



United States Department of Agriculture

Draft Summary Assessment Report of Ecological, Social and Economic Conditions on the Malheur, Umatilla, and Wallowa- Whitman National Forests

Known together as the
BLUE MOUNTAINS NATIONAL FORESTS



Forest Service

March 19, 2024

Cover Photo: Photos across the Blue Mountains national forests. Top Left to right: Horse packing on a trail, the Malheur River, and wildland firefighters assessing a fire. Bottom left to right: A fisherman presents a rainbow trout, hikers enjoying the Wallowa-Whitman National Forest, and an elk roaming the Blue Mountains national forests.

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Malheur, Umatilla, and Wallowa-Whitman National Forests

Summary Assessment Report

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Abstract: The assessment report presents and evaluates existing information about relevant ecological, economic, and social conditions, trends, risks to sustainability, context within the broader landscape and relationship to the Malheur, Umatilla, and Wallowa-Whitman National Forest plans.

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For further information or for copies of individual specialist reports, see the Blue Mountains national forests Draft Assessment Reports website at:
<https://www.fs.usda.gov/detail/umatilla/home/?cid=fseprd1168181> or contact the forest plan revision team at sm.fs.bluesforests@usda.gov or (541) 278-3716.

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Preface

The mission of the Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. To accomplish this mission, the Forest Service is tasked with managing lands for sustainability. The idea of sustainability as it relates to national forest management is to create a balance between our ecological, social, and economic needs.

A New Management Plan

The National Forest Management Act of 1976 requires every national forest or grassland managed by the Forest Service to develop, maintain, and periodically revise an effective land management plan (also known as a "forest plan"). It also requires that plans are revised or amended when conditions significantly change. The existing plans, written in 1990, are outdated in many ways. Natural resource and social conditions have changed, new scientific information is available, and there are additional land management laws. There have been changes in communities, economic activity, and land and resource use patterns.

Forest plans provide strategy and guidance for managing sustainable and healthy forests. We included the three national forests in one plan revision because the landscapes and communities share many similar attributes and values connected by land and water. The process for the development and revision of plans, along with the required content of plans, is outlined in planning regulations, often referred to as the Planning Rule. The current Planning Rule became official in 2012 and can be found at:

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5362536.pdf

The vast possibilities of our great future will become realities only if we make ourselves responsible for that future.

— Gifford Pinchot

What is an Assessment?

Under the 2012 Planning Rule, one of the initial steps in revising a forest plan is to enter an assessment phase. The Malheur, Umatilla, and Wallowa-Whitman (Blue Mountains) National Forests initiated the assessment process to revise forest plans on July 31, 2023.

The forest plan revision process entails ten steps beginning with a preassessment phase. The full revision process can be viewed at the Blues Plan Revision website, located at:

<https://www.fs.usda.gov/detail/umatilla/home/?cid=fseprd1066821>

We are currently working on step two of this process, the assessment phase, which evaluates existing and relevant information on the current conditions and trends of a national forest. Assessments also help us identify new information to inform the future steps of plan development. Topic areas include ecological, economic, social, and cultural conditions. This draft assessment represents a high-level summary of the assessment process, which provides a clear base of information for identifying what needs to change in the existing 1990 forest plans.

Public review and feedback on this draft assessment is welcome through spring of 2024 and this information will be used to form further plan development. Please share any knowledge of existing conditions, trends, or risks, as well as best available scientific information that may be useful to include in this document. We value your knowledge as a national forest user.

Although public input provided during assessment review does not constitute a formal public comment period, this feedback, along with input gathered from public meetings scheduled for April 2024, will be considered while completing the final assessment. To provide feedback on the draft assessment reports, please visit the following webpage at:

<https://cara.fs2c.usda.gov/Public/CommentInput?project=64157>

Going forward, several options exist for the public to review and comment on additional documents, such as the forest plan and associated environmental impact statement. A notice of intent will be released, which provides an opportunity for submitting comments to gain standing for the subsequent objection process. Providing comments during officially designated comment periods is important for ensuring that your voice is heard. Watch for announcements on the Blue Mountains national forests plan revision webpage at:

<https://www.fs.usda.gov/detail/umatilla/home/?cid=fseprd1066821>

We have cited detailed assessment reports at the end of every section in the summary assessment document. These reports, as well as a place to enter feedback on the assessment, can be found on the Blue Mountains national forests Draft Assessment Reports web page at <https://www.fs.usda.gov/detail/umatilla/home/?cid=fseprd1168181> or by contacting the forest plan revision team at SM.FS.bluesforests@usda.gov or (541)278-3716.

Introduction

The Blue Mountains

Loved by many, the remote Blue Mountains have sustained life and people for millennia. The general area of the Malheur, Umatilla, and Wallowa-Whitman National Forests are affectionately nicknamed the “Blues,” one simple word to encompass the staggering array of landscapes it represents.

One can begin by describing the land’s rolling grasslands to its canyons eroded by winding rivers, or the mountain peaks that overlook it all. We can also imagine standing over the largest living organism in the world, a fungus that impresses with its 3.5 square miles and approximately 35,000-ton mass. However, this still doesn’t provide a full picture of what the Blue Mountains national forests are today. To do so, it’s helpful to view the three national forests for their social, economic, and environmental values, which is one of the purposes of this report.



Cindy McReynolds, the first Forest Service woman packer, Wallowa-Whitman National Forest (Photo courtesy of USDA Forest Service, Pacific Northwest Region archive)

Here are a few of these values and benefits, all of which are discussed in the following pages:

- Recreational opportunities ranging from camping, hunting, fishing, horseback riding, hiking, sightseeing, mushroom and berry picking, skiing, snowmobiling, and motorized trail use
- Habitat for iconic western North American species, including salmon, bighorn sheep, elk, and gray wolf
- Clean air and cold, clear water
- Scenic highways and byways
- Cultural and historic sites
- Economic benefits related to tourism and recreation, including resorts, and outfitter services
- Natural resources such as timber, firewood, minerals, and forage for livestock grazing
- Wild rivers and diverse animal and plant species
- Intact forests, shrublands, and grasslands
- Utility infrastructure such as powerlines, pipelines, and communication towers

A New Management Plan

The Malheur, Umatilla, and Wallowa-Whitman National Forests extends from northcentral Oregon, southeast Washington, and into the western border of Idaho. The forest plan revision effort for the Blue Mountains national forests does not include the Hells Canyon National Recreation Area in the Wallowa-Whitman National Forest. The Hells Canyon National Recreation Area (HCNRA) comprehensive management plan was completed in 2003, providing its current management direction. The Hells Canyon plan includes 627,200 acres of the Wallowa-Whitman National Forest and almost 34,000 acres of the Nez Perce and Payette National Forests in Idaho. These areas will be excluded from further discussion in much of the assessment.

The plan area includes 4.9 million acres in Washington and Oregon:

- 1.7 million-acre Malheur National Forest including the adjoining 242,000-acre portion of the Ochoco National Forest as one administrative unit
- 1.4 million-acre Umatilla National Forest
- 1.8 million-acre Wallowa-Whitman National Forest, which excludes Hells Canyon National Recreation Area

The Blue Mountains national forests plan area include portions of 12 counties: 8 in Oregon, and 4 in Washington. With headquarters in John Day, Pendleton, and Baker City, Oregon and eight ranger district offices located in John Day, Hines, Prairie City, Heppner, Ukiah, Baker City, Joseph, and La Grande, Oregon and two ranger district offices located in Pomeroy and Walla Walla, Washington.

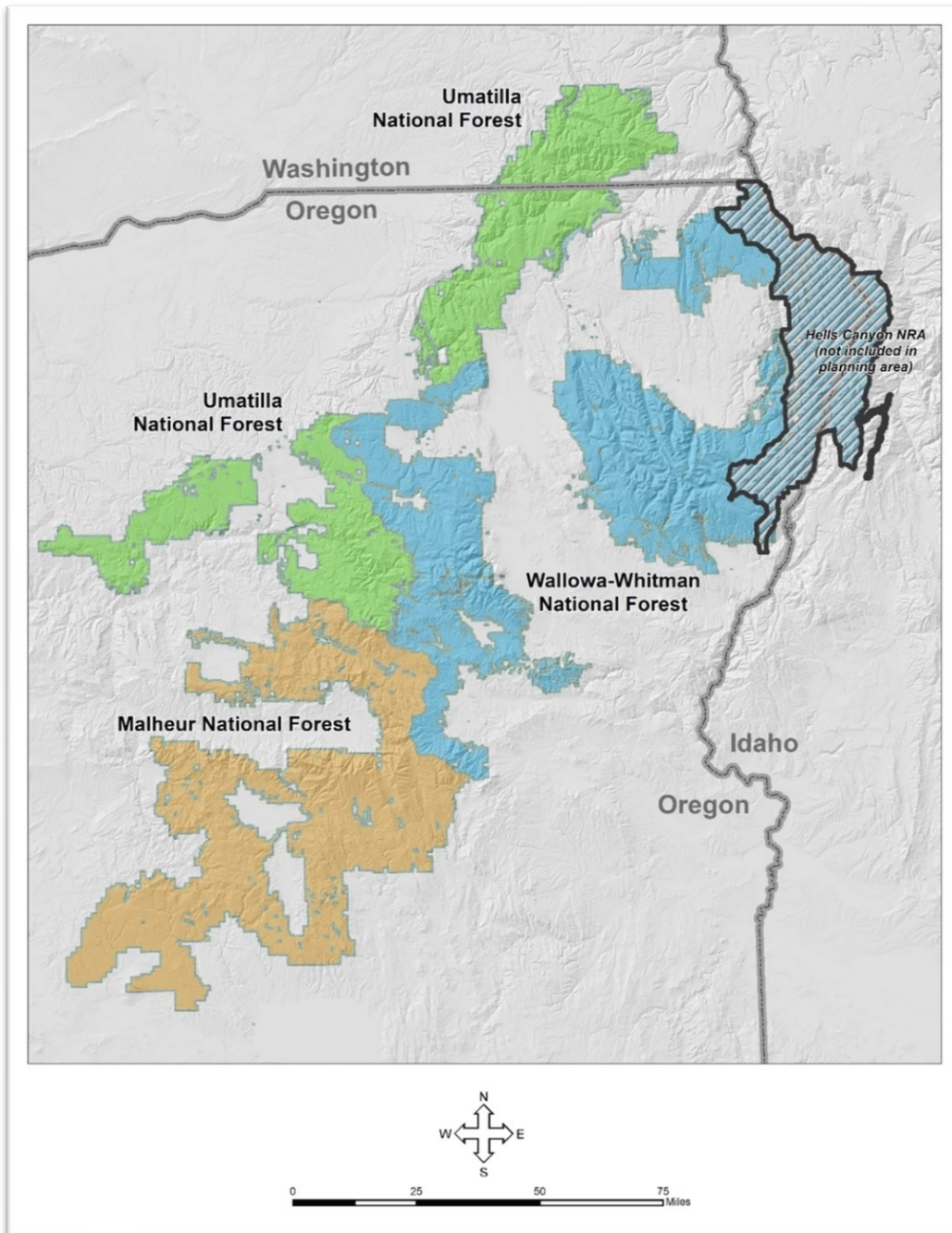


Figure 1. National Forest System Lands administered by the Malheur, Umatilla, and Wallowa-Whitman National Forests

Best Available Scientific Information

During the assessment process, revision team specialists used the best available scientific information to evaluate conditions, trends, and risks. We used a wide range of relevant, quality data, including monitoring reports. You can find full reference citations in the individual detailed assessment reports cited at the end of each section.

Public and Tribal Involvement

The Blue Mountains national forests plan revision effort was publicly launched in August 2022, via press releases, email, and website announcements. We initiated an assessment of existing conditions with a Federal Register notice on July 31, 2023. In August, September, and October 2023, the forest plan revision team held 11 public meetings to:

- Provide an understanding of what forest plan revision is and why it matters.
- Gain an understanding about the scope and scale of the Blue Mountains national forests.
- Gather local knowledge and information, current trends, conditions, perceptions, and concerns.



Open House in Pendleton, Oregon (USDA Forest Service, Blue Mountains national forests archive)

In-person, open house meetings in eastern Oregon were held in Baker City, Enterprise, John Day, Heppner, Hines, La Grande, Pendleton, Prairie City, along with the Washington community of Dayton. We held two meetings virtually, garnering a wider range of participants. In sum, 163 people attended these 11 meetings.

The Blue Mountains national forests plan revision staff consulted with four local Tribes, and interacted with state, local, and other governmental stakeholders (including the Blues Intergovernmental Council), and interest groups.

The open houses included a values mapping exercise to identify special places. We asked individuals how they currently use the national forests and what works well regarding national forest management. We also had people identify necessary changes. The values mapping exercise was available online via a story map and hardcopies were available at open houses and at the district offices. The team produced spatially detailed maps of the results which will

be used to identify trends, values, or a need for change. The story map and the official website outlined how to submit information and how we might use that information the assessment.

We received a total of 131 questionnaires and unique letters, and over 400 form letters requesting fair opportunities for the public to provide input. We heard from people what they would like to see in the revised plan and desired changes in current forest management. Themes include types of multiples uses and recreation and travel opportunities, access, increasing or decreasing designated areas, coordination among agencies, habitat connectivity, and the importance of ecosystem health.

The plan revision team reviewed comments, local information, and published sources submitted by the public and incorporated them where applicable into the assessment process. All public comments received during the assessment phase will also be reviewed and considered during the development of the forest plans.

ASSESSING ECOSYSTEMS AND WATERSHEDS

Climate

Climate Change in Our Backyard

Many of us have already observed a changing climate and its effects. Garden peas might be planted earlier, hiking plans may be canceled due to extended wildfire smoke, and the mountains might appear less snowcapped than before. In the Pacific Northwest, average temperatures have increased by 1.3 to 1.6 degrees Fahrenheit since 1900. Warming will continue in the Blue Mountains, and at a faster rate than previous warming periods in the geological record. When compared to observed temperatures from 1950 to 1999, average warming is projected to increase by 4.3 to 5.6 degrees Fahrenheit by 2050 in the Pacific Northwest, depending on greenhouse gas emission levels. Changes to future annual precipitation totals are uncertain, but due to warming, precipitation is anticipated to fall more as rain than snow in winter than in the past and in more extreme weather events. Changes in temperature and precipitation in turn affect plant and animal communities, and drive other forest processes like fire, insect and disease outbreaks, flooding, and drought.

We expect profound environmental consequences in the Blue Mountains and surrounding communities. Here are some major impacts:

- Increased drought frequency and duration
- Increased fire severity and frequency of uncharacteristically severe fire
- Drier soils in summer and increased water stress on vegetation
- Decreased snowpack and earlier snowmelt
- Altered timing and availability of water supply, with declining summer water levels and accompanying increase in stream water temperature
- Higher magnitude of insect and disease outbreaks and accompanying tree mortality
- Increased magnitude of peak streamflow, threatening roads and aquatic habitat
- Changes to vegetation mix and life cycles
- Threats to alpine and subalpine habitat persistence
- Changes in wildlife distribution and patterns in response to changing vegetation
- Increased stream temperatures, challenging all cold-water dependent species
- Increased stress to species that are already vulnerable
- Changes to rangeland conditions and sustainable livestock grazing levels
- Changes in timber production levels
- Impacts to national forest infrastructure, including campground locations and bridge sizes
- Changes in scenic character, recreation experience, seasonal recreation opportunities, public safety, and access
- Changes in availability of cultural resources

Expected Effects to Snow and Water

Climate change significantly impacts how water cycles through the Blue Mountains. Precipitation will fall more as rain than snow, decreasing the amount of snow accumulated, also known as snowpack. Pronounced changes in snow and streamflow are expected to occur in the high elevation areas of Eagle Cap Wilderness in the Wallowa Mountains, and along the northerly sections of the Umatilla and Wallow-Whitman National Forests. Areas where snow doesn't persist, such as the mid-elevation Blue Mountains, Elkhorn, Greenhorn, and Strawberry Mountains, may become mostly snow-free.

A warmer spring means that the snowpack melts earlier, creating stronger peak stream flows that may alter streams and riparian habitat for fish — potentially damaging roads and decreasing national forest access. Earlier snow melt also means that less water is stored for late summer when demand is the highest by plants, animals, and communities that surround the Blue Mountains.

Less water in riparian environments in the summer, along with drier soil conditions caused by higher temperatures, can increase the vulnerability of forests and grasslands to disturbances such as insects, severe fire, and drought. The severity of these disturbances on the ecosystems in the Blue Mountains depends in part on how resilient, or healthy, the ecosystems are. However, most ecosystems in the Blues are impaired or less resilient than in the past. Therefore, disturbances such as drought, fire, and insect and disease will likely be more severe, and ecosystems may not provide the same functions and services that they have in the past. The Terrestrial, Aquatic, Watersheds, and Wildlife Assessment Reports discuss the current conditions of ecosystems in greater detail.

Ecological effects of climate change within the national forests in turn may influence the social and economic conditions of communities surrounding the Blue Mountains. Changes in precipitation may affect availability of water for irrigation, municipalities, and culturally significant fish and wildlife for Tribes. The forecasted increase in wildfires and associated smoke increase risks for those living close to national forest boundaries (the wildland urban interface) and beyond. On the other hand, investments into forest health, such as restoration and fuels reduction, contribute to local economies.

Looking Forward: Conclusions and Concerns

The existing forest plans do not address a changing climate, nor its related impacts. Rising temperatures and changes in precipitation patterns have likely contributed to environmental, economic, and social changes in the Blue Mountains. This trend is expected to continue at an accelerated rate. Increasing our efforts to improve ecosystem health through management actions can strengthen an ecosystem's resilience to the impacts of climate change. Continued monitoring and research specific to the Blue Mountains on climate, precipitation, snowpack, hydrology, and other resources are important to help managers adapt to changing conditions while balancing sustainability with economic and social needs.

Additional Information

Warren, K. et al. 2024. Assessment for Forest Plan Revision – Climate Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168597.pdf

Halofsky, J. E. and D. E. Peterson, eds. 2017. Climate Change Vulnerability and Adaptation in the Blue Mountains Region, General Technical Report PNW-GTR-939. U.S. Forest Service, Pacific Northwest Research Station, Portland, OR. 331 p.

https://www.fs.usda.gov/pnw/pubs/pnw_gtr939.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Soil

Essentially, all life depends upon the soil ... There can be no life without soil and no soil without life; they have evolved together.

— Charles E. Kellogg, Third Chief of USDA Bureau of Chemistry and Soils

A Vital Natural Resource

With each step that we take, what lies underfoot is a vital and fragile resource. Soil is the foundation for plant, animal, and fungal life. It holds and releases water, provides nutrients and a growing medium for plants, and offers habitat for wildlife above and below ground. It also houses numerous organisms that cycle nutrients, provides long term storage for carbon, and buffers effects of pollutants. In doing all these functions, it holds a record of the past, cataloging human activities and earth's changes over time.

Soil is influenced by its underlying rock type, the terrain that is located on, and its local climate. Cool areas with regular precipitation have different soil conditions than those found in warm, dry areas. These differences influence how productive soil is in its ability to sustain plant growth. The quality, or health, of soil depends on both the inherent capability of soil and its current condition. Soil quality can be impaired by severe disturbance, including compacting, eroding, heating, or displacing the soil. Human activity can greatly disturb all soil types, and soils have different abilities to withstand these disturbances based on its type. Activities such as using heavy equipment, intense grazing, road maintenance, recreational activities, and construction can all cause detrimental effects on soil. Events like severe wildfires, floods, and landslides also impact soils.

Forest Service Responsibilities

Regulations, including the National Environmental Policy Act of 1969 and the National Forest Management Act of 1976, mandate that productivity of the land (and soil) should not be permanently degraded due to Forest Service management activities. The Forest Service Soils Manual and the Pacific Northwest Region Soil Quality Standards (for all national forests in Oregon and Washington) provide guidelines and methods to implement these regulations. They call for managing soil resources to sustain ecological processes and function so that ecosystem services are provided in perpetuity. They further require that project activities consider soil properties when assessing the condition and potential effects on soils.

Soil Conditions Today

Overall, soil conditions on the Blue Mountains are maintaining soil quality and productivity and adhere to Regional and National Soil Quality Standards.

The Blue Mountains national forests hold a wide diversity of soil types. Soil is generally nutrient poor on steep mountain slopes and ridges, while deep and fertile in the lower valleys. About two-thirds of soils are derived from volcanic rock, and about half of all soils have volcanic ash deposits from Mount Mazama's eruption roughly 6,800 years ago. Ash capped

soils are highly productive, regardless of underlying soil type, with increased water holding capacity and higher organic matter than other soils. Water storage is particularly important for the Blue Mountains as the area has limited moisture.

A little over half of the carbon in forests in the Blue Mountains is stored belowground; in non-forested ecosystems, a higher percentage is stored belowground. Belowground carbon stores can be more stable than aboveground biomass. Soil carbon sequestration improves nutrient retention, expands water capacity, and reduces erosion.

The greatest threat to soil quality is erosion of topsoil. Topsoil contains most of the soil's nutrients, carbon, organic matter, and microorganisms. Permanent loss of soil productivity occurs when the loss of topsoil happens at a rate greater than the natural ability of soil to replace it. The Blue Mountains generally have a high risk of erosion, and soils with ash caps are easily eroded when disturbed. Another threat is compaction, which restricts the soil's ability to hold air and water.

We can trace much of the current soil condition for the Blue Mountains national forests to past management activities since the late 1800s. From the late 1800s to mid-1900s, commercial livestock grazing occurred year-round and lacked management. This severely impacted rangelands in the Blue Mountains national forests, including compaction, soil displacement, and invasion by non-native vegetation. Timber harvests from the 1920s to 1990s used high pressure, ground-based equipment to remove large trees, along with site preparation to regenerate trees. These activities increased soil compaction and erosion in the harvest areas. Many roads were also constructed to haul out timber, creating soil erosion, displacement, and sedimentation to streams.

Today, implementation of state and federal Best Management Practices, National and Regional Soil Quality Standards, National Forest Management Act, and the Clean Water Act helps minimize disturbance and maintains or restores soil quality and productivity. In addition, limits have been placed on grazing seasons, to prevent soil disturbance during the wet season when soil is more vulnerable to damage. Thinning dense forests, woodlands, and conifer-invaded grasslands has increased light and reduced water competition to encourage understory grasses and shrubs. In turn, these understory plants help increase organic matter content in the soil, improving overall soil conditions.

Wildland Fire and Soil

Wildland fires are a natural ecological process within Blue Mountains national forests. While low intensity fires can boost nutrient cycling and leave beneficial charcoal, high severity fires can consume the entire forest floor and its coarse woody debris, eliminating long term storage of nutrients. Without the protective blanket of the forest floor, exposed soil is prone to erosion, flooding, debris flow, and landslides, increasing sedimentation in streams. In prescribed or managed burn areas with low burn severity, leaf litter layers and organic matter likely stay intact and nutrient losses are minimal.

Looking Forward: Conclusions and Concerns

Over the last 30 years, forest monitoring and research have demonstrated the importance of maintaining soil quality and productivity. The Forest Service updated National Soil Quality Standards in 2010, giving clear guidelines on how to measure and maintain inherent soil productivity through an ecological lens. Under the new 2012 Planning Rule, soil management

direction has broadened, requiring plans to maintain or restore landscapes to protect the ecosystem services that healthy soils can provide, such as clean and constant water, providing nutrients for plant growth, and carbon storage. Continued trends in precipitation, temperatures, and wildfire patterns are expected to affect soil health, erosion and sedimentation risk factors, and carbon storage.

To meet these new requirements, we need a better understanding of the effects of livestock grazing for different soil types, as well as modern timber harvest technologies on remaining coarse wood material. More data collection will be important on the Malheur National Forest to work towards completing a full soil inventory. The Umatilla and Wallowa-Whitman National Forests have existing soil surveys.

Additional Information

Reynolds, Becki et al. 2024. Assessment for Forest Plan Revision – Soils Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168603.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Air Quality

Why are the Blue Mountains...Blue?

We have the air to thank for this area's namesake. As sunlight enters the atmosphere, it is scattered, bouncing off air molecules and volatile organic compounds produced by trees. Blue light scatters the most, 10 times more than red light, as it has one of the shortest wavelengths of visible light. The more air between you and the mountain, the more scattering of blue light there is, and the deeper blue hue the mountain takes on.

Trees, water, and places to recreate come to mind when people think about national forests and the benefits they provide. People often think about clean air if there is a lack of it, such as times when vast areas are under a cloak of wildfire smoke. Clean air provides life to nearly all living organisms, enhances scenic views and outdoor experiences, helps maintain water quality, and contributes to personal health and healthy ecosystems.

Forest Service Responsibilities

We must evaluate air quality to comply with local, state, and federal air quality conditions under the Clean Air Act of 1963 and its subsequent amendments. In designated wilderness, the Forest Service must monitor sensitive natural resources, such as alpine lakes, snowpack, precipitation, and lichen, as they are known to be sensitive to air pollution.

Air quality in national forests is highly affected by prevailing winds and sources of emissions from elsewhere. While national forest managers don't have much control on what drifts into the air from other sources, they must control sources of emissions generated in National Forest System lands and coordinate with local and regional air quality agencies. Emission generating activities can include prescribed fires or dust from management projects.

Local Air Quality Classifications

The Clean Air Act of 1963 and its subsequent amendments in 1977 protect air quality at two different levels within the Blue Mountains. The Act establishes the strongest level of protection for Class I areas. These include most national parks, wilderness areas greater than 5,000 acres and designated before 1977 and designated tribal land. Blue Mountains' Class I airsheds include Hells Canyon National Recreation Area, Eagle Cap Wilderness, and Strawberry Mountain Wilderness. Little to no degradation to air quality is acceptable in these areas.

The rest of the Blue Mountains national forests are classified as Class II areas and can receive a greater amount of human-caused pollution than Class I areas.

State smoke management plans regulate smoke from prescribed burning. These plans attempt to balance the need for prescribed burning with minimizing smoke impacts to communities. States must not allow smoke from prescribed burning to exceed the National Ambient Air Quality Standards (NAAQS), and often have more stringent rules which limit smoke to time-averaged concentrations below the NAAQS. In contrast, smoke from wildfires is not regulated.

Current Air Quality Conditions and Trends

The annual average amount of haze, also known as light extinction, has decreased since 2000 in the Eagle Cap and Strawberry Mountain wilderness areas. This is primarily due to decreases in ammonium nitrate and ammonium sulfate because of State implementation plans to reduce pollutants. Ammonium nitrate is the largest contributor to hazy skies, and sources include automobile emissions, power plants, industrial boilers, and cement kilns. Ammonium sulfate is derived from a combination of ammonia and sulfur dioxide. Ammonia emissions come from intensive farming practices, fertilizers, and biomass burning, while sulfur dioxide is emitted primarily from burning of coal and oil. Organic mass also contributes to haze, and comes from paints, solvents, cleaning, and disinfecting products, as well as fuels and organic carbon emitted from trees in the form of terpenes. The figure below shows the decreasing trend of haze and its sources for Eagle Cap and Strawberry Mountains Wilderness from 2001 to 2021.

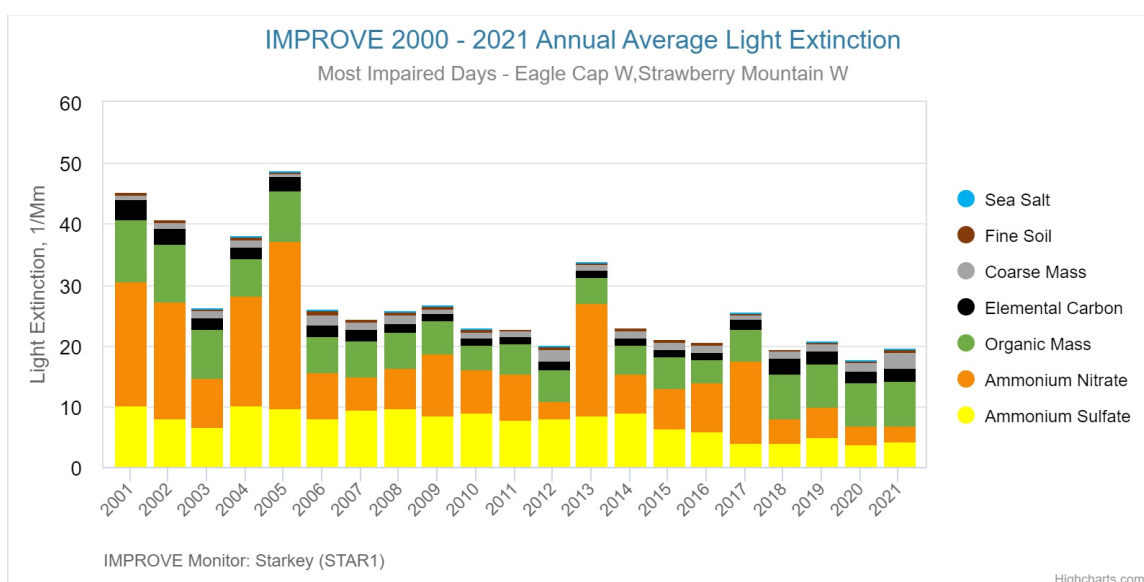


Figure 2. Visibility trends and sources of haze in Eagle Cap and Strawberry Mountain Wilderness Areas

Wildfire Smoke

In Oregon, Washington, and Idaho, wildfire can be the largest source of temporary air pollution, more than emissions from electrical generating facilities, industrial sources, petroleum refining, or automobiles. Smoke contains numerous pollutants, including particulate matter, carbon monoxide, greenhouse gases, and air toxics. Smoke impacts from wildfires can adversely affect air quality, public health, school athletics, travel, tourism, employment, the economy, transportation, and wine and timber industries.

Within the last decade, wildfire smoke has become widespread and long lasting. Emissions from wildfire have been increasing in Oregon since 2014. An analysis of the ten air quality monitors located in and near the Blue Mountains, show an increasing trend in the number of days each summer with unhealthy levels of air quality since 2015.

Current trends and scientific models predict a continued increase in wildfires and associated smoke throughout the 21st century. This is relevant to forest plan revisions because national forests have the most acres burned each year, more than any other landowner.

Looking Forward: Conclusions and Concerns

National forest managers have a continuing legal responsibility to monitor for compliance with state and national air quality standards.

While regulations have helped improve air quality from source emissions, wildfire smoke has been increasing in the last decade, and this trend is expected to continue. Pollutants and smoke from wildland fires temporarily degrade air quality. Because fire is a natural part of the ecological process, Blue Mountains managers may choose to start a prescribed burn. We make these decisions with consideration to protect lives, property, and air quality. Looking forward, specialists will need to continue and expand research to get a more complete evaluation of air pollution on and from the Blue Mountains national forests, as well as monitor how current conditions affect ecosystems.

Additional Information

Borchers, A., E. Chu, T. Doyon, and M. Metcalfe, 2023. Blue Mountain Forest Plan Revision – Socioeconomic Technical Report in Support of the Malheur National Forest Assessment. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168675.pdfusda.gov

Brochers, A., T. Doyon, and M. Metcalfe, 2023. Blue Mountain Forest Plan Revision – Socioeconomic Technical Report in Support of Umatilla National Forest Assessment. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168676.pdf

Brochers, A., T. Doyon, and M. Metcalfe, 2023. Blue Mountain Forest Plan Revision – Socioeconomic Technical Report in Support of Wallowa-Whitman National Forest Assessment. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168677.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Aquatic, Watershed and Riparian Ecosystems

Forests and Clean Water

It may surprise some to learn that one of the original purposes of creating federal forest reserves, now national forests, was to protect water quality and quantity. Widespread logging started in the West by the 1800s and created bleak landscapes with brown, mud filled rivers. In response, Congress, through the Organic Administration Act of 1897, set the purpose of securing water and timber resources for national forests.

No national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States...

– Organic Administration Act of 1897

This was a decision that both responded to an unfolding crisis and was also forward thinking because wherever there is water, life follows. In fact, aquatic and riparian ecosystems are some of the most biodiverse places on the planet. In the Blue Mountains national forests, over 30,000 miles of rivers and streams and 2,000 lakes and ponds support diverse communities of aquatic species, including salmon and steelhead. Local communities and Tribes rely on the Blue Mountains for a variety of beneficial uses such as drinking water, recreation, agriculture, industry, culturally significant foods, and hydropower.

Most streamflow in the Blues Mountains national forests is derived from snowmelt. Spring runoff has typically begun in late February at lower elevations, continuing into August at highest elevations. Water eventually flows to the Columbia River system or closed Harney-Malheur lakes basin of southeastern Oregon. Major tributary rivers of the ecoregion include the Burnt, Grande Ronde, Imnaha, John Day, Malheur, Powder, Silvies, and Umatilla in Oregon, the Tucannon in Washington, and the Walla Walla which spans both Oregon and Washington.

What Are Aquatic and Riparian Ecosystems?

Ecosystems are defined as a biological community of interacting organisms and their physical environment. Aquatic and riparian (streamside) ecosystems consist of streams, rivers, lakes, ponds, groundwater, and their biological communities. Wetlands are where water regularly saturates soils for an extended period and may be connected to ground or surface waters.

In managing for the health of plants and animals that depend on these ecosystems, the Forest Service also considers social and economic factors. These include recreation, scenery, Tribal traditional uses, and community water supplies.



**Hurricane Creek with Sacajawea Peak, Eagle Cap Wilderness
(photo by Gregg Bousfield)**

Current Aquatic, Riparian, Wetland, and Watershed Conditions and Trends

Current forest plan direction for the Blue Mountains focuses on management of riparian habitat conservation areas. Strategies to prevent degradation of these conservation areas typically include management buffers of 50 to 150 feet on both sides of non-fish bearing streams, and 300 feet on both sides of fish-bearing streams. Other strategies include increased protection of watersheds supporting federally listed fish species, standards and guidelines intended to modify or limit adverse effects of land management, and monitoring.

For the Blue Mountains national forests, we evaluated aquatic, wetland, and riparian ecosystems for their ecological integrity, that is, how well an ecosystem is functioning, and whether it can withstand and recover from major disturbances.

Aquatic Ecosystems

What streams contain and how they are shaped can influence habitat for aquatic species and downstream water movement. Woody debris, sediment, and riparian vegetation are all important habitat components for aquatic organisms. For aquatic species and fish, ideal streams feature diverse habitats including many deep pools to hide and rest, boulders and fallen trees in the streambed to provide refugia, trap sediment and create more deep pools, cold and clear water, habitat for food sources, and a lack of fine sediment that would plug refugia spots or blanket spawning areas. The Forest Service identified the most intact, properly functioning streams in the Blue Mountains national forests or "reference" streams, to provide a benchmark to measure other streams against.

By comparing individual streams to reference streams, the conclusion is that overall condition of aquatic ecosystems in the Blue Mountains national forests can improve, as they have deviated from ideal conditions in a significant way. The presence of fine sediment is increasing, and the density of medium sized streambed particles is decreasing. Recent wildfires may have created more erosion and released sediment to streams. The number of pools is decreasing, and pools are becoming shallower, possibly due to recent flood or drought events that are expected to be more frequent in the future. Of all the trends, only large wood frequency was improving in the Blue Mountains national forests, possibly from recent wildfires, which created more downed wood. More large wood may increase pool depth.

The Blue Mountains national forests have increased the pace and scale of aquatic passage, stream habitat, and riparian restoration treatments. We have replaced about 150 fish passage barriers with larger culverts or bridges throughout the three national forests. Over the last few decades, we have completed restoration work on a portion of the impacted lands and cannot quickly restore systems that have been degraded by a century of impacts.

Wetland and Riparian Ecosystems

The Blue Mountains hold a diverse range of vegetative communities in wetland and riparian ecosystems, all of which are changing due to ecological drivers and stressors. Douglas-fir and grand fir usually represent conifer dominated riparian areas in warmer conditions. However, ponderosa pine, which is well adapted to drier conditions, is now growing in these same areas, as soil moisture has decreased over time. In certain locations where groundwater levels have lowered, water-loving willows have given way to drought tolerant currant, shrubby cinquefoil, and common snowberry. Willows and cottonwoods are also browsed on by livestock and wildlife or removed for agricultural uses. Relatively uncommon and fire-dependent quaking aspens are declining and being replaced with conifers, due to fire exclusion and browsing by native wildlife and livestock.

About 42 to 51 percent of all known wetlands in the Blue Mountains national forests are considered riverine (wetlands connected to streams). Palustrine wetlands (freshwater wetlands not associated with streams) are in greater numbers in the Malheur National Forest, whereas the Wallowa-Whitman National Forest has more lacustrine (wetlands along lakeshores) and riverine wetlands.

Wetland and riparian ecosystems at lower elevations with more open, gentle valley bottoms, are inherently more impacted than ones in higher elevation and confined areas. Previous impacts by land use are magnified by natural disturbances such as flooding and wildfire.

Groundwater Ecosystem

Where percolating water meets an underlying layer of bedrock, water travels along the impervious layer and erupts in approximately 5,000 known springs in the Blue Mountains national forests. Of all springs in the Blue Mountains, Malheur National Forest has the most mapped springs at 53 percent, compared to Wallowa-Whitman at 35 percent, and the Umatilla at 12 percent. About half of the groundwater-dependent ecosystems systems that have been inventoried showed adverse impacts to soils and vegetation from water diversions, other human uses, and ungulates.

Evaluating Watersheds

Watersheds are areas of land where all precipitation either drains on the surface or underground into an outlet stream or river. The Forest Service uses a standardized process called the Watershed Condition Framework to evaluate watershed conditions and prioritize restoration efforts. The process evaluates every watershed containing at least five percent of National Forest System land for how they function in relation to water quality and quantity, channel function, aquatic, and terrestrial habitat conditions, and other environmental factors that can influence the state of a watershed. Based on the findings, watersheds are classified as “functioning properly,” “functioning at risk,” or “impaired function”.

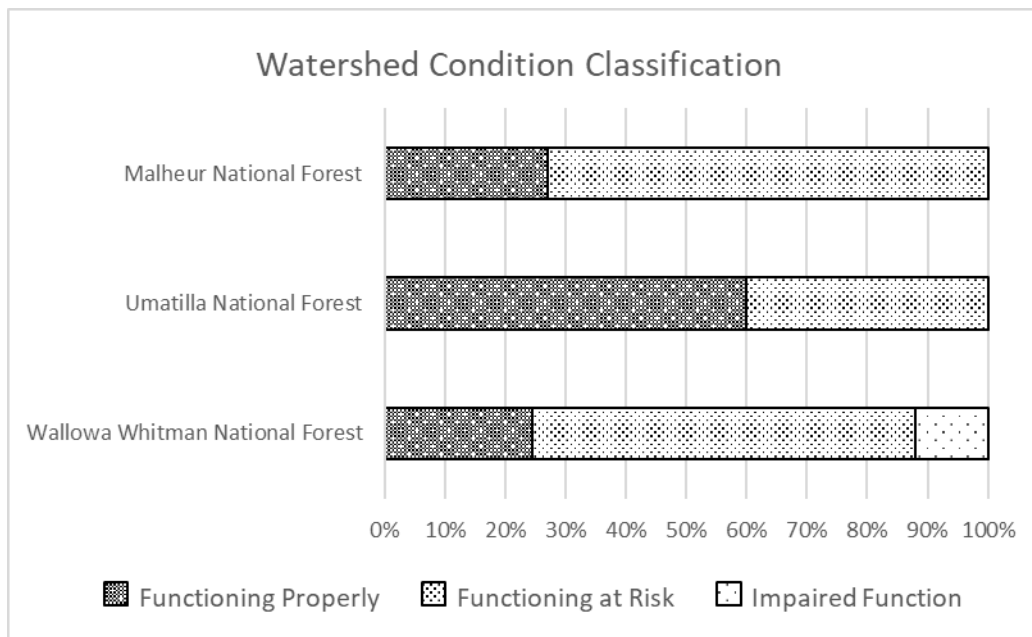


Figure 3. Overall watershed conditions of the Blue Mountains national forests, Watershed Condition Framework

Fewer than 30 percent of watersheds on the Malheur and Wallowa-Whitman National Forests are rated as functioning properly, while most watersheds are functioning at risk. This contrasts with the Umatilla National Forest, where 60 percent of the watersheds are in a properly functioning condition. Only the Wallowa-Whitman National Forest has watersheds classified with impaired function, at about 12 percent. A map of the Watershed Condition Framework ratings is shown on the following page.

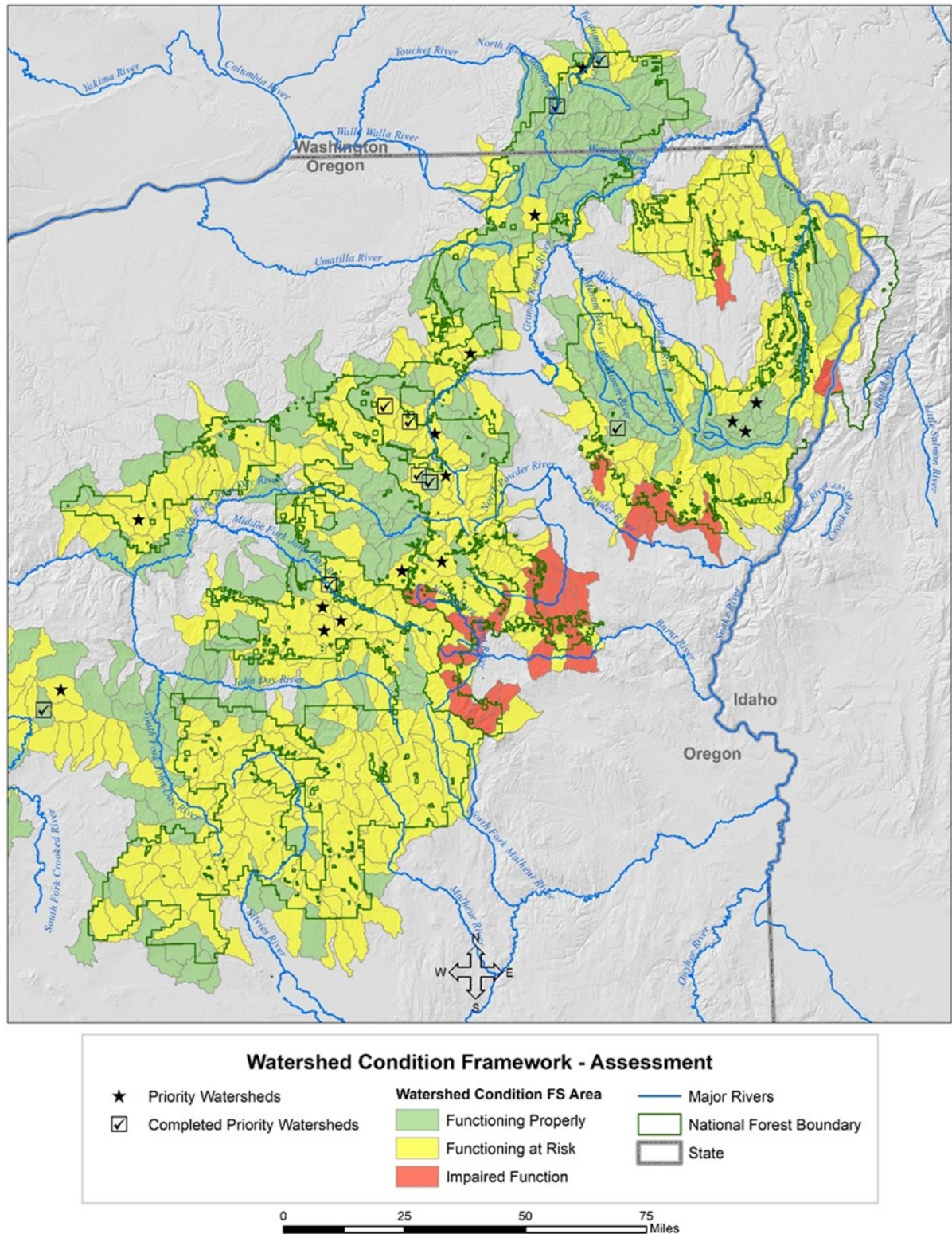


Figure 4. Map of watershed conditions for the Blue Mountains national forests

In the Blue Mountains, roads and trails, water quality, riparian and wetland vegetation, and aquatic habitat have substantial influence on overall watershed conditions. For example, roads and trails that were poorly located or designed can deliver sediment and pollutants to streams, resulting in degraded aquatic habitat. Other influences on watershed conditions include water quantity, fire effects, forest cover, rangeland vegetation, soil condition, overall forest health, and terrestrial invasive species.

Water Quality and Use

Water quality is generally good in most flowing surface waters in the Blue Mountains national forests, with less than nine percent of total stream miles considered impaired according to state water quality standards. Twenty-eight percent of all perennial streams (those flowing year-round and of particular importance to fisheries) are impaired. The primary cause of impairment is elevated water temperature from loss of stream shade, altered channels, loss of floodplain connectivity, and changes in streamflow. Other factors include excess sediment, elevated *E. coli*, low dissolved oxygen, and low pH. In addition, hazardous substances from past mining were identified in certain areas, along with nutrients and bacteria from livestock, wildlife, and recreation. About 60 percent of lakes and reservoirs are impaired, relative to surface area, due to elevated temperature, low dissolved oxygen, excess sediment, arsenic, and methylmercury. Monitoring data suggests improvement in water temperature over the last 20 years from management strategies such as increasing widths of riparian buffers for timber harvests, reduced grazing near streams, and subsequent regrowth of riparian vegetation that provides more shade to streams.

Monitoring data for water quality from best management practices shows that roads, range, and water uses contributed to fair or poor ratings from 2015 to 2022. Issues with roads were related to stream crossings, maintenance, storage, and parking areas. Issues with range were related to grazing and livestock management undertaken through an allotment management plan and grazing permit with term status. Water use issues were related to operations and maintenance of spring-source facilities.

Most water diverted from the Blue Mountains national forests is from thousands of permitted diversions used for agriculture on private lands. Domestic and municipal water uses account for a small amount of the total water withdrawn in the Blue Mountains. Groundwater accounts for less than 10 percent of total water withdrawals, mostly for irrigation. Most of the Forest Service owned water rights are used to benefit domestic livestock.

Water for irrigation on downstream private lands accounts for less than a quarter of total annual streamflow. However, in areas where irrigated agriculture is most developed, summer water use accounts for about half to almost all available streamflow. Counties with well-developed irrigation of Blue Mountains water sources have the highest amount of economic risk from climate change, but also have the highest opportunity to benefit from watershed restoration on the national forests.

Many communities in the Blue Mountains and surrounding areas rely on national forests for their drinking water. National Forest System lands are the primary source of drinking water for the cities of Walla Walla, Pendleton, La Grande, Baker City, and many smaller communities. Some communities have municipal water rights in National Forest System lands but currently use other sources. Overall water use in the United States, Oregon, and counties encompassing the Blues Mountain national forests has decreased over the last decade. However, groundwater use has increased relative to surface water use during the same time period. This

trend is likely due to less regulation and conservation measures on groundwater use when compared with surface water use, as well as technological advances resulting in more efficient use.

Aquatic Species at Risk

Some populations of bull trout, Chinook salmon, steelhead, and sockeye salmon within Blue Mountains national forests are listed as threatened and endangered under the Endangered Species Act. Common risks and stressors among these species are historical declines in aquatic habitat condition and, for the more mobile and migratory populations, connectivity issues caused by infrastructure like road culverts to hydroelectric power facilities. Barriers to movement can also be caused by high water temperatures, low seasonal flow, and competitive or predatory interactions with nonnative species. Viability of Snake River Basin steelhead and Chinook salmon is also influenced by factors outside Forest Service control. These include mortality associated with upstream and downstream passage over multiple mainstem dams in the Snake and Columbia Rivers, cyclical ocean conditions, commercial, tribal, and recreational harvest, and interbreeding with nonnative hatchery stock. Still, considerable spawning, rearing, and migratory habitat exists within the high elevation, cool waters of the Blue Mountains national forests.

Fish such as salmon, trout, and steelhead have cultural, social, and economic importance in the Blue Mountains. Salmon are a culturally important food source for Tribes in the area. They are popular sport fish for anglers and are key to maintaining outfitter and guide businesses and supporting local economies. Fish also serve important ecological roles in the Blue Mountains and are an integral part of complex food webs. Salmon and steelhead, being anadromous (migrating up rivers from the sea to spawn), are key to nutrient exchange between marine and inland freshwater systems.

All three forests within the Blue Mountains contain critical habitat (a legal designation that protects specific geographic areas necessary for the persistence of species or populations listed under the Endangered Species Act) for each of the listed fish. While aquatic and population monitoring for all federally listed fish show that fish habitat is improving, overall aquatic conditions are still considerably departed from ideal reference streams in other important metrics. Population levels are so low in many watersheds that they are at high risk of local extinction (also known as extirpation). These populations are considered unviable without meaningful management intervention.

Restoration of riparian areas within the Blue Mountains national forests and lands of other ownerships are underway. However, faster habitat recovery directed by improved and consistent monitoring and research are necessary to create resilient populations that can sustain into the future or re-populate if extirpation events occur, and to meet species' recovery goals.

Bull Trout (threatened)

Bull trout is listed as threatened under the Endangered Species Act. Bull trout are both migratory and resident within the plan area and critical habitat is present on all three Blue Mountains national forests.

The Blue Mountains bull trout populations fall within the Mid-Columbia River and Upper Snake River Recovery Plans, which outline three recovery goals:

- Bull trout will be geographically widespread across representative habitats and demographically stable.
- The genetic diversity and diverse life history forms of bull trout will be generally conserved.
- Cold water habitats essential to bull trout will be conserved and connected.

Most of these populations are migratory, but some resident populations have been isolated and are very small due to historical land use impacts.

Current habitat conditions range mostly from fair to poor and are generally stable. Their habitat is heavily fragmented by fish passage barriers such as culverts, dams, and irrigation diversions, as well as downstream reservoirs. Warming temperatures and reduced snowpack are expected to further threaten cold-water habitat. Previous restoration efforts have improved and stabilized habitat conditions, and future restoration projects will build upon this improvement. For more details regarding specific populations, please see the Species at Risk Assessment Report.



Bull Trout, photo by R. Tabor, US Fish and Wildlife Service

Chinook Salmon (threatened)

Chinook salmon are listed as threatened under the Endangered Species Act in areas of the Umatilla and Wallowa-Whitman National Forests that drain into the Snake River Sub-Domain Recovery Plan area, as determined by National Marine Fisheries Service. Portions of the Malheur and Wallowa Whitman National Forests contain populations within the John Day River system. These populations are within the Middle Columbia River Sub-Domain, and they are not federally listed as threatened or endangered.

Chinook are the largest of the five Pacific salmon species. Threats to Chinook salmon include overfishing, habitat loss, overuse of water resources, and dams. Populations of Chinook salmon have dropped to a fraction of historical levels, primarily from dams, overfishing, loss of habitat, poor ocean conditions, and hatchery practices.

Spawning habitat on the Blue Mountains national forests tend to be high in elevation, where cold waters are already protected by wilderness designation. Additional spawning habitat is protected within areas managed as Wild and Scenic Rivers, such as the mainstem Grande Ronde and its Wenaha River tributary. The most recent status assessment by the National Marine Fisheries Service for Snake River Basin spring and summer Chinook salmon populations associated with the Umatilla National Forest indicate that all populations are at high risk and not viable. Snake River Basin fall Chinook salmon are currently viable and at an overall low risk of extirpation.

Steelhead (threatened)

Steelhead, like salmon, are at a fraction of their historical abundance due to similar causes such as overfishing, loss of estuarine habitat, hydropower, poor ocean conditions, and hatchery practices. Anadromous fish (fish that use both ocean and freshwater habitat) of these species on all three Blue Mountains forests are listed as federally threatened. The Malheur National Forest supports four Middle Columbia River steelhead populations in three adjacent subbasins. The Umatilla National Forest provides habitat for six steelhead populations within the Middle Columbia River distinct population segment and four populations within the Snake River Basin distinct population segment. The Wallowa-Whitman National Forest provides habitat for one Middle Columbia River steelhead population and six Snake River Basin steelhead populations. All three Blue Mountains forests maintain some viable populations of steelhead. However, there is considerable variability among occupied subbasins, and stream reaches with several populations considered unviable and stable, or unviable and declining.

Sockeye Salmon (endangered)

Listed in 1991, the endangered Snake River sockeye salmon is present on the Wallowa-Whitman National Forest during migrations through the Snake River in Hells Canyon. They use the mainstem of the Columbia and Snake Rivers as a migration corridor to reach their spawning areas in Idaho. The plan area doesn't provide spawning habitat or early rearing habitat outside the mainstem of the Snake River. Consultation on sockeye salmon was completed for the Hells Canyon National Recreation Area Comprehensive Management Plan and no changes are currently proposed. Although a hatchery program reduces the risk of immediate loss, Snake River sockeye salmon remain at a high risk for extinction within 100 years, when considering natural reproduction rates.

Expected Trends

Declining snowpack will reduce summer water availability and alter the timing and magnitude of peak stream flows. This shift will affect availability of water supply for municipal and public uses downstream, likely lowering water availability in late summer when demand is highest.

Increased frequency and severity of wildfire will likely cause more erosion and sediment, remove stream shade, and destabilize stream channels. Reduced groundwater is expected to shrink wetland areas, and streams may become more intermittent. Expected changes in

temperature and late season stream flows hasten the pace of existing habitat degradations. These effects are likely a viability concern for some fish populations in some stream reaches. Productivity of recreationally valuable fisheries will likely be reduced as well.

Looking Forward: Conclusions and Considerations

Most of the watersheds in the Blue Mountains national forests could be improved. Amendments to the 1990 forest plans have strengthened upon original management direction, and all future revised plans in Oregon and Washington will incorporate the Regional Aquatic Riparian Conservation Strategy to improve aquatic and riparian conditions. Based on best available science, we expect aquatic species and habitats to be affected by a declining snowpack, temperature changes, reduced ground water, and summer flows. Increased frequency and severity of wildfire will likely mobilize more erosion and sediment to streams, remove stream shade, and destabilize stream channels with strong peak water flow. We need a greater understanding of groundwater and riparian systems, along with how they interact with stressors such as climate change, severe wildfire, and water use. By better understanding ecosystem responses to changing conditions and other issues, we can more effectively target management strategies to protect aquatic resources.

Additional Information

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https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168608.pdf

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Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Terrestrial Vegetation Ecosystems and Species

Terrestrial (land-based) ecosystems in the Blue Mountains evolved with fire. Ponderosa pines developed protective and massive plates of bark that flake off when set ablaze. Mature Douglas-fir and western larch also have the thick, insulative bark, along with high and open branches to avoid crown fires. Western larch germinates and grows readily in fire-blackened mineral soils, as do quaking aspen and lodgepole pine. The cones of lodgepole pines are sealed with resin and require heat to release their seeds and germinate.

Ecological Stressors and Integrity

Species have adapted to a historical pattern of fire that has changed dramatically in the recent past. Dry upland forests historically experienced up to 15 percent of an area burned as high severity, whereas current conditions can expect up to 60 percent of an area burned as high severity fire. Changing patterns of precipitation and rising temperatures may extend the dry season and affect water quantity and quality. The additional stress to vegetative communities makes them more vulnerable to disturbances such as insect and disease outbreaks, competition-induced mortality, and severe fires. Past land management such as timber harvest, grazing, and road building have compounded these challenges by removing much of the large, drought- and fire-resistant trees, fragmenting habitat, and altering riparian vegetation and hydrological systems.

These impacts have altered how well terrestrial ecosystems function. Akin to how healthy people can more easily recover from illness, healthy forests and plant communities have a better chance of withstanding stress and adapting to change—from both human and natural causes. This is called ecological integrity, a concept we use to evaluate how vegetative communities are faring.

Social, Environmental and Economic Benefits

Trees and other vegetation in the Blue Mountains provide a wide range of social, cultural, environmental, and economic benefits. These include forage, recreation, wildlife, scenery, grazing, open space, clean air and water, economy, firewood, tourism, forest products, sanctuary, and ceremony. Maintaining and enhancing these benefits is an integral part of sustainable vegetation management.

Current Management Direction

The current 1990 plans present goals and objectives for terrestrial ecosystems under other resource topics, including timber, wildlife, fish, diversity, ecosystems and diversity, and old growth. In 1994, the Pacific Northwest Regional Forester of the Forest Service issued the Interim Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales on Eastside Forests. This regional amendment, known as Eastside Screens, applies to all three forest plans and focused direction towards old growth and large tree management. Implementation of Eastside Screens along with national riparian standards greatly reduced the number of acres available for forest treatment activities through timber sales. As a result,

forests have become overly dense, and exhibit reduced structural diversity across the landscape.

While the importance of vegetation management is clear, recent decades have brought big challenges such as increased public use, invasive species, climate change, insects and disease, and past management practices related to fire suppression, grazing, and other land uses.

Terrestrial Vegetation Communities

Vegetation communities are differentiated by factors such as precipitation, elevation, topography, and soils. All major and rare type terrestrial ecosystems of the Blue Mountain national forests are exhibiting degraded and impaired ecological integrity of varying degrees, as shown in the table below. Under the current 1990 forest plans management direction, terrestrial ecosystems are expected to function and provide benefits at a reduced level.

Table 1. Current ecological integrity ranking by ecosystem type for the Blue Mountains national forests

Terrestrial Ecosystem Type	Ecological Integrity Ranking
Dry Upland Forest	Moderate but declining
Moist Upland Forest	Moderate but declining
Cold Upland Forest	Low
Grasslands	Moderate but declining
Whitebark pine	Low
Aspen	Low
Sagebrush Steppe	Moderate but declining

Dry Upland Forest

Dry upland forests are the most common forest type in the Blue Mountains. They occur at low to moderate elevations with warm dry summers and cold wet winters. Water, or lack thereof, limits tree growth at low elevations. Common species in these areas such as ponderosa pine and Douglas-fir are well adapted to thrive with fire. Prior to European settlement, Tribes frequently burned in many areas to increase food supply, maintaining fire as a regular part of the dry forest ecosystem. European settlement greatly impacted natural fire cycles and forest health through fire exclusion and suppression, timber harvest, introduction of nonnative plant species, and livestock grazing.

A healthy dry upland forest hosts trees of different ages and openings with an abundance of native grasses and shrubs, and individual trees scattered throughout. After a century of management impacts, these areas now host a surplus of dense, young, and mid-aged forests rather than open, mature forests. Dense trees compete for nutrients, light, and water, increasing vulnerability to events like widespread disease, insect outbreaks, drought, and large, severe fires. Temperature and moisture changes will magnify the impacts of these stressors, causing uncharacteristic disturbances such as unusually severe wildfire behavior. In the Blue Mountains, ecological integrity of dry upland forests is moderate, but declining.

Moist Upland Forests

Moist upland forests are highly productive, capable of producing the most biomass of any forest type in the Blues. These occur at moderate elevations in the mountains up to the lower areas of the subalpine zone, between dry upland forests and cold upland forests. Unlike dry upland forests that are water-limited and cold upland forests that are more energy-limited, moist upland forests fall in between on the spectrum, with potential for sites to be limited by water or energy. Current warming trends are expected to continue, which may increase productivity in higher elevation moist upland forest but cause drier conditions and reduced productivity where these forests occur at lower elevations.

Moist upland forests host a diversity of tree species. Forested stands may look very different from one another based on their structure, density, and makeup of tree species. Species that sprout and grow quickly after a disturbance that creates more open light (for example, a wildfire) are known as early seral species, and include western larch, Douglas-fir, ponderosa pine, and lodgepole pine. Late seral species such as subalpine fir, grand fir, or Engelmann spruce are more shade tolerant, fire-sensitive species that dominate over time in the absence of high severity disturbance.

Historical fires in this forest type ranged from low-intensity surface fires to fires that killed most trees. Moderate to high-severity fire is more common than low severity fires in this forest type. Past fire suppression and exclusion has favored more shade tolerant and fire-sensitive tree species. In addition, past timber harvests removed large fire-resistant trees, such as ponderosa pine, western larch, Douglas-fir, and western white pine, reducing diverse structures and species mix typical of this forest type. Today, moist upland forests currently exhibit moderate but declining ecological integrity.

Cold Upland Forests

Cold upland forests occur in the subalpine zone, at moderate and high elevations with cold, wet winters and mild, relatively cool and dry summers. Tree species, including whitebark pine, limber pine, mountain hemlock, subalpine fir, grand fir, Engelmann spruce, and lodgepole pine, have historically weathered deep, persistent snowpack, low temperatures, and short growing seasons. Fires rarely effect this forest type. When fires do occur (normally every 150 to 300 years or more), they are often severe enough to kill most or all the trees. Disturbances related to weather such as wind is more common, and at smaller scales.

Continued trends in temperature and precipitation may cause cold upland forests to transition toward high elevation woodlands with a higher presence of ponderosa pine or Douglas-fir. Pockets of cold upland forests may persist in the highest elevations, such as within the Wallowa-Whitman National Forest. Increased insect and disease activity may increase tree stress and mortality as well. Cold upland forests currently exhibit moderate but declining ecological integrity.

Grasslands

Grasslands account for approximately 10 percent of the 4.9 million acres within the Blue Mountains national forests, providing high quality water storage and release, soil protection, biodiversity including rare and unique plant communities, and forage. Grasslands consist of herbaceous vegetation and grasses, occurring mostly where the climate is arid to semi-arid with hot summers and cold winters. Most grassland communities are naturally adapted to fire and disturbance. Past fire suppression and exclusion has increased the encroachment of

conifer trees and western juniper, therefore outcompeting native herbaceous plants. This impacts forage quantity, quality, and availability for native wildlife and permitted livestock. Prescribed fire is beneficial at lower intensities or when completed in mosaic patterns to mimic natural wildfire.

Grasslands serve as early indicators of climate change as they are more sensitive to annual climate variability compared to forestlands. Intense historic grazing, higher than historical fire frequency, and invasion by exotic plants are the biggest threats to the sensitive species occupying grassland habitat. Current range management has improved conditions from historical use, but more restoration work is needed. Grasslands in the Blue Mountains currently exhibit moderate but declining ecological integrity.

Rare and Unique Ecosystems and Species at Risk

Although rare and unique terrestrial ecosystems occupy a small percentage of the planning area, they provide vital habitat for wildlife and endemic and rare plant species. Maintaining and restoring rare and unique ecosystems is essential for overall species diversity and integrity on a larger scale.

Species at risk are those listed under the Endangered Species act or a local species of conservation concern.

Whitebark Pine (threatened)

The U.S. Fish and Wildlife Service listed whitebark pine as threatened under the Endangered Species Act in 2023. Whitebark pine is a keystone species mostly found in higher elevation areas within cold upland forests and wilderness areas. The Wallowa-Whitman National Forest contains the most whitebark pine while the Umatilla and Malheur National Forests have smaller populations. Wildlife species in high-elevation areas depend on it as a food source, and its seeds are scattered by birds called Clark's nutcracker. Whitebark pine also plays a vital role in high-elevation areas as it is one of the first species to grow after a disturbance, stabilizing soil, moderating snowmelt, and providing cover for other tree species.

White pine blister rust and mountain pine beetle outbreaks, along with increased frequency and intensity of disturbances, have led to the decline of whitebark pine in both the United States and Canada. During the past two decades, warmer temperatures have allowed mountain pine beetle to shift upward and persist in high elevation forests. Longer, drier summers may have also increased mortality. Past fire suppression practices have also allowed shade-tolerant conifers to outcompete whitebark pine. Whitebark pine exhibits low ecological integrity in the Blue Mountains.



Whitebark pine, photo by Diana Tomback

Aspen

Quaking aspen, while found throughout northern and western North America, create an uncommon and unique habitat type in the Blue Mountains. Aspen trees are valuable for wildlife such as deer, elk, woodpeckers, songbirds, and small mammals.



Quaking aspen stand at Elk Flat Meadow, Umatilla National Forest. Photo by USDA Forest Service, Umatilla National Forest archive.

The reproductive capacity of aspen has declined due to fire suppression, conifer encroachment, excessive ungulate browsing, insects, and drought and will likely be exacerbated by expected trends in temperature and moisture. Significant efforts have been made since 1990 to restore these and other hardwood species in the plan area. However, the distribution and recruitment of young age aspen needs to increase. A continued decline can reduce the sustainability of certain wildlife populations and key ecosystem components. Aspen currently exhibits low ecological integrity in the Blue Mountains.

Sagebrush shrublands

Sagebrush shrublands make up a small portion of the plan area but contribute to the biological diversity of forests, including habitat for rare species such as sage grouse, a species of conservation concern found primarily in the Malheur National Forest. Sagebrush shrublands have declined since the late 1850s due to land use conversion and invasive plants. The extent and condition of sagebrush communities are threatened by juniper encroachment, roads, off-highway vehicle recreation, wildfire, invasive species, and grazing.

Sagebrush is deep-rooted and well adapted to cold winters and summer drought. There is evidence within the past ten years that sagebrush presence has increased with a warming climate. While a warmer climate can result in a greater extent of sagebrush shrublands, more frequent and severe wildfires can convert shrublands to non-native annual grasses in some areas. Sagebrush shrublands are currently exhibiting moderate but declining ecological integrity.

MacFarlane's Four O'clock (threatened)

MacFarlane's four o'clock is a rare perennial forb endemic to a small range, growing predominantly below 3,000 feet in canyon grasslands. The only known occurrences within Blue Mountains national forests are in Hells Canyon National Recreation Area. Potential stressors include invasions by aggressive nonnative plants, poor to degraded land health conditions, and changing fire frequency and seasonality. Variations in temperature and precipitation also affects plant vigor, recruitment, and viability at sites.

Spalding's Catchfly (threatened)

Spalding's catchfly is an herbaceous perennial found on open ridges in the Umatilla and Wallowa-Whitman National Forests. It occurs mostly in Pacific Northwest bunchgrass grasslands and sagebrush-steppe, and occasionally in open-canopy pine stands. All populations in the Blue Mountains national forest are within active grazing allotments, although pastures in the Umatilla National Forest have been rested until we consult with the U.S. Fish and Wildlife Service. We have identified two key conservation areas on the Wallowa-Whitman National Forest.

Spalding's catchfly populations are stable or increasing. The main threats facing Spalding's catchfly in the Blue Mountains national forests are invasion by nonnative plants, grazing and trampling, and change in fire frequency and seasonality. Invasive plants that currently threaten Spalding's catchfly include yellow star thistle, sulfur cinquefoil, North African grass, Japanese brome, downy brome, and rye brome.

Looking Forward: Conclusions and Considerations

In terrestrial ecosystems, past management actions such as fire suppression, timber harvests, and grazing combined with current forest plan and Eastside Screen direction, continue to influence how terrestrial ecosystems function today. Now, much of the landscape is dominated by dense, young, and middle-aged forests. Tree species are shifting away from those that are most resilient to disturbances such as fire, drought, and insects and disease. Climate change compounds the effects of these disturbances, increasing the threat of insect and disease outbreaks and wildfire that is uncharacteristic in intensity, severity, occurrence, and distribution. The ecological integrity of all major and rare types of terrestrial ecosystems in the Blue Mountains are degraded to some degree, limiting their ability to withstand and recover from disturbance. New scientific information and data show a compelling need to shift the management paradigm to sufficiently address the vulnerabilities that future disturbances present to these ecosystems. Ongoing consideration of new science for management is essential in adapting and responding to changing conditions and uncertainties that terrestrial ecosystems face.

Additional Information

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https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168595.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Fire

Fire is a natural ecosystem process in the Blue Mountains national forests. Historically, fire was a predominant disturbance type in the area, especially in dry upland forests with limited moisture. Fire-adapted forests like many of those found in the Blue Mountains evolved with frequent, low, and mixed severity fire under short to medium length return intervals. This kept forests from becoming too dense, and fuels (from both live and dead understory vegetation) from accumulating. However, this vital natural process was removed through fire suppression. Fire suppression policies, originally enacted to protect timber resources, has allowed forests to become uncharacteristically dense and ground fuel to accumulate.

Today, much of the landscape is currently moderately to highly departed from reference conditions for vegetation and fuel. Dry upland forests, most common to the Blue Mountains, exhibit moderate to declining ecological integrity and are less resilient to disturbance events. The threat of large wildfires under these conditions, exacerbated by expected temperature and drought trends, can create wide-ranging tree mortality. While fire is important to the Blue Mountains, uncharacteristically severe fire is now an ecosystem stressor and a potential threat to communities due to past management policies.

Fire and Vegetation Challenges and Concerns

A multitude of challenges and concerns related to fire and vegetation is described below.

Aspen. Historically, natural wildfires helped aspen grow by removing the shade of taller trees, killing encroaching conifer trees, and stimulating new sucker growth from aspen root systems. Elimination of fire can reduce its ability to regenerate.

Climate Change. Observed changes in temperature and moisture are expected to continue and lead to more severe and frequent wildfires.

Conifer spread. Over time, conifers can spread onto land that was historically dominated by sagebrush or grasses. Elimination of fire can hasten this process.

Fire suppression. Fire suppression has contributed to increased vegetation density and woody debris buildup, which can lead to severe fires that kill most of the vegetation in an area. Fire suppression also interferes with the natural transition of one plant type to another over time.

Forest cover reduction. Forest cover (the amount of forest in a particular area of land) amounts have been reduced in some areas because of recent large-scale wildfires. This has affected vegetation and watersheds. Cover for wildlife has been reduced, natural regeneration rates have been delayed and re-burn risk has increased.

Homogeneity. Severe fires, invasive species, fire suppression, and other actions can interfere with natural vegetation transitions, resulting in structural homogeneity, or a lack of species diversity.

Wildfire. As a natural part of ecosystem changes, fire influences many environmental factors such as vegetation mix, nutrient recycling, and stimulation of fire-dependent and fire-adapted

vegetation. Climate change, drought, insect infestations and long-term fire suppression are among the conditions that can cause wildfires to be much more severe, resulting in a higher level of destruction and a longer time for burned areas to recover.

Wildland-Urban Interface. The wildland-urban interface is the area where wildlands and human development meet. Having human residences, commercial properties and infrastructure near managed natural lands creates additional considerations when it comes to land management issues such as forest and fuel management and prescribed burning.

Carbon stocks. Closely related to fire and vegetation are carbon stocks, which is the amount of carbon stored in the world's land-based ecosystem—mainly within living vegetation and soil, but also in dead wood and litter. Forest carbon levels naturally change over time. For example, when they're in a rapid growth mode, forests may pull more carbon dioxide from the atmosphere than they give off, which may help slow climate change. But when there's a wildfire, the opposite can happen—forests can give off more carbon dioxide than they store.

Management Tools

Managing fire within its range of variability contributes to restoring ecological integrity and forest resiliency through active forest management. Current forest plan direction allows the use of prescribed fire (management-ignited) as a tool to achieve resource objectives. Other methods for managing vegetation and fuel load include non-commercial and commercial thinning, mastication (chipping and mulching small trees, shrubs, and fuels), debris piling, and burning. These tools can help reduce forest fuels, prepare a site for regeneration following harvest, and improve wildlife habitat. Prescribed fire can influence vegetation conditions in a similar manner to wildland fires. Over the past few years, there has been an increased emphasis on the hazardous fuel management program within the Blue Mountains national forests. The Forest Management Assessment Report provides further details on acres treated for fuels.

Looking Forward: Conclusions and Considerations

As wildfires grow in scale and duration, and increasingly impact nearby communities, we need a clearer understanding of how wildfires affect economies and communities. Wildland fire impacts are often described in terms of lives threatened, structures and homes lost or damaged, overall suppression costs, and damage to the natural resource base on which many rural communities rely. We also need a better understanding on the effectiveness of forest management tools in different situations to restore forest resiliency. Continued restoration of forests and watersheds using a suite of management tools including thinning and prescribed fire can improve resilience against larger and more severe wildfires.

Additional Information

McCusker, N. 2024. Assessment for Forest Plan Revision – Forest Management, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168604.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Carbon Stocks

What are Carbon Stocks, and How Do They Change?

Life as we know it is carbon-based and present in all living beings. In forests, trees and plants take carbon dioxide from the air and transform it into building blocks for growth, above and below ground. Carbon exists above ground in live vegetation and dead plant material, and below ground in organic materials within soils and in roots. The total amount of this stored carbon in land-based ecosystems is called carbon stock.

Carbon dioxide and other greenhouse gas emissions over the last century are causing climate change. When carbon is taken out of the atmosphere by plants (sequestered), it can reduce the severity of climate change. Carbon is released back into the atmosphere as carbon dioxide when vegetation burns or decomposes. Carbon cycles dynamically through our ecosystems and forest carbon levels naturally change over time. For example, when trees are young and growing rapidly, forests usually pull more carbon dioxide from the atmosphere than they give off, creating a carbon “sink.” But when there’s a severe wildfire, the opposite can happen – forests can give off more carbon dioxide than they store, which releases greenhouse gases like carbon dioxide to the atmosphere and contributes to climate change, creating a carbon “source.”

Forest carbon stocks, like the forests themselves, are influenced by disturbances and environmental factors. Disturbances include fires, timber harvest, fungi or insect-related tree mortality, and competition-induced mortality in forest stands. Forests aged 30 to 60 years old sequester the most carbon in most forest types. Very young forests take up less carbon from the atmosphere, and aging forests have higher ratios of mortality and carbon release.

We expect some aspects of climate change to enhance vegetation growth. Environmental factors that may increase the growth of vegetation include the increase in carbon dioxide concentrations in the atmosphere, nitrogen deposition, and the availability of key nutrients. However, precipitation characteristics like decreased snowpack and temperature changes are expected to increase disturbance frequency and severity to forests and increase tree mortality. This would transfer carbon from live to dead carbon pools and ultimately to the atmosphere.

Based on national inventory data, carbon stocks in national forests within the Pacific Northwest Region (Oregon and Washington) increased by an estimated 16 percent from 1990 to 2020, meaning that more carbon has been gained than released. The Blue Mountains national forests’ carbon stocks all increased between 1990 and 2020. Although carbon has been accumulating in the Blue Mountains national forests since the 1950s, it is doing so at a slower rate in recent years, due to disturbances and aging effects (many forest stands harvested in the early 20th century have moved into older age classes). In the early to mid-1990s, timber harvest was the largest carbon disturbance on the three Blue Mountains national forests. Since then, wildfire has become largest disturbance.

Forest carbon stocks also include harvested wood products during their estimated usable life, such as wood used for lumber and furniture. We estimate that in 2013, wood products harvested since the establishment of the Forest Service accounted for 6.4 percent of total carbon stocks in the Pacific Northwest Region. The region is now in a period of decreasing

percentage in carbon stocks held in harvested wood as large volumes of wood harvested in previous decades are slowly retired and decay.

Carbon Stocks in Rangelands

Rangelands account for approximately 16 percent of total area in the Blue Mountains National Forests. Most of the carbon in non-forested areas is belowground in soils and roots. By contrast, forests typically store one-half of the total carbon below ground. The extent to which factors like grazing history and changes in wildfire patterns influence rangeland carbon dynamics in these national forests is not well understood. Because soil carbon in rangelands is generally stable, substantial changes in carbon levels are typically a result of dramatic changes in land use that persist indefinitely. For example, there can be substantial losses of soil carbon where rangelands have been converted to agricultural use. Like forests, managing the health of rangelands and avoiding land use and land cover change are key concerns for maintaining carbon stocks.

Existing Conditions and Disturbances

In 2020, the Malheur National Forest had the lowest carbon density of the national forests in the Pacific Northwest Region. The Wallowa-Whitman and Umatilla National Forests were fifth and sixth least carbon dense out of 17 national forests. All three national forests have increased carbon stock levels from 1990 to 2020, with the Malheur and Wallowa-Whitman National Forests having the largest increase, about 33 percent, in carbon stock across the Pacific Northwest Region, although the rate of carbon accumulation is slowing.

Current forest conditions, which reflect the legacies of historical fire suppression and logging, make forests more vulnerable to fire, pest outbreaks, and other disturbances, resulting in aboveground less stable and secure carbon stocks. Fire replaced timber harvest as the most significant disturbance affecting carbon during the years between 1990 to 2011. Based on anticipated trends and scientific models, we expect the Blue Mountains to get even warmer, intensifying disturbance frequency and severity. These changes may also affect how well vegetation regenerates following a disturbance.

Looking Forward: Conclusions and Considerations

Carbon stocks have been increasing over the last three decades in the Blue Mountains national forests. This increasing trend can be an indicator of overstocked and stressed forest stands that have decreased both ecosystem health and resilience to disturbance. In recent years, fire has been the most significant disturbance decreasing carbon stocks. Increasing the resilience of national forests and grasslands to disturbances is important in maintaining or improving their carbon stability over the long term. The 1990 forest plans do not address the role of forest ecosystems in the carbon cycle or management effects on carbon storage or sequestration. Agency policy related to carbon assessment and stewardship evolved after the signing of the current forest plans in the Blue Mountains. The 2012 Planning Rule requires inclusion of baseline carbon stocks and consideration in planning efforts.

Additional Information

Warren, K. et al. 2024. Assessment for Forest Plan Revision – Baseline Assessment of Carbon Stocks Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168596.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Terrestrial Wildlife Ecosystems and Species

The wildlife and its habitat cannot speak, so we must, and we will.

– Theodore Roosevelt

Wildlife Management Over Time

In 1979, Jack Ward Thomas, former Chief of the Forest Service and then lead wildlife researcher at the Pacific Northwest Forest and Range Experiment Station in LaGrande, Oregon, developed a Forest Service handbook titled, “Wildlife Habitats in Managed Forests, the Blue Mountains of Oregon and Washington.” It called for a shift in managing for one wildlife species at a time to a focus on evaluating the impacts of forest management on all wildlife. The handbook also set a framework for forest managers to alter timber harvest plans to leave suitable habitat for wildlife. This ethos is reflected today in the 2012 Planning Rule, which emphasizes ecological integrity of the ecosystems that provide for wildlife habitat.

The Forest Service 2012 Planning Rule lists wildlife conservation as one of the multiple uses required for consideration during plan revision. The Planning Rule states, “Wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species.” This is challenging due to past management practices, increasing fires, rising recreational use, demand for services and amenities, and a changing climate.

Social, Environmental and Economic Benefits

The Blue Mountains wide diversity of species and habitats provide a great many social, economic, recreational, and environmental benefits. The area is noted for exceptional elk hunting opportunities, a high density of black bears, the only moose population in Oregon, and recovery of bighorn sheep and wolves. Simply experiencing wildlife presence is part of the forest recreation experience, along with intentional viewing, photography, and birding. Tribal communities often rely on traditional foods, such as water, salmon, game (such as elk and deer), roots (such as cous, camas, and bitterroot), and berries (such as huckleberries and chokecherries). While these plants and animals, as well as water and other resources, have cultural significance, they also provide recreational viewing and hunting experiences and are an important economic contributor to local economies. Pollinator species such as bumble bees are receiving heightened attention due to declines and their importance to maintaining plant life for people and animals.

Wildlife Directives and Challenges

Management concerns related to wildlife habitat on the Blue Mountains national forests include:

Climate Change. A warming climate can increase frequency or severity of drought, fire, wind, floods, insects, and disease. These changes can alter habitat characteristics and force species to seek more suitable areas, which may not be available.

Fire and fuel management. Managing both wildfire and prescribed burning is critical to maintaining species and habitats that evolved with fire. Many wildfires are beneficial to wildlife, but others can rapidly reduce habitat in the short term.

Invasive plants. If left unchecked, invasive plants can reduce or make habitats unsuitable for native species.

Management coordination. Wildlife cross administrative boundaries. As a result, habitat and wildlife management efforts must be coordinated with other agencies and private landowners.

Multiple use. Under the Federal Land Policy and Management Act of 1976, “multiple use” includes various recreational activities, commercial resource extraction and other land uses, which can change habitat or disturb wildlife.

Special Habitats Important for Wildlife

The current 1990 forest plans refer to special habitats as old growth forest, snags and down wood, riparian areas, meadows, aspen, bald eagle winter roosts, raptor nests, and unique areas such as caves and elk wallows. Some of these habitats have special designations within the current forest plans while others have forest-wide standards and guidelines.

Old Growth Forest

Many wildlife species require the structural complexity typical of mature and old forests for habitat. Large, old trees are important ecological keystones, whether found within an old growth stand or as scattered individuals. They develop features that make them valuable wildlife habitat, for fire and drought resistance, and as a seed source for new trees. Large trees are also important for carbon sequestration and storage.

The presence of large old trees within a stand can make a substantial difference for wildlife habitats. Regional landscape assessments over the past 20 years show declines in the number of large old trees and amounts of old forests in eastern Oregon. In the past few years, the number of ponderosa pine and Douglas-fir trees greater than 21 inches diameter at breast height in eastside forests have increased since 1995, however the number of old trees has declined. Trees 150 years in age and older decreased by approximately 8 percent between 2001 and 2017.

Snags and Down Wood

Snags and down, decaying wood are important habitat components of forested ecosystems. Numerous species depend on snags and down wood for nesting, food sources, and refuge and they use snags or down logs differently at various stages of decomposition.

Snags and down wood are deficient across most Forest Service managed watersheds, especially snags over 20 inches diameter at breast height. In current management, local projects have left more snags and down wood than are required to increase overall snag densities across the landscape. We have also left down logs and slash on the ground as wildlife habitat for species such as black bear and American marten, along with their food sources, such as carpenter ants and small mammals. Down wood is also important for rare snails and plant life.

Existing forest plan standards for snags in harvest units used calculations that are no longer valid according to new scientific information, which needs to be addressed in plan revision.

Aspen

Aspen is an important wildlife habitat in the Blue Mountains because it contains a high diversity of wildlife species compared to adjacent areas. However, aspen is scattered throughout the landscape and are in decline. Since 1990, we have undergone many restoration projects for aspen and other hardwood species. However, it has proven difficult to spread aspen to new areas or establish sprouts in current areas. Changes in temperature and moisture are expected to reduce water availability, causing additional stress and aspen decline. A continued decline in this important habitat type could reduce certain wildlife populations and key ecosystem components such as aspen snags.

Unique habitats

Small but important sites such as caves, cliffs, talus, seeps, springs, elk wallows, and raptor nests, are protected by standards and guidelines in the current forest plans. Active forest management projects have restrictions to protect these special areas, although other activities such as livestock grazing, recreation, and mining do not provide the same restrictions.

Riparian Areas and Meadows

Riparian areas provide habitat for fish, wildlife, plants, and invertebrate species. They also serve as travel corridors and provide water sources and cover. Wildlife species use riparian areas at higher proportions than other areas of the forest, and biodiversity is overall higher.

Meadows and other forest openings provide forage and habitat for many wildlife and plant species. These areas support plant and animal diversity and are home to rare and endemic species. Vegetation in many meadows have changed in the Blue Mountains, primarily due to fire suppression and grazing. These disturbances often cause downcutting of streams, triggering long-term changes in meadow vegetation and hydrologic function. Changes in ground water levels and soil moisture can displace plant species. Ongoing restoration projects benefit water quality, fish, and riparian-dependent species.

Wildlife Habitat Connectivity

Connectivity refers to the ecological conditions that exist at several spatial and temporal scales that provide landscape linkages and permits the daily and seasonal movements of animals within their home ranges. Connectivity is important for the dispersal and genetic interchange between populations, including but not limited to, the long-distance range shifts of species in response to environmental changes. The ability to successfully move between habitats is essential for the long-term survival of many species. Both Washington and Oregon have conducted state-wide analyses of barriers to wildlife movement. Forested areas of the Blue Mountains are reasonably well connected with primary landscape scale issues being highways and other barriers such as fences that prevent mule deer and pronghorn migration and increase the probability of fence entanglement and higher rates of mortality. In addition, vegetation management can reduce connectivity between suitable habitat patches for species that are sensitive to “edge” such as American marten and northern flying squirrels.

Current forest plans require special consideration including connectivity corridors between all late and old structure forest stands when planning vegetation management activities. These

connectivity corridors include stand level standards such as a minimum corridor width to maintain a higher degree of connectivity for species sensitive to “edge”. This has been effective at reducing habitat fragmentation at the sub-watershed scale; however, the plans do not address existing barriers, such as highways that cross the national forests, connections between roadless areas, or species-specific corridors such as big game migration routes.

Species Classifications

The Forest Service’s 2012 Planning Rule requires that national forests identify and evaluate vulnerable species in the plan area. The U.S. Fish and Wildlife Service keeps lists of federally endangered, threatened, proposed, and candidate species per the Endangered Species Act. Definitions of several vulnerable species classifications are below.

Endangered Species. These species are federally recognized as being in danger of extinction throughout all or a significant portion of their range.

Threatened Species. These species are federally recognized as likely to become extinct in the foreseeable future throughout all or a significant part of their range.

Proposed Species. Species for which there is sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act and development of a proposed listing regulation is not precluded by higher listing priorities.

Candidate Species. Plants or animals being considered for listing as endangered or threatened species, but not yet the subject of a proposed rule. There is sufficient information on their biological status and threats to propose them for listing but there are other higher priority listing activities.

Species of Conservation Concern. The Forest Service designation of “species of conservation concern” applies to native species not included in Endangered Species Act categories, but have declining populations, habitat threats, restricted habitat range or other factors of concern and for which the best available scientific information indicates substantial concern about the species’ capability to persist over the long term in the plan area.

Determining species of conservation concern is part of the 2012 Planning Rule approach to meet the National Forest Management Act’s requirement of “providing for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives.” Over 300 potential species of conservation concern are being assessed for the plan area. This list can be found in the Species at Risk Assessment Report. Pending review, the species will be grouped according to habitats and risks, to develop forest plan components. We will not finalize the species of conservation concern list until plan revision is complete.

Species of Public Interest. These are species commonly enjoyed and used by the public for hunting, trapping, observing, or sustenance, including cultural or tribal uses. The term “Species of Public Interest” is used in the assessment to organize the descriptions of these species. It is not a specific designation like threatened or endangered species, or species of conservation concern. State fish and wildlife agencies manage many of these species through hunting regulations.

State fish and wildlife agencies manage wildlife, while the Forest Service manages their habitat.

Wildlife Species on the Blue Mountains

Gray Wolf (endangered)

Gray wolves are native to the area and serve as an apex species, occupying a top place in the natural food chain. Key habitat components for wolves include year-round prey of elk, deer, moose, and smaller prey, secluded denning and rendezvous sites, and open spaces with minimal exposure to humans.

Absent for many years due to low tolerance by humans, wolves have made a comeback to the Blue Mountains. The primary threats to wolves continue to be human related, including illegal shooting, conflict with livestock which can result in lethal take permits, and vehicle collisions. Of the 20 wolf mortalities in Oregon in 2022, 17 were human caused.

Gray wolves are listed and managed as an endangered species where they occur west of Oregon and Washington State Highway 395. Listed status applies to 43 percent of the Malheur, and 20 percent of Umatilla, and none of the Wallowa-Whitman National Forest. While individual wolves roam this area, there are currently no wolf packs west of Highway 395, as defined by four or more wolves traveling together in winter.

In contrast, many wolf packs reside east of Highway 395 and are thus not listed as endangered. Currently, 18 wolf packs are utilizing most of the Umatilla National Forest, the Wallowa-Whitman has 11 packs, and the Malheur has 1 pack. The Blue Mountains wolf population has steadily grown since 2008 but has slowed down in the past few years.

Wolverine (threatened)



Wolverine at remote camera, Wallowa-Whitman National Forest, photo by USDA Forest Service

Known for their persistence and ferocity, wolverines are the largest land-dwelling member of the weasel family. They are adapted to live in cold, snowy areas with large, flat feet, thick fur coat, and a compact body. Wolverines range long distances year-round but dig dens for pup rearing in areas that retain snow well into the spring. They hunt mammals such as rabbits and rodents and consume carcasses of large animals including elk and deer. The Wallowa-Whitman National Forest has the most potential wolverine habitat in the plan area. While there is currently no evidence of wolverines reproducing in the Blue Mountains, individual wolverines are occasionally documented with camera traps on the Wallowa-Whitman.

Projected declines in snow pack are the main global threat to wolverine persistence. Spring snow cover is predicted to decrease as precipitation falls more as rain than snow. Wolverines avoid both motorized and non-motorized recreation, especially during the denning period. Avoidance of human disturbance and declines in snowpack may cause the limited amount of wolverine habitat in the Blue Mountains national forests to be reduced.

Monarch Butterfly (candidate species)



Monarch on milkweed, photo by Stephanie McKnight, Xerces Society

Monarch butterflies are one of the few insects to make a migratory journey every year. Monarchs that live in the west migrate to the coastal areas of central and southern California in the winter. They lay their eggs and feed exclusively on milkweed as caterpillars.

The western population of the monarch butterfly has been in general decline over the last 23 years, and the probability of extinction for the western population is 92 to 95 percent over the next 30 years. The primary reasons for their decline are widespread pesticide and herbicide use, degraded habitat, and limited availability and distribution of milkweed and nectar. Careful timing and using best management practices during forest management activities such as grazing, prescribed burning, and wildfire suppression can affect the availability of host and nectar plants.

Bighorn Sheep (species of interest)



Bighorn sheep rams, photo by Mark Penninger

Bighorn sheep are valued for recreational and tribal benefits such as hunting and viewing and provide a food source for key predators such as wolves and cougars. They are included as a potential species of conservation concern but are highlighted here due to heightened public interest. Bighorn sheep prefer high elevation habitat with steep, rocky areas to escape predators. Although many factors affect bighorn sheep populations and habitat, the most significant is the potential for disease transmission from domestic sheep or goats. To help manage disease spread, domestic sheep need to be effectively separated from bighorn herds. Although current forest plans don't identify areas unsuitable for permitted domestic sheep and goat grazing, changes are made periodically in Allotment Management Plans.

Mule Deer (species of interest)



Mule Deer, photo by David Herr

Mule deer are important game animals that contribute to local culture and economies, as well as cultural and ecological values. They are ecologically adaptable and can be found in a wide range of climate and vegetation zones. The combined total mule deer population in Oregon has never reached the established state objectives, many of which were established as long ago as 1981. Declines since 1990 are believed to be primarily due to combined effects of drought and severe winters. Research suggests many mule deer herds in Oregon are nutritionally limited and may be at or very near landscape potential.

Rocky Mountain elk (species of interest)



Cow elk group, Umatilla National Forest, photo by USDA Forest Service

Rocky Mountain elk are highly valued for hunting, wildlife viewing, and for tribal and cultural significance. Their habitat is expansive across the Blue Mountains. Current populations are stable overall, although some herds are not meeting state population objectives. There are approximately 55,400 elk in the Oregon hunt units overlapping the Blue Mountains national forests, which is quite close to the total management objective of 56,800. Washington

Department of Fish and Wildlife estimates 3,900 elk in the Blue Mountain elk management zone, which is 30 percent below the state objective of 5,500 elk. The Washington Blue Mountain herd was stable until about five years ago when a severe winter reduced the population.

Existing forest plans focus on providing a mix of dense tree cover and open forage areas and limit motor vehicle access in some key areas such as winter range and calving areas. While tree cover is still an important habitat consideration, the best available scientific information now indicates that the distance from open motor vehicle routes and the quality and quantity of forage are key aspects of elk habitat. A new model for the Blue Mountains region that evaluates nutritional and habitat conditions for elk at landscape scales will soon be available.

Looking Forward: Conclusions and Concerns

Some species have declined in numbers while others have remained stable or have increased. Species dependent on cold climates and persistent spring snowpack may experience shrinking habitat, with warming temperatures and precipitation falling more as rain than snow. Future wildlife management will be challenged by predicted changes in climate, combined with threats of invasive species, and challenges in managing wildlife and public interactions. Scientific information has evolved since the current plans were created regarding wildlife habitat requirements and will be used to inform new management direction. Managing for healthy, resilient wildlife habitats increases the likelihood of maintaining viable wildlife populations, especially when faced with disturbances events.

Additional Information

Yates, K., H. Harris. 2024. Assessment for Forest Plan Revision –Species at Risk Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168595.pdf

Harris, H. 2024. Assessment for Forest Plan Revision – Wildlife Species and Habitats of Interest, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168607.pdf

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ASSESSING SOCIAL AND ECONOMIC SUSTAINABILITY AND MULTIPLE USES

Cultural and Historical Resources and Uses

People in the Blue Mountains

We can reflect on the role of humans in past and present ecosystems to help understand today's landscapes and natural resource issues. Cultural resources have scientific, scenic, ecological, social, educational, and recreational value and offer a tangible connection to history and culture. They also offer a sense of place and have an intrinsic value to people whose ancestors used and occupied the lands.

The Blue Mountains were not pristine wildernesses prior to the arrival of non-native people. Indigenous people actively managed these ecological systems. Plant gathering methods increased the productivity of the soil and increased the yield of important food resources. Fish, game, and plant harvests were timed to ensure future availability. Fire was consistently used to manage vegetation for human and animal consumption. The rivers provided salmon, steelhead, sturgeon, lampreys, suckers, and trout and these resources were managed and cared for.

Indigenous cultures in the region remained generally stable until the effects of European colonization of North America reached the area many centuries ago. Long before the arrival of non-native emigrants in the region, foreign diseases swept across the area and caused significant population loss and social disruption. Several Tribes adapted the horse into their culture as early as 1700. In the 1850s and 1860s, some Tribes entered into treaties with the United States in which they retained their sovereignty and access to critical resources.

The Lewis and Clark Expedition in 1804 opened exploration by non-native people in the Blue Mountains. American and Canadian fur trappers followed, and Oregon Trail migration began in the early 1840s. Gold was discovered in the Blue Mountains in the 1860s and Euro-American and Chinese settlement began in earnest. By 1870, Chinese and Chinese Americans made up 79 percent of miners and 42 percent of the population in Grant County, some working in Chinese owned mining companies while others participated in skilled trades. Mines and settlements required timber, and logging became a big industry in the area in the 1880s.

Grazing and farming increased as the population grew. Mining and logging required railroads and roads, many of which are still in place today. Ditches were also constructed to move water to mining and agricultural operations. From 1902 to 1907, land in the Blue Mountains were withdrawn from the public domain as Forest Reserves, eventually designated as national forests in 1908. As the population increased, more people began visiting the national forests for recreation. In the 1930s, the Civilian Conservation Corps constructed and improved many Forest Service recreation sites in the Blue Mountains. The Forest Service also established many fire lookout towers, along with cabins and other administrative sites.

The Need for Preservation

Today, cultural resources are vulnerable to infrastructure development, inappropriate public use, looting and vandalism, management activities, timber harvest, livestock grazing, and mining, along with natural processes such as erosion by wind and water, weathering, and wildfire. Cultural resource surveys completed during the planning phase for site-specific

projects and prior to ground disturbance can identify previously unknown cultural resources. If resources are found, we mitigate potential damage by changing operating plans. Though the potential to affect cultural resources exists, they have been carefully managed to avoid or mitigate adverse effects.

Laws and Regulations

Because cultural resource sites are nonrenewable resources and easily damaged, there are many laws and regulations to help protect them. One of these is the National Historic Preservation Act of 1966, which requires Federal agencies to consider the effects of their decisions on historic properties. The Act also established the National Register of Historic Places, which is the United States' official list of sites, objects, districts, and landscapes that have qualified as being worthy of preservation.

Cultural resources that are listed on the National Register or are eligible for listing are called "historic properties." For a property to be eligible for the National Register, it must meet at least one of the following criteria:

- That are associated with events that have made a significant contribution to the broad patterns of our history.
- That are associated with the lives of persons significant in our past
- That embody the distinctive characteristics of a type, period, or method or construction, or that represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction.
- That have yielded, or may be likely to yield, information important in prehistory or history.

The Blue Mountains national forest plans from the 1990s have different priorities and levels of detail related to the National Historic Preservation Act. While the Forest Service follows new direction when it is adopted, the decades-old forest plans do not reflect new laws, regulations, and guidance developed over the past 30 years. However, both contain management goals and objectives related to cultural preservation and both mention sites of cultural importance.

Cultural Resources on the Blue Mountains

Cultural resources listed on the National Register are further categorized into four types: pre-contact site, historic site, traditional cultural property, and historic properties of religious and cultural significance to Indian Tribes (HPRCSIT).

Pre-Contact Site. These sites were established before the advent of a continuous written record, or before approximately 1800 in this area. Pre-contact sites common to the Blue Mountains include quarries, tool manufacturing sites, hunting camps, fishing stations, plant gathering and processing sites, rock art sites, villages, and sites resulting from other types of activities.

Historic site. Historic sites were established after the advent of a continuous written record, or after approximate 1800 in this area. Historic sites in the area include, but are not limited to homesteads, mines, railroads, cabins, corrals, lookout towers, and Forest Service administrative sites.

Traditional cultural property. These sites are associated with cultural practices or beliefs of a living community, is rooted in that community's history, and is important in maintaining the continuing cultural identity of the community.

Historic Properties of Religious and Cultural Significance to Indian Tribes (HPRCSITs).

This type of cultural resource whose significance is derived from the role it plays in an Indian Tribe's historically rooted beliefs, customs, and practices may be located on ancestral, aboriginal, or ceded lands of the Tribe. Tribes may define cultural resources differently. HPRCSITs were not recognized by the 1990 forest plans and need to be included in plan revision.

Traditional cultural properties and HPRCSITs include sites, districts, buildings, structures, or objects that are valued by communities for the role they play in sustaining that community's cultural integrity. Examples include plant gathering sites, fishing stations, a rural community, or a rodeo ground. The exact number and kind of cultural resources in the Blue Mountains is unknown. Additional cultural resources will continue to be discovered and evaluated as surveys are completed for potential management activities.

Many cultural resource sites identified on National Forest System lands within Oregon and Washington are in the Blue Mountains National Forests:

- Malheur National Forest has 18 sites are listed with the National Register, 2,380 are eligible for National Register listing, 505 are ineligible for listing, and 2,265 unevaluated sites.
- Umatilla National Forest has 1 site listed with the National Register, 633 are eligible for National Register listing, and 1,403 unevaluated sites.
- Wallowa-Whitman National Forest includes 1 site listed with the National Register, 34 are eligible for National Register listing, 43 are ineligible for listing, and 5,129 unevaluated sites.

Looking Forward: Conclusions and Concerns

Cultural resources are greatly valued but remain vulnerable to human and natural causes. We need more resources to complete site evaluations and monitor already evaluated sites to determine their current conditions. Cultural resources are surveyed for projects include ground disturbance activities and protected by mitigation plans. HPRCSITs need to be included in the plan revision process, as these resource sites were recognized after the 1990 forest plans.

Additional Information

Hatfield, D. 2024. Assessment for Forest Plan Revision – Heritage Program and Tribal Resources Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1169471.pdf

Please contact the listed offices on the cover page to request a printed copy of the detailed assessment report.

Areas of Tribal Importance

Tribal Treaties

The Blue Mountains national forests contain a significant portion of lands ceded by the Tribes in various treaties and was designated as part of the National Forest System by the Organic Administration Act of June 4, 1897. Lands were originally ceded through the Treaties of 1855 by the Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of Warm Springs, Nez Perce Tribe, and Confederated Tribes and Bands of the Yakama Indian Nation of the Yakama Reservation. The treaty with the Klamath Nation of 1870 ceded lands extending into the Malheur National Forest.

These treaties are known for their specific language recognizing certain reserved rights of the tribes in aboriginal use areas. The Burns Paiute Tribe, Shoshone-Paiute Tribes of the Duck Valley Reservation, Fort McDermitt Paiute and Shoshone Tribes, Fort Bidwell Indian Community of Paiute Indians, and the Confederated Tribes of the Colville Reservation (through the Joseph Band of the of the Nez Perce Tribe) are federally recognized American Indian Tribes that also have interests in the management direction and project planning of the Blue Mountains national forests.

Legal Responsibilities

Current forest plans for the Blue Mountains national forests do not provide any guidance on Tribal consultation or consideration of areas of Tribal importance when planning management activities. However, many laws, regulations and directives specify Forest Service responsibilities when it comes to working with Tribes.

The Federal Government has a “trust responsibility” toward federally recognized Native American tribes. This means that the Federal Government has set the “highest moral obligation” to protect tribal lands, assets, resources, and rights, including many established legal rights on lands outside of designated reservation lands. In addition, the American Indian Religious Freedom Act of 1978 requires government agencies to eliminate interference with the free exercise of Native American religion and accommodate access to and use of religious sites if the use is reasonable and doesn’t conflict with an agency’s essential functions. According to the Act, a sacred site is a specific location on federal land that a Native American tribe or its qualified representative has identified to a federal agency as being sacred because of its religious or ceremonial significance.

The Forest Service’s responsibility to protect tribal cultural resources and sacred sites is spelled out in many other laws, regulations, and directives. In 2012, the Forest Service and the Department of Agriculture’s Office of Tribal Relations were directed to review and evaluate existing laws, regulations, and policies in terms of how well they provide a consistent level of protection for sacred tribal sites located on National Forest System lands. A few other directives include:

- **The Food, Conservation, and Energy Act of 2008 (the 2008 Farm Bill), subtitle B.** The Farm Bill authorizes reburial of Tribal remains and cultural items found on National Forest System lands, and the authority to provide Tribes with forest products

for traditionally cultural purposes. It also allows temporary closure of National Forest System lands for cultural purposes and a confidentiality provision.

- **The Tribal Forest Protection Act of 2004.** This law authorizes the consideration of tribally proposed projects on national forests to protect Indian trust resources from fire, disease, or other threats that develop on National Forest System lands.
- **Executive Order 13007 (Indian Sacred Sites, 1996).** This executive order requires Federal land managers to accommodate access to and ceremonial use of Indian sacred sites and requires avoiding adverse effects to those sites.
- **The Archaeological Resources Protection Act of 1979.** This law governs the excavation of archaeological sites on Federal and Indian lands in the United States, and the removal and disposition of archaeological collections from those sites. The Federal Land Policy and Management Act of 1976.
- **The National Historic Preservation Act of 1966 and amendments.** This law directs agencies to consult with tribes and consider traditional cultural properties when planning management activities.

What This Means for the Blue Mountains

In the decades since the forest plans were written, it is now understood that not just simply specific sites, but entire landscapes may qualify for special consideration by planners in land management decisions. Natural resources such as certain animals, plants and minerals are also considerations. For a Tribe to exercise its treaty-reserved rights and for the Forest Service to meet its trust responsibilities, the natural resources that Tribes rely on must exist in healthy and sustainable populations on the national forest. Tribal concerns must be weighed against other potential land uses, including recreation and commercial uses that could provide regional economic or social benefits. We have been working with Tribes at the project level to identify areas and resources of Tribal importance.

For a Tribe to exercise its treaty-reserved rights and for the Forest Service to meet its trust responsibilities, the natural resources the tribes rely on must exist in healthy and sustainable populations on the national forest.

Because the governments and cultures of indigenous peoples are unique, Blue Mountains national forest land managers consult with federally recognized Tribes in Oregon, Washington, and Idaho that have treaty-based legal rights on National Forest System lands of the Blue Mountains or have communicated interest in the Blue Mountains natural and cultural resources as part of their traditional use areas. These include:

- Nez Perce Tribe
- Confederated Tribes of the Umatilla Indian Reservation
- Confederated Tribes of Warm Springs
- Burns Paiute Tribe

Tribal inclusion in Forest Service under the 2012 Planning Rule encourages involvement from the beginning and throughout the entire revision process. Where appropriate, Indigenous, Traditional, Ecological Knowledge (ITEK) can and should inform federal decision making along with scientific inquiry. A White House memorandum in 2021 from the Office of Science and Technology Policy and Council on Environmental Quality defines ITEK as a “body of observations, oral and written knowledge, practices, and beliefs that promote environmental sustainability and the responsible stewardship of natural resources through relationships between humans and environmental systems.”

Culturally Significant Foods

Culturally significant foods (which include water, fish, animals, roots, and berries) are used in ceremonies and subsistence for the perpetual cultural, economic, and sovereign benefit of American Indian cultures. A key element of spirituality for Tribal groups in the Blue Mountains is that all animals and plants in the ecosystem, like humankind, are intelligent and have moral rights and obligations. Clean water, salmon, elk, deer, camas, bitterroot, huckleberries, and chokecherries are some examples of culturally significant foods in the Blue Mountains.

The Forest Service can manage for habitat and plant community conditions that support culturally significant foods, along with the opportunity to address allowable harvesting techniques.



Culturally significant foods: Camas (top left), Lewisia rediviva (bottom left), Camassia quamash (middle), Yampah tuber (top right), and Vaccinium membranaceum (bottom right), photo by USDA Forest Service

Culturally significant plants can be used for food, medicine, or religion. Over 125 plant species are used for dyes, cordage, containers, glues, weaving materials, and medicinal and spiritual purposes by the Plateau peoples. The medicinal and ritual traditions in plant medicine are well recognized as being connected, rather than separate types of treatment. Tribes may have

methods of harvesting food and plants that encourage propagation of the resource through ITEK.

Forest drivers and stressors create varying risks and opportunities for supporting culturally significant foods. For example, risks from climate change and increased fire intensity and frequency can affect vegetation availability, and therefore culturally significant foods, across the landscape. Both the Nez Perce Tribe and the Confederated Tribes of the Umatilla Indian Reservation have identified bighorn sheep and elk as two priority wildlife resources of concern. Concerns have been raised regarding disease transmission to bighorn sheep from domestic sheep and goats, and of elk being pushed out of traditional ranges on the Blue Mountains national forests. Elk populations are stable overall, although some populations are not meeting state objectives.

Looking Forward: Conclusions and Concerns

The 1990 forest plans provided management direction for the cultural resource program which focused on compliance with law and regulation. The plans did not provide management direction for areas of Tribal importance and culturally significant foods. Policies involving protection of tribal areas and resources, and the way the Forest Service consults with tribes has evolved considerably. This includes how the Forest Service recognizes and manages traditional and cultural landscapes. The legal framework of federal policy, laws, and executive orders provides guidance and establishes a higher standard for tribal consultation and the protection of sensitive information that is considered private to the tribes.

The Forest Service has a legal responsibility to consider sites and regions of cultural importance in relation to current and proposed uses of the land. Vandalism, theft, grazing, forest thinning, prescribed burns, land exchanges, noxious weed control, recreational use, mining, and climate change are all potential land management issues that could impact Tribal use, resource persistence, and spiritual values.

We continue to work closely with local Tribes to identify and prioritize areas of cultural significance, including sacred sites.

Additional Information

Hatfield, D. 2024. Assessment for Forest Plan Revision – Heritage Program and Tribal Resources Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1169471.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Social and Economic Benefits and Conditions



Strawberry Mountains from Oregon State Highway 395, Malheur National Forest. Photo by USDA Forest Service.

Caring for Land and Serving People

Humans have managed and lived in deep, balanced relationship with the Blue Mountains since time immemorial. Euro-American settlers brought other resource management goals and paradigms. After seeing rampant land degradation, Baker County petitioned their congressional representatives in 1901, prior to the establishment of forest reserves, to withdraw the mountains around Baker City and Sumpter from public domain to protect the area's water supply. To protect grazing, timber and water resources, Malheur and Harney residents submitted requests to withdraw the Strawberry Mountains and the headwaters of the Malheur, Silvies, and John Day Rivers the following year. These petitions resulted with the Secretary of Interior temporarily withdrawing more than 3 million acres of northeastern Oregon in July of 1902.

During that time, federal surveyor Harold Languille reflected that many area stockmen were initially against the proposed reserve. Many of the strongest opponents eventually pledged support after understanding that the proposed reserves could prevent conflict between grazing and logging as well as prevent destruction of forest resources.

(The 1902 Withdrawal) was doubtless the most controversial of all the withdrawal...It bore upon the economic life and welfare of almost the entire northeastern quarter of Oregon. Agriculture, stock-raising, mining, lumbering, and all of their adjunctive interests were actually or potentially concerned.

-Harold Languille, federal surveyor

Created over a century ago, the Forest Service is tasked with sustaining the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations. Under the 1960 Multiple Use and Sustained Yield Act and the 1976 National Forest Management Act, national forests have provided clean drinking water and air, wildlife habitat, timber, recreational experiences, subsistence hunting and gathering, along with many other amenities for people all over the nation. Today, these uses and benefits are often referred to as "ecosystem services" and are dependent on maintaining the health of forests, waterways, and grasslands of National Forest System land.

Local National Forest Benefits

The Blue Mountains national forests' social, economic, and environmental benefits and uses are extensive. Key benefits and uses include:

- Agriculture related to livestock grazing.
- Clean air and water, productive soils, and wildlife habitat.
- Cultural settings, sacred Tribal lands and locations, and historic buildings and structures.
- Natural lands conservation, recreation, and scenery.
- Educational and volunteer programs that provide opportunities to connect with nature and learn about conservation.
- Storage of carbon in soil and vegetation
- Employment, including jobs related to recreation, ranching, mining, and forest management activities.
- Forest products, including timber, firewood, Christmas trees.
- Subsistence uses such as fish, game, plants, seeds, berries, and mushrooms.
- Water resources for drinking, agriculture, aquatic habitats, hydropower, and recreation.
- Federal land payments to counties to help offset losses in property taxes to do non-taxable Federal lands within their boundaries.

The 2023 Blues Intergovernmental Council Final Socioeconomic Report highlights the critical importance of these uses to local communities. In particular, the report identified strong cultural and economic ties of timber, grazing, and recreation to this area.

Area of Influence

Demographic and economic data are typically available at the county level, and social and economic influences extend beyond the boundaries of the national forests to local and regional communities. As a result, the area of influence is defined at the county level and beyond the planning area.

Blue Mountains national forests plan area lie within 14 counties in Oregon and Washington, occupying 17 percent of region's total land area. This is a rural area, with a population density of 11.03 people per square mile. Only Montana, Wyoming and Alaska have lower population densities. Population density provides a perspective on the availability of open space and recreational opportunities, civic infrastructure, population sustainability and growth potential, and a trend towards urbanization. While ecologically similar, the three Blue Mountains national forests differ in their surrounding communities, especially at the county level. The

map below shows where the Malheur, Umatilla, and Wallowa-Whitman National Forests lie in relation to county boundaries. Nearly all the counties are facing economic hardships greater than the average U.S. population.

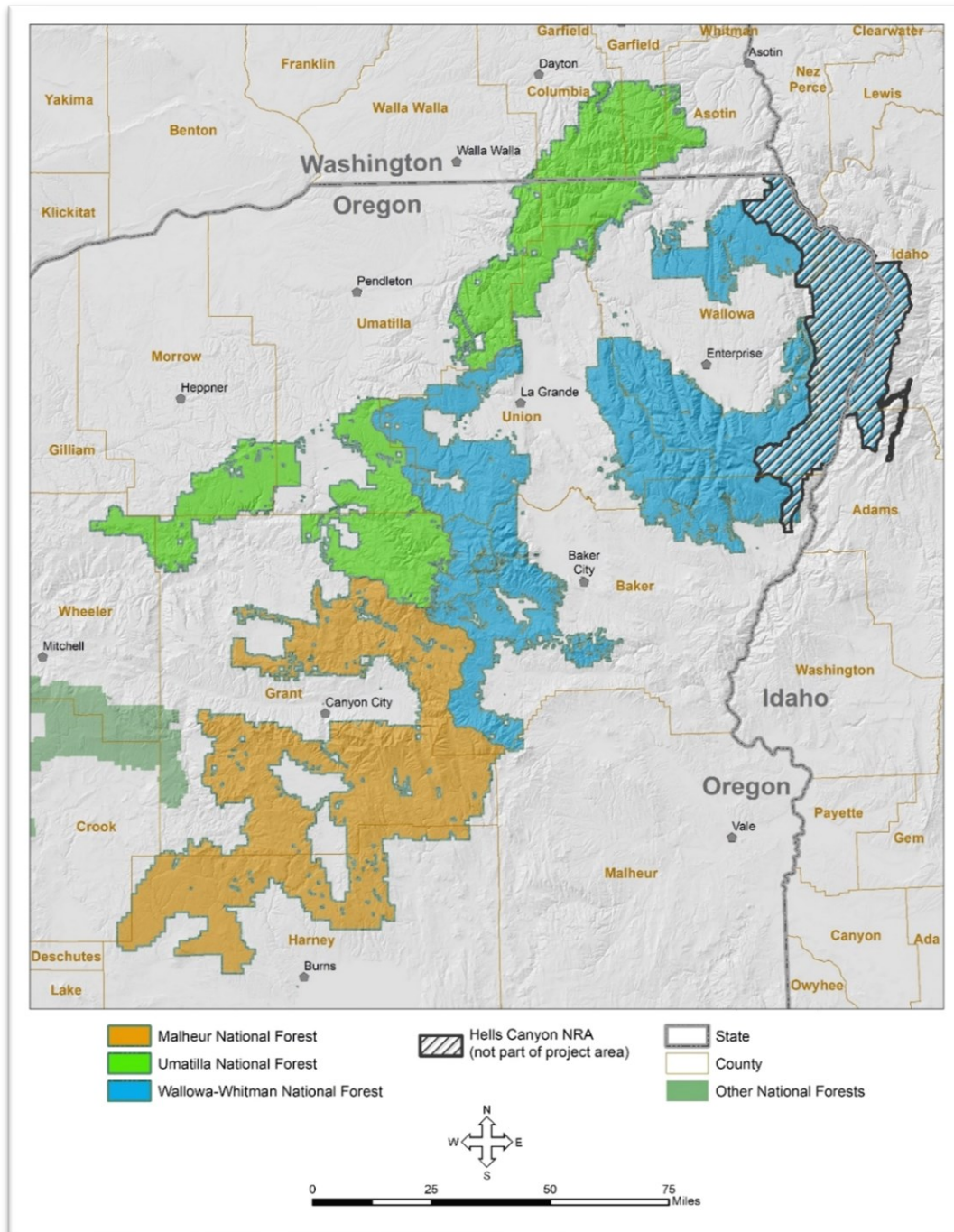


Figure 5. The Blue Mountains national forests' socioeconomic area of influence by county

Blue Mountains Demographics

Population

Population growth can be an indicator of a region's desirability to live and work, whereas population declines can signal challenges in economic opportunities or aging populations. Population growth for the area of influence is at or below regional and country averages. Between 2010 and 2021, the population in Crook County grew the most by 13 percent, above the Oregon State average of 12 percent and national average of 8 percent. All other counties grew below the state average with most of the counties growing modestly, between 2 and 6 percent. Grant County saw a slight decline (negative 2 percent) in population over 11 years.

Wheeler County has the smallest population with 1,477 residents in 2021. Umatilla County has the largest population (79,509), followed by Walla Walla (62,168), Nez Perce (41,820), and Malheur (31,313) Counties.

Age

Different age groups have different needs, values, and attitudes concerning national forest management. A younger than average population can indicate the need for family-friendly activities and uses, such as a trail system with ranging degrees of difficulty, while an older than average population might increase the demand for easily accessible trailheads and camping. Across the areas of influence, ages 35 to 44 are the least represented at 12 percent in 2021, with approximately equal proportions of those 34 and younger and 45 and older. Population age has, since 2010, grown older, following the general trend of the United States. Crook, Grant (OR) and Asotin and Columbia (WA) were categorized as "retirement destinations" by the U.S. Department of Agriculture's Economic Research Service due to an increase in people of retirement age from 2000 to 2010.

What effects may an older population have on surrounding communities? An area with a large percentage of retirees that earn fixed incomes from investments and transfer payments (such as dividends and Social Security payments), rather than salaries and wages are generally buffered by shifts in local industries. This population may be less sensitive to changes in forest management, which mostly impact jobs and salaries.

Education

Education level is one of the most compelling indicators of economic success and well-being. Historically, communities with a more educated workforce tend to have higher incomes, have faster growth rates, and are better able to withstand economic downturns and recessions. The socioeconomic planning area has average high school graduation rates and below average college and postgraduate rates when compared to national averages. This pattern is a nationally occurring distinction between urban and rural areas.

Race and Ethnicity

The socioeconomic planning area is predominately Caucasian with few minorities. Morrow, Umatilla, and Malheur, and Walla Walla Counties have above average Hispanic populations when compared to state and national averages. American Indian representation in Nez Perce County is at five percent, above state and national averages of one percent of total population.

Income and Unemployment

Nearly all of the planning area counties are facing economic hardships greater than the average U.S. population. Median household income is an indicator of general economic well-being. The national median income in was \$69,021 in 2021. The counties in the plan area range from \$5,300 to \$28,100 less than the Oregon median household income of \$70,084 in 2021.

Poverty level is an important measure of economic well-being within a region. People living in poverty may be more vulnerable to changes in national forest management or the availability of opportunities on the national forest.

Even in times of prosperity, a natural rate of unemployment exists, falling between five to six percent. This inherent rate reflects that workers move between jobs and industries at any given time. In 2022, Nez Perce County had the lowest rate of unemployment in the area of influence whereas Garfield County had the highest rate.

Management Decisions and Their Impacts

Land management decisions can have a great impact on a region's social and economic health. One way to measure the degree management decisions affect communities is by examining socioeconomic resilience and how deeply tied the communities are to forest activities and management.

Community Resiliency

To support future forest planning efforts, the Blues Intergovernmental Council (BIC) commissioned a study to investigate the socioeconomic differences between counties. Published in 2023, the report created a Risk/Opportunity Index (ROI) to measure a county's susceptibility to socioeconomic changes resulting from changes in national forest planning decisions. The results of this index clearly show that the counties in the region face different socioeconomic challenges. Therefore, changes in the forest plan have the potential to affect these counties differently, and these differences need to be considered in plan revision.

The index is composed of two parts:

- Resilience - The ability of a county to withstand or recover from an outside disruption to its economy. Resilience considers natural, monetary, and human or social capital a county has as well as the ability to convert its capital into economic resilience.
- Exposure - A county's economic ties to the national forests of the Blue Mountains. Stronger economic ties equal higher exposure levels: thus, the location is more sensitive to changes in activities on national forests. Alternatively, a location that is resilient but not closely tied to national forest activities (low exposure) may be less vulnerable to such shifts.

The counties vary widely in their ROI values. The following figure is a scatter plot of resilience versus exposure for the 15 counties in the Blue Mountains area. Starting at Quadrant I on the upper right, with high exposure and low resilience, are Grant, Wallowa, and Wheeler Counties with the highest ROI values. These counties are most closely tied to national forest activities and are the least economically resilient. While they are most vulnerable to shifts in Forest Service activities, these counties also hold the greatest potential to be affected by changes in the forest plan. The lower left-hand quadrant of this figure, Quadrant III, represents high resilience and low exposure with a low ROI value. Walla Walla, Malheur, and Nez Perce Counties in this quadrant are the most robust against changes in Forest Service activities.

Counties with intermediate ROI values, grouped in the middle oval of the figure, are generally resilient to and can still benefit from restructuring of Forest Service activities. Counties in this grouping include Umatilla, Union, Crook, Baker, Morrow, Asotin, Columbia, Garfield, Harney, and Walla. Counties with high ROI values, grouped in the top right oval of the figure, are generally resilient to and can still benefit from restructuring of Forest Service activities. Counties in this grouping include Grant, Walla, and Wheeler.

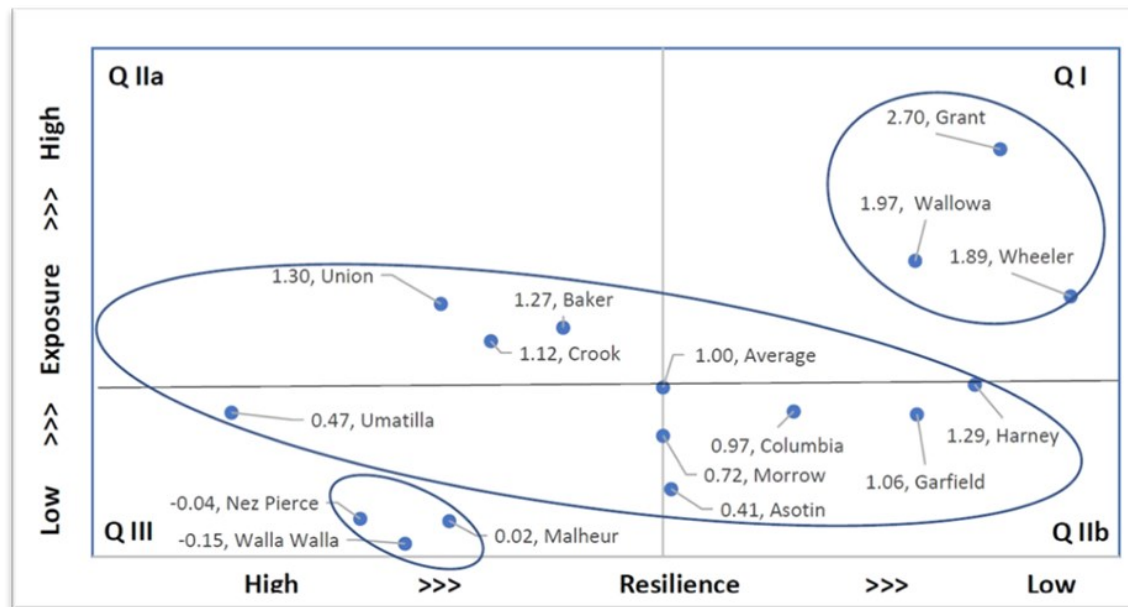


Figure 6. Risk Opportunity Index Results, Blues Intergovernmental Council Socioeconomic Report, 2023

Environmental Justice

Under the Forest Service's 2012 Planning Rule, social and economic issues are important considerations for forest plans. In addition to managing a broad set of social and economic benefits, the Forest Service is required to serve the American public in a way that does not discriminate. This includes the concept of environmental justice, a social movement that emphasizes the fair distribution of environmental benefits and burdens.

Environmental justice grew from the Civil Rights Movement of the 1950s and 1960s. More recently, President Bill Clinton signed Executive Order 12898 in 1994, requiring Federal agencies to address the effects of their programs, policies, and activities on minority and low-income populations. The Council of Environmental Quality (a division of the Executive Office of the President) then instructed agencies on how to address environmental justice under the National Environmental Policy Act of 1969. Agencies are instructed to examine geographic distribution by race, income, and other factors and to consider that information when making land management decisions. The Forest Service uses many information sources, including Federal census data, the Economic Profile System-Human Dimension Toolkit, and the Forest Service's National Visitor Use Monitoring Program.

The data provided in the assessment phase will direct public outreach efforts and allow forest officials to include historically disenfranchised populations in the planning process. Proposed actions will also consider the unique environmental justice issues facing communities surrounding National Forest System land. To identify local forest communities with potential environmental justice concerns, data was analyzed on a census block level within a 25-mile radius surrounding the Malheur, Umatilla, and Walla-Whitman National Forests.

Poverty

Low-income communities may feel the impacts of environmental management decisions differently than higher-income communities. The average population living in poverty was 12.9 percent within the area of influence. Different income can affect living conditions, health levels, and self-efficacy. These different living conditions can be adversely impacted by planning decisions. For example, low-income communities may lack adequate healthcare access to address changing environmental issues. An individual without long-term and emergency medical care can suffer a higher risk of wildfire smoke-related harm, an issue that can be affected by forest management of fire conditions. Cost barriers can also impact one's ability to recreate in and enjoy public lands.

Statistically significant poverty levels are found in and adjacent to urban areas, including Lewiston, Pendleton, and Walla Walla. Other areas with statistically significant poverty levels include La Grande and Baker City. 2012 Planning Rule guidelines direct that attention must be paid to these communities in the outreach, planning, and public comment period. This includes taking initiative to involve communities on their own terms and finding solutions to overcome barriers to participation that may arise from time constraints, financial burdens, and other issues facing the communities in question.

Race

Minority racial and ethnicity status are also factors considered when meeting environmental justice requirements. Historically, minority racial and ethnic communities have been impacted by urban and environmental planning at different levels than other communities and may not have the same resources to mitigate impacts. One example of this difference can be seen in disparate wildfire risk among various groups. Studies show that indigenous communities may face the highest wildfire risk due to their closer proximity to National Forest boundaries in comparison to other groups. Forest management decisions can also directly impact a Tribe's ability to use and control fire on these borders to promote cultural and subsistence harvesting or other fire-dependent practices.

Identifying minority ethnic and racial communities can help inform how these groups interact with national forests, and whether the Forest Service is serving all communities. For example, the area surrounding Umatilla National Forest has a higher average of Hispanic/Latino and non-white populations than areas surrounding the Malheur and Wallowa-Whitman National Forests. Data from U.S. Forest Service's National Visitor Use Monitoring shows that Hispanic and Latino communities are underrepresented as visitors to Blue Mountains national forests when compared to populations found in surrounding counties. In accordance with National Environmental Justice guidelines, an effort is underway to involve these underrepresented communities in the planning process, including identifying community needs for participation, such as translated outreach materials.

Government Revenue Sharing

Payment in Lieu of Taxes (PILT) are federal payments to local governments that help counties offset losses in property taxes associated with nontaxable federal land located within a county's boundary. PILT payments are distributed by the Department of the Interior for tax-exempt federal land administered by the Bureau of Land Management (BLM), the Forest Service, the National Park Service, U.S. Fish and Wildlife Service, and for federal water projects and some military installations.

Payments to states and local governments support public services in communities near the Blue Mountains national forests and contribute to employment and labor income in surrounding counties. Some of the least affluent counties receive the largest payments. Federal payments to local governments in sparsely populated and low-income areas are likely to be particularly meaningful, since these areas typically get less revenue from property, sales, and income taxes to fund local government operations. In 2022, payments awarded to counties in the Blue Mountains area of influence exceeded 21 million dollars.

Another source of federal revenue to counties comes from revenue sharing payments from commercial activities on federal land, such as livestock grazing and timber harvests. Payments began in 1908, sharing 25 percent of money received annually. Since 2008, the payments are based on 25 percent of the 7-year rolling average of annual receipts.

However, in 2000, the Secure Rural Schools and Community Self-Determination Act was passed which offered a guaranteed source of payments not tied to annual commercial revenue on national forests. Congress did not reauthorize the Secure Rural Schools Act in 2016, and payments reverted to the 25 percent payments. In 2022, this program provided payments to counties in the Blue Mountains area of influence totaling 8.4 million dollars.

Looking Forward: Conclusions and Concerns

Management decisions for the Blue Mountains national forests influence the economic and social setting for area communities. Counties in the region each have a unique mix of resilience, values, priorities, and concerns. They also face different socioeconomic challenges. The importance of this diversity is highlighted in the 2023 Blues Intergovernmental Council Final Socioeconomic Report. Future management changes will impact counties differently, and these differences need to be considered in the plan revision process.

Additional Information

Borchers, A., E. Chu, T. Doyon, R. Graw, and M. Metcalfe, 2024. Blue Mountain Forest Plan Revision – Socioeconomic Technical Report in Support of the Malheur National Forest Assessment. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168675.pdf

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Blues Intergovernmental Council Final Socioeconomic Report. Co-authors Rural Engagement and Vitality Center; Eastern Oregon Center for Economic Information at Eastern Oregon University; Ecosystem Workforce Program at University of Oregon and Wallowa Resources. (revised August 2023). 149p. https://bluesintergovernmentalcouncil.wordpress.com/wp-content/uploads/2023/10/bic-socio-economic-subcommittee-risk-opportunity-index-report_revised_8-9-2023-2.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Rangelands and Grazing

Permitted livestock grazing in national forests started with the inception of the Forest Service in 1905. Initial policy stated that, “The Forest Service will allow the use of forage crop of the reserves as fully as the proper care and protection of the forests and the water supply permits.” More recently, the Multiple-Use Sustained-Yield Act of 1960 stated that national forests “shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes.”

Today, the Forest Service continues to balance grazing with other needs and improvements to soil, water, and vegetation. Livestock grazing is also recognized as an important cultural, social, and economic benefit for local communities.

A Historical Perspective

A few years ago, Eastern Oregon was one of the best range sections of the West. The rich bunch grass waved knee deep on hill and plain in such close growth that it was mowed with machines for hay.

– Harold Langille, Forest Inspector on the Proposed Blue Mountains Forest Reserve, 1906

Much of the Blue Mountains was covered with lush grass and herbaceous vegetation prior to Euro-American settlement. In the 1840s, settlers came via the Oregon Trail and brought substantial numbers of cattle and sheep to the Blue Mountains. The vast, healthy grassland that forest inspector Harold Langille described quickly changed during the late nineteenth and early twentieth centuries, when staggering numbers of livestock roamed the area. A survey of sheep ranges completed before 1903 found mountain meadows that were stripped of vegetation and subsequently had severe soil erosion to the point of complete soil loss, where only a bed of exposed rocks remained.

Open range grazing ended in 1906 when the Forest Service began regulating the use of summer range and separated areas for sheep and cattle as there were mounting tensions between the two uses. The subsequent decades brought great reductions in permitted livestock grazing. Although levels in the Blue Mountains have varied over time, they’re much lower than they used to be.

Rangelands in the Blue Mountains

Rangelands in the Blue Mountains include natural grasslands, shrublands, savannas, alpine tundra, moist semi-deserts, and riparian and wetland plant communities, including marshes and wet meadows. Today, rangelands account for 16 percent of National Forest System lands in the Blue Mountains, about 765,000 acres of 4.9 million total acres. With the addition of grazable forest lands, the total grazing land is approximately 69 percent, or 3.4 million acres, in the Blue Mountains national forests.

Benefits of Rangelands and Grazing

Rangelands and ranching are strongly tied to local culture and historical identity. For some, ranching contributes to economic livelihoods as people profit from the sale of food, biofuel, fiber, animal feed, and biochemicals created from rangeland resources. Working ranches also help preserve open space, and without access to allotments on the national forests, some ranches may no longer be economically viable. Open space has related intangible benefits, such as the enjoyment people get from hunting, fishing, observing plants and wildlife, and studying natural systems.

Current Management Direction

Current 1990 forest plans call for managing sustainable production of palatable forage for grazing by livestock and dependent wildlife species in a manner that maintains or improves ecological condition and plant communities. Permits are issued to qualified ranchers to graze livestock on designated allotments during late spring, summer, and early fall. The number of permitted livestock or seasons of use have declined slightly to balance resource conflicts and ensure enough forage between big game and livestock.

Grazing allotment management and allowable utilization levels may be constrained by habitat protection measures. Grazing guidelines for federally listed inland and Pacific-migrating fish species (known as INFISH and PACFISH) protect habitat conditions for species listed under the Endangered Species Act. Modified grazing strategies and utilization standards have reduced use levels in riparian areas.

As of 2023, the Blue Mountains national forests manage 212 active cattle allotments and 11 active sheep allotments, along with 14 vacant cattle allotments and one vacant sheep allotment. The cattle allotments support permitted grazing for 50,557 cow and calf pairs, or 163,047 head months. The sheep allotments support permitted grazing for 14,374 ewe and lamb pairs, or 57,858 head months.

Rangeland Health

Rangeland health is affected in part by soil stability, watershed function, integrity of nutrient cycles, plant species composition, and its resiliency to disturbance events. A variety of past activities, such as livestock grazing, mining, logging, and fire exclusion have altered rangelands and forestlands, causing soil disturbances still evidenced today, with compacted and eroded soils, changes in ground cover types, and non-native vegetation. Forage conditions on grazeable rangelands and forestlands have been evaluated since the 1950s using condition and trend monitoring. Data from these monitoring sites show that overall, rangelands in the Blue Mountains are in fair condition.

While livestock grazing and riparian guidelines considerably improved conditions, recovery trends for rangeland and riparian vegetation have slowed. Some sites remain in poor to fair condition — primarily foothills impacted by nonnative plant species, and certain high elevation sites where historic impacts have exceeded a recovery threshold. It is likely that upland rangeland conditions will continue to improve on most sites under current management. This improving trend could be impacted or even reversed by stressors like invasive species, drought, and warmer temperatures. Past fire exclusion allows for conifer or other woody vegetation encroachment, continuing to impact grazing land health. Forage conditions have been reduced by woodland juniper encroachment and expansion of invasive

plant species. Rangeland areas exhibiting poor conditions are not expected to change without intensive rehabilitation.

Stressors

Stressors to rangelands include invasive plants, overgrazing, wildfire, drought, and warmer temperatures. A large portion of the Blue Mountains is susceptible to invasive plants in areas dominated by dry forest, dry grass, dry shrub, and cool shrub types which are the types of sites that many invasive species evolved in and are adapted to. If established, invasive plants can increase in abundance or expand into lower elevation grassland, shrubland, and open woodland communities.

Rangeland systems can serve as an early indicator of climate change due to the dominance of grasses and forbs that are more sensitive to annual variability of changes in temperatures and precipitation compared to forestlands. Increased disturbance from more frequent, extended droughts amplifies conditions that favor wildfire, insect outbreaks, and invasive plants.

Looking Forward: Conclusions and Concerns

Livestock grazing in the Blue Mountains national forests has been an important part of the local economy and culture for over a century. While grazing practices and rangeland conditions have improved substantially over past decades, the legacy of high historical livestock levels and associated activities still impacts the current ecological integrity of some ecosystems in the Blue Mountains. The ecological integrity of rangelands in the Blue Mountains is declining to some degree, limiting its ability to withstand and recover from disturbances. New scientific information and data show a need to shift management strategies to improve range conditions and improve resiliency to future disturbances. Long term ecological trend data is needed to assess whether the current utilization standards are adequate to protect and improve ecological integrity and to inform conditions and trends. Going forward, forest plans will need to incorporate grazing conservation measures for species that have been federally listed since the 1990 plans were drafted.

Additional Information

Lavery, M. 2024. Assessment for Forest Plan Revision – Rangeland Resource Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168601.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Forest Management and Timber

Conservation and Sustainability

Traveling to the Pacific Northwest in 1897, Gifford Pinchot, then serving as a Department of Interior forestry agent, had a mission to change public opinion towards the newly created federal forest reserves. To assuage fears that natural resources would be forever untouchable, he promoted his philosophy of conservation, arguing for the “wise use” of resources rather than complete preservation. He later served as the first Chief of the Forest Service and developed the first school of forestry in the country. Although he started with a more utilitarian view of timber extraction, age and experience shifted his thinking towards forestry with ecological sensitivity. Pinchot’s later revisions of “The Training of a Forester,” encouraged readers to expand upon their education of tree types and growth habits to include studies in entomology, fungal communities, and “understand them as members of the plant communities,” and their “relationships to each other and to climate and physiography.”

“...where conflicting interests must be reconciled, the question shall always be answered from the standpoint of the greatest good of the greatest number in the long run.” –Gifford Pinchot

Pinchot’s iconic statement is still echoed in the Forest Service’s mission: to sustain healthy, diverse, and productive forests and grasslands for present and future generations.

Today, forest management activities such as timber harvests, reforestation, prescribed burning, and non-commercial thinning are important tools for establishing and maintaining sustainable ecological conditions within the national forests. Timber harvest, defined as cutting trees used for building and carpentry, can have an essential role in restoring ecological resilience by enhancing wildlife habitat, creating a mosaic of forest stand density and tree species composition, increasing hazardous fuels management, and minimizing impacts of insect and disease. In addition to affecting the structure and composition of forests, timber harvests provide forest products and contribute to the local economy.

How Conditions Have Changed

The Blue Mountains national forests have a long history of providing timber and other forest products to meet regional and national needs. Beginning in the 1920s, large timber sales focused on removing commercially valuable timber of old ponderosa pine. High harvest levels remained through the 1980s.

A substantial reduction in timber harvest volume began in the 1990s from factors such as overproduction, global competition, technological advances, decreased U.S. consumption of paper and paperboard products, and environmental regulations that caused major changes in the timber industry, particularly in the Pacific Northwest.

Timber harvest volume is measured in board feet – one board foot refers measures one foot long, one foot wide, and one inch thick, or 144 cubic inches. The Blue Mountains national forests went from highs of almost 600 million board feet (MMBF) annually in the early 1990s to a current 20-year annual average of around 75 MMBF. Lands of other ownership also experienced this sharp decline of timber harvest over the same period.

The current forest plans provided for an annual harvest of 200 MMBF on the Malheur, 124 MMBF on the Umatilla, and 144 MMBF on the Wallowa-Whitman National Forest. The overall timber volume removed since the plan was adopted is much less than originally anticipated, averaging 75 MMFB annually from 2003 to 2022 totaled across all three national forests. Decreases in logging, labor saving technologies, and loss of production capacity have resulted in declines in timber-related employment in local communities.

Since the signing of the 1990 forest plans, amendments to the plans have been adopted to steward riparian and old growth forest areas. Inventoried roadless areas, designated as part of the 2001 Roadless Areas Rule, account for about 18 percent of the Blue Mountains national forests that are not suitable for timber production. Roadless areas are set aside to provide large, relatively undisturbed landscapes that contribute to healthy watersheds and clean drinking water and provide for extensive outdoor recreation (see the Designated Areas Assessment Report for more information).

The 1990 forest plans focused on traditional forestry practices that involved forest management to tend, harvest, and regenerate the forest. Changes in national forest policy (such as the Healthy Forest Restoration Act and the Collaborative Forest Landscape Restoration Program), amendments to the 1990 forest plans (Eastside Screens), and societal shifts in public involvement of the management of national forests (the collaborative process) have led to ecological forestry practices. Objectives today focus on removing smaller diameter trees, reducing fuels that increase fire hazard, shifting species composition, and managing to protect and promote old trees, riparian areas, and wildlife habitat.

Forest Service projects have evolved from being primarily focused on timber resources to promoting forest health and resiliency from a multi-resource perspective, while still contributing to and supporting local economies as well as growing and expanding new markets. New science and monitoring within the Blue Mountains national forests have helped inform this shift.

Existing Conditions and Trends

Current forest plans primarily address traditional forest products such as sawlogs, roundwood, and firewood. However, they are largely silent on nontimber products such as Christmas trees, posts and poles, fuelwood, mushrooms, berry picking, and landscaping transplants. These uses help connect people to their national forests, provide for reserved tribal rights, and support subsistence needs and recreation. Demand for these products has grown since the current forest plans were produced.

Due to past fire suppression and forest management practices, forests in the Blue Mountains are growing faster and becoming denser than under historic levels of disturbance, which includes natural mortality, timber harvests, non-commercial thinning, and fuel reduction removals. Excessive forest growth, or overgrowth, can lead to competition-related mortality, insect and disease outbreaks, and severe wildfires, compounded by expected changes in temperature and moisture. Insect infestations and disease have become more severe,

including the mountain pine beetle, pine engraver, Douglas-fir beetle, and western spruce budworm.

Wildfire and its effects since 1990

Easily one of the most significant factors to affect the Blue Mountains national forests is the increased frequency and severity of wildfire in the landscape. As the table below displays, from 1990 through 2019, over 1 million acres of the Blue Mountains national forests has been burned by wildfire. Of this, about 350,000 acres burned in management areas with a timber production emphasis as identified in the 1990 forest plans, representing about 33 percent of the timber production acres. Where stand-replacing fire occurs, regenerating trees need at least 50 to 60 years before reaching a size of commercial value. Expected changes related to soil moisture, precipitation, temperature, and fire, may make conditions challenging for regenerating seedlings.

Salvage harvests of fire-killed trees before trees lose economic value occurred within a few years of some fires in the Blue Mountains, representing a small percentage of each fire area. Promoting the development of a more diverse mosaic of forest species, ages, and densities may increase resiliency to disturbance events.

Table 2. Blue Mountains national forests acres burned by wildfire 1990-2019

Forest	Total Acres Burned	Acres Burned in Timber Production Emphasis Management Areas
Malheur NF	281,250	138,600
Umatilla NF	293,740	106,160
Wallowa-Whitman NF	503,080	109,290
Totals	1,078,070	354,050

Fire and Fuels Treatments

Fire and fuels treatments, such as prescribed burning, slashing, and piling of fuels, are also methods that the Forest Service uses to manipulate forest vegetative conditions. Generally, treatments occur in association with timber harvest to reduce activity fuels and prepare sites for planting. As harvest levels declined over the last 20 years, fire and fuels treatments have focused more on hazardous fuels reduction. From 1990 to 2019, the Blue Mountains national forests have completed fuel treatments to over 2.6 million acres. See the Fire Assessment Report for more information.

Looking Forward: Conclusions and Concerns

Levels of timber harvest and forest management activities have decreased since the late 1980s and have been substantially less than what the current 1990 plans anticipated. High density forest growth due to a history of fire exclusion and other factors, has increased the risk of uncharacteristic, high-severity disturbances in the future. For future planning, we need to assess the demand and capacity for processing forest products originating from the Blue Mountains national forests.

Additional Information

McCusker, N. 2024. Assessment for Forest Plan Revision – Forest Management and Timber Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168604.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Energy Resources, Minerals, and Geohazards

Conservation means the wise use of the earth and its resources for the lasting good of men.

- Gifford Pinchot, first Chief of the U.S. Forest Service

Long Valued Resources

Westward expansion by European settlers was fueled in part by the promise of finding gold and homesteading. Former miner turned senator, William Stuart Morris, drafted the General Mining Act in 1872, which provides citizens the ability to explore, discover, and locate mining claims for minerals on open public lands. According to the law: “Except as otherwise provided, all valuable mineral deposits...shall be free and open to exploration and purchase, and the lands in which they are found to occupation and purchase, by citizens of the United States and those who have declared their intention to become such.”

A Complex of Considerations

More than 150 years later and despite many amendments, this law is now one of many others that direct how federal lands should be managed for mineral and energy extraction. Here are a few of the others:

- Organic Administration Act of 1897
- Mineral Leasing Act of 1920
- Materials Act of 1947
- Wilderness Act of 1964
- Multiple Surface Use Act of 1955
- National Environmental Policy Act of 1969
- Mining and Minerals Policy Act of 1970
- Clean Water Act of 1972
- Resource Conservation and Recovery Act of 1976 (which amended the Solid Waste Disposal Act of 1965)
- Federal Land Policy and Management Act of 1976
- National Materials and Minerals Policy, Research and Development Act of 1980
- Energy Policy Act of 2005, and Energy Act of 2020
- Infrastructure Investment and Jobs Act of 2021
- Inflation Reduction Act of 2022

Managing mineral and energy resources is complex, especially when considering economics, environmental policies, cultural shifts, recreational demands, and national and local politics.

Energy and mineral resources provide the raw materials that support and contribute to all aspects of modern society and technology. It is the policy of the Federal Government to "foster and encourage" responsible mineral development on public lands. Management of each type of energy or mineral resource requires consideration of applicable laws and agency regulations, jurisdiction of other federal or state agencies, and appropriate disposal authorities.

Who's In Charge of What

When considering mineral exploration and development on National Forest System lands, it's important to remember that the Forest Service shares administrative responsibilities with the Bureau of Land Management (BLM). The BLM is charged with administering mining claims and leases, while the Forest Service is responsible for managing the occupancy and use of the surface resources as well as the disposal of certain mineral materials. This structure applies to the entirety of the Blue Mountains national forests, but 1.3 million acres are withdrawn from mineral entry due to other designations.

Mineral and Energy Resources

Large portions of the Blue Mountains are covered by volcanic rocks from the Columbia River Flood Basalts and the Strawberry Mountain Volcanics, which are generally considered to have low mineral potential. The Elkhorns, Greenhorns, Wallowa, and Hells Canyon have elevated mineral potential from accreted terranes, which are blocks of continental fragments and oceanic islands that collided with a continent and permanently attached. Generally, management guidance provided in the 1990 forest plans as amended, along with consultation under the Endangered Species Act, were sufficient to prevent or eliminate unacceptable resource effects while providing opportunities for renewable and nonrenewable energy and mineral resource production.

Energy resources are comprised of renewable energy (solar, wind, geothermal, hydropower, and biomass energy) and non-renewable energy resources (crude oil, natural gas, coal, and oil shale). These non-renewable and geothermal energy minerals are considered "leasable" minerals and are available via competitive and non-competitive leases administered by the BLM.

Mineral resources are categorized into three types, based on the different laws that apply to each type. These include:

- Leasable minerals (specific minerals including crude oil, natural gas, coal, sodium phosphate, and others)
- Locatable minerals (rare minerals such as gold and silver).
- Saleable minerals (common materials such as landscaping rock or sand and gravel)

Leaseable Minerals

Leasable minerals include non-renewable energy such as oil, gas, coal, sodium phosphate and renewable energy resources (geothermal). The extent of these resources is unknown due to

their depth and difficulty of exploration through the overlying Columbia River basalts. No large-scale commercial production or economic discovery has been made in the Blue Mountains national forests.

Non-energy leasable exploration and development of resources including sodium, potassium, and phosphate in the Blue Mountains national forests are expected to be low due to the existing geologic conditions. While there is potential for interest in geothermal leasing, it is unexpected in the near term as other higher-potential areas in the country remain unleased.

Locatable Minerals

Historical production of locatable minerals, or rare minerals, include gold, silver, copper, lead, zinc, platinum, and chromium. Gold mines in northeastern Oregon were the largest producers in the state at one time. From discovery in 1861 to 1942, placer and lode gold deposits were worked extensively, and some production continues today. Gold mineralization appears to be associated with granitic intrusive rocks located throughout the Blue Mountain region. For 2024, Bureau of Land Management records show 2,407 active claims on the three national forests: 109 on the Malheur National Forest, 47 on the Umatilla National Forest, and 2,251 on the Wallowa-Whitman National Forest.

Saleable Minerals

Saleable mineral resources exist throughout the Blue Mountains. The abundance of volcanic basalt and andesite formations make this resource readily available. Relatively minor production of rock materials (crushed basalt, riprap, crusher reject material) occurs intermittently in the Blue Mountains national forests – mostly for National Forest System road maintenance or construction work. This demand will likely increase in the future for uses both within and beyond National Forest System lands.

Renewable Energy Resources and Infrastructure

Extensive areas for the potential to develop wind energy lies outside the boundaries of the Blue Mountains National Forests. The areas with highest potential for development within the boundaries are found at higher elevations, often in designated wilderness which are excluded from development and far from the current electrical grid. Likewise, while geothermal resources exist in the Blue Mountains national forest, areas of highest potential for development lie outside of National Forest System boundaries. In addition, estimating the full distribution of geothermal resources is difficult and not yet completely understood.

There is currently no geothermal, solar, or wind energy infrastructure of industrial scale in the three national forests, and none are proposed currently. The Wallowa-Whitman National Forest has two hydroelectric Federal Energy Regulatory Commission licenses within the planning area. Individual use hydroelectric or solar energy sources are known to occur under permit or as an ancillary portion of an authorization. The rural location, fire-prone landscape, and lack of infrastructure will continue to make renewable energy infrastructure a challenge.

Conditions may change with recent approval of the Boardman to Hemingway Transmission Line. While not yet constructed, this project will route a single-circuit 500-kV electric transmission line that stretches 270.8 miles long, crossing the Wallowa-Whitman National Forest northwest of La Grande. Future renewable energy sources may connect with this transmission line and provide additional renewable energy opportunities in the future. Recent biomass processing and energy producing infrastructure in the communities surrounding the

Blue Mountains national forests has increased the use of local forest products as biofuel over the past decade.

Geological Hazards

Geologic hazards are natural and human-caused geologic processes that can pose danger to public health and safety, infrastructure, and resources. The Blue Mountains national forests encompass a variety of geologic parent materials, featuring basic and igneous rocks, clay, metamorphic and sedimentary rocks, as well as glacial deposits and volcanic ash. Some hazards found in the Blue Mountains include landslides, floods, acid-producing rocks, earthquakes and volcanic activity, steep topography, and abandoned mines.

Federal laws and agency regulations provide some guidance for geologic hazards, noting that hazard zones should be identified, and that infrastructure should avoid known areas. Many counties have also prepared emergency plans, including Umatilla County's Natural Hazards Mitigation Plan which includes consideration of earthquakes, landslides, and volcanic events.

Landslides are most likely to cause damage to infrastructure and loss of life in the Blue Mountains. Landslides may be triggered by extreme rain on snow events that are likely to become more frequent along with increased erosion from frequent and severe fires. Landslides can create fish barriers and increased sediment in rivers, to the detriment of aquatic species.

Hazards are also present in the Blue Mountains near past and present mining activity. Abandoned mine lands are being examined and remediated while current mining activities are monitored. Reclamation bonds enable mining site cleanup following activities.

Looking Forward: Conclusions and Concerns

Current forest plan direction has prevented unacceptable resource damage while providing opportunities for energy and mineral resource production. However, these plans do not reflect new laws, regulation, and scientific information. As commodity prices change and efforts by Congress to domestically source minerals continue, conditions may support development and investment in large-scale mining in Eastern Oregon.

Blue Mountains national forest management would benefit from increased research on likely geologic resource locations. Renewable energy sources are dependent on local infrastructure and coordination between the Forest Service and energy producers to drive the future of development.

Additional Information

Plocharsky, J., D. Hatfield. 2024. Assessment for Forest Plan Revision – Mineral, Energy, and Geological Hazards Resources Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1169472.pdf

Please contact the offices listed in the cover page to request a printed copy of the detailed assessment report.

Existing Designated Areas

*To those devoid of imagination, a blank place on the map is a useless waste;
to others, the most valuable part.*
— Aldo Leopold

Wide open, undeveloped land across the Blue Mountains national forests is a large part the area's identity. Designated areas such as the Eagle Cap Wilderness, the largest in Oregon, contribute to this experience. Designated areas are places that are identified and managed to maintain its unique special character or purpose. Areas that require designation by acts of Congress are national heritage areas, national recreational areas, national scenic trails, wild and scenic rivers, wilderness areas, and wilderness study areas. Examples of administratively designated areas are experimental forests, research natural areas, scenic byways, and botanical areas.

These areas provide services such as protecting water and air quality, unique wild plant and animal species, and wildlife habitat. They also provide scientific, ecological, educational, scenic, and historical benefits. Designated areas provide for wild landscapes, scenic beauty, and spiritual connection. Many are assured with the knowledge that wilderness is being protected, as it provides for solitude and wilderness recreation experiences.

Current Direction and Conditions

What designated areas have in common is that they all have their own rules and regulations for how they are managed. Forest plans attempt to maintain the unique qualities of the designated areas by tailoring the frequency and type of certain activities to meet the area's requirements. Much has changed since many of these areas were first designated. Changes in the trajectory of wildfire characteristics, social values, vegetation composition, and visitation rates will need to be addressed in plan revision.

Existing Designated Wilderness

Designated wildernesses receive the highest level of land protection by the Federal Government. The Wilderness Act of 1964 defines designated wilderness as "an area of undeveloped Federal lands retaining its primeval character and influences, without permanent improvements or human habitation, which is protected and managed to preserve its natural condition." Designated wilderness management is based on the 1964 Wilderness Act, Forest Service regulations and directives, and the current 1990 forest plans.

People value wilderness for solitude, intact forests for habitat and intact landscapes, spiritual uses for solace of open, quiet, beautiful places, wildlife and pristine settings, and economic opportunities for tourism, hunting, and fishing. Wilderness landscapes may also contain culturally significant and sacred sites important to indigenous people and historic resources that speak to the nation's collective past.

The Blue Mountains national forests currently manage nearly 1 million acres of wilderness distributed across seven designated wildernesses. The Hells Canyon Wilderness, consisting of 217,927 acres, is “nested” within the larger Hells Canyon National Recreation Area (HCNRA). This planning effort will focus on the remaining six designated wildernesses shown in the figure on the following page, totaling 759,666 acres, and they are:

- Strawberry Mountain Wilderness – 69,350 acres, Malheur National Forest
- Monument Rock Wilderness – 19,650 acres, Malheur and Wallowa-Whitman National Forests
- North Fork John Day Wilderness – 121,352 acres, Umatilla National Forest
- North Fork Umatilla Wilderness – 20,435 acres, Umatilla National Forest
- Wenaha-Tucannon Wilderness – 177,423 acres Umatilla National Forest
- Eagle Cap Wilderness - 350,460 acres, Wallowa-Whitman National Forest

The 2012 Planning Rule requires agencies, during forest plan development or revision, to identify and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System and determine whether to recommend any such lands for wilderness designation. There have been no new administratively recommended wilderness areas or areas designated by Congress in the Blue Mountains since the 1990 forest plans. Any areas recommended for wilderness designation will be managed to protect and maintain the ecological and social characteristics that provide the basis for their suitability.

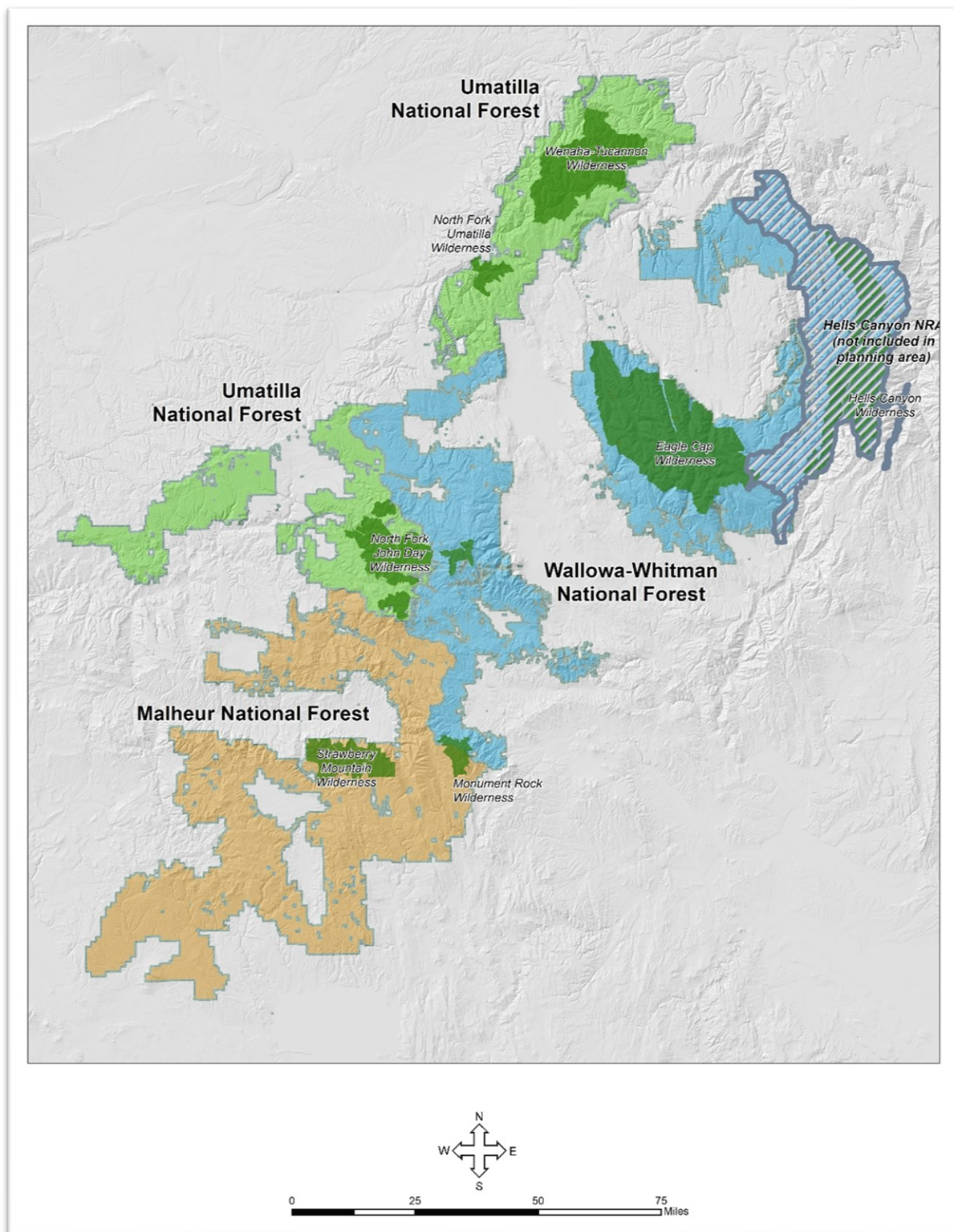


Figure 7. Map of existing designated wilderness areas in the Blue Mountains national forests

Wild and Scenic Rivers

Congress enacted the Wild and Scenic Rivers Act in 1968 to preserve certain rivers for their free-flowing condition, water quality, and outstanding remarkable values. Rivers or river segments are eligible to be considered for inclusion in the National Wild and Scenic River System if they are essentially free flowing (without major dams, diversions, or channel modifications) and if they possess at least one “outstandingly remarkable” scenic, recreational, geologic, fish, wildlife, historic, cultural, or other similar value. These areas are preserved in their free-flowing conditions, with various protections from development. Riverfront lands and flow-dependent values are also protected. There are three steps to obtaining this designation: eligibility, suitability, and Congressional action.

Across the Blue Mountains national forests, there are 11 wild and scenic rivers. Of those 11 rivers, approximately 162 miles are classified as wild, 58 as scenic, and 48 miles as recreational. All designated river segments in the Blue Mountains have comprehensive river management plans and are listed in the following table.

Table 3. Miles and classifications of wild and scenic rivers in the Blue Mountains national forests

River Name	Wild	Scenic	Recreational	Outstandingly Remarkable Values
Malheur NF				
Malheur River	6.7	7.0	0.0	Scenery, geology, wildlife habitat, history
North Fork Malheur River	0.0	25.5	0.0	Scenery, geology, wildlife, fisheries
Totals	6.7	32.5	0.0	
Umatilla NF				
Wenaha River	18.7	2.7	0.15	Recreation, scenery, wildlife, fisheries
Grande Ronde River*	17.4	0.0	1.5	Recreation, fisheries, wildlife
North Fork John Day River*	24.3	10.5	8.9	Scenic, recreation, fisheries, wildlife, cultural
Totals	60.4	13.2	10.55	
Wallowa-Whitman NF				
Eagle Creek	4.5	6.0	18.4	Fish, recreation, scenery, cultural resources, geology/paleontology
Grande Ronde River*	17.4	0.0	1.5	Recreation, fisheries, wildlife
Joseph Creek	8.6	0.0	0.0	Scenic, recreation, geology, fish, water quality, wildlife, cultural resources
Imnaha River	15.0	0.0	0.0	Scenic, recreation, fisheries, wildlife, historic, botanical, cultural resources
Lostine River	5.0	0.0	11.0	Scenic, recreation, fisheries, wildlife, botanical
Minam River	41.9	0.0	0.0	Scenic, recreation, geology, fisheries, wildlife

North Fork John Day River*	3.5	0.0	6.9	Scenic, recreation, fisheries, wildlife, cultural
North Powder River	0.0	6.4	0.0	Recreation, scenery
Totals	95.9	12.4	37.8	

* The Grande Ronde and North Fork John Day rivers are listed above for both the Umatilla and Wallowa-Whitman National Forests as administration is shared. Mileage for the North Fork John Day River is divided within the table to reflect the mileage within and administered by each national forest. The Grande Ronde River is part of the administrative boundary between the Umatilla and Wallowa-Whitman National Forests, and the mileage is displayed equally for each of the National Forests.

Each comprehensive river management plan was reviewed, and no river segments were identified as having impacted ORVs through increased visitor use.

Inventoried Roadless Areas

Many of the designated areas in the Blue Mountains national forests overlap with inventoried roadless areas. Inventoried roadless areas are managed under the Forest Service's 2001 Roadless Area Conservation Rule. These large areas of roadless public lands provide special values such as essential habitat for plant and animal species, clean water, fisheries, and outstanding primitive recreation opportunities. The 2001 Roadless Rule designated 72 Inventoried Roadless Areas, totaling approximately 977,020 acres within the plan area as shown in the map below. These areas cannot be modified under a forest plan revision effort.

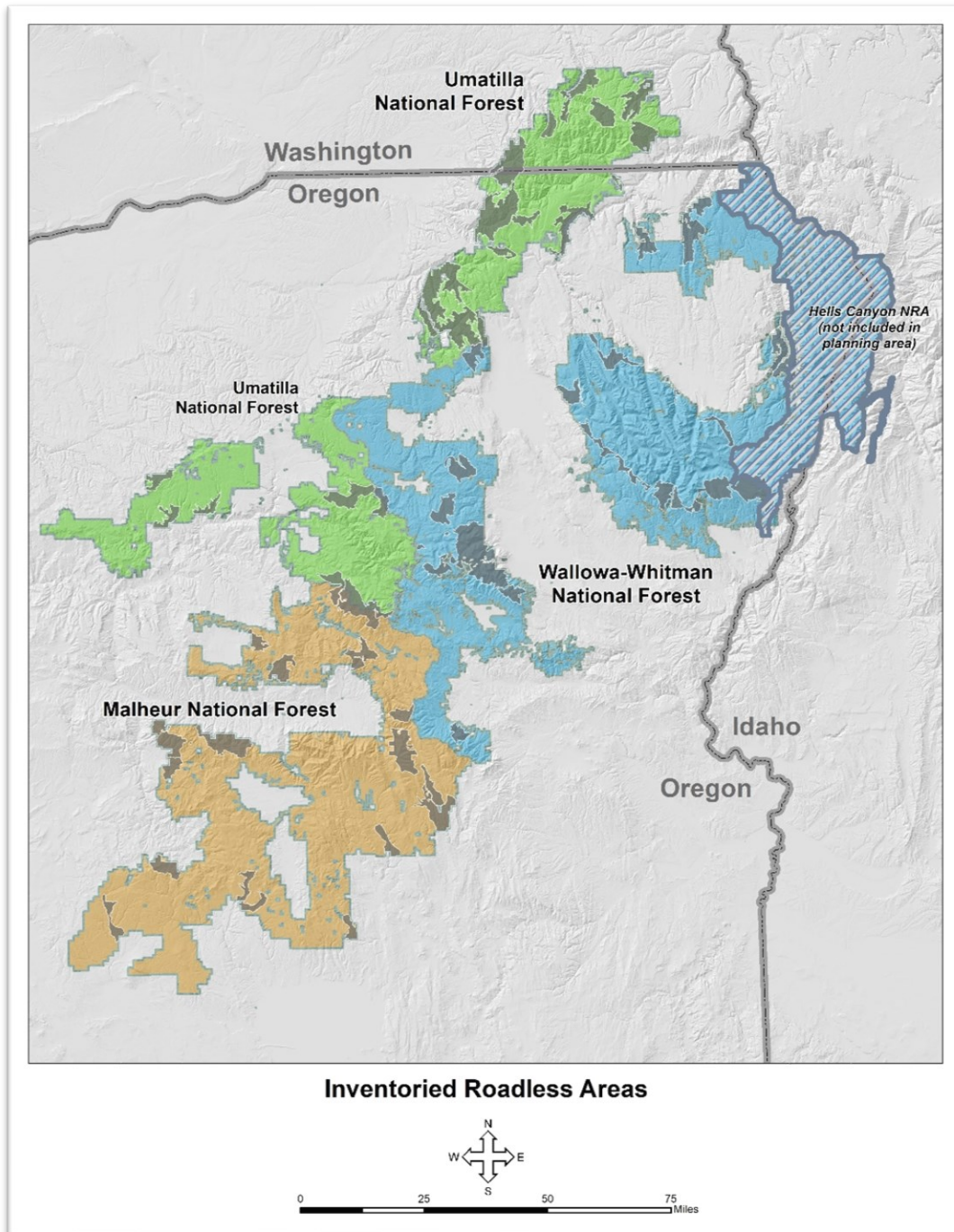


Figure 8. Inventoried Roadless Areas across the Blue Mountains national forests

Research Natural Areas

Research natural areas are places that a federal agency has designated to permanently promote and protect for biodiversity. They form a network of ecological reserves that allow non-manipulative activities related to research, monitoring, and educational purposes. Generally, livestock grazing, timber harvest, wildlife habitat improvements, range

improvements, new trails and other activities are limited or prohibited. Research natural areas within the Blue Mountains are listed below:

Malheur National Forest. Canyon Creek (736 acres), Dry Mountain (2,260 acres), Dougout Creek (911) acres, and Shaketable (385 acres).

Ochoco National Forest. Dry Mountain (1,187 acres), Silver Creek (844 acres) and Stinger Creek (453 acres).

Umatilla National Forest. Pataha Bunchgrass (67 acres), Rainbow Creek (570 acres), Wenaha Breaks (1,971 acres).

Wallowa-Whitman National Forest. Haystack Rock (418 acres), Horse Pasture Ridge (338 acres), Indian Creek (1,003) acres, Gerald S. Strickler (190 acres), and Vance Knoll (198 acres).

Starkey Experimental Forest and Range

The 27,100-acre Starkey Experimental Forest and Range is the only experimental forest in the Blue Mountains, located in the Wallowa-Whitman National Forest and is co-managed with the Pacific Northwest Research Station. Established in 1940, it is a world-class research facility for long term, operational scale scientific studies on the effects of management activities on ungulates and fisheries, as well as effects of deer, elk, and cattle on ecosystem process and function. The long-term nature of Starkey Project research has generated a substantial data legacy, focused on the following three goals:

1. Measure the habitat, behavioral, nutritional, energetic, and population responses of elk, mule deer, and cattle to intensively managed forests and rangelands at landscape scales at which management occurs.
2. Gain knowledge of the ecological effects and roles of elk, mule deer, and cattle as they contribute to ecological processes and patterns in managed forests and rangelands as part of disturbance regimes of herbivory and other disturbance processes.
3. Integrate socioeconomic systems studies with foundational ecological research.

Over 300 publications have been produced from Starkey Experimental Forest and Range since the 1990 forest plans. This plan revision effort needs to consider the results of these studies in future management guidelines. Summaries of the major research findings can be found at the U.S. Forest Service Pacific Northwest Research Station's Starkey Project [website](#).

Murderer's Creek Wild Horse and Burro Territory



Murderer's Creek Wild Horses, photo by USDA Forest Service

The Wild Free-Roaming Horses and Burros Act of 1971 states that wild horses and burros are “living symbols of the historic and pioneer spirit of the West.” It calls for the Bureau of Land Management and the Forest Service to co-manage and protect free-roaming herds on public lands. Murderer's Creek Wild Horse Territory started in 1975 and overlaps parts of Malheur National Forest as shown in the figure on the following page. The current forest plan's goal is to maintain a herd averaging 100 animals to maintain a balance with other resources.

Today, overpopulation of wild horses is impacting rangeland and riparian resources within and outside the territory. Wild horses are straying outside of the territory and causing some conflicts with private landowners. A recent 2022 survey estimated a population of 503 animals, and populations have increased an average of 11 percent per year since 2018. Issues such as climate variability, existing resource condition, and vulnerabilities in riparian areas are being considered with the Murderer's Creek Wild Horse Management Plan, which is currently being analyzed under a Preliminary Environmental Assessment Draft (2023). The final decision and information from this assessment will help inform the plan revision process.

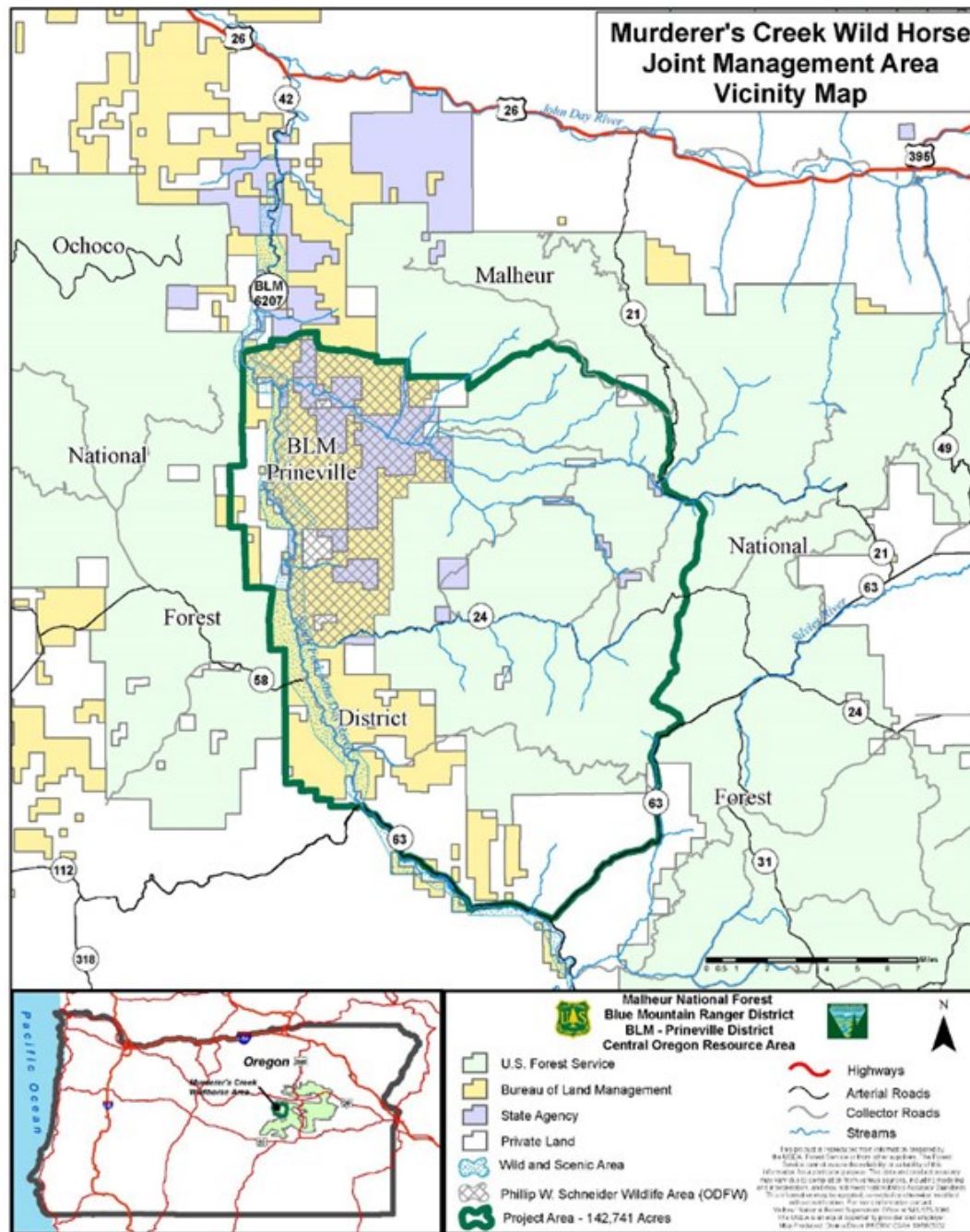


Figure 9. Murderer's Creek Wild Horse Territory and Herd Management Area, also known as the Murderer's Creek Wild Horse Joint Management Area.

National Recreation, Scenic, and Historic Trails

The National Trails System Act of 1968 authorizes the creation of a national trail system for recreation, scenic, and historical values. No nationally designated trails are recognized by the current 1990 forest plans. Since then, 72.5 miles of national trails have been designated across the Blue Mountains national forests.

National Recreation Trails. This is a designation given to existing trails that contribute to health, conservation, and recreation trails. Being a part of the National Trails System bring more visibility and potential funding.

Malheur National Forest: Arch Rock, Cedar Grove, Malheur River National Recreation trails totaling 9.3 miles.

Umatilla National Forest: Jubilee Lake, North Fork, South Winom Creek National Recreation Trails, totaling 29.9 miles.

Wallowa-Whitman National Forest: Elkhorn Crest and High Wallowa National Recreation Trails, totaling 25 miles.

National Historic Trails. These areas are designated to protect the remains of significant travel routes that reflect the history of the nation. Spanning more than 2,000 miles over six states, the Oregon National Historic Trail allows one to trace the path of early American settlers. The Wallowa-Whitman National Forest holds an 8.3-mile segment of this vast trail.

Scenic Byways and All-American Roads

The U.S. Department of Transportation recognizes national scenic byways for one or combination of archeological, cultural, historic, natural, recreational, and scenic qualities. Like national trails, designation heightens public awareness and increases potential funding opportunities for maintenance and infrastructure improvements. The plan areas encompass portions of the Journey Thru Time, Blue Mountains, and Elkhorn Scenic Byways, totaling 139 miles. None of these byways were included in the current forest plans and need to be considered in plan revision.

Other Designated Areas – Special Interest Areas

Broader in scope and allowable activities, designated Special Interest Areas are created to protect and enhance unique or special resources. They can be designated by Congress or agency decisions. Resources can include plant, animal, geological, historical, paleontological, or scenic resources.

Botanical Areas. Botanical areas contain specimens, groups of plant colonies or plant communities that are significant because of form, color occurrence, habitat location, life history, ecology or other features. The Malheur National Forest has two botanical areas, Cedar Grove and Fergy Spruce Grove. The Umatilla National Forest has seven botanical areas, Charley Creek, Karl Urban, Teal Spring, Elk Flat Meadow, Woodward Campground, Ruckel Junction, and Shimmiehorn. Wallowa-Whitman National Forest has Mount Howard-East Peak, which is a botanical area as well as a national natural landmark.

Geological Areas. These areas have unique geological features or significance. Magone Lake and Tex Bridge are Geological Areas comprising 41 acres on the Malheur National Forest, and the Umatilla has Big Sink Geological Area, totaling 416 acres.

Cultural-Historical Areas. Cultural-Historical Areas can include historic sites, buildings, or objects of National Register significance. The Malheur has the Sumpter Valley Railroad Site, which is 13 acres, while the Umatilla has Greenhorn, Olive Lake – Fremont Powerhouse, and Target Meadows, three historical areas totaling 1,173 acres.

Scenic Areas. Scenic areas have unique physical characteristics that provide pleasing views and dispersed recreational opportunities. They are designated to protect, enhance, and foster public use and enjoyment of special landscapes. The Vinegar Hill-Indian Rock Scenic Area is the only scenic area in the Malheur National Forest, totaling 12,800 acres, and is shared with the Umatilla National Forest which has 21,900 acres of the scenic area. Silver Creek Scenic Area is a 1,500-acre area in the Umatilla that is not formally designated but treated in the current forest plan as a scenic area. An additional area on the Umatilla is Grande Ronde Scenic Area totaling 9,100 acres.

Recommended Wilderness

Forest plan revisions efforts, such as the one underway in the Blue Mountains, are accompanied by a wilderness recommendation process that inventories potentially suitable lands, conducts evaluation and analysis of suitability, and makes a recommendation for inclusion of lands, if any, into the National Wilderness Preservation System. This recommendation is a Forest Service administrative designation in forest plans. It serves as a preliminary recommendation for review by the Chief of the Forest Service, the Secretary of Agriculture, and both houses of Congress.

The existing forest plans did not identify recommended wilderness. The current wilderness recommendation process, which includes input from the public and other agencies, is compiling an inventory of potentially eligible wilderness lands for further evaluation and analysis. While none of these areas have been designated as wilderness, any lands that are forwarded for recommendation would be managed in a way that protects their condition for consideration as designated wilderness. Management issues for these locations are generally like those in designated wilderness areas.

Municipal Watersheds

A municipal watershed is an area that serves a public water system as defined by the Safe Drinking Water Act of 1974. Six communities around the Blue Mountains national forests have water systems that depend on water from National Forest System lands. These watersheds may be managed for multiple uses so long as management activities do not degrade water quality. The Malheur National Forest has Long Creek and Byram Gulch, two municipal watersheds totaling 535 acres. Umatilla National Forest has one municipal watershed, Mill Creek, at 20,300 acres. There are two municipal watersheds in the Wallowa-Whitman, providing water for Baker City and LaGrande City, totaling 24,483 acres.

Looking Forward: Conclusions and Concerns

Designated lands cover a wide range of features in the Blue Mountains national forests, involving many different agencies, laws, and regulations. Forest plan revision provides an opportunity to inventory and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System and determine whether to recommend any such lands for wilderness designation following the process provided in the Forest Service Handbook 1909.12, Chapter 70. Forest plan revision can include other special designated areas that were not included in the current plans.

Additional Information

DeCroo, M., M. Lavery. 2024. Assessment for Forest Plan Revision – Designated Areas Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168598.pdf

Please contact the offices listed on the cover page to request a printed copy of the detailed assessment report.

Scenery

The world is big and I want to have a good look at it before it gets dark.

—John Muir



Eagle Cap, Wallowa-Whitman National Forest, photo by USDA Forest Service

The View Matters

The 2012 Planning Rule states that the Forest Service must consider sustainability of recreation settings and “scenic character” (a sense of place based on an area’s visual attributes) in planning decisions. The Forest Service must also consider the economic and social value of scenery for people viewing national forest scenery, both from within and outside its boundaries.

Features that make a view interesting are called “scenic attributes”, which include identifiable patterns, distinct color, texture, form, and elements such as aspen stands and rock formations, which are all dependent on functioning ecosystems. These attributes create images that serve as backdrops to personal experiences and memories.

Current Scenic Conditions

Accounting for scenery can be complicated, but there are various methods to determining current scenery conditions. All indicators show that management activities on the Blue Mountains national forests play an integral part in the high-quality scenery of this region.

Scenic Integrity. Scenic Integrity is defined by the Forest Service as the amount of visual disturbance that detracts from a natural landscape. Such visual disturbances include high intensity timber harvests, roads, utility lines, mines, and facilities. About 15 percent of the Blue Mountains landscape has a low to very low scenic integrity level, 20 percent of the area has a moderate level, and 50 percent of the area has high scenic integrity level. Twelve percent of the landscape has very high scenic integrity, where scenic character is intact without visual disturbances. Most of the visual disturbances are related to pre 1980 timber harvests for the Blue Mountains.

Scenic Stability. This measure determines the ecological sustainability of the landscape and its scenery attributes. Past management activities such as wildfire suppression over the past century and timber harvest practices, like clearcuts before the 1980s, impacted scenic resources. These activities resulted in conditions such as homogenous, overly dense forests with tree species that are not as resistant to fire. Scenery resources could be at risk from natural disturbances such as uncharacteristically large, stand-replacing wildfires, and insect and disease disturbances. Future management decisions also have potential to impact scenic resources. For the Blue Mountains, 63 percent of highly valued and distinctive scenery has moderate scenic stability, meaning that while most scenery attributes are present, they may suffer from a disturbance event. Less than 5 percent of the same highly valued and distinctive scenery areas have high scenic stability, meaning that the dominant scenery attributes are present and are likely to be sustained.

Looking Forward: Conclusions and Concerns

People value the Blue Mountains national forests for their natural beauty, undeveloped and undisturbed scenes, and rural western setting when visiting and recreating. Results from the 2019 National Visitor Use Monitoring report indicates that visitors found scenery and the condition of the environment to be highly satisfactory and important to their recreation experience across the Blue Mountains. Like with other resources, scenery can be altered by natural disturbance events such as fire, insect and disease, flood, drought, and invasive species and human caused disturbance such as timber cutting, mining, etc. While people greatly value these scenic resources, they can be impaired by high severity disturbance events. Managing for ecological integrity can help maintain scenic conditions for the Blue Mountains.

Additional Information

DeCroo, M. 2024. Assessment for Forest Plan Revision — Recreation Settings, Opportunities, Access, and Scenic Character Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168602.pdf

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Recreation Settings and Opportunities

I felt my lungs inflate with the onrush of scenery – air, mountains, trees, people. I thought, ‘This is what it is to be happy.’

— Sylvia Plath



Burnt Cabin Trail Bridge, Umatilla National Forest, photo by USDA Forest Service

Endless Opportunities for Outdoor Enthusiasts

The Blue Mountains national forests provide a wealth of recreation opportunities for residents and visitors across the nation. Diverse topography, landscapes, water features, vegetation, fish, and wildlife, make the Blue Mountains a valued outdoor escape. The three national forests received 502,000 visits annually, as identified by the 2019 National Visitor Use Monitoring (NVUM) survey. This annual figure includes visits to Hells Canyon National Recreation Area, as NVUM estimates are available at the national forest level, and not for more specific areas.

The top five activities in the Blue Mountains were hiking and walking, viewing natural features, viewing wildlife, driving for pleasure, and relaxing. Other activities include:

- All-terrain vehicle, motorcycle and off-highway vehicle trails
- Swimming, boating, floating and kayaking
- Cabin and fire lookout rentals
- Cross-country skiing
- Day use areas
- Campsites and campgrounds
- Downhill ski areas
- Fishing
- Hiking and backpacking
- Horseback riding
- Hunting and trapping
- Interpretive sites
- Mineral collection (including gold panning and petrified wood)
- Mountain biking
- Picnicking areas
- Recreational driving
- Recreational target shooting
- Resorts
- Rock and ice climbing
- Scenery and wildlife viewing and photography
- Snowmobiling trails
- Snowshoeing
- Wildlife viewing areas

While visitors to national forests often participate in many recreation activities during one visit, such as combining boating with wildlife viewing and viewing natural features, visitors often have one main activity in mind. For the Blue Mountains, hunting was the most popular main, or primary activity when surveyed in 2019, representing 18 percent of visitors. Downhill skiing ranked second, with 11 percent of all visitors, while hiking or walking, driving for pleasure, relaxing, gathering forest products, fishing and winter sports were indicated as primary visit purposes by 5 to 10 percent of visitors.

The Blue Mountains are important local and national recreation destinations. Almost all residents of Oregon and Washington participate in outdoor recreation in some form. In addition to providing enjoyment and adventure, outdoor activities help bolster the recreation economy and provide health benefits which reduces medical expenditures for individuals. Hunting and fishing remain important to Tribes, national forest visitors, and people who live throughout the region. Recreation and related tourism, especially during hunting season, is a major component of the rural economy in northeast Oregon and southeastern Washington.

A Closer Look at Recreation Opportunities

The Blue Mountains national forests manage recreation programs under three types of settings: developed, dispersed, and backcountry.

Developed Recreation

Settings include developed campgrounds, downhill ski areas, snow parks, interpretive trails, motorboat launch sites – all of which are mostly found in areas accessible to motor vehicles and adjacent to primary roads and highways. Facilities at developed sites generally have more constructed amenities to help enhance the visitor's experience, and visitors can expect to have more frequent contact with others who to share the facilities. The environmental surroundings are usually scenic in nature, such as scenic ridgetops, river corridors, or lakes. Primary activities associated with developed sites are camping, boating and fishing, snowmobiling, downhill skiing, biking, driving for pleasure, and viewing wildlife and scenery. When surveyed recently, user satisfaction across the Blue Mountains national forests is good to very good for developed day use and overnight sites.

Developed recreation settings are typically the most well-known and heavily used sites within the national forests. This type of concentrated use requires ongoing maintenance to meet user expectations. For example, few of the facilities offered currently accommodate the size and length of modern recreation vehicles and most are not yet fully accessible for visitors with disabilities. Some crowding is experienced and expected, and the cleanliness of the sites may be impacted for short periods during peak use. Resource impacts are also more frequent at developed sites due to heavy use near lakes and streams that can cause impacts to stream banks, riparian vegetation, beaches, fish spawning areas, and overall water quality.

Dispersed Recreation

Dispersed recreation settings offer a broad array of opportunities to users who require few developed site amenities. Visitors often seek this setting to participate in activities such as hiking, hunting, backpacking, stock packing, gathering forest products, biking, off-highway vehicle riding, fishing, and viewing scenery and wildlife. Outfitter and guides also provide commercial services for hunting, fishing, day rides, and river boating and rafting.

National forest dispersed campsites, off-highway vehicle trailheads, and wayside interpretive sites are examples of minimally developed facilities that are rustic in nature yet appeal to those wanting to be more self-sufficient. The sites lack plumbing, paved surfaces, or potable water sources found in developed recreation setting. These areas are accessed via secondary or primitive roads and trails. Scenic and recreation river corridors also occur within this setting. Peak periods can occur during fall hunting seasons when larger groups tend to congregate for hunting in traditional locations. During the rest of the year, campsites and activities are more dispersed, and social encounters tend to be infrequent.

Site amenities and road access in these settings are infrequently maintained, which can result in resource damage due to heavy use of dispersed sites and cross country off-highway vehicle use. National forest roads and trails comprise between 50 and 70 percent of facilities used by dispersed recreation users in the Blue Mountains.

Backcountry Recreation

Backcountry recreation occurs in the least developed setting and provides the greatest opportunity for solitude, risk, and challenge in environments of rugged, undeveloped landscapes. These landscapes are often deep, isolated canyons, heavily forested plateaus, and rocky ridgelines. There are minimal facilities and visitors often partake in challenging activities that depend on an individual's self-reliance. Visitors may encounter rustic or primitive facilities such as information or direction signs, rustic toilets, and trails. Activities available in these areas, such as hunting and fishing, mountain biking, off-highway vehicle riding, trail riding and stock packing, backpacking, skiing, and snowshoeing, and river boating and rafting, often require higher levels of outdoor skills. There were 42,000 designated wilderness area site visits in 2019 to the Blue Mountains national forests. Visitor satisfaction regarding dispersed recreation ranged from average, good, or very good and was associated with the general forest condition. Wilderness visitors rated their satisfaction as good or very good, with notable dissatisfaction towards interpretive displays and signs.

Although less frequent than at dispersed and developed recreation sites, there are instances of resource damage due to heavy use of popular dispersed campsites, cross country off-highway vehicle use, frequent use near beaches, and heavily traveled destination trails. The degree of solitude can be less than expected in popular areas as well. Some conflicts between different

types of multiple use groups, such as horseback riders, hikers, off-highway vehicle users, backcountry skiers, mountain bikers, and snowmobile users, occur on trails and in multiple use areas.

Looking Forward: Conclusions and Considerations

Recreation use and visitation has increased since the 1990 current plans were issued. The 2017 Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP) Survey reported that 95% of Oregonians participated in at least one outdoor recreation activity. With the rise in popularity of outdoor recreation comes the risk of over-crowding, which can diminish the visitor experience and disturb natural resources. Predicted shorter seasons for winter recreation activities, abnormally long wildfire seasons, and heat waves in the warmer months could change when and where visitors can recreate. These conditions can also reduce the availability and quality of water-based recreation. Poor air quality in areas experiencing longer wildfire seasons and more smoke could concentrate visitors to areas with less or no smoke which risks over-crowding.

The survey also identified top priorities for future recreation needs; cleaner and more abundant restrooms, soft surface walking trails, natural play areas, nature and wildlife viewing areas and public access to waterways. Additional priorities include providing free-of-charge recreation opportunities, ensuring clean and well-maintained facilities, and developing additional walking and hiking trails.

Oregon's 2019-2023 SCORP also highlights five important demographic and societal changes facing outdoor recreation providers, including the Forest Service, in the coming years:

- Aging population
- Increasingly diverse population
- Lack of youth engagement in outdoor recreation
- An underserved low-income population
- Physical activity for health benefits

Recreation participation in Oregon has been shown to underrepresent racial minorities, people with limited incomes, and people with disabilities. Land managers must seek out ways to provide equitably accessible recreation to all and also address the rise in popularity of outdoor recreation while maintaining a balance of recreation and conservation.

Recreation facility infrastructure continues to have a backlog of deferred maintenance needs, and sites are slowly conforming to Americans with Disabilities Act standards. Capital improvement projects have upgraded some high use sites and agreements with other recreation providers and volunteer groups have resulted in improved sites at many locations.

Additional Information

DeCroo, M. 2024. Assessment for Forest Plan Revision – Recreation Settings, Opportunities, Access, and Scenic Character Report, Blue Mountains national forests.
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168602.pdf

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Infrastructure and Access

America's highways, roads, bridges, are an indispensable part of our lives...We use them each and every day, for every conceivable purpose.

— Christopher Dodd

The Importance of Infrastructure

Infrastructure enables much of the Blue Mountains national forests' recreation, administrative, and commercial use. Infrastructure supports and directly affects multiple uses, which include recreation, timber, grazing, water uses, minerals and energy, and access to fish, wildlife, and plants. It enables recreational opportunities, management of national forests, provides for water and sanitation, and helps make a visit to national forests a quality experience. Maintaining national forest infrastructure is also important to local economies and quality of life for people living in nearby communities.

For our planning purposes, infrastructure is defined as the human-built property that supports the management and use of the land. Categories covered in this section include the transportation system (forest roads open to public travel, maintenance levels, bridges, and air strips); recreation (developed facilities, trails, resorts, and recreation residences); and administrative structures (administrative facilities, dams, water diversions, fences, and communication towers).

Current Forest Plan Direction

The 1990 forest plans provide the following general guidance:

Transportation - Provide and manage a safe and economical road and trail system and facilities needed to accomplish the land and resource management and protection objectives of the forest.

Recreation and Administrative - Provide and manage recreation and administrative facilities sufficient to serve the public and accomplish land and resource management and protection objectives of the forest.

Existing Conditions

Demand for various uses, including recreational and commercial uses, has risen since the current 1990 forest plans were written. While use and demand has risen, budgets have not kept pace. As a result, it has become increasingly difficult to sustain national forest infrastructure in a condition that adequately provides for and protects visitors and natural resources.

Transportation Infrastructure

Transportation infrastructure includes National Forest System roads, bridges, and airfields. National Forest System roads provide access to the Blue Mountains national forests and are a

component of a larger transportation network managed jointly with other public road agencies.

In the Blue Mountains national forests, 11,575 miles of roads are open for public use either seasonally or year-round while approximately 10,320 miles of roads are used mainly for administrative purposes and are generally closed to public motorized use. Within the road systems in the Malheur, Umatilla, and Wallowa-Whitman National Forests, there are 38, 26, and 50 road bridges respectively. The number of road miles is generally declining through road decommissioning projects, which treat unnecessary roads to prevent further resource damage.

New, permanent road construction has markedly declined since the 1990 forest plans, and road system condition has deteriorated. Current funding levels inadequately provide for full maintenance of the existing transportation system. Consequently, the road maintenance budget has been prioritized for double-lane passenger vehicle roads, which are typically the most traveled portions of the road system.

With the focus shifting to maintaining roads for passenger car use, the deferred maintenance backlog for the remainder of the road system continues to grow. As the condition of the road system has deteriorated, concerns have increased regarding public safety and resource damage. Overall, much of the road system is lacking regular maintenance, which can potentially degrade water quality, aquatic habitat, and wetlands. In addition, anticipated increase in spring high stream flows will make current infrastructure more vulnerable.

Appropriated funding for road construction and maintenance has decreased while use, wear and expenses have increased.

In addition to the road system, 4 airstrips are present in the Blue Mountains national forests: 1 on the Umatilla, and 3 on the Wallowa-Whitman.

Recreation Infrastructure

Due to the recreation emphasis of the national forests, there are considerable numbers of recreational and historic facilities. Recreation infrastructure include cabins, picnic shelters, toilets, associated water and wastewater systems, trails, developed campgrounds, and other structures. Across the Blue Mountains national forests, there are 133 developed campgrounds, 4,957 miles of trail, 3 ski resorts, and 11 recreation residence tracts.

Administrative Infrastructure

Administrative infrastructure includes administrative facilities, dams, fences (including grazing allotment fences), utility corridors and communication system facilities within the plan area. The Blue Mountains national forests have over 226 miles of utility corridors, 33 communication sites, 43 dams, 66 administrative buildings, and 4,788 miles of fencing. Administrative buildings include barns, bunkhouses, guard stations, ranger district offices, work centers, utility buildings (sheds and storage buildings) and communication system buildings such as lookouts and repeaters. All buildings, including those located on lands of other ownership and used specifically for administration of National Forest System lands, were included.

The Forest Service uses facility master plans to align changing budgets, administrative, and workforce needs. The long-term goal identified in the Facility Master Plan is to reduce the amount of facilities space to affordable levels while meeting administrative needs. The current master plan outlines which buildings will be disposed or retained for future use.

Looking Forward: Conclusions and Concerns

Public use of the Blue Mountain national forests is increasing. There is a greater demand for services and use, subsequently increasing wear and tear on roads, buildings, and other infrastructure. This trend is expected to continue. The inability to adequately maintain existing infrastructure potentially reduces access, recreation services, and public use.

Additional Information

DeCroo, M. 2024. Assessment for Forest Plan Revision – Infrastructure Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168599.pdf

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Land Status, Ownership, and Use

Managing lands and realty for National Forest System lands help improve access to national forests and its many benefits, enhance natural resource stewardship, and provide for visitor experiences. This program also authorizes many types of uses for the benefit of the American people.

Land Status and Ownership

Of the 4.9 million acres in the plan area, approximately 249,000 acres are non-federal lands within the Blue Mountains national forest boundary. Most of these acres are privately owned, while others are managed by the Bureau of Land Management, or state and local governments. Ownership changes occur through land exchange, fee purchase, and the use of easements to acquire certain rights short of fee ownership.

There are also many easements and rights-of-way that are not federally managed. This is where the concept of “land status” comes in. While land ownership relates to the name on the deed, land status refers to a combination of ownership and land use rights. Although most rights have been acquired, the Forest Service continues to identify where acquisition of road and trail easements and rights-of-way are needed to provide for public access and management goals. Land status records are kept by the Forest Service.

Land Adjustment Programs

Created by Congress in 1964, the Land and Water Conservation Fund (LWCF) provides money to government entities to purchase land, water, and wetlands to:

- Provide recreational opportunities.
- Protect clean water
- Preserve wildlife habitat
- Protect scenic vistas
- Protect archaeological and historical sites
- Maintain the pristine nature of wilderness
- Address climate change

The Great American Outdoors Act enacted in 2020 provides permanent and full funding to the Land and Water Conservation Fund, investing in public lands and access for years to come.

Under land adjustment programs, the Forest Service can use these funds to acquire and consolidate key tracts of private land to conserve natural habitat, reduce the risk of permanent development in sensitive areas, and enhance public recreational opportunities. The Forest Service can also secure permanent road and trail rights-of-way (easements) to assure the protection, administration and use of National Forest System lands and resources.

Since 2009, the three national forests have undertaken land acquisition, land exchange and land sale activity. Specifically, the Malheur National Forest acquired 13,087 acres; the Umatilla National Forest acquired 1,186 acres and exchanged out 491 acres; and the Wallowa-Whitman National Forest acquired 8,497 acres and disposed of a little over twenty acres through 13 separate sales.

In some instances, the national forest boundary, shown in the map below, is irregular due to varying ownerships. There are also scattered private lands within the national forests as well as isolated National Forest System land parcels surrounded by private lands. Because of these situations, there is a continuing need for boundary adjustment to meet the needs of national forest administration as well as for effective private land management.

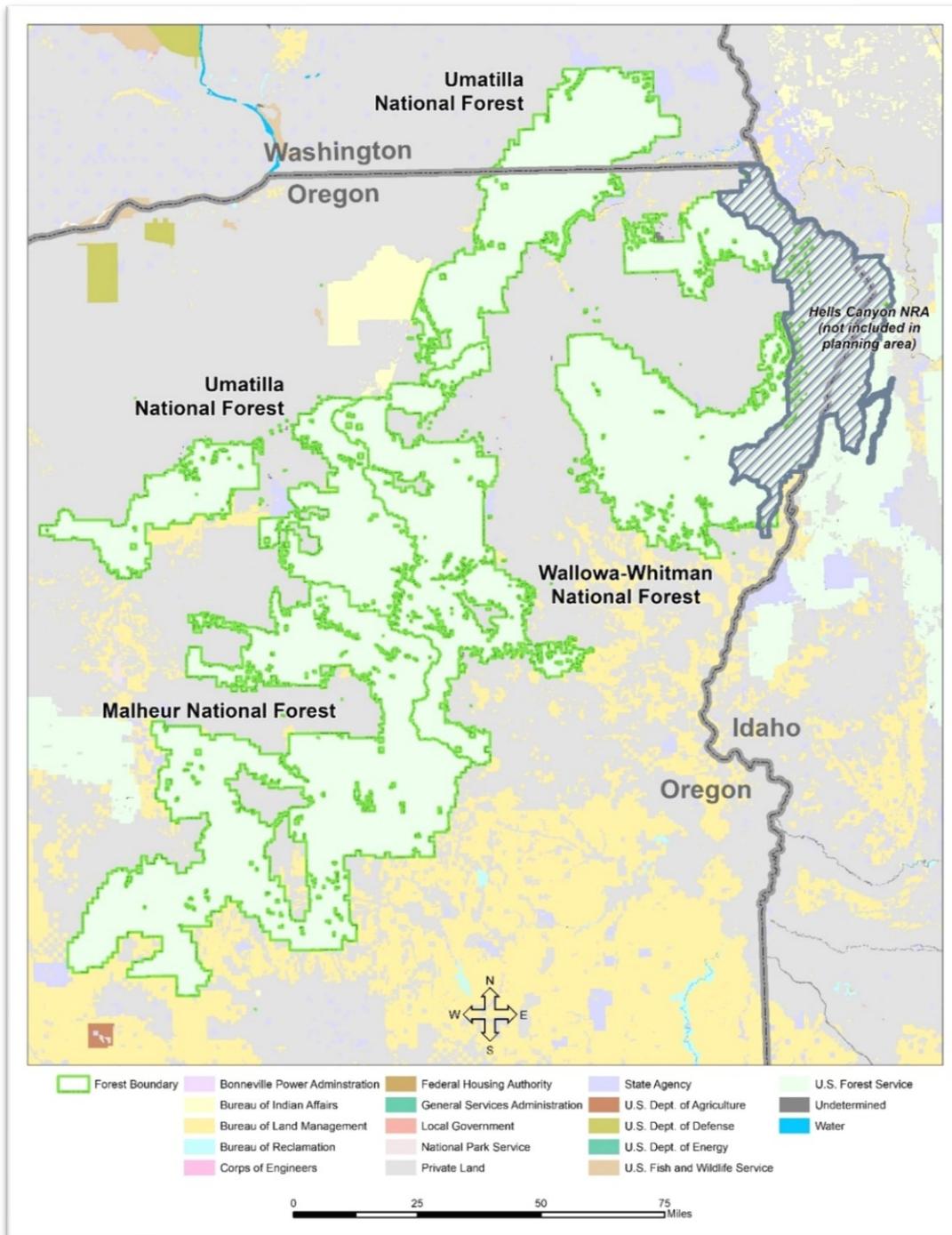


Figure 10. Blue Mountains national forests boundaries and land ownership types

Special Uses

Land occupancy and use by private parties and other government entities is managed through the issuance of special use authorizations. Authorized special uses include industrial or commercial use, private uses, and a variety of recreational uses.

Special uses on national forests allow over 150 different types of uses on National Forest System lands and are granted for specific periods of time. Uses are permitted through special use authorizations after careful consideration to see if the proposed use can be located on lands of other ownership, or if the use is in the public interest.

The Blue Mountains national forests currently administer over 600 special use authorizations. Examples of uses include recreation residences, outfitter and guide services, communication sites, research and training, special events, rights-of-way for roads and trails, and dams. The special use program also administers proposed utility and transportation corridors for oil and gas pipelines, fiber optic or communication lines and for power lines. Timber harvest, grazing, and mining activities are managed separately.

Looking Forward: Conclusions and Concerns

The current forest plans state that land ownership will be adjusted as opportunities arise, where this would serve to consolidate NFS lands, result in a net reduction in property lines, acquire lands in Federally designated areas, obtain lands needed for administrative or research purposes, improve resource conservation and production, resolve landownership conflicts, or otherwise be clearly in the public interest. Private land transactions that either border or are located within administrative boundaries of National Forest System will likely continue.

For special uses, the current Blue Mountains national forests plans direct units to provide for the use and occupancy of the forest by private individuals or federal, state, and local governments when such use is consistent with forest management objectives, is in the public interest, and cannot be reasonably served by development on private land.

Additional Information

Laverty, M. 2024. Assessment for Forest Plan Revision – Land Ownership, Access, Use Report, Blue Mountains national forests.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1168600.pdf

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