Fig. 5). Landscape evaluation products can be combined with fireshed projects to identify high-priority areas within planning areas that are high-priority from both the lens of wildfire transmission and the dual benefit criteria (Fig. 4). Once high-priority areas are identified, the PODs prioritization and the fine-scale products in the landscape evaluation can be used to refine project delineation and implementation.

SETTING TREATMENT TARGETS: HOW MUCH TO TREAT?

Forest Service Wildfire Crisis Strategy

The WCS has different treatment targets depending on the geography of interest and timeframe in eastern Washington. In the Central Washington Initiative (CWI) landscape the inital treatment target is 134,500 acres for the first two years (2022-2024). The treatment target for the Colville Northeast Washington Vision (CNWV) is to treat 2,000 acres per year, totaling 20,000 acres over the next 10 years. Note that the CNWV target corresponds only to treatment targets funded by the WCS. The Colville NF has a 20-year planning cycle that, while not funded through WCS, will address forest health concerns. Overall, the goal is to treat 20,000-25,000 acres per year on the Colville NF.

The treatment targets in the WCS are based on work that suggests approximately 35 to 45 percent of a fireshed should be treated through a range of fuels and forest management activities, including mechanical thinning and prescribed fire[24], to restore fire-adapted conditions. The WCS recommends that maintenance treatments occur at intervals of 10 to 15 years in order to maintain a resilient condition.

Washington's Forest Health Strategic Plan

The FHSP includes two target goals that play out at different scales and timelines of the plan. The first target is to treat 1.25 million acres by 2037. The treatment target in the FHSP was based on research on forest structure restoration needs[20] combined with an accessibility analysis.

The second target corresponds to the treatment targets determined during the landscape evaluation. Specifically, the landscape evaluation produces a treatment need range for the planning area[14]. Landscape treatment need includes number of acres needing treatment by a combination of forest type (dry, moist-cold) and forest structure (size class and canopy closure), as well as anticipated treatment type (non-commercial thinning, commercial thinning, fuels treatment, prescribed fire and managed fire). The treatment need is based on the departure of current conditions relative to an historic, and in some cases, future range of variation. Current conditions are assessed based on recent LiDAR or Digital Aerial Photogrammetry data depending on the region[14]. The methodology used to determine the treatment need range in the landscape evaluation also varies with geography. In the Okanogan-Wenatchee National Forest, departure assessment is based on the framework for landscape evaluation developed by the Okanogan-Wenatchee National Forest Restoration Strategy[25, 26] combined with input from local land managers and stakeholders that is specific for each planning area. In planning areas encompassing the Colville NF, departure was derived from state and transition models developed for the Colville National Forest Plan Revision[27] and the Integrated Landscape Assessment Project[28].

The FHSP treatment needs are a target and if met, would increase landscape resiliency. However, treatment needs do not account for any regulatory, operational or feasibility constraints that may deem a site unsuitable for treatment. For example, in the FHSP, targets do not account for federal land management allocations, including the Northwest Forest Plan, and Endangered Species Act consultation that often limits active restoration in support of endangered species habitat protection. Landscape evaluations are all-lands assessments intended to support and strategically focus management on high priority areas across boundaries. It is up to individual landowners to determine what treatments are appropriate in any specific location given their management objectives, as well as operational and economic considerations[14].

Treatment need is defined within a range, rather than a single target number, to account for variability in forest conditions and management goals. Of the 2,965,639 acres of forested lands in planning areas that have completed landscape evaluations, the combined treatment need range is 962,639-1,385,820 forested acres – approximately 32-47% of total forested acres in eastern Washington. The Little White Salmon planning area has the lowest treatment range (21-32% of forested acres) and the Chumstick to Lower Peshastin planning area has the highest treatment range (43-63%)[14].

Summary

The WCS establishes long-term (10 years) and short-term treatment targets (fiscal year) for the selected landscapes and has dedicated funding to support that work. These treatment targets

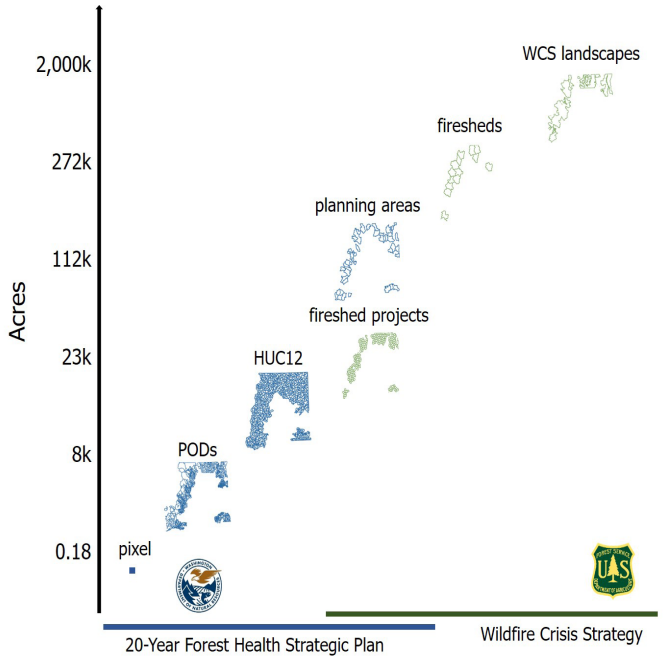

Fig 5. Nested scales of the different forest health policies in eastern Washington. The YY axis shows the average size of each prioritization unit, but distances in the axis are not true to scale. The FHSP produces prioritization products that vary from pixel scale (landscape evaluation, landscape treatment 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.

are based on an overarching literature estimate that 35-45% of firesheds need treatment to achieve a resilient condition[24]. However, the WCS does not include an analysis of the forest condition specific to each WCS landscape. Similarly, the WCS does not have a treatment prioritization within each WCS landscape (i.e., mid-scale assessment of priorities between landscape and project level). The WCS has dedicated funding to support the work across ownerships and tight timelines to accomplish work on a rolling basis over the course of the ten years of the strategy.

The FHSP requires DNR to conduct landscape-specific assessments that include treatment targets based on current forest conditions and departure assessments from reference conditions. From the 1.25 million acres to be treated by 2037 in eastern Washington, treatments are expected to occur primarily in planning areas and within the ranges described in the treatment needs. However, there is no legislative requirement on how much should occur inside or outside planning areas, or a minimum number of acres treated per year.

The WCS and FHSP recognize that treatment targets are estimates based on the best available science at one point in time. Targets will be adjusted as forest conditions change based on treatments, wildfires and other disturbances, and as improved data sources become available. Furthermore, both agencies recognize that treatment need exists across eastern Washington and are actively working to implement forest health

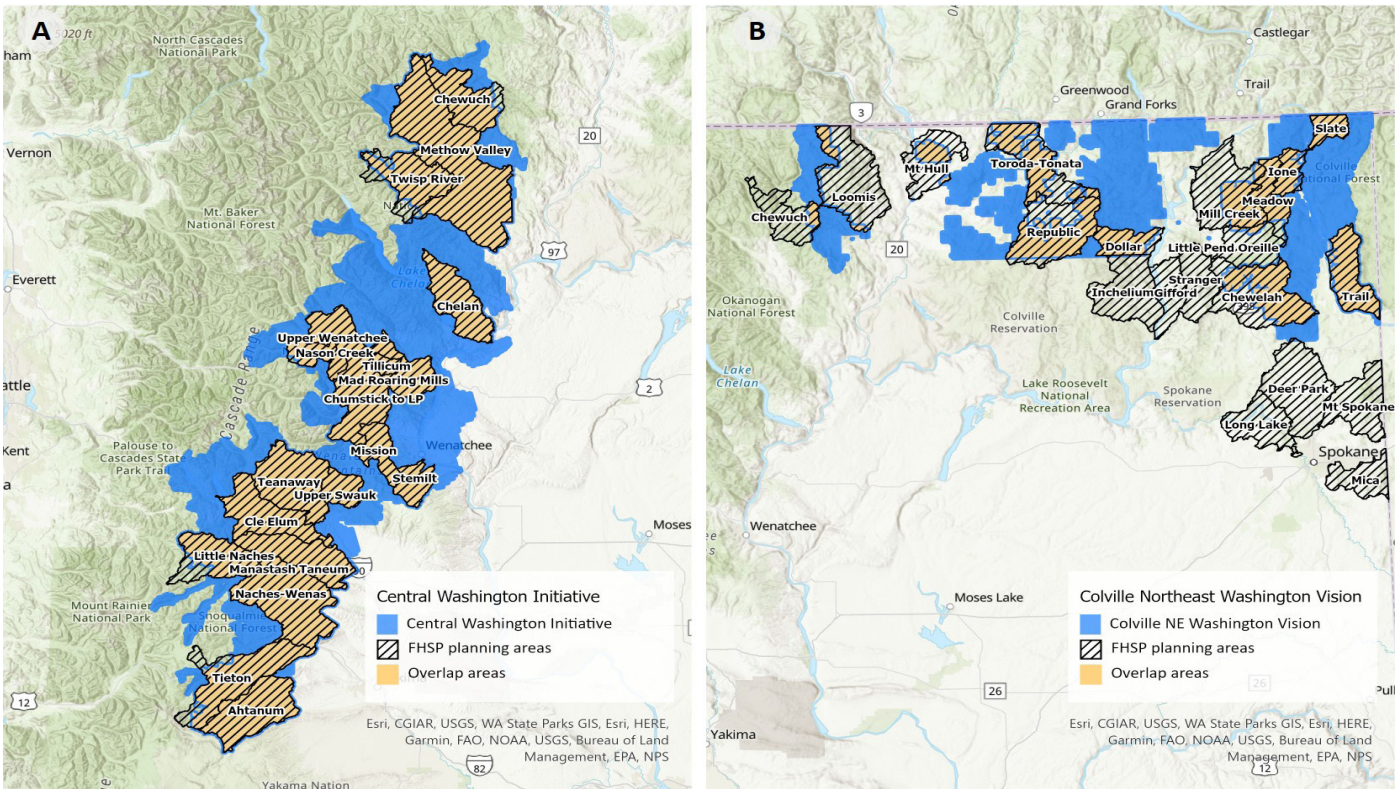

Fig. 6. Overlap between WCS landscapes and FHSP planning areas. Overlap within the Central Washington Initiative and Colville Northeast Washington Vision is shown in A and B, respectively.

and fuels treatments within and outside of planning areas and WCS landscapes.

HIT THE GROUND RUNNING IN WASHINGTON: COLLABORATION, ACCOMPLISHMENTS AND CHALLENGES IN THE CENTRAL WASHINGTON INITIATIVE LANDSCAPE

In June of 2022, DNR and the Forest Service, specifically the Okanogan-Wenatchee National Forest (OWNF), signed a Central Washington Initiative Memorandum of Understanding (CWI MOU)[31]. The purpose of the CWI MOU was to formalize cooperation toward promoting resilient landscapes and communities that are adapted to changing wildfire conditions within the CWI landscape (Fig. 6).

The CWI MOU follows the direction provided by the Shared Stewardship Strategy established by DNR, the Washington Department of Fish and Wildlife and the Forest Service in 2019. The Washington Shared Stewardship Strategy was the first formal step in recognizing the value of state and federal collaboration in forest, wildfire and community resilience work. It builds upon and expands on existing partnerships like the Good Neighbor Authority. The Shared Stewardship Strategy focused on creating a pathway for identifying landscape scale needs for targeted investments towards forest restoration and community wildfire resilience activities by combining federal and state tools, programs and authorities to achieve the greatest benefits for shared goals.

The CWI MOU provides a framework for coordination, collaboration and accountability specifically for activities within the CWI landscape. The intended result is increased efficiency in the planning and implementing of forest restoration treatments and wildfire resilience projects by leveraging resources and funding opportunities presented by the BIL and HB 1168. It states common goals and defines a framework to increase the number of forested acres treated to reduce wildfire risk, improve watershed resilience and create safer conditions for wildland firefighters.

New forest restoration treatment goals and timelines for the CWI landscape identified in the MOU include increasing forest health on 200,000 acres of national forest lands and 150,000 acres of non-federal lands in the next 10 years. The CWI specifies the treatment targets as planned footprint acres – defined as unique areas of land where a treatment was completed[32]. Accounting treatment acres as footprint acres is an important distinction from accounting treatment areas as activity acres. Activity acres correspond to the sum of completed treatments when multiple types of treatment (e.g. mastication, thinning, prescribed fire) occur on the same acre. In this type of accounting, acreage duplication is preserved[32].

The initial WCS restoration goals were to treat 124,000 acres between fiscal year 2022 and 2024. The new treatment goals correspond to the sum of the lower end of the treatment target range for all the FHSP planning areas within the CWI landscape. The new treatment targets provide a tangible example of integration between WCS and FHSP restoration goals during the implementation process. MOU-specific goals will be achieved in part due to targeted forest health investments in Chelan, Kittitas, Okanogan and Yakima Counties over the next 10 years.

In addition to the revised treatment targets, the MOU requires the parties to develop a five-year plan for planning and implementing CWI objectives and goals, and identifies current and future projects, as well as a more detailed annual operating plan that identifies annual deliverables, actions, and project timelines. The CWI MOU also includes provisions to provide transparent and regular monitoring and progress reporting, and for DNR and OWNF to develop an external communication and engagement strategy.

The CWI five-year plan (October 2022-September 2027) includes a list of current and intended future projects, treatments and activities across the OWNF, DNR state lands, and some private lands in the CWI boundary over the next five-year period[33]. The plan includes 192,000 acres of projected treatments across 17 priority planning areas in the CWI. This means that 78% of the proposed treatment for the next five years is within acres identified in both the CWI and FHSP planning areas.

Projected treatments correspond to "shovel ready" projects – those with a signed decision that meet all requirements of the National Environmental Policy Act (NEPA) and related law, regulation, and policy. These shovel-ready projects correspond to 54% of the overall treatment target established in the MOU. Furthermore, the five-year plan includes an additional 502,700 acres to feed the pipeline of projects in early stages of planning.

Despite the strong alignment between state and federal strategies within the CWI geography, there are several challenges to the successful implementation of the FHSP and WCS. The five-year plan recognizes and lists some of the issues the region faces that have chronically hindered the agencies' capacity to implement work on the ground at a pace and scale the WCS requires. Some of the challenges include:

1. Staff capacity and agency turnover: creating and maintaining organizational resiliency guarantees that both organizations have the services to support the influx of work, the staffing and retention capacity to ensure staff stay available, motivated and committed to see work through.

2. Planning: creating and maintaining a sustainable offering of projects to ensure that work is done as resources and funds are available. On OWNF lands, this means investing in streamlining NEPA planning in priority areas using Forest Service capacity and identifying where DNR resources and data can increase pace, scale and efficiencies. NEPA planning is the most complex and time-consuming portion of keeping a steady pipeline. On non-federal lands, this means investments in assessment, prioritization and community outreach targeted to accomplish work in alignment with priorities identified in planning areas and firesheds.

3. Lack of forest products industry: proactive consideration of contractor capacity in the region and contribution to the development of new and existing forest products and biomass utilization in the region.

4. The need for targeted coordination of the Washington State Smoke Management Plan to allow for more prescribed fire than currently allowed to be utilized at the pace and scale needed to reduce risk and maintain resilient forest conditions .

Challenges related to workforce capacity, markets and industry were also highlighted more broadly for the Oregon and Washington regions (Region 6) as part of a series of round tables organized by the Forest Service with the support of the National Forest Foundation. The goal of the round tables was to gain region-based input on the WCS implementation plan. For Region 6, in addition to the abovementioned challenges, roundtable discussions highlighted the need for outcome-based prioritization and metrics of progress. Other themes included incorporating Indigenous Traditional Knowledge and Indigenous Stewardship into active engagement and planning, implementing, and fostering mechanisms and processes used to integrate fuels treatment and forest restoration on Tribal, federal, state, and private lands.

CONCLUSIONS

A summary of differences between the federal and state strategies

The WCS prioritizes firesheds projects, firesheds, and large landscapes where potential wildfire transmission to communities is greatest and fuel management is appropriate at the Western U.S. scale. The assumption is that protecting communities comes from limiting the source of fire that exposes communities, and if the goals for the restoration treatments are met, forest health and resilience will improve in tandem with community resilience protection.

The WCS prioritization and goals are all-lands. Addressing the source of fire exposure across all ownerships allows different actors (Forest Service, Washington state, Tribes, and private landowners) to recognize and own their component of the fire problem and act on it where they have the agency to do so. One common criticism of the WCS is that protection of structures is better accomplished via on-site home hardening. While it is true that home hardening is the last line of defense against structure loss, treating the source of fire exposure across different ownerships does not detract from home hardening and active suppression. In fact, the WCS is an addition to the existing fuels program that addresses the myriad of values on public lands.

Furthermore, home hardening does not contribute to addressing the forest health decline across the western United States that is the root cause for catastrophic fires and home loss over the last two decades, nor is it within the purview of the Forest Service. We need both fire-adapted communities and healthy and resilient landscapes. New initiatives like the Community Wildfire Defense Grant (CWDG) program at the federal level and Wildfire Ready Neighbors at state level are accelerating the former, while WCS and FHSP are primarily focused on the latter. These are complimentary strategies, and both are required in order to change our relationship with fire.

The WCS is a high-level blueprint for where to prioritize fuels and forest restoration treatments. The approach was to prioritize locations more likely to generate ignitions that will expose communities, water sources and critical infrastructure to wildfires, acknowledging that as priorities were downscaled, additional values would be incorporated into final project treatments. Firesheds encompass the complete spectrum of

values on public lands, and the work needed to address exposure to communities will improve the overall condition of public lands. Diverse treatment objectives such as water, biodiversity, and critical habitat, among others, are further accounted for at the project scale.

The FHSP prioritizes treatments where forest health need is greatest. The assumption is that if projects are successful in improving forest health, this will also increase community protection and reduce loss to fire across all resources and values. Before the dual benefit analysis was included, early versions of the landscape evaluation had no explicit integration of risk or exposure to people and property. Risk to people and property was only included in the prioritization of HUC12s. The same criticisms that the WCS faces when it comes to the value of the plan in terms of protecting communities is also relevant to the FHSP.

Mitigating risk to communities will require diverse and complementary strategies. The FHSP was designed to address the decline of forest health through strategically placed, landscape-scale thinning and prescribed burning projects that reduce density, increase heterogeneity at multiple scales, and prepare forested landscapes for climate change. Healthy and resilient forests are not just more resilient to fire but also to other disturbances, such as drought. In other words, the FHSP links the forest health crisis in eastern Washington to wildfire risk mitigation. One can think of it as targeting the root of the problem in order to address the more visible symptom of loss of property. Healthy forests are resilient forests that provide clean air and water, wildlife habitat, recreation opportunities and stable carbon storage.

Alignment, challenges and opportunities

The spatial overlap between priorities of the FHSP and WCS is a strong indication of the importance of those priority landscapes. On the 2.5 million acres of land that are the focus of both federal and state strategies, there are ripe opportunities to engage with collaborative partners and achieve treatment goals. Aligning resources by matching investments where FHSP landscape evaluations are available and extending analyses from planning areas to firesheds (or WCS landscapes) can contribute to accelerating project implementation under the frameworks of both the WCS and FHSP. Because of the geographic alignment between WCS landscapes and FHSP planning areas, there is clear agreement on the highest priority locations to implement forest health and wildfire risk reduction work in eastern Washington State.

There is significant overlap of Forest Service-led science in the WCS and FHSP. The landscape evaluations in FHSP are based on the best available science on the ecology and management of fire-dependent landscapes[34, 26], wildfire risk[35] and transmission[7, 36]. The landscape evaluation methodology is built on the restoration frameworks and forest plans developed for the Okanogan-Wenatchee and Colville National Forests. This shared scientific background is likely to explain, at least in part, the significant alignment in priorities in eastern Washington.

The funding available to implement WCS will contribute to accomplishing the FHSP goals, and vice versa. In these landscapes, combining the WCS fireshed project prioritization with the data products from the FHSP landscape evaluations can inform the prioritization and delineation of new planning areas, accelerate implementation of shovel-ready projects, and ultimately build strong alignment and social license for achieving the dual benefits of science-based restoration and wildfire risk reduction[37].

WCS landscapes have dedicated funding for forest health activities. FHSP planning areas do not have dedicated funding for implementation at the levels of the WCS, but DNR and other state agencies have received historic levels of funding in recent years (HB 1168, SB 5546, etc.) along with staff capacity and tools to fully implement the FHSP. State funding, however, is provided on a biennial basis, with individual fiscal years ending in June. Funding levels are subject to change based on the health of the state economy, and future funding at the state and federal level for these programs is not guaranteed. Demonstrating alignment and successfully implementing projects that meet multiple resource objectives will be critical to building continued public support for the FHSP and WCS.

Early project planning examples in eastern Washington are demonstrating the potential of the WCS and FHSP. In central Washington, managers are utilizing DNR landscape evaluations within the CWI landscape to inform the development of proposed actions in the NEPA process. Once a project is developed, Forest Service staff and DNR are working together to evaluate whether the location and scale of proposed treatments meet landscape treatment priority needs and the dual benefit analysis objectives associated with forest health and wildfire risk reduction. Further, PODS and PCLs are being delineated concurrently by federal and state fire staff, which is fostering alignment around the use of fuel breaks and will likely inform the use of the new Fuel Break Categorical Exclusion on the Okanogan-Wenatchee National Forest.

Given that DNR assessments are all-lands, the results of the landscape evaluations inform the work of state uplands, which manages more than two million acres of state lands, and the outreach and financial assistance provided to neighboring landowners including the Washington State Department of Fish and Wildlife, Washington State Parks, numerous Tribes, and non-industrial private forest landowners. Implementing treatments across all-lands is critical to effectively reducing risk and creating healthy and resilient forest landscapes, a key goal identified in both the WCS and FHSP.

Integrating new tools and data products into existing processes is often challenging for hierarchical bureaucracies like the Forest Service and DNR. Leadership intent is critical to setting the stage for success. Likewise, Forest Service and regional staff must be able to clearly understand how these new tools are relevant to their work and contribute to meeting their goals for a project. DNR and Forest Service staff are working together to make the data products and assessments associated with WCS and FHSP easily available and in a usable format for Forest Service managers. DNR scientists have spent considerable time since 2017 meeting with Forest Service staff to workshop the assessment tools and create the enabling conditions to integrate the data products into NEPA planning processes. Overall, these efforts have been well received, and there are now several Forest Service projects informed by assessment results produced by DNR scientists. A new project that builds off of early efforts is the

Places, People & treatment Priorities (3P) project, a collaboration led by DNR and USDA Rocky Mountain Research Station to focus on the collaborative development of project scale priorities (i.e., the lower left, Fig. 5) in FHSP planning areas aligned with WCS landscapes. The 3P project will pilot a framework to delineate fuels and forest health (Priority) projects that are collaborative (People), context-sensitive (Places) solutions, leveraging existing and new data to ensure projects reflect operational and regulatory constraints of diverse ownerships. It will include a modeling exercise to compare pre- and post-treatment planning areas regarding their fire outcomes.

Beyond sharing data and analyses, investing in developing strong working collaborations between Forest Service and DNR scientists, specialists, managers, and planners will continue to be key to accomplishing the goals of the FSHP and WCS. A shared understanding of similarities and differences in the planning and implementation process for both agencies will avoid redundancies, duplications, and misalignment. This is particularly true when it comes to work across all lands. A shared message that starts with a common understanding of the data and prioritization process will boost the legitimacy of these two strategies and engagement with adjacent landowners.

Given the historic levels of public investment at the federal and state levels, growing societal concern over wildfire, and alignment of our agencies, we have a once in a lifetime opportunity to act with urgency and conviction to meet the goals of the WCS and FHSP. In Washington state, this alignment is translating into accelerated planning and implementation of fuels reduction and forest health treatments. These actions, combined with the work to prepare communities, are creating the conditions to change how we live with fire.

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