FREQUENTLY ASKED QUESTIONS

20-Year Forest Health Strategic Plan: Eastern Washington

Current version: December 2021

To support the transformative work in our state's 20-Year Forest Health Strategic Plan: Eastern Washington (20-Year Plan), it takes a team of forest health scientists and partners who understand the leading research on this issue, as well as increased public understanding of how Washington's forest health and wildfire issues, threats, and opportunities are intertwined.

That's why the Washington State Department of Natural Resources (DNR) is taking this opportunity to address common questions and misconceptions about forest health work in Washington and to provide more insight into the latest science. This is a living document that will continue to grow and evolve as new research comes to light.

Key resources:

- 20-Year Forest Health Strategic Plan: Eastern Washington
- Forest Health Assessment and Treatment Framework Report 2020
- Stewardship and Landowner Assistance

Editors:
Chuck Hersey, Garrett Meigs (DNR)

Contributors:
Ana Barros, Derek Churchill, Stevie Mathieu, Will Rubin, Annie Smith, Andrew Spaeth, Jen Watkins (DNR)
Forest Health Advisory Committee; Keala Hagmann, Susan Prichard (UW); Paul Hessburg (USFS)

Contact:
Amy Ramsey (DNR)
Forest Health Strategic Plan Coordinator
360-902-1694
amy.ramsey@dnr.wa.gov

What is the DNR 20-Year Forest Health Strategic Plan?

In 2017, the Washington State Department of Natural Resources (DNR) collaborated with federal, state, Tribal, and community organizations to develop the 20-Year Forest Health Strategic Plan: Eastern Washington. A primary focus of the 20-Year Plan is to increase the pace and scale of scientifically sound, landscape-scale, cross-boundary forest management and restoration treatments to increase forest and watershed resilience. The end goal is to treat at least 1.25 million acres in eastern Washington forest health priority planning areas by 2037. The plan is unique in its all-lands, all-hands, multi-level approach to identify high-priority landscapes (also known as planning areas) while prioritizing locations for treatments that both enhance forest resilience and support community wildfire protection.

Within a given forest health priority landscape, the treatment target is typically to move 30 to 50 percent of forested acres from overly dense to open conditions. Treatment prescriptions are based on current forest structure and composition, departure from historical range of variability, and other factors. The forest health treatment needs for priority landscapes are expressed as a range because landscapes are naturally dynamic due to natural disturbances and climate variability. The range in treatment acres also provides options for landowners to manage for and balance different objectives while still meeting the overall goal of a resilient landscape that can better adapt to a changing climate.

Forest health treatments are designed and implemented to support fuel reduction, ecological restoration, and wildfire management objectives. Resilient forest conditions can be restored through a variety of treatment methods, including non-commercial thinning, commercial thinning, prescribed fire, managed wildfire, regeneration treatments, and maintenance treatments. A key component of this adaptive management framework is long-term monitoring of forest health conditions that involves collaborative partners and spans multiple levels (stand, planning area, and region). In addition, DNR supports community adaptation to increasing fire risk by increasing defensible space and house hardening to protect homes throughout Washington.

Further information:

- Forest Health Assessment and Treatment Framework Report 2020
- Adapting Western North American Forests to Climate Change and Wildfires: 10 Common Questions
- Objectives and Considerations for Wildland Fuel Treatment in Forested Ecosystems of the Interior Western United States

Why are timber harvests necessary in forest health treatments and restoration efforts?

Due to fire suppression and forest management practices over the last century, forests have grown denser and accumulated hazardous levels of fuel. These changes in our forests have led to uncharacteristic wildfire impacts, exacerbated drought stress, and intensified insect and disease outbreaks. The resulting forest health crisis encompasses millions of acres of forestlands across eastern Washington.

Research from across the interior west has shown that mechanical treatments that remove excess trees are the most effective tactic for reducing forest density and lowering the risk of crown fires, especially when followed by prescribed burning. Non-commercial and fire-only treatments can accomplish some of these goals, but these tools require allocation of limited treatment dollars and often necessitate multiple entries to sufficiently reduce fuel loads. Commercial timber harvests are part of a suite of tools we can use to address the forest restoration needs in addition to non-commercial thinning, prescribed fire, and managed wildfire.

Thinning forests and reducing fuels is expensive work, sometimes costing more than $1,000 per acre if using strictly non-commercial approaches. Based on DNR's landscape evaluations of our priority landscapes, the majority of acres identified for treatment are in the medium to large dense forest structure class where commercial thinning may be viable, depending on landowner objectives, regulatory requirements, and operational and economic considerations. In addition to boosting rural economies, commercial thinning provides revenue that is often invested in other integrated activities, such as non-commercial thinning, prescribed fire, and aquatic restoration projects.

DNR and partners are continuously looking for ways to make forest restoration strategies more economically sustainable. The 20-Year Plan is already resulting in new partnerships and more state and federal investments in Washington. We need positive working relationships with forest products industry partners in order to complete our ambitious goals, and we value their contributions to the collective effort to increase forest resilience while supporting rural economic development.

Further information:

- Goal 3 of the 20-Year Forest Health Strategic Plan
- Are Fuel Treatments Effective at Achieving Ecological and Social Objectives? A Systematic Review
- Fuel Treatments and Fire Severity: A Meta-Analysis

What role does wildfire play in the restoration of a forest ecosystem?

Wildfires are a natural and vital component of forest ecosystems in eastern Washington. Historically, fires occurred as often as once each decade in dry forests, helping to maintain open forests with fire-adapted trees, plants, and wildlife. Historical wildfires recycled nutrients into the soils and reduced the amount of fuel buildup under tree canopies. Those natural wildfires became much less common beginning in the early 1900s due to a combination of policy changes and other factors, including fire suppression, grazing, and cessation of Indigenous burning practices. Today, when wildfires escape suppression efforts, often under extreme conditions brought on by climate change, the result is often higher levels of tree mortality within larger burn footprints than historically would have occurred, especially in our dry forest types. Severe fires can also have devastating impacts on nearby homes, businesses, public infrastructure, air quality, water quality, and recreation opportunities.

Wildfires that burn at low or moderate severity often have beneficial effects by removing less fire-resistant trees, consuming surface fuels, and increasing spatial variability. The use of managed wildfire under moderate weather conditions and in remote locations is a key strategy for restoring and maintaining landscapes. This is especially true in areas that have previously been treated with thinning and prescribed burning to reduce fire risk. Over time, prescribed fire and managed wildfire are important tools that will be necessary to match the scale of the treatment need. However, given the substantial departure of most of our forests from historical conditions and the widespread existence of homes and infrastructure throughout the wildland-urban interface, wildfire suppression is often a necessary tool to reduce risk to values.

Over the past few decades, hundreds of formal research studies across the western United States have established a broad scientific consensus that our dry forest ecosystems are no longer resilient due to a century of fire exclusion and past forest management practices. Multiple lines of evidence show that forest restoration activities, including forest thinning and prescribed burning, can begin to bring dry forests back to a healthier and more resilient state, reduce the risk of uncharacteristically severe wildfires, and enhance the ability of trees to resist insects and diseases. Proactive restoration will also increase the ability of land managers to allow wildfire to fulfill its natural role while supporting the safety of firefighters and adaptation to climate change.

Further information:

- Adapting Western North American Forests to Climate Change and Wildfires: Ten Common Questions
- Evidence for Widespread Changes in the Structure, Composition, and Fire Regimes of Western North American Forests
- Restoring Fire-Prone Inland Pacific Landscapes: Seven Core Principles

How is climate change addressed in the 20-Year Plan?

The 20-Year Plan is fundamentally a climate adaption strategy for eastern Washington forests. Due to decades of fire exclusion, forest conditions in eastern Washington are increasingly susceptible to uncharacteristic wildfires, drought, and other stressors that lead to increased tree mortality. These risks will only grow over time as the climate warms and the resulting impacts become more severe. Climate projections indicate that as temperatures increase, snowpack will decline, tree stress will increase, and fire seasons will get longer. In light of the threats associated with climate change, forest restoration has become more important than ever.

The 20-Year Plan's goal of conducting 1.25 million acres of scientifically-sound, landscape-scale restoration treatments by 2037 is intended to create forest conditions that are much more resilient to our current and future climate by reducing tree density and favoring tree species that are best adapted to the environment. Historically, frequent fires kept tree densities and overall biomass levels far below current levels, which also reduced tree competition and increased forest resilience to drought. Restoring forest composition and structure and reducing fuels in Washington's forests is an important part of adapting to climate change. In addition, DNR is committed to helping communities adapt to increasing fire risk by increasing defensible space and house hardening to protect homes throughout the state.

At DNR, we recognize the effects of climate change on Washington's forests and prioritize the implementation of treatments in locations that are more vulnerable to drought, uncharacteristic wildfire, and fire risk to communities. Our scientists monitor the latest research and are poised to adapt our forest health strategy over time as we continue to learn more about the impacts of climate change and the effectiveness of forest health treatments. In fact, a more robust monitoring framework for forest health treatments is one of the primary goals written into the 20-Year Plan.

Further information:

- Adapting Western North American Forests to Climate Change and Wildfires: Ten Common Questions
- DNR's Plan for Climate Resilience
- Wildfire and Climate Change Adaptation of Western North American Forests: A Case for Intentional Management

How does the 20-Year Plan address carbon sequestration in eastern Washington?

Increasing forest carbon storage is not an objective of the 20-Year Plan, but it is important to assess the plan's potential short- and long-term impacts on carbon dynamics. To address the huge forest restoration need in eastern Washington by changing dense forests to more open forests, we will reduce the amount of aboveground carbon storage in the short term. The current levels of carbon stored in Washington dry forests are unsustainable and exist only due to fire exclusion practices that resulted in increased tree density and artificially inflated capacity for carbon storage.

Although forest restoration and fuel reduction treatments remove carbon from treated areas, retaining large, fire- and drought-tolerant trees and reducing their vulnerability to disturbances lowers the carbon costs of forest restoration. In addition, the immediate reduction in forest carbon stores can be partially offset by storage of carbon in wood products, reduced emissions from subsequent disturbance events, sustained growth of the remaining trees, and the creation of stable carbon in charcoal following prescribed burning.

Given the rising average number of acres burned annually by wildfire and the likelihood of continued increases due to climate change, the current levels of carbon in eastern Washington forests will be reduced significantly by wildfires, insect outbreaks, and drought. By reducing the risk of tree mortality and carbon emissions associated with high-severity disturbances, large-scale forest restoration activities may help sustain a higher baseline of stable carbon stocks in eastern Washington over the long term than if we just let wildfire act on its own. Continued study and monitoring of forest conditions will be essential to understand carbon stability and forest responses to disturbance at stand, landscape, and regional levels.

Further information:

- Can Fuel-Reduction Treatments Really Increase Forest Carbon Storage in the Western US by Reducing Future Fire Emissions?
- The Effects of Forest Restoration on Ecosystem Carbon in Western North America: A Systematic Review
- Opinion: Managing for Disturbance Stabilizes Forest Carbon

Will proactive forest restoration efforts be enough to counter the uncharacteristic wildfires driven by extreme weather and climate change?

Today's fires are driven by multiple factors, including climate change, a century of fire suppression policies, and past forest management practices. Fire seasons have gotten longer and more extreme, and climate change projections indicate that more extreme burning conditions will become more prevalent over time. Restoring forest composition and structure while reducing fuels in eastern Washington forests is thus an important adaptation strategy for climate change and extreme weather events.

Unusually hot, dry, and windy conditions increase fire intensity and can reduce the effectiveness of treatments. However, even in extreme fire weather conditions, such as strong winds, fuel treatments can slow fire spread, limit fire intensity, and decrease tree mortality. Studies in Washington have found that thinning followed by prescribed burning can mitigate fire severity, even under extreme conditions. This observational research is supported by simulation studies showing that fuel treatments reduce fire intensity and effects under a variety of weather conditions.

The primary goal of forest restoration treatments is not to reduce the amount of forest burned, but rather to lessen the risk of severe impacts on forests, water, wildlife habitat, and communities. In addition, many fires occur under moderate weather conditions where treatments can reduce fire intensity and increase management options for firefighters. Treated areas can serve as important control points to support firefighter safety, operations, and travel routes. As areas affected by wildfires and treatments increase over time, their overlap will continue to increase, providing DNR opportunities to quantify treatment effectiveness under a range of burning conditions. Tracking treatments and understanding the potential beneficial work of wildfires are key components of the 20-Year Plan long-term monitoring framework.

Further information:

- Adapting Western North American Forests to Climate Change and Wildfires: Ten Common Questions
- Forest Restoration Work Helped Firefighters Stop Boyds Fire
- Evidence for Widespread Changes in the Structure, Composition, and Fire Regimes of Western North American Forests

Do forest restoration activities like thinning and burning increase wildfire risk because open forests can have drier fuels and higher wind?

During the peak of the wildfire season (July-September), most grasses, shrubs, and dead woody material in eastern Washington forests are very dry and will readily burn given an ignition source, even in dense, shady forests. Dense forest conditions, especially in our dry forest types, can lead to uncharacteristically intense wildfire behavior where most trees are killed due to abundant surface, ladder, and canopy fuels that are connected in close proximity.

Open, dry-forest habitat can have drier fuels and higher wind speeds, but that is natural in these fire-adapted forests. Forest restoration treatments that reduce surface and ladder fuels return dry forests to their historical condition while reducing the likelihood that fires will move from the forest floor into the canopy. In addition, treatments that reduce the density of the overstory limit the ability of crown fires to spread from tree to tree. This is why thinning and controlled burning are so effective at reducing wildfire risk, insect outbreaks, and diseases in these forests while lowering fire risk in surrounding communities.

Increasing wildfire extent in recent years has provided important opportunities to evaluate the effects of forest restoration treatments on fire behavior and other ecosystem processes. Key findings of recent studies include:

- At a stand level, individual treatments (10-100 acres) can reduce fire intensity and severity, often shifting a crown fire to a surface fire and resulting in lower tree mortality. Treatments are particularly effective when they include both mechanical thinning and surface fuel reduction with prescribed fire.
- At a landscape level, restoration treatments (1,000s-10,000s acres) can cumulatively alter patterns of fire spread and intensity, thereby reducing the amount of uncharacteristic, high-severity fire in dry forests and reducing risk to communities.
- It is possible to realize landscape-level benefits of restoration treatments while treating a portion of a given landscape (30-40%) and maintaining areas of dense forests for wildlife habitat and other ecosystem services.

Further information:

- Evidence for Widespread Changes in the Structure, Composition, and Fire Regimes of Western North American Forests
- Video: We've Spent 100 Years Growing a Tinderbox Across the West
- Whiteboard Video: Co-Management of Fire Risk Transmission Partnership

What are shaded fuel breaks and how do they factor into landscape-scale restoration?

Shaded fuel breaks and landscape-scale forest health treatments are complementary approaches that can help achieve restoration goals. Shaded fuel breaks are typically linear treatments 100 to 400 feet wide that occur adjacent to a control feature, such as a road. Forest vegetation is reduced to provide safe areas for effective fire operations such as suppression, prescribed fire, and managed wildfire.

Landscape forest restoration treatments take place when vegetation within a large area is manipulated in order to reduce fuel loads and establish more natural vegetation structure and composition. The two key components of landscape treatments are that they are large (100's to 1,000's of acres) and variable in terms of post-treatment vegetation structure. Landscape treatment areas contain pockets of untreated, dense forests, openings with no trees, and large areas of thinned forests. Landscape treatments can include a wide array of activities to reduce the density and amount of forest vegetation to more appropriate levels and spatial patterns at a given site. Specific treatment types and methods include commercial thinning, non-commercial thinning, fuelbreaks, prescribed fire, managed wildfire, and regeneration treatments. Landscape treatments are the primary means of restoring healthy and resilient forests at a watershed scale while also reducing fire risk.

The combination of creating shaded fuel breaks and completing landscape treatments in the most efficient locations and at the appropriate scale will significantly increase our capacity to protect communities, support firefighters, restore ecosystem function, and enhance landscape resilience. Strategically positioned and appropriately maintained fuel breaks contribute to resilient forests by providing opportunities for prescribed fire, managed wildfire, or fire suppression, all of which are essential tools of the 20-Year Plan.

Further information:

- Understanding the Role of Shaded Fuel Breaks in Support of Washington's 20-Year Forest Health Strategic Plan: Eastern Washington. Washington Department of Natural Resources, Olympia WA 2021 [Report available by request]
- Factors Affecting Fuel Break Effectiveness in the Control of Large Fires on the Los Padres National Forest, California
- Fuelbreaks for Wildland Fire Management: A Moat or a Drawbridge for Ecosystem Fire Restoration?