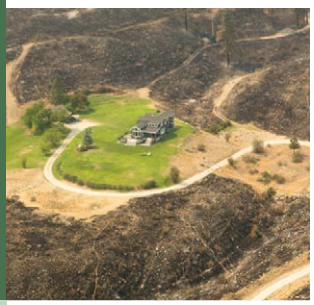

WASHINGTON STATE WILDLAND FIRE PROTECTION 10-YEAR STRATEGIC PLAN

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

SECOND EDITION | AUGUST 2019

WASHINGTON STATE DEPT OF NATURAL RESOURCES

HILARY S. FRANZ
COMMISSIONER OF PUBLIC LANDS

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The **Washington State Legislature** continues to provide leadership and support to reduce the impacts of wildland fires. The efforts of the Legislative Wildfire Caucus Members and many others have accelerated our ability to respond to the wildland fires of today and prepare for the wildland fires of tomorrow.

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LETTER FROM THE COMMISSIONER OF PUBLIC LANDS

Hilary S. Franz,
a statewide elected official, is Washington's fourteenth Commissioner of Public Lands.

When I was elected Commissioner of Public Lands, I soon realized that there was a critical need to develop a new vision for protecting Washington's communities from wildfire. Longer fire seasons, population growth, declining forest health, and threats to our well-being have combined to make wildland fire a top priority.

The intensity, size, and number of wildland fires is on the rise in Washington. In 2018, we had the most fires ever in our state – more than 1,800. At times, Washington had the worst air quality in the world due to wildfire smoke. And with 40 percent of fires on the westside, it was clear wildfire is not an eastside or westside issue, it is a Washington state issue.

The challenges that Washington faces now, and in the future, related to wildfire are growing and becoming ever more complex. They include the challenge of preventing wildfires, creating resilient landscapes and fire-adapted communities, improving response, and assisting with post-fire recovery.

These challenges are interconnected and often share a common set of needs, including cohesive leadership, a shared understanding of risk and risk-based decision-making, well-supported firefighters, effective community engagement, and effective response.

This strategy is built on decades of partnerships and crafted by agency and community leaders, tribes, wildland fire managers, and the public – and identifies effective solutions for a prepared, safe, and resilient Washington. It is a bold vision for how all of Washington can benefit from safely managing wildfire.

All of Washington can be adapted and prepared, and our landscapes can be healthy and resilient. And, critically, we will be better situated to prevent wildland fire and safely suppress unwanted fire.

The solutions contained in this strategy support other strategic approaches for forest health and wildfire risk reduction, including DNR's 20-Year Forest Health Strategic Plan: Eastern Washington, the Washington Forest Action Plan, and the goals of the National Cohesive Wildland Fire Management Strategy.

I look forward to working with partners throughout Washington to implement the Washington State Wildland Fire Protection 10-Year Strategy. It won't be easy, and it will take action from the legislature, agencies, tribes, the private sector and partners to achieve this vision. But inaction is not an option and we have no time to waste.

It's time for bold, forward-thinking investments and actions to safeguard Washington's people and places.

HILARY S. FRANZ
COMMISSIONER OF PUBLIC LANDS

Jolly Mountain Fire. Photo Courtesy of Darcy Batura, The Nature Conservancy

WILDLAND FIRE ON THE RISE IN WASHINGTON

In 2018, wildland fires burned more than 350,000 acres in Washington state and cost more than $112 million dollars to suppress—all before the end of August.[1] Smoke from fires within Washington as well as those in British Columbia blanketed the state from Seattle to Spokane. Across Washington, air quality was extremely unhealthy and, for several days and locations, ranked among the worst in the world.[2] Yet, 2018 was not the state's worst for fire. In recent years, hotter, drier summers and longer fire seasons have led to a trend in increased fire starts and area burned. Fires in 2014 and 2015 burned approximately 425,300 and 1,064,100 acres and cost state and federal agencies nearly $182 million and $345 million in firefighting expenses, respectively.[3] In addition to the significant structural and economic losses, three firefighter lives were lost in 2015.

These wildland fire costs and loss statistics are sobering; however, they tell only half the story. Wildland fire is both a natural and essential part of

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1 Northwest Interagency Coordination Center (NWCC), 2018. Large Incident Summary, Year-to-Date (through August 28, 2018). Statistics include all fires over 100 acres in timber and 300 acres in grassland across all ownerships.

2 Seattle Times, August 15, 2018. Seattle's Dirty Air Among World's Worst, But Relief is in Sight.

3 Note numbers are from NWCC 2014 and 2015 Annual Reports and as such, do not include timber fires less than 100 acres or grass fires less than 300 acres.

WILDLAND FIRE ON THE RISE IN WASHINGTON

Washington's landscapes. In some ecosystems, the historical emphasis on suppressing wildland fire has contributed to the record-breaking fires of the present and created conditions that, if unchanged, foretell an alarming future. This is the paradox of wildland fire: to successfully manage wildland fire, Washington needs more "good" fire on the landscape and not less. "Good" fires are generally less intense with a greater mosaic of burn severities. They work for us, in the right places at the right times, to improve landscape health, reduce fuels, and improve the outcomes of future wildland fires. However, fires that start in the wrong places during unsafe weather conditions still require effective suppression to avoid catastrophic outcomes.

This seeming contradiction—that fire can both safeguard and threaten our values—is challenging. Practitioners are still learning how best to use fire to benefit ecosystems and the communities that depend on them. Going forward, more work will be needed throughout the state to understand and embrace this dual role of fire on the landscape.

Fortunately, individuals, communities, organizations, and agencies have been collaborating to meet the increasing wildland fire challenges in the state for several decades. Washington's State Resource Mobilization Act was passed in 1993 in response to the Spokane firestorm. Washington's first Firewise USA® community was formed in 2002, and Washington led the nation with the development of the first statewide Fire Adapted Communities Learning Network in 2014.[4] Washington implemented its first prescribed fire training exchange in 2017. Even with these efforts, and those of many others, Washington's collective ability to reduce the impacts of wildland fire is severely stressed, with increasing risks to life, property, and ecosystem health.

The magnitude of this challenge has increased since the completion of Washington state's last wildland fire strategic plan in 2006. Accordingly, to support the collective effort to better prepare for, respond to, and recover from wildland fire, both today and in the coming decades, the Washington State Department of Natural Resources (DNR) convened partners, stakeholders, and members of the public to craft a new vision and strategic direction for managing wildland fire in Washington state. The planning process took place over a six-month period and involved hundreds of people from across the state. The planning team also met with the Wildland Fire Advisory Committee (WFAC) and leadership from DNR, federal fire management agencies, local

Stakeholders during the Plan development process. Photo courtesy of Cascadia Consulting Group.

4 See *Appendix A: Wildland Fire Timeline* for a more complete history of wildland fire in Washington.

WILDLAND FIRE ON THE RISE IN WASHINGTON

fire districts, and others. In addition, the team reviewed current and past wildland fire plans and reports from across the nation. This engagement, research, and analysis provided the basis for the findings and recommended strategies and actions presented in this plan.

This Plan—the *Washington State Wildland Fire Protection 10-Year Strategic Plan*—builds on decades of partner-led work and addresses the critical challenges, risks, and opportunities associated with preparing for, responding to, and recovering from wildland fires in Washington. The Plan takes both a short- and longer-term approach to achieving better fire outcomes through an integrated set of strategies and actions to be implemented before, during, and after fire. The Plan, a companion to the 20-Year Forest Health Strategic Plan for Eastern Washington, looks comprehensively at wildland fire issues across Washington through the lens of how fire can best be safely managed to both reduce losses and costs and to achieve resilient and healthy ecosystems and communities. It offers solutions to emergent needs and issues and expected future conditions.

Chelan First Creek fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

A NEW APPROACH TO WILDLAND FIRE MANAGEMENT

Decision-makers, stakeholders, and members of the public working to improve state wildland fire outcomes overwhelmingly agree on the need for change and a new approach to wildland fire management in Washington. Key themes—drawn from the summit, practitioner workshops, stakeholder survey, and consultations with experts and a review of evolving national policies and other states' practices—include the following, which serve as the rationale and drivers for this Plan:[5]

- **The fundamental need to change our practices and increase our collective knowledge to be able to adapt to more frequent and intense wildfire.** Washington needs to simultaneously reduce the incidence and impacts of uncharacteristic fires and use lower-intensity fires where appropriate to achieve healthy landscapes and provide for the safety and well-being of communities. Science tells us we need more fire, not less, on many of our lands, particularly more low and moderate intensity fire on the east side of the state.[6] The challenge is to safely manage beneficial fire to avoid impacts to highly valued resources and assets. This includes areas adjacent to the wildland urban interface and on lands managed for resource values (i.e., timber or agriculture).

- **The important but challenging step of shifting our state's approach to wildland fire management to be more *proactive*.** Echoing the prescriptions of the 20-Year Forest Health Strategy, Washington's landscapes and communities will benefit from activities such as thinning for forest health, reducing unwanted fuels and vegetation, implementing prescribed fires, and managing naturally occurring fire—as well as engaging landowners and residents to help them become adapted to and resilient from fire. This shift to a more proactive approach allows for the use of "good" fire where appropriate while minimizing the incidence of catastrophic fire. Making this change will enable our ecosystems and communities to better withstand the impacts of wildland fire without relying solely on suppression and response to protect highly valued resources and assets (known as HVRAs).

Forest health education in the field. Photo courtesy of Guy Gifford, DNR.

5 See *Stakeholder Interests and Desired Outcomes* section for more information.

6 Haugo et al., 2015; Hessburg and Agee, 2003.

WILDLAND FIRE ON THE RISE IN WASHINGTON

- **Improved coordination and collaboration across agencies and jurisdictions at all levels and across time scales.** The affected public, firefighters, state and federal agency personnel, private landowners, and non-profit organizations have expressed strong demand for more efficient use of available resources and increased effectiveness in preventing, preparing for, responding to, and recovering from wildland fires.

- **The desire of communities to be more fully engaged and better supported in reducing risks before, during, and after wildland fires.** Communities—including those living or working in the wildland urban-interface (WUI) as well as land and property owners—want to be active and vital partners in wildland fire management by both giving information to and receiving information from wildland fire and land management agencies. This information must be tailored to the needs of the entire community, recognize that some people in our communities have historically been left out of information exchange, and ensure that no matter where one lives, what language one speaks, or whether one owns land, everyone has the information they need to prepare for, live with, and be safe during wildland fire.

Flowery Trail Wildfire Community Preparedness Day. Photo courtesy of Dan Holman.

- **The need to prepare for expected increases in wildland fires in future years.** Washington will need more resources and smart strategies informed by risk analysis, science, and adaptive management to prepare for and respond to more wildland fire in the years to come. Future wildland fire projections due to climate change, coupled with the lasting consequences of past forest management practices, suggest more fire starts, increased acres burned, and a longer fire season; the characteristics of the 2015 fire season could become the new norm—the new average fire year.[7] The occurrence of severe or uncharacteristic fires is expected to increase in both eastern and western Washington. Personnel, equipment, air resources, advanced data, technology, and information systems—as well as community capacity improvements and other resources—will need to be developed and deployed to deal with this increasing risk.

- **The importance of maintaining a highly capable, well-trained, and supported workforce able to both fight wildland fires and address resilience, preparedness, fire-adapted communities, and recovery needs and goals, with adequate equipment and infrastructure now and for the future.** Stakeholders reported that

7 Littell et al., 2010; Barbero et al., 2015; USFS, 2015.

WILDLAND FIRE ON THE RISE IN WASHINGTON

Chelan First Creek Fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

challenges such as an aging workforce, poor workforce retention, and difficult working conditions are limiting our collective ability to provide for the safety and well-being of our communities as well as sustain the healthy forests, rangelands, and other landscapes on which we all enjoy and depend.

- **The need to face difficult choices when managing and responding to wildland fire and protecting values at risk.** With wildland fires burning with more intensity and getting larger[8] on average, and with more people living in WUI, exposure and risks from wildland fire are increasing. This reality has consequences for wildland fire response and the potential to increase costs and losses. Because of limited resources and personnel, local fire protection districts can be challenged to provide adequate structural fire protection in the WUI. In rangeland areas of the state where there is either no wildland fire protection or limited protection, DNR is being asked to support suppression efforts, without a clear mandate to do so.

8 Clark, 2018.

HOW THIS PLAN WAS CREATED

The strategies and actions in this Plan reflect extensive stakeholder involvement, build on a foundation of previous planning efforts, draw on best practices and solutions developed in other states, and reflect the knowledge gained from quantitative risk assessment models. In addition, the Plan adopts the National Cohesive Strategy (see National Cohesive Strategy, page 14) as an organizing framework and aligns with Washington's 20-Year Forest Health Strategic Plan (FHSP) for Eastern Washington (see page 25).

STAKEHOLDER ENGAGEMENT

Agency leaders, managers, wildland fire management practitioners, experts, advocates, and the public provided input throughout the planning process. Their perspectives and insights are critical to the vision, priorities, strategies, and findings presented in this Plan. Stakeholders participated in the following key ways:

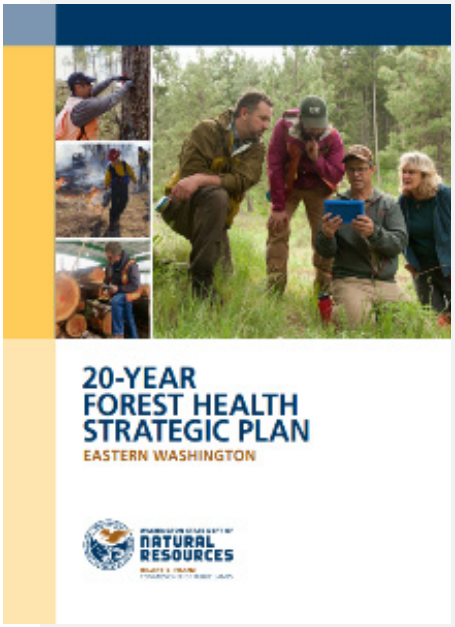
- The **Washington Wildland Fire Summit**, held in January 2018 to initiate the planning process and attended by more than 120 leaders, partners, and stakeholders in Washington wildland fire management. Attendees began to craft a vision for Washington wildland fire management, identified practices that are working well, and defined changes needed to improve outcomes.
- An **online survey** completed by 846 members of the public, practitioners, and managers/owners of large properties. Respondents shared their perspectives on the current state and desired future of wildland fire management in Washington.
- **Semi-structured interviews** with 35 leaders, partners, experts and other stakeholders who provided their specialized expertise and/or in-depth understanding of current conditions, key barriers and opportunities, and potential solutions and priorities. Interviewees included experts in prevention, post-fire recovery, limited English proficiency (LEP) community engagement, fire use, and others.
- **Five workshops** to help refine the vision and formulate goals and key strategies to improve wildland fire outcomes. Approximately 150 wildland fire management practitioners, experts, and community members active in wildland fire issues—including representatives from Firewise USA® and Fire-Adapted Communities—participated in statewide workshops in Spokane, Wenatchee, and Tacoma. An additional 26 members of the public attended open houses held in tandem with the workshops. Two topical workshops were convened to identify specific challenges, needs, and priorities for improving

wildland fire outcomes: one for LEP communities (19 participants) and one focused on arid lands, rangelands, and unprotected lands (29 participants).

- **Fifteen briefings** with leaders, partners, and stakeholders—such as the WFAC, DNR staff, executive-level agency leadership, and the Washington State Coalition for Language Access—to obtain input and feedback on the preliminary vision, goals, and strategies. The WFAC was involved throughout the planning process, reviewing early engagement findings, strategies, and a draft version of the Plan.

PAST PLANNING EFFORTS

The planning process involved a review of previous plans, studies, and reports addressing the needs and issues associated with managing wildland fires in Washington and beyond to incorporate lessons learned and enduring solutions. These included:



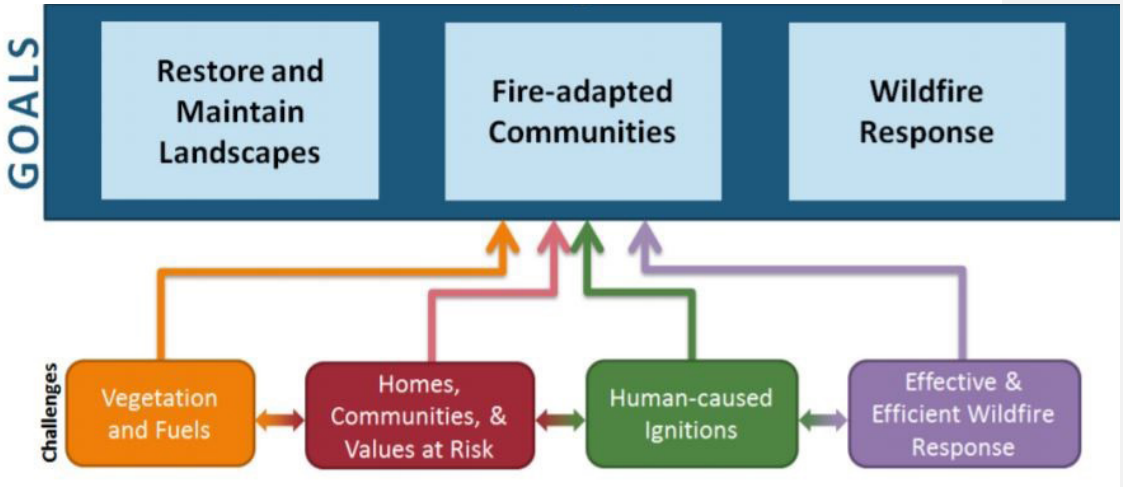
- Washington's **2006 Strategic Plan for Wildfire Protection**, which primarily addressed DNR lands and actions related to forest health and safety and aggressively suppressing wildland fires.
- The **Statewide Forest Resource Assessment and Strategy**, completed in June 2010, which focused on working forestlands, biodiversity conservation, forest health, and wildland fire hazard reduction.
- The **Governor's Wildland Fire Council Listening Sessions**, completed in 2016, highlighted the importance of active forest management, increased collaboration and initial attack support, and addressing the needs of communities throughout the fire cycle.
- **Washington's 20-Year Forest Health Strategic Plan (FHSP) for Eastern Washington**, completed in 2017 by DNR with extensive stakeholder engagement. This plan set a goal of treating 1.25 million acres of forest land in eastern Washington over the next 20 years to improve forest health and reduce wildland fire risk. It took a large landscape and science-based approach to prioritizing actions to maximize the effectiveness of forest health treatments. It included a specific goal and recommendations to reduce the risk of uncharacteristic wildland fire on large landscapes and so is closely related to the focus of this Plan. See page 25 for more information on the relationship between this Plan and the FHSP.
- The Joint Legislative Audit and Review Committee (JLARC) **Wildfire Suppression Funding and Costs study**, completed in 2018, which examined wildland fire costs and how those costs are shared across agencies and identified where better data are required to understand trends and needs going forward.

- DNR's **Smoke Management Plan**, currently under revision.
- Report on the ongoing **Forest Resiliency Burning Pilot Project**, which recommends strategies and actions to enable increased use of prescribed fire to treat landscapes.
- **WFAC reports** including the *Issues, Recommendations and Action Summary* completed in 2016.

NATIONAL COHESIVE STRATEGY

The 2014 **National Cohesive Wildland Fire Management Strategy** (Cohesive Strategy) set national goals and defined challenges to meeting those goals. It established a vision to *"safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and, as a nation, live with wildland fire."* This Plan adopts a framework similar to the Cohesive Strategy (Figure 1), which consists of three goals related to resilient landscapes, fire-adapted communities, and wildland fire response. The Cohesive Strategy addresses four key challenges: 1) managing fuels and vegetation, 2) protecting communities and homes, 3) preventing human-related wildland fires, and 4) achieving safe and effective response. This Plan has adopted those challenges and added a fifth—post-fire recovery—to address the needs of communities and ecosystems as they attempt to recover from wildland fires after they occur. Please see the text box for more information on the Cohesive Strategy.

Figure 1. National Cohesive Strategy Framework[9]



9 Best management practices that reflect the goals of the Cohesive Strategy and have informed the development of this plan include Utah's Catastrophic Wildfire Reduction Strategy: Protecting the Health and Welfare of Utahns and our Lands (2013), The Alaska Interagency Wildfire Management Plan (updated in 2016), the Strategy Fire Plan for California (updated in August 2018), as well as the 2018 Oregon Fire Summit.

WILDLAND FIRE ON THE RISE IN WASHINGTON

Carlton Complex fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

The National Cohesive Wildland Fire Management Strategy was developed collaboratively by federal, state, and local stakeholders at the direction of the 2009 FLAME Act. The Cohesive Strategy relies on three key assumptions that underlie risk reduction throughout the nation, as quoted below:

1. **Prioritization of investment and use of resources.** Reducing risk significantly will require that existing resources be used more efficiently. From a national perspective, this may require reallocation of resources across agencies, geographical areas, or program areas.

2. **Acceptance of increased short-term risk.** Significantly reducing fuels across broad landscapes will require expanded use of wildland fire to achieve management objectives. Using fire as a tool carries inherent risks that must be considered in the short-term to achieve the longer-term benefits.

3. **Greater collective investment.** Even with greater efficiency and acceptance of short-term risk, current levels of investment may be inadequate to achieve the levels of risk reduction desired. All who have a stake in the outcome, from individual property owners to the Federal, state, tribal, and local governments, must share the costs and level of effort necessary to redeem responsibilities for reducing risks posed by wildland fire.

Strategies developed by this Plan are consistent with the key management actions identified in the final phase of the Cohesive Strategy, published in 2014, and focus on opportunities within Washington State. Cohesive Strategy management actions include:

- Prescribed fire
- Managed wildfire for resource objectives
- Fuels treatment using mechanical, biological, or other non-fire methods
- Home and community action
- Building codes
- Reduction of intentional ignitions
- Prepare for large, long-duration wildfire
- Protect structures and target landscape fuels
- Protect structures and target ignition prevention

WILDLAND FIRE ON THE RISE IN WASHINGTON

QUANTITATIVE WILDFIRE RISK ASSESSMENT

The Plan incorporates current science to inform strategies and actions to better prepare for, respond to, and recover from wildland fires. The Pacific Northwest, all lands, Quantitative Wildfire Risk Assessment (QWRA),[10] recently developed by the US Forest Service (USFS), provides a science-driven quantitative assessment of wildland fire hazards and risks to Washington's resources and assets. The QWRA assesses risk to determine how resources and assets in a given geographic area could potentially be impacted by wildland fire, considering several factors including:

- The likelihood of a fire burning.
- The intensity of a fire if one should occur.
- The exposure of assets and resources based on their locations.
- The susceptibility of those assets and resources to wildland fire.

Together with the best available social science, a thorough stakeholder engagement process, and lessons learned from decades of partner progress in wildland fire management, the QWRA grounds the recommendations of this Plan. More discussion of the QWRA can be found on page 47.

Chelan First Creek fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

10 Pacific Northwest Quantitative Wildfire Risk Assessment. 2018. USFS Pacific NW & Alaska Regions/BLM State Office. Portland, OR. Project Manager: Rick Stratton (rdstratton@fs.fed.us).

TERMINOLOGY

Definitions of key terms used are provided in *Appendix B. Acronyms and Definitions*. Two terms—"community" and "safe"—have a specific meaning in this Plan, as defined below:

Community

Community is inclusive of private landowners, property owners, residents, groups of individuals, neighborhoods, municipalities, and others. It goes beyond the traditional notion of communities as residents *living in a particular area* to include formal and informal groups of individuals—such as landowners who may share a similar geography (e.g., southeast Washington ranchers) or be spread across the state (e.g., private forest landowners). It also includes persons working toward a common aim like fire-adapted communities or well-trained, well-equipped responders, municipalities, and at the broadest geographic scale, all who live in Washington and are affected by wildland fire.

Communities refers to a *shared sense of belonging or purpose*, the social networks that build and sustain that sense of belonging and enable collective action toward a common goal, and in some cases, specific geographies where social networks and a shared sense of belonging or purpose exist.[11]

Safe

Safe refers to creating and sustaining conditions that limit the harmful effects of wildland fire. Creating and sustaining safety means prioritizing human life over landscapes and property and may involve adequate training for responders and those living in fire-prone areas, ensuring evacuation orders are delivered in time to all in harm's way in a manner all can understand, and even landscape treatments that reduce fuel build-up or risk of post-fire debris flow. Being safe is both a requirement of today and a vision for tomorrow, as the state learns and improves ways to keep everyone protected from wildland fire.

11 Fairbrother et al., 2013.

SCOPE OF THE PLAN

This Plan adopts a holistic approach to achieve alignment around key wildland fire and land management issues throughout the state with the goal of achieving better fire outcomes that include protecting communities and ecosystem values at risk and reducing losses and costs from wildland fire. The recommended strategies and actions, therefore, are not specific to DNR. Many organizations currently work together through interagency agreements, local operating plans, and mutual aid agreements to suppress and respond to wildland fires. Along with tribes, non-governmental organizations (NGOs), and the private sector, they are also responsible for the forestry, agriculture, conservation, restoration, and other activities that occur across Washington's landscapes that are at risk from wildland fire. These entities include (listed alphabetically):

FEDERAL	Bureau of Indian Affairs (BIA) Bureau of Land Management (BLM) Federal Emergency Management Administration (FEMA) National Park Service (NPS)	Natural Resource Conservation Service (NRCS) National Weather Service (NWS) U.S. Army Corps of Engineers (USACE) U.S. Forest Service (USFS) U.S. Fish & Wildlife Service (USFWS)
STATE	Department of Commerce Conservation Commission Department of Natural Resources Department of Ecology (DOE) Emergency Management Division (EMD)	Washington Military Department (MIL) Washington State Parks Washington State Patrol (State Fire Marshal's Office) Department of Fish & Wildlife (WDFW) Wildland Fire Advisory Committee
LOCAL	Conservation districts County governments Emergency Managers	Local fire districts Municipal governments Washington Fire Service
TRIBES	Confederated Tribes of the Colville Reservation Confederated Tribes and Bands of the Yakama Nation	Kalispell Tribe of Indians Spokane Tribe of Indians Quinault Indian Nation
PRIVATE SECTOR	Cattle and agricultural interests Firewise USA® Communities Land managers	Land owners Timber interests Wildland fire and fuels contractors
NGOS	Community preparedness, adaptation, and recovery organizations Conservation organizations Firefighters associations	Limited English proficiency (LEP) community organizations Washington Prescribed Fire Council Washington Resource Conservation & Development Council

Individuals and communities also play a vital and important role in achieving better fire outcomes. Accordingly, this Plan includes strategies to fully engage and address the needs of diverse communities, including landowners, residents, and others at risk from wildland fire.

WASHINGTON STATE DEPT OF NATURAL RESOURCES

WILDLAND FIRE ON THE RISE IN WASHINGTON

Wenatchee Complex Fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

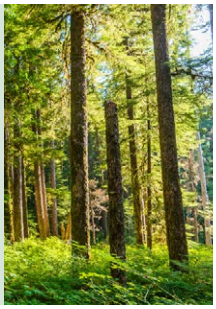
ALL WASHINGTON: Prepared, Safe, Resilient

VISION

As part of the planning process, stakeholders shared their visions for how to better manage and live with wildland fire. This vision statement reflects these aspirations to achieve better fire outcomes.

All Washington—safely managing and living with wildland fire

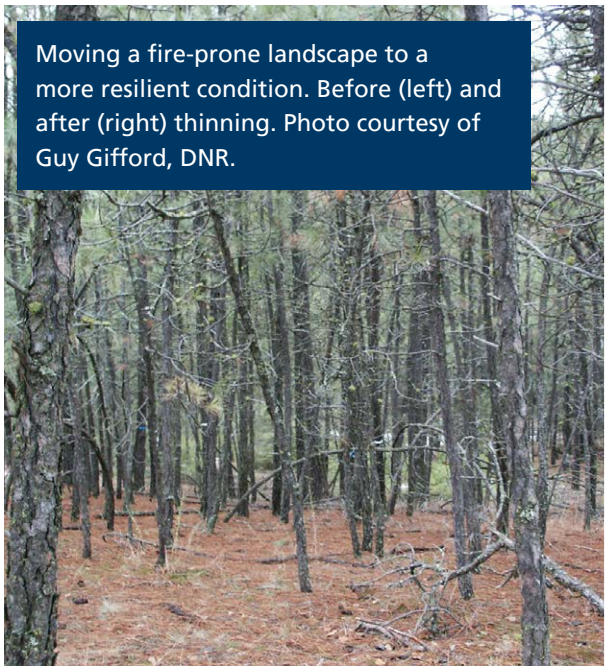
Working collaboratively across jurisdictional boundaries and with engaged communities, we safeguard what we value. All of Washington is adapted and prepared, and our landscapes are healthy and resilient. We prevent wildland fire, use fire where allowable, and safely suppress unwanted fire.



All Washington envisions that we embrace an inclusive, cohesive approach to wildland fire management:

- **All communities and landowners** are engaged and supported to safely, effectively, and efficiently prepare for and react to wildland fire.
- **All lands** in the state are adequately protected with the right policies and protection strategies.
- **All landscapes**—not just forests—have a plan and sufficient resources to mitigate the greatest risks and deliver maximum benefits across landscapes.
- **All agencies** coordinate and communicate effectively, deploying their assets and capabilities in a manner that makes the best use of their resources and strengths.
- **All people**, no matter their language spoken, income level, origin, or background have access to quality information, at the right time, about wildland fire preparedness, prevention, response, evacuation, post-fire hazards, and recovery.
- **All individuals—**residents, land and property owners, and visitors**—**take responsibility for reducing risk from wildland fires and minimizing risks to others (i.e., from one community or property owner to another, or from HVRA owners to responders).
- **All organizations** encourage and embrace innovation, continuous improvement, partnerships, and locally based solutions in overcoming the challenges faced with wildland fire.
- **All Washington** works together to address the highest risks first—prioritizing communities and landscapes that are the most threatened and vulnerable.

ALL WASHINGTON: PREPARED, SAFE, RESILIENT



Moving a fire-prone landscape to a more resilient condition. Before (left) and after (right) thinning. Photo courtesy of Guy Gifford, DNR.

GOALS AND OUTCOMES

Similar to the vision, the goals and outcomes established for this Plan reflect extensive stakeholder input as well as extensive discussions with the WFAC, DNR management, and senior managers from local, state, and federal wildland fire management agencies. These goals and outcomes align with the Cohesive Strategy, are closely linked to the vision, and provide the basis for the strategies and actions recommended in this Plan.

GOALS

- **Washington's preparedness, response, and recovery systems are fully capable, integrated, and sustainable.**
- **Landscapes are resilient.** In the face of wildland fire, they resist damage and recover quickly.
- **Communities are prepared and adapted for current and future fire regimes.**
- **Response is safe and effective.** There is zero loss of life, of firefighters or the public, from wildland fires.

OUTCOMES

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

ALL WASHINGTON: PREPARED, SAFE, RESILIENT

By adopting this vision and the associated goals and outcomes, this strategic plan charts a new path to wildland fire management in Washington. Fundamentally, the Plan involves moving from a reactive to a proactive approach in dealing with wildland fire—from a primary focus on suppression and response to an emphasis on investing in prevention, resilient landscapes, and fire-adapted communities. The vision—*All Washington—Safely managing and living with wildland fire*—means that we embrace the positive role that fire plays in restoring many of—our landscapes and that we learn to safely live with wildland fire, whenever and wherever it occurs.

The Plan envisions that by investing "upstream" in prevention, preparedness, and resilience, Washington's communities and ecosystems will benefit from a future where fires are more manageable and less intense, with reduced losses and costs "downstream" (Figure 2). However, given the poor health of many of Washington's forested, arid, and other wild lands, and the impacts of a changing climate, these benefits will not happen overnight. In the years ahead, Washington is likely to experience more frequent and intense fires and smoke events, even as we begin to implement the strategies in this Plan. Hence in the short and near term, we may need to devote substantially more resources to wildland fire management—investing in proactive solutions and improved systems and response capabilities even as we absorb the costs and losses associated with more wildland fire and smoke.

Figure 2. Better fire outcomes are achieved through investing in and prioritized actions in advance of wildland fire. Through better understanding risks, mitigation, engaging communities, and improved response, the Plan will increase safety and protection over time while reducing costs and losses and achieving an outcome of less intense more manageable fire.

ALL WASHINGTON: PREPARED, SAFE, RESILIENT

Chelan fires (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

STRATEGIES

The Plan consists of 10 strategies designed to achieve better fire outcomes for all of Washington. The strategies are summarized on the following page and described in more detail beginning on page 56. The first four strategies address cross-cutting issues which must be solved to realize system-wide improvement in wildland fire management. These four strategies are designed to achieve Goal 1—fully capable, integrated, and sustainable systems. As such, they also contribute to realizing the other goals and the effectiveness of the other strategies. These strategies address critical issues raised by stakeholders—improved coordination, a fully capable workforce, and better funding—as well as establish a risk-based approach to prioritizing investments and actions.

The remaining strategies are designed to achieve resilient landscapes, fire-adapted communities, and safe and effective response (Goals 2, 3, and 4 respectively). They tackle the challenges of managing fuels and vegetation, effectively engaging communities, preventing human-related fires, meeting post-fire recovery needs, addressing gaps in protection, and improving the effectiveness of response.

ALL WASHINGTON: PREPARED, SAFE, RESILIENT

Figure 3. Washington's strategic framework

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

S1	Provide leadership and coordination to guide implementation and facilitate agency alignment.
S2	Use risk assessment to inform mitigation and protection planning and to establish priorities.
S3	Enhance and sustain a highly capable workforce.
S4	Advance sustainable funding.

GOAL 2. Landscapes are resilient—in the face of wildland fire, they resist damage and recovery quickly.

S5	Expand programs and practices to manage fuels and vegetation.

GOAL 3. Communities are prepared and adapted for current and future wildland fire regimes.

S6	Establish and sustain fire-adapted communities.
S7	Reduce human-related wildland fire.
S8	Meet post-fire recovery needs, building on current capacity and capabilities.

GOAL 4. Response is safe and effective.

S9	Establish effective protection for all lands.
S10	Improve response planning, operations, and infrastructure.

Alignment with the 20-year Forest Health Strategic Plan, Eastern Washington

The strategies developed for this Plan were designed to align with those in the 20-Year Forest Health Strategic Plan completed by DNR in 2017, while having different but complementary focus areas. While the FHSP includes elements of wildland fire management in its goals and strategies, the focus of the FHSP is eastern Washington forested lands. Recognizing that wildland fires are not confined to forests, nor to eastern Washington, this Plan takes a statewide approach. During the engagement processes for both the FHSP and this Plan, stakeholders consistently advocated for resilient landscapes and wildland fire risk reduction. Consequently, the FHSP and this plan support and reinforce each other as further detailed in Figures 4 and 5.

Throughout implementation of both plans, proactive communication and coordination will be essential to reduce redundancy and create opportunities for shared work. In particular, communication between the Forest Health Advisory Committee and the WFAC—as well as internal communication between DNR's Wildland Fire Division and the Forest Health Division—will be essential.

Figure 4. Washington's Forest Health Strategic Plan and Wildland Fire Protection Strategic Plan support and reinforce each other

Wildland Fire Protection Strategy

VISION:
All Washington—safely managing and living with wildland fire.

Working collaboratively across jurisdictional boundaries and with engaged communities, we safeguard what we value. All of Washington is adapted and prepared, and our landscapes are healthy and resilient. We prevent wildland fire, use fire where allowable, and safely suppress unwanted fire.

GOALS

1. **Washington's preparedness, response, and recovery systems are fully capable, integrated, and sustainable.**
2. **Landscapes are resilient.** In the face of wildland fire, they resist damage and recover quickly.
3. **Communities are prepared and adapted for current and future fire regimes.**
4. **Response is safe and effective.** There is zero loss of life, of firefighters or the public, from wildland fires.

FOCUS AREAS

- All of Washington
- All landscapes (including smaller, fragmented ownerships and non-forested landscapes)
- Wildland fire risk management and reduction

ALIGNMENT

Both plans:

- **Identify and manage wildland fire risk.**
- **Protect communities and values.**
- **Maintain resilient landscapes.**
- **Integrate landowner community objectives and values.**
- **Recognize the appropriate role of fire on the landscape.**

20-Year Forest Health Strategy

VISION:

The goals and strategies outlined in the plan will reduce wildfire hazards to state trust lands and private forest owners, leverage additional funding, increase confidence for businesses, and accelerate the development of resilient forest ecosystems for the benefit of current and future generations.

GOALS

- **Accelerate the pace and scale of Forest Health Treatments.**
- **Strategically focus work to protect communities and values.**
- **Promote Rural Economic Development and the use of restoration by-products.**
- **Respect and integrate diverse landowner objectives.**
- **Monitor progress and adapt strategies over time to ensure treatment effectiveness.**

FOCUS AREAS

- Eastern Washington Forests
- Large, forested landscapes
- Forest health

Figure 5. Washington's Forest Health Strategic Plan and Wildland Fire Protection Strategic Plan support and reinforce each other.

Chelan fires (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

IMPLEMENTING THE PLAN: HIGH-PRIORITY ACTIONS

This Plan will require action by the state legislature, agencies, communities, tribes, the private sector, and other stakeholders to systematically implement the strategies over the short term (1-2 years), near term (2-4 years), and longer term (more than 4 years). This phased approach will enable agencies to address the highest risks first and put in place building blocks that will lead to improved fire outcomes for years to come. Figure 6 provides an overview of the phasing of implementation, with more details provided in *Appendix D. Implementation Strategy Overview*.

Priorities for the short and near term:

- **Establish the leadership structures, organizational framework, and working groups as the foundation for Plan implementation**: Create an executive-level leadership forum to provide high-level guidance and facilitate alignment. Assign the *Wildland Fire Advisory Committee* the responsibility of overseeing risk planning, prioritizing mitigation resources, and ensuring stakeholder engagement. Establish *regional councils* and *local coordinator* positions in at-risk counties (Strategy #1). Selectively create working groups and task forces to develop and advance solutions to high-priority issues and challenges.
- **Use risk assessment to inform resilience and protection planning and establish priorities**: Invest in the capacity and tools to quantify the state's current and projected wildland fire risk. Use these tools to conduct state, regional, and local planning and strategically prioritize actions and investments.(Strategy #2).
- **Increase the workforce and capacity across agencies and partners to address current and projected wildland fire management needs:** Establish new positions for year-round fuels treatment and response capabilities (Strategy #3). Increase resources for prevention (Strategy #7) and recovery (Strategy #8). Invest in response infrastructure (Strategy #10).

- **Develop and deploy new methods and approaches to inclusively engage communities and foster behavior change:** Conduct pilot projects, and engage limited English proficiency communities (Strategy #6).
- **Enact policies to enable comprehensive wildland fire protection services statewide:** Through legislation, establish Rangeland Fire Protection Associations as an option for protection in currently unprotected communities. In addition, facilitate the annexation or creation of new fire districts, so that within two years, no lands or communities are unprotected (Strategy #9).
- **Invest in resilience and community preparedness:** With priorities identified, increased capacity, and engaged communities, ramp up investment in programs and actions to create resilient landscapes, and fire-adapted communities. Accelerate funding for, and implementation of, the 20-year Forest Health Strategic Plan for Eastern Washington (Strategy #5, 6, & 7).
- **Address post-fire recovery needs:** Create a taskforce to recommend solutions and establish a Burned Area Emergency Response (BAER) team (Strategy #8).
- **Invest in infrastructure, facilities and support to improve response:** Increase wildland fire fighting workforce, expand training, increase air capacity, and improve facilities (Strategy #3 and #8).
- **Advance a sustainable funding solution:** Convene a high-level Task Force to identify and recommend to the legislature a durable, robust funding mechanism for wildland fire protection and response capabilities, and investments in forest health, fire-adapted communities, and post-fire recovery. Engage the legislature to ensure sufficient funding to reduce risks and provide for the long-term safety and resilience of communities (Strategy #4).

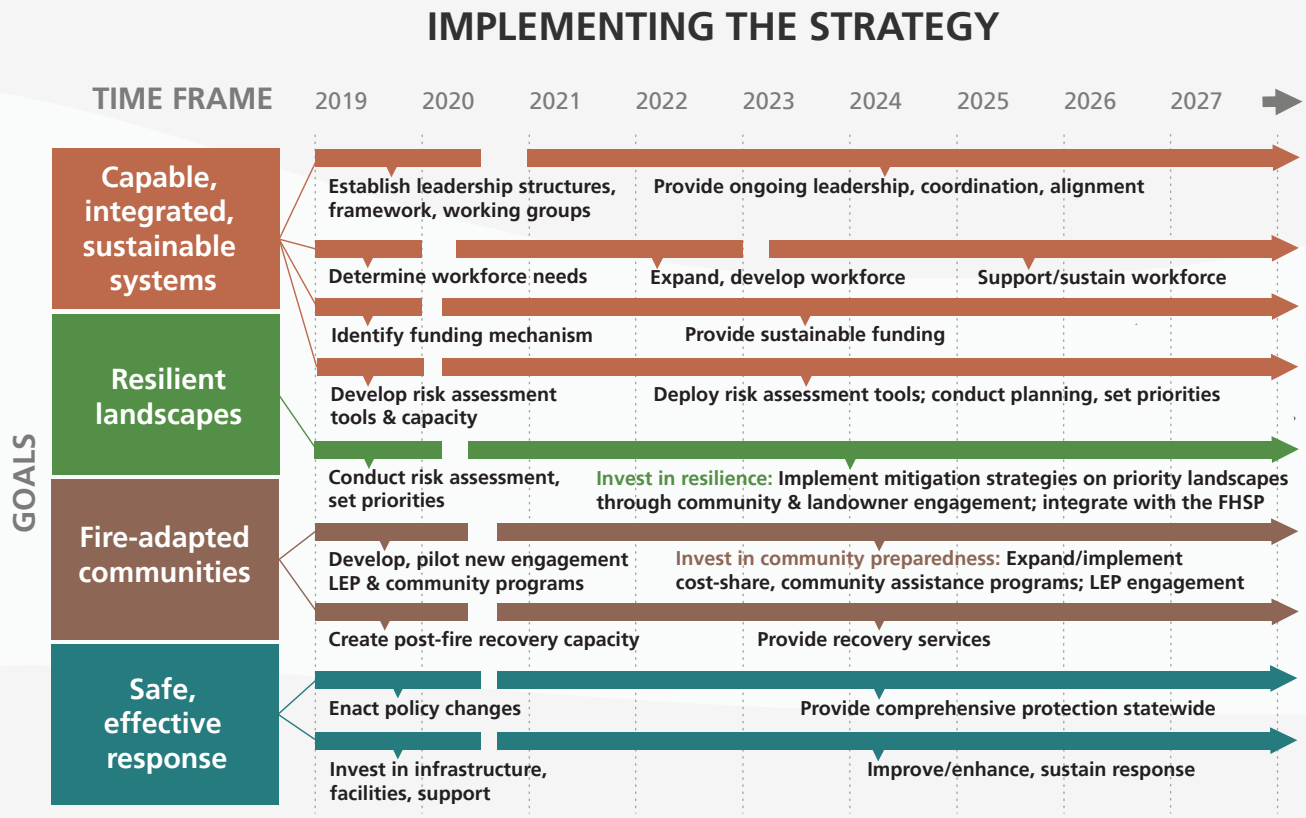


Figure 6. Implementation Plan Overview

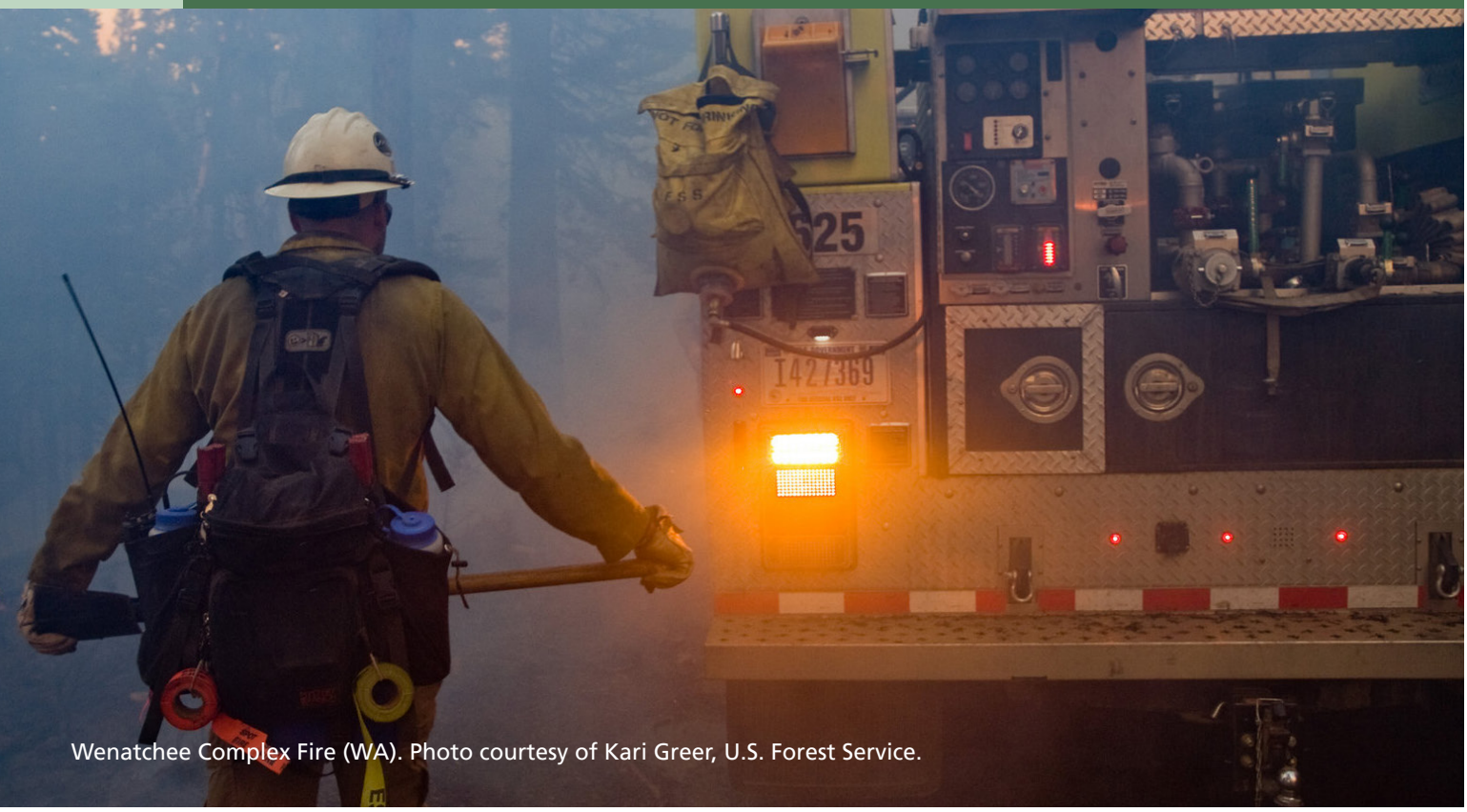
METRICS TO TRACK PROGRESS

This Plan includes a set of metrics designed to measure progress toward goals and outcomes. Metrics have been adopted from the Cohesive Strategy where applicable.[12] As this Plan is implemented, and wildland fire science continues to advance, metrics are likely to evolve. Key metrics include:

- Number of firefighter injuries and fatalities attributed to wildland fire
- Number of and percent change in human-related wildland fires
- Costs of wildland fire suppression and recovery
- Economic losses from wildland fires
- Percent of communities at risk with a high probability of withstanding wildland fire without loss of life and infrastructure
- Percent of priority landscapes with vegetation and fuels conditions that support social and ecological resilience

The complete list of metrics is included in *Appendix E. Metrics*.

12 National Strategy Committee, 2016. Cohesive Strategy Crosswalk and Strategy Alignment.



Wenatchee Complex Fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

CURRENT SITUATION ANALYSIS: Risks and Costs Increasing

The process to formulate plans and strategies to reduce risks from wildland fire and achieve better fire outcomes begins with a clear understanding of wildland fire trends, the natural role of fire across Washington's diverse landscapes, and the costs, barriers, challenges, and opportunities associated with the current system of prevention, preparedness, and response. This section provides a concise summary of these findings informed by an extensive review of the literature (see References Cited) and consultations with experts.

KEY FINDINGS

Today, uncharacteristic wildland fire is on the rise in Washington and is resulting in increased suppression and recovery costs, property losses, risks to people, and damages to our ecosystems. Problems are exacerbated by practices that have altered the historic, natural cycles of wildland fires, increased development in fire-prone areas, an under-resourced fire response system, and the emerging effects of climate change. Yet more Washingtonians than ever before are aware of fire risk and taking proactive measures, legislators are taking action, and there is growing recognition that we need to change our approach to create more resilient landscapes, fire-adapted communities, and safe and effective wildland fire response.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

Many of Washington's landscapes and ecosystems depend on wildland fire for their health and vitality. To varying degrees, wildland fire is, in fact, a natural and essential part of many of the state's ecosystems. Historically, fire has played an important role in preventing the accumulation of dead and dry debris, or "fuel," in fire-prone forests and shrub-steppe, and stimulating or maintaining the healthy growth of trees and vegetation within ecosystems. In eastern Washington, past fire regimes have been characterized by frequent, moderate-to-low-intensity fire. In contrast, across much of western Washington, fire was historically less frequent and more severe. With some of the world's most productive forests, fuels were typically abundant and large patches of stand-replacing fire were common. Forest regeneration following these fire events was typically robust.

WASHINGTON'S HISTORIC FIRE REGIMES[13]

Eastern forests, grasslands, and brushlands

- A dry, warm climate led to dry, ignition-prone vegetation that burned every few years to every few decades.[14]
- Vegetation typically did not accumulate on the landscape; fires were less severe.
- In the far eastern part of the state, where the Rocky Mountains' proximity causes more moisture to fall, fires burned with less frequency but moderate severity.

Western forests and grasslands

- A cool, wet climate led to abundant vegetation that burned every few decades to every few hundred years.[15]
- Late summer conditions helped dry abundant vegetation, when combined with ignition and strong east winds, resulted in infrequent large fires.
- Fires in western forests are often contain a mosaic of burn severities but generally have larger patches of stand-replacing fire than their eastern counterparts.
- Forests in the Olympic Mountains' rain shadow and western grasslands burned more often, but less severely.

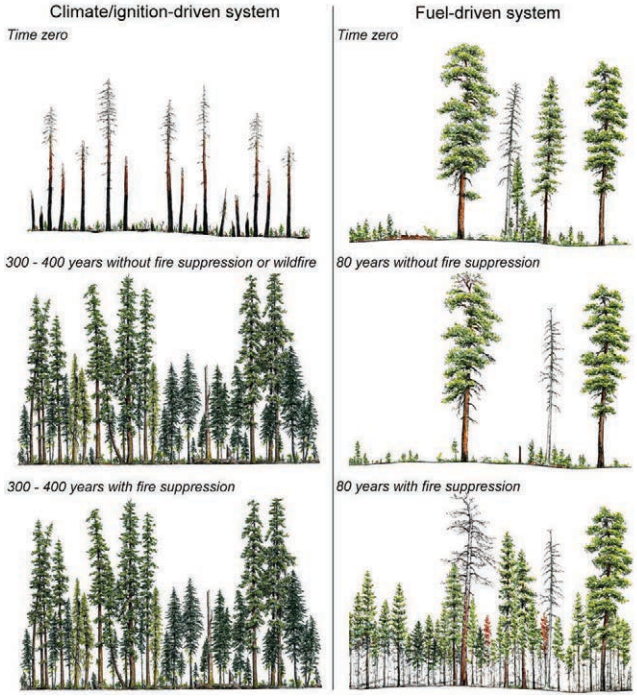


Figure 7. Comparison of eastern and western Washington forests after a wildfire (time zero) as depicted by Halofsky, et al., 2018. In western Washington (climate/ignition-driven systems), large patches of stand-replacing wildfire are more common. Fire suppression makes little difference in the structure of forest stands. Eastern Washington forests (fuel-driven systems) tend to have more low- and mixed-severity wildfire and a shorter period of time between fires. When wildfire is excluded, fuel builds up in the forest and contributes to future wildfire growth and severity.

13 Historic fire regimes refer to the time period prior to European influence and date back several hundred years.

14 Gedalof et al., 2005; Agee, 1993.

15 Sugimura et al., 2008; Gedalof et al., 2005; Walsh et al., 2008; Agee, 1993.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

TRENDS

Increasing Acres Burned

Landscape management practices, past and current fire suppression practices, and a changing climate are disrupting the historic, natural cycle of wildland fires. As a result, we are experiencing nearly a four-fold increase from 117,000 average annual acres burned (2000 to 2011) to 460,500 average acres burned (2012 to 2017).[16] In 2018, 48 large fires burned over 355,000 acres throughout Washington.[17] Non-forested areas are not exempt from these trends. Washington's largest fire in 2016 burned 176,600 acres of mostly grassland.[18]

While more acres are now being burned using managed and prescribed fire, the amount is insufficient to restore ecosystem health or significantly reduce wildland fire risk. Native Americans used fire to improve conditions for plant and animal species, to clear land, and for other purposes. Fire is still being put to work for us in Washington. For example, so far this year, prescribed fires had been completed on over 11,000 acres in Washington.[19] Between 2009 and 2013, Washington state burned over 18,000 acres on average each year.[20] Reducing wildland fire risk and restoring landscapes requires many tools, including prescribed fire, mechanical treatment, commercial thinning, grazing, and managed wildland fire. However, at current treatment rates, on federal lands alone, it would take 53 years to meet Washington's forest restoration needs.[21] Current research indicates that while our fire-prone eastern Washington forests are burning more acres, they are experiencing substantially less low- and moderate-severity fire when compared to historic fire regimes. This "fire deficit" is largest in dry, eastern Cascade forests where we are seeing an order of magnitude less fire than occurred historically. In addition, the percentage of area burning with high severity in these dry forests has increased to 36 percent (up from 6-9% historically).[22]

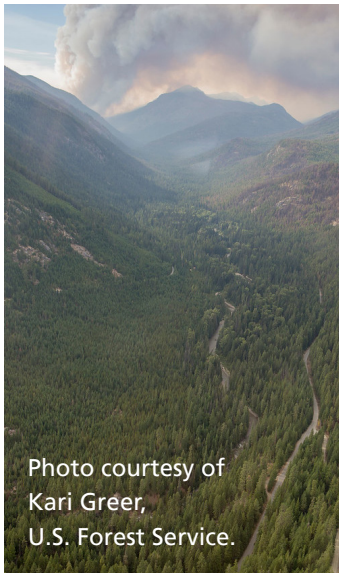


Photo courtesy of Kari Greer, U.S. Forest Service.

Changing Climate, Longer Fire Seasons

Climate change is accelerating the risks faced throughout Washington. Projections estimate that the annual area burned will quadruple in Washington's forests by the 2040s and will double in non-forested areas such as the Columbia Basin and Palouse Prairie (see "Wildfire Affects Us All" inset, p. 39).[23] Climatic conditions conducive to very large fires—those over 12,355 acres—are also expected to

16 DNR, In Progress. Wildfire Discussion Draft.

17 2018 Year-to-Date (8/28/2018) Large Fire Statistics provided by NWCC. Statistics are best available information and subject to revision. Large fires are considered to be over 100 acres in timber and 300 acres in grass.

18 This was the Range 12 fire near Sunnyside; it was responsible for 58 percent of area burned in 2016. NWCC Annual Report, 2016. gacc.nifc.gov/nwcc/content/pdfs/archives/2016_NWCC_Annual_Fire_Report_FINAL_2017-2-28.pdf.

19 NWCC Detailed Situation Report, 10/16/2018.

20 DNR, 2014.

21 DNR, 2014.

22 Unpublished research. Haugo et al., 2018.

23 Affected forests include the western and eastern Cascades, Okanogan Highlands, & Blue Mountains. Projection is compared to 1980-2006 (Littell et al., 2010).

triple in the interior western US by mid-century.[24] Meanwhile, our fire seasons are getting longer. The USFS reported that in 2015, fire seasons were averaging 78 days longer than in 1970.[25] By mid-century, the wildland fire season could last approximately 35 days longer, beginning about two weeks earlier and lasting about three weeks longer compared to 1971-2000.[26]

Increasing Costs

The increased amount and intensity of fire is resulting in exorbitant costs. The cost to manage large wildland fire in Washington state averaged nearly $37 million per year between 2008 and 2012. Between the years of 2013 and 2018, the average annual expense quadrupled ($153 million).[27] However, suppression costs are only a small fraction of the total cost of wildland fire—estimated to be nine percent of the total.[28] When loss of assets and disaster recovery are included, the financial burden is even greater. The remaining costs are associated with damages to businesses, infrastructure, habitat, timber, grazing, and agriculture, as well as impacts on health.

Growing Wildland-Urban Interface

More people are moving to areas adjacent to wildlands, resulting in more communities, homes, and values at risk. Washington state has over 4,500 square miles of wildland-urban interface—a land area almost the size of Connecticut.[29] Over 951,000 homes have been built in this area, each with an average lot size of 0.9 acre (see Figure 8 for the top 25 communities in Washington likely to be exposed to wildland fire). However, the potential for continued development of the wildland-urban interface is significant; approximately 71 percent of Washington state's private forestland within 0.3 miles of public forestland has yet to be developed.[30]

In 2017, eastern Washington's population grew by 1.3 percent, continuing a two-year trend of increasing rates of growth.[31] Thirty-eight percent of Washington's 2017 growth occurred in King County, an area that is expected to face increasing risks from wildland fire as the climate continues to change.

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24 This projection is for 2040-2069, compared to 1971-2000 (Barbero, et al. 2015).

25 USFS, 2015.

26 This projection is for 2040-2069, compared to 1971-2000 (Barbero, et al. 2015).

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

28 Headwaters Economics, 2018b. The Full Community Costs of Wildfire

29 Headwaters Economics, 2018a. Economic Profile System Report. WUI is defined in this statistic as private land within 0.3 miles of public forestland. Note that this statistic omits private land within grassland and open shrubland and therefore is likely to under-report the WUI.

30 Ibid. Additionally, Goal 2 of the FHSP recognizes the challenges a growing wildland-urban interface presents for forest and wildfire management and highlights the need to reduce the risk of conversion of forested areas to non-forested uses.

31 Population growth numbers from Washington Office of Financial Management (OFM). Available at: www.ofm.wa.gov/sites/default/files/public/dataresearch/pop/april1/ofm_april1_poptrends.pdf. In addition to general growth in at-risk areas, population is migrating from lower risk to high-risk areas. According to Seattle Times, 2018: "U.S. Census data shows that net migration from Snohomish, King and Pierce counties to Chelan, Douglas and Kittitas counties was around 160 people per year during the most recent survey period, 2011-2015. But that's a marked change from five years earlier, when net migration between the regions ran the other way by some 44 people a year" (www.seattletimes.com/business/seattle-areas-economic-boom-splashes-over-the-cascades-bringing-work-and-worries)

Figure 8. Top 25 places most likely to be exposed to wildland fire in Washington state. Table adapted from: Scott, et al. (2018).

COMMUNITY EXPOSURE RANKING[32]	PLACE NAME[33]	TOTAL NUMBER OF HOUSING UNITS EXPOSED TO WILDLAND FIRE[34]
1	Leavenworth	4,025
2	Ellensburg	12,204
3	Selah	5,873
4	Spokane	58,409
5	Wenatchee	11,864
6	Chelan	2,938
7	Goldendale	3,341
8	Tonasket	2,343
9	Cashmere	3,822
10	Omak	4,065
11	Twisp	1,364
12	Deer Park	6,684
13	Clarkston Heights-Vineland	3,198
14	Okanogan	1,947
15	Colville	4,720
16	Cle Elum	1,936
17	Winthrop	1,095
18	Sunnyslope	2,528
19	Brewster	1,973
20	Kittitas	1,952
21	Entiat	1,570
22	Ahtanum	2,318
23	Summitview	1,361
24	Malott	830
25	Manson	1,670

32 Exposure is represented by the likelihood of a wildland fire (measured by annual burn probability through the QWRA). Places are ranked as highly exposed due to a combination of high likelihood of a wildland fire occurring and high population.

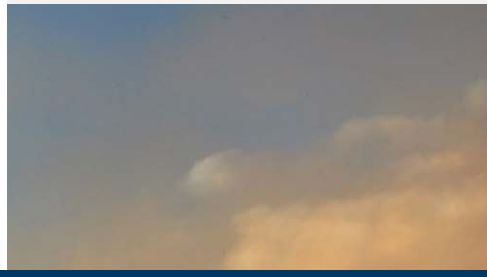
33 Populated Place Area as defined by the U.S. Census Bureau plus the population within a 45-mintue drive of the community core.

34 Housing units from the Where People Live spatial dataset. Units were included if they were located on burnable landcover (such as grasses, shrubs, understory trees, etc.) or within approximately 500 feet of burnable landcover.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

Increasing Vulnerable Communities at Risk

Many of Washington's most vulnerable populations live in areas with high wildland fire risk. Older adults, young children, and those with limited English proficiency can be vulnerable during wildland fires due to potential health impacts (to the old and the young) and language barriers (those with limited English proficiency). Washington state is home to close to a million people age 65 and older. This segment of the population comprised approximately 15 percent of the state population in 2017 (an increase of 3% since 2010).[17] Six eastern Washington counties (Yakima, Grant, Adams, Franklin, Douglas, and Chelan) have the highest percentages of households who report speaking English less than very well; Chelan and Yakima counties are in the top five Washington counties at risk from wildland fire (see "Hazard x Vulnerability = Wildfire Risk" inset, p. 40).[35] Recent research indicates that vulnerability to wildland fire is unequal; census tracts that are majority Black, Hispanic, or Native American have a 50 percent greater vulnerability to wildland fire than other census tracts.[36]



Current and emerging wildland fire risks and the impacts of wildland fires are widespread, not confined to forests nor to eastern Washington. Wildland fire risk is a shared risk and a shared responsibility.

Changing Fire Dynamics in Western Washington

As the climate changes, forested areas of western Washington face the potential for increasing risks from wildland fire along with associated management challenges, costs, and consequences. The 2017 Norse Peak fire illustrates the potential costs and losses of wildland fire on the westside of Washington. This fire, located near Mt. Rainier, consumed 52,000 acres in heavy timber and cost nearly $20 million to suppress.[37] While measures to reduce wildland fire risk are well understood in fire-prone forests such as those found on the eastern slopes of the Cascade mountains, adaptation options are much less well understood on western slopes. Recent studies indicate adaptation measures for forests that historically experience stand-replacing wildland fire differ from those with a low-severity fire regime, with an emphasis on post-fire adaptation actions as opposed to pre-fire mitigation actions.[38]

Photo courtesy of Kari Greer, U.S. Forest Service.

35 American Community Survey, 2016 and QWRA, 2018. Over 1 in 4 households (28.6%) in Adams County speak English less than very well for the population 5 years and over. In Chelan County, 1 in 10 households speak English less than very well. The percentage of households in the other counties speaking English less than very well are 13.0 percent (Douglas County), 16.1 percent (Yakima County), 17.9 percent (Grant County), and 23.4 percent (Franklin County).

36 Davies et al., 2018.

37 NWCC, 2017. 2017 Annual Report.

38 Halofsky et al., 2018.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

Wenatchee Complex Fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

CHALLENGES AND BARRIERS

The challenges that Washington faces now and in the future are growing ever more complex. Challenges include preventing wildland fires, creating resilient landscapes and fire-adapted communities, improving response and assisting communities with post-fire recovery. These challenges are interrelated and often share a common set of needs: cohesive leadership, a shared understanding of risk and risk-based decision making, a well-supported workforce, effective community engagement, and effective protection for all lands across the state.

Key barriers have been identified in all challenge areas; several have been highlighted below. Note that many of the barriers discussed apply to all five of the challenges facing wildland fire management.

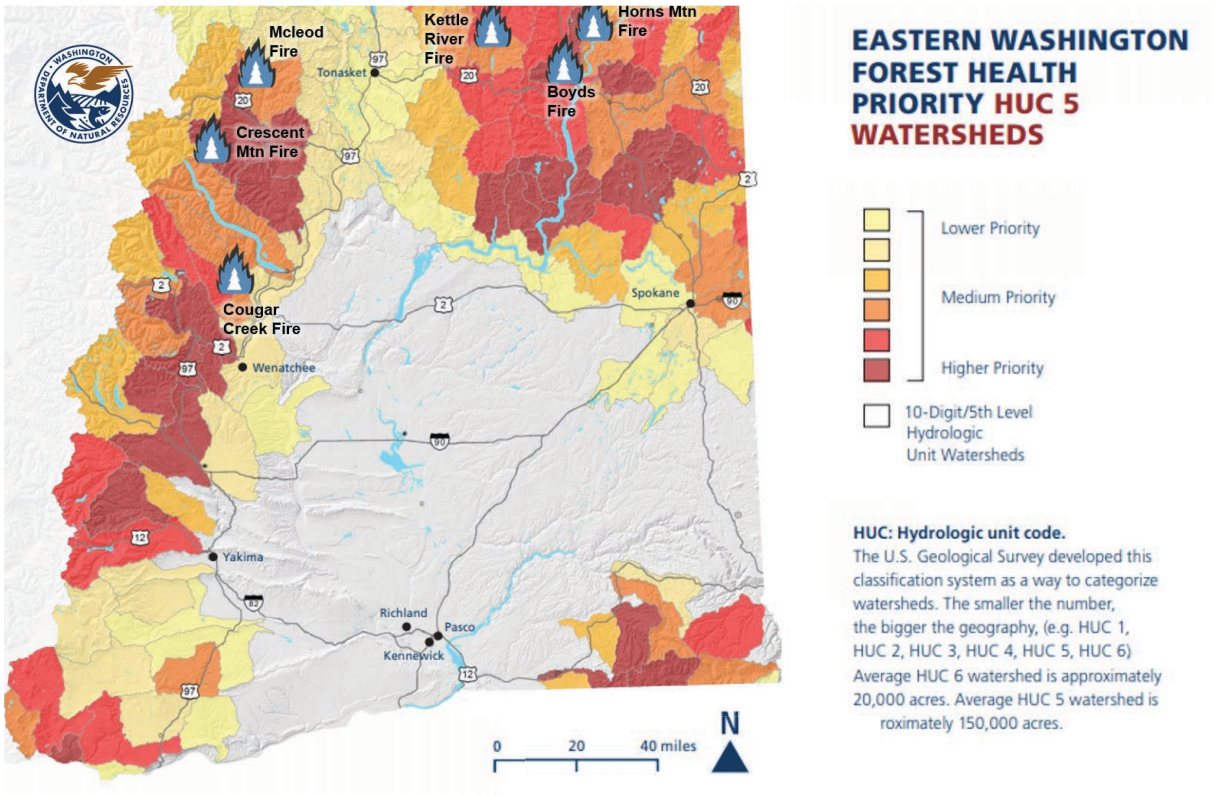
CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

Challenge: Fuels and Vegetation Management

Many of Washington's fire-prone forests are dense with fuel and susceptible to invasive species, pests, and disease, and much of our grasslands and rangelands are at risk from invasive species and habitat encroachment. In fact, the FHSP identifies 2.7 million acres in eastern Washington that require more active management to regain forest resiliency and sets a goal of treating 1.25 million acres over the next 20 years.[39] These forests contain far more fuel than they did historically and present significant management challenges. Paradoxically, those fires that are successfully suppressed even in challenging fuel conditions, are exacerbating the fuel build-up problem that leads to more intense fires.[40] The spread of cheatgrass, particularly in the Columbia River basin, has contributed to the rapid spread and extent of fires in rangeland areas.[41]

KEY BARRIER: Lack of support and/or trust. Public support for prescribed and managed fire can be limited due to a variety of factors, including lack of trust, health impacts, and poor communication of burn objectives, timing, and location.

Figure 9. Four of the large fires in August 2018 were burning in areas that were identified by the FHSP as priority watersheds for landscape restoration. Many of these watersheds have departed significantly from their historic condition, and consequently have increased wildland fire risk. Restoration and management actions will continue in these watersheds as the FHSP is implemented and will factor into the future effects of wildland fire in these areas (both positive and negative).



39 DNR, 2017. FHSP.

40 Calkin et al., 2014.

41 Pellant, 1996.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

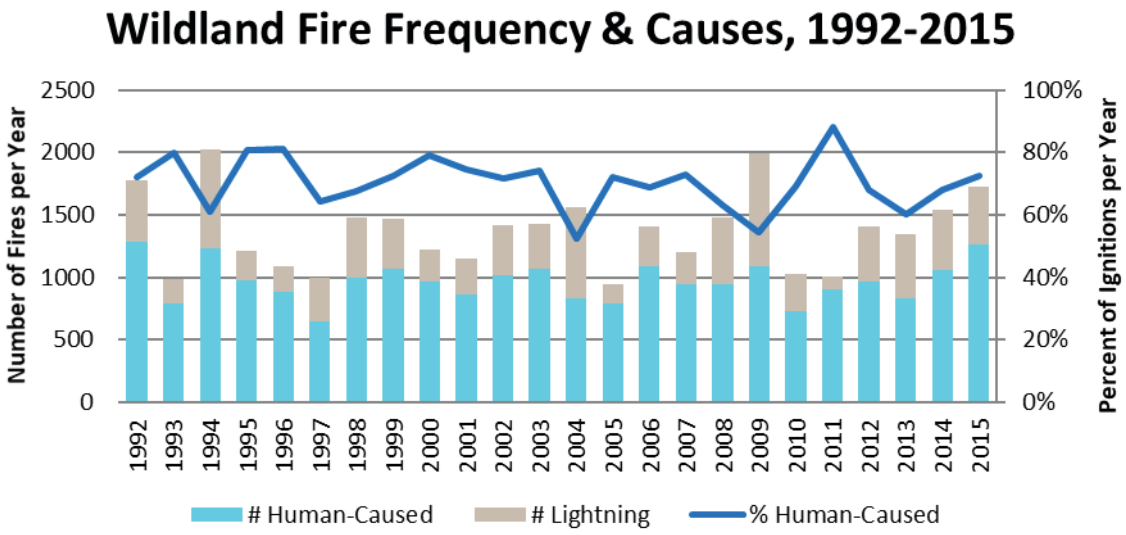
Wildland fire prevention education. Photo courtesy of Guy Gifford, DNR.

Challenge: Human-related Wildland Fire

Human-related wildland fires continue to represent the largest cause of wildland fires in Washington state. From 1992 to 2015, these fires accounted for nearly 70 percent of total wildland fire starts (Figure 10).[42] While the percentage of human-related wildland fires has varied some from year to year, there has been no consistent, sustained reduction in human-related wildland fire since at least 1992. Over $17 million was spent in 2017 suppressing human-related wildland fires on state and federal land in Washington.[43]

KEY BARRIER: Insufficient data and lack of personnel. Data on wildland fire prevention, preparedness, suppression, and recovery costs, causes, and resources are inconsistent across jurisdictions and often incomplete. Capacity for fire prevention is limited across the state.

Figure 10. Number of wildland fires in Washington state across all jurisdictions.[44]



42 Only Washington data represented. The entire dataset is nationwide and includes 1.88 million wildfire records, representing a total of 140 million acres burned during the 24-year period (Short, 2017).

43 NWCC Annual Report, 2017.

44 Only Washington data represented (Short, 2017).

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

Challenge: Homes, Communities and Values at Risk

Communities and vulnerable populations across the state are struggling to keep up with accelerating wildland fire risks. Experiences throughout the country show that engaged, adapted communities are highly effective at reducing the impact of large fires, but even those with active wildland fire preparation initiatives lack the resources and support needed to fully prepare for wildland fire. In 2018, most communities in Washington experienced significant air quality hazards; however, few were prepared with masks or refuge areas for sensitive populations (Figure 11). As population increases in the WUI along with wildland fire risk, more investment is needed to increase the pace and scale of community resilience improvements throughout Washington. Ten of Washington's counties are ranked in the top 10 percent of 414 western counties for undeveloped private forestland (see "Wildfire Affects Us All" inset, p. 39). Codes and ordinances that reduce wildland fire risk by requiring ignition-resistant construction materials would be of significant benefit in these counties, yet most communities are still building in wildland fire-prone areas without accounting for wildland fire in their land use planning processes. Communities are asking for more timely and appropriate communication about wildland fire risks, response, and recovery.

KEY BARRIER: Lack of access. Communities often lack access to available resources, including technical knowledge and facilitation skills. Some agency programs exist, but communities are not aware of them or lack the capacity to apply to or engage with them.

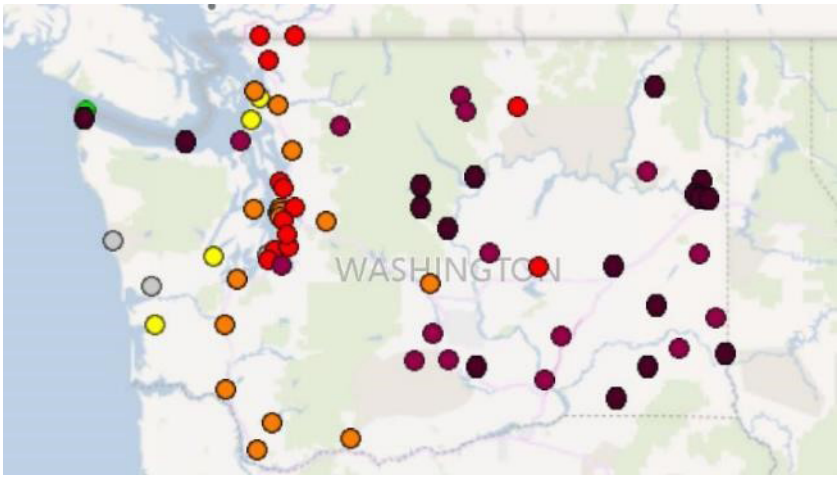


Figure 11. Washington Air Quality on August 20, 2018 as reported by the Department of Ecology. The darker the dot, the worse the air quality: red signifies unhealthy; maroon signifies very unhealthy; dark red signifies hazardous.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

Challenge: Effective Wildland Fire Response

Wildland fire response systems are stretched. While multiple agencies coordinate remarkably well to suppress wildland fires once they start, there is widespread acknowledgment that better communication and improved cross-jurisdictional coordination are needed to achieve a truly unified approach to fire response. Both volunteer and permanent firefighting forces also struggle to recruit and maintain a pipeline of qualified, well-trained responders. Effective response systems will need to address firefighter safety, training, and retention as fires grow in frequency and intensity. In addition, thousands of acres of Washington state are outside of a formal fire protection district,[45] challenging neighboring jurisdictions and further taxing the wildland fire response system.

KEY BARRIER: Lack of capacity throughout wildland fire prevention, preparedness, response, and recovery systems. Capacity limitations include insufficient agency resources and programs to meet community needs as well as insufficient community organizational structure to coordinate and engage with both landowners and agencies.

Home at the edge of the WUI in Chelan (WA).
Photo courtesy of Kari Greer, U.S. Forest Service.

45 A draft DNR GIS analysis suggests that over 350,000 acres in Washington are currently unprotected.

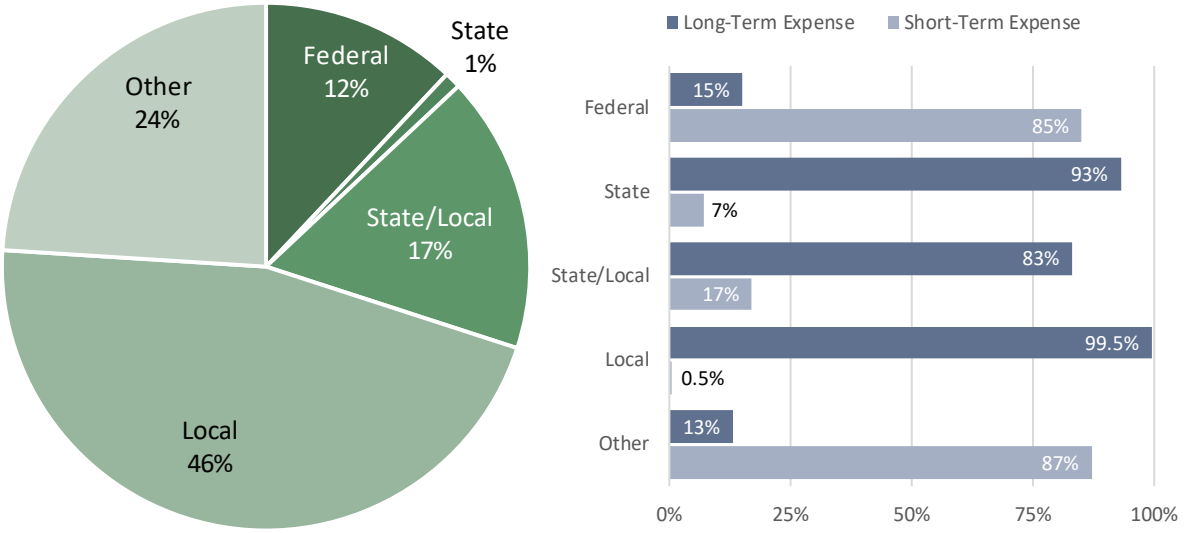
CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

Challenge: Post-Fire Response

Currently, Washington lacks a consistent, integrated response to support post-fire recovery. Often referred to as the "second disaster," floods, hazard trees, and debris flows pose a threat to communities for approximately five years following a fire. Community recovery, including rebuilding the social and built landscapes, can often take longer. In addition, costs and losses associated with post-fire recovery extend far beyond the cost of suppression, home and property loss, aid, and evacuation. National studies indicate that 65 percent of all wildland fire-related costs and losses occur more than six months after the wildland fire, with most of the cost being borne at the state and local levels (Figure 12).[46] Resources to address the impacts of wildland fire are often not coordinated between agencies and difficult for communities to navigate.

KEY BARRIER: Lack of coordination and capacity. Coordination between agencies and capacity within agencies is often lacking with respect to post-fire recovery. Many agencies lack a clear mandate to engage in post-fire recovery.

Figure 12. Summary of national averages of proportional costs of wildfire (including recovery as well as suppression) paid at the local, state, federal level and how those costs are distributed as short- and long-term expenses. Short-term expenses include suppression, home and property losses, and other short-term expenses such as immediate landscape mitigation. Long-term expenses include home and property depreciation, energy and infrastructure repair, ecosystem services, and other long-term losses such as tax, business, and natural resource loss. Data from The Full Community Costs of Wildfire (May 2018) is based on a nationwide review of wildland fire cost and loss case studies and not specific to Washington alone.



46 Headwaters Economics, 2018b.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

Figure 13. TREX participant Nolan Brewer (DNR) ignites a prescribed fire outside of Roslyn on October 5, 2017. Photo by John Marshall.

Figure 14. Participants in the Cascadia TREX prepare for a prescribed fire on October 3, 2017. Photo by Cheryl Barth.

ACTION, OPPORTUNITY, AND PARTNERSHIP

Washingtonians are taking more action than ever before. Since 2002, 212 communities in Washington state have earned recognition through the Firewise USA® program and reported over $10.8 million in investments to make their homes and neighborhoods more fire resistant.[47] In 2016, Washington led the nation with 32 new Firewise USA® communities. Wildland fire risk reduction has also gone beyond the individual and neighborhood scale: in 2014, with support of the BLM, Washington became the first in the nation to expand the Fire Adapted Communities Learning Network to the state level. Thirteen communities and over 10 agencies and organizations from the San Juan Islands to Spokane participate in the Washington State Fire Adapted Communities Learning Network (WAFACLN).

Cooperation and coordination have enabled key opportunities. In the fall of 2017, Washington hosted its first-ever prescribed fire training exchange (TREX). The Cascadia TREX program completed 419 acres of prescribed fire on USFS, WDFW, The Nature Conservancy (TNC), and private lands over a two-week period while providing invaluable prescribed burning experience to 18 participants from agencies including local fire service, DNR, and USFS (Figure 13 and Figure 14). And in 2017 and 2018, almost 1,200 firefighters trained at three interagency fire academies hosted by DNR.

47 DNR Firewise USA® Community Investment Data.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

In addition to local action, Washington lawmakers are paying attention. Wildland fire issues have been a major focus in the legislature since 2014, resulting in prioritized programs to improve forest health, support local fire districts, and create more effective prescribed fire programs such as burn manager certifications (Figure 15). Washington's legislature also authorized "good neighbor agreements" between state and federal agencies to create the Forest Lands Revolving Account to fund restoration activities on federal lands.

Figure 15. One of 29 DNR wildland fire engines transferred to local fire districts to provide much-needed initial attack capacity as part of the surplus program authorized by Washington's legislature in 2017.

Photo courtesy of Janet Pearce, DNR

ESHB 2928 FOREST RESILIENCY PILOT

Directed by ESHB 2928, the Department of Natural Resources worked with three landscape collaborative groups, the Washington Prescribed Fire Council, and agency and non-profit partners to identify burn sites and implement the pilot project. During the fall of 2016 and the spring of 2017, partners completed prescribed fire on USFS and WDFW land and developed recommendations for continuing and expanding the use of prescribed fire. The final recommendations report (in progress) highlights the importance of collaboration and coordination between burners and stakeholders, the need for quality communication with the public, opportunities for policy changes, and the overall need to increase the capacity of, and support for, prescribed fire practitioners to increase the pace and scale of prescribed fire on the landscape.

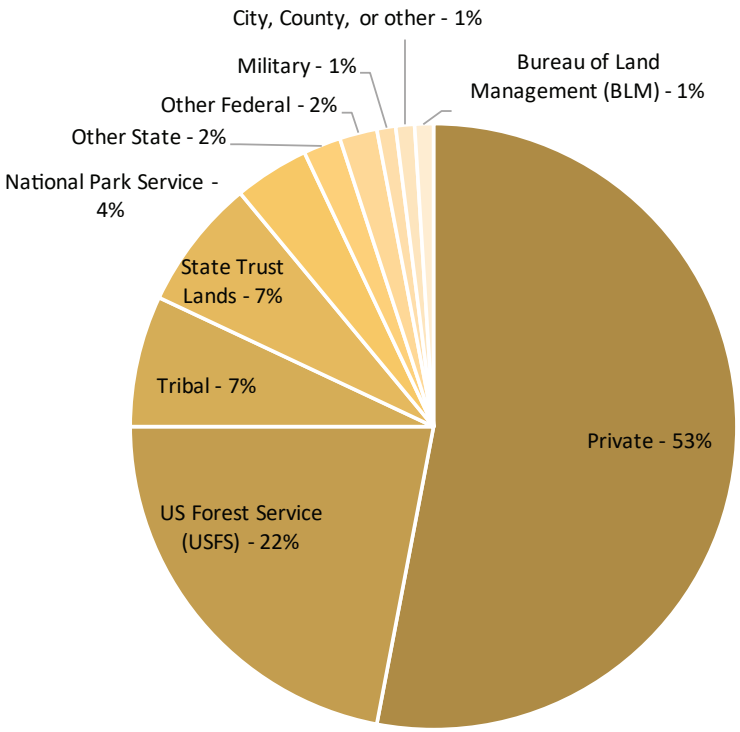
CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

There is policy activity at the federal level as well. The elimination of "fire borrowing," which is the practice of diverting funds from forest health and fire prevention programs to fight wildland fires, will enable proactive support of resilient landscapes and prevention. The Shared Stewardship outcome-based investment strategy developed collaboratively by the US Forest Service and partners (released in August of 2018) places an increasing emphasis on working with states to co-manage risk across landscapes, completing the right treatments at the right scale, and using all available tools for active management.[48]

Partnerships and collaboration are more important than ever. The increasing costs and risks associated with wildland fire make seamless collaboration essential to better wildland fire outcomes. With over 50 percent of land in Washington privately owned, residents and communities need to be active partners in wildland fire risk reduction (Figure 16). As depicted in Figure 17, multiple agencies and organizations are currently engaged in supporting work before, during, and after wildland fire. Improving coordination between and among these organizations and with communities is a priority focus of this Plan.

Now is the time to capitalize on actions, opportunities, and partnerships to move toward solutions for Washington's future.

Figure 16. Land ownership across Washington. This chart illustrates responsibilities born by federal, state, local, and tribal governments, as well as the private sector.




Thinning in progress near Tonasket. Photo by Ken Bevis, DNR.

48 USFS, 2018a.

CURRENT SITUATION ANALYSIS: RISKS AND COSTS INCREASING

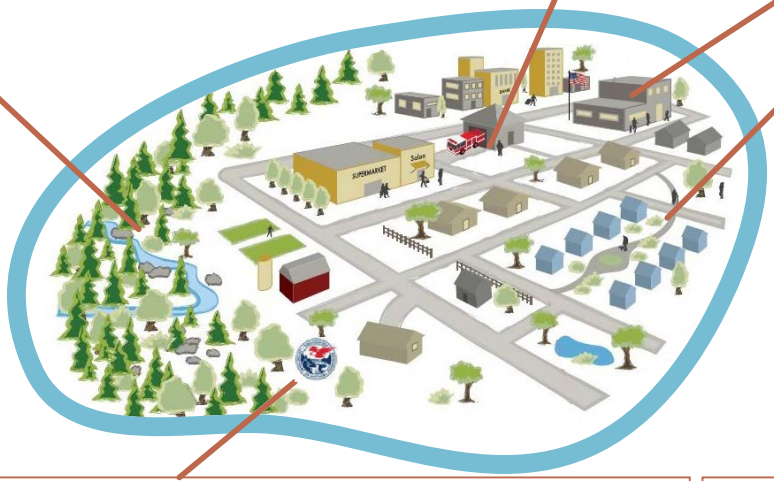
Chelan First Creek Fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

Collaboration and coordination are essential for all parts of the fire cycle—before, during, and after.

LOCAL FIRE SERVICE: Approximately 500 fire departments are responsible for structural and wildland fire protection. A significant number of their members are volunteers. State mobilization (through WSP) provides resources when local capabilities have been exceeded.

LOCAL JURISDICTIONS: Counties and cities are responsible for land use planning and WUI code implementation. Wildfire evacuations are the responsibility of local law enforcement.

TRIBES: Several individual tribes maintain fire organizations and authorities. Programs include suppression resources, prevention, and BAER support. On other tribal lands, DNR provides full or partial protection (at the request of/under contracts or agreements with each respective tribe). BIA also provides protection and prevention programs.



FIRE PREVENTION: Efforts take place in and around communities (usually during periods of high fire danger) with support from the federal fire agencies, DNR, and tribes.

POST-FIRE RECOVERY: Community groups and long-term recovery organizations with assistance from FEMA and national volunteer groups help communities rebuild after wildfire. Agencies such as NRCS and conservation districts help landowners navigate post-fire hazards. Assessments of burned areas (e.g., BAER efforts) are funded on federal land and completed by USFS, BLM, BIA, and other federal agencies.

PRIVATE LANDS: Private landowners own and manage over 50% of Washington State's land area. Whether private industrial forestland or small family holdings, land managers are taking action to reduce fuel and manage vegetation. Since 2002, 212 communities in Washington have earned Firewise USA® recognition.

FEDERAL LANDS: There are approximately 12.5 million acres of federally managed land in Washington. Fire management services are provided by USFS (9.4 million acres), NPS, BLM, BIA, and USFWS. Agencies use a suite of tools including suppression, managed wildfire, prescribed fire, and fire prevention. Many support CWPP development and Fire Adapted Communities.

DNR PROTECTED LANDS: DNR is responsible for preventing and fighting wildfires on 13 million acres of private, state and tribal-owned forestlands, grasslands, and shrublands across Washington State, all of which pay an assessment to support DNR wildfire management costs. DNR manages prevention activities such as education programs, determines industrial fire precautions, and provides technical and financial assistance programs for landowners to help them achieve forest management objectives, address insects and disease within their forestlands, and mitigate the risks from wildfire. State land management partners include DNR Uplands Division, WDFW, Washington State Parks, and others.

COMMUNITY PREPAREDNESS: Conservation districts and community preparedness groups (like WAFACLN and Firewise USA® Communities) support sustainable communities and resilient landscapes. State agencies such as the Department of Commerce and Washington State EMD emphasize business resilience and continuity planning.

Figure 17. The partnership landscape in Washington is diverse, with many agencies and organizations engaged in wildland fire management before, during, and after fires. Graphic adapted from the Guide to Fire Adapted Communities (2014).

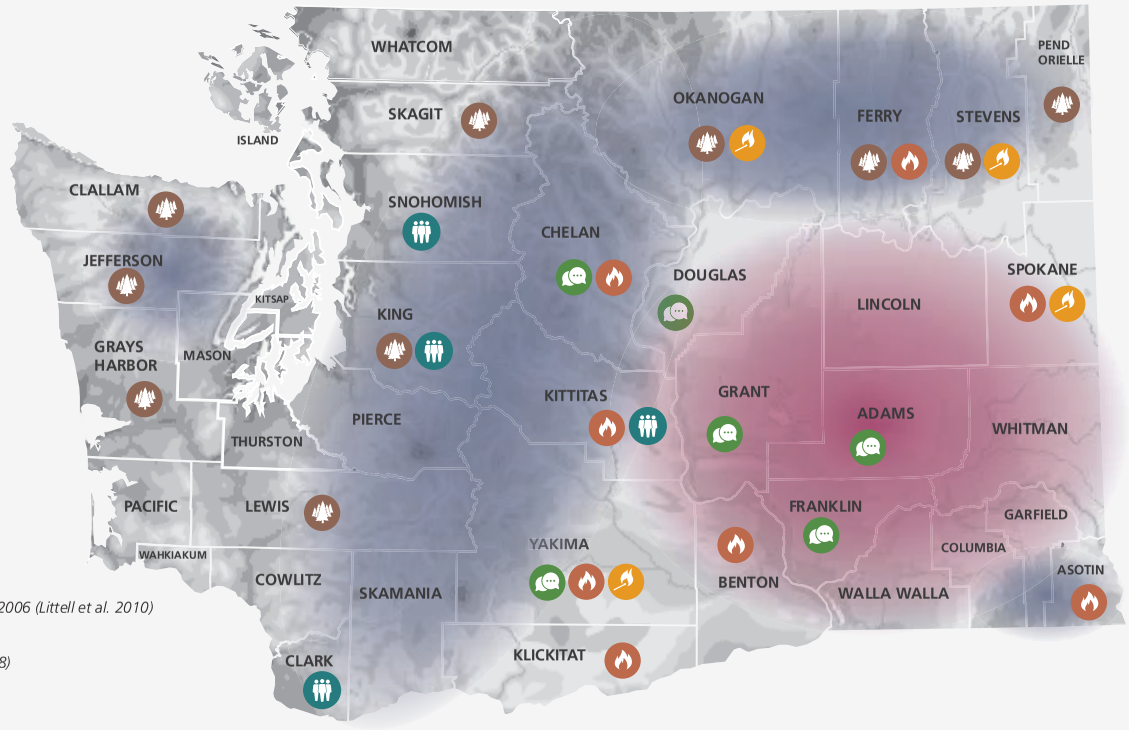
WILDFIRE
AFFECTS US ALL

Wildfire is a shared risk, and a shared responsibility.

Significant increases in area burned are projected across much of the state. Many of these areas overlap with counties with swiftly increasing population and ample undeveloped land in fire-prone areas. In these areas, much of the population faces communication barriers, human-related wildland fires are very common, and wildland fire risk is already very high.

DATA SOURCES:

2040 Burn Projections. These are compared to 1980-2006 (Littell et al. 2010)
Population Growth (Washington OFM 2018)
Wildfire Risk (QWRA 2018)
Undeveloped Forestland (Headwaters Economics 2018)
Language (2016 American Community Survey)
Smoke Incursion (Washington ECY 2018)
Human-Caused Fires (Short 2017)



2040 BURN PROJECTIONS

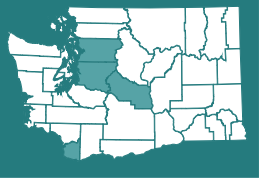
Annual area burned projected to quadruple by 2040s. More frequent fires; area more suitable to large fire growth.

Annual area burned projected to double by 2040s.

POPULATION GROWTH

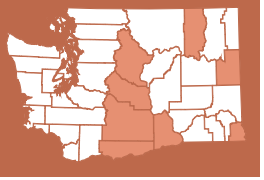
Largest percent growth in county population in 2017:

Kittitas:	2.33% (1,020)
King:	2.31% (48,600)
Clark:	2.17% (9,990)
Snohomish:	2.14% (16,540)



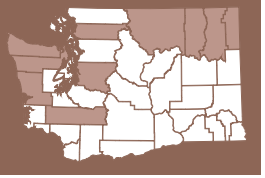
WILDFIRE RISK

These counties are in the top 20th percentile of wildfire risk, as assessed by the QWRA.



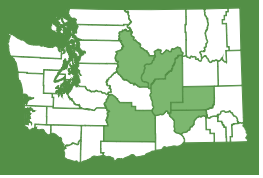
UNDEVELOPED FORESTLAND

At or above the 90th percentile of 414 western counties for acres of undeveloped private forestland bordering public forestland.



LANGUAGE

Between 1 in 10 and more than 1 in 4 households speak English "less than very well" (2016 ACS data).



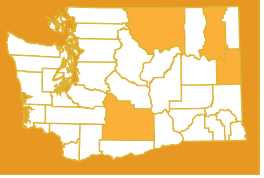
SMOKE INCURSION

Smoke-related issues, including air quality, visibility, and human health impacts, affect the entire state.

HUMAN-RELATED WILDLAND FIRES

Highest numbers of human-related wildland fires in the state from 2006-2015:

Yakima:	1,187
Okanogan:	859
Stevens:	1,155
Spokane:	1,001



HAZARD x VULNERABILITY = WILDFIRE RISK

The Quantitative Wildfire Risk Assessment (QWRA) at a glance

Wildfire risk, discussed frequently throughout this Plan, can be defined as a **product of hazard and vulnerability**. The QWRA (2018) uses this framework to assess wildfire risks throughout Washington and Oregon by examining the likelihood and severity of wildfire based on historic fire occurrence and extent (hazard), as well as the exposure and susceptibility (vulnerability) of highly valued assets and resources to wildfire.

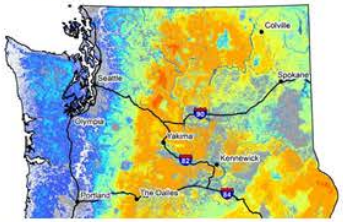
What is hazard and vulnerability in the QWRA? (model inputs)

The QWRA uses FSim (a large-fire simulation program) to quantify wildfire hazard using local data on fuel, weather, topography, and historical fire occurrence .

HAZARD

PROBABILITY (frequency)

Current burn probability is based on historic fire occurrence data and factors in suppression probability.



Current burn probability: Lowest — Highest

INTENSITY (severity)

Potential burn intensity, as represented by the probability of experiencing flame lengths greater than 6 feet.

Areas mapped in green and grey are non-burnable or have modeled flame lengths less than 6 feet.

Potential burn intensity: Lowest — Highest

VULNERABILITY

EXPOSURE & SUSCEPTIBILITY

Vulnerability of highly valued resources and assets (HVRA). Through stakeholder engagement, the following HVRAs were selected:

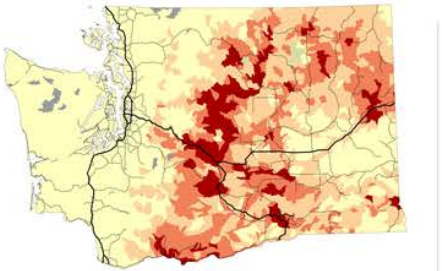
1. People and property
2. Infrastructure and watersheds
3. Timber

To determine vulnerability, a stakeholder engagement process was used to identify and map HVRAs, quantify their response to a range of flame heights, and determine their relative importance. However, only data available statewide in Washington and Oregon was considered. The QWRA may under-report the vulnerability, and therefore the risk, to rangelands and other land values across the state that were not included in the original data analysis.

What does the QWRA tell us about wildfire risk? (model outputs)

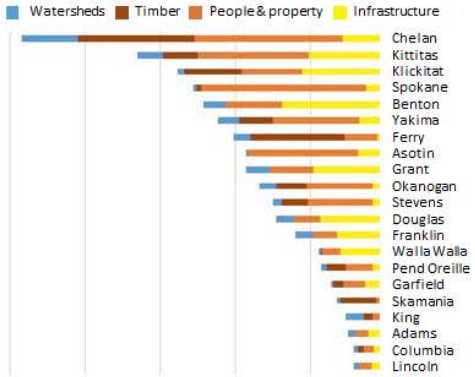
CURRENT RISK

Risk is shown at the watershed scale. It is important to note these risks are current; large fires and climate change will influence future risk. Note that the values are an average across the watershed.



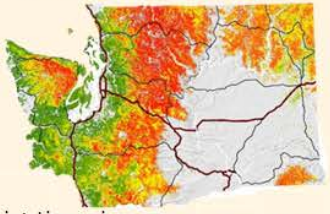
HVRA loss: Low — Very high

Washington counties currently at highest risk from wildfire. The counties shown are expected to experience the largest change to HVRAs should a fire occur.



PROJECTIONS OF FUTURE RISK

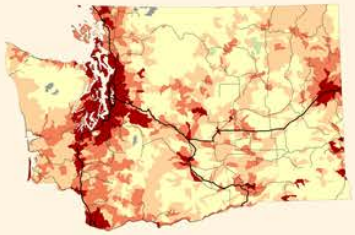
Fire probability in forested areas is projected to increase most on the west slope of the Cascade Mountains and eastern Olympic Mountains (left). The state's highest concentration of HVRAs evaluated in the QWRA are also largely located in western Washington and would be vulnerable to wildfire if it occurred (right). This suggests future wildfire risk will increase statewide, not just in eastern Washington. However, to quantify future wildfire risk through the QWRA or another approach, information on projected burn probability and potential intensity must be included in the assessment, along with information on other values at risk such as rangelands.



Projected increase in future burn probability: Lowest — Highest

Above: Projected increase in burn probability (2041-2070 vs. 1981-2010) (Davis et al., 2017).

Right: If a fire were to occur, the QWRA shows the greatest losses in highly valued resources and assets would be expected where dark red is visible.



HVRA loss: Low — Very high

Stakeholder Interests, Perceptions and Desired Outcomes

Between January and June 2018, nearly 1,000 stakeholders from across the state shared their vision for a more resilient, prepared Washington and provided input on the challenges, successes, priorities, and gaps to improving wildland fire outcomes across the state. Through detailed qualitative analysis of data from in-person meetings and an online survey, several major findings emerged. These major findings form the foundation for the strategies in this Plan.

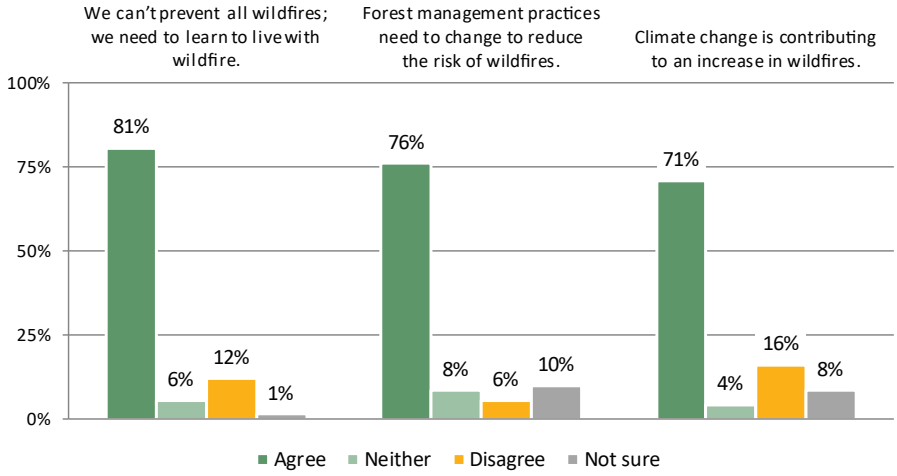
Major Findings across Stakeholders

Among all stakeholder and public input, there is widespread agreement on the need for thoughtful change and strong support for a unified, borderless, landscape approach to fire—before, during, and after. Among public survey respondents, there is foundational agreement that Washington needs to learn to live with wildland fire, that forest management needs to change to reduce wildland fire risk, that climate change is contributing to an increase in wildland fires, and that wildland fire risk has increased in the past 10 years (see Figures 18-19 on page 49). Workshop participants articulated their vision as "[we] manage fire as one entity," "us vs fire, not us vs them," "borderless restoration," and "borderless response." Stakeholders recommended a unified approach based on a shared vision that balances and makes best use of the strengths of all those involved in wildland fire management. They believe it is crucial that each entity play the role that is the most effective and efficient use of their time and resources. As one workshop participant said, "this [coordinated] approach will draw on the strengths of all entities who have a role to play to provide the best service possible." This means that **all are involved**, including not only fire response entities but communities, landowners, the private fire industry, and conservation districts, among others. Where lands are unprotected or under-protected currently, the overwhelming recommendation was for changes to policy and legislation to better protect that land.

Better coordination and cooperation across agencies, jurisdictions, and other boundaries is the crucial "missing piece" in addressing a stretched system. Despite acknowledged improvement in federal and state agency coordination, between 50 and 80 percent of practitioners surveyed indicated moderate to significant improvement was needed before, during, and after wildland fire at multiple geographic scales, with the most significant improvement needed at the state level (see Figure 25 on page 61). Twenty-four (24) of 35 interviewees cited the need for improved coordination, and all workshops included robust discussion of coordination needs and priorities. Consistent with the vision described

above, there is widespread desire to see the various entities involved in wildland fire management—at all levels—make the best use of their individual strengths and share resources at all points in the process. The emphasis on resource sharing is partly due to a desire for greater efficiency and partly due to concern about a lack of adequate, consistent, predictable, and timely funding for a variety of high-priority activities. Interviewees commented that "Right now, [they are] all competing for [the] same funds…[they] should be pulling together joint applications" and a top priority was to "have consistent funding streams for the recommended actions [because] right now, [we are] defaulting to local organizations and jurisdictions and they are strapped. It takes too long to get grants, federal programs, etc." Practitioners surveyed identified inconsistent funding for prevention and preparedness (55%) and insufficient funding for response (40%) as among the greatest barriers to improved wildland fire management.

Figure 18. More than 70 percent of public survey respondents agree with these three foundational statements about wildland fire in Washington.



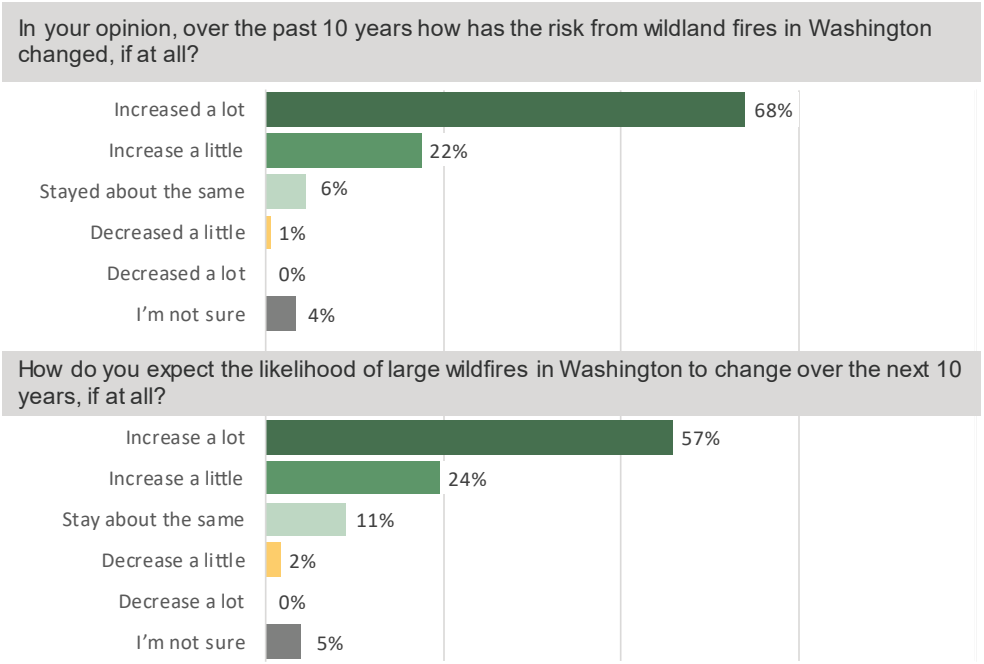
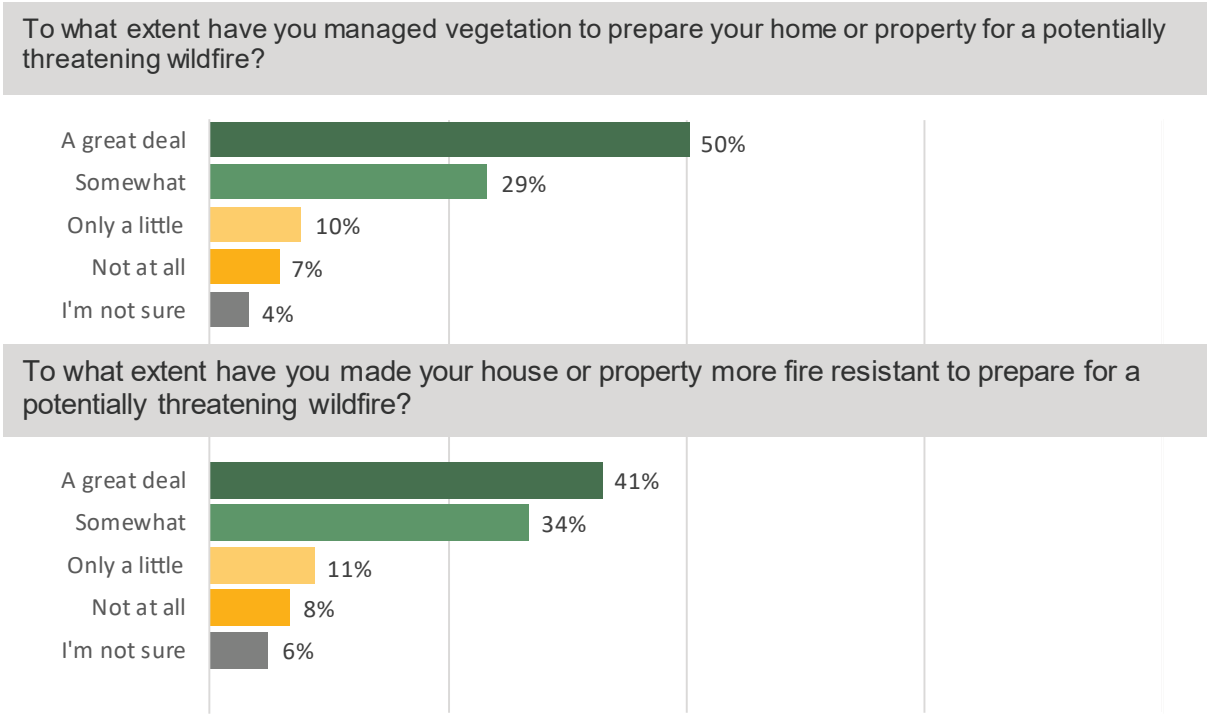


Figure 19. More than 50 percent of public survey respondents perceived wildland fire risk and the likelihood of large fires have increased a lot in the past 10 years.

STAKEHOLDER INTERESTS, PERCEPTIONS AND DESIRED OUTCOMES

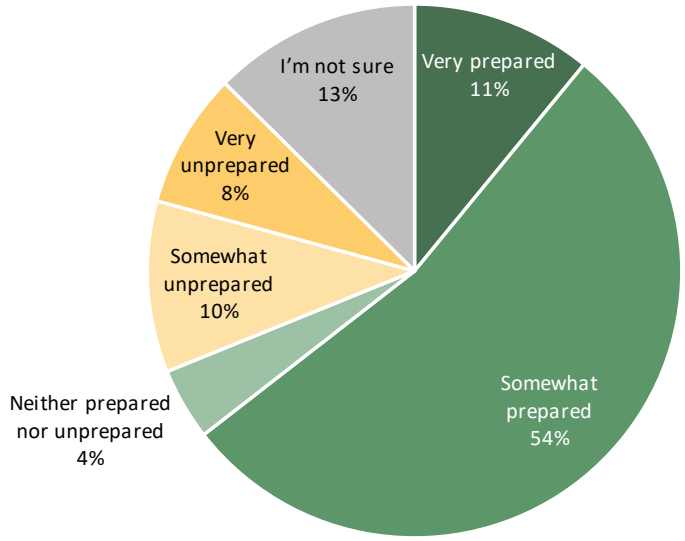
Stakeholders see prepared communities and a healthy, resilient landscape as the top priorities for improving wildland fire outcomes in Washington right now. While many across the state have already taken significant action to prepare their home or property for wildfire (Figure 20), most (51%) only feel "somewhat prepared" for wildland fire (Figure 21). Stakeholders strongly suggested this Plan focus efforts before wildland fire (e.g., in prevention, resilient landscapes, and communities) to reduce the size, intensity, cost of, and losses from wildland fire. Workshop participants noted that "resilient means able to recover and begin the succession process without lots of human intervention." Participants emphasized balance and synergy among preparation, response, and recovery. One interviewee illustrated this balance as: "land use codes that limit growth in WUI…[and] forest health and fuel treatments to better defend [against fires] with less folks."

Figure 20. Most public survey respondents have prepared their home or property for wildfire, with 41 percent having managed vegetation "a great deal" and 50 percent having improved fire-resistance "a great deal."



STAKEHOLDER INTERESTS, PERCEPTIONS AND DESIRED OUTCOMES

Figure 21. Just 19 percent of public survey respondents (n=280) indicated they felt "very prepared" for wildland fire, in response to the question, "How prepared or unprepared for wildfire do you feel?"



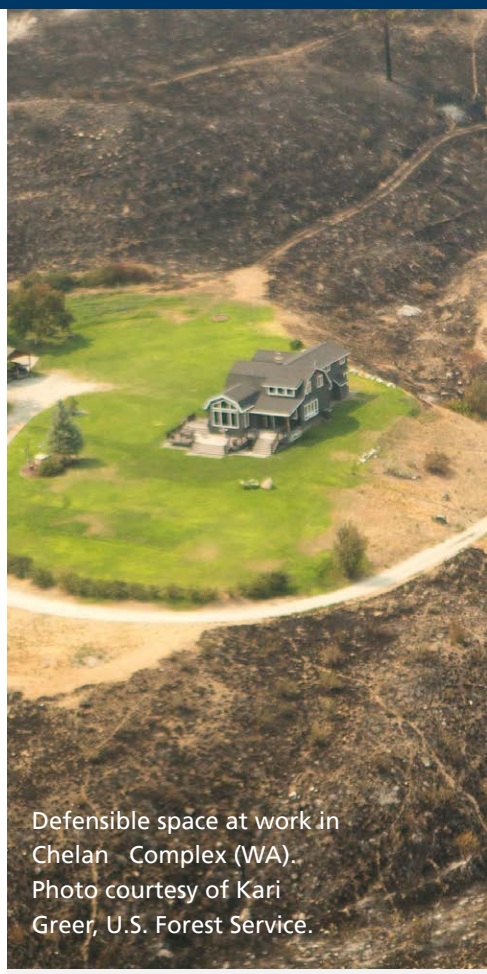
VISION FOR THE FUTURE

"To get back to historic fire regimes of low-intensity, frequent fire, Washington should: 1) actively reduce fuel loads…2) start implementing prescribed fire as a necessary tool…3) support private landowners…to also improve fire resiliency on their ownerships…"

~Workshop participant

Stakeholders requested tailored, local approaches that honor communities as knowledge holders. Communities, rural ranchers, and other large landowners are seen as knowledge holders who want, need, and must be engaged and supported throughout the entire fire cycle. Given the wide-ranging levels of preparation among Washington's communities, stakeholders conveyed that outreach must be tailored to the needs of, and level of preparation within, communities. Participants in the topical workshop on arid lands and rangelands observed that even in communities with little ability to prepare, their local knowledge of water sources and access roads can prove invaluable to wildland fire management.

Across the survey, workshops, and interviews, more focus, support, and resources for limited English proficiency communities were consistently identified as a need. A widespread lack of timely, quality in-language communications before, during, and after wildland fire place LEP communities, many of whom live in rural agricultural communities far from fire response resources, at disproportionate risk from wildland fire. Stakeholders recommended intentional development of cultural competency within emergency response agencies, leveraging community organizations as conduits between agencies and LEP communities, and making a long-term commitment to engaging LEP communities because "effective, inclusive outreach takes follow-up." In addition, stakeholders emphasized the need for professional translation and interpretation: "translation has to be to planned and prepared for. There has to be access, it has to be built into budgets, and it has to be professional." Professional translation means translators and interpreters understand both the community they are translating for and the subject they are translating about. Relationships with



Defensible space at work in Chelan Complex (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

existing community organizations were seen as essential both in terms of building trust with the LEP community and providing a conduit for translated materials.

Consistently across communities, **workshop participants and interviewees highlighted the need for truly accessible and actionable resources.** Accessible and actionable resources such as guidance on creating defensible space or home property assessments are seen as removing barriers to community empowerment and enabling communities to play an active role in becoming more prepared for wildland fire, thereby increasing the likelihood that they will engage in preparedness activities (Figure 22). They saw actionable resources as those that lead to empowered communities and create a sense of "buy-in" so the community's overall preparedness increases. Approximately 40 percent of public survey respondents and 62 percent of practitioners identified home property assessments on how to mitigate fire risk as a top priority for improvement or investment. Forty percent of public survey respondents also selected home and property protection education campaigns as a top priority. This focus on changing behavior was echoed by the practitioners surveyed, 51 percent of whom cited "build awareness and change behavior in communities" as the top priority to improve wildland fire outcomes. Stakeholders also requested better access to existing resources. Twelve (12) of 35 interviewees called for enhanced access to state and federal services such as hand crews, aviation support, or pre-positioned resources more generally, citing a lack of authority, planning, coordination, or communication as barriers to resource access.

VISION FOR THE FUTURE

"Community-driven action plan[s] can be…used as the foundation for awareness, research, and empowerment. Also necessary is the buy-in from local, state, and federal agencies to support and sustain this effort for the long-term success."

~Workshop participant

Figure 22. A community's level of preparation varies along a spectrum, and outreach should be tailored to each community's needs and preferences.

STAKEHOLDER INTERESTS, PERCEPTIONS AND DESIRED OUTCOMES

Communities want high-quality communications before, during, and after wildland fire. "High-quality" means a coordinated approach, consistent messaging, and audience-appropriate content, such as focusing on land value and management priorities when working with rural landowners or highlighting the location of evacuation routes in developed areas with limited access. Communications also need to focus on topics appropriate for the time of year: getting the right message to the right community at the right time, such focusing prevention campaigns before the wildland fire season begins in fire-prone or high-ignition areas. In addition to the needs described for LEP communities, improvement in transitions between Incident Management Teams (IMTs) and between fire response and post-fire recovery are needed. One interviewee noted, "Transitions during IMTs can be improved. This is an opportunity to strengthen the information handoff." Another said, "in the absence of recovery input, responders will…achieve their goals and that can be counter to the recovery goals." Communications across jurisdictions also need improvement. Common strategies to support improved communications include consistent messaging and data and information sharing.

There is a sense of urgency and broad support for accelerated and tailored landscape treatments around the state. Stakeholders supported risk assessment and prioritization across the spectrum of landscape types, as well as more active management such as mechanical treatment, pre-commercial thinning, managed wildland fire, and prescribed fire (see next finding). In general, people consider a broad range of activities as contributing to their landscape's resilience and requested more input into how those landscapes are managed. Many workshop attendees and interviewees who shared their vision for the future described "healthy forests that can withstand wildland fire," "agencies and communities collaborate together to protect the landscape from catastrophic fire," or activities to return the landscape to historic fire regimes.

Based on stakeholder input, the top needs and priorities for resilient landscapes vary by type of landscape:

- **In more developed areas** such as Leavenworth or Spokane, stakeholders supported reducing fuels and hardening structures throughout the community. Collective action (actions taken by multiple stakeholders, at multiple scales) is seen as needed to truly reduce wildland fire risk, especially in communities located in the WUI.
- **In areas where the landscape is actively managed on the east side of the state**, stakeholders want to transition back to a more fire-adapted landscape and restore the historic low-severity fire regime through treatment methods, especially prescribed fires, and preferentially removing invasive species and species that are not fire-adapted.
- **In areas with more rural land ownership**, listen to landowners for guidance on fire management actions, and collaborate to identify priority prescribed fire areas.
- **In more "wild" landscapes**, stakeholders emphasized values such as healthy, well-connected wildlife habitat and addressing invasive species. Critical habitat for pygmy rabbit, sage grouse, and sagebrush was specifically mentioned.

Preparing for a prescribed fire at the TNC Moses Coulee Preserve. Photo courtesy of Cheryl Barth.

STAKEHOLDER INTERESTS, PERCEPTIONS AND DESIRED OUTCOMES

Prescribed fire is seen as a valuable tool for hazardous fuels reduction, habitat improvement, and further developing and maintaining firefighter expertise. There is broad support for increased use of prescribed fire. Whether as a tool for fuels reduction, invasive species management, or firefighter training, the multiple perceived benefits of prescribed fire made it a high priority across the survey, workshops, and interviews. Seventy-seven percent (77%) of practitioners surveyed identified prescribed fire as the top priority for improvement and increasing investment, followed by mechanical removal (66%). Similarly, approximately 50 percent (50%) of the public identified prescribed fire as the most important action to take to reduce wildland fire risks and impacts (see Figure 30 on page 86). Stakeholders emphasized appropriate and strategic use of prescribed fire, recommending its use in the off-season in areas with the greatest fuels reduction need. Many suggested focusing fuels reduction in the WUI and saw prescribed fire as an important training opportunity for firefighters. To address the smoke from prescribed fire, participants recommended changes to existing smoke management regulations and public education to increase support for policy change.

Both public (70%) and practitioner (~80%) survey respondents indicated that wildland fire response efforts from wildland fire and land management agencies are effective overall (Figure 23). Several key areas for improvement were also identified. The most common request to improve response performance was to improve coordination, with 45 percent of practitioners surveyed identifying it as the top priority action (more than any other option). Twenty (20) of 35 interviewees identified better coordination along with better access to resources and improved efficiencies as the key improvements needed in wildland fire response.

Figure 23. Both public (left) and practitioner (right) survey respondents indicated Washington is most effective with wildland fire response and least effective with post-fire recovery.

Stakeholders perceive that resources exist, but they need to be more available to all entities and sufficient staff are needed for implementation. They also supported deployment of the closest and best resources—"facilitate any agency to use any other resource that is needed"—to extinguish the fire as soon as possible. Stakeholders strongly supported improved coordination of resources during response with varying degrees of understanding of the need for agency accountability for and control over the use of available resources. Other commonly cited strategies included prepositioning resources, providing

additional resources for extended initial attack, and standardized training. Workshop participants and interviewees suggested more support staff and "boots on the ground" so prioritization is not needed between people, values, and landscapes. Practitioners identified availability of personnel is the response practice most needing improvement (50%). In addition to adding more people to the workforce, workforce capacity is about strengthening training and utilizing all available resources.

Autonomy is important to stakeholders at the local level; there is consistent support for devolving authority to local entities whenever possible. Stakeholders consistently emphasized increased local autonomy to prepare for, respond to, and recover from wildland fire, suggesting efforts to "fund and empower local communities to engage in fire preparedness, response, and recovery while in tandem pressuring policy-makers to remove administrative and financial barriers for these efforts" (Spokane workshop). Popular approaches to enhance local autonomy included partnering with communities year-round to improve wildland fire preparation, response, and recovery; providing actionable and accessible resources; and for those on unprotected lands, providing options to achieve protection such as Rangeland Fire Protection Associations (RFPAs), annexation into a nearby fire district, forming a new fire district, and paying an assessment to DNR.

Greater attention to post-fire recovery, especially the transition between response and recovery teams, is needed. Among stakeholders, post-fire recovery seems to vie with prevention for the weakest link in the wildland fire management cycle. For both public (50%) and practitioner (70%) survey respondents, agency effectiveness in post-fire recovery was rated the lowest of prevention, preparation, response, and recovery (Figure 23). Not surprisingly, half of practitioners surveyed indicated moderate to significant improvement is needed in agency coordination around post-fire recovery. Workshop participants and interviewees cited the lack of institutional infrastructure, lack of communication about available financial resources and other support, high costs, and a lack of broad public awareness of the "second disaster" as the top challenges associated with improving post-fire recovery. Workshop participants expressed interest in fielding state and/or private BAER teams comparable to federal BAER teams, such as the state and private BAER team successfully fielded following the 2014 and 2015 fires in Okanogan County."[49] Furthermore, "post-fire recovery [should be] included in community and business resiliency planning before the fire [and considered] in management decisions during the fire." Achieving a seamless transition between fire response and post-fire recovery was also viewed as important.

TIPPING THE SCALES TOWARD RECOVERY

"I think we are a long way as a state from tipping the scales in wildfire prevention and adaptation... Recovery needs to rise to support our communities and landscapes as we all work toward fire response, prevention, and adaptability."

~Interviewee

49 However, funding for these teams is inconsistent and no permanent team has been established. See discussion of BAER teams beginning on page 108.

Solutions for a Prepared, Safe, Resilient Washington

Achieving better wildland fire outcomes will require an integrated, cohesive set of solutions designed to create a more safe, prepared, and resilient Washington. Accordingly, this Plan consists of ten inter-related strategies to achieve four key goals (right).

These strategies provide cross-cutting solutions to enable systems change and respond to specific challenges facing Washington throughout the fire cycle (see Figure 24). Where timeframes are specified, short-term (1-2 years), near-term (2-4 years), and longer-term (more than 4 years) horizons are used.

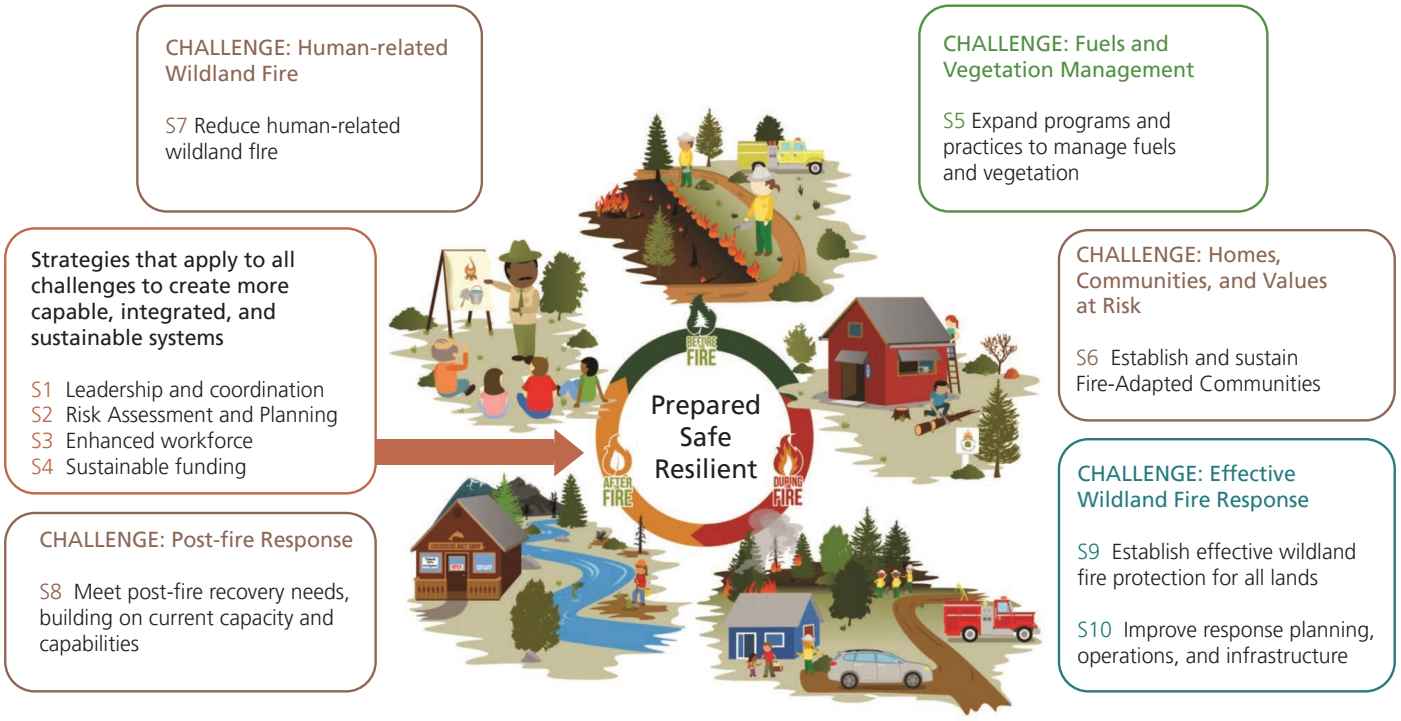
1 CAPABLE, INTEGRATED, SUSTAINABLE SYSTEMS

2 RESILIENT LANDSCAPES

3 FIRE-ADAPTED COMMUNITIES

4 SAFE, EFFECTIVE RESPONSE

Figure 24. The fire cycle (as depicted by the WAFACLN and adapted for this Plan) recognizes that wildland fire impacts communities before, during, and after the fire itself and requires a suite of actions to reduce the impacts of fire. Many communities are in more than one phase of the cycle at one time—recovering from one wildfire while simultaneously preparing for the next. Wildland fire challenges, and the strategies that address those challenges, are shown throughout the fire cycle.



STRATEGIES SUMMARY

GOAL 1. WASHINGTON'S PREPAREDNESS, RESPONSE, AND RECOVERY SYSTEMS ARE FULLY CAPABLE, INTEGRATED, AND SUSTAINABLE.

S1: PROVIDE LEADERSHIP AND COORDINATION TO GUIDE IMPLEMENTATION AND FACILITATE AGENCY ALIGNMENT

1.1 Convene a leadership forum to facilitate the development and alignment of agency efforts to achieve Plan goals.

1.2 Assign the WFAC the responsibility of providing advice on risk planning, prioritizing mitigation resources, and facilitating stakeholder engagement.

1.3 Establish regional and local coordinating capacity.

S2: USE RISK ASSESSMENT TO INFORM MITIGATION AND PROTECTION PLANNING AND TO ESTABLISH PRIORITIES

2.1 Quantify current and projected wildland fire risk.

2.2 Conduct comprehensive risk-mitigation planning to prioritize actions.

2.3 Establish a Wildland Fire Risk Management, Mitigation, and Protection Planning program in DNR.

S3: ENHANCE AND SUSTAIN A HIGHLY CAPABLE WORKFORCE

3.1 Establish an interagency taskforce to determine the workforce needed for Plan implementation.

3.2 Increase capacity of the state's wildland fire prevention, preparedness, and recovery workforce.

3.3 Increase capacity of the state's wildland fire treatment and response workforce.

3.4 Create processes and pathways to better use the existing wildland fire workforce.

3.5 Address retention and succession planning issues within the wildland fire workforce.

3.6 Provide effective training for the wildland fire management workforce.

S4: ADVANCE SUSTAINABLE FUNDING

4.1 Building on the work undertaken for the JLARC study, establish the true costs of wildfire in Washington state to better inform resource allocation decisions.

4.2 Identify and evaluate alternative sustainable funding mechanisms for resilience and wildland fire suppression.

4.3 Convene a taskforce to develop and advance funding strategies.

GOAL 2. LANDSCAPES ARE RESILIENT – IN THE FACE OF WILDLAND FIRE, THEY RESIST DAMAGE AND RECOVER QUICKLY.

S5: EXPAND PROGRAMS AND PRACTICES TO MANAGE FUELS AND VEGETATION

ALL LANDSCAPES

5.1 Increase investment in fuels and vegetation management.

5.2 Address and resolve barriers to managed natural and prescribed fire.

EASTERN WASHINGTON LANDSCAPES

5.3 Ensure coordination between Washington State's 20-Year Forest Health Strategic Plan and Washington's 10-Year Wildland Fire Protection Strategic Plan.

5.4 Develop and implement wildland fire mitigation and fuels treatment plans for non-forested landscapes.

WESTERN WASHINGTON FORESTS

5.5 Develop and implement wildland fire mitigation, adaptation, and response policies and plans for at-risk landscapes and communities in western Washington.

GOAL 3. COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

S6: ESTABLISH AND SUSTAIN FIRE-ADAPTED COMMUNITIES

6.1 Develop and implement engagement strategies, such as community-based social marketing, that foster behavior change.

6.2 Enhance engagement with limited English proficiency communities.

6.3 Increase capacity, coordination, and networking of community assistance programs.

6.4 Facilitate adoption of land use plans, regulations, and codes that reduce wildland fire risk in the WUI.

6.5 Mitigate incursions of wildland fire smoke into community airsheds.

S7: REDUCE HUMAN-RELATED WILDLAND FIRE

7.1 Collect and use data to focus prevention efforts in high-risk areas and on high-risk causes.

7.2 Increase capacity for prevention planning and implementation.

7.3 Enhance, expand, and align education programs, messaging, and regulations.

S8: MEET POST-FIRE RECOVERY NEEDS, BUILDING ON CURRENT CAPACITY AND CAPABILITIES

8.1 Evaluate wildland fire recovery needs and recommend solutions.

8.2 Increase public awareness of risks post-wildland fire and facilitate access to resources to mitigate those risks.

8.3 Establish a state and private lands Burned Area Emergency Response (BAER) team(s) to assess non-federal lands post-fire.

GOAL 4. RESPONSE IS SAFE AND EFFECTIVE.

S9: ESTABLISH EFFECTIVE PROTECTION FOR ALL LANDS

9.1 Through legislation, establish Rangeland Fire Protection Associations (RFPAs) as an option for protection.

9.2 Support annexation or creation of a new fire district as an option for protection.

9.3 Address under-protected lands by exploring opportunities to consolidate or regionalize fire service in eastern Washington.

9.4 Clarify DNR's authority to respond to wildland fires when they are not a threat to forestland and state mobilization has not been approved.

S10: IMPROVE RESPONSE PLANNING, OPERATIONS, AND INFRASTRUCTURE

10.1 Conduct cross-boundary "pre-fire response" analysis and planning, including evacuation planning.

10.2 Enhance communication during wildland fire response.

10.3 Authorize the Chief of the Washington State Patrol (WSP) to mobilize suppression resources prior to wildfire incident under predefined circumstances.

10.4 Invest in robust infrastructure.

10.5 Regularly monitor and evaluate the effectiveness of wildland fire protection in western Washington; identify and implement changes as needed.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 1: WASHINGTON'S PREPAREDNESS, RESPONSE, AND RECOVERY SYSTEMS ARE FULLY CAPABLE, INTEGRATED, AND SUSTAINABLE.

Four strategies contribute to achieving Goal 1. These strategies consist of actions and initiatives to improve leadership and coordination, establish a shared understanding of risk and priorities, improve the workforce, and provide sustainable funding. As cross-cutting solutions that facilitate systemic change, together these strategies enhance the ability of wildland fire management entities in Washington to improve the resiliency of landscapes, create and sustain fire-adapted communities, and provide safe and effective response.

S1 PROVIDE LEADERSHIP AND COORDINATION TO GUIDE IMPLEMENTATION AND FACILITATE AGENCY ALIGNMENT

Effective implementation requires aligned leadership at multiple scales and more seamless integration of preparedness, response, and recovery.

In the planning process, virtually all stakeholders, managers, and experts identified improved coordination and better alignment of policies and practices within and across land and wildland fire management organizations as a critical need and an essential first step in implementing the cohesive approach and improving fire outcomes (see Figure 26 on page 61). Stakeholders widely recognized and greatly appreciated recent improvements in response but agreed on the importance of further improvements across agencies, timeframes, and scales to address the challenges of managing fuels and vegetation, preventing fires, reducing risk to communities and property, and dealing with post-fire recovery—as well as response.

RATIONALE FOR STRATEGY

- Provides leadership at multiple scales.
- Improves outcomes of all other strategies.
- Establishes conduits between high-level leaders and communities.
- Addresses widespread desire for systemic change in coordination and collaboration.
- Seen by stakeholders as key systemic change needed to improve wildland fire outcomes—supported by over half of practitioners surveyed and cited by 24 of 35 interviewees.

In some cases the significant differences between agencies make better coordination and alignment complicated and difficult, including that: 1) federal, state, and local agencies answer to different constituencies and leadership; 2) multiple jurisdictions with different missions, mandates, priorities, funding sources, and responsibilities are engaged across multiple landscapes at different scales; and 3) communication within and across agencies is often constrained by agency processes, technology, and culture.

This strategy outlines an initial approach to providing the leadership, organizational framework, and coordinating entities to overcome barriers stemming from these differences, facilitate the efficient use of resources, and generate better alignment, coordination, and outcomes.

Figure 25. Practitioners surveyed (n=566) indicated improved coordination is needed at multiple geographic scales.

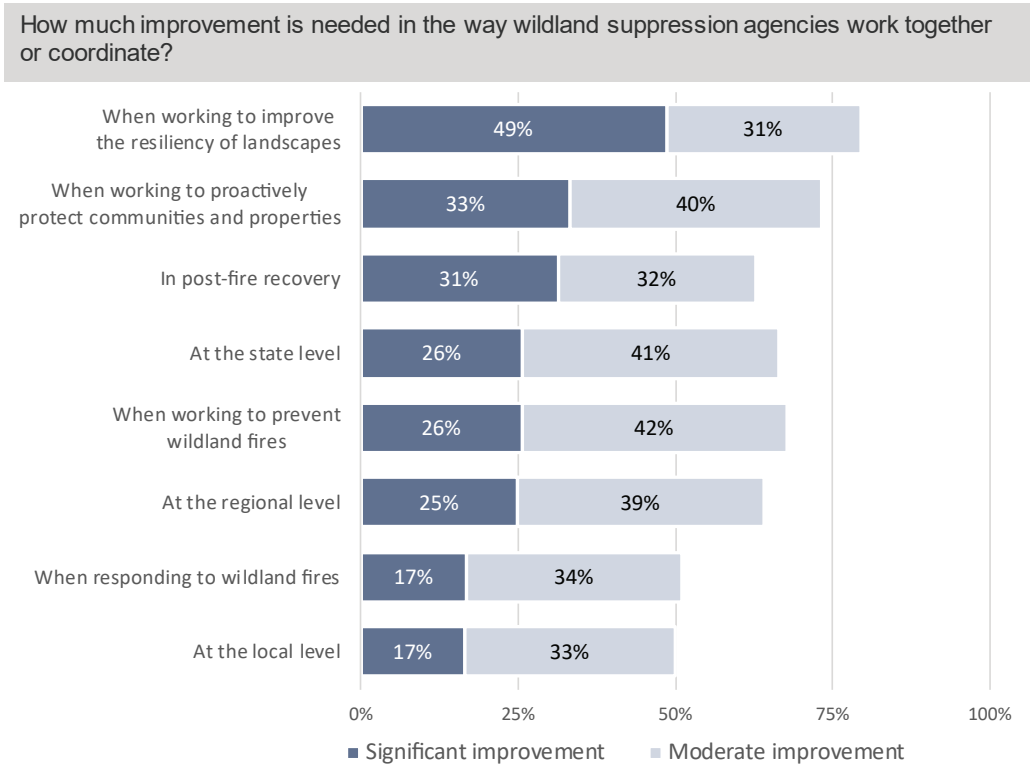
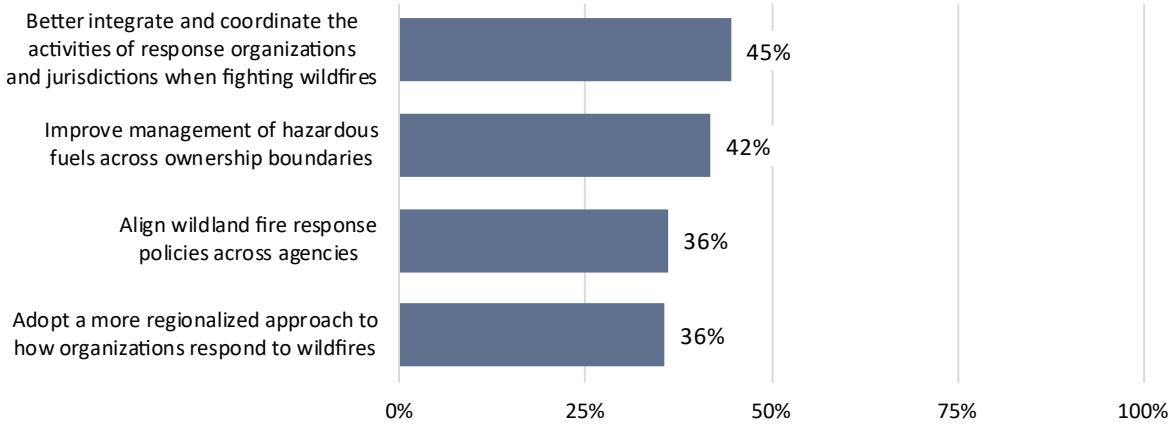


Figure 26. The top four actions practitioners identified for wildland fire agencies to improve response are all related to improved coordination.



GOAL 1: WASHINGTON'S PREPAREDNESS, RESPONSE, AND RECOVERY SYSTEMS ARE FULLY CAPABLE, INTEGRATED, AND SUSTAINABLE.

1.1 CONVENE A LEADERSHIP FORUM TO FACILITATE THE DEVELOPMENT AND ALIGNMENT OF AGENCY EFFORTS TO ACHIEVE PLAN GOALS.

Convene an executive-level leadership forum to provide high-level guidance on Plan implementation, set priorities and expectations, and coordinate actions across agencies. Leaders would review and agree on a framework for how to align policies and strategies across agencies, how to overcome barriers and inertia, and how to resolve conflicts and issues as they arise.

The leadership forum would be comprised of executives responsible for their agencies' policy decisions and who can best provide this high-level strategic oversight and guidance. Membership would include officials from the USFS, DNR, the Association of Fire Chiefs, the State Fire Marshal, BLM, BIA, NPS, and USFWS, as well as representatives from tribes, WDFW, Washington Department of Agriculture, NRCS, EMD, Washington National Guard (WNG), the WFAC, the Forest Health Advisory Council (FHAC), the Washington Rx Fire Council, conservation districts, and the Conservation Commission. These members would facilitate the alignment of policies and actions related to resilience, preparedness, and recovery. Ideally, members should have delegated authorities to act on behalf of their agencies.

Wenatchee Complex Fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

Responsibilities include (see Figure 27 on page 66):

- Facilitating alignment across agencies on policies and strategies as well as consistency in implementation.
- Identifying and resolving competing priorities across and within agencies.
- Tracking progress towards goals and outcomes.
- Collaborating to obtain the resources needed to meet goals.
- Identifying and addressing near-term "low-hanging fruit" opportunities and fixes, which can create early momentum to enable longer-term success.

Forum discussions should be focused at the strategic policy level. Activities at an operational level would continue to be handled within agencies and existing work groups (e.g., the Pacific Northwest Wildfire Coordinating Council (PNWCG) sub-committees and Fire Defense Committee [FDC]). The work should not duplicate existing efforts or create more bureaucracy. Instead, this work should strive to align and integrate state and federal policies, practices, and resources, as is encouraged by the Secretary of Agriculture's recent directive on shared stewardship.[50]

50 USFS, 2018b. Toward Shared Stewardship Across Landscapes: An Outcome-Based Investment Strategy.

Southerland Canyon fire (WA). Photo courtesy of Richard Parrish, BLM.

A potential model for this forum is the National Wildfire Leadership Council/National Strategy Committee, which is an advisory body responsible for making recommendations, aligning agency priorities, and enabling consistent implementation of policies and strategies. The effectiveness of this group, in part, comes from members' shared purpose and the commitment to working together to establish direction and solve problems as they arise.

1.2 ASSIGN THE WFAC THE RESPONSIBILITY OF PROVIDING ADVICE ON RISK PLANNING, PRIORITIZING MITIGATION RESOURCES, AND FACILITATING STAKEHOLDER ENGAGEMENT.

In 2015, the legislature passed legislation creating WFAC to advise the Commissioner of Public Lands on all matters related to wildland firefighting in the state. This advice includes, but is not limited to, recommending capital budget requests related to wildland firefighting and strategies to enhance the safe and effective use of private and public wildland firefighting resources. The legislature also created a local wildland fire liaison position to provide advice to the Commissioner on issues such as access to land during fire suppression activities, availability of local fire suppression assets, environmental concerns, and landowner interests.

Going forward, the WFAC, supported by the liaison, could play a critical additional role in advising the Commissioner on measures of success and implementation of strategies to reduce wildland fire risk, identifying actions to overcome barriers to risk mitigation, identifying and building awareness of how to best leverage existing efforts for successful mitigation, and facilitating the coordination of agency and stakeholder resources.

Fulfilling these responsibilities will require a broader membership and greater capacity for WFAC and increased coordination with the Forest Health Advisory Committee. Key actions:

A. **Broaden the membership of the WFAC** to include prevention, community preparedness, and recovery expertise. In addition to the members specified in ESHB 2093, members should have geographic, agency, gender, experiential, and cultural diversity, which will build trust and accountability. Collectively, the members should be able to address all aspects of the fire cycle.

B. **Increase the capacity of the WFAC** through additional staff support and resources.

C. **In addition to its current responsibilities, delegate the following Plan implementation responsibilities to the revised WFAC:**
   - Advise on further development of the inputs to the risk assessment (e.g., incorporating arid lands community values) and its deployment. Address any shortcomings in the existing version of the tool. Engage with stakeholders and ensure that all important values are incorporated (Strategy #2).
   - Review the risk assessment outputs and recommended priorities and advise DNR on investment actions to achieve Plan goals.
   - Facilitate discussions and decision-making regarding funding for mitigation projects, with the approval of and close participation of the agencies currently responsible for planning, engagement, and coordination.
   - Serve as a forum for stakeholder discussions related to Plan implementation.
   - Continue to monitor response effectiveness.

D. **Formalize the relationship between the WFAC and the Forest Health Advisory Committee** to ensure effective coordination between the groups on goals, strategies, and actions (e.g., periodic scheduled meetings between the committee chairs, exchange of committee notes, an annual briefing of accomplishments and work plans of the other committee).

1.3 ESTABLISH REGIONAL AND LOCAL COORDINATING CAPACITY.

A. **Create regional coordination councils** as a conduit to integrate community values into the programmatic activities related to risk management assessment, wildland fire planning, and response. Given the unique complexities that exist throughout the state, regional coordination councils should be created to ensure the integration of the best local knowledge into these risk management and planning efforts. Regional coordinating councils may:

   - Use a risk assessment process to identify communities at risk from catastrophic wildland fire as well as priority actions to mitigate those risks.
   - Identify significant barriers to reducing risk from wildland fire.
   - Provide geographic context and understanding to risk prioritization, including contributing local knowledge to the mapping of HVRAs, priority landscapes for restoration, WUI areas requiring fuel and vegetation management, and landscapes appropriate for prescribed or managed fire.

B. **Establish a fire-adapted community coordinator position** in the highest-risk eastern Washington counties and at the regional scale elsewhere. Coordinators will connect land managers and individuals working on risk reduction activities primarily before and after response, while playing a supporting role in response as appropriate. Coordinators should:

- Support risk management assessment, wildland fire planning efforts, and program implementation at a relevant local scale that reflects the opportunities and challenges of different regions.
- Integrate local wildland fire mitigation efforts with the wildland fire risk mitigation elements of the FHSP (specifically Goal 2 of the FHSP).
- Connect at-risk residents, landowners, and communities to existing available resources.
- Support local coordination efforts by convening individuals, organizations, and stakeholders (e.g., to complete Community Wildfire Protection Plans [CWPPs] and pre-response plans)
- Exist within diverse agencies and organizations, but with a common position description. Coordinator positions can be offered as an incentive for local jurisdictions to coordinate wildland fire risk reduction in their respective areas (with no more than one position per county).
- Connect to each other through a professional network or association in order to facilitate sharing of practices and achieve consistency between jurisdictions and agencies.
- Be provided for all of Washington, so that whether at the county or regional scale, all Washington communities have access to fire-adapted community coordinators.

The Chelan Complex fire in 2015 burned in the WUI around the City of Chelan. Photo courtesy of Kari Greer, U.S. Forest Service.

GOAL 1: WASHINGTON'S PREPAREDNESS, RESPONSE, AND RECOVERY SYSTEMS ARE FULLY CAPABLE, INTEGRATED, AND SUSTAINABLE.

Figure 27. Conceptual organizational framework for Strategy #1.

	MEMBERSHIP	RESPONSIBILITIES	RELATIONSHIP TO OTHER ENTITIES
Leadership Forum	USFS DNR Association of Fire Chiefs State Fire Marshal BLM BIA NPS USFWS Tribes NRCS EMD WNG WFAC FHAC Conservation Commission Private sector (ex-officio)	Facilitate alignment across agencies. Resolve competing priorities. Track progress. Collaborate for resources. Policy and coordination focus.	Work with PNWCG and other groups as appropriate to address issues. Provide policy guidance and address organizational issues as recommended by WFAC.
WFAC	Members as specified by ESHB 2093 Members appointed by the Commissioner of Public Lands with the following areas of expertise: Community preparedness and mitigation Fire prevention Post-fire recovery Resilient landscapes (i.e. at-large FHAC position to ensure alignment and coordination) Diverse, inclusive membership	Review QWRA inputs and outputs. Review and advise on investment priorities. Provide forum for review of Plan implementation. Monitor response effectiveness. Advisory and coordination focus.	Established by Washington state legislature and responsible for tasks assigned through the legislature (e.g., HB 2561). Coordinated by DNR Wildfire Liaison and supported by DNR staff. Recommend policy issues for resolution. Seek input from regional coordinating councils and fire-adapted communities coordinators regarding local challenges, opportunities, barriers and issues.
Regional Coordinating Councils	Varies by region Community, fire preparedness, response, recovery organizations, and regional agency representatives	Act as a conduit for community values into planning. Regional coordination focus.	Key conduit for information transfer between scales.
Fire-Adapted Communities Coordinators	N/A	Act as a connection point for individuals. Support risk assessment. Integrate mitigation efforts between FHSP and this Plan. Support local coordination capacity. County and community coordination focus.	Convene local organizations and individuals. Transfer information (opportunities and barriers) to and from regional councils, WFAC, and/or the leadership forum, as appropriate.

S2

USE RISK ASSESSMENT TO INFORM MITIGATION AND PROTECTION PLANNING AND TO ESTABLISH PRIORITIES

Improving our state's wildland fire outcomes requires that we prioritize the highest risks first, and that those risks reflect all community assets and values.

Quantitative analyses of wildland fire risk in the context of additional state, regional, and local input will provide the basis to inform critical wildland fire management decisions related to mitigation, response, resource allocation, and deployment. This will enable the setting of priorities and co-management of risks across landscapes and at different scales and timeframes using a consistent foundation and framework. A cornerstone of this Plan, therefore, involves combining existing wildland fire management expertise and robust community involvement with data and analytics to inform activities including:

- Quantitatively assessing wildland fire risks at the state, regional and local levels.
- Conducting risk/value-based planning to inform where to make investments to mitigate those risks.
- Deploying resources to manage fuels and vegetation in and near the WUI and providing support for community preparedness.
- Informing operational decisions with risk-based data collected ahead of the incident (e.g. where wildland fire poses less risk to values, potential management strategies)
- Aiding programmatic and pre-season planning as well as incident prioritization and firefighting resource allocations during the peak wildland fire season.

RATIONALE FOR STRATEGY

- Establishes a "baseline" of risk.
- Assesses and adjusts for changes over time, incorporating climate projections and other variables to allow state, regional, and local entities to plan for future risks.
- Provides the ability to evaluate priorities for mitigation actions and quantify resource needs going forward.
- Provides a tool to support better coordination and cohesive decision-making.
- Incorporates the concept of risk-based wildland fire planning and response in state policy.
- Enables the setting of priorities for risk-reduction treatments irrespective of jurisdictional boundaries.
- Links risk analysis and reduction to reduced losses and costs over the long term.
- Establishes a policy of using risk management as the basis for decision-making.
- Can be used to prioritize and position firefighting resources.
- Leads to better and more efficient and targeted use of available resources.
- Supports many of the other strategies in this Plan.

- Informing protection planning and evaluation of protection alternatives, considering both the risks and benefits achieved from alternative investments and actions.

Deploying this capacity across the state will facilitate a paradigm shift toward a risk-based approach to setting priorities for funding and implementation.

The QWRA developed by the USFS provides foundational information about wildland fire hazards and risks to resources and assets. This tool is currently being used in Oregon and Washington to support wildland fire response, regional fuel management planning decisions, revisions to land and resource management plans, and provision of information to the public. The QWRA will need to be updated and enhanced to incorporate additional values, such as rangeland values.

Quantitative risk assessment, using the QWRA and other modeling tools, can be used at multiple scales:

- **At the state level**, risk assessment can provide a better understanding of relative and evolving risks in different regions of the state. It can be used to establish priorities for risk mitigation investments and to position firefighting resources accordingly. For example, the forested eastern slopes of the Cascade Mountains and the far eastern portions of the state face different risks and have different assets than the rangeland/non-forested lands found in the basin and elsewhere.
- **At the regional and local levels**, risk assessment can be used to: 1) set priorities within and across boundaries for the use of prevention and mitigation activities such as prescribed fire and mechanical fuel treatments, 2) identify areas for preseason fire simulations with federal, state and local partners, and 3) support fire operations in response to wildland fire incidents, identifying those infrastructure assets and natural resources most susceptible to fire. This preseason risk assessment and analysis information can help inform decision-making for prioritizing and positioning firefighting resources.
- **At the local and community levels**, risk assessment can enhance CWPPs by providing the data, analysis, and visualization capabilities to enable experts, community members, and other stakeholders to come together and gain a shared understanding of the risks and vulnerabilities faced and the strategies and actions needed to mitigate them. It can also be used to inform FEMA's Natural Hazard Mitigation Plans (NHMPs), develop evacuation plans, and address post-fire risks and recovery.

Carlton Complex fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

In short, quantitative risk assessment enables decision-makers to manage and allocate resources based on a risk/value determination. One goal of quantitative risk assessment is to prioritize treatment and protection investments to address areas of highest risk to highly valued resources and assets. Investments can also be prioritized where those investments would yield the greatest return.

Risk assessment and prioritization based on highest risk is, however, only one of several factors to consider when making decisions. **Return on investment** and **outcomes achieved** are also critical to informing decision making. Investments located in medium or even low risk areas that deliver substantial mitigation or protection benefits could be prioritized. Conversely, projects based in high risk areas in which implementation is extremely difficult, or in which expected return on investment is low, could be de-prioritized. Other related variables are important to consider as well, including the capacity of a given project recipient or the **momentum** and **opportunity** that could result from having a highly successful project in a highly visible location or community. The application of quantitative risk assessment, therefore, cannot be formulaic. Decision-makers need to be highly strategic in considering all variables, with the purpose of creating healthy, resilient landscapes and communities and minimizing wildland fire risk.

Priority strategies and actions to quantify risks, conduct risk-based planning, and assign responsibilities for managing and conducting the assessments and planning are described below.

2.1 QUANTIFY CURRENT AND PROJECTED WILDLAND FIRE RISK.

A. **Create and deploy the capacity to produce and maintain a quantitative wildland fire risk assessment.** Build on the existing USFS QWRA assessment tool and engage landowners, communities, stakeholders, and agencies to assess wildland fire hazards, and high value resources and assets, at the appropriate scale as inputs to the tool.

- Incorporate available future climate projections into the tool to facilitate science-based risk assessment.
- Provide for transferability between scales (e.g., from state to local).
- Integrate with the forthcoming scenario investment tool associated with the USFS Shared Stewardship Initiative.
- Create a portal system that supports communications and transparency with landowners, communities, and wildland fire managers (see the Oregon example in Figure 28, page 70).

B. **Connect and link state assessments with regional and local data, mapping, and planning efforts to support regional and local risk assessments and inform strategic pre-fire response planning.** This includes activities such as harvest/thinning, prescribed fires, managed wildland fire use, and suppression efforts to promote long-term reductions of fire severity in targeted areas.

Figure 28. Oregon Wildfire Risk Assessment Portal. The 2018 release of the Oregon Explorer portal allows any individual with internet access to view quantitative wildland fire risk information on a map. The Explorer portal enables landowners to see overall watershed risk, burn probability, flame length potential, large fire history, and more. Similar risk assessment portals are available in Colorado and Texas.

2.2 CONDUCT COMPREHENSIVE RISK-MITIGATION PLANNING TO PRIORITIZE ACTIONS.

Planning to manage wildland fire risk has been occurring across the state to varying degrees and levels in communities and jurisdictions. In places that have completed wildland fire plans (such as CWPPs or NHMPs), risk assessment can provide the basis for evaluating and enhancing the effectiveness of existing plans using the new risk assessment information. For under-protected communities and areas where no plans have been developed, risk assessment can be used to inform such planning.

A. **Conduct state level planning.** Use risk assessment to inform plans and strategies to address wildland fire risk across Washington's diverse landscapes, with the goals of prioritizing for mitigation the highest risks first and achieving the greatest return on the use of state resources for resiliency, preparedness, and prevention. Identify different risks and treatments in different parts of the state and at different scales.

- As part of state level planning, establish the appropriate level of response resources (i.e. use a risk-based approach to determine what resources are needed where). As risk profiles shift over time, deploy resources accordingly.

Photo courtesy of Kari Greer, U.S. Forest Service.

B. **Conduct regional level planning.** Through consultations with local governments, fire authorities, and stakeholders, determine the appropriate scale for regional planning (e.g. county, watershed, or sub-county).

- Develop plans for under-protected communities at high risk, HVRAs, and landscapes including rangelands and wildlands with high conservation value. This includes shrub-steppe and strategic areas located near core habitat areas or high-use wildlife areas.
- Identify where different policy and management practices across ownership boundaries affect risks as the basis for aligning policies and practices.
- Establish priorities for cross-boundary treatments. This includes identifying where active management and mechanical treatments are required and where managed fire under the right conditions may be beneficial. Integrate and align these areas with the FHSP.

C. **Utilize risk assessment to inform new and enhance existing Community Wildfire Protection Plans.**

- Provide grants and technical assistance to support use of QWRA and other risk assessment tools for community planning and to incorporate risk-based prevention goals and post-fire hazards and recovery into plans.
- Incorporate visualization and mapping capabilities to facilitate stakeholder engagement and decision-making.
- Require that communities at high risk conduct CWPP planning using the risk management framework as a precondition for receiving project funding.

2.3 ESTABLISH A WILDLAND FIRE RISK MANAGEMENT, MITIGATION, AND PROTECTION PLANNING PROGRAM IN DNR.

Photo courtesy of Chris Brandon.

A. Develop a work plan in conjunction with the USFS and other partners to implement a wildland fire risk assessment and protection planning program for Washington State. The program would be based upon the QWRA and, potentially, a wildland fire planning tool such as the Wildland Fire Investment Planning System (WFIPS)[51] or equivalent. The protection planning element would include evaluating protection alternatives using a qualitative stakeholder process.

B. Assign DNR the responsibility for developing and deploying the quantitative risk assessment modelling and planning tools. These responsibilities include:

- Establish the assessment scope, the types and levels of risk to be evaluated, the appropriate scales, and the values to be included at each scale.
- Develop, populate, and regularly update and supportthe tool for use by all agencies and partners at all levels throughout the state.
- Inform priorities for the basing of firefighting resources, with review provided by the relevant funding agency.
- In coordination with WFAC, facilitate alignment between entities doing mitigation work to prioritize those actions and areas that provide the greatest benefit in reducing overall risk.
- Support WFAC in conducting outreach to stakeholders to facilitate a shared understanding of wildland fire risk in the state.

C. Establish program positions within the DNR Wildfire Division and DNR Regions with the responsibility of leading the risk management/ mitigation planning effort at the state, regional, and local levels. These responsibilities include delivering plans and budget proposals which incorporate risk management, infrastructure assessment, community asset information, and firefighting resource needs and performance information to ensure the most effective level, mix, and basing of firefighting resources.

D. Systematically collect, analyze, and report on data related to wildland fire risks, prevention, mitigation, suppression, and costs. Comprehensive, accurate data are needed to inform planning, populate the risk assessment model, and make decisions regarding allocation of resources and program effectiveness. This includes the need to collect data that informs restoration work and prevention activities. Efforts to collect these data should be extended to include collecting statewide cross-agency data on prevention, preparedness, and post-fire recovery programs. This work should complement the work that DNR has initiated related to the 2018 JLARC Wildfire Suppression Funding and Costs Report that identifies steps for improved suppression cost accounting.

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51 Product of the Rocky Mountain Research Station of the USFS. Currently in Beta version. https://www.firelab.org/project/wildland-fire-investment-planning-system-wfips

E. Coordinate with regional and local planning and decision-making entities.

- Assign regional coordination councils the responsibility of integrating community values into the risk assessment and protection planning process.
- Assign the fire-adapted community coordinators the responsibility to facilitate use of the risk assessment modeling tools and planning framework for county-level mitigation and response planning.

S3 ENHANCE AND SUSTAIN A HIGHLY CAPABLE WORKFORCE

Meeting the current and future demands of wildland fire requires an interagency workforce with adequate training and equipment to better prevent, prepare for, and respond to wildland fire.

As the climate continues to change, the fire season lengthens, and fire behavior intensifies, the capacity of the state's workforce to prevent, mitigate, and fight wildland fires faces unprecedented challenges.

Multiple geographic areas are experiencing large fires simultaneously, limiting the availability of resources nationwide. The National Preparedness Level—a measure of fire activity, resource availability, and fuel conditions—reached and remained at its highest level in three out of the past five years. Northwest IMTs were assigned to fires for an average of 568 team days per year between 2014-2017, an increase from the 352 average team days per year between 2011-2013.[52] The workforce is fighting fire longer, in more places, and under more challenging conditions.

The state also faces constraints in maintaining a workforce capable of meeting pressing needs for fuels treatment and vegetation management including forest health treatment (as discussed in the FHSP), prevention, preparedness, and recovery. During the stakeholder engagement process, participants identified post-fire recovery and prevention as two of the areas needing the most improvement.

RATIONALE FOR STRATEGY

- Maximizes use of existing resources.
- Provides opportunities for cross-training suppression, mitigation, and prescribed fire personnel.
- Increases efficiency with retention of qualified, trained workforce.
- Adds both seasonal and permanent capacity to the system.
- Supports efforts to address succession planning for Incident Management Teams.
- Long-term workforce planning needs (across all wildland fire agencies) addressed through interagency taskforce.
- Addresses response practices stakeholders identified as most needing improvement.

52 Data compiled from NWCC annual reports, 2011-2017.

3.1 ESTABLISH AN INTERAGENCY TASKFORCE TO DETERMINE THE WORKFORCE NEEDED FOR PLAN IMPLEMENTATION.

An effective workforce is needed across all elements of a cohesive approach to wildland fire (resilient landscapes, fire-adapted communities, and effective wildland fire response). Planning for future workforce needs, particularly with the projected increases in wildland fire season length and severity, is also essential for efficient workforce development and deployment.

A. **Form a taskforce with broad representation to complete a workforce gap analysis within two years. Identify areas where increased capacity will be needed based on future wildland fire risk.** The taskforce should contain representatives from wildland fire preparedness and response organizations, private contractors, and potentially from local workforce boards and community/technical colleges. Coordinate the taskforce with other entities (such as PNWCG and the FHAC) to reduce redundancy and provide a more comprehensive analysis. Include an inventory of existing resources statewide.

3.2 INCREASE THE CAPACITY OF THE STATE'S WILDLAND FIRE PREVENTION, PREPAREDNESS, AND RECOVERY WORKFORCE.

In addition to the fire-adapted community coordinator positions established in Strategy #1.3, workforce capacity enhancements are needed before and after wildland fire response.

A. **Add year-round wildland fire prevention staff across agencies to enable strategic prevention planning, increased coordination, and the development and deployment of prevention programs.** While prevention staffing has decreased over the past decade, human-related wildland fires have not. Investments in permanent fire prevention staff have a significant return on investment; the largest human-related wildland fire in 2015 (North Star) cost more than $44.5 million to suppress. Prevention staff are needed to better align and implement education programs and messaging (Strategy #7.3).

B. **Establish LEP coordinator positions within the lead fire response agencies**—DNR, USFS, and the State Fire Marshal—responsible for developing and disseminating cultural engagement strategies and communication tools, providing cultural competency training, and coordinating translation and interpretation services.

C. **Provide staffing to initiate and coordinate post-fire recovery services.** While Strategy #8 enhances and provides capacity for post-fire recovery, staffing to coordinate post-fire recovery services with communities is also critical. Limited capacity exists within a number of different agencies, but roles and responsibilities are often unclear. Additional coordination capacity is essential to ensuring communities have timely access to post-fire recovery services.

3.3 INCREASE THE CAPACITY OF THE STATE'S WILDLAND FIRE TREATMENT AND RESPONSE WORKFORCE.

Practitioners identified availability of personnel as the response practice most needing improvement. Short-term enhancements to the wildland fire workforce will allow Washington to keep pace, temporarily, with the increasing severity of wildland fires in Washington. Permanent, year-round staffing provides opportunities for off-season planning and landscape health treatment work, minimizes turnover and staff attrition, and maximizes the value invested in training. Increases in seasonal capacity, through collaborative partnerships with local fire districts, supports more effective initial attack and enhances community preparedness. Enhancements to the joint Department of Corrections (DOC)/DNR correctional crew program will put more trained people on the fireline and increase the rate of forest health treatments.

Practitioners surveyed identified "availability of personnel" as the response practice most needing improvement (50%).

More full-time personnel or contractors was the third priority for most improving the effectiveness of resilience activities, with 36 percent of practitioners listing it as a priority.

A. Increase the permanent wildland fire workforce at DNR to complement and supplement the existing volunteer-based model.

- Convert 30 seasonal engine driver positions to permanent positions providing additional capacity for both treatment and response.

B. Enhance seasonal capacity.

- Establish two additional DNR hand-crews, bringing the DNR hand-crew total to four. Consider having these crews composed of military veterans, similar to a veteran crew program in the BLM.
- Staffing of DNR crews should be managed to enable DNR to provide training assistance and deployment support (fireline supervision) to the WNG when WNG crews are mobilized during declared emergencies.
- Encourage the development and basing of additional private vendor hand crews and wildland fire engines in Washington.

C. Create capacity inside of DNR to engage the private sector in fuels management and risk mitigation activities. Many of the skills needed for fire response could have crossover with other job needs in the forest, and linkages to industry could help with diverse employment efforts that result in multiple year-round opportunities for those involved in fire response. This would be a benefit for fire response, forest health, and private industry.

- Increase the capacity of private industry to provide mitigation and suppression services.
- Identify opportunities to align private industry and forest health investments as well as help build a more robust, year-round workforce.
- Build synergy with private industry and forest health investments.

D. **Add seasonal capacity for home assessments, fuels mitigation, and prevention work at the local level through agreements between DNR, conservation districts, and local fire districts** (see Figure 29 on page 77). Support existing local organizations currently undertaking or capable of performing this work (see Strategy #6.3) in addition to developing new partnerships where capacity is entirely absent.

Approximately 40 percent of public survey respondents and 62 percent of practitioners indicated *home property assessments on how to mitigate fire risk* were a top priority for improvement or investment.

E. **Enhance the statewide joint DOC/DNR Camps correctional crew program and identify a sustainable funding strategy.** Incarcerated crews work year-round conducting silvicultural work and fuel reduction. This work provides job training and adds approximately 400 personnel to the wildland fire workforce conducting initial attack and mop-up. In addition, incarcerated individuals work in camp mechanic, sewing, and small engine repair shops learning job skills throughout the year and providing logistical support by staffing three mobile kitchens which feed up to 1,500 firefighters.

3.4 CREATE PROCESSES AND PATHWAYS TO BETTER USE THE EXISTING WILDLAND FIRE WORKFORCE.

Response resources continue to be limited in both Washington and across the nation. It is critical to make better use of all available resources, in addition to adding capacity to the system. The leadership forum (Strategy #1.1) can be a venue to explore ways to streamline agency processes and remove jurisdictional barriers that may prevent rapid access to resources.

A. **Increase the use of private contracted resources to fill projected critical resource needs for both suppression and risk mitigation.** This includes evaluating the viability of, and developing a process for, hiring contracted resources for prepositioning, initial attack response, and incident management. Evaluation should include analysis of safety, operations, and financial management.

B. **Create pathways and opportunities for firefighters from local fire districts and other agencies to more seamlessly integrate into incident management.** Pathways may include access to key training courses and better incorporation into state and federal dispatching processes.

C. **Consider training and utilizing the IMTs for all-hazard assignments and integration into the statewide Comprehensive Emergency Management Plan** during large planned events and declared natural disasters. Legislative action may be needed to effectively enable this capability.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 1: WASHINGTON'S PREPAREDNESS, RESPONSE, AND RECOVERY SYSTEMS ARE FULLY CAPABLE, INTEGRATED, AND SUSTAINABLE.

Photo courtesy of the Chumstick Wildfire Stewardship Coalition.

Figure 29. Fire District personnel from Chelan County Fire District #3 worked collaboratively with the Chumstick Wildfire Stewardship Coalition in the spring of 2018 to reduce fuels on almost 120 acres in the Leavenworth area. Homeowners contributed 440 volunteer hours to the effort. This partnership enhanced wildland fire mitigation and initial attack capacity.

3.5 ADDRESS RETENTION AND SUCCESSION PLANNING ISSUES WITHIN THE WILDLAND FIRE WORKFORCE.

Stakeholders, particularly DNR staff, highlighted the system-wide need for improved workforce retention and succession planning to improve the effectiveness of initial and extended attack response personnel. Improving workforce retention would allow continued investment in career professionals, reducing training costs and providing more efficient and safer initial and extended attack. With the increasing demands on IMTs, ensuring a pipeline of qualified and available personnel is essential.

A. **Create intentional career paths for wildland fire professionals, including both suppression personnel and mitigation specialists (such as landowner assistance foresters).** Provide professional development opportunities, including training that supports Incident Command System qualifications, as well as opportunities for career progression.

B. **Support interagency initiatives to provide succession planning for IMTs and overhead positions identified as "critical shortage" positions** based on workforce gap analysis (Strategy #3.1). This will require strong interagency coordination from the wildland fire workforce and should include examination of both the current shortage positions as well as shortages likely to result from the continued lengthening of fire seasons throughout the nation.

C. **Review both permanent and seasonal state firefighter compensation and benefits.** Consider increasing pay and benefits to be on par with inter-agency pay standards. Review and enhance the state retirement system for wildland firefighters to better reflect the increased exposure to the wildland fire environment over time and the increasing workload.

3.6 PROVIDE EFFECTIVE TRAINING FOR THE WILDLAND FIRE MANAGEMENT WORKFORCE.

Interagency wildland fire training is essential for a high-capacity workforce throughout the fire cycle. At present, interagency wildland fire training academies rely on a "militia model," using personnel as needed from other job duties. As a result, training can be inconsistent and places a significant burden on primary and non-primary fire staff. A dedicated training cadre will greatly increase the efficacy and efficiency of the training program.

In addition to providing training specific to responding to wildland fires, stakeholders identified a need for training to increase the effectiveness of the preparedness workforce, including training for prevention and post-fire recovery

Three of the top five priorities practitioners identified to improve wildland fire outcomes are related to better supporting personnel. Twenty-five percent (25%) identified increasing the number and capabilities of permanent wildland fire personnel as a top priority. Thirty-six percent (36%) of practitioners identified training and other support as one of two top priorities.

Photo courtesy of Kari Greer, U.S. Forest Service.

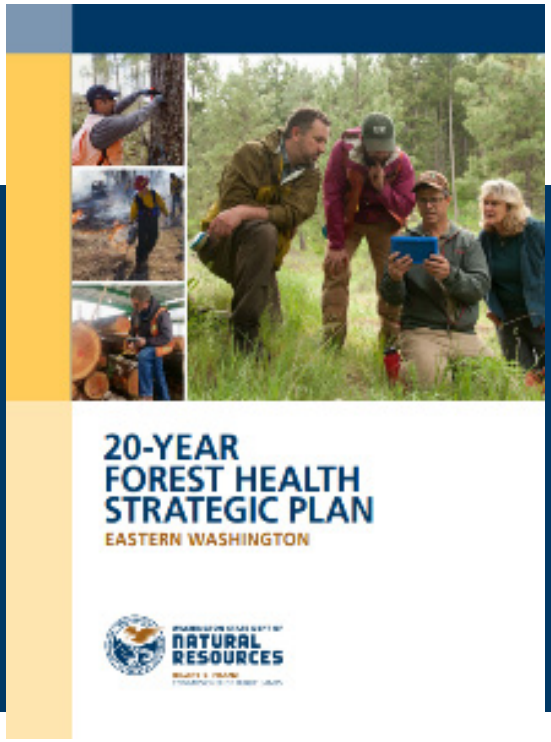
(see Strategy #7 and Strategy #8, respectively), prescribed fire, and home assessments. Training should be provided for personnel across agencies and, where possible, opportunities to cross-train wildland fire practitioners should be created.

A. **Establish an interagency wildland fire academy with a permanent management and instruction cadre.** Utilize existing resources to hire and retain a permanent group of professional trainers.

B. **Expand the pool of trained and experienced prescribed fire practitioners by increasing classroom and live fire training opportunities for state and local agencies.** This includes the prescribed fire training and certification program that DNR is already tasked by the legislature with providing.

C. **To reduce losses in the WUI, invest in home ignition zone training for wildland fire mitigation specialists.** Reduction of fuel and use of ignition-resistant building materials can dramatically reduce the risk to homes and assets within the WUI. Training that aligns with National Fire Protection Association standard 1144 helps wildland fire mitigation specialists assess home ignition zones and recommend effective mitigation measures.

D. **Standardize training, qualifications, and certification across agencies and response organizations.** Standardized training will take time to implement but will provide multiple benefits, including increasing capacity by avoiding duplication of resources.



20-YEAR FOREST HEALTH STRATEGIC PLAN

Strategy #3 of this Plan aligns with Goal 3 of the FHSP, which is to "enhance economic development through implementation of forest restoration and management strategies that maintain and attract private sector investments and employment in rural communities." The FHSP notes that effective landscape-scale forest treatments will require adequate infrastructure and logging workforce. Investments in worker training for forest health treatment and prescribed fire crews are also recommended.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 1: WASHINGTON'S PREPAREDNESS, RESPONSE, AND RECOVERY SYSTEMS ARE FULLY CAPABLE, INTEGRATED, AND SUSTAINABLE.

S4

ADVANCE SUSTAINABLE FUNDING

Sufficient and reliable funding for wildland fire prevention, risk mitigation and suppression is essential to meeting the challenge of protecting resources, WUI communities and other highly valued resources and assets.

Despite recent and much-needed investments in wildland fire management, funding for wildland fire in Washington remains inadequate to meet current and future expected costs. The need for a smart, strategic funding approach is paramount. Upfront investments in proactive measures to mitigate and reduce risks can provide a positive "return on investment", resulting from reduced costs for response and recovery from wildland fires over the long term.

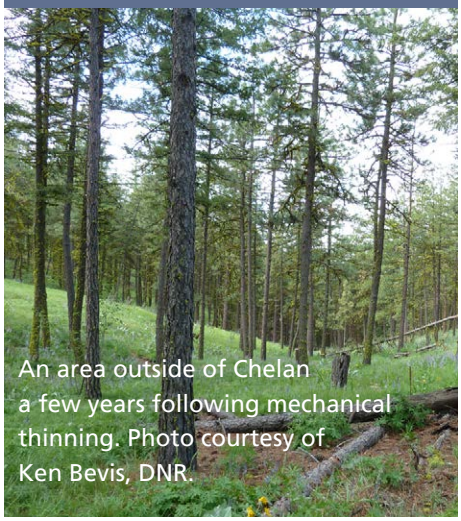
The end of "fire borrowing" at the federal level and increased state-level appropriations for fuels treatment and community preparedness are welcome changes—serving to increase resources for resilience and adaptation. However, key challenges with the current system remain, as identified by the public, practitioners, and experts, including:

- **Uncertain, uneven funding for preparedness:** At the state level, the legislature makes appropriations from the general fund for prevention, home assessments, fire-adapted communities, and related preparedness activities delivered by Conservation Districts, DNR, and other partners. Funding levels can be inconsistent, fluctuating from budget cycle to budget cycle, making it difficult to build and sustain these programs.
- **Insufficient funding for resilience:** Resources available for fuels treatment, vegetation management, and landscape level forest health are also appropriated by the state legislature from the general fund and through federal appropriations for federal lands. Current state-level funding covers only a fraction of the cost needed to fundamentally improve the resilience of at-risk fire prone forests, arid, and other lands. With the end of "fire borrowing", the federal government will have more funding available nationally for forest health treatments than in the past. However, the overall funding levels are unlikely to be sufficient to address the backlog of overstocked forests and meet growing needs.

Two of the top four barriers to improved wildland fire management are related to funding: insufficient, inconsistent funding for prevention and preparedness was the #1 barrier (55% of practitioners surveyed), and insufficient funding for respond was the #4 barrier (40% of practitioners surveyed).

Cost benefit analysis conducted by the State of Oregon found $5.7 million in economic returns generated for every $1 million spent on forest restoration. Forest restoration also created suppression savings; for every $1 invested in restoration the state saves $1.45 in suppression.

SOURCE: Rasmussen et al., 2012



An area outside of Chelan a few years following mechanical thinning. Photo courtesy of Ken Bevis, DNR.

Photo courtesy of Kari Greer, U.S. Forest Service.

- **Insufficient funding to meet DNR's current and future response resource needs:** As the fire season lengthens and fires become more complex and resistant to control, the cost of wildfire suppression is steadily increasing. Because of current forest conditions and climate change, eastern Washington is expected to continue to experience the majority of high cost wildland fires, while western Washington is expected to see an increase in the decades ahead.
- **Insufficient resources for local fire district protection and response:** Some fire districts located in sparsely populated rural areas with limited economic activity lack the resources to provide adequate protection in the event of wildland fire. In addition, with protection limited, the scope and extent of fire often increases, resulting in increased costs.

Going forward, with the goal of increasing preparedness, safety, and resilience, these shortcomings need to be addressed and additional resources allocated to fund the strategies that comprise this Plan. One approach to determining funding levels could be to index future appropriations to the level of wildland fire risk on the landscape. This would entail quantifying the risks statewide and then having the legislature provide funding based on that level of risk.

Recommended short-term actions are listed below.

4.1 BUILDING ON THE WORK UNDERTAKEN FOR THE JLARC STUDY, ESTABLISH THE TRUE COSTS OF WILDLAND FIRE IN WASHINGTON STATE TO BETTER INFORM RESOURCE ALLOCATION DECISIONS.

This includes:

- Identifying current expenditures by state, local, and federal agencies for preparedness, prevention, adaptation, response, and recovery in Washington state.
- Estimating losses from wildland fires to property, jobs, agricultural and timber resources, other ecosystem services, and economic activity over the last 10 years.
- Estimating the cost of health impacts from increased wildland fire smoke in Washington state for the last 10 years.

Photo courtesy of Kari Greer, U.S. Forest Service.

- Estimating resource requirements and costs for the next 10 years to implement the strategies proposed in this Plan as well as those in the Forest Health Strategic Plan.

4.2 IDENTIFY AND EVALUATE ALTERNATIVE SUSTAINABLE FUNDING MECHANISMS FOR RESILIENCE AND WILDLAND FIRE SUPPRESSION.

This review could include:

- Determining to what extent, if any, non-forest landowners of the state should share in pre-suppression costs given that urban communities and residents in the WUI are often affected directly by wildland fire or smoke, and, in part, benefit from the protection services provided on forest lands.
- Determining the potential to offset wildland fire management costs by incentivizing risk mitigation actions by landowners and/or response organizations.
- Establishing an insurance mechanism as an alternative or complement to the current assessment fee.

4.3 CONVENE A TASKFORCE TO DEVELOP AND ADVANCE FUNDING STRATEGIES.

- The taskforce should be comprised of members of the legislature, landowners, community members, and response agencies with wildland fire suppression systems funding expertise and knowledge.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 1: WASHINGTON'S PREPAREDNESS, RESPONSE, AND RECOVERY SYSTEMS ARE FULLY CAPABLE, INTEGRATED, AND SUSTAINABLE.

Photo courtesy of Ken Bevis, DNR.

EFFECTIVE DEFENSIBLE SPACE AND HOME HARDENING

The 2014 Rising Eagle Road Fire burned 579 acres and six residences. This home survived the fire due to the homeowner's actions before the fire and some intervention by wildland firefighters during the fire. The home was built with a non-combustible metal roof that was kept clear of debris. The homeowner also maintained low vegetation around the home and a gravel perimeter next to the foundation.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 2: LANDSCAPES ARE RESILIENT. IN THE FACE OF WILDLAND FIRE, THEY RESIST DAMAGE AND RECOVER QUICKLY.

To sustain resilient landscapes across Washington, the right tools must be used in the right places at the right times. The strategy under this goal focuses on providing a suite of tools tailored to the needs of the ecosystem.

S5 EXPAND PROGRAMS AND PRACTICES TO MANAGE FUELS AND VEGETATION

Accelerating the pace and scale of landscape resilience requires coordinated investment in a suite of tools, including mechanical treatment, prescribed fire, and managed wildland fire.

Healthy, fire-resilient forests, rangelands, uplands, shrub-steppe, and other wildlands are the first line of defense in reducing the risk of wildland fire to communities and ecosystems.

In fire-prone forests, landscapes that are resilient have reduced fuel loads, a low prevalence of non-fire adapted invasive species, natural fire breaks, and are made healthier through lower intensity, less severe fires. Through existing restoration and management practices, historic fire regimes can be re-established in many ecosystems, reducing the number and impact of uncharacteristic fires and thereby better protecting community, economic, and ecosystem values during future fires.

In much of western Washington (outside of the Puget Trough), resilience options are generally fewer because most of the forests are naturally dense and fuel-rich. Large patches of stand-replacing fire are typical for these systems and are difficult or impossible to completely avoid. A healthy and resilient west-side forest should promote diversity in both species and forest stand structures. Diversifying forest structure can help increase resilience to insect, disease, and drought-related disturbances.

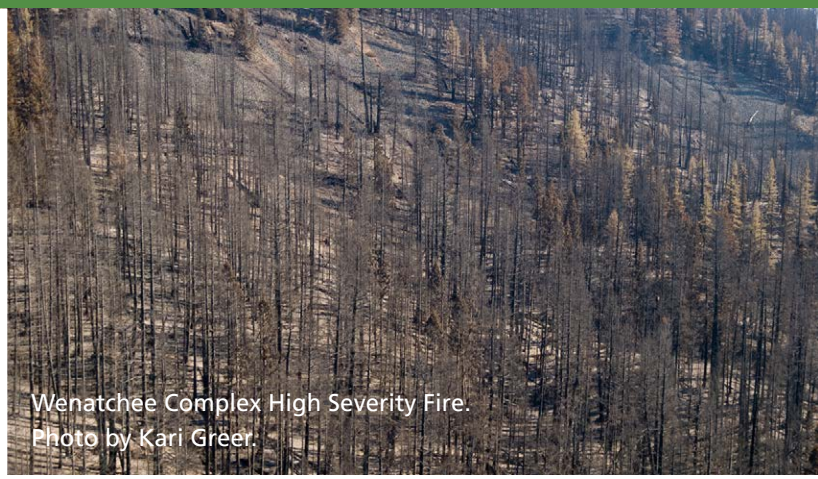
RATIONALE FOR STRATEGY

- Enables the use of multiple management tools and strategies.
- Meets overlapping objectives of forest health and wildland fire risk reduction.
- Responds to stakeholder demand for more prescribed fire.
- Complements and coordinates with the FHSP.
- Encourages long-term, sustainable management of fuels and vegetation risk.

Stakeholders and experts share a sense of urgency around the need to accelerate and expand these efforts to create healthy, resilient landscapes, particularly in the highest fire-risk areas of the state. There is a sense that, even with current plans in place, investments in treatments are insufficient relative to need, the state is falling behind due to climate change, and multiple barriers need to be addressed and overcome to enable action at the pace required. As one stakeholder put it, "time is of the essence."

GOAL 2: LANDSCAPES ARE RESILIENT. IN THE FACE OF WILDLAND FIRE, THEY RESIST DAMAGE AND RECOVER QUICKLY.

Wenatchee Complex Moderate Severity Fire. Photo by Kari Greer.



Wenatchee Complex High Severity Fire. Photo by Kari Greer.

ALL LANDSCAPES

5.1 INCREASE INVESTMENT IN FUELS AND VEGETATION MANAGEMENT.

Treatment of fuels and vegetation management in the WUI, fire-prone forests, and other wildlands is significantly underfunded relative to the costs of fighting fires once they start. Greater investment in the near-term is expected to yield benefits over the longer term, particularly if fuel treatment becomes more economically viable. Mechanical removal and prescribed fire were the highest priority approaches to increasing landscape resilience among practitioner survey respondents. Prescribed fire was the top priority for increased investment among public survey respondents (see Figure 30 on page 86).

A. **As an outcome of the risk assessment and protection planning process, engage land managers, wildland fire managers, stakeholders and experts to determine appropriate management policies and methods for mechanical treatment, managed fire, and prescribed fire across diverse landscapes with different types of ownership.** Build consensus for any changes needed to existing policies and approaches to reduce risk at the landscape level. Incorporate FHSP evaluation data where appropriate. Consider and incorporate wildlife habitat benefits and the protection of threatened or endangered species as warranted.

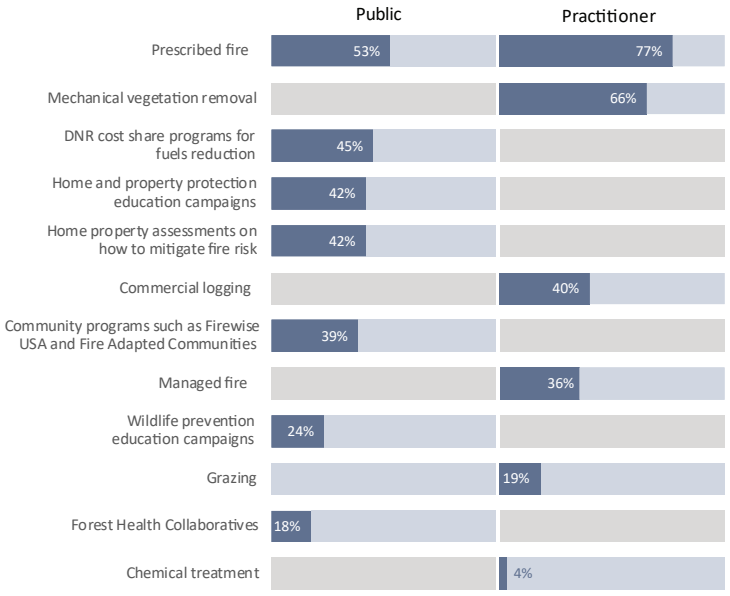
B. **Develop and share best practices for treating fuels and vegetation, harvesting and thinning timber, conducting prescribed burns, and engaging community members on landscapes located in or near the WUI.** Diverse barriers (such as lack of trust, lack of belief in treatment effectiveness, and concerns about other resource values) can limit support for active management of Washington's landscapes and make it difficult to manage fuels and vegetation to reduce fire risks in a timely or cost-effective way. To address these challenges, land managers will need to undertake proactive community engagement and education efforts (see Strategy #6.1). Engagement processes should be interactive, recognize and empower local leadership, and include opportunities for peer-to-peer interaction. Agencies also need the capacity to develop and test new approaches through pilot projects and ways to adapt, learn, and share best practices.

C. **Expand and accelerate the deployment of actions to reduce fuels and vegetation adjacent to homes, communities and other values at risk.** This applies to all landscapes and includes the increased use of mechanical thinning and prescribed fire. In western Washington, where fire is infrequent and forests have more fuel accumulated, landscape-level thinning treatments may not be appropriate. However, reduction of fuel adjacent to values at risk is appropriate across all landscapes.

D. **Expand efforts to reduce the spread of invasive species and noxious weeds which contribute to wildland fire spread.** Efforts to reduce the spread of invasive species and noxious weeds should be taken prior to wildland fire ignition as well as post-fire during the restoration and/or rehabilitation of disturbed areas. Though cheatgrass was ultimately not added to the state noxious weed list in 2018, it is distributed throughout Washington state with several counties reporting considerable land coverage.[53]

5.2 ADDRESS AND RESOLVE BARRIERS TO MANAGED NATURAL AND PRESCRIBED FIRE.

The strategic planning process revealed broad support among the public, practitioners, and experts for the increased use of multiple methods to manage fuels and vegetation to reduce wildland fire risk and improve forest health (Figure 30). All management tools are needed to address this challenge, including prescribed fire, managed fire, and mechanical thinning. In some places, more than one tool is needed; mechanical treatment followed by prescribed fire is often the best way to improve our ability to control unplanned ignition. Management tools provide multiple benefits related to fire-prone resilient landscapes and risk reduction, including the ability to create safer landscapes for firefighters, reduce fuels, create defensible space, manage invasive species, and provide training opportunities.



*Percent only reports Firewise USA for practitioners. Fire Adapted Community was selected by 27% of practitioners.

Figure 30. Both public (left) and practitioner (right) survey respondents identified prescribed fire as a top priority for wildland fire management going forward. Practitioner responses are specific to top priorities for improving community and landscape resilience, while public responses apply to top priorities for improvement or increased investment across wildland fire management programs and activities.

53 Washington State Noxious Weed Board, 2018.

WASHINGTON STATE DEPT OF NATURAL RESOURCES

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 2: LANDSCAPES ARE RESILIENT. IN THE FACE OF WILDLAND FIRE, THEY RESIST DAMAGE AND RECOVER QUICKLY.

Sinlahekin Wildlife Area

A RESILIENCE SUCCESS STORY

Historically, wildfires burned every few years in the Sinlahekin Wildlife Area.

As fires were excluded from this area, the forest became more dense and began to accumulate fuel which could carry fire into the tree canopy (see photo 2010, *Before Treatment*).

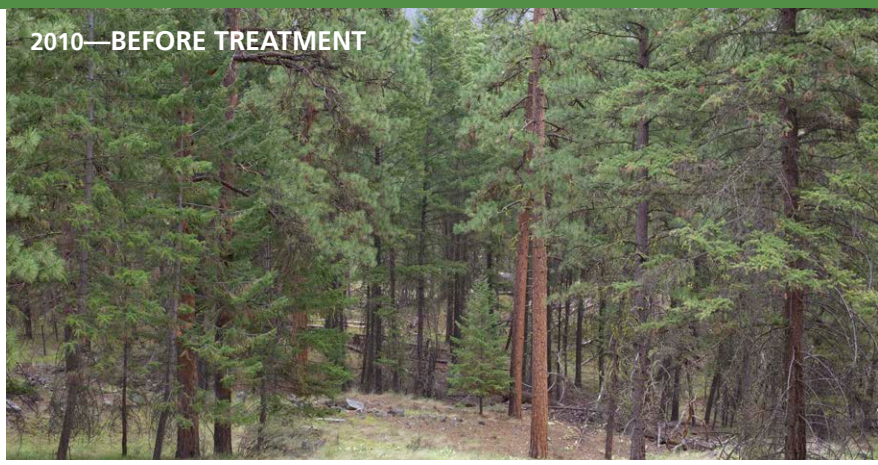
In winter 2011, fuel—in the form of small-diameter trees—was removed from this forest stand (see photo 2011, *After Commercial Thinning*).

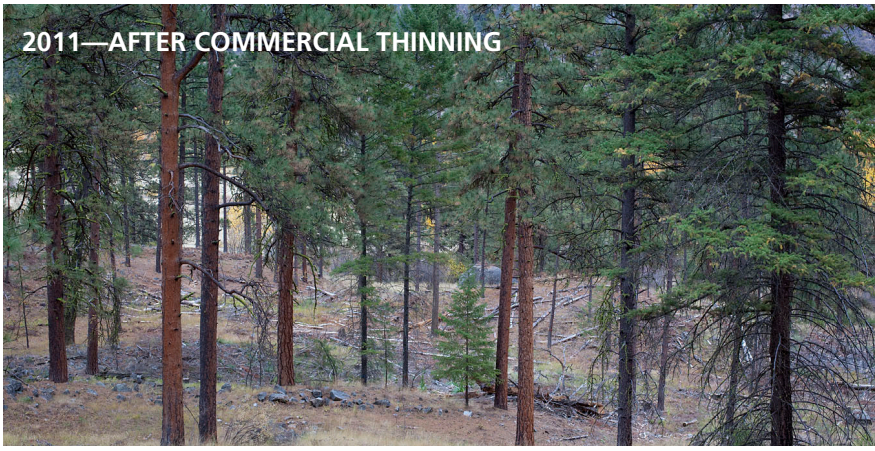
Managers used prescribed fire to remove slash and accumulated dead wood from the area (see photo 2015, *After Prescribed Fire*).

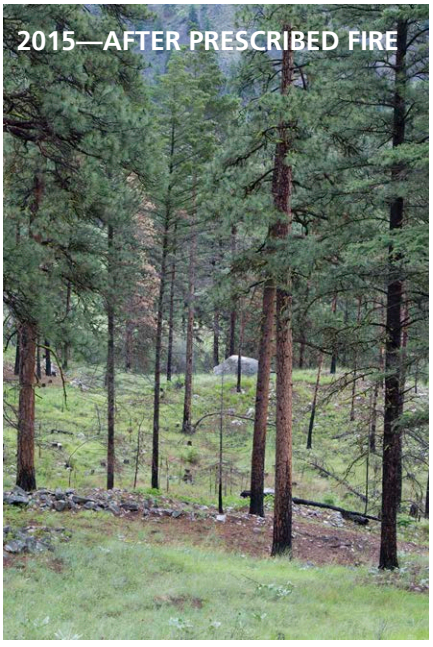
Later in 2015, the Lime Belt fire burned over 133,000 acres, including the area shown. The fire burned with low severity here, likely as a result of the forest health treatments applied prior to the fire (see photo 2015, *After Lime Belt Fire*).

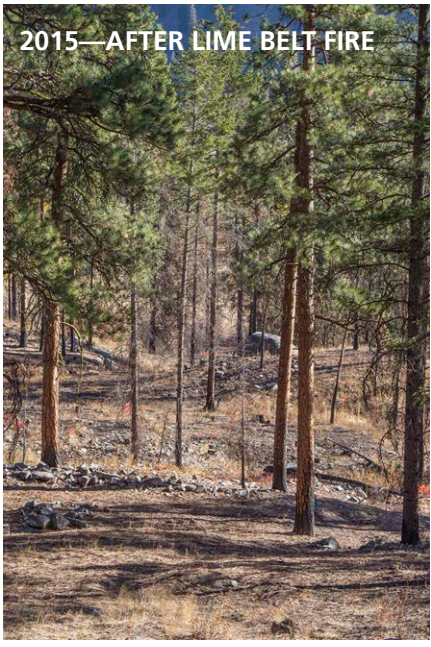
Sinlahekin Wildlife Area managers report that areas that were thinned but had not yet been treated with prescribed fire did not fare as well.

Photos by John Marshall and courtesy of TNC and WDFW.


2010—BEFORE TREATMENT


2011—AFTER COMMERCIAL THINNING


2015—AFTER PRESCRIBED FIRE


2015—AFTER LIME BELT FIRE

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 2: LANDSCAPES ARE RESILIENT. IN THE FACE OF WILDLAND FIRE, THEY RESIST DAMAGE AND RECOVER QUICKLY.

For prescribed and managed fire specifically, stakeholders recognize that the associated health, air quality, regulatory, and safety challenges need to be addressed and resolved. These issues are complex and significant; accordingly, it will be important to develop and implement best practices that engage communities, regulators, and other stakeholders. The draft 2928 Forest Resiliency Pilot Project report identities a potential set of best practices currently being reviewed by DNR and other agencies.

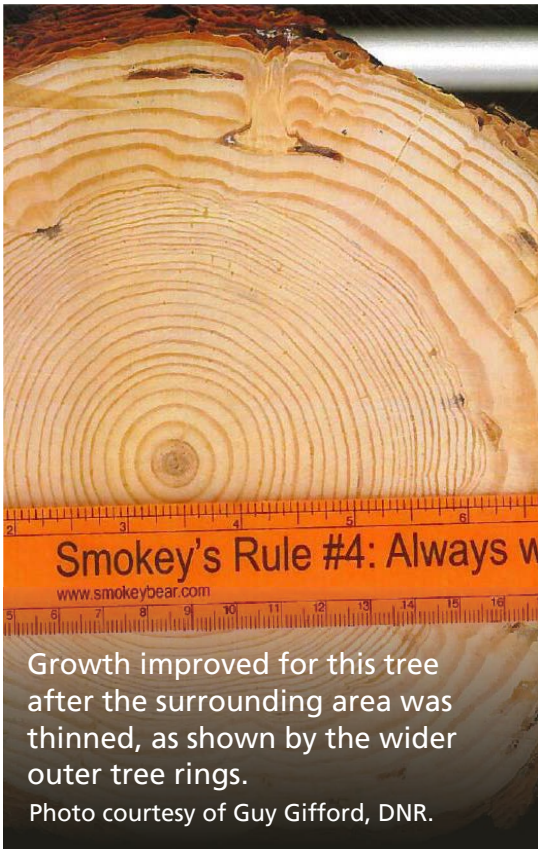
A. In the near-term, review and, if appropriate, implement recommendations from the draft 2928 Forest Resiliency Pilot Project report.

- Support collaboration and coordination between prescribed burners, regulators, and other stakeholders to identify challenges, find solutions, and develop partnerships.
- Continue communication, outreach, and education to the public on why, when, and where prescribed fire is happening.
- Increase and support capacity and expertise of prescribed burners, communicators, regulators, and others to better manage an increase in the pace and scale of prescribed fire.

B. Engage with stakeholders to revise and consolidate the rules and regulations that pertain to prescribed fire and smoke across the Revised Code of Washington (RCW) to simplify and streamline the regime that permits and regulates prescribed fire.

- Include a review of current DOE smoke regulations to determine if a higher level of smoke from prescribed fires is warranted and supported by stakeholders.
- Consider and advance legislative action to change regulations based on the outcome of the review and stakeholder engagement.

C. Using the risk assessment planning and prioritization process (Strategy #2), identify areas on the landscape where managed fire meets both ecosystem and landowner objectives and does not increase the risk to other HVRAs. Manage those landscapes accordingly. Use of wildland fire for resource benefit can increase landscape health and reduce fuels adjacent to values at risk. To be effective, managed fire must be safe and allowable, occurring in the right place, under the right conditions, at the right time, and with the right intensity. In some cases, managed fire may be part of a suite of wildland fire management strategies including full suppression and/or protection of individual values at risk.



Growth improved for this tree after the surrounding area was thinned, as shown by the wider outer tree rings.
Photo courtesy of Guy Gifford, DNR.

EASTERN WASHINGTON LANDSCAPES

5.3 ENSURE COORDINATION BETWEEN WASHINGTON STATE'S 20-YEAR FOREST HEALTH STRATEGIC PLAN AND WASHINGTON'S WILDLAND FIRE PROTECTION STRATEGIC PLAN.

While the basic tenets of both plans are in strong alignment, it will take focused effort to ensure that the plans are well coordinated. Each plan should accelerate the other, as opposed to competing for resources and capacity.

A. **Integrate planning and actions across the FHSP and this Plan.**

- Apply the cohesive approach to landscape treatments and wildland fire risk reduction. Engage the new leadership forum, WFAC, regional councils, and relevant agencies in efforts to ensure coordination and integration of the two plans.
- Integrate the supply generated from fuels and vegetation management in the WUI with Goal 3 of the FHSP, enhancing rural economic development. Identify incentives and other support needed for small landowners to contribute to this supply chain.

B. **Accelerate investment in and implementation of forest health plans** to keep pace with climate change and increasing wildland fire risks. Ensure that collaborative processes lead to timely implementation.

5.4 DEVELOP AND IMPLEMENT WILDLAND FIRE MITIGATION AND FUELS TREATMENT PLANS FOR NON-FORESTED LANDSCAPES.

These landscapes include rangelands, other agricultural lands, and shrub-steppe lands that are home to threatened or endangered species or critical wildlife habitat.

A. **Actively engage landowners and communities in this planning process** and continue engagement through each phase of implementation. Use the capabilities and framework created under Strategies #1 and #2 (the regional councils, local fire-adapted community coordinators, and a shared understanding of risk) to develop these plans.

B. **Implement treatments on non-forested landscapes**, deploying methods to protect agricultural and rangeland values and threatened and endangered species in shrub-steppe habitat. Make invasive species removal a key consideration in selecting priority fuel treatments on non-forested landscapes. Similarly, consider grazing as a key fuels management tool where the landscape can accommodate it.

GOAL 2: LANDSCAPES ARE RESILIENT. IN THE FACE OF WILDLAND FIRE, THEY RESIST DAMAGE AND RECOVER QUICKLY.

Norse Peak Fire as seen from Crystal Mountain Boulevard. Photo courtesy of INCIWEB.

WESTERN WASHINGTON FORESTS

5.5 Develop and implement wildland fire mitigation, adaptation, and response policies and plans for at-risk landscapes and communities in western Washington.

A. **Continue to suppress fires where consistent with other management objectives and Washington state statutes.** Unlike fire-prone forests, suppressing wildland fire is more consistent with the infrequent fire regime that characterizes most of western Washington. Extending fire-free periods in these forests carries relatively few consequences compared to doing so in eastside forests and allows time to redevelop a diversity of seral stages that may be more resilient to disturbance.[54]

B. **Reduce other forest stressors.** Minimizing existing stressors reduces strain on ecosystems and promotes resilience. Examples include promoting landscape connectivity and genetic, species, and structural diversity, while keeping invasive species pressure to a minimum.[55]

C. **Develop post-disturbance response strategies sooner rather than later.** Unlike fire-prone forests, the greatest opportunity to increase forest resilience in western Washington may be following a wildland fire. Without proper planning now, post-fire management following a large event may default to practices that worked well in the past, even if such actions may be detrimental in a warmer and drier future.

D. **Develop innovative strategies to respond to large events in the face of changing conditions.** While many response strategies can be developed in the near term, there are still many ecological and management unknowns. Small-scale trials examining different species combinations, densities, and/or genotypes can be implemented sooner to inform possible future management options. Research should also take advantage of the relatively rare opportunities to study westside fires that do occur (such as the 2017 Norse Peak and 2018 Maple fires), to better understand patterns of burn severity, species responses, and successional trajectories following these events.

54 Halofsky et al., 2018.

55 Halofsky et al., 2018.

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

By being prepared and adapted, communities—inclusive of land and property owners, residents, businesses, workers, neighborhoods, and institutions—are resilient and can withstand wildland fire, leading to better fire outcomes. In short, this goal involves enabling communities to safely live with fire whenever and wherever it occurs.

Three strategies help Washington communities achieve this goal. These strategies intend to establish and sustain fire-adapted communities through changing behaviors and practices, preventing unwanted human-related fires, and increasing the capacity to recover quickly and safely after a fire.

S6 ESTABLISH AND SUSTAIN FIRE-ADAPTED COMMUNITIES

Creating communities capable of withstanding wildland fire requires new approaches to engagement and investments in coordination, capacity, and programs to galvanize action.

Effective engagement is essential for risk reduction, as protection of individuals, homes, communities, and other values at risk often requires changes in behavior.[56] **Engagement must be more than traditional outreach; effective engagement to create fire-adapted communities requires that practitioners understand the communities in which they work, including what actions people are taking, why they are taking them, their current level of preparedness, and desired resources to increase preparedness.**[57] Communities—especially high-risk ones such as LEP communities—need timely, quality information about wildland fire risks, preparedness, evacuation, and recovery. Resources must be actionable and accessible. Communities want to be active partners in wildland fire risk reduction.

RATIONALE FOR STRATEGY

- Uses current social science.
- Builds trust and cultural competency, as well as capacity for engagement across the entire community.
- Enables direct, clear, and real-time communication with LEP communities.
- Diverse communities require diverse drivers of change; a resilient system requires diverse opportunities for individuals and communities.
- Strengthens community systems by using diverse partners while agencies build capacity to catch up and offer new tools.
- Supports change at the local level, feeds into regional infrastructure (coordinating councils).
- Provides opportunities to make change at multiple scales and to link and interweave those scales.

56 Social science research indicates that many WUI residents are taking action to reduce their wildland fire risks but that "awareness of the risk does not automatically lead to adoption of risk-reduction behavior." (Toman, et al., 2013).

57 *Ibid.* Factors that can influence risk reduction behavior by landowners include: trade-offs with other values, social norms, perceptions of risk and effectiveness of mitigations, ability to complete the risk-reduction, local ecological conditions, residency status, and the condition of adjacent properties.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

To meet the needs of Washington's communities—from the most prepared to the least prepared—engagement approaches must be deployed before, during, and after wildland fire. Some communities are leaders in preparedness and others can and should be learning from their approaches and experiences.

With effective engagement and support, communities can limit costs and losses and improve resilience (i.e., become fire-adapted). Practices that increase fire adaptation happen at multiple scales and include CWPP development, forest management, fuel reduction near homes and other values at risk, ignition-resistant construction, land use and evacuation planning, and business continuity planning (see Figure 33 on page 93). The more actions an individual or community takes, the more fire-adapted they become.

Strategies to support fire adaptation throughout Washington build on successful existing programs such as Firewise USA®. These strategies also include recommended changes to existing programs and encourage stronger land use planning and building codes.

Figure 31. Stakeholders emphasized several crucial elements to support fire-adapted communities.

During the engagement process, stakeholders emphasized several crucial elements to support fire-adapted communities and build a future that "fund[s] and empower[s] local communities to engage in fire preparedness, response, and recovery while in tandem pressuring policymakers to remove administrative and financial barriers for these efforts" (workshop participant).

- Outreach must be tailored to the needs and level of preparation within communities, and honor communities as knowledge holders and partners. Importantly, outreach should allow for autonomy whenever possible; recognize that while many have taken action to prepare for wildland fire, they feel they could be more prepared (see Figures 20-21 on pp 50-51); and meet diverse needs within communities, such as health (e.g., those with respiratory conditions) and language (e.g., LEP communities) needs. Both public and practitioners surveyed identified cost-share program incentives, property assessments, home protection planning or education, and community programs such as Firewise USA® as priorities for improvement and increased investment (Figure 32, right).
- Resources must be truly accessible and actionable to remove barriers to community engagement and enable communities to play an active role in wildland fire preparation and mitigation.
- Communications must be high-quality—meaning messaging is consistent, appropriate to the audience and season, and coordinated in its delivery—before, during, and after wildland fire.

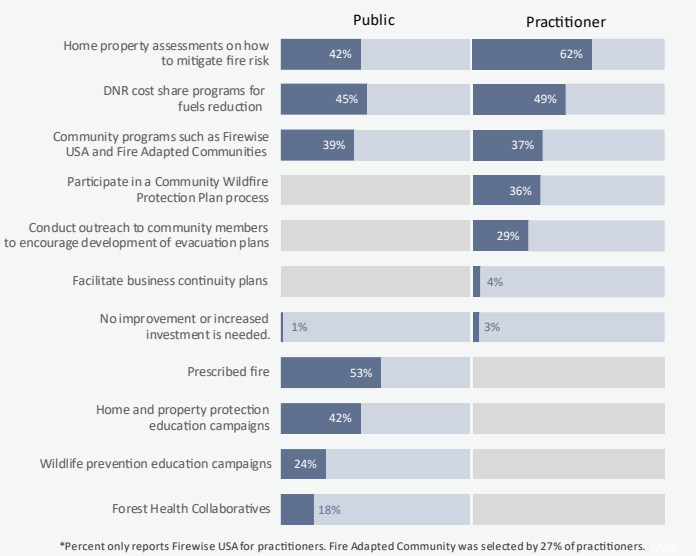
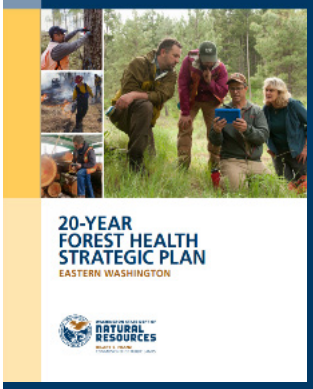


Figure 32. Home property assessments, cost-share programs, and community programs were top priorities for both the public and practitioners. Practitioner responses are specific to top priorities for preparing communities to live with wildland fire, while public responses apply to top priorities for improvement or increased investment across wildland fire management programs and activities.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.



GOAL 2 OF THE FOREST HEALTH STRATEGIC PLAN

Reduce risk of uncharacteristic wildland fire and other disturbances to help protect lives, communities, property, ecosystems, assets, and working forests. Strategies:

1. Support Fire-Adapted Communities and landowner assistance programs that provide resources to coordinate risk reduction activities including defensible space near homes and structures.
2. Support the development and integration of CWPPs with state and federal resources and priorities.
3. Conduct mechanical treatments and controlled burns in the WUI to increase firefighter safety and reduce risks to communities.
4. Reduce risk of conversion of forestland to non-forest uses.
5. Communicate relevant and timely information about wildland fire risk to landowners, policy makers, and the public. Assist communities in planning for future wildland fire events.

Figure 33. Fire-adapted community practices at multiple scales.

PRACTICES THAT CREATE A MORE FIRE-ADAPTED WASHINGTON

Individual	Neighborhood	Community	Watershed	County/ Regional	State
Ignition-resistant building Home ignition zone preparation Evacuation kits Business continuity plans Home assessments Forest, range, and agricultural stewardship and management plans	Firewise USA® program Ingress/egress routes	Fuel breaks Proper addressing and signage Ingress/egress route WUI codes Land Use Planning Fire-adapted Communities Community Wildfire Protection Plans Home assessment training Ready, Set, Go! program	Forest restoration Spatial fire management planning/ prioritization Prescribed fire Fuel treatments	Communication plans Vegetation disposal and pick-up programs Wildfire-recovery plans Natural hazard mitigation plans Community Wildfire Protection Plans	Incentive programs for fuel reduction Technical assistance for community planning Incentive programs (cost-share) for home hardening Insurance discounts for homes certified as wildfire-resilient

Fire-adapted community coordinators, regional coordinating councils (Strategy #1.3), and fire-adapted community networks help facilitate coordinated actions at multiple scales.

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

6.1 DEVELOP AND IMPLEMENT ENGAGEMENT STRATEGIES, SUCH AS COMMUNITY-BASED SOCIAL MARKETING, THAT FOSTER BEHAVIOR CHANGE.

Community-based social marketing strategies focus on systematically empowering communities to act for social benefit. Social marketing strategies are not social media strategies; social marketing is grounded in the communities served, is interactive, and helps to better change individual behavior. Resources such as the National Woodland Owner Survey and USFS social science research community exist to help practitioners better understand the behavior and motivations of residents in the WUI and form the foundation of applying community-based social marketing practices to this field. Survey data suggests widespread agreement on foundational wildland fire management issues and increased risk from wildland fire in recent years (see Figure 18 on page 49). However, some gaps in our understanding of Washington communities exist, particularly in the non-forested areas of the state. Rural and urban communities also often have different expectations and communication needs. Conducting research to better inform practitioner engagement efforts will maximize their effectiveness.

A. **Survey Washington's WUI residents to gather information on motivations and barriers at the individual scale.** Results should inform engagement strategies before, during, and after wildland fire.

B. **Provide community-based social marketing training to those working with and in communities**, such as community engagement specialists and landowner assistance foresters.

C. **Emphasize interactive engagement approaches that build trust.** Research has shown the importance of interactive engagement approaches and the key role of trust in natural resource management.[58] The ESHB 2928 Forest Resiliency Pilot Project (report in progress) provides examples of high-quality, interactive engagement that can be used as a model.

D. **Support development and implementation of new engagement strategies** by conducting pilot projects, providing technical assistance, and connecting communities to additional resources.

6.2 ENHANCE ENGAGEMENT WITH LIMITED ENGLISH PROFICIENCY COMMUNITIES.

In order for all Washingtonians to have access to essential wildland fire information throughout the fire cycle, all entities directly serving communities must commit to enhancing language access services and LEP engagement. In addition to the LEP coordinators positions established in Strategy #3.2, agencies can enhance engagement with LEP communities through training of existing staff. Presently, agencies often lack the training to effectively engage with LEP communities; trust between agencies and these communities can suffer as a result. Individuals with limited English proficiency also often lack timely, quality information about wildland fire risks, preparedness, evacuation, and recovery. Future community engagement needs to focus on developing trust, providing timely translation and interpretation services, and providing effective training for wildland fire practitioners.

58 Shindler, et al., 2014.

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

A. **Develop curriculum for, and provide cultural competency training to, first responders and community engagement organizations/specialists** (e.g., fire agencies, IMT members such as liaison officers and public information officers, Fire-Adapted Communities coordinators, conservation district staff, landowner assistance foresters) to ensure effective engagement with the LEP community.

B. **Identify LEP leaders and organizations in high fire risk communities, and develop effective, long-term partnerships.** Sustained improvement in engagement with LEP communities will require first building trust with community leaders and organizations, and through them, building trust with communities. Building trust may entail providing needed services to communities, working to identify communities' core wildland fire gaps and needs related to pre-fire preparedness, planning, and response, and developing information-sharing methods and materials, with opportunities for community collaboration throughout the process. LEP leaders and organizations can also serve as a trusted conduit for information to be shared with the LEP community but cannot be the only conduit for information sharing. Developing effective, long-term partnerships will, over time, build connections to LEP communities, resulting in improved wildland fire-related services and information sharing.

C. **Provide high-quality, professional translation and interpretation.** Translation refers to written communication and interpretation refers to oral communication. Both are essential to providing timely and accurate information.

- Invest in phone interpretation services and interpreters who are knowledgeable about wildland fire and the local area to provide timey, high-quality interpretation for wildland fire information and evacuations. Telephone interpretation services facilitate real-time communication between the public and incident information officers. Common to the health-care industry, these services provide accurate information to the public, support multiple languages, and are designed for efficient use.
- Invest in the development of universal communication materials using symbols and pictures to increase access to information.
- Develop the capacity for translation of notices and alerts. Consider standardizing basic notifications, particularly evacuation notifications, so communication can be issued in the top six languages in every service area.

6.3 INCREASE CAPACITY, COORDINATION, AND NETWORKING OF COMMUNITY ASSISTANCE PROGRAMS.

Currently, multiple organizations and agency programs provide assistance to communities and landowners throughout the year and across the state. However, many of these organizations and programs are stretched thin, with demand for services outpacing capacity. Fire districts, federal agencies, and DNR have expertise in predicted fire behavior and risk-reduction but may not be available during the height of the fire season. Conservation districts and community coalitions provide fuel-reduction assessments and offer a wide range of assistance in community preparedness and recovery practices (including business continuity planning and recovery) but often struggle to fund critical programs.

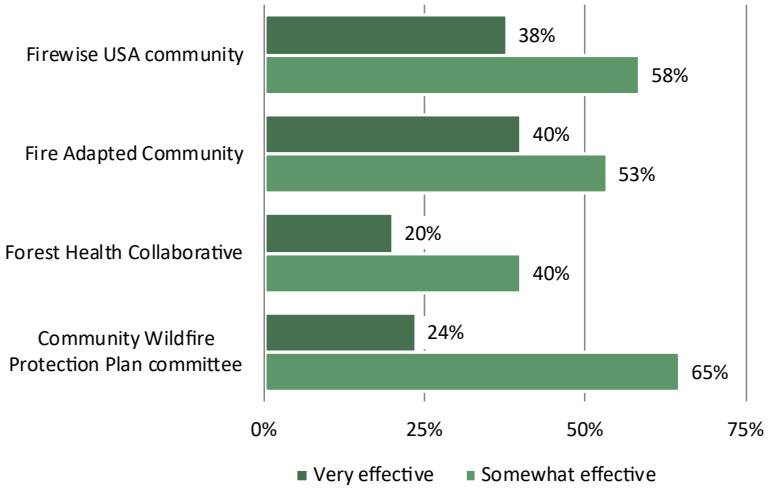


Figure 34. Public survey respondents consider existing community groups to be effective.

A. **Increase resources for landowner assistance, response, recovery, and community engagement programs provided by diverse entities** (e.g., federal agencies, DNR, conservation districts, community coalitions, fire districts, counties, and recovery organizations). Research indicates that interactive engagement, particularly engagement with a local and tailored approach, is one of the most important mechanisms to encourage mitigation actions.[59] Increasing the capacity of local programs, in local places, will help improve residents' access to existing resources.

B. **Assess and redesign cost-share programs to more comprehensively reduce wildland fire risk for all fuel types and to encourage ignition-resistant building materials.** Cost-share programs are an important tool for reducing risks to existing homes and buildings. Present cost-share programs are primarily focused on removing small diameter trees on private lands in the WUI. This addresses only one of the many wildland fire risks faced. Few cost-share programs provide for improvements to the structure of the home itself (e.g., to help offset the cost of roof replacement) or for activities such as restoration of shrub-steppe habitat, prescribed fire, or removing diseased larger diameter trees from the landscape. These programs should be assessed and redesigned to provide effective incentives for risk reduction.

59 McCaffrey, 2015.

- Ignition-resistant building materials are a key factor in reducing the risk to structures (Figure 35). Cost-share programs should be redesigned to either offset a portion of the cost of structure retrofitting or to allow the retrofitting of structures to count toward a portion of the homeowner's in-kind match for fuel reduction in the area surrounding the home.
- Cost-share rates should be evaluated and adjusted as necessary to increase participation in risk-reduction activities. Public survey respondents indicated that a lack of financial resources (41%) and time (40%) were the primary impediments to taking more action on wildland fire, which suggests reducing the financial burden will support increased participation in these activities. The survey completed in Strategy #4.1 can be used to help inform rates.
- Other options should be identified and evaluated to provide incentives for private landowners to reduce wildland fire risks on their property.

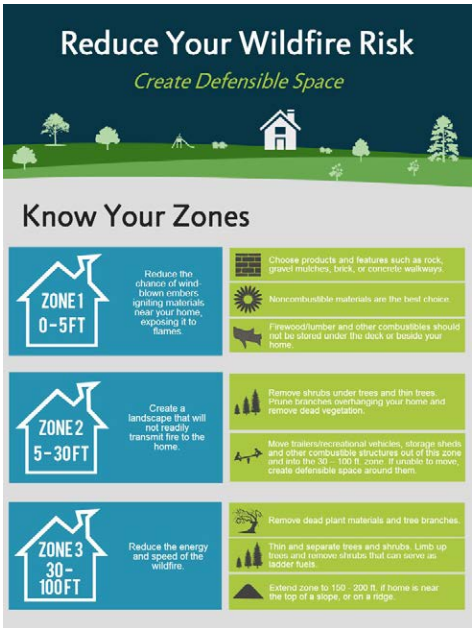


Figure 35. The building components of a home (e.g., roofing and siding), together with the home's surrounding vegetation, are primary factors in whether a home is vulnerable to wildland fire embers. Wildland fire risk can be reduced through the creation of defensible space around the home. Source: Insurance Institute for Building and Home Safety.

C. Support initiatives to increase participation in the Firewise USA® program and convene member communities to share best practices and encourage additional mitigation and preparedness work. The Firewise USA® program emphasizes the role of individuals in community preparedness and encourages neighbors to work together to reduce their collective risk.

- Encourage existing Firewise USA® communities to support new communities through the application process. Exiting programs, such as conservation districts, community preparedness organizations, and DNR Landowner Assistance programs, should be resourced to provide this support.
- Provide opportunities for Firewise USA® communities to connect with each other. Connecting these communities, both to each other and to agency personnel, will help build trust, increase community access to information and existing mitigation resources, and help with recovery.[60]

D. Expand the Washington State Fire Adapted Communities Learning Network to include additional communities in diverse at-risk landscapes. Throughout the engagement process, stakeholders emphasized the need for an expanded WAFACLN. This finding was consistent with stakeholder input received during the 2016 Governor's listening sessions.

60 McCaffrey, 2015.

6.4 FACILITATE ADOPTION OF LAND USE PLANS, REGULATIONS, AND CODES THAT REDUCE WILDLAND FIRE RISK IN THE WUI.

A. **Encourage implementation of WUI building standards (e.g., use of noncombustible and ignition-resistant construction materials and defensible space) in at-risk communities. Consider developing and adopting statewide codes.** The materials that comprise homes, businesses, and other at-risk assets significantly impact the flammability of those assets. An untreated wood shingle roof, for example, is the greatest threat to a home.[61] Implementation of building standards can reduce wildland fire risk by requiring that new construction utilize ignition-resistant construction materials.

B. **Provide training and incentives for land-use planning that address the WUI.**

- Provide assistance to communities and jurisdictions seeking to plan for wildland fire. Technical assistance may include mapping at-risk areas within the jurisdiction (e.g., risk mapping through the QWRA or similar quantitative assessment) and providing sample steep slope ordinances, landscaping regulations, watershed management plans, and subdivision design standards. Sample text could emphasize vegetation standards, construction materials, ingress/egress routes, and firefighter safety.
- Provide training to communities to better incorporate wildland fire into plans, codes, and regulations.
- Engage with planners and county staff to address the WUI in land use plans and limit WUI expansion at the neighborhood and community scales.
- Provide funding for conservation easements that have the dual goals of removing development rights from, and allowing for management of fuels on, selected high-risk properties in the WUI. These strategies are consistent with changes survey respondents suggested (Figure 36).

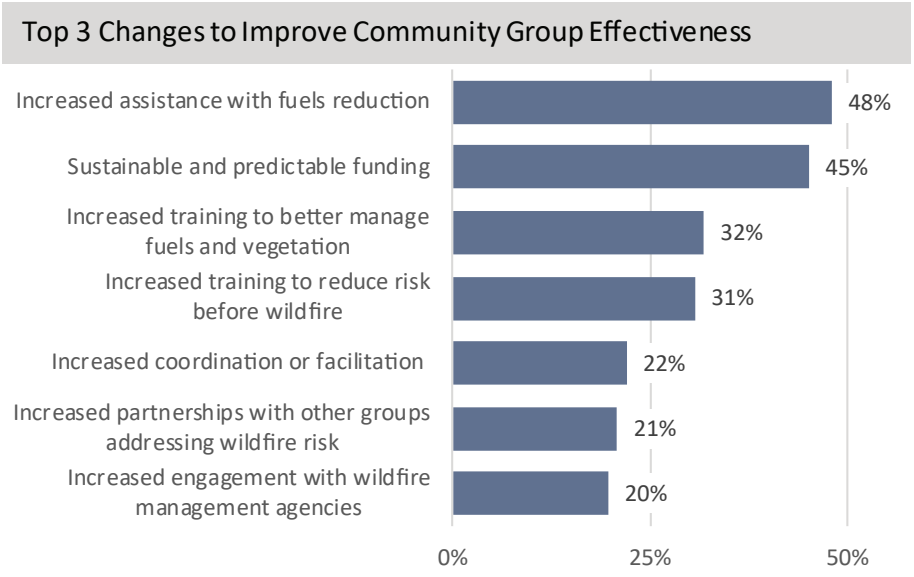


Figure 36. Public survey respondents identified assistance with fuels reduction and sustainable, predictable funding as the key changes needed to make community-based groups more effective at reducing the risk of wildland fires to property and public safety.

61 IBHS, 2017.

6.5 MITIGATE INCURSIONS OF WILDLAND FIRE SMOKE INTO COMMUNITY AIRSHEDS.

Many of the strategies contained in this Plan are intended to reduce the impacts of wildland fire smoke on communities. However, because wildland fires are likely to increase in size and intensity over time, smoke incursions will occur in the years ahead. In addition, smoke from prescribed fires will affect communities and needs to be mitigated. There are certain steps that agencies and communities can take to reduce the impacts of smoke including:

A. **Better prepare Washington communities and reduce impacts of smoke incursions to community health.** Engage non-traditional and cross-sector partners (e.g., health care providers and community health districts) in this effort.

B. **Create a communications template to help change community expectations about smoke from wildland fire including prescribed and managed fire.**

C. **Identify smoke respite areas in high-risk communities where people can take temporary refuge.**

S7 REDUCE HUMAN-RELATED WILDLAND FIRE

Minimizing human-related wildland fire requires interagency cooperation, sound data, and the capacity to implement risk-based prevention policies and programs.

Almost 70 percent of Washington's wildland fires are human-related (see Figure 38 on page 101) and their associated costs are substantial. In addition to the financial costs, for seven out of 10 ignitions, firefighters and communities are exposed to unnecessary risks. Effective fire prevention that keeps even a single unwanted human-related wildland fire from occurring has the potential to significantly reduce costs, losses, and associated risks to the public and firefighters.

Most agencies lack sufficient prevention personnel and struggle to track and report basic prevention expenditures and statistics. Fire prevention teams deployed during periods of high wildland fire severity have been a stop-gap measure in the absence of dedicated prevention staff; however, the lack of year-round fire prevention staff limits interagency coordination and strategic deployment of resources.

RATIONALE FOR STRATEGY

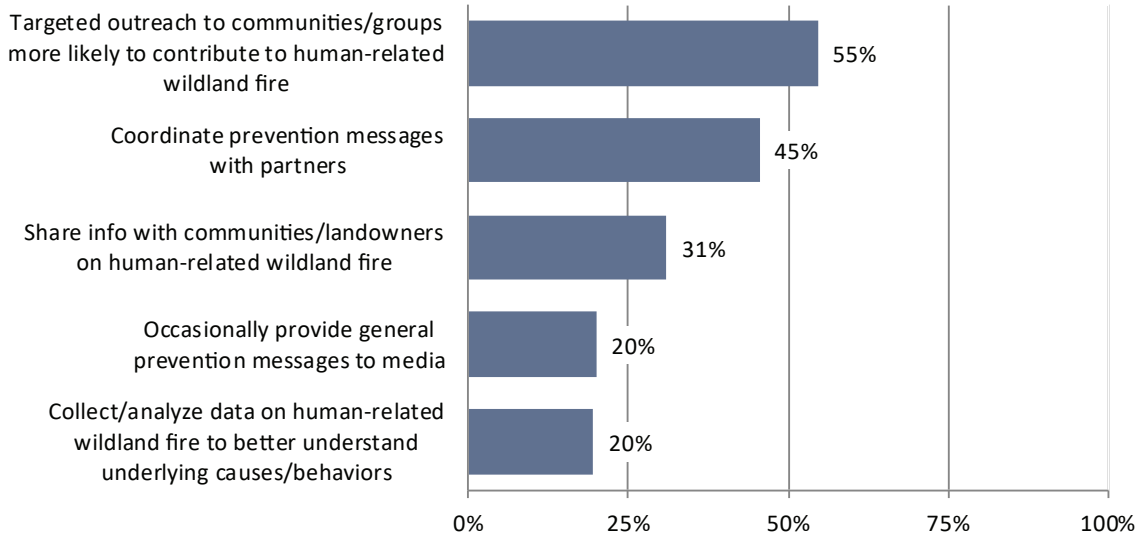
- Preventing human-related wildland fire reduces risk exposure for communities and firefighters.
- Significant return on investment.
- Aligns prevention programs to areas with elevated wildland fire risk.
- Allows firefighters to direct efforts to natural ignitions.
- Enables more effective communication with the public about local, state, and federal agency regulations and restrictions.
- Stakeholders recognized and requested additional resources devoted to prevention.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

Effective fire prevention requires a better understanding of risks, increased capacity in the prevention workforce, and coordinated fire prevention campaigns. In addition, it necessitates increased efforts to align fire regulations and restrictions so that they are easily understood and enforced. Stakeholders emphasized resilient landscape activities, working with communities and groups more likely to contribute to ignitions, youth education, and targeted messaging campaigns to prevent human-related wildland fire (Figure 37).

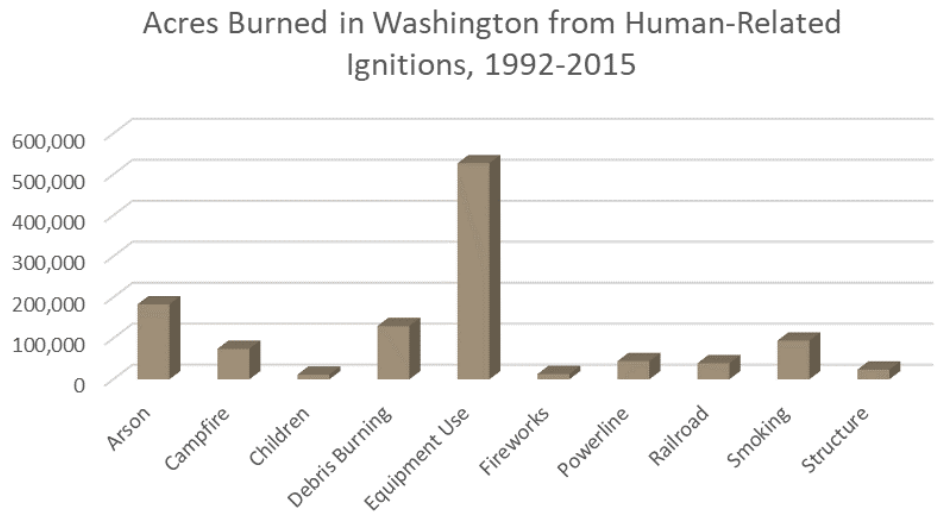
Figure 37 . Practitioners' top priorities for improvement and increased investment in prevention activities focused on outreach and communications.



2017 FIRE PREVENTION TEAM SUCCESS

During the 2017 solar eclipse, an estimated one million additional visitors traveled to Oregon during the peak wildland fire season. PNWCG began planning for the solar eclipse in 2016; during 2017, prevention teams were deployed to focus on the elimination of human-related wildland fire. No known human-related wildland fire ignition developed into any major fire during this event (2017 Eclipse Report, Pacific Northwest Fire Prevention Education Teams). The success of this effort highlights the importance of pre-season planning and interagency coordination.

Figure 38. Equipment use and arson are two common sources of human-related wildland fire ignition in Washington. Data source: Short, 2017.



7.1 COLLECT AND USE DATA TO FOCUS PREVENTION EFFORTS IN HIGH-RISK AREAS AND ON HIGH-RISK CAUSES.

Different parts of the state have different rates of human-related wildland fire, from different sources. To be most effective, fire prevention strategies must be grounded in accurate data on the causes of fires and focused on those behaviors that most frequently cause dangerous fires. Interagency planning tools that rely on the best-available data should be enhanced and deployed to establish program priorities and monitor program effectiveness (see Figure 39 for an example).

A. **Standardize the collection and reporting of fire-cause data across agencies.**

B. **Deploy prevention planning tools that use interagency fire data to establish program priorities and monitor program effectiveness.**

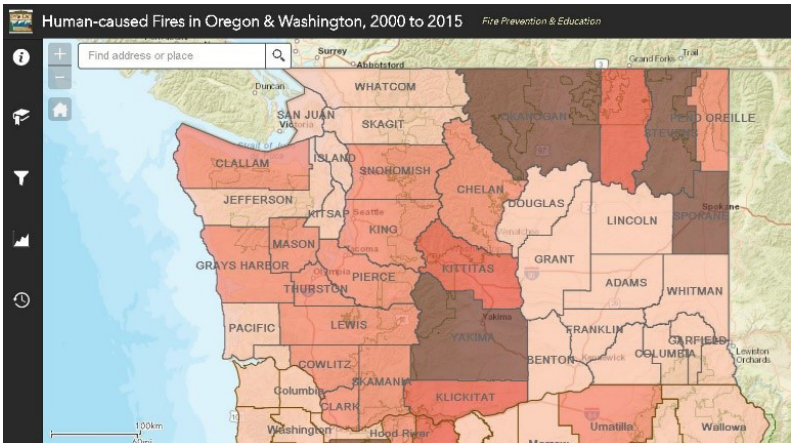


Figure 39. Interagency fire-cause data can be used to inform strategic wildland fire risk reduction activities. This website, currently in "beta" form, shows the Washington counties with the highest number of human-related wildland fires (the darker the color, the higher the incidence of human-related wildland fire). With available, accessible, and accurate data, prevention activities can be focused on those areas with the highest risk. Planning tools like this one, using interagency fire cause data, should be strengthened and deployed.

7.2 INCREASE CAPACITY FOR PREVENTION PLANNING AND IMPLEMENTATION.

Adding personnel with the responsibility for fire prevention and implementation will enable enhanced data collection, deployment of prevention resources to the areas of highest risk, and better coordination among agencies. Currently most jurisdictions rely on part-time prevention teams (groups of trained prevention specialists that can be deployed during periods of high wildland fire danger). While prevention teams are a valuable resource, they struggle with capacity and cannot provide the services and benefits of dedicated, permanent wildland fire prevention staffing.

In addition to adding permanent prevention staff (as discussed in Strategy #3.2), continued enhancement of the prevention teams is needed. The 2014 PNWG report on Fire Prevention and Education Teams notes that the current level of trained prevention team personnel in the region is "very low" and emphasizes the need for continued capacity building through training, prevention team deployments, and additional investment in developing qualified prevention team leaders and prevention team members (in the Incident Command Systems [ICS], positions are called the Prevention Education Team Leader [PETL] and Prevention Education Team Members [PETM], respectively).[62]

A. **Continue interagency efforts to build capacity throughout the prevention team workforce.** Continue hosting trainings and developing prevention team leaders and members through successful prevention team deployments as recommended in the 2014 Prevention Team Strategy—The Four-Year Plan.[63]

7.3 ENHANCE, EXPAND, AND ALIGN EDUCATION PROGRAMS, MESSAGING, AND REGULATIONS.

Practitioners surveyed identified targeted prevention messages and increased coordination with partners as the top two priorities for the reduction of human-related wildland fire. Effective education campaigns and programs train both young and old about safety and prevention. Starting at an early age makes the messaging more likely to stick and offers natural opportunities to weave into existing educational structures such as schools and youth camps. Coordinated messages and consistent regulations reduce confusion and help ensure that those who live, work, and recreate in multiple locations receive the same high-quality prevention information. Communicating and sharing lessons learned across agencies and programs will improve effectiveness and impact over time.

A. **Develop and implement targeted education programs based on fire risk and cause data.** Stakeholders recommended that youth education programs and seasonal programs be developed and deployed across jurisdictions and targeted at specific ignition sources (such as those related to on- and off-road vehicles, target shooting, utilities/powerlines, and unauthorized Fourth-of-July fireworks).

    - Use social science research and social marketing techniques when developing and implementing these programs.

62 PNWCG, 2014. Prevention Education Team Report.

63 PNWCG, 2014. Prevention Education Team Report.

- Make use of all available technologies—including, for example, highway reader boards—to communicate seasonal messages to target audiences.

B. **Enhance efforts to coordinate fire prevention messages and strategies across agencies.**

C. **Continue efforts to align regulations and restrictions, focusing on consistency at the county scale.**

- Improve communication across agencies when establishing or revising burn-ban restrictions.
- Establish protocols and practices to align restrictions across ownership types.

D. **Increase the capacity to enforce current regulations in areas of highest risk.** Stakeholders saw strict enforcement of fire prevention regulations as an important and often underutilized tool.

E. **Establish best management practices to reduce wildland fire risk from powerlines.**

- Form a taskforce comprised of regulatory agencies and electrical power distribution entities to establish best management practices related to power line rights-of-way and infrastructure maintenance to reduce the incidence of power line-related wildland fire ignitions.

S8 MEET POST-FIRE RECOVERY NEEDS, BUILDING ON CURRENT CAPACITY AND CAPABILITIES

Effective recovery requires treating recovery as an equal part of the natural fire cycle, and devoting the resources, personnel, and collaboration needed to minimize the "second disaster."

After a fire, communities often face hazards from flooding, hazard trees, and debris flows in addition to the challenges of long-term community recovery (see Figure 40 on page 104). Locations downstream or adjacent to burned areas are at particular risk from flooding and debris flows for several years after a fire. Post-fire impacts are not confined to forests; rangelands are also susceptible to erosion after a wildland fire. Habitat for wildlife can also be impacted in significant ways. It is also important to recognize that many communities are working to recover while simultaneously needing to continue to prepare for the next wildland fire.

RATIONALE FOR STRATEGY

- Addresses critical short-term recovery needs (helping communities know the risk).
- Serves all lands in Washington through the creation of BAER teams for state/private lands.
- BAER team efforts have a history of success.
- Assessment of post-fire risks provides a risk-based framework for post-fire decisions and investments.
- Incorporates social vulnerability training to better address needs of vulnerable communities.
- Taskforce evaluates long-term recovery needs and provides benefits across disasters (wildland fire, tsunami, earthquake).
- Addresses key gap emphasized by stakeholders.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

Figure 40. Debris flows presented significant challenges after the Colockum-Tarps fire (2013). Photo by Wenatchee World.

Post-fire impacts are not confined to the landscape. Wildland fire-related damages to communities represent a significant and long-term economic cost. Communities are often left to navigate these challenges on their own; those already facing economic hardship may need additional support for a timely recovery. Often, no clear pathway or resources are pre-identified.

While some effective programs exist, there is inconsistent support for communities affected by wildland fire after suppression activities end. Stakeholders noted particular attention is needed to the transition from fire response to fire recovery. Recovery assistance is limited by which types of entities own the land that burns; only federal lands are regularly and sustainably supported by BAER teams to assess post-fire hazards. While similar programs for state, county, or private lands have been implemented in the past, no sustainable funding source or routine training program exists. Few CWPPs address post-fire impacts, and while NHMPs address flood risk, few specifically identify areas where there are multiple hazards (e.g., flood after fire).

For Washington to better withstand the impacts of wildland fire and for long-term costs and losses associated with wildland fire to be reduced, post-fire issues and gaps must be addressed. Near and longer-term priority actions are outlined below.

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

8.1 EVALUATE WILDLAND FIRE RECOVERY NEEDS AND RECOMMEND SOLUTIONS.

Interagency partners and impacted communities should be engaged to evaluate long-term recovery resources, existing disaster recovery plans and systems, gaps, and needs, and to develop appropriate recommendations to support long-term recovery of both the social and environmental landscapes. This review would represent a significant opportunity to align and enhance existing post-fire programs in addition to improving interagency cooperation post-fire.

Agency effectiveness in post-fire recovery was rated the lowest of prevention, preparation, response, and recovery: just 30 percent of practitioners and 50 percent of the public consider existing agency efforts to be effective.

A. Through legislation, **create a taskforce to assess post-fire recovery needs, evaluate current programs and services, and recommend new capacity, funding mechanisms, and funding sources for long-term recovery.**

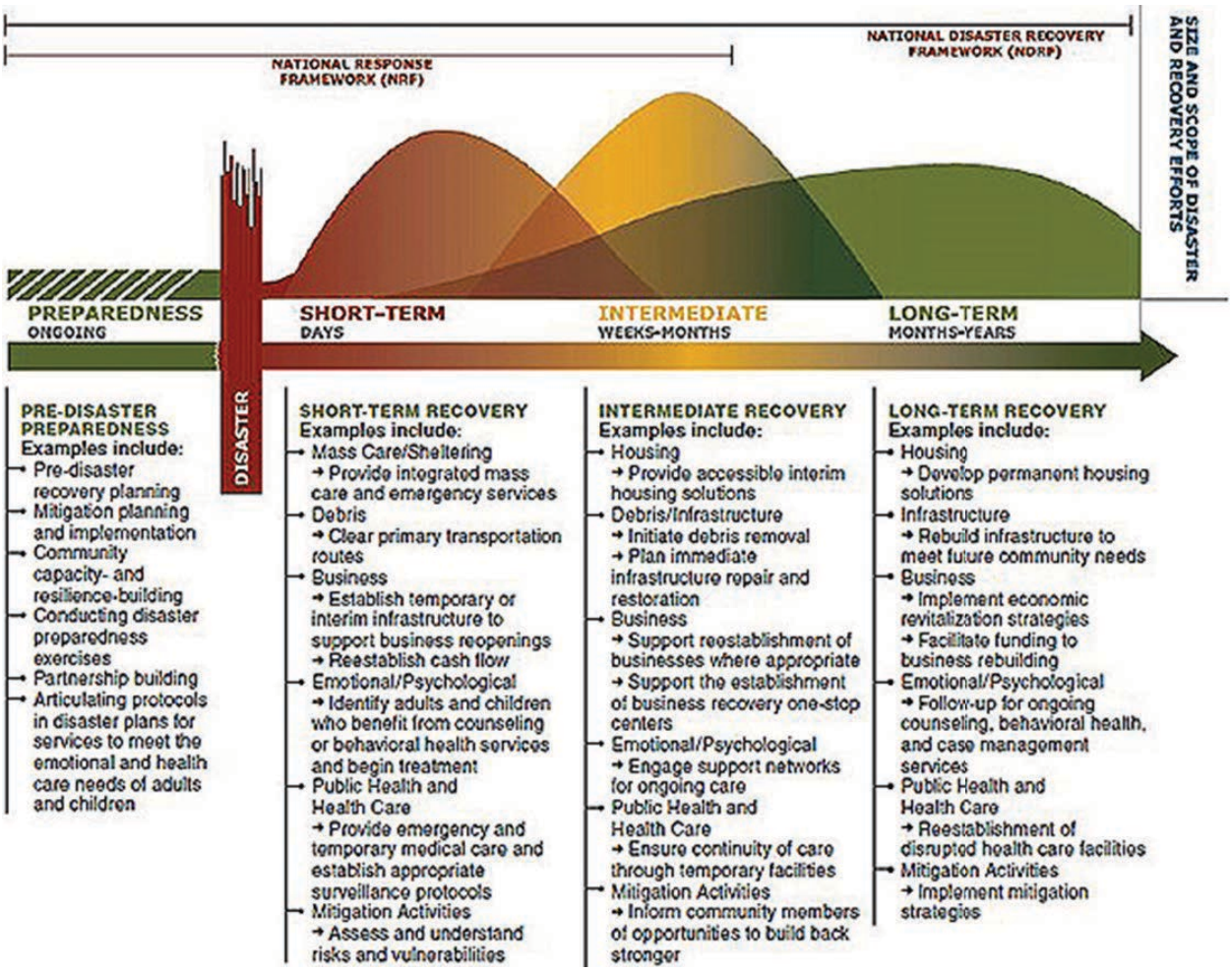
- This assessment should cover environmental, ecological, and social needs, including restoration of habitat and species recovery. Funding mechanisms could include establishment of a state recovery fund.
- This review could potentially be led by the EMD, which is charged with post-disaster recovery/restoration activities under FEMA's National Disaster Recovery Framework (NDRF) and is developing the *Washington Restoration Framework (WRF)*.[64]
- Conservation districts—many of which have been providing recovery services to private landowners—should be engaged in this effort, as well as NRCS, WDFW, and other agencies engaged in restoration and recovery related activities.

B. Establish funding mechanism (as recommended by post-fire recovery taskforce) to enhance timely mitigation of post-fire risks at the local level.

- Pre-fund this account so that post-fire landowner assistance activities can begin immediately to address urgent concerns. Integrate with the NRCS's Emergency Watershed Protection program.

64 The WRF will coordinate actions between the WA Comprehensive Emergency Management Plan and the State Hazard Mitigation Plan. The seven Recovery Support Functions establish the objectives, roles, pre/post-disaster priorities and the programs available including funding sources to support local recovery efforts. See https://mil.wa.gov/emergency-management-division/disaster-assistance-overview/recovery for more information (accessed 11/7/2018).

Figure 41. The Recovery Continuum as depicted in the National Disaster Recovery Framework (FEMA, 2011) and used by EMD during development of the WRF.



8.2 INCREASE PUBLIC AWARENESS OF RISKS POST-WILDLAND FIRE AND FACILITATE ACCESS TO RESOURCES TO MITIGATE THOSE RISKS.

Conservation districts, the NWS, and other agencies have been providing information related to wildland fire recovery for over a decade. However, post-fire resources and information are inconsistent across the state and many communities are left unaware of the hazards posed by debris flows and flooding. As a result, communities are often unprepared. In some areas of the state, due to their topography, weather radar coverage for the types of weather events that can create a post-fire risk is unreliable. Emergency rain gauges can provide critical early warning information to the public, if installed prior to the first storm. Prior to emergency notification, however, the public must be aware of their risks and have access to resources to help mitigate those risks. In addition, fire managers need to be more familiar with post-fire flood and debris flow risks so they are better able to communicate them to the public throughout the fire cycle.

A. **Use quantitative risk assessment** (Strategy #2) to help identify highest risk areas and prioritize implementation.

B. **During response, provide education and information about post-fire risks in communication with communities.** Where needed, develop materials and a deployment plan for those materials, including materials for LEP communities (see Strategy #4).

C. **Provide resources for the timely purchase and installation of emergency rain gauges.**

- Place emergency rain gauges in high-risk areas, as determined by BAER assessments on federal, state, and private land—and considering the social vulnerability of adjacent communities.
- Install rain gauges as soon as possible after the fire.

D. **Identify and communicate opportunities for communities to receive post-fire support** following emergency restoration/recovery processes as identified in the WRF and utilizing resources identified by the EMD (e.g., Washington EMD's Comprehensive Recovery Resources Guide 2018).

E. **Provide post-fire recovery training** to community organizations, local jurisdictions, agency staff, and local post-fire technical assistance personnel so they are knowledgeable and prepared for the complexities of engaging different communities post-fire. Training and assessment tools, such as those provided through the EMD and the University of South Carolina's Social Vulnerability Index, already exist and could be deployed more fully in Washington.

GOAL 3: COMMUNITIES ARE PREPARED AND ADAPTED FOR CURRENT AND FUTURE WILDLAND FIRE REGIMES.

8.3 ESTABLISH A STATE AND PRIVATE LANDS BURNED AREA EMERGENCY RESPONSE TEAM(S) TO ASSESS NON-FEDERAL LANDS POST-FIRE.

BAER efforts are designed to address post-fire hazards such as debris flows, invasive weeds, and flooding. Risks to habitat, archeologic and recreation sites, and others are also assessed. BAER teams complete an assessment of areas burned by wildland fire and then recommend mitigation actions to address those hazards. Presently, the only formal and fully funded BAER teams are federal, and they typically assess only federal or tribal lands. BAER teams should be available for all lands within Washington state regardless of ownership, and should be comprised of personnel from multiple agencies. Organizations and agencies such as DNR, conservation districts, and NWS need to have access to training, consistent funding mechanisms, and clear authorization to work on state and private lands.

A. **Identify pathways and provide training** (including necessary NWCG training) to conservation districts, NWS, NRCS, DNR, and other key state, regional, and federal organizations.

B. **Provide consistent and reliable funding to enable timely assessment** of post-fire risks and impacts.

C. **Clarify—and revise as necessary—state and federal policies** to facilitate seamless BAER work across jurisdictions.

Photo courtesy of Andrew Phay, Whatcom Conservation District, on behalf of the Okanogan Conservation District and Interagency BAER Team.

After the Carlton Complex Fire in Okanogan County, Okanogan Conservation District and several key partners established a BAER team for state and private lands. FEMA provided funding for three experienced BAER team leaders (funded through the Presidential Disaster Declaration). The Conservation Commission funded resource specialists and other federal agencies provided subject matter specialists. The final report informed the placement of 14 emergency rain gauges, helped update the list of eligible structures for the NRCS Emergency Watershed Protection program, and informed those home and landowners of their risks. A similar but smaller effort was successfully undertaken after the 2015 Okanogan Complex and Carpenter Road fires.

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

GOAL 4: RESPONSE IS SAFE AND EFFECTIVE.

Goal 4—safe and effective response—represents the paramount duty of wildland fire management agencies. First and foremost, achieving the goal means no loss of life to either firefighters or the public when responding to fires. In addition, effective response involves suppressing fires through initial attack, mobilization, and deployment at the right time and place to minimize costs and losses and protect high-value resources and assets.

Two strategies serve to directly achieve this goal. Strategy #9 addresses the policy framework needed to provide effective protection on all lands. Strategy #10 specifies planning, operational, and infrastructure changes to improve response effectiveness. In addition, all of the other strategies contribute to achieving this goal. Better planning, an enhanced workforce, increased funding for wildland fire management, and increased resilience, community adaptation, and prevention all serve to reduce risks and lessen the burden on firefighting agencies, thereby increasing their ability to provide safe and effective response.

S9 ESTABLISH EFFECTIVE WILDLAND FIRE PROTECTION FOR ALL LANDS

Wildland fire protection for all lands requires that everyone, regardless of where they live, has access to the wildland fire response services that best meet local needs.

Wildland fire protection services consist of planning for and deploying resources to suppress wildland fires when they occur to protect lives, property, and natural resources. These services—including initial attack, mobilization, and pre-positioning of resources—are provided by authorized local, state, federal, and/or tribal fire protection organizations, depending on the jurisdiction. However, not all lands in Washington State that are at risk from wildland fire currently have such protection services.

Unprotected and under-protected areas increase the risks to life, property, and ecosystem values. There are significant areas[65] of private and state non-forested lands in the state that do not have formal wildland fire protection (unprotected areas) or have protection that is limited in its effectiveness (under-protected areas).

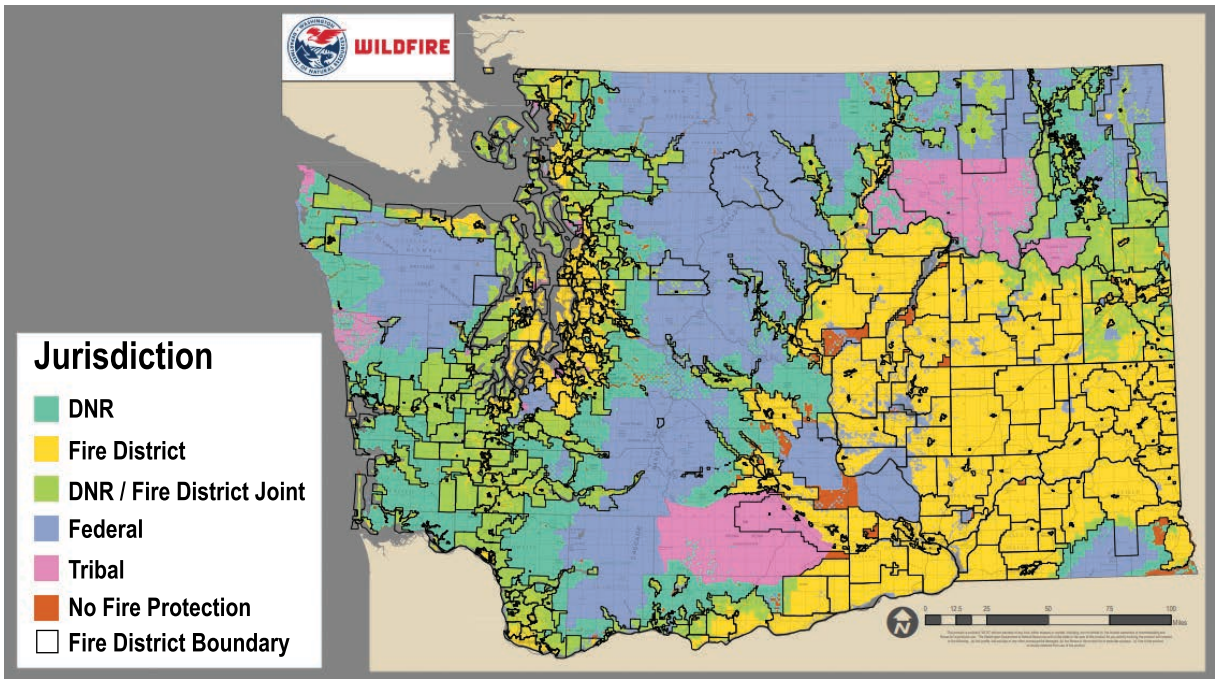
RATIONALE FOR STRATEGY

- Full protection, if adequately resourced, should keep fires smaller and more manageable—reducing losses and costs.
- Provides flexibility to achieve protection that fits local needs.
- Wildland fire on unprotected and under-protected lands is a statewide problem, as fires frequently spread to protected lands and smoke may affect communities everywhere.
- Providing comprehensive protection will reduce risks for everyone.
- Stakeholders support a range of options to achieve statewide protection.

65 DNR analysis still in progress shows over 350,000 acres of unprotected land across Washington.

Unprotected land refers to land that is not located within a local fire protection district boundary or where DNR does not have the authority to protect non-forested wildlands, per statute (Figure 42). DNR is generally responsible for wildland fire protection on private and state forest lands in Washington. DNR carries out this responsibility in cooperation with local fire protection districts as well as tribal and federal wildland fire agencies. On non-forested private and state lands, local fire protection districts may provide wildland fire protection; however, wildland fire protection is not required of the landowner. Non-forested land includes range and prairie lands that can contain significant agricultural or ecological values.

Figure 42. Map of wildland fire protection in Washington. Areas without formal fire protection are shown in red.[66]



Other areas of non-forested private and state wildlands are often characterized as "under-protected."

66 DNR, 2018. Map is approximate and not suitable for parcel-level interpretation of protection status. More specific mapping efforts are underway as a result of Substitute HB 2561 (passed in 2018) and the recommendations of the JLARC (2018) report to the Legislature.

GOAL 4: RESPONSE IS SAFE AND EFFECTIVE.

This is a case where wildland fire protection may be provided, but effectiveness of that protection is limited. Under-protection can occur when the values at risk are spread across large landscapes; a local fire protection district is under-resourced, understaffed, or underfunded; or where no cooperating agreements or mutual aid agreements with neighboring jurisdictions are in place.

Wildland fires frequently occur in unprotected or under-protected areas, but response is often limited as entities are often constrained when responding outside of their own jurisdiction; in some cases, there may be limited response until it crosses onto or threatens formally protected land, where the responsible entity then responds. Consequently, small fires can become large, causing significant and outsized losses.

Solutions to these challenges—and hence, to implementing the "all hands all lands" approach—involve legal and policy action to assign responsibility for protection, providing assistance to ensure safe and effective response, and addressing resource constraints. Achieving full protection and effective initial attack would help keep fires smaller and more manageable and reduce losses and costs.

Ancient Lake fire (WA).
Photo courtesy of Nick Pieper.

9.1 THROUGH LEGISLATION, ESTABLISH RANGELAND FIRE PROTECTION ASSOCIATIONS AS AN OPTION FOR PROTECTION.

Throughout the development of this Plan and during focused workshop discussions, it was clear that the ability to establish RFPAs is supported by many landowners and community members in areas of currently unprotected wildlands in eastern Washington. RFPAs have been shown to work well in managing and suppressing wildfires in certain parts of Idaho, Oregon and Nevada. It was also clear that in establishing and operating RFPAs, attention must be paid to effective training and as well as operational practices during active operations to ensure the safety of the volunteer RFPA members and the professional firefighters who may be working side-by-side when fighting fires.

With appropriate training, equipment, and personnel, RFPAs may be particularly effective at initial attack given the potential for reduced response times.

A. **When developing legislation, address funding and oversight considerations and needs.**

B. **Monitor and evaluate the effectiveness of RFPAs; identify and implement changes as needed.**

9.2 SUPPORT ANNEXATION OR CREATION OF A NEW FIRE DISTRICT AS AN OPTION FOR PROTECTION.

In the planning process, stakeholders expressed that while RFPAs may be the preferred wildland fire protection approach in some areas, in others, annexation to an existing fire district or creation of a new fire district may be the best approach. Existing fire districts have the expertise and experience to identify the operational and logistical needs to support suppression in a particular area and could provide the appropriate training and equipment.

Stakeholders identified barriers to achieving this strategy as the lack of adequate response resources, slow response time due to the distance district volunteers need to travel, and lack of incentive to join a fire district. The lack of incentive to join a district is most acute in small residential developments located at the outskirts of cities and/or surrounded by large swaths of land. These communities often do not want to annex into the local fire district that already responds to their emergencies. Other landowners would like to be annexed into a fire district but are denied due to the district's inability to provide adequate service to a greater area.

It will be important to provide technical assistance, equipment grants, and training to reduce barriers to establishing effective protection by local districts in areas that are currently unprotected. As part of this technical assistance, the state could establish minimum services to be provided. The State Fire Marshal may be best suited to provide this assistance. It will also be important to monitor the effectiveness of the protection services provided through annexation or creation of a new fire district and implement changes as needed for continuous improvement.

9.3 ADDRESS UNDER-PROTECTED LANDS BY EXPLORING OPPORTUNITIES TO CONSOLIDATE OR REGIONALIZE FIRE SERVICE IN EASTERN WASHINGTON

Some local fire protection districts, because of limited resources or a dependence on volunteers, may find it difficult to provide adequate fire protection, particularly when it comes to responding to wildland fire in high-risk areas. Consolidating districts or forming regional fire protection authorities has the potential to increase the response capability for these areas.

9.4 CLARIFY DNR'S AUTHORITY TO RESPOND TO WILDLAND FIRES WHEN THEY ARE NOT A THREAT TO FORESTLAND AND STATE MOBILIZATION HAS NOT BEEN APPROVED.

Increasingly, there are cases where wildland fires occur on non-forest lands and where those fires do not pose a threat to DNR-protected lands. Because of the assets and resources available to DNR, the agency is often asked to respond to these incidents. This creates a tension as it relates to DNR's responsibility and capability to provide protection on lands for which it collects a forest fire protection assessment, and lands where it does not collect an assessment.

S10 IMPROVE RESPONSE PLANNING, OPERATIONS, AND INFRASTRUCTURE

Safe, timely, and effective response statewide, now and in the future, requires pre-planning, seamless integration and communication, strategic pre-positioning, a highly capable workforce, and robust infrastructure.

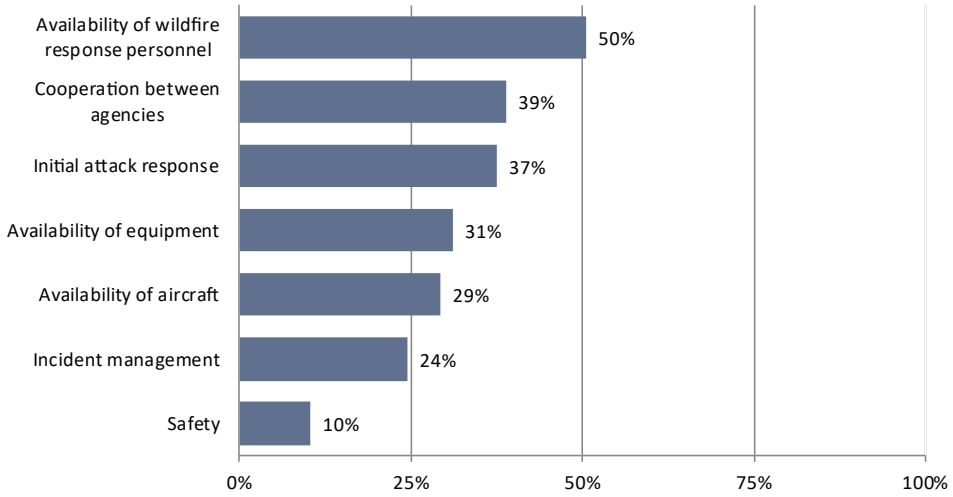
Throughout the planning process, stakeholders identified the need to address critical response issues (Figure 43). Many of these issues were perceived to be "low-hanging fruit." Stakeholders also identified opportunities for process improvements. These challenges to response need to be resolved collaboratively, cohesively, and quickly to maintain a high level of safe and efficient response throughout Washington.

RATIONALE FOR STRATEGY

- Provides upfront action to improve response outcomes.
- Addresses several critical needs that will have immediate impact.
- Enables a more seamless response.
- Infrastructure investments increase effectiveness of workforce improvements.

The solutions presented below address planning and integration, communications, mobilization, and infrastructure. In addition, several of the other strategies included in this Plan will contribute to improved response. Specifically, strategy #3 focuses on enhancing the workforce, with initiatives to 1) increase capacity (staffing), 2) make better use of the existing workforce (across jurisdictions and through increased reliance on private contractors), 3) address succession planning, and 4) provide additional training.

Figure 43. From practitioners' perspective, availability of personnel and resources, along with cooperation between agencies, are the response activities most in need of improvement.



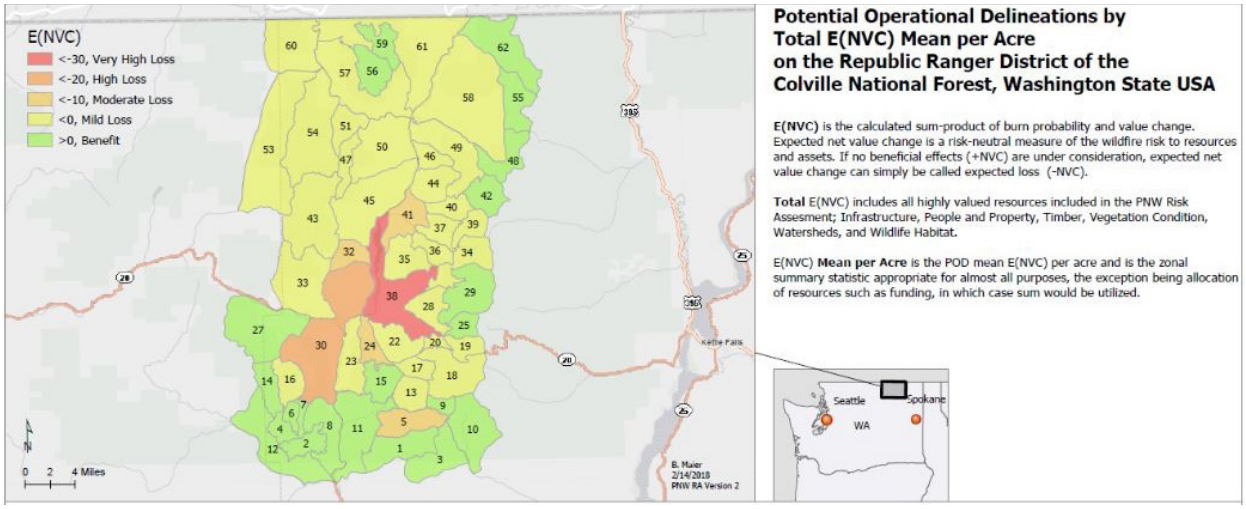
10.1 CONDUCT CROSS-BOUNDARY "PRE-FIRE RESPONSE" ANALYSIS AND PLANNING, INCLUDING EVACUATION PLANNING.

Recognizing that response begins in advance of fire ignition, comprehensive pre-fire response planning and agreements are necessary to integrate science-based risk management and community engagement into effective protection of resources and assets. Quantitative assessment of risks, undertaken as part of Strategy #2, will provide the foundation for response plans and the development of interagency agreements to create seamless fire response.

A. **Create a template for cross-jurisdictional pre-fire response planning that includes suppression strategies for areas of high wildland fire risk.** Pre-fire response plans should be flexible enough to meet local and regional needs while still being based on a shared understanding of risk. High-risk areas should be evaluated for potential containment lines, the appropriate level of response, response capacity needs, necessary mitigation strategies, evacuation routes, resources and assets at risk, and, where appropriate, post-fire risks.

- Provide guidance on the engagement and decision-making process needed to undertake successful pre-fire planning.
- Develop response plans that incorporate wildland fire risk assessment and managed fire utilizing the QWRA and prepared in a way that can be handed off to operational teams (see Figure 44 for an example).
- Develop pre-fire response plans for westside communities and regions based on projected risk.

Figure 44. QWRA data was used to inform potential operational delineations (PODS) on the Republic Ranger District of the Colville National Forest. This data, when incorporated into pre-fire response plans, can help fire management personnel assess risks before a fire starts. Source: QWRA (2018)



GOAL 4: RESPONSE IS SAFE AND EFFECTIVE.

Photo courtesy of Don Seabrook, *Wenatchee World*.

B. **Develop evacuation plans in areas of elevated wildland fire risk.** Projected increases in fire severity as a result of climate change, coupled with the expanding population in the WUI, make evacuation planning essential. Engage with emergency response organizations in the creation, or enhancement of existing, evacuation plans that incorporate the best available data from quantitative risk assessments. Investments in early notification systems, evacuation route planning, community evacuation maps, and interagency evacuation training exercises will better safeguard public and firefighter safety. Evacuation planning is equally important in western Washington, as a result of the historical fire regime (low frequency but high severity).

C. **Evaluate potential to "offset" response areas between federal, state, and local wildland fire response agencies.** Offset agreements consolidate protection responsibilities within agencies and across landscapes to deliver efficiencies and quicker response. As an example, DNR could agree to provide response services to a portion of National Forest land that is adjacent to DNR protection and isolated from other USFS-protected land. This protection would be offset by the USFS providing protection to an isolated piece of DNR-protected land. These offset agreements should be coordinated as part of pre-suppression planning.

D. **Consider developing a master cooperative agreement between Washington Fire Service and/or counties and DNR.** A master agreement would serve to enhance statewide cooperative relationships and delineate a common operating environment (financial, qualifications, training, and response) throughout the state. These could potentially replace current district-by-district agreements with local operating plans between DNR and individual fire districts or municipalities developed to address specific regional differences. Legal barriers might need to be overcome to implement this approach. As a starting point, a standard template could be developed and used for future agreements.

First Creek fire (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

10.2 ENHANCE COMMUNICATION DURING WILDLAND FIRE RESPONSE.

Stakeholders asked for timely, high-quality communications. High-quality communications have consistent messaging, audience-appropriate content, and a coordinated delivery approach. Communication best practices research also highlights the importance of interactive engagement processes, local context, timely and accurate information, trusted messengers, and working before and during response to improve relationships.[67] Existing templates for incorporating pre-fire communications planning—such as the Okanogan-Wenatchee National Forest Information Staffing Guide—are effective at coordinating information delivery and improving distribution of timely information.

A. Develop and deploy improved communication plans and methods

- Identify opportunities and a conduit for communities to provide input for IMT response (pathway for community values at risk to be incorporated) ahead of wildland fire ignition.
- Develop or refine existing pre-fire communications plans, with the involvement of fire response agencies at multiple scales (tribal, federal, state, and local), to provide a template for a locally tailored communication plan.
- Disseminate examples of pre-fire communications plans to fire response agencies throughout the state for local adaptation and use.
- Identify community leaders in advance of wildland fires to engage with IMTs on communications strategies, community needs, and best engagement practices. Provide ICS training to ensure understanding of the incident management system and support more effective integration. Input from PNWCG will be important for the effective implementation of this strategy and should be sought early in the process.

67 Steelman and McCaffrey, 2013.

10.3 AUTHORIZE THE CHIEF OF THE WASHINGTON STATE PATROL (WSP) TO MOBILIZE SUPPRESSION RESOURCES PRIOR TO A WILDLAND FIRE INCIDENT UNDER PREDEFINED CIRCUMSTANCES.

Pre-positioning resources prior to an incident is a means to enhance the initial response capability of a local fire protection districts, particularly in eastern Washington, thereby reducing the potential for loss of life and property and reducing the duration and costs of wildland fires. Circumstances where this would be appropriate would include predicted high-risk days such as dry lightning or red flag days.

Mobilization through the WSP is already allowed through Washington's State Resource Mobilization Act,[68] but at present no pre-positioning is authorized.

A. Through legislation:

- Amend RCW 43.43.960 to better enable WSP to provide for the prepositioning of firefighting resources to assist local fire districts in advance of a predicted episode of fire activity.
- Amend RCW 43.43.961 to allow for the reimbursement of costs (under predefined conditions) of additional (non-local fire district) resources used during initial attack with the intent of reducing the overall cost of state mobilization expenditures.

10.4 INVEST IN ROBUST INFRASTRUCTURE.

Infrastructure—including air resources, ground equipment, technology, and facilities to serve the workforce in the field—provides the backbone of support for an effective and efficient wildland fire force.

A. Enhance DNR's air resources capacity, including training and infrastructure, to meet increased demand for air resources to suppress wildland fires that threaten lands not under DNR's protection. Air support is a necessary resource for initial attack, yet many local fire districts are challenged to have quick access to those resources as they are unable to afford the cost without state or federal support. Pathways and funding mechanisms must be clarified and enhanced to provide quick, effective air support for initial attack where needed.

B. Develop an aerial delivered firefighter/wildland fire aviation support plan for the state. The plan should address a next-generation helicopter platform strategy and transition of the UH-1 (Huey) helicopter fleet.

C. Provide the radio, information systems, and other equipment needed to increase the efficiency, effectiveness, and safety of firefighters in the field. Transparent, adaptable, standardized, and portable information systems are needed to meet current and future wildland fire challenges. Currently, firefighters lack geospatial technology and other modern technology systems. Investments in information systems technology will reduce redundancy between systems, processes,

68 RCW 43.43.960.

Tech in the field at Crescent-McLeod fires (WA). Photo courtesy of Kari Greer, U.S. Forest Service.

and reports; improve efficiency by reducing manual intervention and increasing automation; provide more value to users and customers; better align business processes with service demand; and optimize the interface of processes and systems with other agencies and partners.

D. Upgrade facilities:

- Develop a DNR Wildland Fire Facilities Master Plan and integrate it with DNR's Facilities Plan. The Wildland Fire Facilities Plan should address the need for staging resources during large mobilizations as well as initial attack/crew base facilities and forward operating bases.
- Study the current and projected needs for incident support equipment including kitchens, incident support communications equipment, and other base camp needs.
- Consider co-locating facilities where practical. Co-location can lead to better communication between agencies and increase efficiency.

10.5 REGULARLY MONITOR AND EVALUATE THE EFFECTIVENESS OF WILDLAND FIRE PROTECTION IN WESTERN WASHINGTON; IDENTIFY AND IMPLEMENT CHANGES AS NEEDED.

With the dynamics of population growth and climate change it will be critical to plan for potential increases in wildland fire in western Washington. Ongoing analysis and planning should include evacuation and contingency plans for areas that are identified as being at higher wildland fire risk.

Appendices

APPENDIX A. WILDLAND FIRE TIMELINE

YEAR	TITLE (EVENT/POLICY)	SIGNIFICANCE
1889	Washington becomes a state	
1902	Yacolt Burn	Multiple wildland fires in southwest Washington and northwest Oregon resulted in 38 fatalities and burned 239,000 acres.
1903-1908	Initial wildland fire policies established: State Forest Fire Warden designated, Board of Fire Commissioners established, and Washington Forest Fire Association (WFFA) organizes	22 landowners formed a voluntary association to suppress forest fires within the state of Washington (WFFA).
1908	Forest Fires Emergency Act passed by US Congress	Authorized any necessary USFS spending on wildland fire suppression.
1910	Big Burn (multiple states)	Burned over three million acres across the west and heavily influenced the early suppression policy of the USFS.
1911	Weeks Act passed by Congress	Interagency cooperation in wildland fire begins as the Weeks Act enables cooperation between states and USFS for fire protection.
1911	Biennial appropriation from Washington state Legislature to fight fire increases to $30,000	
1917	Forest Patrol Law passes in Washington	Required fire patrols on private forestland and control of fires by landowners. Fire protection assessment for those unable to provide their own protection was $0.02/acre.
1921	Aerial resources used in Olympic National Forest to patrol for wildland fire	
1922	Protection Act passed by Congress	Directs the US Department of the Interior to suppress fires on its land and to cooperate with other federal and state agencies.
1923	Washington State Firefighters Association established	
1929	Dole Valley Fire	Burned 227,500 acres in Skamania and Clark Counties.
1936	10 am Suppression Policy enacted by USFS	Directed that all fires be suppressed by 10am the day following detection.
1939	Washington state Legislature enables the creation of Conservation Districts.	
1942	Cooperative Forest Fire Prevention Program begins	
1943	Prescribed fires authorized on case-by-case basis on USFS lands	

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APPENDIX A. WILDLAND FIRE TIMELINE

YEAR	TITLE (EVENT/POLICY)	SIGNIFICANCE
1946	First Forest Practices Act passed	
1947	State begins to provide patrol on WFFA lands.	
1948	Washington State Fire Commissioners Association established	
1955	Reciprocal Fire Protection Act	
1957	Washington State Department of Natural Resources established.	
1958	WFFA becomes Washington Forest Protection Association	
1968	212 active sawmills operational in Washington state, representing an estimated 40 percent decrease in sawmills from 1960.	
1969	Washington's first Smoke Management Plan put in place	
1970	Fires in Chelan and Okanogan Counties burn 188,000 acres	
1978	182 sawmills operational in throughout Washington.	
1988	118 sawmills operational in Washington, with an additional 233 facilities focused on other wood products such as pulp, shake and shingle, and pole production.	
1991	Spokane Firestorm	92 fires burned more than 35,000 acres, destroyed over 100 homes,[1] and resulted in one fatality. Spurred the development of the Washington State Fire Service Resource Mobilization Plan.
1993	Washington State Fire Service Resource Mobilization Plan formalized	
1994	Fires in Chelan County burn 180,000 acres and destroy 37 homes.	
1995	Fire Protection Study for DNR completed by TriData Corporation	Found that DNR fire suppression costs had tripled in the past decade (to a total of $10-$12 million annually). Highlighted the "imbalance between public expectations, the budget available for fire protection, and the trends in the severity of the fire problem. Either public expectations have to be lowered and higher losses accepted, or citizens have to take more responsibility for their own protection, or the state needs to increase the resources invested in wildland fire protection."

1 NFPA. (n.d.).

APPENDICES

APPENDIX A. WILDLAND FIRE TIMELINE

YEAR	TITLE (EVENT/POLICY)	SIGNIFICANCE
1995	USFS and BLM fire management integrate	Fire and Aviation Management becomes first unit to integrate USFS and BLM staff in a single, co-located management team.
1995	State Fire Marshal's Office joins the Washington State Patrol.	
1998	76 sawmills operate in Washington; 127 other wood product facilities.	
2000	National Fire Plan formed after fires burn 8.4 million acres across the nation	
2001	Thirtymile Fire burned 9,300 acres and cost the lives of four firefighters.	
2002	River Bluff Ranch becomes first Firewise USA® Community	
2004	North Central Washington Prescribed Fire Council forms	First Prescribed Fire Council in Washington.
2005	DNR Fire Suppression Study issued by the Joint Legislative Audit and Review Committee	
2006	Strategic Plan for Wildfire Protection completed	Establishment of an action-oriented mission based on acknowledging the role of fire in Washington's wildlands, providing exemplary service and leadership, promoting the role of healthy forests, and preventing and safely and aggressively suppressing wildland fires.
2008	54 saw mills operating in the state; 71 other wood product facilities.	
2009	FLAME act directs the US Departments of Interior and Agriculture to develop a cohesive strategy for the management of wildland fire	
2010	Statewide Forest Resource Assessment and Strategy issued	Required by the 2008 Farm Bill to continue receiving federal funds for State and Private Forestry programs. Highlighted importance of working forestlands, biodiversity and habitat conservation, upland water quality, forest health restoration, wildland fire hazard reduction, and urban and community forestry.
2011	Washington State Prescribed Fire Council forms	
2013	Chumstick Wildfire Stewardship selected as one of eight Fire-Adapted Community Learning Network Members in the nation	
2014	National Cohesive Wildland Fire Management Strategy final phase completed	Provides direction to achieve its vision to "safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and, as a Nation, live with wildland fire." Establishes three national goals: resilient landscapes, fire-adapted communities, and safe and efficient response.

APPENDICES

APPENDIX A. WILDLAND FIRE TIMELINE

YEAR	TITLE (EVENT/POLICY)	SIGNIFICANCE
2014	Wildland fires across Washington burn almost 450,000 acres, including the 256,108-acre Carlton Complex fire. Over 350 homes destroyed	
2014	Washington State Fire Adapted Communities Learning Network is first state network in the nation.	
2015	Washington Wildland Fire Advisory Committee and Liaison established with passage of EHSB 2093	
2015	Washington's largest wildland fire season on record, burns over 1.1 million acres burn and kills three firefighters battling the Twisp River Fire	
2015	Post-Wildfire Workshop held in Wenatchee; led to the establishment of the ad-hoc Post-Wildfire Coordination group	
2016	Governor's Wildland Fire Council Listening Sessions held throughout Washington	
2016	37 sawmills within the state; 51 other wood products facilities operational	
2016	Forest and Community Resiliency Roundtable established	
2016	Legislature passed EHSB 2928 to pilot and evaluate new approaches to prescribed fire	
2017	After the Fire Workshop: Connecting People, Ideas, and Organizations hosted by Washington Resource Conservation and Development Council	
2017	20-year Forest Health Strategic Plan completed	Completed as an outcome of EHSB 2376 (2016), the FSHP found that the health of Washington forests is declining. Dense and moisture-stressed forests have become less resistant to insect and disease outbreaks and wildland fires. The strategy is designed to maximize effectiveness of forest health treatments by coordinating and prioritizing forest management activities across large landscapes.
2017	First Prescribed Fire Training Exchange (TREX) held in Washington	

APPENDICES

APPENDIX A. WILDLAND FIRE TIMELINE

YEAR	TITLE (EVENT/POLICY)	SIGNIFICANCE
2017	Washington legislature passes wildland fire-related legislation to create a forest health treatment assessment (SB 5546), prioritize lands to receive treatment (HB1711), review prevention and response actions (SB2561), create a prescribed burn certification program (HB2733), and allow the state to enter into "good neighbor" agreements with the federal government (SB6211)	
2018	Wildfire Suppression Funding and Costs report issued by the Joint Legislative Audit and Review Committee	Found that wildland fire suppression costs are shared with other agencies consistent with formal agreements and that accurate and refined data collection is needed.
2018	Report on the Forest Resiliency Burning Pilot Project in progress	Makes a suite of integrated recommendations to: • Support collaboration and coordination between prescribed burners, regulators, and other stakeholders in order to identify challenges, find solutions, and develop partnerships; • Continue communication, outreach, and education to the public on why, when, and where prescribed burning is happening • Address policy recommendations and continue working through policy challenges; and, • Increase and support capacity and expertise of prescribed burners, communicators, regulators, and others to better serve increased pace and scale of prescribed fire.

APPENDIX B. ACRONYMS AND DEFINITIONS

ACRONYMS

BAER	Burned Area Emergency Response
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CEMP	Comprehensive Emergency Management Plan
COHESIVE STRATEGY	National Cohesive Wildland Fire Management Strategy
CBSM	community-based social marketing
CWPP	Community Wildfire Protection Plan
DNR	Washington Department of Natural Resources
DOE	Washington Department of Ecology
EMD	Washington Emergency Management Division
FEMA	Federal Emergency Management Agency
FDC	Fire Defense Committee
FHAC	Forest Health Advisory Council
FHSP	20-Year Forest Health Strategic Plan for Eastern Washington
HIZ	home ignition zone
HVRA	highly valued resources and assets
ICS	Incident Command System
IMT	Incident Management Team
JLARC	Joint Legislative Audit and Review Committee
KPI	Key Performance Indicator
LEP	limited English proficiency
MIL	Washington Military Department
NHMP	Natural Hazard Mitigation Plan
NPS	National Park Service
NRCS	US Natural Resource Conservation Service
OFM	Washington Office of Financial Management
PLAN	Washington State Wildland Fire Protection 10-Year Strategic Plan
PNWCG	Pacific Northwest Wildfire Coordinating Group
QWRA	Pacific Northwest Quantitative Wildfire Risk Assessment
RCW	Revised Code of Washington
RFPA	Rangeland Fire Protection Association
USFS	US Forest Service
TNC	The Nature Conservancy
TREX	Prescribed Fire Training Exchange

USFWS	US Fish and Wildlife Service
WAFACLN	Washington State Fire Adapted Communities Learning Network
WDFW	Washington Department of Fish and Wildlife
WFAC	Wildland Fire Advisory Committee
WNG	Washington National Guard
WRC&D	Washington Resource Conservation & Development Council
WUI	wildland-urban interface

DEFINITIONS[2]

Awareness	The continual process of collecting, analyzing, and disseminating intelligence, information, and knowledge to allow organizations and individuals to anticipate requirements and to react effectively and safely.
Burned Area Emergency Response (BAER) team	A team formed to analyze post-fire conditions and to take immediate emergency stabilization action to prevent loss of life, property, and critical and natural resources. It is the Agency Administrator's responsibility to order or designate a BAER Team.
Community	Community is inclusive of private landowners, property owners, residents, groups of individuals, neighborhoods, municipalities, and others. It goes beyond the traditional notion of communities as residents living in a particular area to include formal and informal groups of individuals – such as landowners who may share a similar geography (e.g., southeast Washington ranchers) or be spread across the state (e.g., private forest landowners). It also includes persons working toward a common aim like fire-adapted communities or well-trained, well-equipped responders, municipalities, and at the broadest geographic scale, all who live in Washington and are affected by wildland fire. Communities refers to a shared sense of belonging or purpose, the social networks that build and sustain that sense of belonging and enable collective action toward a common goal, and in some cases, specific geographies where social networks and a shared sense of belonging or purpose exist.[3]
Community-based social marketing	An approach to achieving broad sustainable behavior in our communities. It combines the knowledge from psychology and social marketing to leverage community members' action to change behavior. Community-based social marketing is more than education. It is about spurring action by a community and for a community.[4]

2 Except where noted, definitions adapted from the NWCG (www.nwcg.gov/).

3 Fairbrother, et al. (2013).

4 Definition drawn from commonspark.wordpress.com/2011/08/09/what-is-community-based-social-marketing/

APPENDIX B. ACRONYMS AND DEFINITIONS

Community Wildfire Protection Plan	A plan developed in the collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, tribal, and local government, local fire department, other stakeholders, and federal land management agencies managing land in the vicinity of the planning area. A Community Wildfire Protection Plan (CWPP) identifies and prioritizes areas for hazardous fuel reduction treatments, recommends the types and methods of treatment on federal and non-federal land that will protect one or more at-risk communities and essential infrastructure, and recommends measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildland fire response, hazard mitigation, community preparedness, or structure protection, or all of the above.
Contractor	Private sector personnel, vendor, or business hired to provide goods and services to a government agency.
Ecosystem	An interacting natural system that includes all the component organisms as well as the abiotic environment and processes affecting them.
Evacuation	An organized, phased, and supervised withdrawal, dispersal, or removal of civilians from dangerous or potentially dangerous areas and the reception and care of those civilians in safe areas.
Extreme fire behavior	Extreme implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. It usually involves a high rate of spread, prolific crowning and/or spotting, presence of fire whirls, and/or a strong convection column. When extreme fire behavior is present, predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically and sometimes dangerously.
Fire-adapted community	A human community consisting of informed and prepared people collaboratively planning and taking action to safely co-exist with wildland fire.
Fire cycle	Human actions and landscape response before, during, and after wildland fire. Includes preparedness, prevention, response, and recovery phases.[5] Also known as the fire-adapted communities cycle or FAC cycle.
Fire prevention	Activities such as public education, community outreach, law enforcement, engineering, and reduction of fuel hazards that are intended to reduce the incidence of unwanted human-related wildland fires and the risks they pose to life, property, or resources.
Fire season	Period(s) of the year during which wildland fires are likely to occur, spread, and affect resources values sufficient to warrant organized fire management activities. A legally enacted time during which burning activities are regulated by federal, state, or local authority.

5 WAFACLN, 2016. Fire-adapted communities cycle concept and graphic (www.fireadaptedwashington.org/know-your-role).

APPENDIX B. ACRONYMS AND DEFINITIONS

Fire severity	Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time.
Fire suppression	All work and activities connected with control and fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.
Fuel management	Act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire, in support of land management objectives.
Fuel reduction	Manipulation—including combustion—or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.
Fuel treatment	Manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control (e.g., through lopping, chipping, crushing, piling, and burning).
Home assessment	Evaluation of a dwelling and its immediate surroundings to determine its potential to escape damage by an approaching wildland fire. Includes evaluating the fuels and vegetation in the yard and adjacent to the structure, the roof environment, decking and siding materials, prevailing winds, topography, fire history, etc., with the intent of mitigating fire hazards and risks.
Home ignition zone	The area where the factors that principally determine home ignition potential during extreme wildland fire behavior (high fire intensities and burning embers) are present. Comprises the characteristics of a home and its immediate surroundings within 100 feet.
Human-related wildland fire	Any fire caused directly or indirectly by person(s). This does not include prescribed fire.
Incident Command System	A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries.
Incident management team	The incident commander and appropriate general and command staff personnel assigned to an incident.
Initial attack	A preplanned response to a wildland fire given the wildland fire's potential. Initial attack may include size up, patrolling, monitoring, holding action, or suppression.
Initial attack fire	Fire that is generally contained by the attack units first dispatched, without a significant augmentation of reinforcements, within two hours after initial attack, and full control is expected within the first burning period.

APPENDIX B. ACRONYMS AND DEFINITIONS

Managed wildfire	The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas. The goal of managing fires for resources benefits[6] is to allow fire to resume its natural role in the ecosystem. Historically, natural fires create a mosaic of different vegetative types. In turn, these vegetative patterns create a diversity of habitats.
Mitigation actions	Actions that are implemented to reduce or eliminate (mitigate) risks to persons, property, or natural resources. These actions can include mechanical and physical tasks, specific fire applications, and limited suppression actions. Mitigation actions may include fireline construction, fuel treatments and reductions, fuel breaks or barriers around critical or sensitive sites or resources, and creating "black lines" through the use of controlled burnouts to limit fire spread and behavior.
Natural hazard mitigation plan	The purpose of mitigation planning is to identify local policies and actions that can be implemented over the long term to reduce risk and future losses from hazards. These mitigation policies and actions are identified based on an assessment of hazards, vulnerabilities, and risks and the participation of a wide range of stakeholders and the public in the planning process. States, tribes and local governments must have a current, FEMA-approved hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288), as amended by the Disaster Mitigation Act of 2000, provides the legal basis for undertaking a risk-based approach to reducing injury, loss of life, and property damage from natural hazards through mitigation planning.
Prescribed fire	Any fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to meet specific objectives.
Prevention	Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards (fuels management). Actions to avoid an incident, to intervene for the purpose of stopping an incident from occurring, or to mitigate an incident's effect on protect life and property. Includes measures designed to mitigate damage by reducing or eliminating risks to persons or property, lessening the potential effects or consequences of an incident.
Resilient landscapes	Ecosystems that resist damage and recover quickly from disturbances (such as wildland fires) and human activities.[7]

6 Definition adapted from USFS (www.fs.usda.gov/detail/sequoia/home/?cid=fsbdev3_059508)

7 Definition adapted from the Cohesive Strategy, 2014 (www.forestsandrangelands.gov/documents/strategy/strategy/CS-PhaseIIINationalStrategyApr2014.pdf)

Safe	Safe refers to creating and sustaining conditions that limit the harmful effects of wildland fire. Creating and sustaining safety means prioritizing human life over landscapes and property and may involve adequate training for responders and those living in fire-prone areas, ensuring evacuation orders are delivered in time to all in harm's way in a manner all can understand, and even landscape treatments that reduce fuel build-up or risk of post-fire debris flow. Being safe is both a requirement of today and a vision for tomorrow, as the state learns and improves ways to keep everyone protected from wildland fire.
Stand-replacing fire	Fire which kills all or most of the living overstory trees in a forest and initiates forest succession or regrowth. Also explicitly describes the nature of fire in grasslands and some shrublands.
Suppression	A wildland fire response strategy to "put the fire out," as efficiently and effectively as possible, while providing for firefighter and public safety.
Uncharacteristic wildland fire	A fire that differs from the historic fire regime in size, frequency, intensity, and/or severity. Can be large and cause substantial impacts and losses. The term "catastrophic" is sometimes used in the media to describe uncharacteristic fire.
Wildland	An area in which development is essentially non-existent, except for roads, railroads, powerlines, and similar transportation facilities. Structures, if any, are widely scattered.
Wildland fire (used interchangeably with "wildfire" in this Plan)	Any non-structure fire that occurs in vegetation or natural fuels. Wildland fire includes prescribed fire and wildfire.
Wildland-urban interface	The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Describes an area within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildland fire.

APPENDIX C. STAKEHOLDER ENGAGEMENT REPORT

Provided separately.

APPENDIX D. IMPLEMENTATION STRATEGY OVERVIEW

Implementing the 10-Year Wildland Fire Protection Strategic Plan

Preliminary Priority Short- and Near-Term Actions

Strategy/Action		Responsible/Lead Entity	Short Term (2019-2020)	Near Term (2021-2022)
GOAL 1	**S1: Provide leadership and coordination to guide implementation and facilitate agency alignment**			
	1.1 Convene a leadership forum to facilitate the development and alignment of agency efforts to achieve Plan goals.	DNR, lead to establish, partnership to implement	●	●
	1.2 Assign the WFAC the responsibility of providing advice on risk planning, prioritizing mitigation resources, and facilitating stakeholder engagement.	DNR	●	
	1.3 Establish regional and local coordinating capacity.	DNR lead, Legislative Action	●	●
	S2: Use risk assessment to inform mitigation and protection planning and to establish priorities			
	2.1-2.3 Create the capacity to conduct quantitative wildland fire risk assessment; conduct risk-mitigation planning; establish a program within DNR.	DNR lead	●	
	S3: Enhance and sustain a highly capable workforce			
	3.1 Establish an interagency task force to conduct a workforce gap analysis to address current and projected needs.	DNR lead	●	
	3.2 Increase capacity of the wildland fire prevention, preparedness, and recovery workforce.	DNR, USFS, State Fire Marshall, Legislative Action	●	●
	3.2.A. Add year-round prevention staff.	DNR, USFS, State Fire Marshal, Legislative Action	●	
	3.2 B. Establish LEP coordinator positions within the lead fire response agencies.	DNR, USFS, State Fire Marshall, Legislative Action	●	
	3.2.C Provide staffing for post-fire recovery services.	DNR, USFS, State Fire Marshall, Legislative Action	●	
	3.3 Increase capacity of the workforce to meet immediate needs; Provide funding for 30 permanent positions. Add 2 hand crews. Create capacity for private sector engagement	DNR, Legislative Action	●	
	S4: Advance sustainable funding			
	4.1 - 4.3 Conduct a study to document costs and funding needs, form taskforce; recommend sustainable funding levels and mechanisms to legislature	DNR, Fire Service, Fire Marshal, Legislative Action, federal agencies	●	

Implementing the 10-Year Wildland Fire Protection Strategic Plan

Preliminary Priority Short- and Near-Term Actions

Strategy/Action		Responsible/Lead Entity	Short Term (2019-2020)	Near Term (2021-2022)
GOAL 2	**S5: Expand programs and practices to manage fuels and vegetation**			
	5.1 Increase investment in fuels and vegetation management.	DNR, USFS, Legislative Action		●
	5.2.B Prescribed fire: Engage stakeholders to review and revise regulations.	DNR, DOH, ECY, partners		●
	5.3.B Accelerate implementation of/ increase funding for the 20-year FHSP.	Legislative Action, DNR	●	●
GOAL 3	**S6: Establish and sustain fire-adapted communities throughout Washington**			
	6.1.A, D. Develop engagement strategies that foster behavior change: Conduct survey, implement pilot projects.	DNR, Conservation Districts (CD)	●	
	6.2 Enhance engagement with LEP communities.	DNR, USFS, CD, partners	●	
	6.3 Increase capacity coordination, and networking of community assistance programs.	DNR, CD, Legislative Action	●	●
	S7: Reduce human-related wildland fire			
	7.2 Increase capacity for prevention planning and implementation.	DNR, Fire Service, federal agencies, Legislative Action	●	●
	7.3 Enhance, expand, and align education programs, messaging, and regulations.	DNR, Fire Service, federal agencies	●	●
	7.3 E. Form a taskforce comprised of regulatory agencies and electrical power distribution entities to establish best management practices.	DNR lead, Utilities	●	
	S8: Meet post-fire recovery needs, building on current capacity and capabilities			
	8.1.A Create a taskforce to evaluate wildland fire recovery needs and recommend solutions.	DNR, CD, EMD, USFS AGENCIES (Partner agency to lead)	●	●
	8.3 Establish state and private lands BAER teams.	DNR, CD, EMD,federal agencies, Legislative action, (Partner agency to lead)	●	●

Implementing the 10-Year Wildland Fire Protection Strategic Plan

Preliminary Priority Short- and Near-Term Actions

Strategy/Action		Responsible/Lead Entity	Short Term (2019-2020)	Near Term (2021-2022)
GOAL 4	**S9: Provide effective wildland fire protection for all lands**			
	9.1 Establish RFPAs as an option for unprotected lands.	Legislative Action	●	
	9.2 Support annexation or creation of a new fire district as an option for protection.	Fire Service	●	
	9.4 Clarify DNR's authority to respond to wildland fires when they are not a threat to forestland and state mobilization has not been approved.	DNR, Legislative Action	●	
	S10: Improve response planning, operations, and infrastructure			
	10.1 Conduct cross-boundary "pre-fire response" analysis and planning, including evacuation planning.	DNR, USFS		●
	10.3 Authorize the Chief of WSP to mobilize suppression resources prior to a wildland fire incident under predefined circumstances.	Fire Service, Legislative Action	●	
	10.4.A, B: Invest in robust infrastructure: Enhance DNR's air resources capacity, including training.	DNR, Legislative Action	●	

APPENDIX E. METRICS

METRICS FOR GOALS

GOAL	METRIC(S)
1. Washington's preparedness, response, and recovery systems are fully capable, integrated, and sustainable.	**Preparedness** • Practitioner and public survey responses: ratings, satisfaction levels for coordination, integration, and alignment • Number and percent of communities and regions participating in the QWRA or equivalent for integrated resilience and response planning • Funds appropriated for resilience and preparedness; degree of variability of funding level over time **Response** • Workforce gap analysis complete • Percent of resource orders filled (by type)* • Percent of all wildland firefighters who are qualified and equipped in accordance with national standards and the percentage of the total (state/federal) wildland fire budget expended to maintain these resources* • Number of active inter-jurisdictional collaboratives, plans, or agreements* **Recovery** • BAER Teams are established and funded • Number and percent of communities that have developed recovery plans
2. Landscapes are resilient. In the face of wildland fire, they resist damage and recover quickly.	• Percent of total vegetation treatments within high priority wildland and WUI that are strategically located* • Percent of large wildland fires in fire-prone landscapes that burn with uncharacteristically high severity by vegetation type* • Cost of wildfire-damaged landscape restoration* • Cost of post-wildfire recovery*

GOAL	METRIC(S)
3. Communities are prepared and adapted for current and future fire regimes.	• Percent of communities at risk that have adopted and implemented wildland fire risk mitigation plans* • Percent of communities at risk that have incorporated wildlad fire risk into land use planning • Public satisfaction survey—level of self-reported preparedness, change in reported preparedness over time • Satisfaction survey—LEP community engagement and satisfaction levels • Number and percent of communities with Firewise USA® programs or equivalent
4. Response is safe and effective. There is zero loss of life, of firefighters or the public, from wildland fires.	• Number of firefighter injuries and fatalities attributed to wildland fire* • Number of public fatalities attributed to wildland fire* • Percent of unwanted wildland fires suppressed in initial attack*

METRICS FOR OUTCOMES

GOAL	METRIC(S)
1. Safety of the public and firefighters is provided for; wildland fire is suppressed when necessary and used where allowable.	• All metrics identified for Goal 4 • Number of acres of prescribed fire • Percent of fire ignitions managed for resource benefits (where allowed) and number of these acres burned that contribute to landscape resilience* • Percent of monitored fuels treatments that contributed to fire control during a wildland fire*
2. Unwanted human-related wildland fires are virtually eliminated.	• Number of and percent change in human-related wildland fires*

APPENDIX E. METRICS

GOAL	METRIC(S)
3. Costs to suppress wildland fires are reduced; risks and losses to communities and the economy are minimized.	• Number of Fire Management Assistance Grant declarations* • Dollar value of economic losses • Cost of wildland fire suppression • Cost of wildland fire-damaged landscape restoration* • Number of structures lost to wildland fire*
4. Communities and ecosystems are resilient and healthy, can withstand and recover from wildland fire.	• Percent of communities at risk with a high probability of withstanding wildland fire without loss of life and infrastructure* • Percent of priority landscapes with vegetation and fuels conditions that support social and ecological resilience*

* Metrics marked with an asterisk are adapted from the National Cohesive Wildland Fire Management Strategy.[8]

8 National Strategy Committee, 2016.

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