

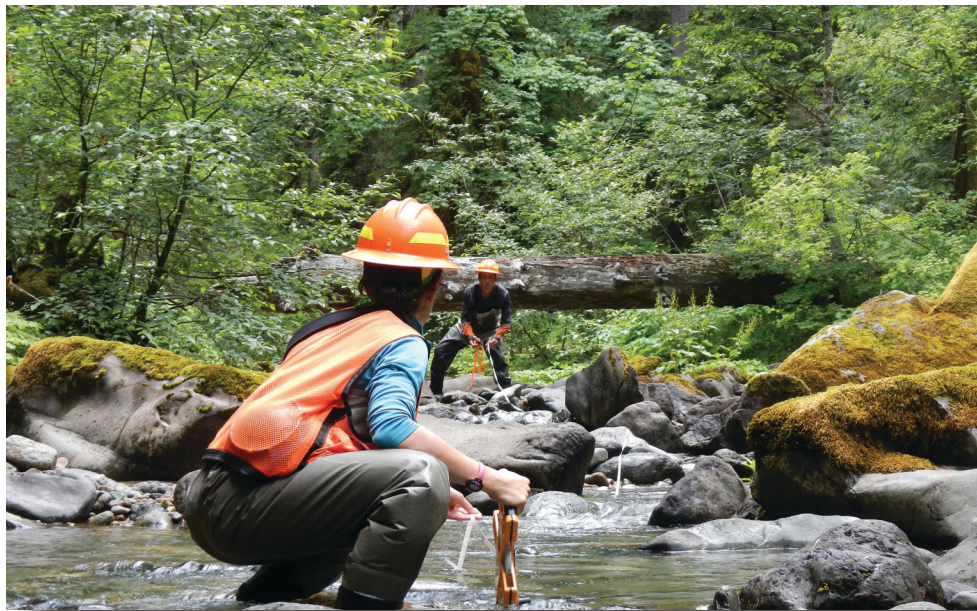
# Chapter 3

## What's Working Well?

*“NWFP monitoring indicates that progress is being made toward meeting several of the original long-term goals, namely maintenance of vegetation conditions that support northern spotted owls and marbled murrelets, protecting dense old-growth forest, providing habitat for aquatic and riparian-associated organisms, and reducing the loss of mature and old forest to logging.”<sup>64</sup>*

In chapter 2, we described recommendations for future planning efforts in the BioA area. Throughout this and subsequent chapters, we provide additional context to the recommendations highlighted in chapter 2 and integrate information using the five broad categories.

In many cases, land management plans in the BioA area are delivering effective, landscape-scale management, achieving positive community benefits, and moving us toward or maintaining desired conditions. During the 2015 public listening sessions, we heard that our public and stakeholders want to keep the parts of the NWFP and other land management planning efforts that have been and continue to be effective. This chapter is a broad look at what's working well in existing land management direction across the landscape in terms of sustaining ecological integrity and achieving benefits to communities. We do not touch on every aspect of what is working well; this is a summary. And, we didn't include findings about what's working well for fire and fuels because we learned most of these issues are management challenges and opportunities for change (see chapter 4, Fire and Fuels).



Through monitoring and evaluation, which are continuous learning tools that form the backbone of Forest Service adaptive management, we learn about what's working well on the lands that we manage. This assessment relied heavily on the results of the NWFP's broad-scale monitoring program but did not evaluate the program itself. The information from the monitoring program meets research publication standards, including peer review, and we use it to tell us if changes are needed to plan direction, management activities, or the monitoring program itself, or if we should reassess the current conditions and trends in the plan area. Broad-scale monitoring answers questions about multiple plan areas across a Forest Service region. NWFP monitoring<sup>65</sup>, in late-successional and old-growth forests, of northern spotted owls and marbled murrelet habitats, watershed and socio-economic conditions, and Tribal-federal relationship has been successful<sup>66</sup> in helping us determine if we're moving toward the desired conditions. The NWFP monitoring might serve as a model, with some adjustments, for similar efforts across the BioA area in the future.

<sup>64</sup> Spies and others, 2018b. p. 970.

<sup>65</sup> <https://www.fs.fed.us/r6/reo/monitoring/>.

<sup>66</sup> Spies and others, 2018b.

## Ecological Integrity

*Reserve Network.* Late-successional reserves, riparian reserves, and congressionally reserved lands are part of a landscape-scale approach that has worked well in supporting the integrity of ecosystems, which includes support for aquatic habitat (figure 3-1) and conservation of habitat for wildlife species. The reserve network also ensures that consistent management direction is applied to each type of land use allocation (figure Intro-3). Other plan amendments, like the PACFISH, INFISH, Eastside Screens, and Sierra Nevada Framework, also have been successful in achieving some desired outcomes including connecting and conserving aquatic habitat and dense, multi-layered forest.

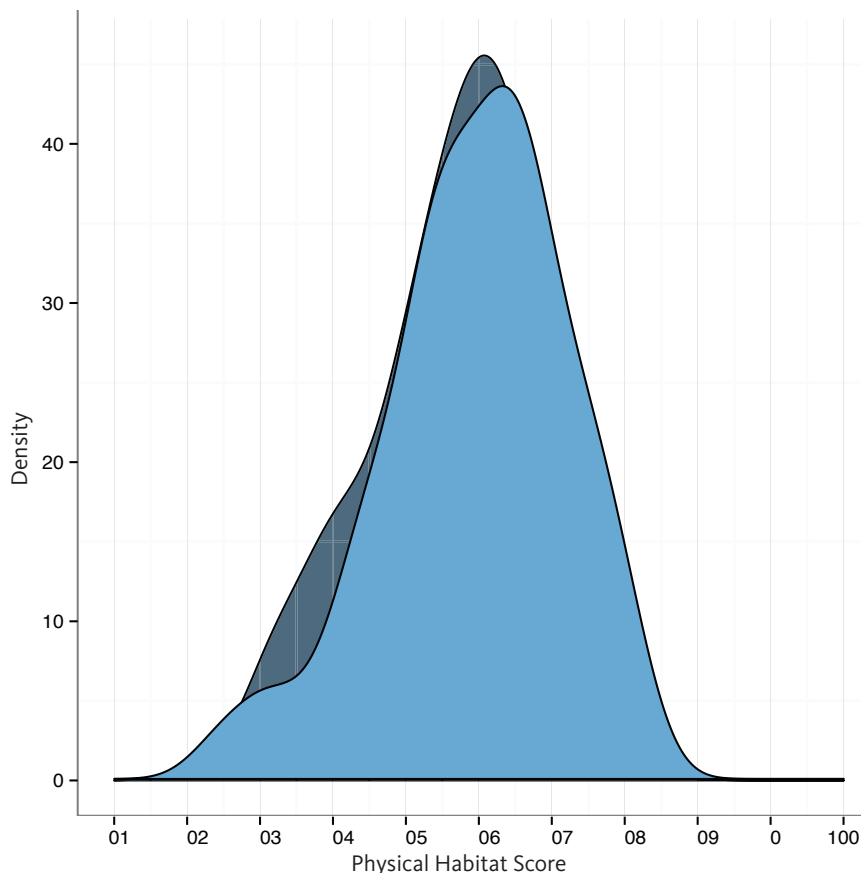


Figure 3-1—This graph highlights a shift to the right (slight improvement) in physical habitat scores determined from stream surveys conducted during 2002–2009 (Rotation 1) and those performed during 2010–2013 (Rotation 2). The physical habitat score is the individual ratings for amounts of fine sediment in channel substrate and presence of large wood. While the amounts of fine sediment in channel substrate and large wood scores were similar between the two rotations, the channel substrate score improved, meaning that less sediment was detected throughout stream channels across the NWFP area. The improvement indicates that changes in land management have been effective at improving aquatic habitat, which benefits federally listed salmon, steelhead, and Bull trout.

While land use allocations and the reserve network have benefited many resources, some adjustments are needed to create landscape resilience, especially in frequent-fire dependent and fire diverse (mixed severity) ecosystems. A well-connected reserve network that will persist into the future will incorporate climate change refugia and fire refugia.

*Conservation of Dense Multi-layered Old-growth Forests.* The NWFP conservation strategies and other strategies, including the Eastside Screens and the Sierra Nevada Framework, have effectively stopped the loss of old trees and old-growth forest on federal lands, mainly in dense multi-layered forest.<sup>67</sup> Old-growth forest is generally considered stable on federal lands and has increased slightly since 1993, providing the abundance, diversity, connectivity, and availability needed to support ecosystem functions and specific old-growth-dependent species in the BioA area (figure 3-2).<sup>68</sup> Reversing the loss of old-growth trees and old-growth forest is mainly due to stopping clear cutting practices and allowing trees to mature on federal lands.

While this old-growth forest conservation approach on federal land has been successful in some respects, old-growth forests that were not defined or emphasized in the above planning efforts are increasingly at risk of loss due to fire.<sup>69</sup> These include old-growth forests in frequent-fire dependent and fire diverse (mixed severity) ecosystems. **Loss of old-growth forests from wildfires in California, southern Oregon, and east of the Cascade crest have been masked by gains in old-growth forest on federal lands west of the Cascades** where trees planted after large 20th century fires have grown into the old-forest category.<sup>70</sup> Acres of old-growth forests have declined in frequent-fire dependent ecosystems.

<sup>67</sup> Spies and others, 2018a.

<sup>68</sup> Davis and others, 2015; Davis and others in review.

<sup>69</sup> Spies and others, 2018a.

<sup>70</sup> Davis and others, 2019.

## Location of old-forest change

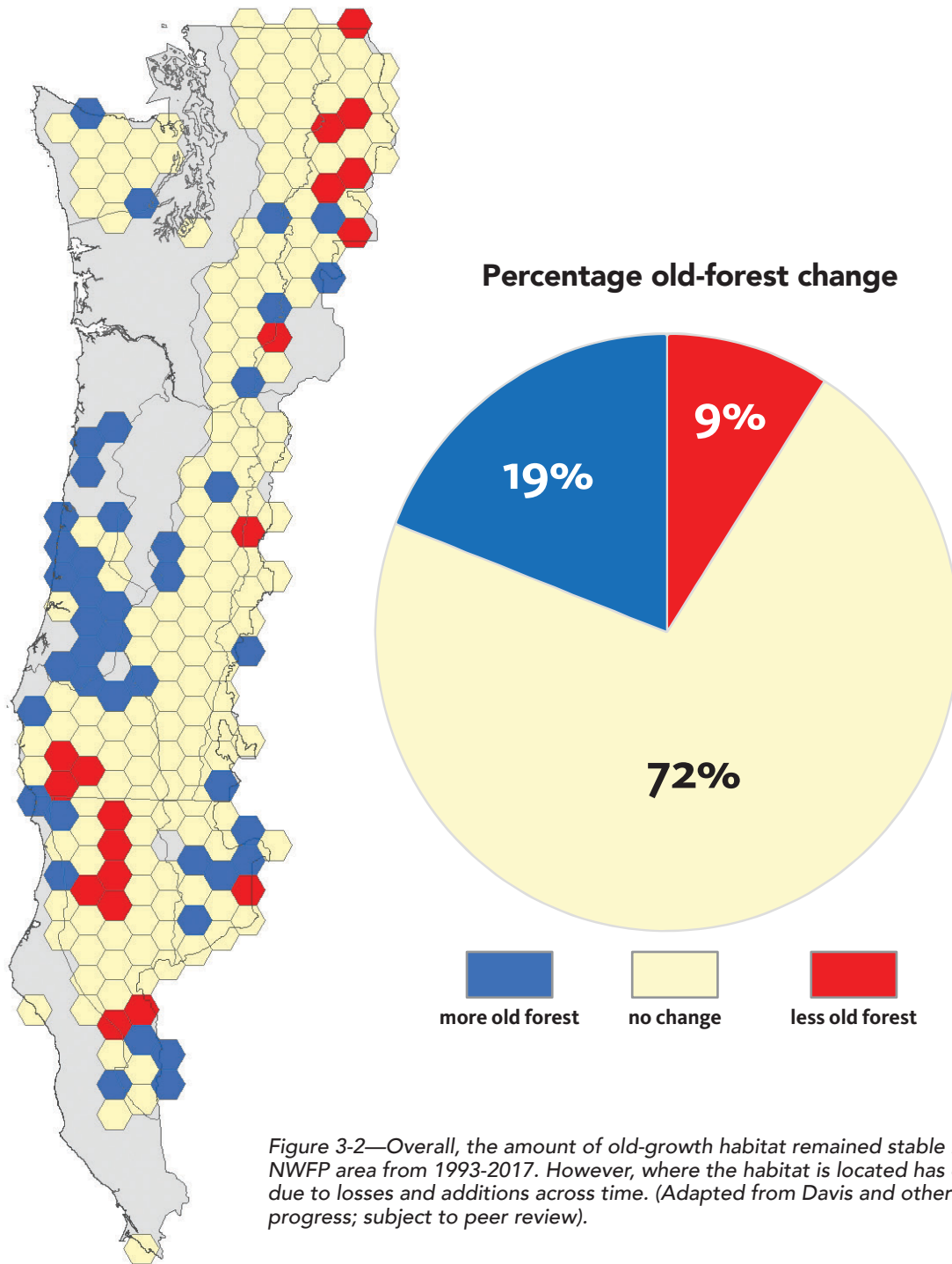


Figure 3-2—Overall, the amount of old-growth habitat remained stable in the NWFP area from 1993-2017. However, where the habitat is located has changed due to losses and additions across time. (Adapted from Davis and others, in progress; subject to peer review).

**Conservation of Aquatic Resources.** The Aquatic Conservation Strategy is working and provides a solid foundation for upcoming planning efforts, with some opportunity for improvements.<sup>71</sup> Intensive monitoring efforts have revealed improving trends for aquatic habitat (figure 3-1), aquatic macroinvertebrates, and water temperatures.<sup>72</sup> Even with climate change projections indicating warmer stream temperatures, monitoring data are showing cooler (improving) stream temperatures across the last 20 years within the NWFP area, which could be a sign of the effectiveness of climate change refugia principles. Monitoring indicates that upslope and riparian conditions have generally improved across the NWFP area.<sup>73</sup> PACFISH, INFISH,<sup>74</sup> and the Sierra Nevada Framework,<sup>75</sup> like the Aquatic Conservation Strategy, also are successfully protecting and restoring aquatic habitat and watersheds.

<sup>71</sup> Reeves and others, 2018.

<sup>72</sup> Miller and others, 2017.

<sup>73</sup> Miller and others, 2017.

<sup>74</sup> Roper and others, 2019.

<sup>75</sup> Furnish, 2013.

## All-lands Aquatic Conservation

Since adoption of the NWFP amendment, many community-based watershed restoration partnerships, including conservation districts, water boards, regional fish enhancement groups, and watershed councils, have formed. Many have adopted an all-lands stewardship approach by conducting assessments and restoration across federal, state, and private borders to improve fish habitat and water quality.

The Willamette National Forest is one of 13 partners forming the McKenzie Watershed Council in Oregon, a group that works together to help restore watershed conditions in the McKenzie River sub basin (figure 3-3). The Forest Service offers unique technical skills and funding for many of the council’s projects, such as stream restoration, fish passage restoration, and outreach efforts.

Forest Service staff have acquired a highly useful skill set through the implementation of NWFP, PACFISH, INFISH, and Sierra Nevada Framework aquatic restoration programs, which guide implementation of diverse, active management treatments (for example, stream and fish passage restoration) to efficiently and effectively restore water quality and aquatic ecosystems at watershed scales.

### ESA-listed Fish Critical Habitat and Land Ownership in the Mckenzie Subbasin Willamette National Forest

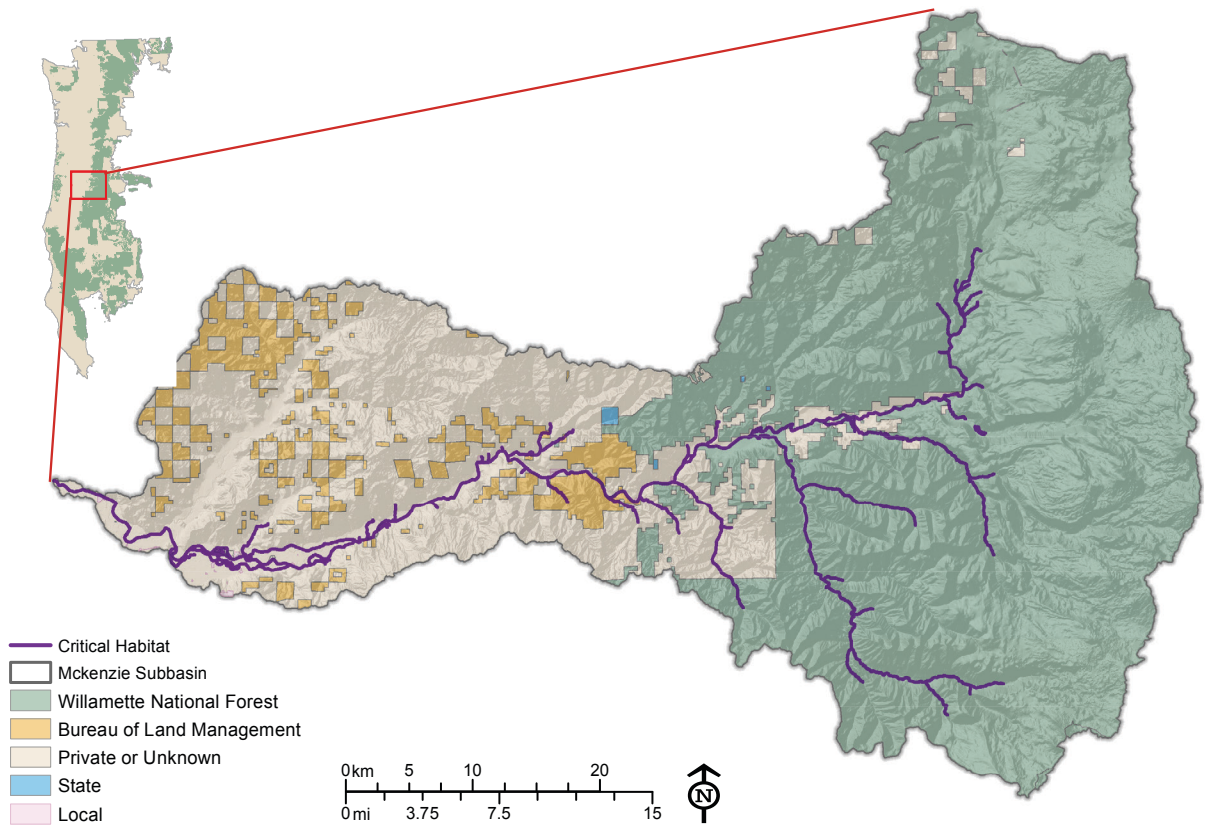


Figure 3-3—The McKenzie River watershed and its critical habitat distribution for fish listed under the Endangered Species Act cross multiple land ownerships. The land ownership mix demonstrates an all-lands restoration approach, where partners work through land boundary and jurisdictional issues to improve watershed conditions for fish, water, wildlife, and local communities.

*Riparian Management Zones.* These areas, a cornerstone of the NWFP, PACFISH, INFISH, and Sierra Nevada Framework aquatic strategies, have resulted in watershed improvements across the BioA area. Passive restoration—when riparian areas recover naturally without active forest management—has been practiced in riparian management areas and has contributed to watershed improvements. Likewise, large trees in riparian areas that were typically harvested before 1994 are now left to grow and provide stream shade, aquatic and terrestrial habitat, and to create a network of migration corridors for animals throughout and between watersheds.

Additionally, streamflow and water-quality conditions, important for providing clean drinking water and enough water for agriculture, recreation, and environmental needs, have been largely maintained or improved. Monitoring indicates that upslope and riparian conditions have generally improved across the NWFP area.<sup>76</sup> Existing land management direction is successfully protecting and restoring aquatic habitat and watersheds.<sup>77</sup> Restoring watersheds and riparian areas also has resulted in areas of climate refugia for species sensitive to changing temperatures and precipitation patterns.<sup>78</sup>

*Carbon Sequestration and Climate Change.* Forests and grasslands in the BioA area store large amounts of both above and below ground carbon in live and dead plant and animal material (figure 3-4).<sup>79</sup> At current rates, timber harvest and disturbance will have little impact on carbon sequestration on federal lands in the wetter, western forests of Oregon, and Washington.<sup>80</sup> As stated in the Forest Service’s 2018 *Synthesis of Science to Inform Land Management Within the Northwest Forest Plan Area*, “the effects of climate change have become a major concern and focus of research since the NWFP was developed and implemented.”<sup>81</sup> Although there is uncertainty associated with the effects of climate change, modernization of land management plans in the BioA area will likely help national forests and grasslands adapt to the effects of climate change and continue to work well at sequestering carbon.

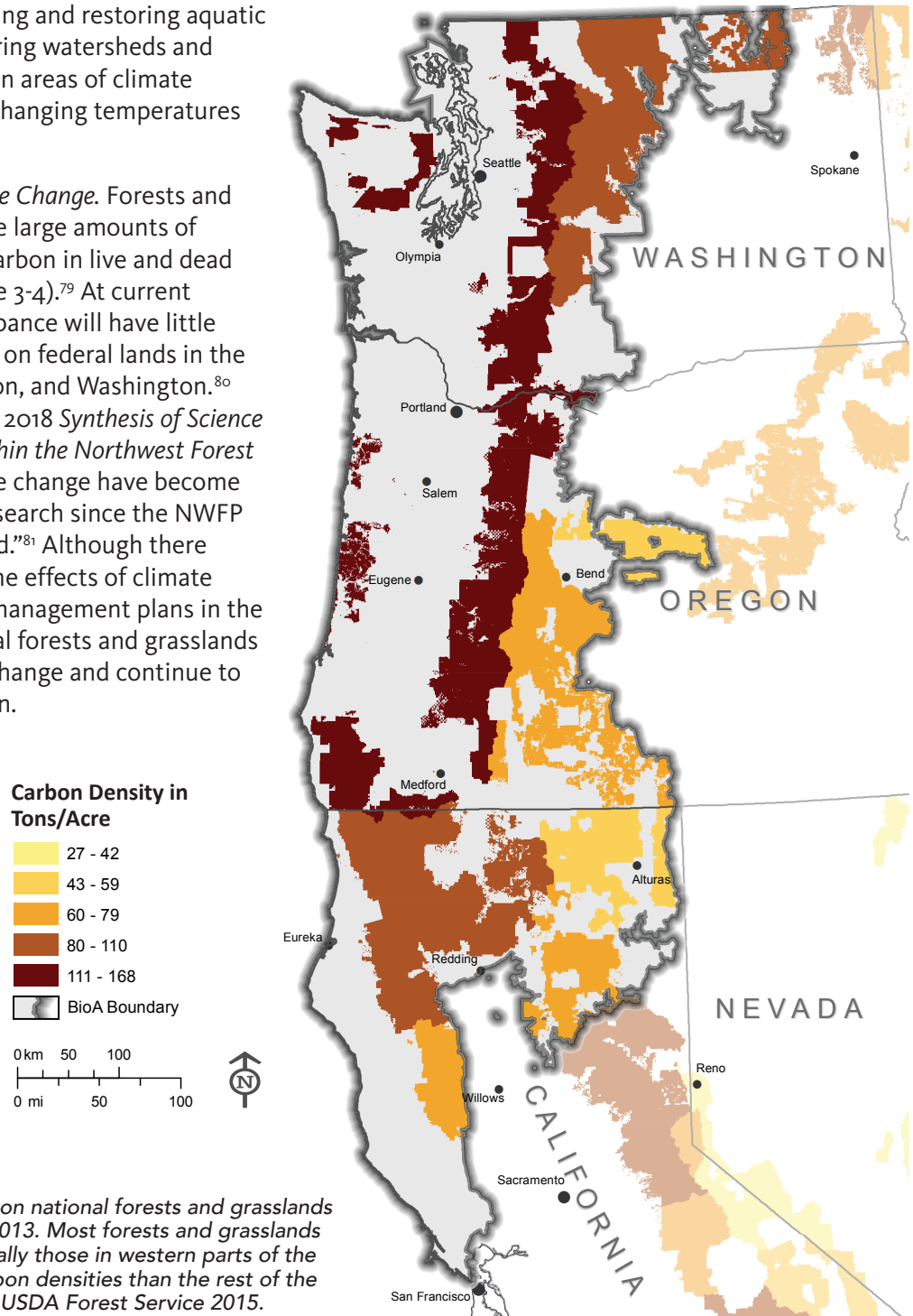


Figure 3-4—Carbon density on national forests and grasslands within the BioA area, as of 2013. Most forests and grasslands within the BioA area, especially those in western parts of the BioA, have much higher carbon densities than the rest of the country (figure 1-4). Source: USDA Forest Service 2015.

<sup>76</sup> Miller and others, 2017.  
<sup>77</sup> Roper and others, 2019.  
<sup>78</sup> Reeves and others, 2018  
<sup>79</sup> USDA Forest Service, 2015. figure 3-4.  
<sup>80</sup> Spies and others, 2018a.  
<sup>81</sup> Spies and others, 2018b.



*Traditional Ecocultural Resources.* Ecosystems within the BioA area provide and support a broad range of cultural resources sites, areas, buildings, structures, and objects that are important to American Indian Tribes. New and emerging forest management concepts, including restoring frequent-fire-dependent systems, align with Tribal ecocultural resource perspectives.<sup>82</sup>

Tribal communities contribute to the social and economic benefits of national forests and grasslands through Tribal culture and viewpoints that can help with restoration-related work and interpretive and training programs. The Aquatic Conservation Strategy and its four main components provide long-term resource benefits, such as improved fisheries habitat, which are central to Tribal well-being.<sup>83</sup>

## First Foods

First foods are traditional foods that have been and remain significant in some American Indian Tribal diets and cultures (Lynn and others 2013). Culturally significant resources, including water, fish, big game, roots, and berries, are used in ceremonies as well as for sustenance and economic benefit to perpetuate American Indian sovereignty and cultures.

The Forest Service understands the Tribal significance of treaty rights and traditional resources, including first foods. Many Tribal members have longstanding, customary knowledge and relationships with natural resources on national forests and grasslands. The interdependent relationship is one in which Tribal practices nurture ecological systems that in turn nurture and sustain cultural continuity and identities.

The goal of promoting Tribal ecocultural resources, such as first foods, is consistent with emerging direction in forest management and the management options presented in the BioA.



<sup>82</sup> Long and others, 2018.

<sup>83</sup> Long and others, 2018.

## Sustainable Timber

Since 2005, timber production levels have remained relatively stable, producing an average of 450 million board feet per year from Forest Service lands within the NWFP area. Recent harvest levels have also been regionally stable at about 72 percent of Forest Service anticipated timber production (figure 3-5). 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—the **predicted harvest of about 600 million board feet per year hasn't been realized**. 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 (chapter 4, Sustainable Timber).

**“Federal forest management contributes to socioeconomic well-being in rural communities by providing timber and nontimber forest products, recreation opportunities, jobs, other ecosystem services, and backdrops for where people want to live and work.”**

*Charnley and others 2018 p. 661*

### 450 million board feet per year from Forest Service lands within the NWFP area

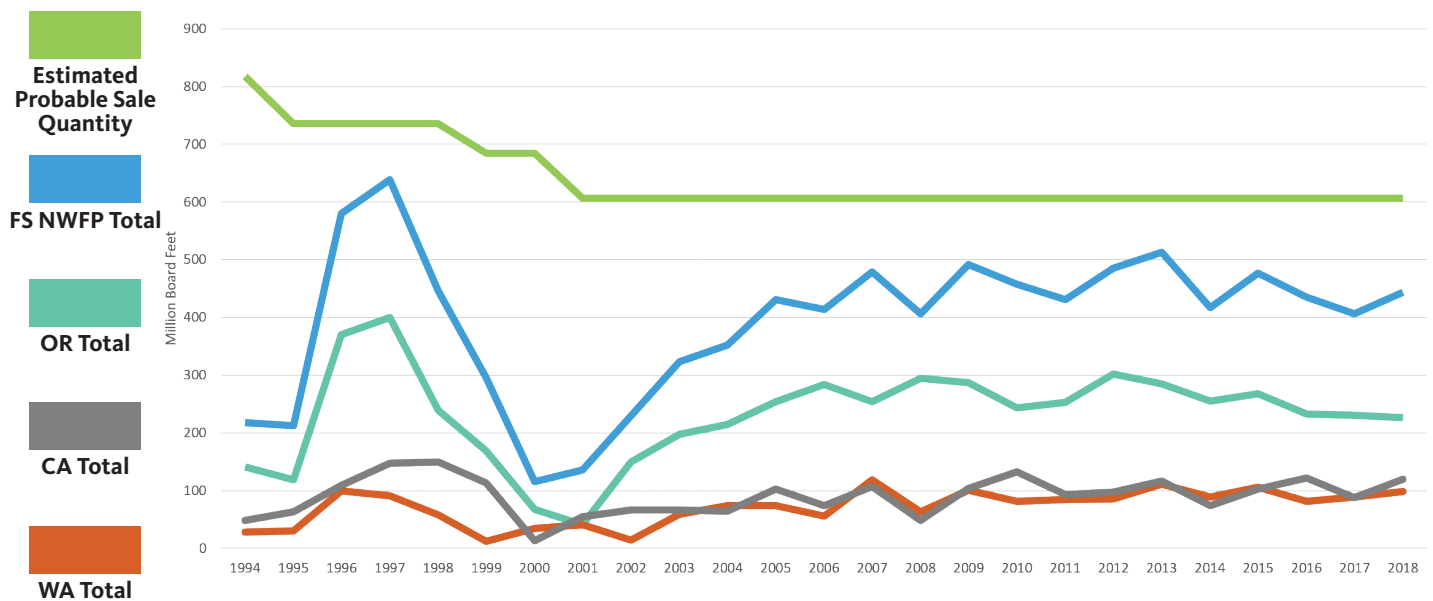


Figure 3-5—Harvest levels have remained stable in the NWFP area for the past decade, although they have been less than projected. The graph shows the amount of timber sold from national forests in the NWFP area between 1994 and 2018 compared to the Forest Service estimated probable sale quantity. Forest Service anticipated timber volume is about 600 million board feet and the agency has produced an average of about 450 million board feet within the NWFP area annually since 2005.

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.<sup>84</sup>

*Evolving timber 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.<sup>85</sup> More modern intermediate methods, such as variable density thinning and variable retention harvest, have been studied and implemented in the BioA area during the past decade. Harvests that retain significant structural elements of the pre-harvest stand have largely replaced clearcutting<sup>86</sup> (figure 3-6). Harvest methods continue to create timber outputs that contribute to local economies, often along with restoration and resilience projects.

<sup>84</sup> Charnley and others, 2018.

<sup>85</sup> Spies and others, 2018b.

<sup>86</sup> Franklin and others, 2018. p.108.

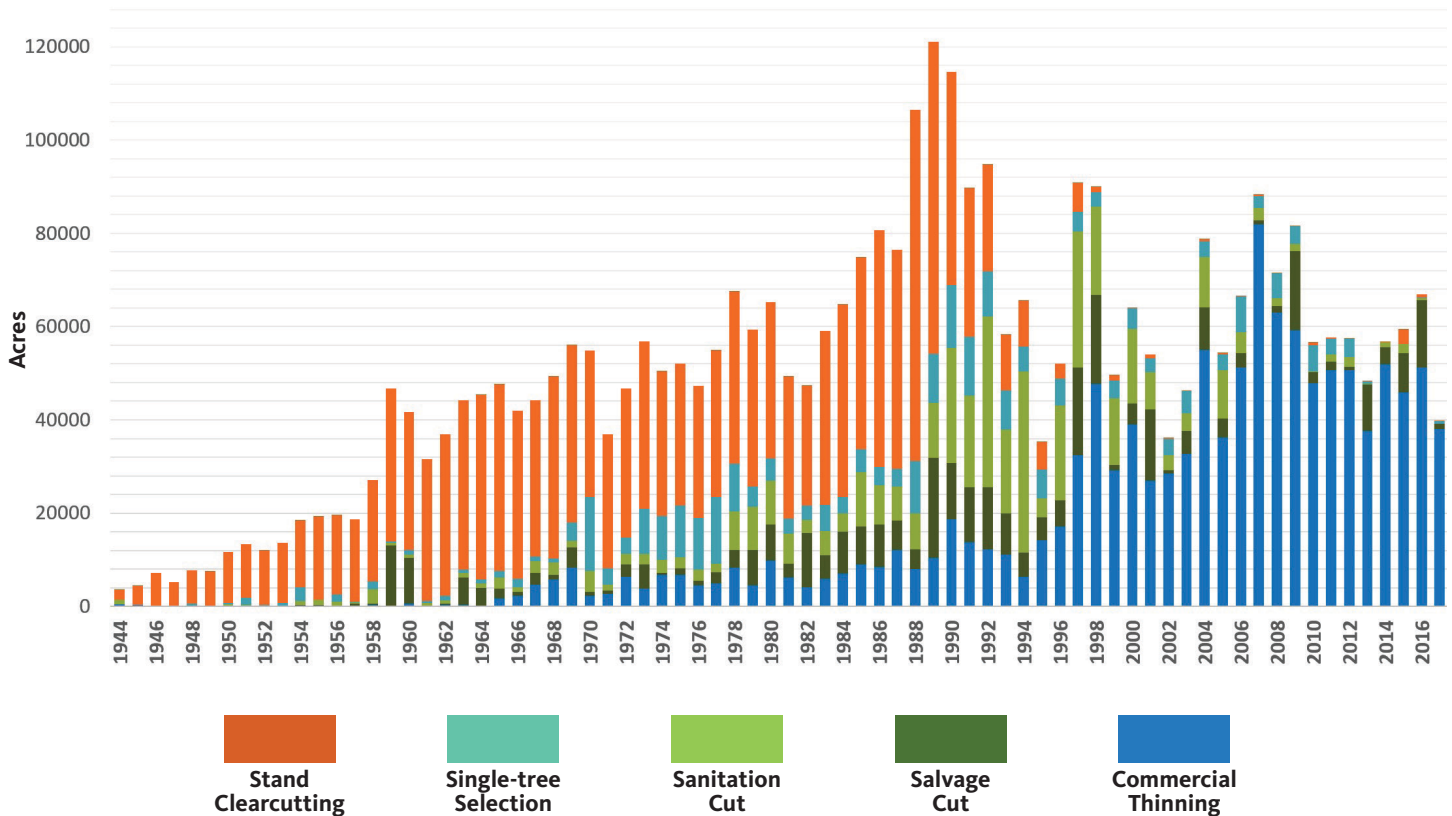


Figure 3-6—Acres of primary harvest types (clearcutting, commercial thinning, salvage, sanitation, and single-tree selection) within the BioA area from 1947 to 2017. There were more than 75,000 acres clear-cut in 1988, while 2007 saw a peak in commercial thinning at just under 82,000 acres. Timber harvest practices have moved to mostly commercial thinning with almost no stand clearcutting.

**commercial thin**—An intermediate timber harvest with the objective of reducing stand density primarily to improve tree growth and enhance forest resilience. Saw-log size material is a product of this management, although regenerating new trees is not an objective. Commercial thinning can include a wide variety of thinning types including low, free, selection and crown thinning in addition to variable density thinning, “skips and gaps”, or the Individuals, clumps, and openings method.

**salvage cut**—An intermediate treatment that harvests trees that are dead or dying due to injurious agents like insects or disease. A primary objective of this timber harvest is to recover economic value.

**sanitation cut**—An intermediate harvest removing trees to improve stand vigor by stopping or reducing the actual or anticipated spread of insects and disease.

**single-tree selection cut**—A regeneration harvest where individual trees of various sizes and ages are removed. The objective of this treatment is to provide space to grow new trees in a multi-age structure in addition to promoting the growth of remaining trees. This is an uneven-aged method. Multiple entries of this activity ultimately result in an uneven-aged stand of three or more age classes or sizes.

**stand clear-cut**—A regeneration harvest that removes all trees in the stand. The objective of this treatment is to grow new trees that are all the same age. It produces a fully exposed micro climate and one cohort of regeneration in one entry.



In the 21st century, ecological forestry, which includes natural forest ecological models, natural forest development, and concepts related to natural disturbances in project design and harvest methods, has become central to how foresters approach landscape planning. However, the broadly diverse harvest methods of ecological forestry, including a variety of regeneration harvests and multi-aged management, are often controversial and not yet widely accepted or applied. The lack of social acceptance, and therefore application, could prove problematic, especially in the face of climate change and social and ecological uncertainty.

The Forest Service is dedicated to supporting the study and use of more modern and diverse methods to meet today's need for resilient landscapes and multiple land management objectives. We will continue to work to build trust and improve consideration of the benefits of various harvest methods.



## Habitat Management

*Old-growth habitat.* The northern spotted owl, listed as threatened under the Endangered Species Act in 1990, is one of many species that relies on old-growth forest habitat. **The reserve network established by the NWFP has been effective in stemming the loss of old-growth habitat from timber harvest on federal lands;<sup>87</sup> however, the owl population continues to decline** (chapter 4, Habitat Management). The reserve network has also been effective in maintaining and enhancing marbled murrelet habitat on federal lands; however, the birds continue to experience population declines in the northern portion of the BioA area. Since the NWFP was adopted, additional conservation focus has been placed on other species, such as marten, fisher, wolverine, and other mammalian carnivores, who also depend in part on late-successional forest habitats.

*Broad-scale habitat conservation.* The core principles of broad-scale conservation developed in the NWFP area are implemented through land use allocations. Late-successional reserves, riparian reserves, and other land use allocations that focus on species recovery have provided clear and effective management direction in the context of habitat protection.

*Survey and Manage.* The survey and manage standards and guidelines in the NWFP require that surveys be conducted before initiating management actions, and actions are limited based on the results of the surveys. Survey and manage standards and guidelines have added much to our knowledge about rare and uncommon late-successional and old-forest-dependent species in the NWFP area.<sup>88</sup> For example, 50 different mollusks have been considered for listing during the past 20 years. And, although none were listed, all the decisions were informed by surveys. Survey and manage standards and guidelines help us focus on certain individual species and contribute to the modernization of forestry practices, such as leaving more dead trees, downed wood, and refugia habitat. However, implementing the survey and manage standards and guidelines has been challenging and improvement and updates are needed.

<sup>87</sup> O'Hara, 2014.

<sup>88</sup> Marcot and others, 2018.

## Sustainable Recreation

The Forest Service is one of the largest suppliers of outdoor recreation in the BioA area, providing opportunities for experiences and activities to a broad range of users. Special use permits are issued to people, clubs, and businesses for many recreational purposes including operation and maintenance of picnic areas, campgrounds, ski areas, and boat docks. The permits provide experiences for the recreating public, while addressing public safety and protecting natural resources.

The Pacific Northwest is a showcase of recreation largely due to outstanding natural resources that have been maintained and improved through conservation strategies like the NWFP and the Aquatic Conservation Strategy. Clean water, healthy vegetation, and improved fishery resources enhance recreation experiences on the national forests and grasslands in the BioA area. Wilderness Areas, Wild and Scenic Rivers, and National Scenic and Recreation Areas provide unique recreation opportunities and complement landscape-scale wildlife management objectives by conserving critical habitat.

### Forest Service Special Use Permits

The Forest Service's Special Use Permit Program provides a variety of land use opportunities. Each year, thousands of individuals and businesses apply for permits to use national forests and grasslands for such activities as water transmission, agriculture, outfitter guiding, telecommunications, research, video productions, road and utility rights-of-way, and recreation. Special use permits provide economic benefits and value for many rural communities. By offering more ways to experience our national forests and grasslands, the special use permit program helps enrich lives by providing opportunities for lasting memories, personal growth, and a sense of connection with our national forests and grasslands.

The Shasta-Trinity National Recreation Area provides one of the largest, most diverse, and complex uses of the special use program for recreation. The 2014 National Recreation Area Management Guide for the Shasta-Trinity estimated that there were about 970 recreation special use permits in use within the National Recreation Area. This includes permits issued for privately owned houseboats and cabins, resorts, marinas, campgrounds, RV parks, outfitter and guide services, concessionaires, boat docks, recreation events, and shooting ranges. Most commercial recreation use happens at the 13 full-service resorts or marinas, while private permitted recreation use is primarily in cabin and houseboat ownership. On the Shasta-Trinity National Forest, the annual revenue generated from cabins, marinas, and houseboats is nearly \$1.5 million.



## Conclusion

In this chapter, we summarized what's working well in the existing land management plans across the BioA area. We recognized that NWFP and other planning direction have met many of their social, economic, and ecological goals, and we want to retain aspects of existing plans that provide benefits to communities and ecosystems. We



also identified where existing science and decades of monitoring and implementation indicate opportunities to expand upon and further improve the parts of existing land management plans. In chapter 4, we explore where existing direction presents management challenges, and we provide a preliminary identification of the need to change direction to ensure the delivery of essential forest benefits to communities and the sustainability of ecological integrity in the BioA area.