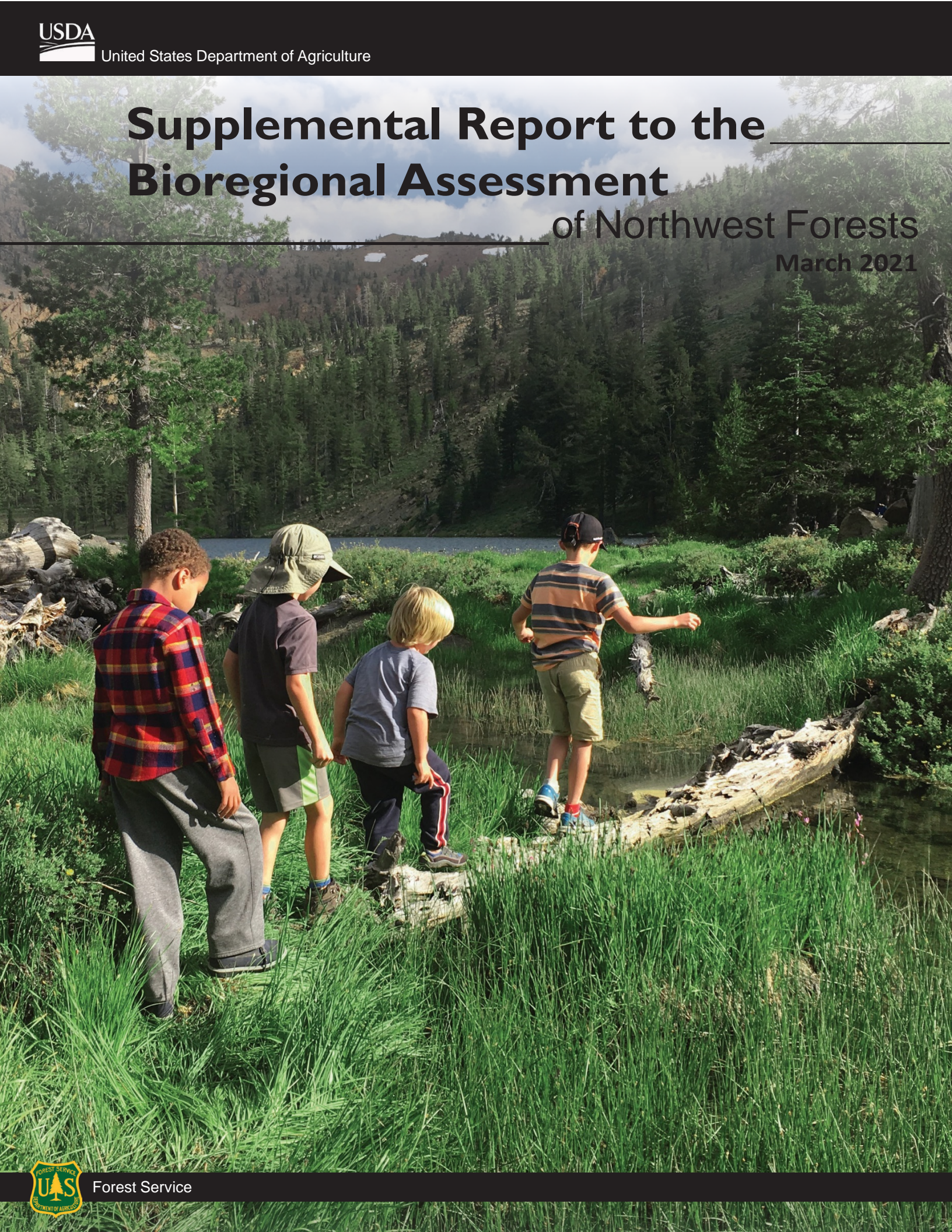




United States Department of Agriculture

Supplemental Report to the Bioregional Assessment of Northwest Forests March 2021



Forest Service

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Supplemental Report to the Bioregional Assessment of Northwest Forests

U.S. Department of Agriculture, Forest Service

Pacific Northwest Region

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Introduction

This Supplemental Report to the Bioregional Assessment of Northwest Forests (report) is a companion document to the Bioregional Assessment of Northwest Forests (BioA). The USDA Forest Service [Pacific Southwest Region](#) and the [Pacific Northwest Region](#) collectively prepared a bioregional assessment of the expanded [Northwest Forest Plan](#) (NWFP) amendment area. The BioA was developed to look and feel different from standard Forest Service planning assessments. It uses plain language and an abundance of graphics to convey current conditions and trends in a relatively brief format. It also highlights the most important findings of the underlying assessment that produced the BioA, but not all findings.

This report was developed to provide additional detail about the BioA and the wealth of information considered by its authors. It includes issues that did not rise to the level of urgency to be included in the BioA but are important for land managers to consider when national forests, grasslands, and scenic areas begin preassessment and assessment tasks. It also provides additional details related to the issues included in the BioA.

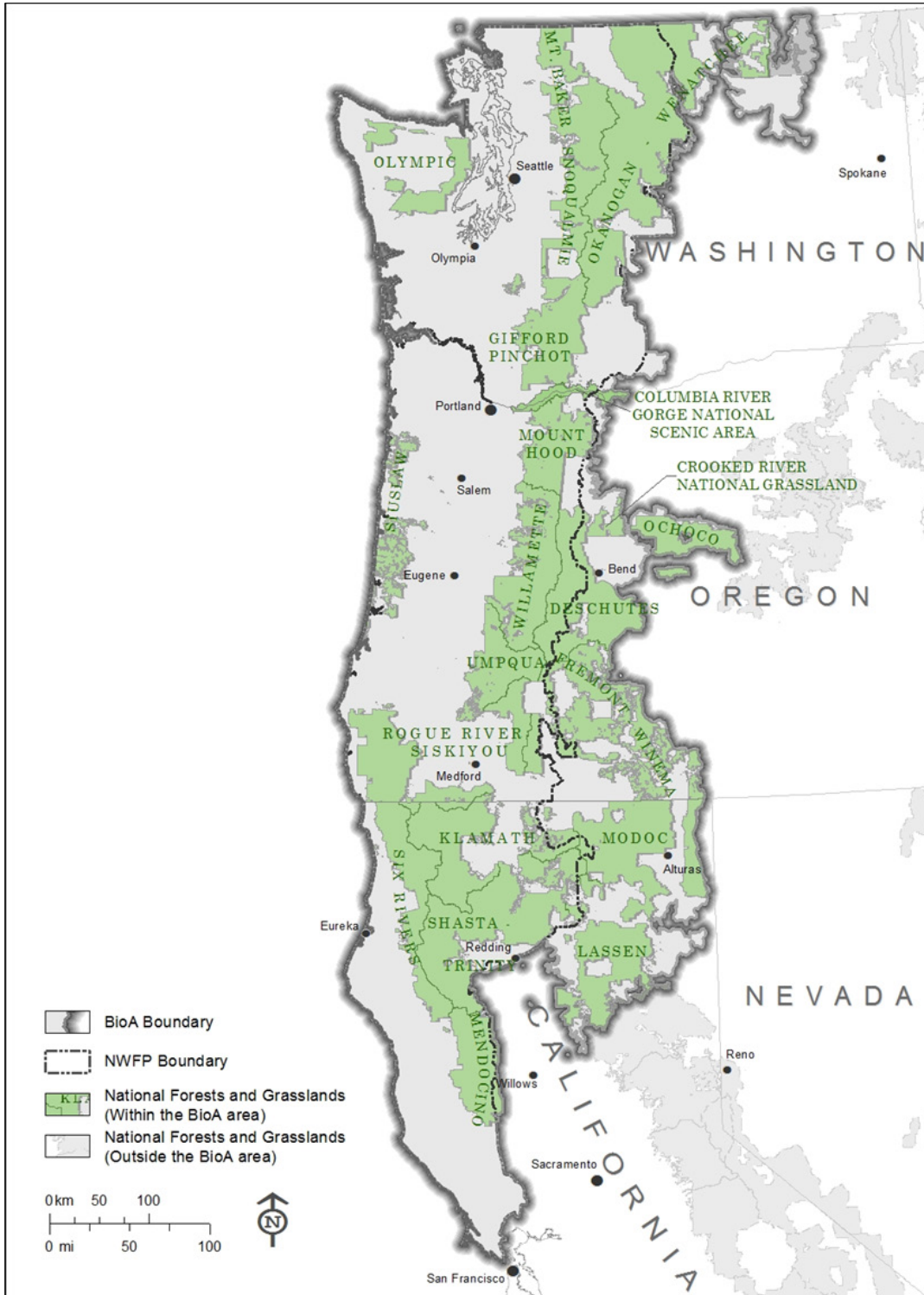
As with the BioA, the focus of this report is on the 17 units that are wholly or partially covered by the NWFP amendment and other planning frameworks, as well as two additional adjacent units (the BioA area). This effort evaluates successes, challenges, trends, and potential management changes in the BioA area. Neither this report nor the BioA makes any land management decisions.

Call-out box 1: Northwest Forest Plan amendment

The 1994 Northwest Forest Plan amended the land management plans of the national forests in the range of the northern spotted owl in the Pacific Northwest region of the United States. The amendment was developed in response to mounting public concern and legal battles that halted timber harvesting in old forests throughout the owl's range. Approval of the amendment allowed timber management to continue with new operating restrictions, while providing for the management of habitat for northern spotted owls, marbled murrelets, and other species associated with old forests and protection of aquatic habitats. However, the goal of maintaining a viable timber industry to sustain rural communities and economies was not fully realized under the NWFP.

The Forest Service's Pacific Northwest and Pacific Southwest Regions manage the national forests and grasslands in the BioA area across Washington, Oregon, and California (map 1). A regional approach to modernizing the land management plans across the BioA area's broad landscape provides an opportunity to understand the unique contributions from, as well as challenges and opportunities within, each individual national forest and grassland. The modernization effort is focused primarily on national forests and grasslands; to assess ecological and social connections across the landscape, we also considered some other federal and non-federal lands.

Introduction



Map 1. Bioregional Assessment boundary

This map includes the BioA boundary, Northwest Forest Plan boundary, and the related 19 national forests and grasslands. The BioA area is larger than the Northwest Forest Plan area; it includes the entire national forests and two additional adjacent units.

Introduction

As natural resource values and ecological, social, and economic conditions have shifted across time, so have the policies that guide Forest Service land management. The U.S. Forest Service 2012 Planning Rule emphasizes an adaptive planning process and resilience to climate change impacts. However, existing land management plans that have not yet been revised are not always consistent with current policies or evolving science and often do not reflect current and anticipated conditions.

Since 1994, when most land management plans in the BioA area were adopted and amended (figure 1), national forests and grasslands have experienced an increase in uncharacteristic wildfires, in the number of species listed under the U.S. Endangered Species Act, and in the spread of invasive species. Climate change, likely the biggest challenge in modern land management, is expected to result in broad-scale ecosystem changes throughout the BioA area. In the past 25 years, the Forest Service has gained more knowledge about the watersheds in the area as well as the terrestrial and aquatic species that depend on the habitats in the BioA area. The agency continues to build relationships with, and to better understand, the communities and American Indian tribes (tribes) served by the national forests and grasslands in the BioA area.

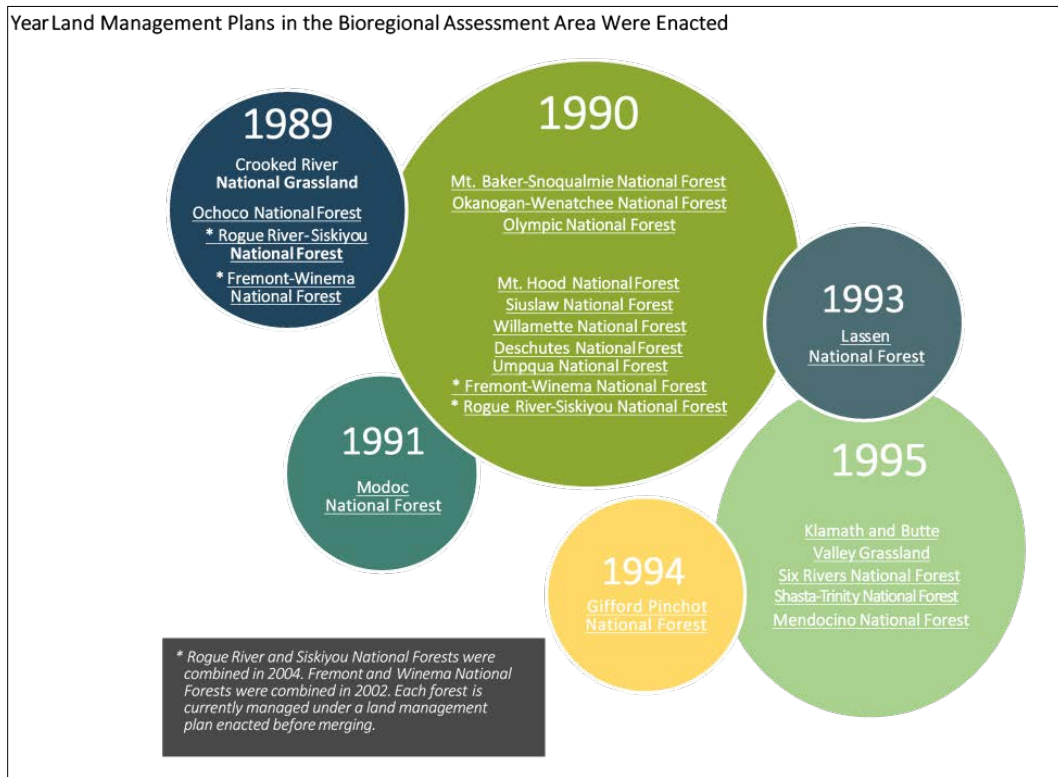


Figure 1. Bioregional Assessment area Land Management Plans

Land management plans in the BioA area are more than 25 years old. There have been changes in social, ecological, and economic conditions as well as in resource demands; and new scientific information and policy are available.

Introduction

This report is grounded in science and was written by an interdisciplinary team of specialists from Regions 5 and 6. It is a snapshot of the challenges and opportunities associated with today's resource management but does not include the level of detail required for formal land management plan modernization. The team relied on existing data gathered from several sources, including the [2018 Synthesis of Science to Inform Land Management Within the Northwest Forest Plan Area](#), the [2014 Science Synthesis to Support Socioecological Resilience in the Sierra Nevada and Southern Cascade Range](#), the [Northeastern California Plateaus Bioregion Science Synthesis \(draft, anticipated March 2020\)](#), and more than 20 years of [NWFP monitoring](#) and implementation experience, two science reviews, as well as information gathered through ongoing [Sierra Nevada Framework](#), PacFish¹ and InFish² effectiveness monitoring programs. In addition, the team used scientific literature from professional journals and technical bulletins, and information gathered from Forest Service personnel who have intimate knowledge of the area. This report is based on the best science and information available at the time it was written; no new analyses or studies were completed.

This report focuses on issues that can be resolved through the land management planning process and does not consider other management constraints, such as budget and staffing concerns. This report does not include all important planning issues, such as lands and realty, cultural resources, grazing and minerals. It does not include specific planning components and is intentionally nonprescriptive. Forest-, project-, and site-specific topics are not discussed in this document; these will be collaboratively developed with partners and stakeholders as the planning process continues. Upcoming land management planning efforts will include new analysis; development or revision of plan components; engagement with stakeholders, tribes, and local governments; and environmental review as required by the National Environmental Policy Act and other laws, regulations, and policies.

The assessment process identifies information gaps that will be addressed in future planning efforts to help consider uncertainties and knowledge gaps related to fire, climate change, invasive species, tradeoffs between ecosystem and species goals, and tradeoffs between ecological and social components. There were some essential geographic information system datasets that contained knowledge gaps. For example, critical habitat maps were not available for southern Oregon and northern California coho salmon, a species listed as threatened under the U.S. Endangered Species Act.

¹ U.S. Department of Agriculture and U.S. Department of Interior (USDA and USDI). 1995. Decision Notice/Decision Record for Interim Strategies for Managing Anadromous Fish-Producing Watersheds on Federal Lands in Eastern Oregon and Washington, Idaho and Portions of California (PacFish).

² U.S. Department of Agriculture and U.S. Department of Interior (USDA and USDI). 1995. Decision of Notice and Finding of No Significant Impact for the Inland Native Fish Strategy: Interim Strategies for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada (InFish).

Organization of the Supplemental Report

This report has four chapters: (1) Serving People, (2) Tribal Rights and Interests, (3) Caring for the Land, and (4) Northwest Forest Plan Land Use Allocations and Management Direction. Each chapter includes background and context along with information under the following section and subsection headings:

What is Working Well

This section highlights what has been working well under the existing plans and suggests that some guidance and direction should be retained as we move through the modernization process.

Key Change Issues

This section identifies landscape management challenges that cannot effectively be addressed under our current plan direction for a variety of reasons.

Planning Considerations

This subsection includes references to the recommendations from the BioA that reflect the key change issue. Because the BioA recommendations are integrated, multiple recommendations may be connected to one key change issue. In addition, this section may include planning considerations that were not explored in the BioA but could be considered as plan modernization moves forward.

Geographic Considerations

This subsection generally provides more detail than the BioA on geographic considerations and may inform upcoming plan modernization efforts by listing groups of forests or individual forests where key change issues occur.

Chapter 1: Serving People

“To sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.” – U.S. Forest Service mission statement.

Introduction

The Forest Service is dedicated to achieving quality land management while providing for sustainable multiple-use management to meet the diverse needs of people. In this chapter we examine key forest benefits and highlight their social and economic values and contributions to the communities we serve. We will further update information related to direct economic benefits to communities with more detailed and site-specific local data during future planning phases. Here, we look back at what's been working well for local communities and where communities have struggled to adapt under current land management plans on the national forests and grasslands in the BioA area. We acknowledge limitations and consider what we can do to improve how we serve communities into the future. More information about the benefits that national forests and grasslands provide to local communities is detailed throughout each chapter of this report.

Benefits to People and Communities

National forests and grasslands provide clean air and water, and habitat for plants and animals; they also preserve cultural resources, conserve natural settings and provide essential commodities and recreational opportunities for the benefit of present and future generations. These benefits (also referred to as ecosystem services) deliver significant value for all Americans. Some benefits, including cultural heritage and biodiversity, may be more difficult to connect directly to monetary values than others, such as timber and water. However, nonmonetary benefits greatly contribute to improving the quality of people's lives. Recognition of the immense value national forests and grasslands generate through this wide range of benefits was included in the original vision of the Northwest Forest Plan Amendment (NWFP), which was to provide “a balanced and comprehensive strategy for the conservation and management of forest ecosystems, while maximizing economic and social benefits from forests” (USDA FS and USDI BLM 1993: E-5).

In 2016, activities on federal lands in the NWFP area supported almost 25,000 jobs in local communities (Grinspoon et al., n.d.).³ Specifically, recreational opportunities, timber activities, and agency employment on National Forest System and Bureau of Land Management lands supported the most jobs as a result of forest activities in these communities (refer to figure 2). Over time, there have been reductions in agency employment and recent increases in employment related to timber harvest on federal lands. Direct jobs are those supported by forest activities (for example, timber harvesting) and

³ Some data and information presented in this chapter are taken from the Northwest Forest Plan—the first 25 years (1994–2018): socioeconomic monitoring results report. The 25-year monitoring report is currently in development and is not finalized as of the writing of the Bioregional Assessment of Northwest Forests and this report. Therefore, the findings presented here are the best available at this time, but the information may change as the 25-year monitoring report is reviewed and finalized.

indirect jobs are supported by subsequent business-to-business transactions that support these forest activities (for example, spending on materials, equipment, and fuel for forest work). There is a relatively high number of jobs supported by recreation on public lands. (Grinspoon et al., n.d.).

Job opportunities on national forests and grasslands outside the NWFP area are important as well. For example, in 2016, the Ochoco National Forest supported almost 800 jobs with the majority resulting from agency employment, grazing and forest products. The Lassen National Forest supported around 1,400 jobs in local communities, mostly in agency employment, forest products, and recreation.⁴ Employment opportunities resulting from activities on the Modoc National Forest totaled around 1,000 jobs focused on grazing and agency employment.

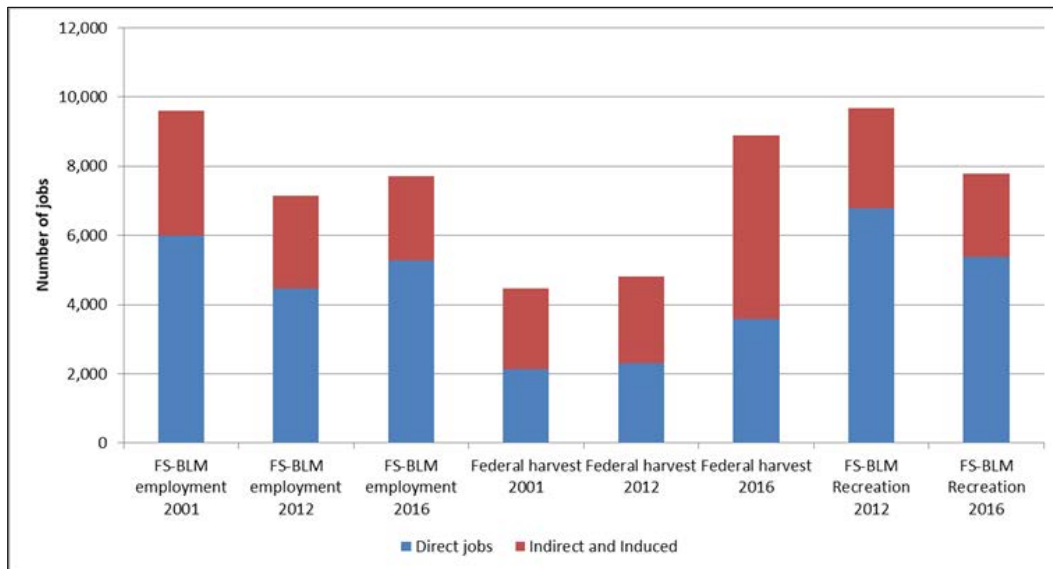


Figure 2. Jobs supported by Forest Service and Bureau of Land Management activities

Employment supported by Forest Service and Bureau of Land Management programs from 2001, 2012, and 2016. Adapted from Grinspoon et al., n.d.

Sustainable Recreation

The recreational opportunities available in the BioA area are numerous and include biking, hiking, off-road vehicles, hunting, fishing, wildlife viewing and water sports to name a few. These activities provide enjoyment for millions of visitors, improve physical and mental health and allow people to establish a connection to the outdoors. Recreational activities are not evenly distributed throughout the NWFP area. Some national forests and grasslands provide a wider variety of opportunities and are closer to population centers than others. As a result, some communities have transitioned to a more recreational- and amenity-based economy, while others have not (Charnley et al. 2018). In addition to these benefits, visitors to the area also contribute to local economies by spending around \$600 million annually on lodging, restaurants, souvenirs, and other trip-related expenses (Charnley et al. 2018). In 2016, this spending by recreation visitors supported around 7,800 jobs in these

⁴ No estimates were available for the Crooked River National Grassland.

communities. These recreation-based jobs are critical to supporting the social and economic conditions in many communities throughout the BioA area (Grinspoon et al., n.d.). Therefore, maintaining and enhancing the quality of recreational experiences on national forests and grasslands is important to supporting visitation and sustaining these socioeconomic contributions to communities.

Forest Products

Land management on national forests and grasslands contributes to supporting forest product jobs in local communities (Charnley et al. 2018, White et al. 2015). The Forest Service hires and trains local contractors to perform forest restoration activities, which provides employment opportunities in many rural areas where such opportunities might otherwise be limited (Nielsen-Pincus and Moseley 2010). Total employment in forest products industries in the NWFP area, including logging and primary and secondary wood manufacturing, has declined over the past 25 years. However, even as harvest on all land ownerships in the area has increased slightly since 2009, there has not been a similar increase in jobs as a result of this increased activity across all ownerships (figure 3).

Overall, timber harvest declined dramatically from 2006 through 2009 (leading up to and through the great recession) with most of the reduction in harvest occurring on non-federal lands. The resulting decline in employment from this period has not experienced an increase because of recent increases in harvest, which may have to do with changes in industry structure and improvements in mill efficiencies (Grinspoon et al., n.d.). These job losses are likely to have a more pronounced effect in small rural communities where up to 10 percent of employment in the community can be in the forest products manufacturing sector (Grinspoon et al. 2016).

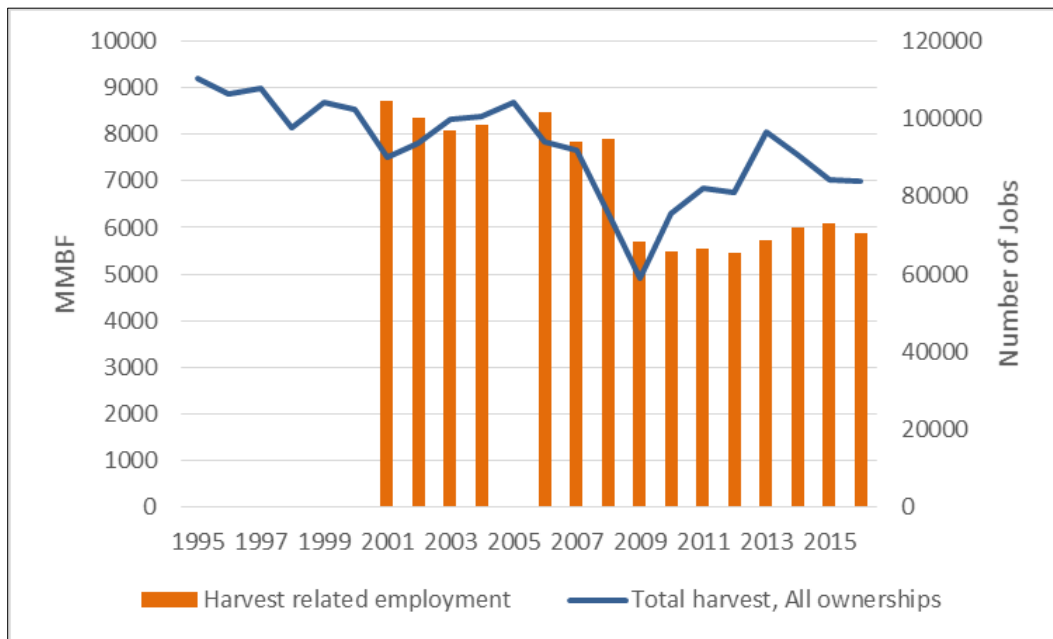


Figure 3. Northwest Forest Plan (NWFP) timber harvest and employment from 1995 to 2016

Timber-related employment (logging and mill processing) and timber harvest on all ownerships in the NWFP area, 1995–2016. MMBF = million board feet. Adapted from Grinspoon et al., n.d.

Despite the overall reduction in traditional timber sector jobs in rural communities in the NWFP area, there is potential for restoration activities to generate employment opportunities (Charnley et al. 2018, Nechodom et al. 2008, White et al. 2015). Contractors from local communities can be hired to perform restoration activities, which is important because employment opportunities in these areas are often limited. However, restoration contracting in some areas has transitioned to lower skilled jobs and can favor mobile businesses that employ a high proportion of temporary and migrant laborers, and therefore may not provide wages that replace former timber industry jobs (Charnley et al. 2018).

A study examining forest and watershed restoration work found that about 16 to 24 jobs are supported for each \$1 million invested in forest restoration activities (Nielsen-Pincus and Moseley 2010). This range is dependent on the type of restoration activities. Another study estimated that upland forest work supports about 10 jobs for each \$1 million invested (White et al. 2015). These job estimates are only for the noncommercial work, where timber is not extracted for sale or use, and any jobs that follow from commercial timber harvest and mill processing in support of these forest restoration projects would be in addition to those stated.

Investments in labor-intensive activities (such as site preparation, tree and shrub planting, and cutting small trees and brush by hand) support a greater number of jobs, whereas investments in highly technical and equipment-intensive activities (such as forest thinning, small-diameter and selective logging, masticating ground fuels, constructing stream habitat features, and excavating floodplain and wetland features) support fewer jobs. Increased pace and scale of restoration leads to employment and economic activity beyond the effects of employment generated by the activities themselves, including the need for materials and equipment purchased from suppliers and restoration workers spending their paychecks for goods and services.

National forests and grasslands in the BioA area also provide a wide variety of nontimber forest products (non-timber forest products), such as moss, mushrooms, cones, grasses, and firewood. These products provide valuable economic and cultural benefits to rural and urban households through their use, harvest, and processing.

Due to the diverse range of products harvested, estimating the true economic contribution of all forest products is difficult. In addition, collection of many special forest products is for subsistence or personal consumption and therefore market transactions do not capture the economic value of these forest products. The retail value of non-timber forest products in the United States is estimated to be at least \$1.4 billion, with much of that coming from the NWFP region (Charnley et al. 2018). In 2012, 99 percent of the value of special forest product permits in the NWFP area included seven categories: foliage, fruits and berries, fuelwood, grass, limbs/boughs, mushrooms, and Christmas trees (Grinspoon et al., n.d.).

Water

Water provides tremendous value to people and communities for municipal, industrial, and agricultural uses. National forest system lands supply more water in the Western United States than any other landowner (Brown and et al. 2008, Luce et al. 2017) In fact, about 49 percent of the water in the Western United States comes from national forests and grasslands (Brown et al. 2016). Water has a monetary value of more than \$3.7 billion

nationally, with the highest values in Oregon, Washington, and California (Sedell et al. 2000). As highlighted in the Bull Run Watershed example, the actual value of this water is immense as communities depend on a reliable water supply for their subsistence and economic growth. National forest and grassland water also provides valuable ecological benefit supporting terrestrial and aquatic species as well as opportunities for recreational activities.

Call-out box 2. National forests and grasslands as a water supplier—Bull Run example

Providing a sustainable flow of clean water is a foundational role of national forests and grasslands and increasingly important given growing populations and climate change projections that reflect changing precipitation patterns. One example in the Bioregional Assessment of Northwest Forests (BioA) is the Bull Run Watershed, the primary drinking water supply for the City of Portland and its 20 wholesale customers. Water from the Bull Run serves more than 950,000 residents in the Portland metropolitan region, which is a quarter of Oregon's population.

Located 26 miles from downtown Portland in the Sandy River basin on the Mount Hood National Forest, the 102-square-mile watershed collects rainwater and snowmelt that then flows to the Bull Run River and its tributaries. The river drains into two reservoirs that store more than 17 billion gallons of water. The watershed has been managed under increasing levels of protection since it was established as a forest reserve in 1892. Ninety six percent of the lands within the Bull Run Watershed Management Unit are under federal management; the rest are owned by the City of Portland.

National Forest Road System

Roads and motorized transportation on roads in and around the national forests and grasslands provide an essential public service through access for recreation, fire suppression, timber sales, and other contracted work. Local communities also use some forest roads for daily commuting. Construction of Forest Service roads generally is paid for by the revenue from timber sales and maintenance occurs through timber and stewardship sale funds. Revenue from these sources has been in decline over the past three decades as timber sale volumes and cut values have declined. This threatens the sustainability of forest road systems and the benefits they provide.

Livestock Grazing

Livestock grazing provides important public benefits and supports employment and the ranching culture in local communities, particularly in the eastern portion of the BioA area on the Modoc, Ochoco and Fremont-Winema National Forests and the Crooked River National Grassland. Livestock grazing opportunities in these areas are critical to ranchers for summer range because of the quality of forage and cooler summer temperatures at higher elevations. Current and projected climate change and related increased frequency, intensity, and scale of wildfires pose challenges for sustaining grazing practices on uplands and threaten the benefits that livestock grazing on National Forest System lands delivers to ranching communities.

Special Use Services

The Forest Service special uses program authorizes land uses that benefit the public and protect public and natural resource values. Each year, the Forest Service receives individual and business applications for activities and facilities associated with water transmission, agriculture, outfitting and guiding, recreation, telecommunications and other utilities, research, photography, and video productions. The Forest Service reviews each application to determine how the request could affect public use of national forests and grasslands.

In the BioA area, the special use activities that are currently generating the most revenues for national forests and grasslands are recreational residences, winter recreation resorts, powerlines, outfitting and guide services, and marinas. In 2018, special uses in the bioregion generated \$19 million for national forests and grasslands (USDA FS 2019). Revenue from special uses has been increasing over time, thus showing the increasing importance of these activities for both providing public services and generating forest revenues.

Air Quality

National forests and grasslands contribute to improved air quality and better visibility from reduced ozone loss and less particulate matter. People view fresh air and good visibility as being healthy, so these factors contribute to an improved sense of wellbeing in the people who encounter them. Good visibility and fresh clean air further enhance peoples' desire to engage in spiritual and cultural activities and recreate on national forests and grasslands, which in turn positively affects recreation-associated jobs and local economies.

Sustaining These Benefits to Influence Community Wellbeing

Management actions that maintain forest health, diversity, and productivity are critical to ensuring sustainable forest benefits to people and communities. It is important for planning to effectively support these management actions by setting a vision for how the forest should be managed and establishing guidance for how these activities should be undertaken. Some forest management actions and their benefits to people and communities include the following:

- implementing restoration projects that improve ecological integrity and resilience to fire and drought, accelerate the development of late successional forest characteristics, and reduce wildfire risk to communities.
- providing forest products to local mills, which supports the local workforce and contributes to the local and regional economies.
- offering access to recreational opportunities and facilities that attract visitors from the local area as well as around the region, country, and world.
- providing clean water and air to promote the good health and wellbeing of residents and visitors.
- restoring habitat for sensitive species, which contributes to biodiversity and supports activities, such as plant gathering, wildlife viewing, hunting, and fishing.

- restoring functional watersheds, riparian areas, and water bodies to provide sustainable water, vegetation, and recreational opportunities.
- restoring populations of threatened and endangered anadromous fish.
- establishing fire-resilient forest conditions along transmission corridors and around towers to meet community energy and communications needs.
- offering livestock grazing, which contributes to local economies through jobs and income, as well as to local cultures, by supporting a community's history, its sense of place, and traditional and cultural uses of the land.

Achieving large-scale success in these types of forest management activities is enhanced by communities that actively support the efforts. Many of the jobs supported by national forests and grasslands are in rural areas and these jobs often represent a significant contribution to local economic development and social sustainability.

Communities, Wood Processing Infrastructure, and Restoration

Over the past 20 years, timber-related infrastructure and workforce have been declining across the BioA area, and wood processing infrastructure east of the Cascade Range has become especially sparse. Limited infrastructure results in higher transportation costs because timber needs to be hauled farther for processing. The lower concentration of sawmills and a lack of local workforce make implementing forest restoration activities particularly challenging in the eastern part of the BioA area.

Planning at the land management plan level provides the Forest Service an opportunity to determine broad strategies to encourage investment in local mill facilities and the workforce that would be needed to successfully implement timber sales and restoration to improve the ecological integrity of forests and support the socioeconomic health of communities.

Communities are all different and as a result, there has been no one common community experience over the past few decades. Some communities have been able to adapt to changes; these include amenity communities that have taken advantage of natural forest settings to benefit from an influx of residents and an increase in visitors interested in recreation opportunities on the national forests and grasslands. Some communities have also successfully developed economic opportunities outside of the traditional forest timber sector by pursuing energy, agriculture, and tourism (Charnley et al. 2018). In contrast, other communities have faced significant challenges because of a variety of economic, social, geographical, and institutional factors as well as changes in federal land management. Restructuring in the forest products industry, improved mill efficiencies, competition for products nationally and internationally, and fluctuations of harvesting on non-federal lands have all affected the timber-based economy (Charnley et al. 2018).

Environmental Justice and Vulnerable Communities

Many communities throughout the BioA area have experienced shifts in population demography. Some communities have seen an increase in minority populations while others experienced an increase in low-income residents. These shifts bring new social challenges that interact with our land management decisions. The 1994 Executive Order on Environmental Justice and the U.S. Forest Service 2012 Planning Rule direct land managers to pay attention to how policy changes or program implementation may affect

vulnerable sectors of communities, such as minority, low-income, elderly, and disabled populations, who may experience the effects of land management changes differently than less vulnerable community members. The planning rule requires the agency to consider that communities are diverse and some community subgroups may require unique outreach to ensure effective communication.

Vulnerable populations are increasing in rural counties in the BioA area, and poverty is increasing or remaining high in these same areas. These rural communities have historic links to federal land management and may be subject to the greatest socioeconomic effects if changes are made to the existing land management plans. The values and views of these vulnerable populations are often underrepresented in planning processes; therefore, outreach efforts must account for the needs of these communities.

Smaller communities in remote locations with a heavy dependence on the timber economy and on a federal supply of timber to support their workforce and infrastructure are directly affected by reductions in federal harvests (Charnley et al. 2006, 2018). These types of communities are found throughout the BioA area.

Figure 4 illustrates the strength of county economic and social ties to federal forest activities in 1990, prior to the NWFP era. The year 1990 is a mid-point between a period of very high harvest activity, as measured by total volume on federal forests in the 1980s, and the adoption of the NWFP in 1994. Counties in southern Oregon and northern California were more likely to be strongly linked to federal forest land management in 1990 than counties in other areas of the NWFP region. Factors determining strength of links to federal forest land management in 1990 include employment in land management agencies (Forest Service and Bureau of Land Management), revenue sharing payments from the federal government to counties linked to federal timber harvests, share of county's total national forest and grassland land area subject to management under the NWFP, share of timber milled within the county from forests and grassland, and private sector jobs in forestry and wood products manufacturing relative to all jobs in 1990.

Individual communities can also be described in terms of strength of links to national forests and grasslands, but community-scale data are not available for this kind of analysis. Communities may not have had the same strength of links to federal forest lands management in 1990 as did the county in which they were located, though the proportion of communities within a county that were strongly linked to federal forest lands management is probably higher in counties with strong links as shown by darker green shades on the map (figure 4). Counties or communities that were extremely strongly linked to federal forest land management may have been more likely to experience challenging economic conditions in the early 1990s related to reduced timber harvests on federal lands immediately before and during the NWFP era (Adams, n.d.).

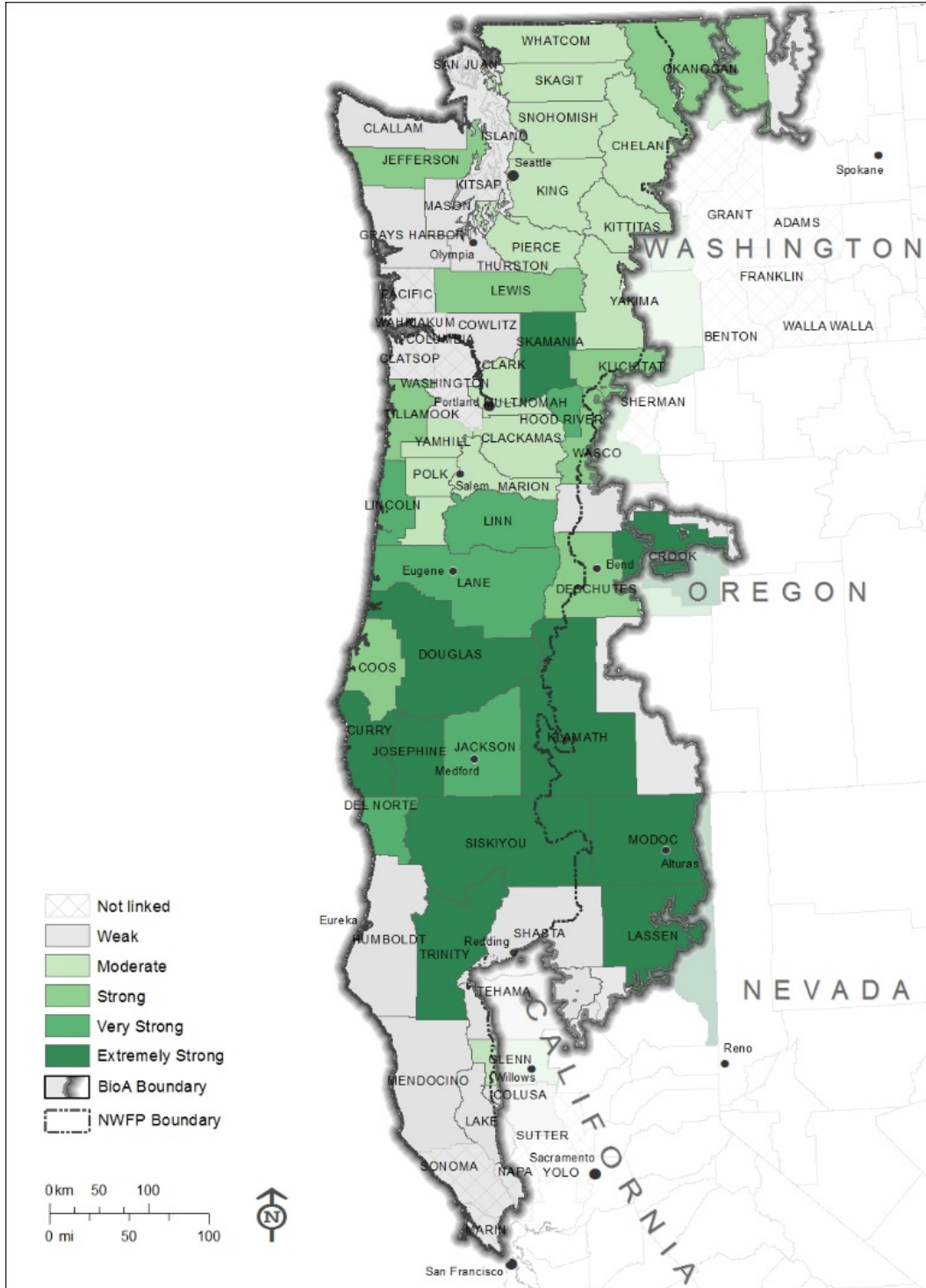


Figure 4. County ties to federal forest activities in 1990

This figure displays the strength of county economic and social ties to federal forest activities in 1990, before the Northwest Forest Plan era. Adapted from Adams, n.d.

The following community stories provide examples of experiences in forest communities in the BioA area. These communities were all historically linked to national forests and grasslands and had to adapt to management changes that were introduced by the NWFP. These brief stories have been adapted from the comprehensive formal analysis of communities in the forthcoming 25-year monitoring report (Coughlan et al., n.d.).

Happy Camp, California

Happy Camp is a small mountain community surrounded by the Klamath National Forest in northern California. The town's timber economy, based almost exclusively on national forest harvests, boomed between the 1950s and 1980s, after which, national forest harvests were sharply curtailed. The last sawmill in the area shut down in 1994. Happy Camp and the surrounding area lost 22 percent of their population during the 1990s. This dramatic change created a void in the community as younger working-class families left to pursue other opportunities. A way of life (working in the woods) that had defined the community was lost and has not returned.

Today, the town is home to the Klamath-Siskiyou Art Center, Karuk Tribe administrative offices that provide important services to the community, and the Forest Service's Happy Camp/Oak Knoll Ranger District offices that have remained open but at lower staffing levels. The community has also worked with the Forest Service to try to expand sustainable recreation visitation in the two wilderness areas adjacent to the community as well as on the Klamath River, which offers excellent opportunities for rafting and fishing.

The community persists, but its population, economy, and social structure have changed dramatically over the past 30 years.

Leavenworth, Washington

Leavenworth is a small mountain town surrounded by the Okanogan-Wenatchee National Forest in central Washington. Nearly 6,000 people lived in Leavenworth by 1920, and the town once supported a large sawmill. However, the timber boom ended when the railroad was rerouted in 1926, and soon afterward the mill closed. Although many locals continued in the timber industry at nearby mills or served in jobs at the Leavenworth Ranger District, the town population steadily declined until the 1960s.

In 1963, community leaders decided to create a Bavarian-themed tourist town to boost the economy. Leavenworth's economy steadily improved during the latter 20th century. Tourism continued to grow as mountain biking, rock climbing, and rafting on the Okanogan-Wenatchee National Forest became popular. In addition, the forest's beautiful scenery and amenities attracted new permanent and part-time residents that spurred burgeoning real estate and vacation rental markets. Though Leavenworth is now prosperous, neither it nor nearby communities in the Wenatchee Valley are associated with timber sector work anymore, a fact that some residents lament. The lack of forestry sector infrastructure in the area makes needed restoration work on the national forest challenging.

Mill City, Oregon

Mill City is at the mouth of the North Santiam Canyon, 30 miles east of the City of Salem. Between the late 1950s and the late 1980s, Mill City thrived. High-wage jobs with the town's lumber mills and the Forest Service sustained a variety of local businesses, a community theatre, and a bowling alley.

Unlike Happy Camp and Leavenworth, the timber industry did not disappear from Mill City. At least one wood products mill has operated in the North Santiam Canyon area throughout the NWFP era. A few small outdoor recreation businesses are in operation, and the area has attracted some retirees. Yet the town still experienced significant social and economic change starting in the 1990s. Because of the elimination of Forest Service positions funded by timber receipts many employees and their families left town. Many local logging contractors either folded or moved away. Houses were left vacant and the number of absentee property owners grew. Highly transitory residents, often with few job skills or prospects, moved to the area to take advantage of cheap housing, bringing additional needs for social services with them. School enrollment declined substantially, reflecting far fewer families with children in the community.

Mill City's population did not decline sharply, unlike many other rural forest towns in the Northwest. In 2017, it had roughly the same number of residents as in 1990, but it is a much different community with fewer services and jobs.

Land Management Plans Can Help Sustain Community Benefits

"Participants would like plan revision to balance local social values and economic considerations (including tourism, recreation, and timber) with environmental concerns and forest health." — From 2015 Forest Listening Session for NWFP modernization page 7.

It is important for planning to support new approaches to forest management that can better sustain the benefits provided by national forests and grasslands. These forest benefits are important in influencing economic conditions and the quality of life in communities across the BioA area. Smaller more rural forest communities can be more susceptible to changes in these benefits, leading to impacts on day-to-day life. Therefore, in order to reinforce needed social and economic sustainability throughout the BioA area, planning can accomplish the following:

Emphasize the value of social and economic benefits of national forests and grasslands—Planning can highlight the potential for national forests and grasslands to provide a multitude of social and economic benefits to people and local communities and include language that supports forest management decisions that sustain these important benefits.

Improve relationships—Planning should foster outreach activities to develop mutual understanding on management needs and local community concerns and should support improved information sharing with stakeholders.

Increase community partnerships and collaboration—Planning should encourage collaboration with states, counties, and local communities to achieve compatible planning goals and facilitate synergy between federal, state, and local fiscal and staff resources.

Recognize forest contributions to local community plans—Planning can contribute to effective stewardship of recreational opportunities and sustainable, healthy, and fire-resilient forest landscapes that are, to the extent possible, compatible with local community needs and plans.

Studies suggest that improving public involvement can reduce conflict, improve public buy-in, increase compliance with agency regulations, and remove barriers to project implementation (Cervený et al. 2018, Koontz 1999, Stern 2008, Whittall 2007). Forest plans should emphasize the need for these types of actions and establish the planning process as a key phase for building consensus among stakeholders with different sets of values on how landscapes should be managed. Planning endeavors to meet as many concerns of stakeholders as possible, but given the diversity of social and economic values, not all needs can be met. To that end, planning can recognize the necessity for an ongoing conversation on public values in order to enhance the understanding of the forest benefits that are important to people and communities in the BioA area.

While peoples' values and social constraints transcend planning, they can hamper planning efforts and strengthen the conflicts that restrain management options. For example, values around old trees and old-growth forest range widely and create challenges to creating broadly accepted ecologically appropriate definitions of old forest that are needed for planning and implementation purposes. Therefore, improving working relationships, building trust and engaging stakeholders and partners is critically important to the success of planning. Improving the understanding of how people connect to the national forests and grasslands strengthens the relationship between the agency and communities and contributes toward building trust. Forest planning efforts that incorporate these connections and acknowledge the diversity of peoples' values, attitudes, and beliefs can be better equipped to understand the interconnections of social and ecological systems and better anticipate future needs for change (Cervený et al. 2018).

Sustainable Recreation

Most people experience their national forests and grasslands through recreational activities. Recreational opportunities and settings in the BioA area provide people with multiple benefits, including improved physical health and fitness; conservation of open space and the environment; educational opportunities about the values of conservation, land stewardship, and responsible recreation; and making nearby communities more desirable places to live. Recreation contributes to social and economic sustainability and provides opportunities to connect people with nature. Diverse topographies, landscapes, water features, vegetation, fish, wildlife, and histories make national forests and grasslands a valued outdoor playground.



Photo 1: Rafting on the Mt. Baker-Snoqualmie National Forest

Rivers provide highly valued settings and opportunities for healthy, active outdoor activities; and they support or diversify local economies and provide needed access to open space and the outdoors.

To provide and enhance recreation benefits, national forests and grasslands establish partnerships with private entities and volunteer-based and nonprofit organizations; these partnerships are mutually beneficial agreements that build capacity to complete essential resource work and benefit communities. As part of land management planning, the Forest Service conducts recreation assessments that include information about existing conditions, trends in visitor uses and preferences, sustainability of recreation settings and opportunities, access, and scenic character. To complete these assessments, land managers use several resources, including a standardized protocol for inventorying the location, condition, and use type, and monitoring resource conditions, as well as planning tools such as the Recreation Opportunity Spectrum, Limits of Acceptable Change, the Scenery Management System, and Visitor Impact Management frameworks. Newer efforts to understand recreation use on public lands include participatory mapping, place-based planning, human ecology mapping, and developing approaches to better understand user values, attitudes, and beliefs. Recreation assessments help managers determine the extent to which a planning area meets the demand for recreation opportunities and the ability of a planning area to sustain recreation settings, opportunities, access, and scenic character, which contributes to better informed management decisions.

What is Working Well

What is Working Well 1—Designated Areas

Designated areas are public lands that receive special protections and management provisions, in recognition of their significant and often unique qualities or values. There are numerous designated areas in the BioA area, including wilderness, scenic and free-flowing rivers, volcanic landscapes, and popular recreation areas. Designated areas can have a wide range of nationally significant qualities that are scenic, geologic, cultural, historic, or ecological. They also may contain outstanding and often unique recreation opportunities, delivering important benefits to the American public, including clean water, biodiversity, and opportunities for adventure or solitude.

Congressional legislation establishes some designations and others occur through agency administrative processes. Some designations have been the source of controversy, and public sentiment varies about the best way to manage designated areas. Regardless, federal land management agencies are charged with the stewardship of these special places, so they may be enjoyed by current and future generations.

Highlights of the Forest Service's designated areas network include the following:

- Three national monuments (two of which are volcanic monuments)
- Six national recreation areas
- Three scenic areas, each with a unique emphasis
- Portions of two national scenic trails and three national historic trails
- More than 1,000 miles of All-American Road
- 5.5 million acres of wilderness across 74 designated units
- Approximately 1,700 miles of wild and scenic river corridor along 204 designated river segments
- Nearly 100 research natural areas
- Three national natural landmarks and approximately 60 special interest areas



Photo 2: Berryessa Snow Mountain National Monument, Mendocino National Forest

The monument's terrain and topography comprise a strong diversity of habitat types that support a variety of plant and wildlife species. In the higher elevation Snow Mountain area, the biological diversity is among the richest in California.



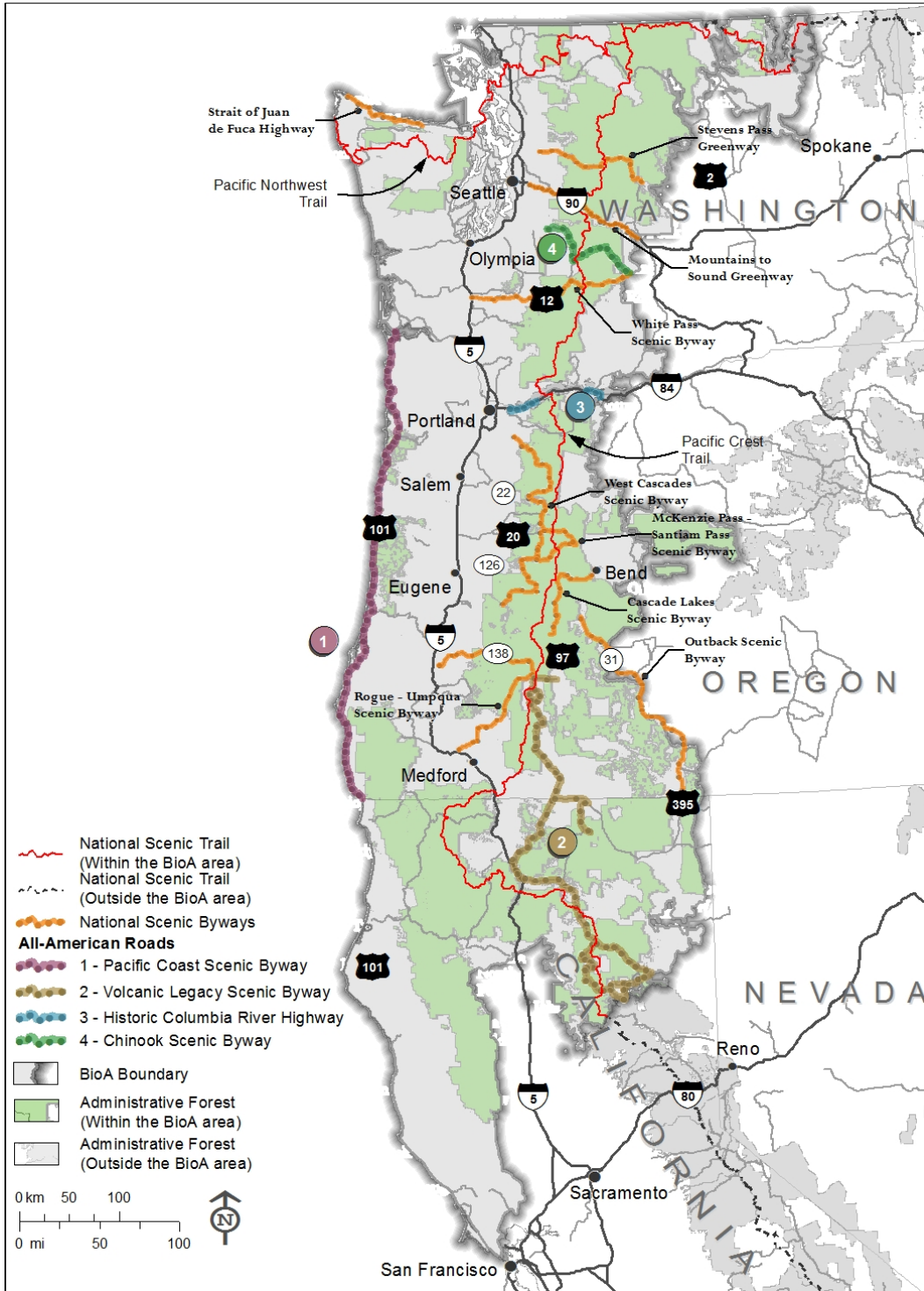
Photo 3. Historic Mott Bridge on the Umpqua National Forest

The bridge represents many combined special area features; it is located on the designated Wild and Scenic North Umpqua River, was built by the Civilian Conservation Corps in 1935, and is a stop on the Rogue-Umpqua National Scenic Byway on the North Umpqua Highway.



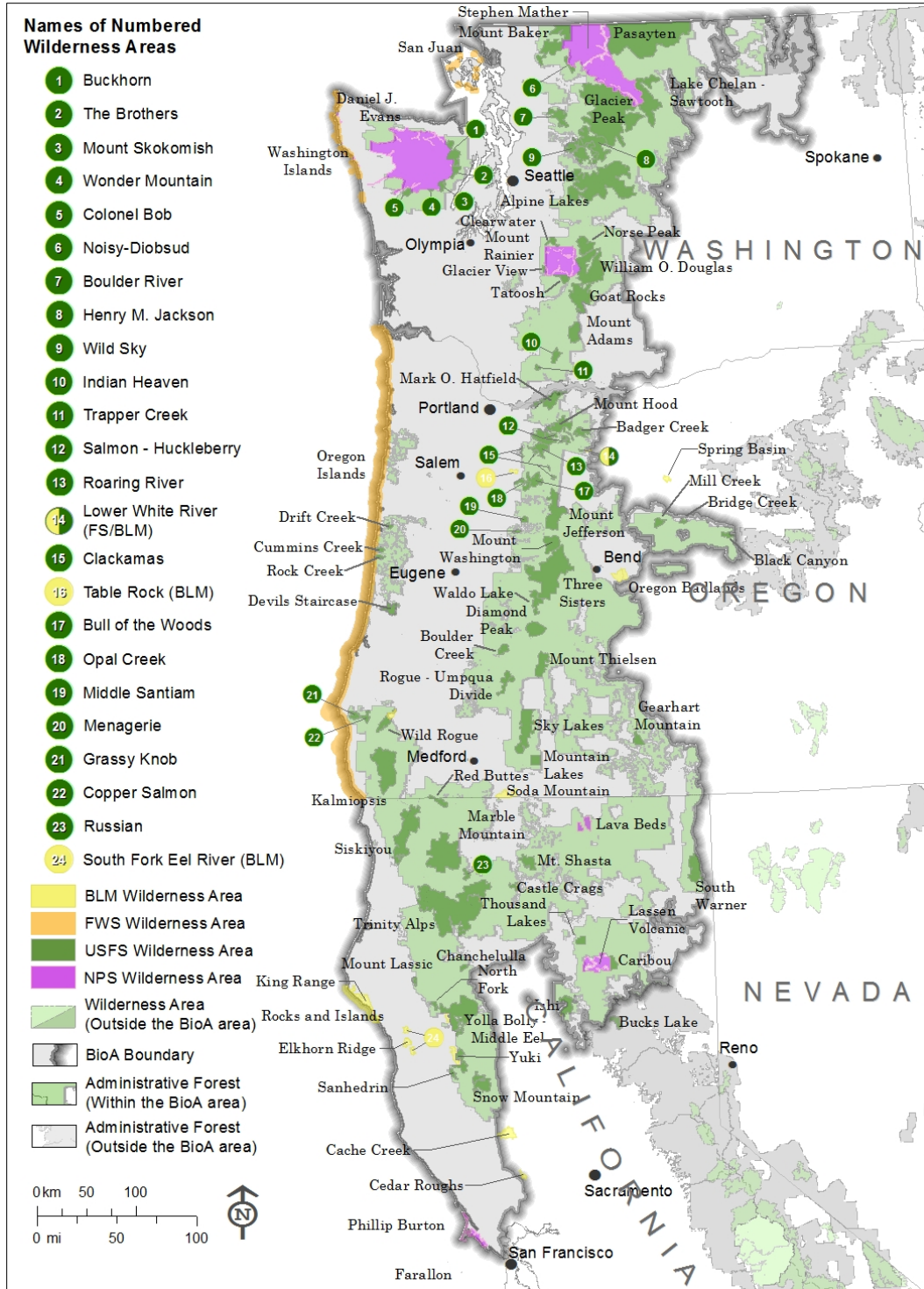
Map 2. Nationally Designated Areas within the Bioregional Assessment area

These areas can have a wide range of nationally significant qualities, including scenic, geologic, cultural, historic, or ecological. They also may contain outstanding and often unique recreation opportunities, delivering important economic and health benefits to the American public.



Map 3. Nationally designated trails and roads in the Bioregional Assessment area

These travel routes recognize a variety of scenic, historic, and recreation values and often cross multiple local, state, and federal jurisdictions, requiring collaborative management across boundaries. Volunteer organizations, user groups, and chambers of commerce also play a key role in stewarding these iconic routes that celebrate our past and America's natural beauty.



Map 4. Designated wilderness in the Bioregional Assessment area

These areas provide social, cultural, economic, scientific, and ecological benefits for present and future generations. Many of America's iconic landscapes include wilderness areas that provide outstanding opportunities for solitude and primitive and unconfined recreation. BLM = Bureau of Land Management, FWS = U.S. Fish and Wildlife Service, NPS = National Parks Service, USFS = U.S. Forest Service.



Map 5. Designated wild and scenic rivers in the Bioregional Assessment area

These select rivers preserve outstanding natural, cultural, and recreational values in a free-flowing condition. They also provide ecological services and values such as clean water, flood irrigation, and fish and wildlife habitat, and they serve an important role in the global water cycle. Many rivers cross national forest boundaries and can include multiple ownerships requiring consistent management and coordination.

What is Working Well 2—Major Supplier of Recreation

The Forest Service is one of the largest suppliers of outdoor recreation in the BioA area. The agency's role in recreation management includes providing for recreation experiences and activities for a broad range of users, as well as administration of special use permits that provide additional experiences for the recreating public and expand capacity for recreation on National Forest System lands. Recreation use is expected to increase, and recreation user demographics and the types of uses are changing, although deferred maintenance for recreation facilities and the transportation system may affect the quality of recreation experiences that the Forest Service provides. National Visitor Use Monitoring results indicate that satisfaction with the recreation experience on each forest is quite high.

What is Working Well 3—National Forest Road System

The national forests and grasslands have an extensive road and trail network that provides opportunities to connect people with nature. Forest transportation systems are essential infrastructure, providing access to the national forests and grasslands for public benefit, permitted uses, agency administrative activity, and traditional and tribal harvesting of forest products. The National Forest Road System also provides key access for fire suppression and search and rescue operations. Impacts and tradeoffs associated with the road system are discussed in the “Key Change Issues” sections in “Recreation,” “Sustainable Timber and Forest Products,” and “Aquatics, Fish and Water.”

Call-out box 3. National scenic trails and associations



The Pacific Crest Trail (PCT) was designated as a national scenic trail in the National Trails System Act of 1968, and stretches from the Mexican border to the Canadian border, covering 2,650 miles and crossing through several national forests within the BioA area. Each year hundreds of thousands of visitors set foot on at least one section of the PCT, whether it is for a day, weekend, or a weeks-long excursion.



The Pacific Crest Trail Association (PCTA) partners with the Forest Service and other land management agencies on a variety of trail stewardship activities along the trail corridor, including maintenance, monitoring, and visitor use management. The PCTA also engages in advocacy and visitor education. In 2014, 1,600 volunteers and staff completed maintenance work on about 1,700 miles of the PCT.

The Pacific Northwest National Scenic Trail (PNT) was designated as a National Scenic Trail in 2009, though the concept of the trail has existed since the late 1970s. The PNT forms a continuous, 1,200-mile path from the Pacific Ocean near Cape Alava to the Continental Divide in Glacier National Park, and many of the PNT segments and rights-of-way existed before the trail's formal designation. Congress tasked the Forest Service with management of the PNT, and the trail crosses through three national forests within the Bioregional Assessment area: the Okanogan-Wenatchee, Mt. Baker-Snoqualmie, and Olympic.



The Pacific Northwest Trail Association (PNTA) works with the Forest Service and other land management agencies on trail construction, maintenance, monitoring, and volunteer coordination. In 2017, trail crews provided 11,800 hours of volunteer labor along the length of the trail.

What is Working Well 4—Sustainable Recreation, Special Uses, and Economic Growth

Recreation visitor spending is an important source of economic activity associated with Bureau of Land Management and Forest Service management in the BioA area. Visitors spend money on lodging, restaurants, souvenirs, and other trip-related expenses. Recent estimates indicate that visitors to the NWFP area spend about \$612 million each year (Charnley et al. 2018). Recreational visitor spending can provide critical economic contributions in forest communities that were adversely affected by changes in the forest products industry. Recreational opportunities on the forest also provide tremendous benefits to the visitors themselves by way of the enjoyment and experiences they have on the forests.

Special uses provide important opportunities and benefits for recreation, energy, communications, and infrastructure. These activities allow access and opportunities on public lands in a way that provides a vast array of social and economic benefits to people and communities. Special uses generate critical forest revenues, \$19 million across the bioregion in 2018, and this revenue has nearly doubled since 2010. Special uses are increasingly important in providing services that are valuable to the public.

Key Change Issues

Key Change Issue 1—Aquatic Strategies and Late-Successional Reserves

The aquatic management strategies implemented within the BioA area provide for clean water, healthy vegetation, and improved fishery resources that support recreational and economic benefits. This contributes to the broad suite of public benefits found within the BioA area and demonstrates the relationship between people, nature, and the continued need to maintain and restore healthy ecosystems.

Within the NWFP area, forest recreation managers have observed conflicts between maintaining existing recreation facilities (including roads and trails) and meeting the NWFP's Reserve and Aquatic Conservation Strategy objectives. The NWFP requires adjusting recreation areas where they conflict with Aquatic Conservation Strategy objectives; if adjustments are not feasible, then NWFP objectives require eliminating or removing the conflicting use.⁵

Forest recreation managers encounter challenges when addressing “saturated” use areas along river corridors because proposed additional facilities are generally not considered “neutral/beneficial” for meeting Aquatic Conservation Strategy objectives. Similar conflicts occur in late-successional reserves, where a primary emphasis is the protection of old-growth-dependent species, such as northern spotted owls and marbled murrelets; existing recreation facilities and uses often come into conflict with species protection. Mitigation measures that would make facilities consistent with the NWFP can be challenging to implement and consulting regulatory agencies would prefer to see conflicting uses eliminated.

⁵ See RM-2, pg. C-34 in Standards and guidelines for management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl (USDA and USDI 1994).

Sustainable recreation challenges and needs include (1) maintaining existing recreation facilities in NWFP reserves, (2) expanding existing sites, (3) creating new recreation sites in areas near water/stream corridors where needed to relieve existing/increasing pressure at existing, similarly sited recreation areas, and (4) achieving Aquatic Conservation Strategy objectives through appropriately designed and managed recreation facilities that meet both recreation and aquatic objectives.

Planning Considerations

Refer to BioA Chapter 2 Management Recommendation

Recommendation 10: Recognize the social and economic benefits to communities and people from sustainable recreation opportunities.

- Develop forest plan components to achieve sustainable recreation management objectives in riparian settings without compromising meeting Aquatic Conservation Strategy and late-successional reserve objectives at the appropriate scale.

Geographic Considerations

National forests and grasslands located near metropolitan areas are most likely to face challenges related to increasing recreational use, deteriorating natural resource conditions within riparian reserve corridors as a result of overcrowding/overuse, and the need to develop new recreational opportunities for growing and increasingly diverse populations. BioA national forests and grasslands can be grouped into three tiers: tier 1 (high visitation) = Columbia River Gorge National Scenic Area and Deschutes, Gifford Pinchot, Mt. Baker-Snoqualmie, and Mt. Hood National Forests; tier 2 (moderate visitation) = Okanogan-Wenatchee, Shasta-Trinity, Siuslaw, and Willamette National Forests; and tier 3 (low visitation) = Fremont-Winema, Klamath, Lassen, Mendocino, Modoc, Ochoco, Olympic, Rogue River-Siskiyou, Six Rivers, and Umpqua National Forests.

Key Change Issue 2—Need to Create Single, Cohesive Planning Document

Existing land management plans are specific to individual forests and grasslands and provide varying levels of plan direction for sustainable recreation-related resources. In contrast to the NWFP's uniform guidance for natural resource management, there is no overall cohesion and consistency to recreation management across national forests and grasslands within the BioA area. Additionally, national forests and grasslands in the BioA area must conform to layers of "plan" direction, including the NWFP and other large-scale plan amendments, species recovery plans, and critical habitat designations, which contributes to a confusing and chaotic planning framework. Congressionally designated areas (including wild and scenic rivers, national monuments, national recreation areas, and national scenic areas) often require additional comprehensive management plans. Many of these plans were approved in the 1990s, and similar to forest land management plans, they may need to be updated, revised or amended. An example is existing recreation direction that relies on outdated recreation opportunity spectrum and scenery management system inventories that do not reflect current recreation uses on the national forests and grasslands and are not responsive to the agency's vegetation restoration challenges and strategies. Updated agency protocols for recreation opportunity spectrums and scenery management systems are available.

Planning Considerations

Refer to BioA Chapter 2 Management Recommendation

Recommendation 10: Recognize the social and economic benefits to communities and people from sustainable recreation opportunities.

- Using information gathered through public engagement, identify and develop recreation emphasis management/geographic area(s) that provide flexibility to address future development needs in terms of increased use and new recreational uses and activities.
- Review the existing trail network and its past, present, and expected use; and evaluate how this use relates to land use allocations and Aquatic Conservation Strategy objectives.
- Develop varying recreation trail and recreation site density for riparian areas with specialized habitat. Use new mapping protocols and integrate inventory findings into updated recreation opportunity spectrums and scenery management system to modernize these inventories and streamline future project implementation.
- Evaluate designated area comprehensive management plans to ensure they are consistent with the new plan components.

Geographic Considerations

The need to create a cohesive recreation strategy is applicable throughout the entire BioA area.

Key Change Issue 3—Sustainable Recreation Opportunities

Regional trends for recreation activity are similar to national trends. Nationally, participation in outdoor recreation activities on public and private lands is level to slightly declining. However, a projected increase in population will overcome the slightly decreasing or level use trends, and overall usage will increase (Bowker et al. 2012). Increasing population within the BioA area exceeds national averages, specifically the Portland and Seattle metro areas and other Northwest population centers. Higher visitation rates resulting from increased populations are expected primarily at developed and interpretive sites. Within the NWFP area, hiking, downhill skiing, and nature-related pursuits are the most common recreation activities as reported by the Forest Service's National Visitor Use Monitoring (NVUM) program. See figure 5 and photo 4.

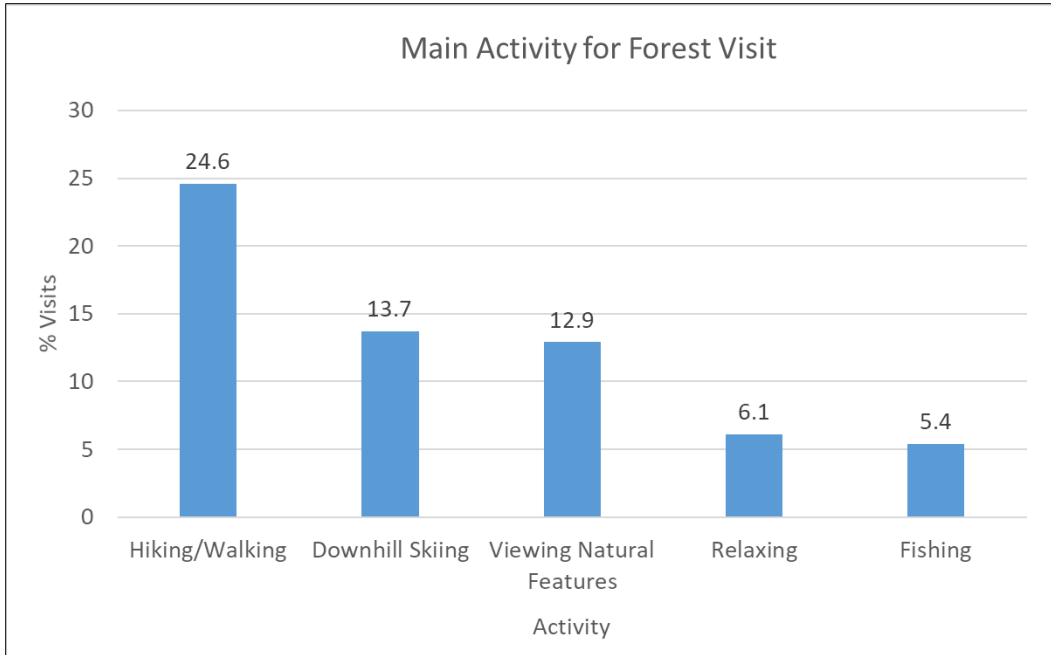


Figure 5. Top recreation activities on National Forest System lands within the Bioregional Assessment area



Photo 4. Upper Austin Ski Area, Mt. Baker Snoqualmie National Forest

While many Forest Service programs, including timber, grazing, and energy production, generate revenue for the U.S. Treasury, ski areas regularly outperform them all.

Planning Considerations

Refer to BioA Chapter 2 Management Recommendation

Recommendation 10: Recognize the social and economic benefits to communities and people from sustainable recreation opportunities.

Expand existing and develop new partnerships to continue delivering the sustainable recreation mission of the agency; and acknowledge existing partnerships for all the critical services they provide. Develop more unified management direction for recreation-related resources to increase agency efficiency given the continued downward trends for agency capacity. Develop sustainable recreation-themed plan components that can adapt to new recreational user activities and opportunities.

Geographic Considerations

National forests and grasslands located near metropolitan areas are most likely to face challenges related to increasing recreational use, changing user demographics, diverse populations, and recreation activity related to new/emerging technologies. See figure 6.

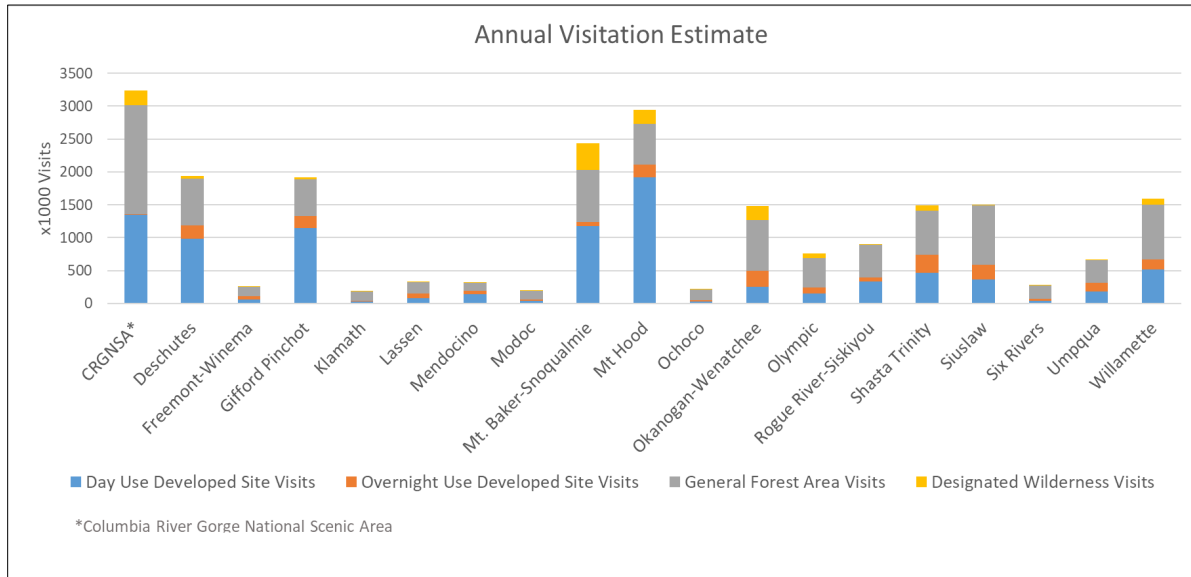


Figure 6. Annual visitor estimates by national forest and recreation setting

Visitation varies widely from forest to forest, and the type of visits vary. This data indicates much higher visitation on national forests and grasslands closer to metropolitan areas and the urgent need to ensure land management plans are adapted to this high level of use (data reported by the Forest Service’s National Visitor Use Monitoring program).

Key Change Issue 4—Access

The Forest Service faces an extensive maintenance backlog for its road system. Recent national reporting indicates an estimated \$3.2 billion maintenance backlog for fiscal year 2016 (USDA 2017). Roads naturally deteriorate over time, and when combined with an excessive maintenance backlog this reduces the overall sustainability of recreation use on national forests and grasslands throughout the BioA area. The forest trail system faces similar maintenance backlogs, which reduces recreational trail access, activities, and opportunities.

Planning Considerations

Refer to BioA Chapter 2 Management Recommendation

Recommendation 10: Recognize the social and economic benefits to communities and people from sustainable recreation opportunities.

- Forest plan components, including desired conditions, objectives, and goals, can be developed with public and stakeholder participation and input to help address the National Forest Road System while considering the tradeoffs associated with access, capacity, and broader natural resource considerations.
- Planning and revision efforts should incorporate partnerships for road and trail system maintenance such as those described in the National Forest Trail System Stewardship Act of 2016—Public Law 114-245 and should use improved analysis tools.
- National forests and grasslands should continue to evaluate motor vehicle use maps annually, which provide better consistency between travel analysis report findings and future land management planning/revision efforts.

Geographic Considerations

Figure 7 displays open road miles by forest by maintenance level⁶, which represents the geographic distribution of the road network in terms of mileage. Trend information presented in the NWFP 20-year monitoring report does not show “open road” mileage per forest, but rather displays mileage per maintenance level from years 1999 to 2012. The total mileage for the National Forest Road System has declined during the past 20-plus years. The 10-year monitoring report for socioeconomic monitoring results provided a summary regarding the overall reduction in the road system:

In general, the Forest Service is adding very few new miles to its road system. Road mileage on national forests and grasslands is generally decreasing; more miles of road are decommissioned than are built. Road decommissioning is ongoing and proceeds as funds become available. Level 1 and 2 road miles have increased with an associated decrease in level 3 through 5 road miles, so fewer miles are accessible to passenger cars. The increase in level 1 and 2 miles has occurred because the loss of funding from appropriated sources. The reduction in work done by timber sale operators means the agency does not have the budget to maintain as many of its roads to higher standards (Charnley 2006: 42).

⁶ Maintenance Levels: ML1 – Roads that have been placed in storage between intermittent uses; ML2 - Roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration; ML3 - Roads open and maintained for travel by prudent drivers in a standard passenger car. User comfort and convenience are low priorities; ML4 - Roads that provide a moderate degree of user comfort and convenience at moderate travel speeds; ML5 - Roads that have a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities.

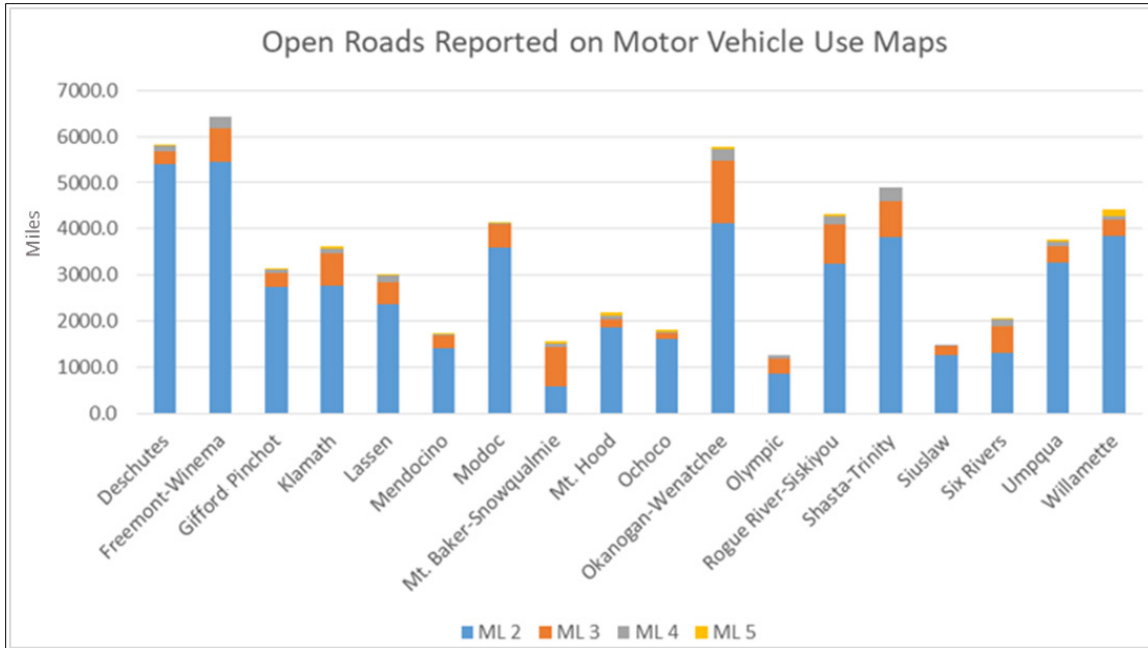


Figure 7. Open roads reported on motor vehicle use maps

The amount of open road miles by maintenance level vary widely across the Bioregional Assessment area and all are generally affected by an extensive maintenance backlog. Dedicating the necessary resources to successfully address and reduce the deferred maintenance backlog will require strategic and long-term actions.

Key Change Issue 5—Sustainable Recreation and Economics

National forests and grasslands face challenges in sustaining current levels of recreation services, developing partnerships to help deliver the agency’s sustainable recreation mission, and administering special use permits to provide essential community services and provide recreational opportunities. The deferred maintenance backlog for recreation related infrastructure (including recreation facilities and road and trail infrastructure) is significant and inhibits sustainability, potentially affecting recreation user experiences. The special use program also faces administration challenges, such as the capacity to review and administer applications and enforce permit restrictions to protect resources. This results in a backlog of permit proposals and increased resource damage and limits the benefits that are provided to the public.

Planning Considerations

Refer to BioA Chapter 2 Management Recommendation

Recommendation 10: Recognize the social and economic benefits to communities and people from sustainable recreation opportunities.

Changes to forest plans that address increasing forest visits would be beneficial to the sustainability of recreational opportunities and the economic and social benefits they provide. Forest plan components, including desired conditions, objectives, and goals, can be developed with public and stakeholder participation and input to support sustainable recreation objectives, to improve special use permit administration and delivery, and to balance these with associated natural resource conservation objectives.

Examples include the following:

- Provide more facilities for overnight stay (as well as multiday activities) as these types of facilities draw visitors from farther away that spend five to eight times more money in local communities than do day users.
- Expand partnerships and encourage engagement with outside agencies, partners, and volunteers to overcome financial challenges associated with deferred maintenance and developing new opportunities. Because current plans do not speak to this topic, revised plans could better highlight the need for these types of expanded partnerships.

Changes to forest plans that help address the sustainability of special use activities can contribute to the economic and social benefits these activities provide to people and communities and include the following:

- Improved plan components that align the need for special use permits with desired forest conditions (for instance, criteria 2 FSH 2709.11, sec. 12.2, which requires that permits be reviewed for consistency with plan elements).
- Design consistent approaches and plan components to address the controversy associated with existing and proposed energy utility corridors. Such approaches may include developing management areas or modifying existing NWFP land use allocations for these types of permitted uses and infrastructure, all of which will be fully explored during the formal planning process.
- Stabilize road and recreation infrastructure to provide continued access, sustainable recreation opportunities, special uses, and associated economic activity.

Geographic Considerations

National forests and grasslands located nearest to metropolitan areas are most likely to face challenges related to increasing recreational use and the need to develop new recreational opportunities for growing and increasingly diverse populations.

Visitation and visitor spending may be disproportionately affected in communities near areas with recreational opportunities most vulnerable to climate change and its impacts to recreational opportunities and access (see next section).

Key Change Issue 6—Sustainable Recreation and Climate Change

The effects of climate change to sustainable recreation activities can be broadly characterized; warmer temperatures may create more opportunities for warm-weather activities (for example, hiking, camping) and present fewer opportunities for snow-based activities (for example, skiing, snowmobiling). The recreating public often adapts to changing conditions by substituting other activities or adjusting the timing or location of activities. Federal agencies administering these affected resources are less nimble in adjusting to changing conditions, which include the following:

- Longer warm-weather recreation and a shortened winter recreation season.
- Reduced opportunities for winter activities in lower elevation zones.
- Increased susceptibility of facilities being underused or unusable due to decreased snow amounts.
- Increase crowding at sites that remain viable for winter recreation.

- Access to high-elevation zones both earlier and later compared to traditional seasons.
- Increased impacts to recreational road and trail systems, such as rutting.
- Wildfire impacts, including reduced access due to road and area closures, smoke impacts, and reduced aesthetics that may impair recreation experiences.
- Hunting/fishing opportunities affected through changes to vegetation, instream flows, and water temperatures.
- Increased temperatures may not align with regulated seasons and might reduce opportunities for cold-water species fishing.
- Reduced streamflow, reservoir levels, and hazardous algal blooms may adversely affect water-based recreation opportunities.
- Increased flooding will affect recreation infrastructure, including riparian trails, trailheads, roads, campgrounds, dispersed campsites, boat launches, bridges, and other infrastructure that supports recreation-related services and benefits.

Planning Considerations

Refer to BioA Chapter 2 Management Recommendation

Recommendation 10: Recognize the social and economic benefits to communities and people from sustainable recreation opportunities.

- Applying adaptation strategies based on key vulnerabilities caused by climate change to inform plan revision assessments that describe potential climate conditions and effects to key resources will be critical to success.
- Plan revisions may also identify and prioritize resource vulnerabilities from climate change. Plan components should include specific emphasis on desired conditions, objectives, and monitoring programs.

Geographic Considerations

Areas that are more vulnerable to climate change occur in the southern, drier portions of the BioA area and are characterized by mid-elevation sites where snow levels are projected to fluctuate and increase in elevation over time, riparian areas affected by an increased frequency of high flow events, and areas more susceptible to increasing size and severity of wildland fire that may affect forest access and reduce scenic and aesthetic values.

Sustainable Timber

Introduction⁷

During the 1980s and 1990s, Forest Service land management plans generally emphasized timber outputs rather than desired landscape conditions. When the NWFP was adopted, the separation of timber-producing lands from the rest of the landscape was aimed at creating a compromise between stopping the loss of old-forest habitats and protecting their dependent

⁷ This document does not make assumptions, draw conclusions, or make recommendations related to future timber sale viability and connected timber markets, value of wood products, or stumpage values. The factors that contribute to the value of vegetation management projects, connected treatments, and timber sale viability are highly variable or unpredictable.

species from timber harvest, while still providing predictable timber outputs from federal lands (USDA FS and USDI BLM 1994: 26). As a result, the amount of old forest on federal lands has stabilized (Davis et al. 2015, Davis et al. in progress [20- and 25-year monitoring reports]), but timber output, while relatively stable for about the past decade, has remained below anticipated levels. In addition, conflicting management direction related to northern spotted owl designated critical habitat has affected anticipated timber harvest. Harvest levels are unlikely to increase under current plans because the objectives for timber production and restoration often conflict with habitat protection objectives.

In recent years, the key challenges have changed, and Forest Service paradigms have shifted, but land management plans have not kept up. See “By Design: Isolation of Timber Production Lands; a Paradigm Shift” section in this document.

What is Working Well

What is Working Well 1—Stable Timber Production

Since 2005, timber production levels have remained relatively stable, producing an average of 450 million board feet (MMBF) per year from Forest Service lands within the NWFP area, although the predicted harvest of about 600 MMBF per year has not been realized. Recent harvest levels have also been regionally stable at about 72 percent of Forest Service anticipated timber production (figure 8). While we view our stable timber production rates as a success, the fact that production levels are consistently below what was anticipated in our land management plans is a concern. Although commercial harvest of timber is planned to continue, conflicting plan direction and restrictions on tree size or stand age, as well as a lack of social acceptance of planned harvest methods like regeneration, will likely limit future harvest.

Predicted Forest Service harvest levels within the NWFP is the approximate Forest Service proportional contributions to probable sale quantity (PSQ) as defined under the NWFP (see “NWFP Probable Sale Quantity Context” section below). Total PSQ estimates in the NWFP Record of Decision and Environmental Impact Statement were 1.1 billion board feet per year and included all federal lands, including Bureau of Land Management timber production. In 1993 it was estimated that although late-successional reserve volumes are not included in PSQ calculations, an additional volume of 100 to 170 MMBF might be obtained from reserve areas (Johnson et al. 1993).

Today, it is important to consider the context of the cumulative changes in what land base is available for timber production emphasis, changes in management direction, and changes in the social acceptability of planned harvest methods when analyzing how the Forest Service has managed timber outputs both within the NWFP area and programmatically within its Pacific Southwest and Pacific Northwest Regions (regions 5 and 6, respectively). These conditions are outlined in more detail in the following sections on key change issues. Over a 5-year period (2014–2018), NWFP national forests and grasslands have reach about 72 percent of Forest Service PSQ (USDA 2019b). National forests and grasslands outside the NWFP area have contributed a disproportionately large amount (given intrinsic productivity and original forest plan estimates) to timber outputs for the Northwest area. Peak timber production was in 2013 at 84 percent of Forest Service PSQ.

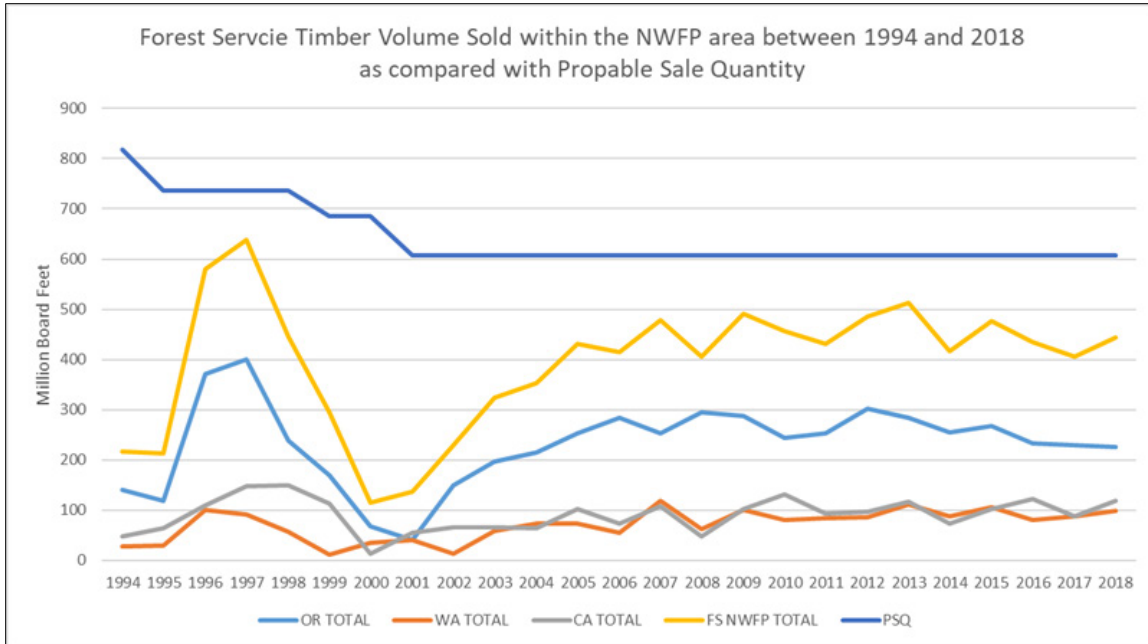


Figure 8. Northwest Forest Plan (NWFP) harvest levels from 1994 to 2018

Harvest levels have remained stable in the NWFP area for the past decade, although they have been less than predicted. The graph shows the amount of timber sold from national forests and grasslands in the NWFP area between 1994 and 2018 compared to the Forest Service estimated probable sale quantity. Forest Service anticipated timber volume is about 600 MMBF and the agency has produced an average of about 450 MMBF within the NWFP area annually since 2005.

Timber harvest area between 1994 and 2017 primarily has been within matrix lands (about 65 percent), and secondarily within late-successional reserves (about 19 percent). About 10 percent of harvest was in adaptive management areas (figure 9). Matrix lands are those federal lands within the NWFP that are outside the six categories of NWFP designations (congressionally reserved areas, late-successional reserves, adaptive management areas, managed late successional areas, administratively withdrawn areas, and riparian reserves). All other land use allocations contributed 1 percent or less by land area to timber production (totaling about 5 percent). Commercial thinning in historic plantations in late-successional reserves and thinning in matrix continues to contribute to timber output. Commercial thinning harvest methods continue across the BioA area, often in concert with restoration and resilience projects.

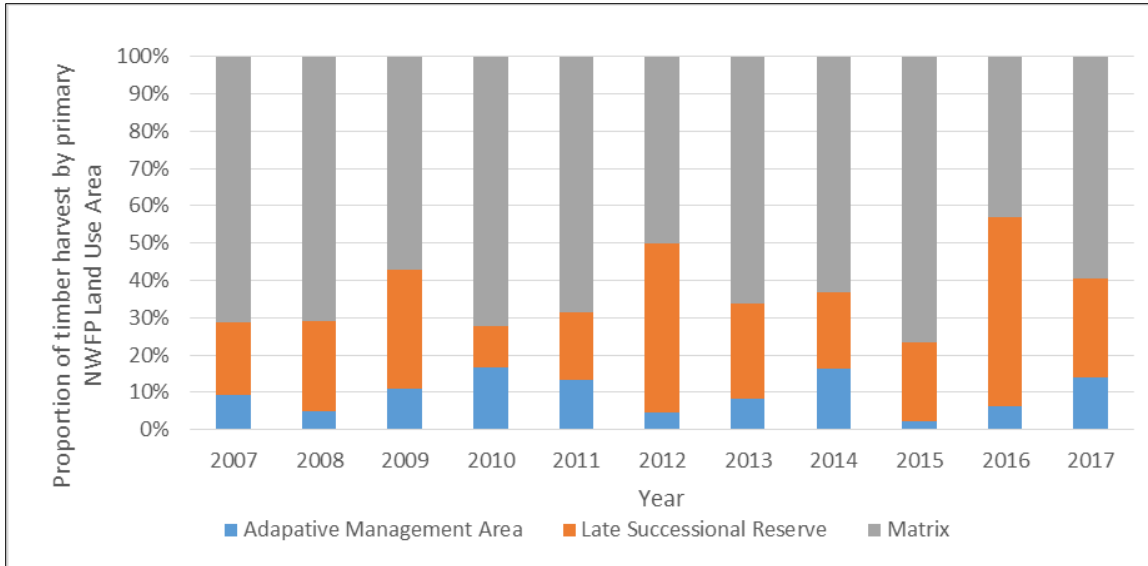


Figure 9. Recent proportion of harvest by Northwest Forest Plan (NWFP) land use allocation

Trends in the proportion of acres of timber harvest activities by primary NWFP land use allocation. About 76 percent of all harvest acres since 1994 has been in matrix or adaptive management area lands. About 19 percent of timber harvest acres have been in late-successional reserve. All other land use allocations contributed 1 percent or less by land area to timber production (totaling about 5 percent not displayed in graphic).

What is Working Well 2—Nontimber Forest Products

In addition to timber products, national forests and grasslands provide a variety of nontimber forest products such as moss, mushrooms, cones, grasses, and firewood. These products support community and household well-being by providing income and economic opportunities, strengthening community networks and relationships, facilitating intergenerational ecological knowledge transfer, and enabling nontimber forest product gatherers to develop stronger connections with nature and improve their mental and physical health (figure 10, photo 5 and photo 6) (Spies et al. 2018). The nominal value is just one indicator of the real value of these products harvested from public lands (Grinspoon et al., n.d.).

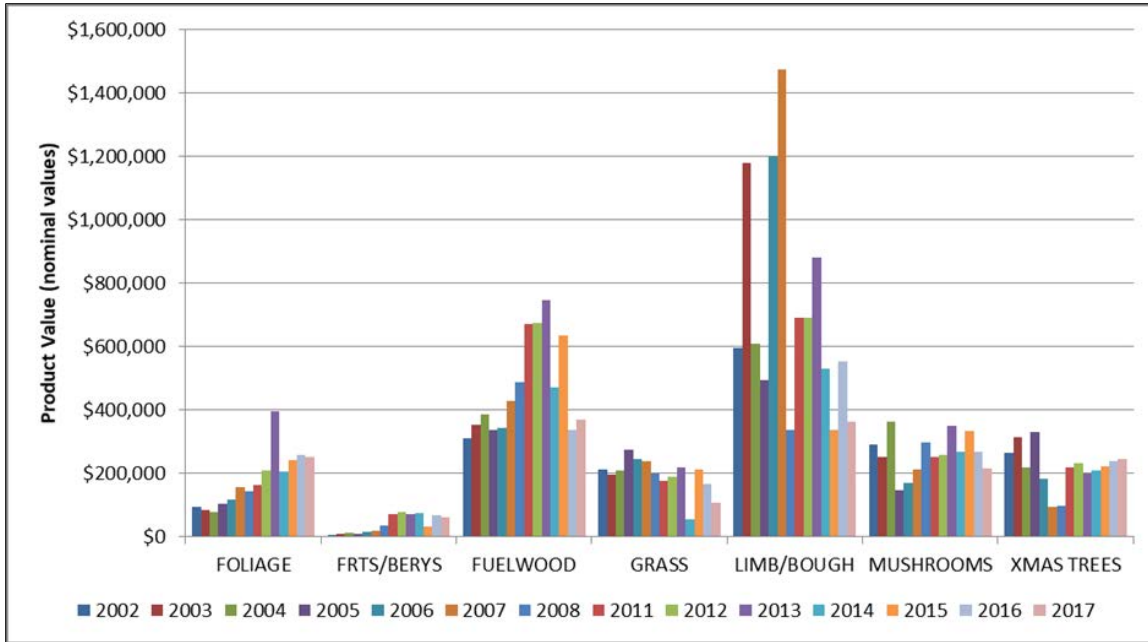


Figure 10. Nontimber forest product values within the Northwest Forest Plan (NWFP) area
Value of special forest products sold from National Forest System lands in the NWFP area 2002–2017. Adapted from Grinspoon et al. n.d.



Photo 5. A young harvester picking mushrooms
Finding a connection to the land by picking mushrooms.



Photo 6. Families cutting Christmas trees

A family outing to harvest a Christmas tree from Forest Service lands can be a cultural tradition.

Call-out box 4. Nontimber forest products

Forests in the Bioregional Assessment area also provide a wide variety of nontimber forest products (NFTP), such as berries, moss, mushrooms, cones, grasses, and firewood. These products are collected both for personal use by individuals and families, and for sale by commercial collectors. Non-timber forest products provide supplemental income and an important safety net for many households as well as providing people with a strong connection to nature. A considerable portion of the workers in the Northwest Forest Plan area are members of minority groups, and environmental justice issues related to these groups' access to and use of nontimber forest products is important to consider in planning.

The retail value of non-timber forest products in the United States is estimated to be at least \$1.4 billion, with much of that coming from the NWFP region (Charnley et al. 2018). In 2012, 99 percent of the value of special forest product permits for national forests in the BioA area was from seven categories: foliage, fruits and berries, fuelwood, grass, limbs/boughs, mushrooms, and Christmas trees (figure 11) (Grinspoon et al., n.d.). In the Pacific Northwest, roughly 20,000 people participated directly in the floral greens/bough sector or the wild mushroom sector. The most important impacts of the NWFP on nontimber forest products are likely to be landscape level changes in forest structure and composition under the plan's provisions. This means that generally late-successional products such as matsutake mushrooms will do well, but early-seral products such as salal and berries may do less well.

What is Working Well 3—Shift in Harvest Methods

Forest Service harvest methods shifted from primarily clear-cutting in the 1980s and early 1990s to mainly commercial thinning after 1994 as we implemented more intermediate harvest treatments with multiple objectives (Spies et al. 2018). Harvest methods that retain significant structural elements of the preharvest stand largely have replaced clear-cutting (Franklin et al. 2018: 108). These harvest methods continue to create timber outputs that contribute to local economies, often in concert with restoration and resilience projects. Forest Service commercial thinning includes traditional, evenly spaced thinning and has, over the past several decades, evolved into more dynamic intermediate thinning methods, such as variable density thinning and variable retention harvest. These more variable thinning methods have been used broadly and studied regularly in the BioA area since the early 1990s (figure 11).

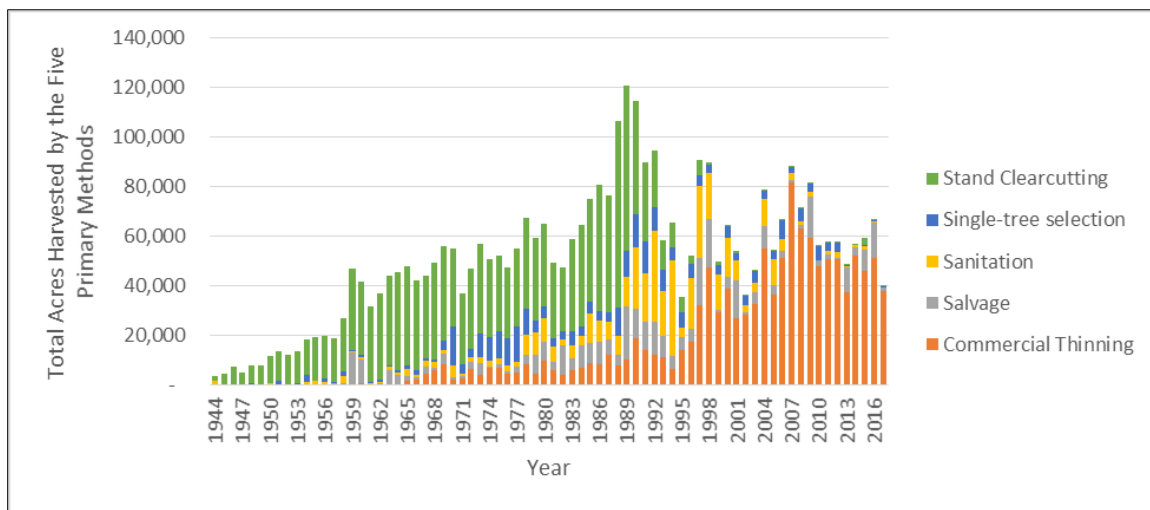


Figure 11. Harvest methods used in the Bioregional Assessment area

Acres of primary harvest types (clear-cutting, commercial thinning, salvage, sanitation, and single-tree selection of trees) within the BioA area from 1944 to 2017. There were more than 75,000 acres clear-cut in 1988, while 2007 saw a peak in commercial thinning at just under 82,000 acres. Timber harvest practices have moved to mostly commercial thinning with almost no stand clear-cutting.

Key Change Issues

Key Change Issue 1—Timber Processing Infrastructure and Forestry Workforce

Timber processing infrastructure and workforce have declined in recent decades (Charnley et al. 2018). Many rural communities in and around the BioA area that rely on federal timber and landscape restoration have been socially and economically affected by declines since the 1990s. Economically feasible restoration efforts, timber processing infrastructure, and having a skilled workforce are needed to support ecological integrity and benefits to communities in the region.

The ability to implement restoration treatments on federal lands is influenced by several factors, including the presence of markets, sawmill facilities, and a capable workforce (map 6). Conversely, the types of restoration treatments implemented, and products generated influence the viability of the infrastructure and the presence of a capable

workforce. For timber production to function as a tool to meet ecological objectives, purchasers must be able to meet the requirements for minimum acceptable bid prices, use the offered wood material, and perform the required work. Therefore, it is difficult to rely on timber harvest to fund forest management and restoration on all but the most valuable timberlands.

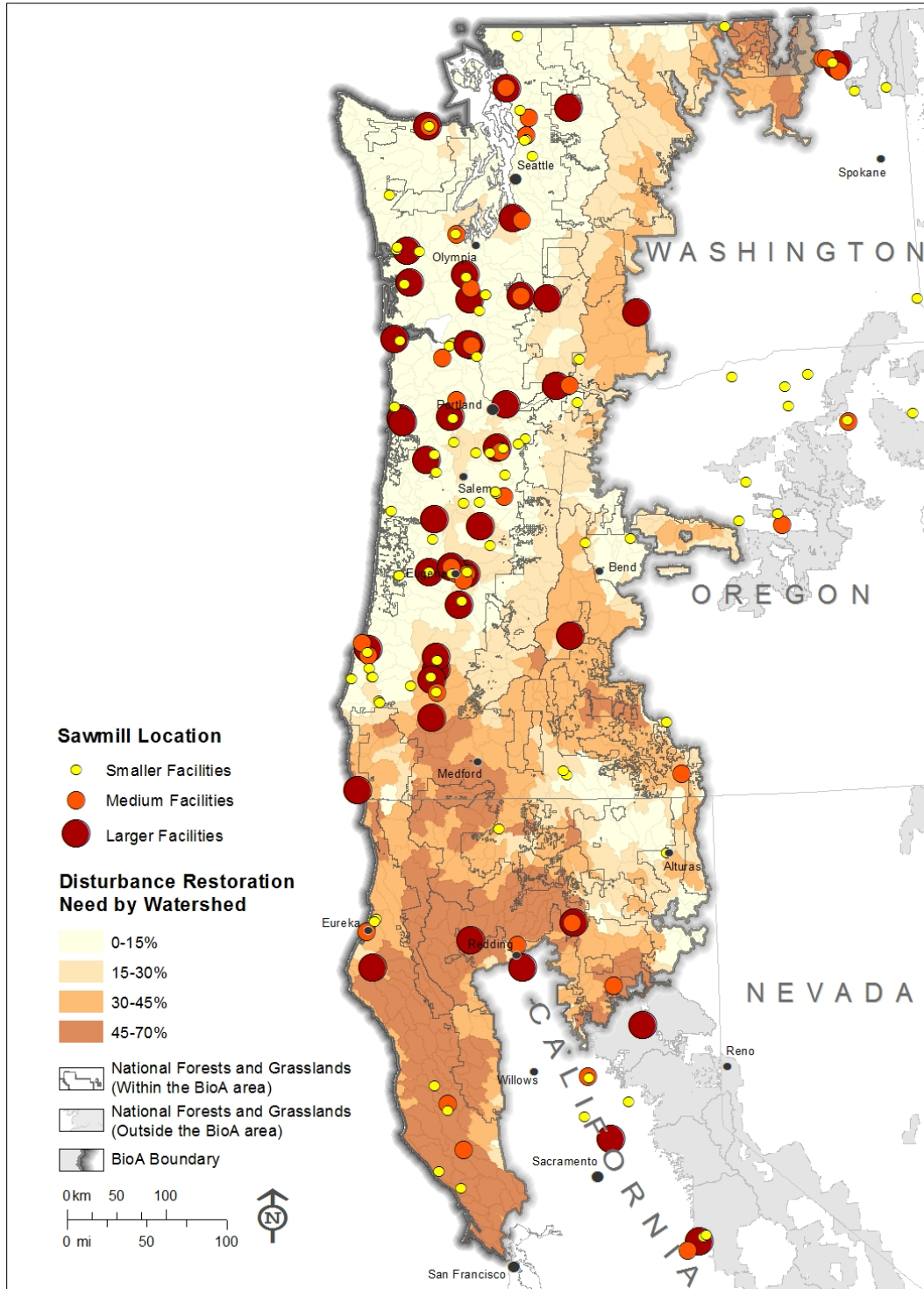
Timber processing infrastructure and a skilled workforce are sparse in some locations, especially east of the Cascade Range. The number of mills has decreased regionally, and the average distance between large mills has grown to about 100 miles, resulting in an increased cost to transport logs to mills throughout much of the BioA area. However, remaining mills have modernized, and total wood processing capacity has increased (Charnley et al. 2018).

Call-out box 5. Mills and workforces

Maintaining a sustainable local wood products infrastructure and workforce is key to Forest Service restoration goals and its mission to provide renewable sources of timber. Local wood processing facilities and the skilled workers they employ transform restoration harvests into valuable products such as lumber, which can in turn financially support more restoration activities.

In the past 20 years, this infrastructure and workforce have declined across the BioA area; processing infrastructure east of the Cascade Range has become especially sparse. Fewer sawmills make restoration activities more of a challenge. This limited infrastructure can result in higher transportation costs and fewer buyers for the timber from these lands.

Modernizing forest plans allows the Forest Service to determine effective strategies to encourage investment in the local mill facilities and workforces needed to increase the pace and scale of restoration to improve the ecological health of forests and support the socioeconomic health of communities.



Map 6. Sawmills within the Bioregional Assessment area and restoration needs as of 2016
Vegetation management can be limited by the ability to use harvested trees and pay for landscape treatments.

Updates to land management plan direction, while unable to resolve all issues, can help to improve social and economic sustainability and better reflect the needs of local communities throughout the BioA area, especially those in hard-hit rural communities across southern Oregon and northern California. While the Forest Service strives to balance the social, economic, and ecological needs of communities and landscapes, there are instances where one resource objective might require more emphasis than others. When updating land management plans, the Forest Service collaborates with American Indian tribes, states, counties, and communities to develop goals and discover potential management approaches that seek the right emphasis on community and ecosystem objectives. For example, plan direction can facilitate increased timber generated from national forests, which can increase timber available to mills, which would increase the workforce needed to maintain a stable pace and scale of restoration. We acknowledge that there is often controversy when the best available science indicates that active management restoration is needed. We understand that conflicting values surround timber harvest and active management, and that we will need to address such issues in upcoming planning efforts.

Geographic Considerations

The number of timber processing facilities has decreased in Washington, Oregon, and northern California. Although total processing capacity has increased in Washington and remains constant in Oregon, the cost of transporting harvested timber to mills has increased in areas with limited remaining infrastructure (Charnley et al. 2018). This is particularly true east of the Cascade Range and in the southern Coast Range (map 6) where restoration needs in frequent-fire dependent ecosystems are urgent.

Key Change Issue 2—Anticipated Timber Volume Output

Similar to limited timber processing infrastructure, timber harvest below projected levels restricts our ability to achieve restoration objectives and support communities and infrastructure. Harvest levels are unlikely to increase under current plans because the objectives for timber production and restoration often conflict with habitat protection objectives. For example, timber production is no longer emphasized on much of the NWFP matrix land because large areas of matrix have been designated as critical habitat for the northern spotted owl. See the “Conflicting Management Direction” section below for more discussion.

Restoration needs in frequent-fire dependent ecosystems usually require the application of mechanical treatments, including timber harvest, often in combination with fuels reduction treatments. Restoration needs exist across the BioA area; this includes restoration needs in NWFP late-successional reserves, matrix, and other land use allocations. Often forest plan direction in these areas conflicts with the application of restoration treatments and the subsequent coproduction of timber.

One example includes commercial thinning in historic plantations within late-successional reserves. Thinning from below is generally only commercially viable every 30 to 50 years on the most productive sites and may not be commercially viable on drier sites for much longer as growth is often much slower in drier areas. Restrictions on harvesting trees that are more than 80 years old in late-successional reserves of the NWFP means that restoration that coproduces timber will be more difficult for the next couple of decades, especially on forests and districts that have a high proportion of late-successional reserves. The challenge arises

because areas available for restoration and commercial timber production will be thinned or have already been thinned within the past 30 years. This progression through time results in stands that are too old and trees that are too large to be commercially harvested under the restrictions in the land management plans. Therefore, needed restoration would likely not be accomplished due to the conflicts between forest plan direction and the application of restoration treatments.

Existing land management plans are not consistent with modern harvest methods and technology. Generally, projects that produce timber currently do not use some harvest methods included in the original plans, like regeneration harvest of old forest in matrix lands. More modern methods and concepts (developed since the 1980s), such as variable density thinning, modern logging methods, and the role of timber harvest in working toward ecological resilience and integrity, have not been incorporated into existing plans. Our current direction focuses more on setting standards and guidelines for timber harvest than on working toward desired conditions. Such a focus can prevent leveraging new technology; an example is technology that allows harvest on steep slopes with little impact to soils. Timber outputs from our highly productive fire infrequent and fire diverse (mixed severity) lands have been particularly curtailed. However, social values related to land management have begun to shift toward recognition of the broad benefits associated with our natural resources and the importance of balancing resource protection with timber production (Charnley et al. 2018).

NWFP late-successional reserves and matrix are similar in their current need for disturbance restoration, which involves mechanical treatments, including timber harvest, in combination with fire treatments (figure 12).

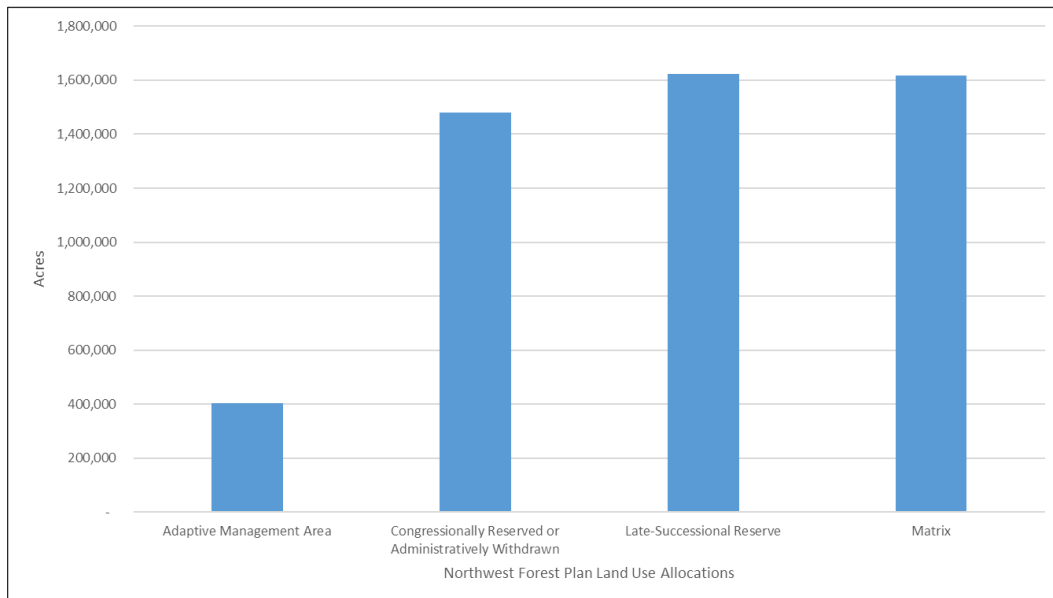


Figure 12. Fire and mechanical treatment needs in the Northwest Forest Plan area

Millions of acres need some combination of mechanical or fire treatment to reduce density and restore forests (disturbance restoration need) in land use allocations, including matrix, late-successional reserve, congressionally reserved and administratively withdrawn, and adaptive management areas. Mechanical treatments to achieve restoration goals can often produce commercial timber as a coproduct of improving ecological resilience.

Planning Considerations

The main BioA recommendation for providing sustainable timber and forest products involves better integration of ecological integrity, landscape restoration, and resilient landscape management with the coproduction of timber. The need is to create 21st century desired conditions with forest plans that emphasize ecological integrity and resilient landscapes. This includes integration of desired conditions related to ecological forestry restoration and resilience in the face of climate change.

Refer to BioA Chapter 2 Management Recommendations

Recommendation 1: Maintain and restore ecosystem characteristics and processes by working toward desired conditions that are compatible with the diverse landscapes across the BioA area.

Recommendation 2: Address the dynamic nature of ecosystems to be better positioned to respond to future environmental uncertainties.

Recommendation 6: Recognize that fire is a natural process and plays an important role in reducing the risk of uncharacteristic fire and in promoting ecosystem health.

Recommendation 7: Expand the use of timber harvest as a restoration tool to provide economic and social benefits to communities.

Recommendation 8: Shift from single-species management to maintaining and restoring habitat for multiple species to help ensure we are managing our ecosystem to be resilient in the face of future change.

Recommendation 9: Promote active management in plant and animal habitats to restore and promote ecological resilience.

Geographic Considerations

The land management plans on the Gifford Pinchot, Mt. Hood, Willamette, and Umpqua National Forests projected the highest timber outputs under the NWFP, and these national forests have experienced significant gaps between projected production and actual output (table 1); these are highly productive national forests and the timber output does not reflect that productivity. This is primarily due to interactions between (1) conflict between underlying forest plan management direction, inventoried roadless area designation and NWFP assumptions; (2) unforeseen complexity and unpredictability for timber production given unmapped riparian reserves, the Survey and Manage program, and northern spotted owl critical habitat; and (3) lack of social acceptability of harvest in old forest and regeneration harvest on matrix lands. Both social acceptability of timber harvest in old forest and regeneration harvest were assumed when the original PSQ calculations were made.

The Willamette, Okanogan-Wenatchee, Rogue River-Siskiyou, Umpqua, Shasta-Trinity, Gifford Pinchot, and Klamath National Forests, and to some extent the Mt. Baker-Snoqualmie and Mt. Hood National Forests, are prime examples of where the Forest Service could be simultaneously producing timber volume and meeting ecological needs but are hampered from implementing sound projects. All these national forests have high or moderate restoration needs (Ringo et al. 2019) in addition to the standing volumes available outside of congressionally reserved areas where active management could both implement

ecologically sound projects and produce timber volumes (Franklin et al. 2018, Spies et al. 2018). We acknowledge that there is often controversy when the best available science indicates that active management restoration is needed. We understand that conflicting values surround timber harvest and active management, and that we will need to address such issues in upcoming planning efforts.

Table 1. Timber volume gap by national forest

Four national forests have the highest planned timber volume output gap: Gifford Pinchot, Mt. Hood, Willamette, and Umpqua National Forests.

National Forests	Projected Timber Volume Output Gap
Okanogan-Wenatchee	Low
Mount Baker-Snoqualmie	Medium
Olympic	Medium
Gifford Pinchot	High
Columbia River Gorge	Low
Mt. Hood	High
Siuslaw	Medium
Willamette	High
Deschutes	Low
Ochoco	Low
Umpqua	High
Fremont-Winema	Low
Rogue River-Siskiyou	Medium
Six Rivers	Medium
Klamath	Medium
Modoc	Low
Lassen	Low
Shasta-Trinity	Medium
Mendocino	Low

Table 1 ranks each forest with a qualitative ranking based on a comparison of planned timber output and actual timber output. The land management plans signed in the 1980s and amended by the NWFP, PacFish, InFish, and Sierra Nevada Framework include projected timber volume outputs. Some national forests have met the projected outputs while others have not. While these volume projections are now more than 25 years old, it is important to show the gap between projected and actual outputs.

Planned timber output was either NWFP PSQ or initial forest plan estimates for national forests or portions of national forests found outside the NWFP area. National forests ranked as “high” generally have the largest volume gap between planned timber output and actual output. These national forests tend to be most naturally high in primary

production capabilities and have more timber production lands (for instance, matrix). National forests ranked as “medium” have a moderate gap between planned and actual timber output. These mid-range national forests are relatively either high or mid-level in intrinsic primary production capabilities and have a moderate level of potential for additional timber production and a moderate level of timber production lands. National forests ranked as “low” generally have a lower gap between planned and actual timber output. Often this is because these national forests have relatively low primary production capabilities, limited potential for additional levels of timber production, and little to no timber production lands.

NWFP Probable Sale Quantity Context

Historically, timber production that was projected has not been met (figure 13). The PSQ was defined under the NWFP as a “rough approximation” for the first decade after the decision (1995–2005), and it was acknowledged that it was unlikely that the annual PSQ estimates would be achieved during the first several years. The total PSQ for all federal lands for option 9 (selected) was 1.1 billion board feet (plus or minus 10 percent) for the first decade. “It will take time for the land management agencies to develop new timber sales that conform to the planning amendments effected by our decision. In addition, the decision contains requirements to perform various levels of analysis or survey work before awarding timber sales in certain areas.” (USDA FS and USDI BLM 1994:19). PSQ was not defined by the agency in the record of decision, but projected calculations were provided by the Forest Ecosystem Management Assessment Team (FEMAT and USDA FS 1993: table VI-2 page VI-5).

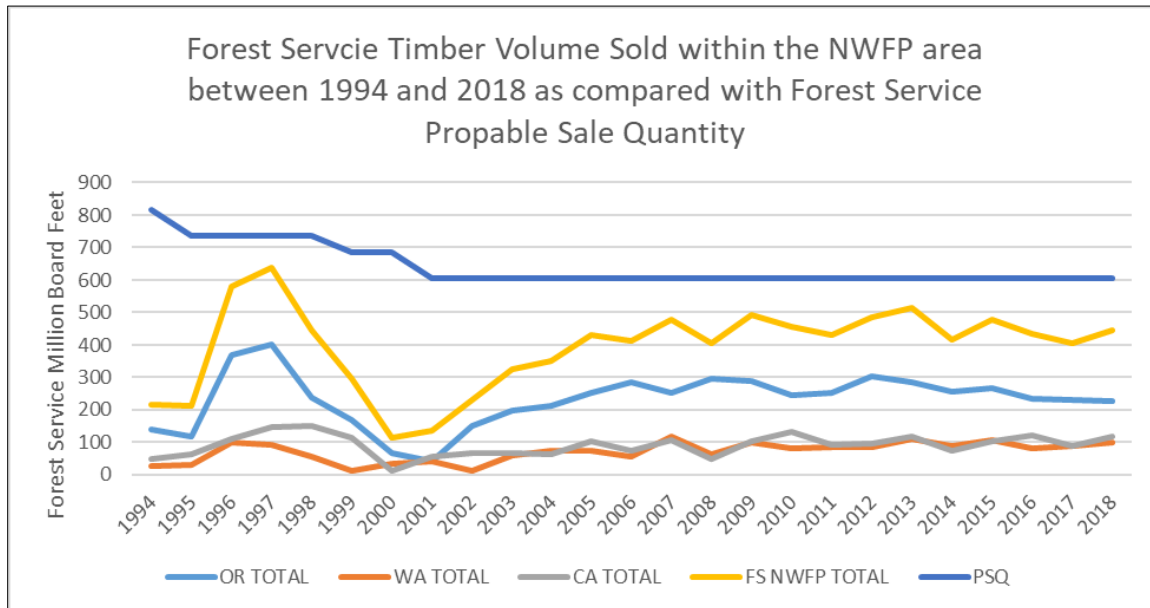


Figure 13. Historic timber volume output in the Bioregional Assessment area

Timber volume output history measured in millions of board feet for the BioA area from 1994 to 2018. Individual forest plans calculated an allowable sale quantity and sale schedule for each forest under the 1982 Forest Service planning rule. These have never been updated.

Anticipated PSQ within the NWFP area was based on the assumption that most of the volume was to come from four of the most productive national forests, the Gifford-Pinchot, Mount Hood, Umpqua, and Willamette (Johnson et al. 1993). The assumed harvest methods on these national forests also included the use of regeneration harvest (15 percent retention) for primarily timber volume production. These harvests with 85 percent removal of live trees tend to look nearly as visually striking as clear-cutting. This level of regeneration harvest was not implemented in large part due to the lack of social acceptance of regeneration harvest and timber production-focused projects. Volume awarded from these four national forests from 2014 to 2018 composed only 28 percent of the total volume awarded from NWFP forests.

In 1993, Johnson and others acknowledged that most of the projected volume of PSQ was anticipated from older forest (50 percent of volume from forest more than 200 years old). This has not been implemented as planned as the use of regeneration harvest has nearly ceased due to social concerns.

By Design: Isolation of Timber Production Lands—a Paradigm Shift

When the NWFP was implemented, the two objectives of "...conserving the ecosystems upon which species depend, and at the same time providing raw materials and other resources that are needed to sustain the health and economic well-being of the people of this country" (USDA FS and USDI BLM 1994: 26) were viewed largely as direct conflicts. Harvest levels from the NWFP area in the late 1970s and 1980s were in the billions of board feet per year—levels that were not sustainable. But regardless of the long-term sustainability of these harvest levels, communities and industry expected and relied on these timber outputs. In 1994, the Forest Service's historic practice and paradigm of harvesting old-growth forests and cutting the largest, often oldest, trees with a singular purpose of wood production, was set against the environmental movement and ecosystem stewardship. What has changed most dramatically since 1994, besides timber output, is the idea that these two objectives are not necessarily in conflict, especially (Pipkin 1998) at landscape scales.

The 1994 NWFP and other amendments (Eastside Screens, PacFish, InFish) were meant to be planning tools to move federal lands, the public, and the courts past this historic gridlock. The NWFP amendment had the goal of creating a framework for achieving both timber production and protecting ecosystem function and diversity. In this 1980s and 1990s context, (1) timber production and (2) protection of biological diversity and ecosystem function were separate goals. The two goals were kept separate both as ideas and physically, through management area delineation in each forest plan and the NWFP land use allocations (late-successional reserves, riparian reserve, adaptive management area, and the remaining matrix).

The current goals and objectives for the Forest Service are multiple use and include ecosystems services and ecological integrity. Collaboration, shared stewardship and a shifted focus toward ecosystem management in our multiple objective lens are now at the heart of the Forest Service mission. Today the Forest Service, our partners, collaborative groups, and the public are all using, and continuing to develop, new language to describe this synergistic connection and the multiple objectives that are the source of these paradigm shifts.

Phrases such as “active management,” “restoration,” “creating resilient landscapes,” “fuels reduction,” and “thinning” describe how timber harvest and timber production can be elements or outcomes of projects designed to do much more than get logs to the mill. In fact, for the Forest Service, timely and financially sustainable implementation of restoration, fuels reduction, and the creation of landscape resilience often require timber harvest and the revenue produced from salable logs. We acknowledge that even when the best available science indicates that active management restoration is needed, conflicting values around timber harvest or other types of active management still exist, which we will need to address in upcoming planning efforts.

Furthermore, ecosystem and landscape resilience are not integrated into our existing forest plans. Current plans generally acknowledge forest health, usually under the context of forest health for the continuation of primarily timber production purposes, not necessarily holistic ecosystem function, resilience, or integrity. Existing forest plans often conflict with modern desired conditions.

Call-out box 6. Shared stewardship

"Shared Stewardship is about working together in an integrated way to make decisions and take actions on the land." - USDA Forest Service Chief Vicki Christiansen.

Today's forest land managers face a range of urgent challenges, including catastrophic wildfires, more public demands, degraded watersheds, and insect and disease epidemics. The Forest Service is committed to a shared stewardship strategy to address these challenges by working collaboratively to identify priorities for landscape-scale treatments. The agency works with a variety of partners to do the right work in the right place and at the right scale. By coordinating at the state level to prioritize land management, the Forest Service will be able to increase the scope and scale of critical forest treatments that support communities and improve forest conditions.

The shared stewardship strategy builds on a foundation of collaborative work, such as the Joint Chief's Landscape Restoration Partnership, the National Cohesive Strategy for Wild/and Fire Management, and the Collaborative Forest Landscape Restoration Program. It also builds on authorities created or expanded in the 2018 Omnibus Bill and the 2018 Farm Bill, such as the Good Neighbor Authority. The Forest Service will build on this foundation, working more closely than ever with states, tribes, and other partners to set cross-boundary priorities.

Conflicting Management Direction

One of the primary reasons that timber outputs from the NWFP area have been below anticipated levels (PSQ estimates) is that the plan expectation that matrix lands under the NWFP would emphasize timber production has not been met. Today, an estimated 1.5 million acres (8 percent) of the NWFP area aligns with timber production emphasis (table 2) (example map 7). In 1994, about 16 percent of the NWFP area emphasized timber production.

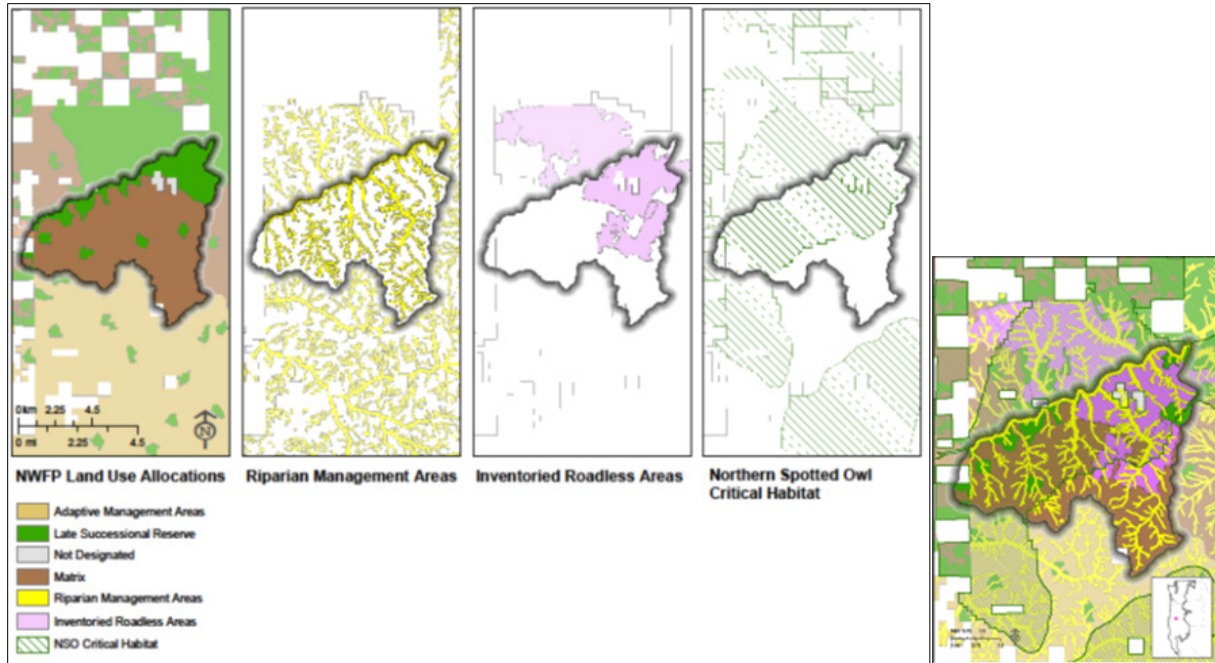


Figure 14. Conflicting demands in matrix lands

The land available for timber production under the Northwest Forest Plan (NWFP) is much less than what was left undesignated in the NWFP. All undesignated lands in the NWFP were assumed to be timber production emphasis and dubbed “matrix.” Underlying land management plan direction and inventoried roadless area designation often conflict with NWFP assumptions about timber production. Matrix was assumed to emphasize timber production, but timber production goals in matrix are superseded by more restrictive stipulations. Examples of more restrictive management direction include minimum canopy cover requirements for ungulates and requirements for tree retention or limited tree stumps. Inventoried roadless areas generally prohibit timber harvest. Unmapped riparian reserve, survey and manage, and northern spotted owl critical habitat designations create further complexity and unpredictability for timber production. Northern spotted owl critical habitat designation that overlaps with the matrix allocation has reduced the land base available for primary timber production.

Forest Plan Management Emphasis

Understanding individual forest plan management emphases and amendments, constraints and standards and guidelines as related to vegetation management on our forests is complex. All forest plans in the BioA area have been affected by one or more large-scale amendments. In addition, each forest includes areas that have been designated or administratively withdrawn/Congressionally reserved throughout the years since 1994, including wilderness designations that prohibit timber harvest, or designations that allow limited or no vegetation management (national recreation areas, research natural areas, wild and scenic rivers). The combination of underlying forest plans, amendments, and administratively withdrawn/Congressionally reserved areas is complex, and forest plan direction across the BioA area is diverse. To better understand and summarize the forest plan management emphases as related to active management of vegetation, we have summarized the entire BioA area into four broad categories (modified from Ringo et al. 2016):

- A. **Forest plan timber production emphasis:** areas where both the underlying forest plan and NWFP matrix overlap to emphasize timber production. These forest plan areas do not necessarily restrict mechanical treatments beyond standard guidelines and the areas may be used to meet wood production targets (for example, general forest, suitable timber, timber production). Timber production emphasis areas include areas where Eastside Screens 21-inch diameter at breast height standard applies depending on old-forest landscape conditions on forests outside of the NWFP area.
- B. **Forest Plan multiple objective emphasis:** areas where mechanical treatments may be restricted by forest plans or an amendment such as the NWFP for multiple objectives. Mechanical treatments are limited but possible depending on forest conditions or management objectives (for example, elk winter range, riparian reserves, managed old growth, visual corridors). *NWFP late-successional reserves and riparian reserves are considered part of the multiple objective category of forest plan management emphasis.*
- C. **Inventoried roadless areas:** the Roadless Area Conservation Rule generally prohibits timber harvest and road construction in Inventoried Roadless Areas.
- D. **Preservation:** areas designated for long-term preservation by act of Congress or forest plan allocation, and no mechanical treatments are permitted (for example, wilderness or research natural areas), and areas where vegetation is only managed for non-vegetation objectives such as those used for national recreation areas.

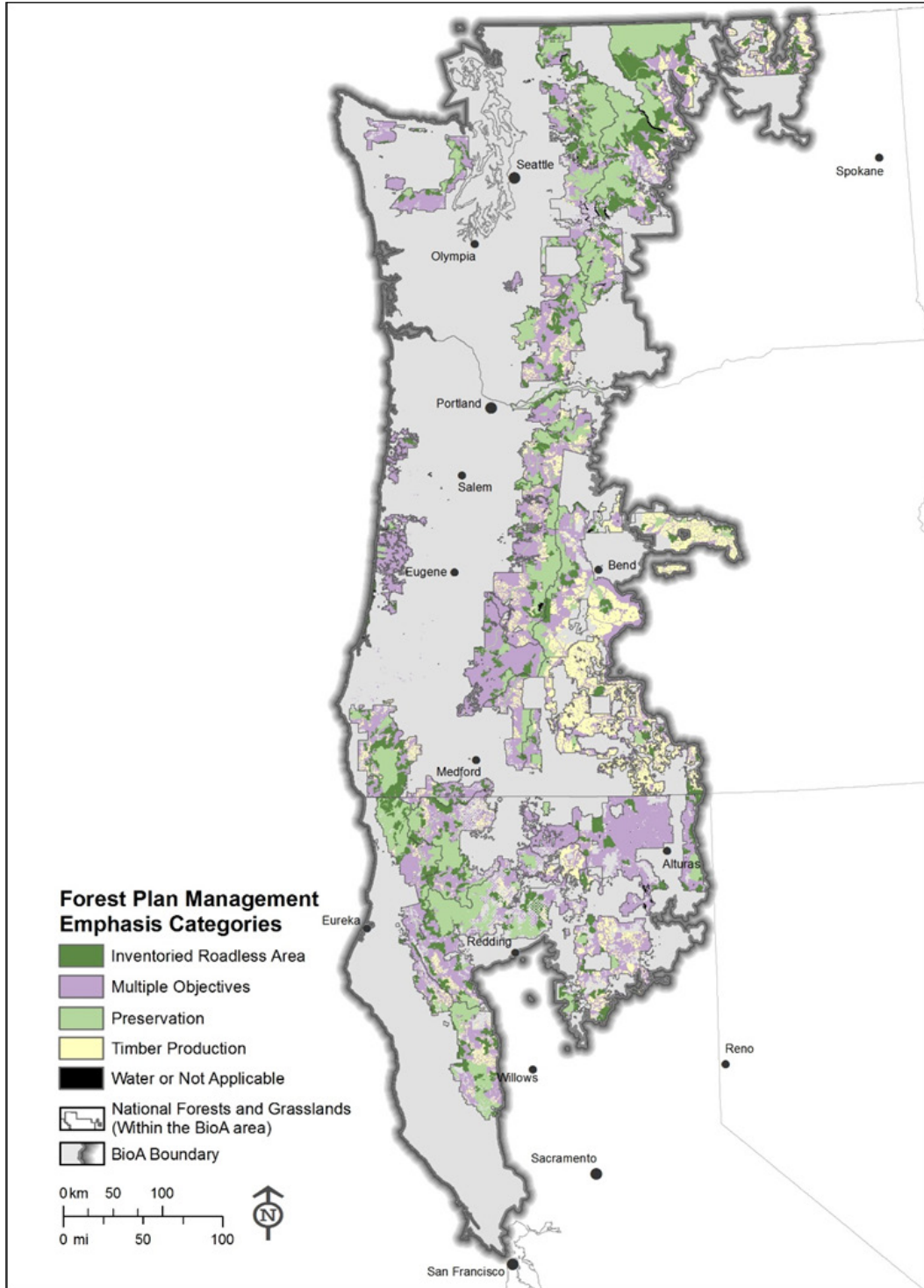
In 2001, the Forest Service promulgated national regulations (known as the Roadless Area Conservation Rule) that permanently codified the designation of inventoried roadless areas on about 530,000 acres of matrix lands and 1.6 million acres of late-successional reserves (figure 15) within the BioA area. The rule generally prohibits timber harvest and road construction in inventoried roadless areas.

Northern spotted owl critical habitat designation also overlaps with timber management emphasis, and this overlap shifted management to an old-forest habitat conservation focus that was not necessarily consistent with planned timber production emphasis. This overlap reduced the total timber production emphasis area to approximately 940,000 acres, or 5 percent of all Forest Service lands in the NWFP area (figure 16, figure 17, and figure 18).

Table 2. Forest plan management emphasis on matrix lands

This table displays the percentage of area for four categories of management emphasis within matrix lands in the Northwest Forest Plan area.

Forest Plan Management Emphasis Category	Percentage of Matrix with each General Emphasis	Acres of Matrix General Emphasis
Multiple objectives	54%	2,765,285
Timber production	30%	1,567,555
Inventoried roadless area	10%	531,329
Preservation	5%	230,871



Map 7. Vegetation forest plan management emphasis categories for the Bioregional Assessment area.

Categories are a combination summary of underlying Forest Plan direction, amendments including the NWFP Land Use Allocations, inventoried roadless area extents, and administratively preserved or withdrawn areas for a purpose other than vegetation management (for example, national recreation areas).

Table 3. Bioregional Assessment area by percentages under different forest plan management emphases

Forest Plan Management Emphasis Category	Percentage BioA Area	Approximate BioA Acres
Multiple objectives	43%	11,900,000
Preservation	23%	6,300,000
Inventoried roadless area	16%	4,860,000
Timber production	18%	4,290,000

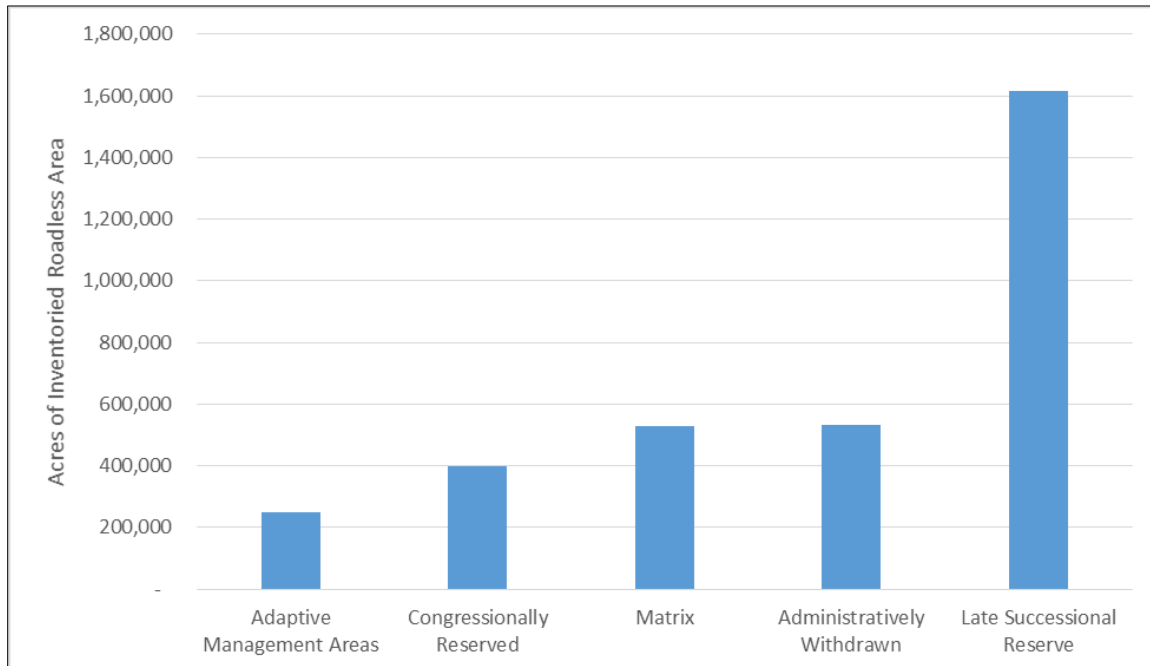


Figure 15. Acreage of inventoried roadless area by Northwest Forest Plan land use allocation

Inventoried roadless area that was designated in 2001 by primary NWFP land use allocation. Most inventoried roadless area was designated in late-successional reserves and administratively withdrawn areas, but about 530,000 acres also were designated in matrix areas.

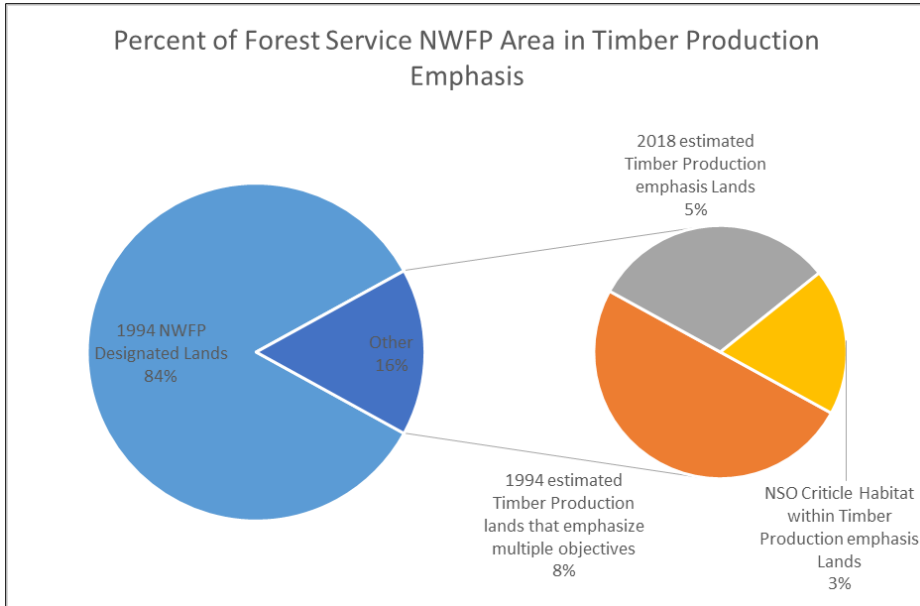


Figure 16. Percentage of the Northwest Forest Plan (NWFP) area with timber production emphasis

Timber production under our current forest plans conflicts with habitat protection and other objectives. In 1994, an estimated 16 percent of the NWFP area had a timber production emphasis (other = matrix). Of these lands, only about 5 percent remain in timber production emphasis today. About 8 percent (1.58 million acres) have multiple objectives emphasis as a result of forest plan direction (for example, visual corridors, ungulate habitat), inventoried roadless area designation, or other designation (national recreation area). With the most recent northern spotted owl recovery plan, about 3 percent (644,000 acres) have been designed as northern spotted owl critical habitat, leaving approximately 940,000 acres (5 percent of NWFP area) of matrix, or primary timber production lands.

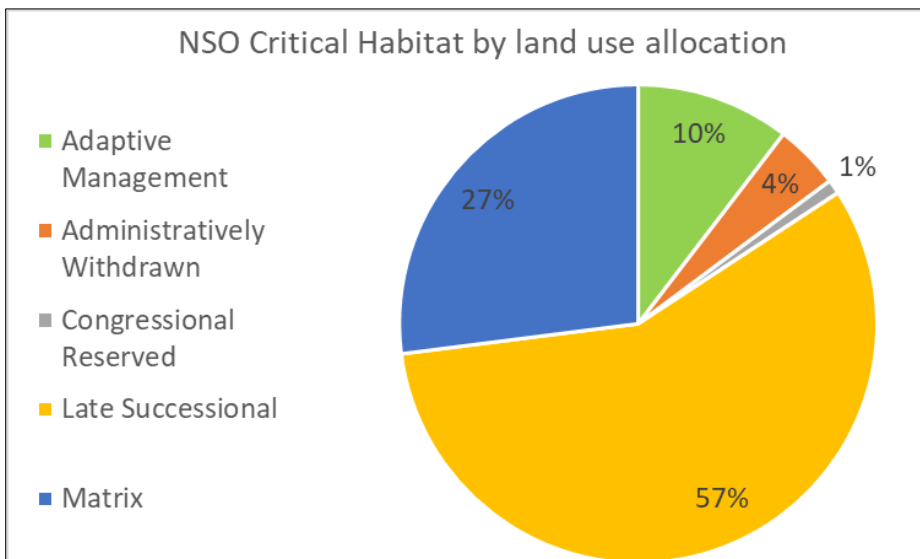


Figure 17. Designated northern spotted owl critical habitat in each land use allocation

Designated critical habitat management emphasis for northern spotted owl is most aligned with late-successional reserve, congressional reserves, and administratively withdrawn allocation objectives.

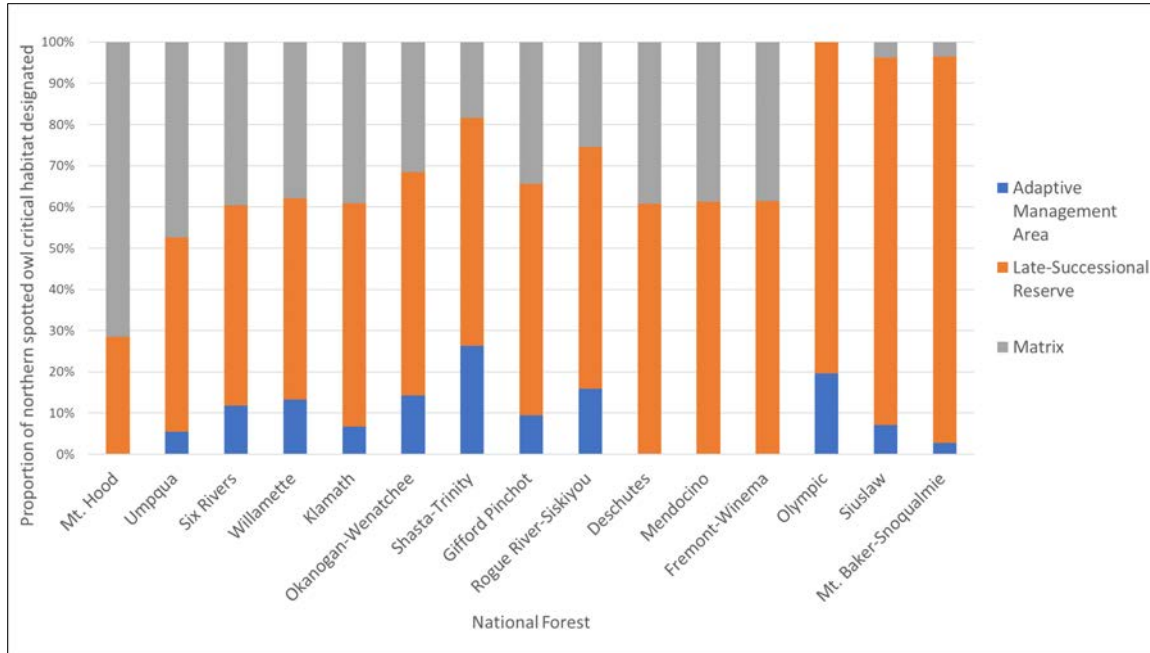


Figure 18. Proportion of northern spotted owl critical habitat by actively managed Northwest Forest Plan land use allocations

Northern spotted owl critical habitat designation is most proportionally aligned with late-successional reserves on the Mt. Baker-Snoqualmie, Siuslaw, Olympic, Fremont-Winema, Mendocino, and Deschutes National Forests; more than 60 percent of northern spotted owl critical habitat is within late-successional reserves on these national forests. Non-alignment of northern spotted owl critical habitat with late-successional reserves and other reserves indicates a potential need to adjust land allocations in coordination with designated critical habitat for northern spotted owls and other species.

The primary intent of the matrix land use allocation under the NWFP was to support desired and probable timber production goals set forth in the plan, while also interfacing with other land use allocations to sustain old-forest and riparian areas. Most of the area where timber has been harvested since 1994 has been in matrix. Conflicts have added both tangible and perceived restrictions to mechanical vegetation management on matrix lands that we consider here. Conflicts generally fall into three categories:

Desired Conditions: spatial and design constraints include existing plan definitions, some plan components, Survey and Manage, lack of clarity of desired conditions for consultation processes, northern spotted owl critical habitat designation, and interpretation.

Process: constraints may include multiple layers of internal process, including the Regional Ecosystem Office, Regional Interagency Executive Committee, and adaptive management area processes.

Investment and Tolerance Limits: limits are reached by agency personnel related to planning process and perceived risk. Implementation of projects has limitations related to high complexity, process levels, and perceived litigation risk for the agency.

Estimates of timber production for national forests and grasslands outside the NWFP are complex because forest plan direction regarding these estimates has never integrated the adoption of Eastside Screens, including the 21-inch-diameter at breast height standard or PacFish/InFish.

An important consideration is the regional implication of real and perceived restrictions on timber production on NWFP lands. Harvest records in the Forest Service's Pacific Northwest Region indicate that within the BioA area, national forests that are partly or completely outside the NWFP footprint tend to produce more timber volume than most NWFP national forests (the Willamette National Forest is the exception) in recent years. Examples of forests east of the Cascade Range that have produced more timber than wetter NWFP forests include the Malheur, Fremont-Winema, and Colville National Forests.

Another trend that is important to consider is the large number of acres treated in fire-dependent landscapes. Of all the BioA national forests and grasslands, the Fremont-Winema, Deschutes, Klamath, Lassen, and Shasta-Trinity National Forests treated the most acres between 2010 and 2017. This shift in timber harvest from the most intrinsically productive national forests of the Cascades and North Cascades to the generally less productively capable East Cascades and Klamath Ecoregions is likely the result of two primary factors: (1) the national focus on restoration of fire-dependent ecosystems and (2) conflicting management direction of the NWFP with both timber production and restoration treatments.

Road System Context

Roads and motorized transportation networks provide access for commercial and noncommercial harvest activity and other contracted work on national forests and grasslands, in addition to private inholdings and infrastructure for transportation of timber to mills. The National Forest System portion of the road system is not sustainable at its current extent and maintenance level, given current agency capacity (photo 7, figure 19). National Forest System roads were built primarily with revenue from timber sales and such funding contributes to road maintenance, but this revenue has declined in the past three decades as timber sale volumes have declined (Charnley 2006). Road condition and distance to mills affects the cost of vegetation management activities and the amount of revenue that can be gained from them. Other sources for funding for road maintenance have also declined in the past three decades. From 2003 to 2018, there was a 59-percent reduction in appropriated funding for road maintenance but only a 2-percent reduction in the road system.

Bridges are an example of a potentially acute road maintenance constraint related to timber harvest implementation. Many bridges do not have the load capacity to support timber haul or are in poor conditions, making timber harvest machinery transport unsafe. There are many more bridges on national forests in the western Cascades than east of the Cascades.



Photo 7. Example of road damage on a paved road

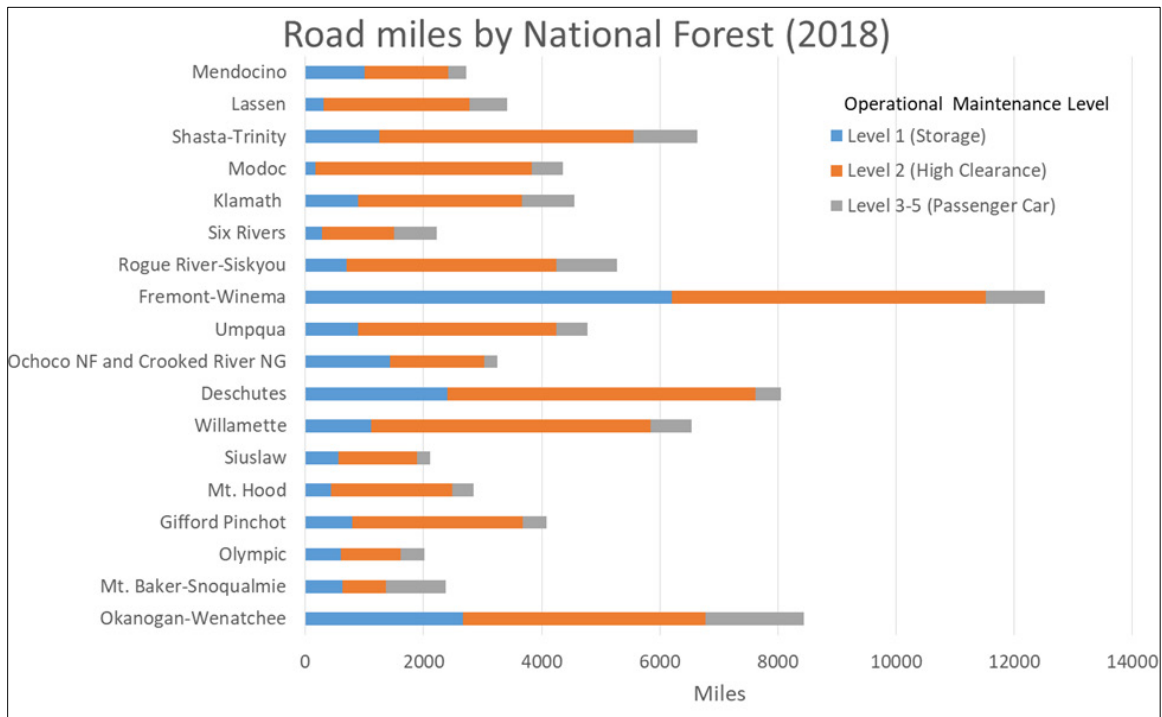


Figure 19. Road miles by maintenance level and national forest in the Bioregional Assessment area

Road mileage and maintenance levels vary widely and while not directly correlated provide an indication of the maintenance backlog and needs along with access to a given forest.

Forest Plan Elements that Reflect Underlying Trust Issues

Both the 80-year exemption of the NWFP and the 21-inch standard of the Eastside Screens are relatively simple policy rules developed to deal with complex forest biodiversity issues. These elements were developed to help describe old forest. In addition to helping describe old forests, these elements reflect the public’s underlying differing values around old forests and trust issues surrounding federal land management that existed when the management direction was developed, and which still exist to some extent today. We acknowledge that land management planning alone will not resolve conflicts in values, tradeoffs, or build trust among stakeholders and the Forest Service. We are committed to learning how and why stakeholders hold different values and to providing transparent public engagement opportunities throughout the entire planning process to increase shared learning and build trusting relationships. Science can guide the Forest Service in the modernization of these elements, but understanding, trust, and social and political durability are the primary drivers of how policy is developed or changed.

Late-Successional Reserve Context Related to Timber Production

There is a need to support continued management in late-successional reserves to meet desired ecological conditions. This includes the development of old forest in wetter regions and resilience of landscapes to climate change and disturbance, such as fire in frequent-fire dependent and fire diverse (mixed severity) ecosystems. Treatments aimed at resiliency-based density reduction, species composition, and landscape pattern shifts can contribute to the coproduction of timber in some of the most productive landscapes.

Timber volumes derived from late-successional reserves currently, and will increasingly, bump against the 80-year exemption as trees grow and age (figure 20 through figure 22). We discuss more fully the complexity of defining old forests in the “Forest Ecology” section below. It is important to point out that depending on the ecosystem and landscape, there is a tipping point somewhere between 80 and 200 years where forests tend to take on the characteristics of old forest. How and what we define as old forest has important implications for management and implementation.

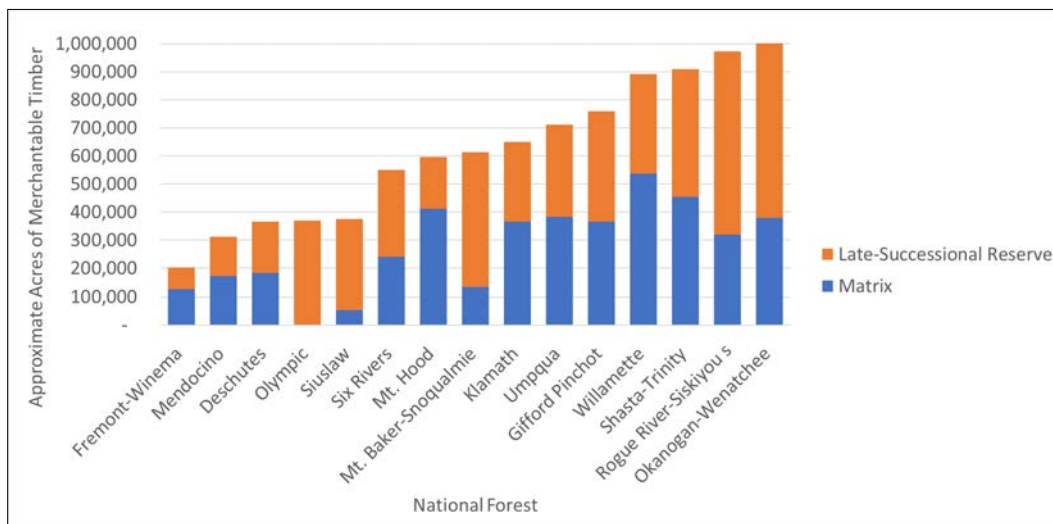


Figure 20. Timber volume by national forest and Northwest Forest Plan late-successional reserve and matrix land use allocations.

Approximate acres of merchantable-size timber volume (more than 12,500 board feet per acre of standing tree volume) by national forest and two primary NWFP land use allocations: late-successional reserve and matrix. Not all national forests and grasslands have the same potential to sell additional timber volume. Total acres of standing merchantable timber in matrix is about 4 million and about 5 million acres in late-successional reserves. Forests with less than 100,000 acres of matrix or late-successional reserves were excluded from this graphic.

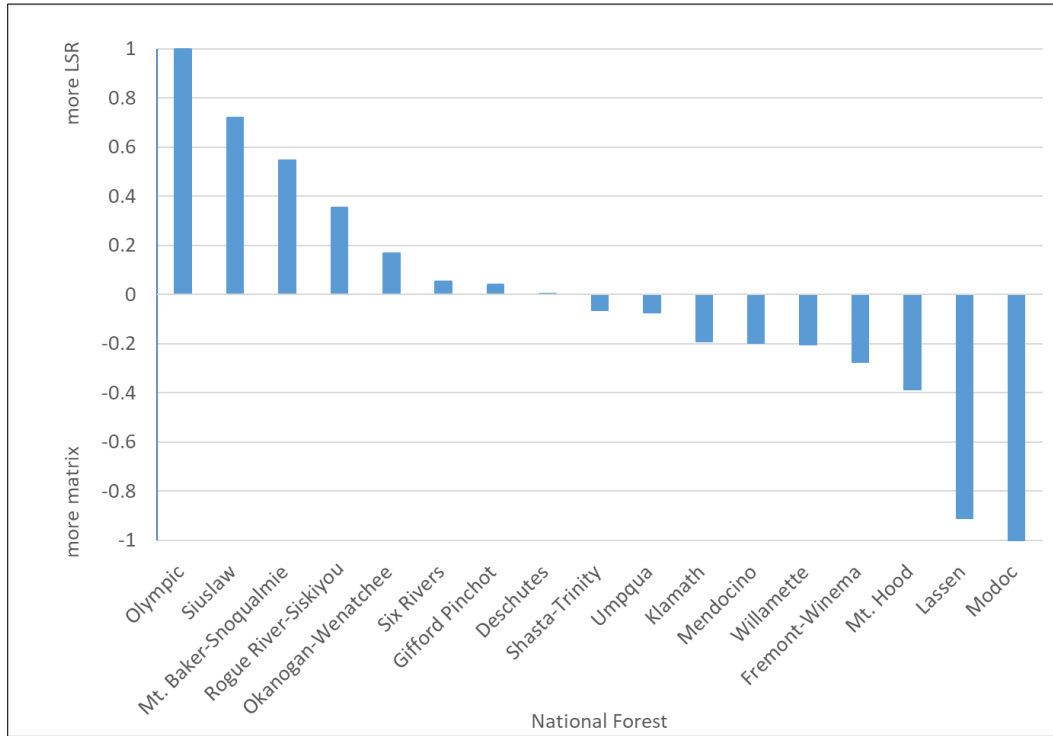


Figure 21. Index of late-successional reserve and matrix land use allocations by national forest

Forests with an index of 1 have almost all potential active management land base in late-successional reserves (little to no matrix lands). Forests with a value of -1 have nearly all potential active management land base in matrix lands and have little to no LSR. The Olympic and Siuslaw National Forests have almost all their potential active management areas in late successional reserves (value of 1). The Rogue River-Siskiyou has almost 40 percent more LSR than matrix lands. The Mt. Hood has almost 40 percent more matrix than LSR lands. More lands in late successional reserves as compared to matrix means that constraints like the 80-year exemption will likely make restorative or old-forest enhancing treatments more difficult, especially as trees naturally age.

With the 80-year threshold for exemption, more acreage will become too old for exempted vegetation treatments such as thinning. Of the 6.1 million acres of forests that are 80 to 200 years old, the Okanogan-Wenatchee has the most acres by almost 950,000 (figure 22). The Shasta-Trinity, Rogue River-Siskiyou, Klamath, Gifford Pinchot and Six Rivers National Forests have between 400,000 and 750,000 acres of forest aged 80 to 200 years old. In 1993 it was estimated that although late-successional reserve volumes are not included in PSQ calculations, an additional volume of 100 to 170 MMBF might be obtained from reserve areas (Johnson et al. 1993).

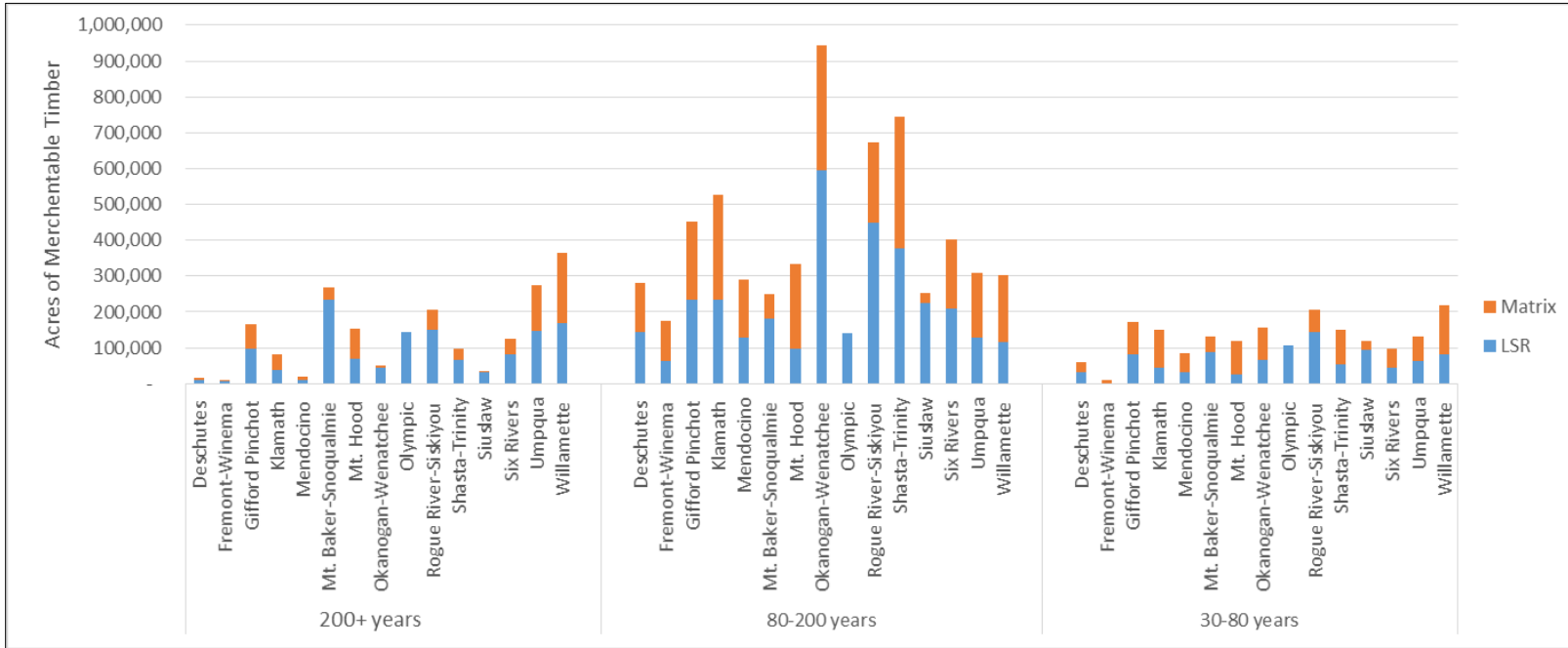


Figure 22. Acres of merchantable timber volume by age class, forest, and Northwest Forest Plan land use allocation

National forests and grasslands have most of their standing volume in the 80- to 200-year age class in both matrix and late-successional reserves across the NWFP area. Acres of forest that contain merchantable timber (small-tree and larger size classes) and are between 30 to 80 years old within the NWFP area by forest and land use allocation, including late-successional reserves and matrix, are estimated here. Some national forests and grasslands, including the Rogue River-Siskiyou, Olympic, Siuslaw, and Mt. Baker-Snoqualmie, have most of these younger forests. With the 80-year exemption, more acreage will become too old for exempted vegetation treatments such as thinning over time. Of the 6.1 million acres of forests 80 to 200 years old, the Okanogan-Wenatchee has the most acres by almost 950,000. The Shasta-Trinity, Rogue River-Siskiyou, Klamath, Gifford Pinchot, and Six Rivers National Forests all have between 400 and 750 thousand acres of forests aged 80 to 200 years old.

There is a need to support national forests with Eastside Screens contribution to timber volume output (see “Forest Ecology” section for more context on Eastside Screens). One component of the Eastside Screens that affects both restoration and resilience project implementation and timber product output is a forest plan standard that restricts harvest of trees greater than 21 inches diameter at breast height. The Eastside Screens require a landscape-scale analysis of forest structure. If the results of this analysis indicate there is a lack of old forest as compared with historic reference conditions, then there would be no harvest of trees, regardless of species, greater than 21 inches diameter at breast height outside of old forest. This standard also has been implemented to effectively restrict harvest of trees 21-inches diameter at breast height in old forest of all structural classes, even when harvest of some of these trees would maintain and conserve old forest. This standard, intended to conserve old and large trees on a landscape where the largest trees were historically cut, can conflict with attaining desired restoration across the landscape (Johnston et al. 2018, Merschel et al. 2019). This is especially true where ingrowth of white fir and grand fir undermines the protection and culturing of ecologically desired species such as ponderosa pine in frequent-fire dependent and fire diverse (mixed severity) ecosystems.

Forest Service Staffing and Budget Context

Increasing project costs, reduced agency staffing, and constrained budgets hamper efforts to increase the pace and scale of forest restoration activities. Forest budgets for restoration have not been increasing and less money is available because of constantly decreasing budgets and fire management taking up a larger portion of the overall agency budget (USDA FS 2015b) (figure 23 through figure 25).

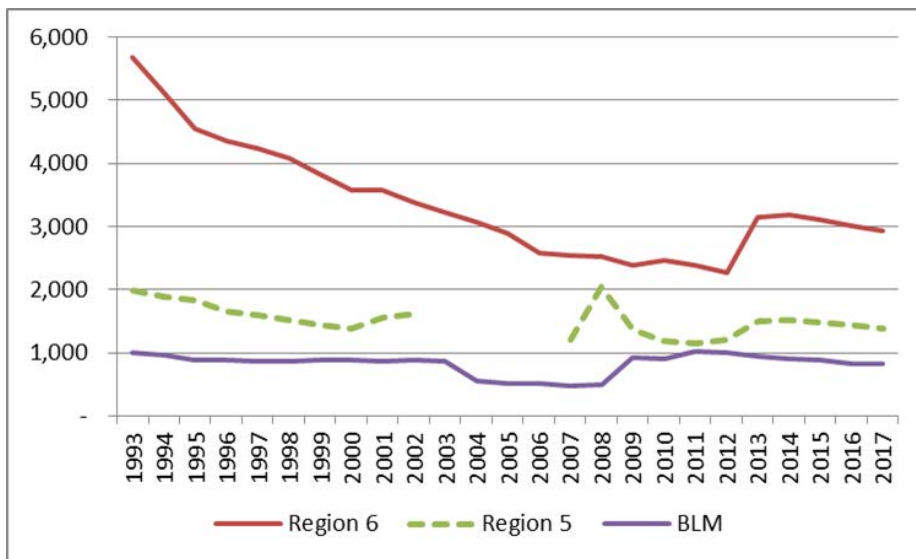


Figure 23. Northwest Forest Plan area staffing by agency and Forest Service regional staff from 1993 to 2017

Staffing reductions indicate reduced capacity to plan and implement vegetation management activities (Adapted from Grinspoon et al., n.d.). Nationally, the Forest Service employs approximately 3,000 permanent non-fire employees in the forestry (1,036) and forestry technician (1,973) series (human resource roster report, February 7, 2018), which is 17 percent

of the non-fire permanent workforce. There are fewer than 100 field level professional foresters in all of Forest Service Pacific Southwest and Pacific Northwest Regions (regions 5 and 6, respectively). One out of four permanent non-fire foresters and forestry technicians has at least 25 years of service and is nearing if not already eligible for retirement. Additionally, one out of three permanent non-fire foresters and forestry technicians has at least 20 years of experience. In Regions 5 and 6, there are about 260 foresters at all levels and about 600 forestry technicians.

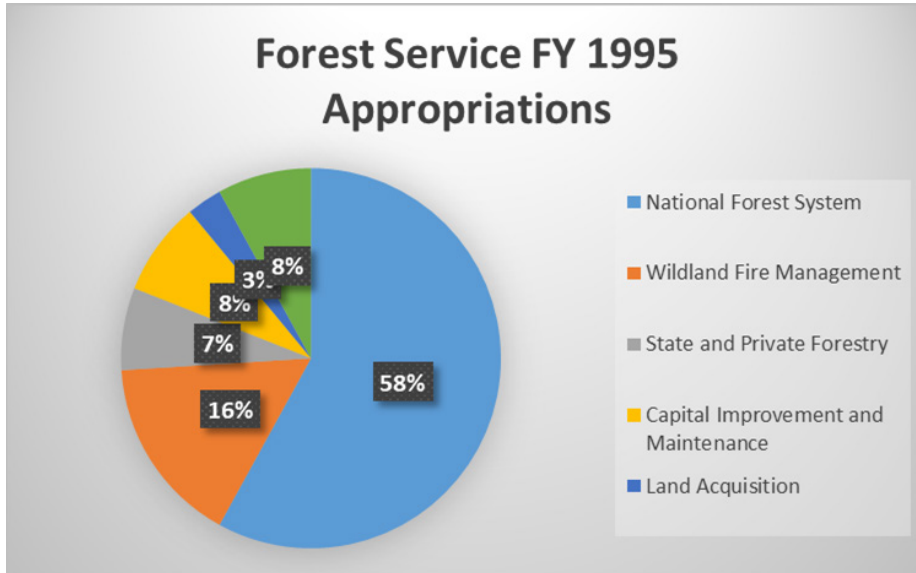


Figure 24. Forest Service fiscal year 1995 budget appropriations

This chart provides an indication of funding focus and capacity at the beginning of management under the Northwest Forest Plan, PacFish and InFish plan amendments.

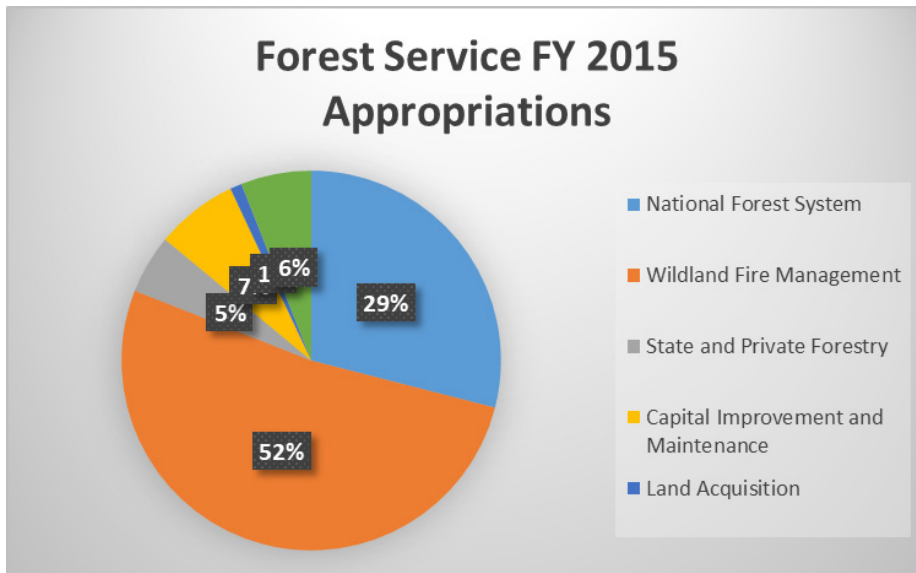


Figure 25. Forest Service fiscal year 2015 budget appropriations

This graph highlights the current funding focus and capacity and the changes when compared to figure 23 and figure 24. Note the much larger proportion of funding allocated to wildland fire management.

Conclusion

In this chapter, we recognized the significant values that national forests and grasslands deliver to all people, especially to those in communities that directly depend on economic benefits from these lands. Moving forward, we know that balancing complex ecological needs with the growing social and economic needs of communities within the BioA area will take a commitment to ongoing communication, collaboration, and coordination to develop solutions that address these challenges.

In chapter 2, you'll read about our current relationship with American Indian tribes and opportunities to better work with these tribes to help secure their treaty rights, especially when ecosystems within the BioA area provide and support a broad range of ecocultural resources important to tribes, including foods, medicine, materials, and nonmaterial values.