

The Forest Service and Communities

The relationships between land and people in
the Pacific Northwest Region

Fall 2016



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About this project

This is a joint project between the US Forest Service Pacific Northwest Region and the University of Oregon Ecosystem Workforce Program. This project aims to help the Forest Service and its partners better understand and communicate the social and economic contexts in which the Forest Service operates and document Forest Service impacts in advancing sustainable natural resources-based economies. We designed this project as a collaborative learning process in which we would experiment with new ways to use, integrate, and represent data, especially Forest Service data, to understand potential applications of data already being collected and recorded as well as identify data gaps and strategize how to fill them. This book documents the first year of experimental work and reflects the questions asked, data used to answer the questions, interpretation of the resulting data, and key insights from the learning process.

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Acronyms

BLM	Bureau of Land Management
CCLS	Community Capacity and Land Stewardship Program
FACTS	Forest Service ACTivity Tracking System
FPDS	Federal Procurement Data System
G & A	Grants and Agreements
gPAS	geo-enabled Performance Accountability System
HUC	Hydrologic Unit Code
IWEB	I-Web for Grants and Agreements data
NFF	National Forest Foundation
NICE	NatureWatch, Interpretation and Conservation Education
NVUM	National Visitor Use Monitoring
ROSS	Resource Ordering and Status System
TIM	Timber Information Manager
USFS	United States Forest Service
USGS	United States Geological Survey
VIPR	Virtual Incident PRocurement
VPR	Volunteer Partner Reports, now VSR: Volunteer Service Reports
WCF	Watershed Condition Framework
WIT	Watershed Improvement Tracking
WCATT	Watershed Classification and Assessment Tracking Tool
WUI	Wildland urban interface



INTRODUCTION

The intent of this project is to help the Forest Service and its partners better understand and communicate the social and economic contexts in which the Forest Service operates and document Forest Service impacts in advancing sustainable natural resources-based economies.

Over the past several years, the Pacific Northwest Region of the United States Forest Service has developed a number of region-wide maps that display key ecological conditions across Oregon and Washington. In addition, the University of Oregon's Ecosystem Workforce Program and other partners have developed several sets of maps and infographics to illuminate social and economic conditions in Eastern Oregon. The goal of this project was to build on these prior efforts to identify new ways of understanding which could be useful in the broader geography of the Pacific Northwest.

To develop this project, Ecosystem Workforce Program and the Pacific Northwest Region of the Forest Service worked in partnership to identify what regional Forest Service staff wanted to understand about the social and economic conditions and impacts in the region with respect to their program areas. These conversations have informed our development of research questions and guided our analysis presented in this document.

We then worked with Forest Service staff from different program areas to understand what data exist and how we might be able to use these data in our analysis. We anticipate this to be a three-year project, and as additional data becomes available (e.g. more spa-

For this first year, we use four central questions to guide our efforts:

- 1. What are some key characteristics of national forests in the region that set context for our analysis?**
- 2. What is the social and economic context in which the Forest Service operates in Oregon and Washington?**
- 3. How are the Forest Service and its partners working together?**
- 4. How is the Forest Service conducting integrated restoration, and could we link data on Forest Service partners to integrated restoration efforts?**

tially explicit data in FY 2016 and 2017), we will be able to build upon our work to date. **Our work together is a collaborative learning process in which we have experimented with ways to utilize, integrate, and represent data, especially Forest Service data, to identify new potential applications of data already being collected as well as identify data gaps and strategize how to fill them.** We document key insights from this learning process throughout this document to foster dialogue and considerations for future project stages and disseminate the results of our analyses. We also highlight potential avenues for future work in the conclusion, building off our key lessons learned in this first year.

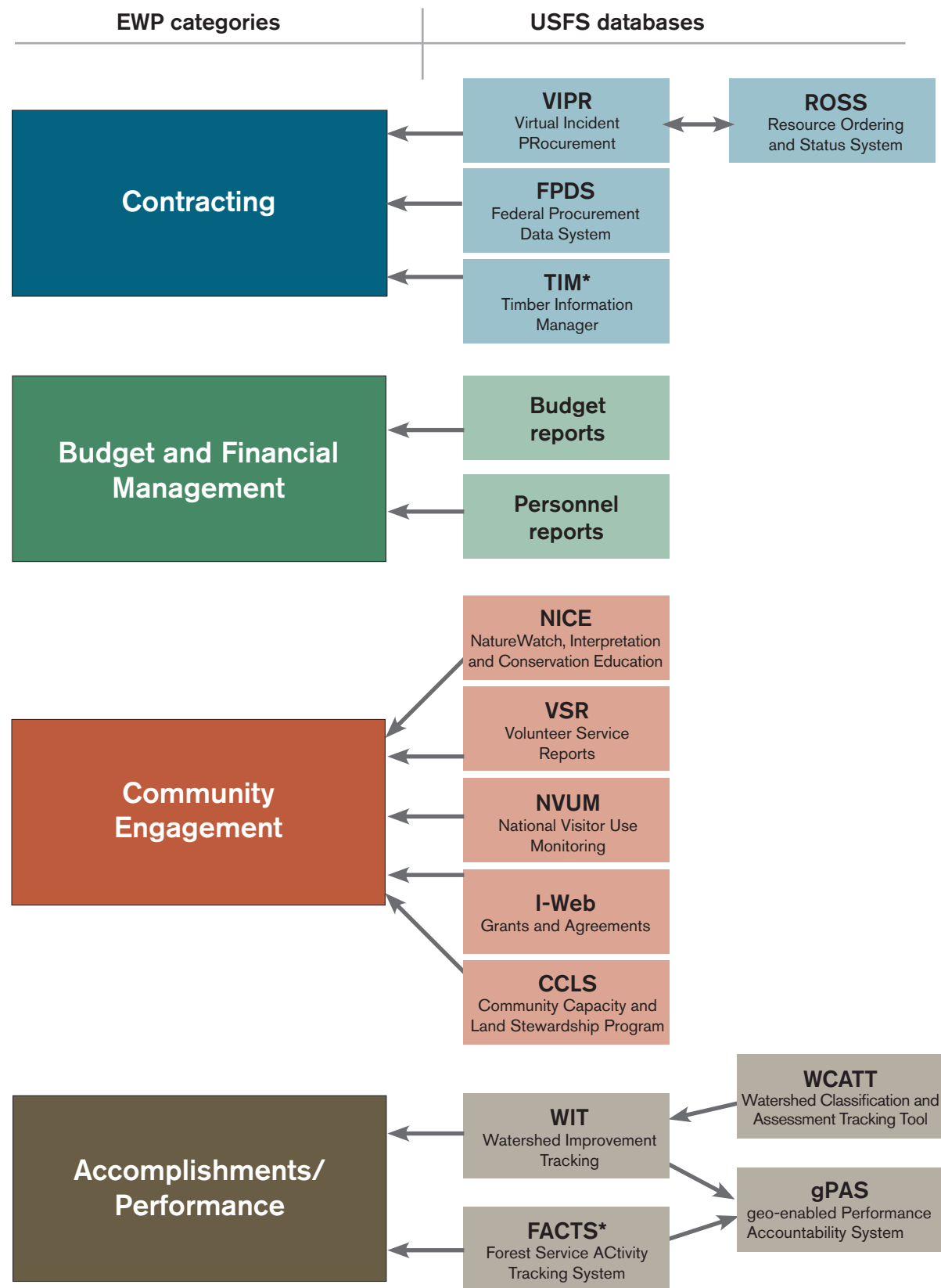
In this project, we used existing Forest Service data in new ways, including attempting to link between databases, either directly or by using data from different databases side by side. This involved the use of over ten different Forest Service databases or distinctly different data sources. We used these data in various research processes to determine how existing Forest Service data and reporting approaches could represent restoration efforts in the national forests of the Pacific Northwest, including integrating the use of other data sources (e.g. Census data). This document provides different modes to think about the context in which the Forest Service operates and how Forest Service efforts impact communities in, near, and even distant to the national forest system in Oregon and Washington. By documenting not only our results and interpretation but also our learning process and methods throughout this process, we hope to facilitate richer discussion of findings to date and anticipate the next phase of research development.

It is important to note that this document only displays what data was reported in the databases noted on page 5. We know that forests often accomplish more than they are able to enter in their respective reporting systems, which is an important consideration for data throughout this document.

Roadmap

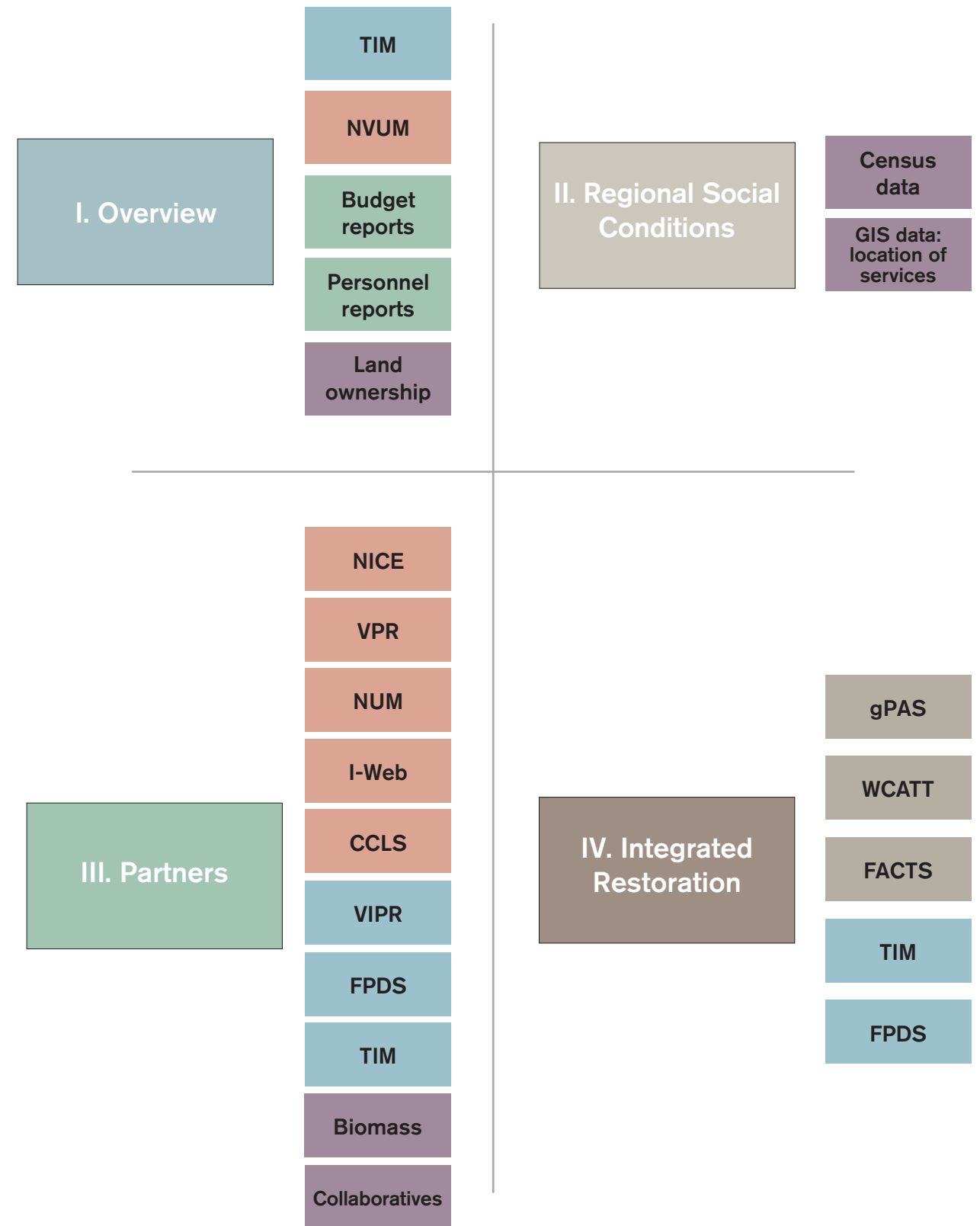
This document contains four chapters, bookended by an introduction and conclusion. Because our goal was to tell stories through data in new ways, within each section we present two story lines: 1) the story of research results and data interpretation, and 2) the story of data used and lessons learned.

US Forest Service data and databases



* These databases are part of the Natural Resource Manager (NRM) system

Data used in each chapter of this document



■ = non-USFS data



CHAPTER I. PACIFIC NORTHWEST REGION OVERVIEW

What are some key characteristics of national forests in the region that set context for our analysis?

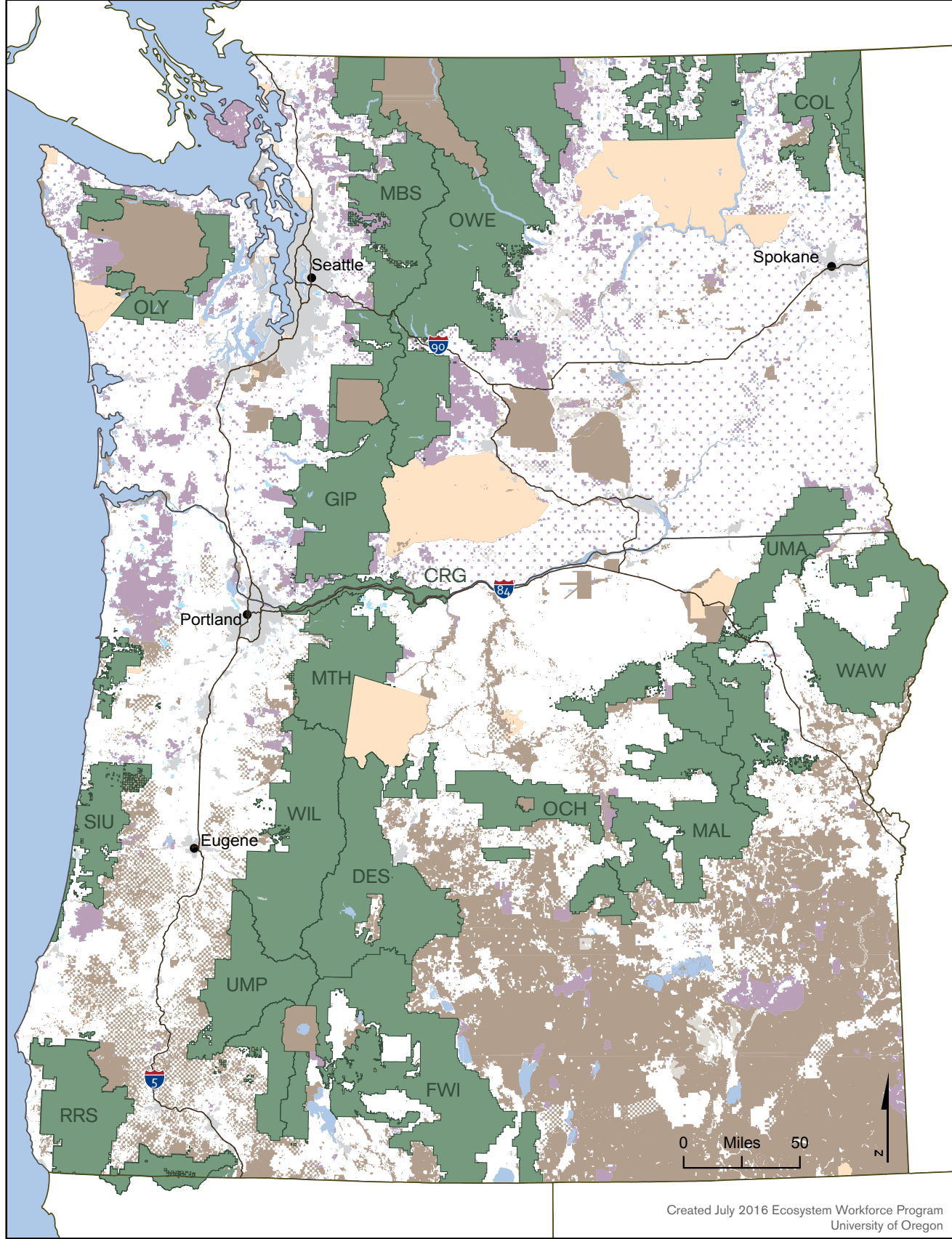
This chapter provides the reader with a geographic introduction to the region and illustrates the relative size of the national forests, using various measures side by side: acreage, budget, personnel, timber volume sold, and visitors.

We provide a map of the landownership patterns across Washington and Oregon to illustrate the matrix of land ownership and interconnectedness of land managers (see Map 1.1, page 7). The distribution of federally managed land across the region results in close connections between public and private landowners. Although this mixed landownership pattern is generally known by those working in the region, we use the shapefile of each of the 16 forests (including one national grassland) and one national scenic area in the region throughout this document to emphasize how the Forest Service is particularly impacted by these mixed patterns. **The varied shapes of forests in the region do not adhere to any particular ecological or administrative boundaries (other than Forest Service designated lands), which means that forests span counties, towns, dry and wet forests, wilderness, urban and rural areas, and a variety of social and demographic conditions.** As such, it is clear that characteristics of forests will also vary in their priorities as well as how and where they are conducting forest restoration and impacting communities. As the first year of this project, we strove to provide information on existing conditions, baseline, and trends across the entire region, so we could better understand both forest-specific and region-wide trends and variations.

Data used in Chapter I: Overview

Data	Sources	Dates	Analysis & Considerations
Land ownership shapefiles: <ul style="list-style-type: none"> ▪ USFS lands ▪ Federal lands ▪ Bureau of Indian Affairs lands ▪ State owned lands ▪ Oregon Urban Growth Boundaries ▪ Washington Urban Growth Areas ▪ Interstates 	USGS USGS State of Oregon State of Washington Tigerline Files	2015 2015 2015 2010 2014	Used shapefiles for map creation
Forest Service acreage	Forest Service Land Area	Downloaded September 2016	Used acreage by forest, scaled each forest circle.
Forest Service budget	USFS: Budget and Financial Management, Donna Alwine	2015, received June 2016	FY 2011-2015 average by forest Total spent. Does not include fire suppression spending or working capital fund.
Forest Service personnel	USFS: Budget and Financial Management, Donna Alwine	2015, received June 2016	FY 2011-2015 average by forest
Forest Service timber sales	Timber Information Manager (TIM)	2011-2015, received Sept. 2016	FY 2011-2015 average by forest
Forest Service visitors	National Visitor Use Monitoring (NVUM) Survey	Data collected between FY 2010-2015	Total by forest Annual visitation estimates average by forest

Map 1.1 Oregon and Washington land ownership



Legend

- U.S. Forest Service lands
- Other federal land
- Reservation/Native American
- State
- Urban
- Private

Region 6 forests and acronyms

Unit Code	Unit Name
CRG	Columbia River Gorge National Scenic Area
COL	Colville National Forest
DES	Deschutes National Forest
FWI	Fremont-Winema National Forest
GIP	Gifford Pinchot National Forest
MAL	Malheur National Forest
MBS	Mount Baker-Snoqualmie National Forest
MTH	Mt. Hood National Forest
OCH	Ochoco National Forest and Crooked River National Grassland
OWE	Okanogan-Wenatchee National Forest
OLY	Olympic National Forest
RRS	Rogue River-Siskiyou National Forest
SIU	Siuslaw National Forest
UMA	Umatilla National Forest National Forest
UMP	Umpqua National Forest
WAW	Wallowa-Whitman National Forest
WIL	Willamette National Forest

This diversity of conditions on the ground is also reflected in variations between forests in their size (acreage), budgets, personnel, timber production and visitors. We see that some national forests are large (e.g. Okanogan-Wenatchee) or small (e.g. Ochoco) across all measures, but others (e.g. Mt. Baker-Snoqualmie) may have limited timber harvest and significant visitor use or vice versa (e.g. Malheur or Fremont-Winema). **This suggests, as is commonly said, that there are some “recreation forests” and some “timber forests” but there are also forests that are both and some that are neither, and some are providing other resources and services not shown here.**

Budgets for each of the forests within the region vary widely, and have implications for the amount of work each forest can accomplish. Budget trends over time by forest and the region overall also represent how the agency accomplishes work in the face of generally declining budgets. Similarly, the number of staff within the forests show personnel trends within and between forests, often linked to the capacity of a forest to accomplish projects. In Figure 1.1 (page 9) we show averages from the past four to five years. **The resulting scaled circles provide a sense of conditions**

on forests in the past five years. What is masked in these averages is the year to year variability forests experience in their budgets, personnel, and other administrative conditions that impact their forest management priorities and capacity. For example, when we look at forest personnel FTE for 2010-2015, year-by-year we can see that in general 2013 represented the lowest level for personnel across the region. In most cases forest personnel decline has leveled out in recent years (2014-2015), although there has been a notable decline even in the past 5 years. These short term trends need to be placed in the context of multi-decadal declines in Forest Service employment in the Pacific Northwest Region.

In many cases in the region, as budgets and personnel have declined, forest visitors have increased, which raises questions about how forests are handling increased visitor traffic (and associated services and infrastructure) with smaller budgets and fewer personnel. This mismatch between declining budgets and increases in visitors suggests forests may be doing more with less, or as we explore in later sections of this document, they may be finding other ways to get forest work done with their partners.

Chapter takeaway:

Exploring the varied social and ecological landscape in which Pacific Northwest forests are located provides context for understanding differences between forests. How the public views, uses, and engages with forests for different purposes is an important consideration at the forest and regional level.

Data Takeaways:

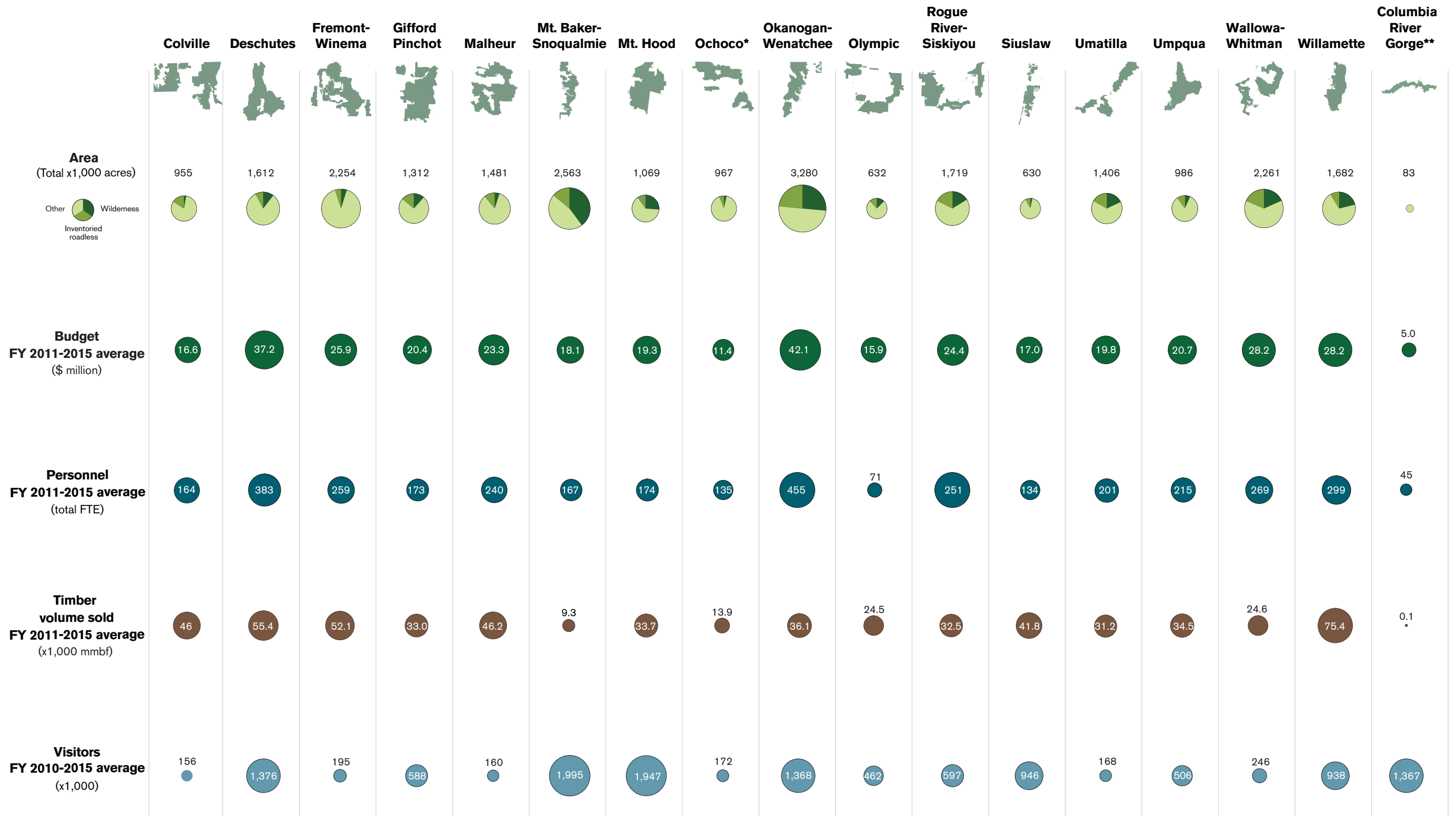
Lessons learned:

- Since annual variations in administrative forest characteristics (e.g. budget, personnel) are not captured in averages, we should consider other ways to use these data to tell a fuller story, such as trends over time.
- Using different forest characteristics side by side can provide helpful context for other analysis in this document, as well as for explaining variations between forests, their priorities and operation.

Future considerations:

- Include numbers for proportion of forest acreage that is inventoried as “Roadless,” to add to understanding of the composition of each forest, beyond wilderness and non wilderness?
- Breakdown budget numbers to understand how much money is being spent via personnel, contracts, and grants and agreements?
- Breakdown budget numbers to explore how growing fire expenditures are affecting the region and national forests?
- Compare other benefits to timber and visitor use? Could using traditional measures such as animal units being grazed, number of camp sites, hunting or fishing permits, as well as other nontraditional measures such as carbon storage or drinking water users served be valuable for comparisons?

Figure 1.1 Overview by national forest unit, Pacific Northwest Region



* Includes the Crooked River National Grassland
 ** The Columbia River Gorge is a National Scenic Area (NSA)

REGION TOTALS	Area	Budget	Personnel	Timber volume sold	Annual visitors
	24,891,973 acres	\$373,675,160	3,675 FTE	590,000 mmbf	13,187,347



CHAPTER II. REGIONAL SOCIAL CONDITIONS

What is the social and economic context in which the Forest Service operates in Oregon and Washington?

Building on the previous chapter, which identified variations in national forest characteristics across the region, this section provides an overview of the social and economic context in which the Forest Service operates in Oregon and Washington.

The importance of such data reflects the differences between national forest logistics, such as acres, staff, budgets, and main uses. By understanding the social and economic conditions in which individual forests (or even districts) are operating, we can better understand how Forest Service efforts impact each area differently, as well as where and how the Forest Service engages with communities, businesses, and other partners. Taken together, this data can help the Forest Service understand how and where they should act on the landscape. **This chapter is split into three sections: the first section looks at demographic data to gain a better perspective of social vulnerability across the region, and the second section looks at isolation from key amenities such as banks, hospitals, interstate onramps, and airports. The third section demonstrates the variability of social and economic trends across the region and their relationship to national forests by showing examples of demographic and isolation conditions around three different forests in Oregon and Washington.**

2.1 Using Demographic Data to Understand Social Vulnerability

Research on natural hazards, climate change, and other natural and social disturbance has found that households and communities that are “socially vulnerable” can struggle to prepare for, respond to, and recover from disturbances such as natural disasters, substantial policy changes, and economic shocks, often because their limited social and economic resources can restrict adaptability.

The national forests in Oregon and Washington are no strangers to such slow and fast moving shocks. Transitions in the national forest policy and global timber markets, as well as urbanization, the Great Recession, expanded wildland urban interface (WUI) housing, and intensified wildfires are all recent examples of such shocks.

Social vulnerability:

The ability of communities to prepare for, respond to, and recover from disturbances such as natural disasters, substantial policy changes, and economic shocks

In this literature, social vulnerability is typically measured using demographic data from the Census such as poverty, level of education, and English language proficiency. These vulnerability factors resemble those linked to other social inequalities (e.g. access to information, political power, social capital, see Cutter et al. 2003, referenced in the data table on page 11), which can affect the ability for households and communities to garner the resources to respond and adapt to change.

We first provide a map of national forest system and other federal lands in Oregon and Washington, and county lines as a reference for the demographic maps on the following pages (see Figure 2.1, page 11). We created a series of maps that depict demographic variables of note, using Census data to represent poverty, single mother households, educational attainment, and non-English speaking households. In a subsequent section, we examine restoration accomplishments with a focus on understanding when and how national forests are performing integrated restoration. Further experimentation could occur next year to see if these data sets can be effectively integrated to understand linkages between social conditions and where the Forest Service works.

Overall, the demographic characteristics in Oregon and Washington suggest generally better demographic conditions than the nation as a whole, although the regional and national poverty rates are nearly the same. However, these rates vary considerably within the two states, with higher rates of poverty and social vulnerability in reservation and agricultural areas.

Data used in Chapter 2.1: Social vulnerability

Data	Source(s)	Dates
Social vulnerability: ¹		
▪ Individuals below poverty line	U.S. Census Bureau, American Community Survey 5-Year Estimates	2010–2014
▪ Single mother households		
▪ Amount of college education		
▪ Households speaking languages other than English		

Analysis: Following spatial vulnerability approaches in the scholarly literature, we originally planned to create a social vulnerability index: essentially a rolled-up measure of different demographic data that previous social vulnerability research has identified as important. Our goal was to relate a social vulnerability index to where the national forests are conducting restoration to understand how forests' efforts to improve ecological conditions may relate to communities of potentially significant social vulnerability. We found that creating such a rolled-up index masked many of the variations in social conditions across the states.

We decided to start instead by analyzing each potential variable separately, to look at the variation, range and geographic distribution of each variable, to understand how and what we might roll together into one larger indexed measure in the future.

What we display here are each of these identified social vulnerability measures, with a scale comparing national rates and Oregon and Washington specific rates, in order to illustrate through shading which areas within the region are above (lighter shading) and below (darker shading) national and regional rates.

Considerations: Analysis was conducted at the census block group level.

Using social condition variables individually also allowed us to consider what sorts of additional variables we may want to include. In other words, we could consider what pieces of the social and demographic story were missing from our series of maps.

As we describe in Chapter 4, the spatial information associated with accomplishments data (which we had originally intended to link to social conditions data) would require additional linking and analytical considerations before it could be connected to social vulnerability data, so we deemed such an analysis premature.

¹ Cutter, S. L., Boruff, B. J., and Shirley, W. L. 2003. Social vulnerability to environmental hazards. *Soc. Sci. Q.*, 842, 242–261.

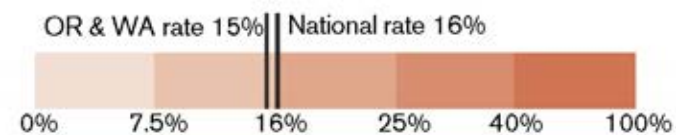
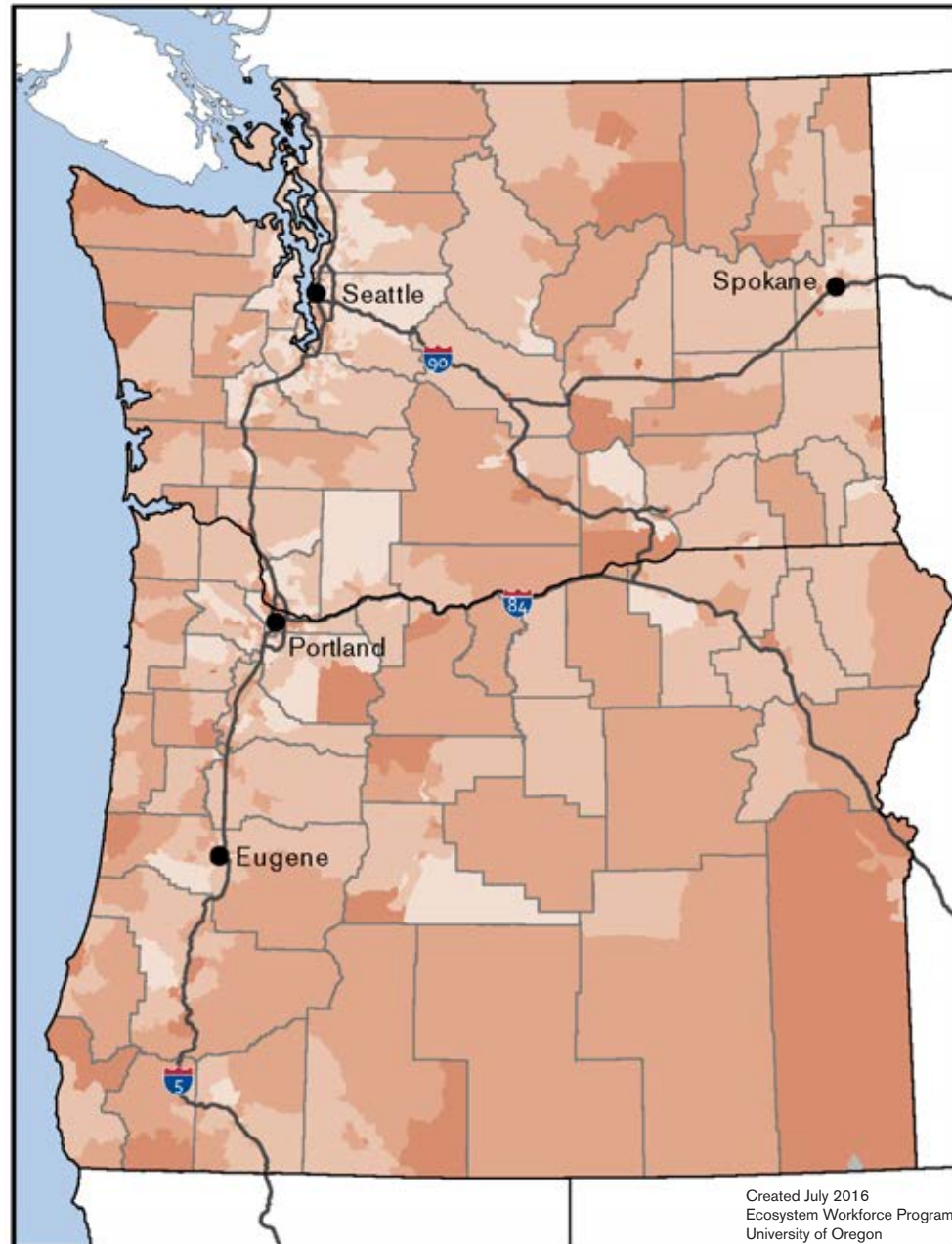
Map 2.1 Oregon and Washington federal lands and county lines



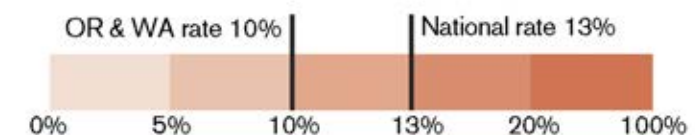
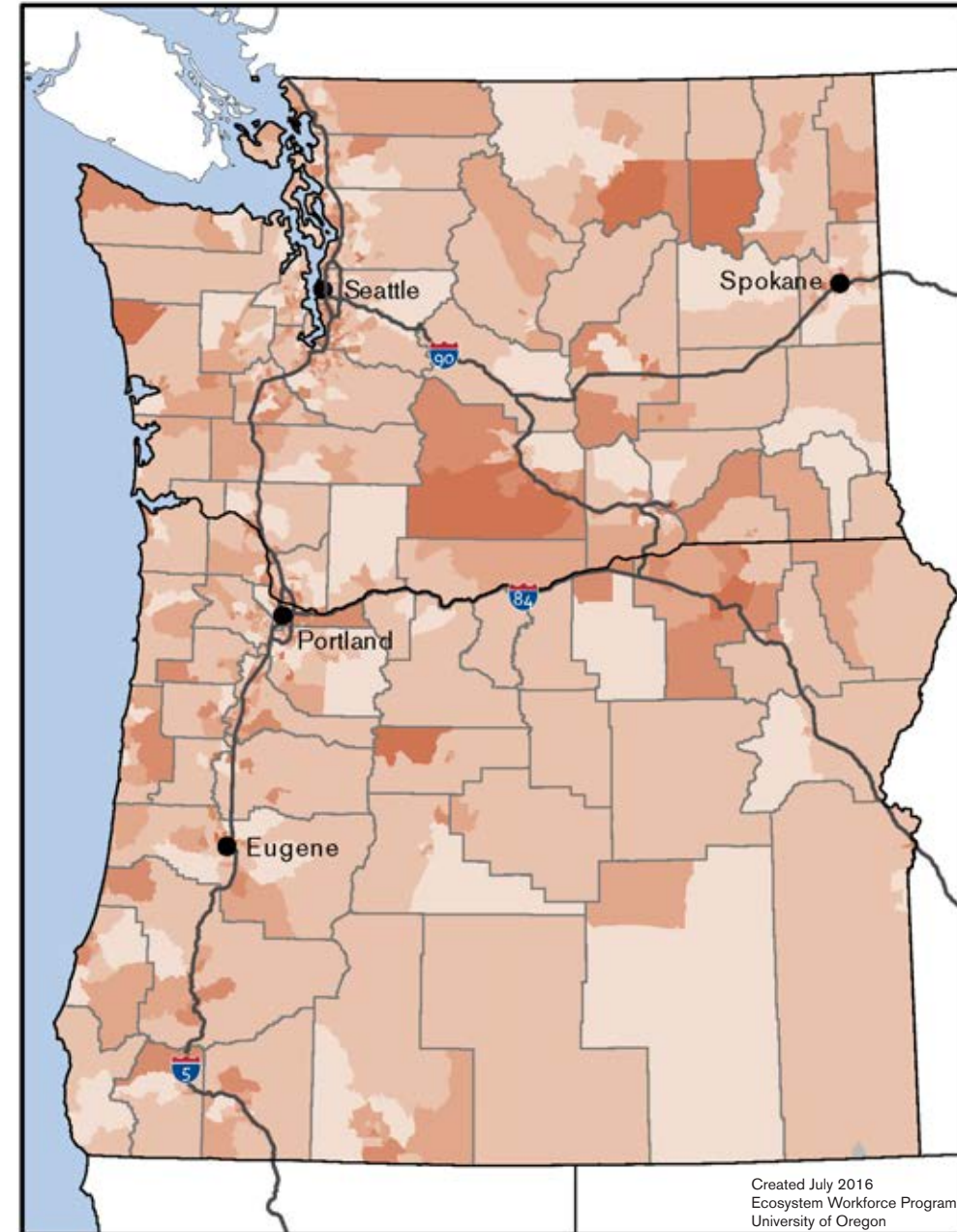
The map of individuals below the poverty line (Map 2.2, below) shows several areas exceeding the national poverty rate, which include pockets in southern Oregon (near the Rogue River-Siskiyou National Forest), bordering the southern area of Mt. Hood National Forest, and some areas of northeastern Washington, primarily on reservation lands. Southeastern Oregon contains the most individuals living in poverty, but it is also one of the least densely populated. Regions such as southern Oregon and areas east of the Gifford Pinchot National Forests have higher population densities and higher rates of poverty compared to other regions of Washington and Oregon.

The map of single mother household rates (Map 2.3, below) shows that rates are the highest in central and northeastern Washington (primarily on reservation lands, but also near Okanogan-Wenatchee and Colville), as well as northeastern Oregon (Umatilla and Wallowa-Whitman). There are also small areas with higher rates of single mother households west of the I-5 corridor, near forests west of the Cascades.

Map 2.2 Percent of individuals below poverty line, 2014*



Map 2.3 Percent single mother households, 2014*

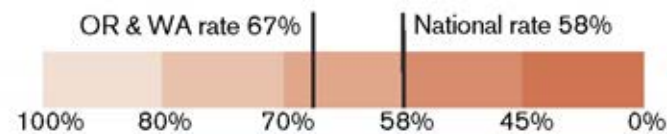
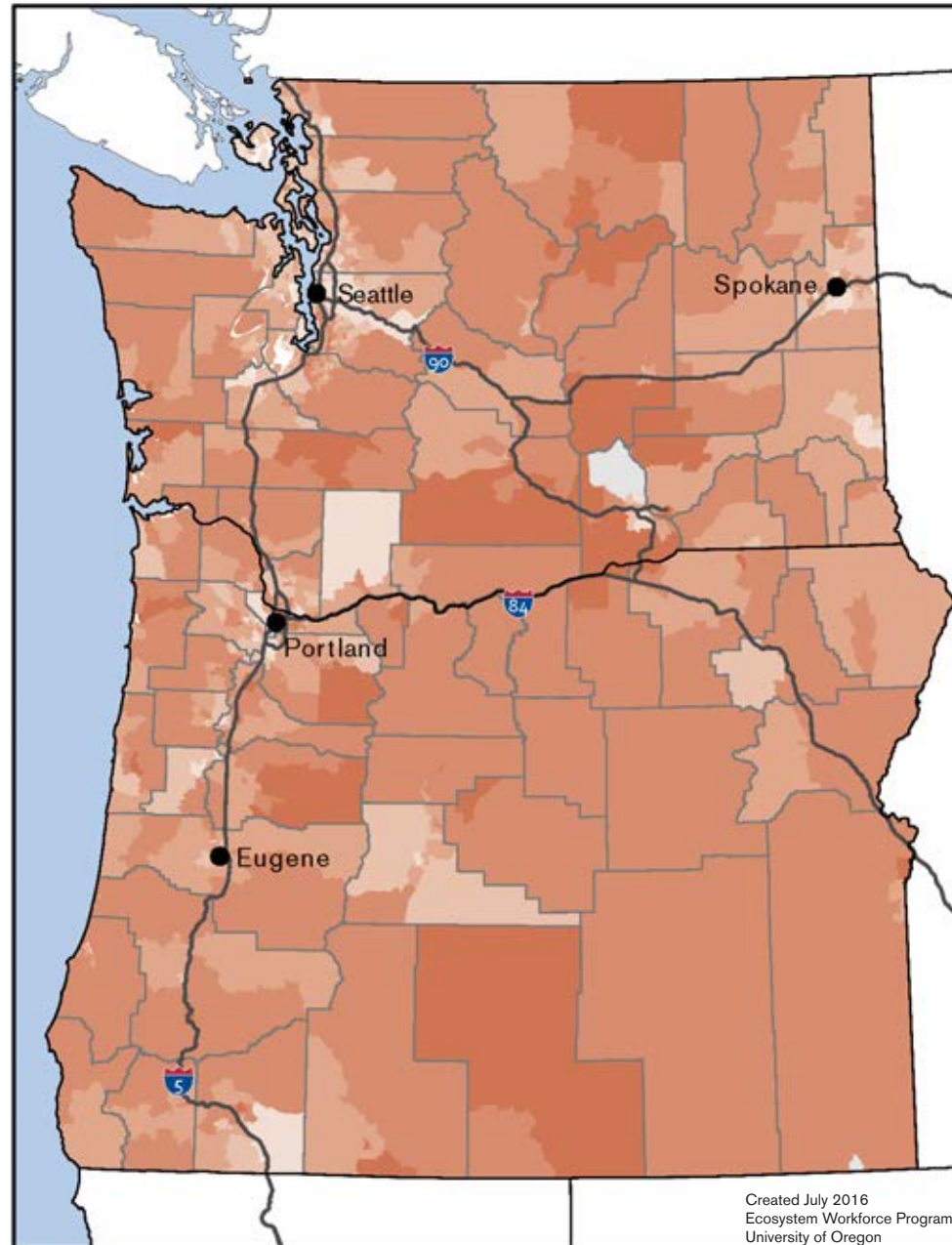


*Data presented by census block group level (lines on maps)

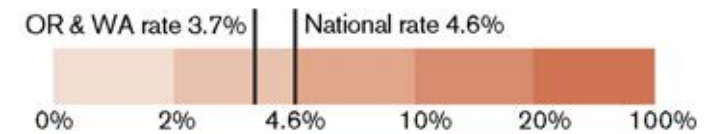
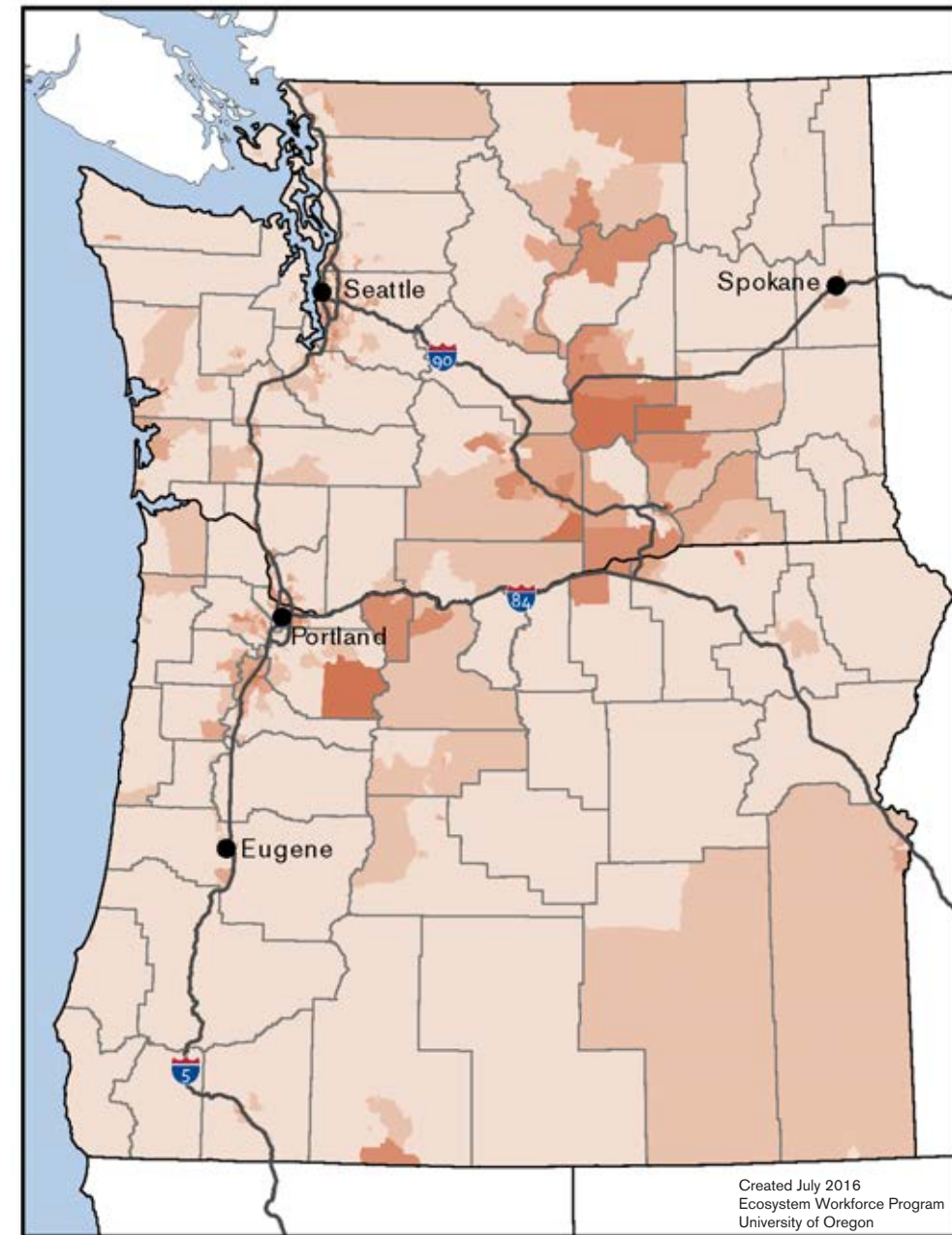
The map of college attendance rates (Map 2.4, below) shows that college level education is generally lower in the eastern regions of Oregon and Washington compared to the western regions of the two states. There are particularly low rates of college attendance in the Willamette Valley east of the I-5 corridor, where many agricultural workers, immigrants, and seasonal employees live and work on tree and agricultural farms. Similarly, in Washington (east of the Okanogan-Wenatchee), agricultural areas have lower levels of education compared to the region as a whole, also true of reservation communities.

The map of households that speak languages other than English (Map 2.5, below) shows that these households are more concentrated in central Washington, primarily in agricultural and reservation areas that also have lower college education rates. The highest concentrations of bilingual or non-native English speakers in Oregon reside in census blocks east of Portland near Mt. Hood on reservation land and in some agricultural areas.

Map 2.4 Percent of individuals with at least some college, 2014*



Map 2.5 Percent non-English speaking households, 2014*



*Data presented by census block group level (lines on maps)

2.2 Measuring isolation

In addition to demographic variables, isolation from financial resources and transportation and communication networks can also be economically as well as socially challenging in Washington and Oregon and can potentially increase reliance on national forest capacities and resources. In some parts of the Pacific Northwest, people travel long distances to access goods, services, and medical facilities, all of which can impact their lifestyle, dependency, and linkages to their national forests. Understanding these patterns of isolation from services can help both individual forests understand their communities and their access to basic services nearby, as well as allow the Regional Office to deepen their understanding of the varied conditions facing individual forests and Ranger Districts. For example, natural resource-based economies in particularly isolated landscapes may have a higher dependence on not only their nearby public lands for employment, but also for entertainment and cultural purposes.

We created isolation maps to measure distances between all places on the map and the closest feature, including post offices, banks or hospitals, interstate freeway onramps, and airports.

The context map (Map 2.6, page 15) shows forest system lands, other federal lands, as well as major freeways and highways in Oregon and Washington as reference for the isolation maps on the following pages.

Our first isolation map provides population density shaded blue or red based on the political party of the congressional member elected in each district (Map 2.7, page 15). The darker shades showing larger populations are concentrated in western Oregon and Washington along the interstate freeways, although over time populations east of the Cascades have been increasing in some places. Since congressional districts have approximately equal populations, seeing district boundaries can create a broad visual representation of population. In addition, in the Pacific Northwest, Republican members tend to represent less densely populated eastern districts while Democratic members tend to hold smaller, more densely populated districts.

Data used in Chapter 2.2: Isolation

Data	Source(s)	Dates
Isolation—Distance to nearest:		
▪ Post office	Bureau of Transportation Statistics, USDOT.	Downloaded 2/12/2016
▪ Bank or hospital	National Highway Planning Network, Bureau of Transportation Statistics, USDOT	Downloaded 2/15/2016
▪ Interstate freeway on-ramp	Board of Geographic Names, managed by USGS	Downloaded 02/2016
▪ Commercial airport	FDIC Current locations for all institutions. Health Resources and Services Administration Data Warehouse, US Dept of Health & Human Services	Data current as of 2/18/2016 (updated weekly). Hospitals downloaded 2/19/2016

Analysis and considerations:

Calculated distance to each identified service in GIS. Shaded from closest (light) to furthest (dark) from service(s).

Point feature shapefiles were analyzed in ArcGIS 10.4 to create a distance layer for each variable. The distance layer was created using the Cost Distance tool in the Spatial Analyst toolbox, which calculates the Euclidian distance from each location in the study site to the nearest point feature.

Banks: Bank locations were geocoded to convert street addresses to Lat/Long coordinates for use in GIS applications. Geocoding utility used was Goldberg DW. 2016. Texas A&M University Geoservices. Available online at <http://geoservices.tamu.edu>.

Distances are calculated by geodesic distance (straight lines), not taking mountain ranges and accessible roads into account.

We used path distance with cost surface-network model, and used US TIGER files with drive times.

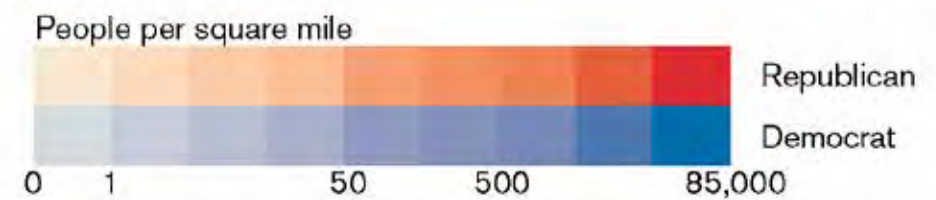
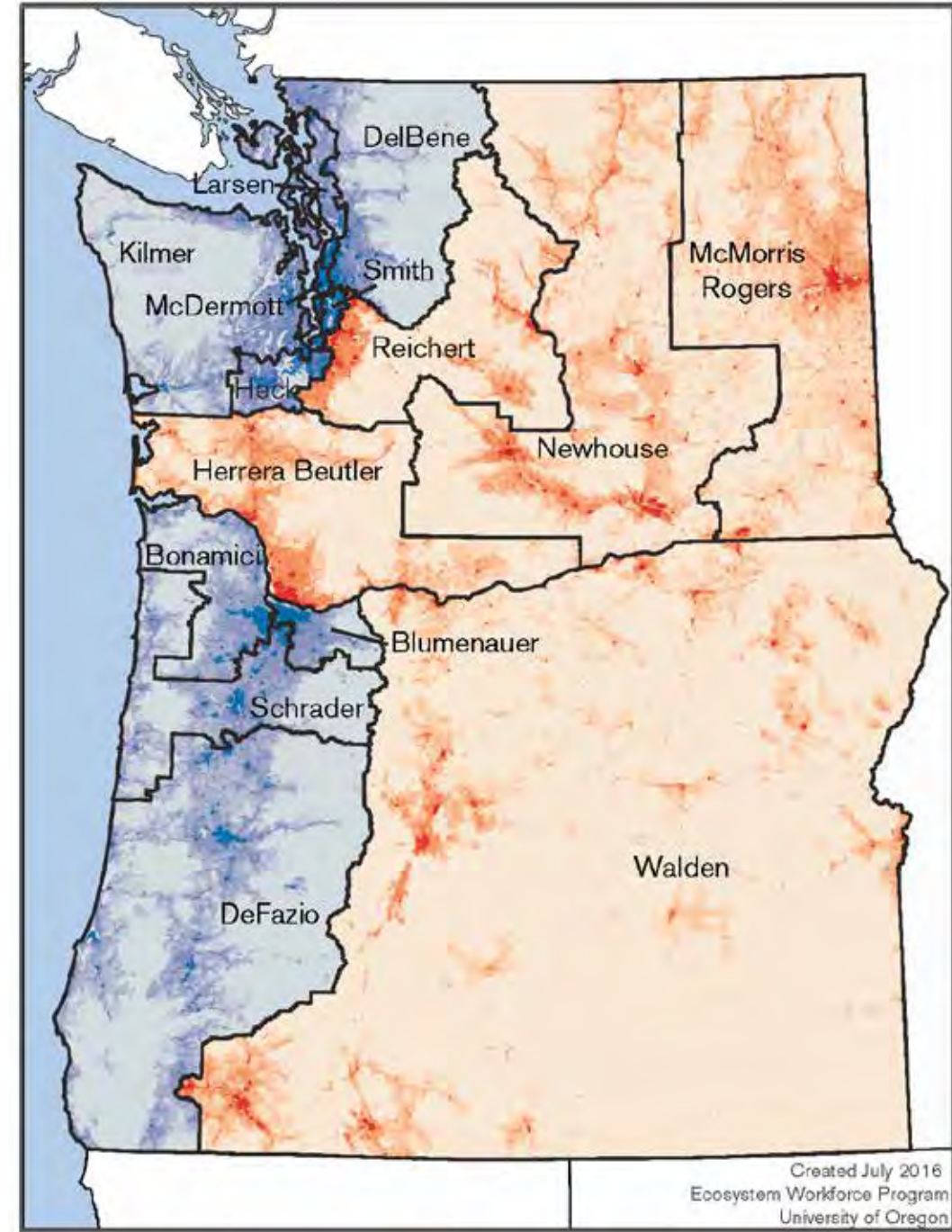
Map 2.6 Oregon and Washington, federal lands and US highways



- National forests, Pacific Northwest Region
- National forests, other regions
- Other federal land

Created July 2016
Ecosystem Workforce Program
University of Oregon

Map 2.7 Population density and political representation, 2015



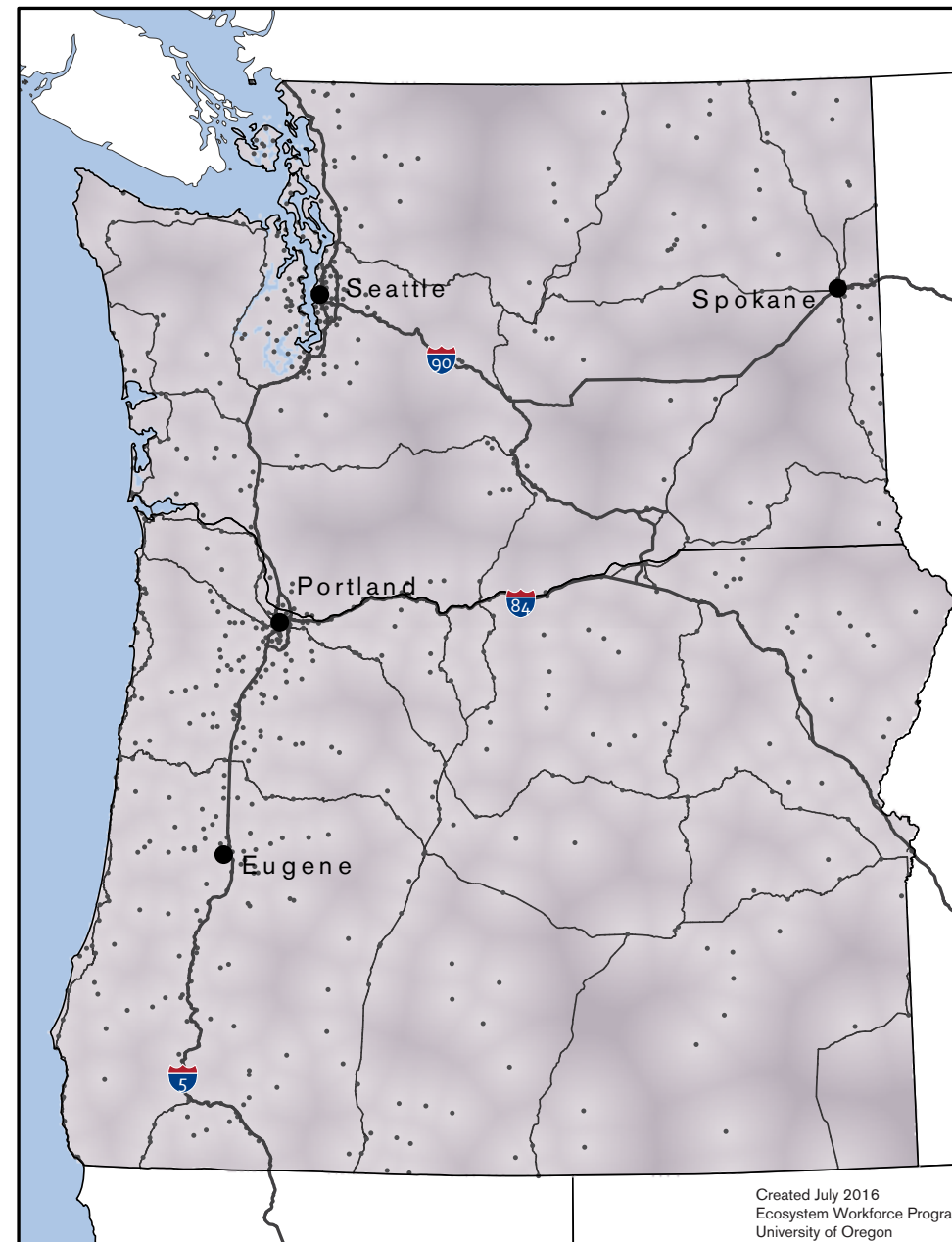
Created July 2016
Ecosystem Workforce Program
University of Oregon

Services such as post offices, banks, and hospitals are clustered along the I-5 corridor. However, the distance to post offices (Map 2.8, below) is more evenly spread across the region than banks, and even more so than hospitals (Map 2.9, below), which are far more concentrated in population centers and become especially sparse south and east of central Oregon. Distances to post offices are generally shorter, and they are thus more accessible than other services like banks or hospitals.

The distance to the nearest interstate freeway on-ramp (Map 2.10, page 17) directly impacts access

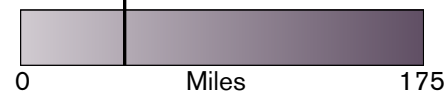
to services, as these maps show. The distance to main roads such as freeways, given road condition and access, weather conditions, and mountain ranges shows how isolated some communities are from access to other services typically found along major roads. Many of the communities shown as most isolated in these measures are near to or bordering national forest land, especially in northeastern Washington (Colville) and eastern Oregon (southwest of Ochoco, Malheur, and Fremont-Winema), which creates a different set of social and economic conditions from regions with similar demographics but far better access to services.

Map 2.8 Distance to nearest post office

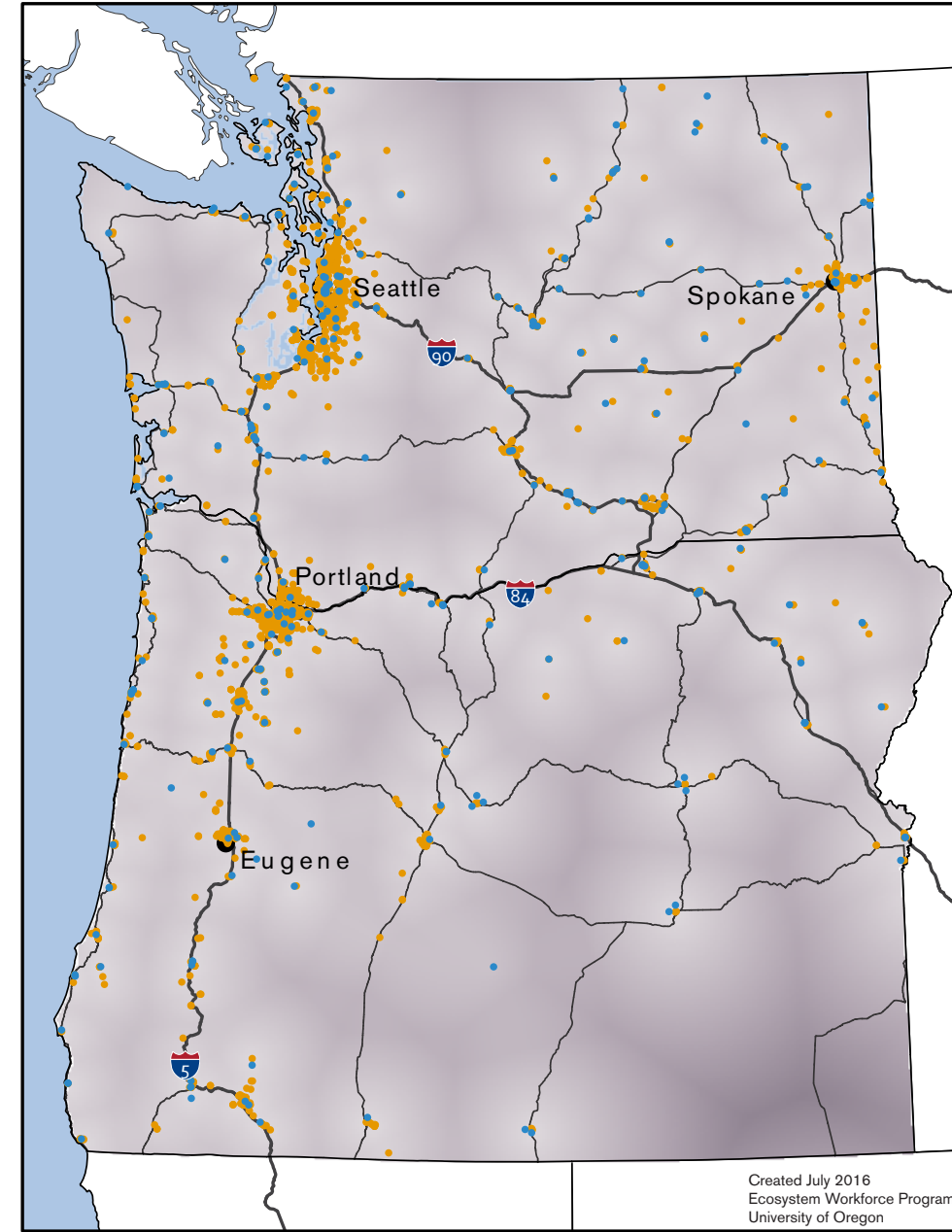


• Post office

Maximum distance: 46 miles



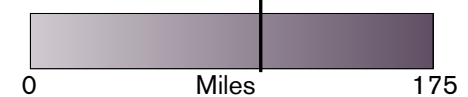
Map 2.9 Distance to nearest bank or hospital



• Bank

• Hospital

Maximum distance: 100 miles

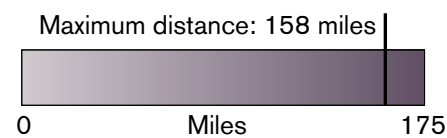


Commercial airports in Washington, spread from east to west, are more accessible than in Oregon where most airports are on the interstate, with the exceptions of Klamath Falls and Redmond (Map 2.11, below).

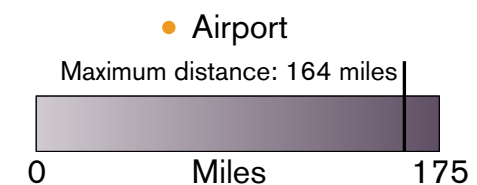
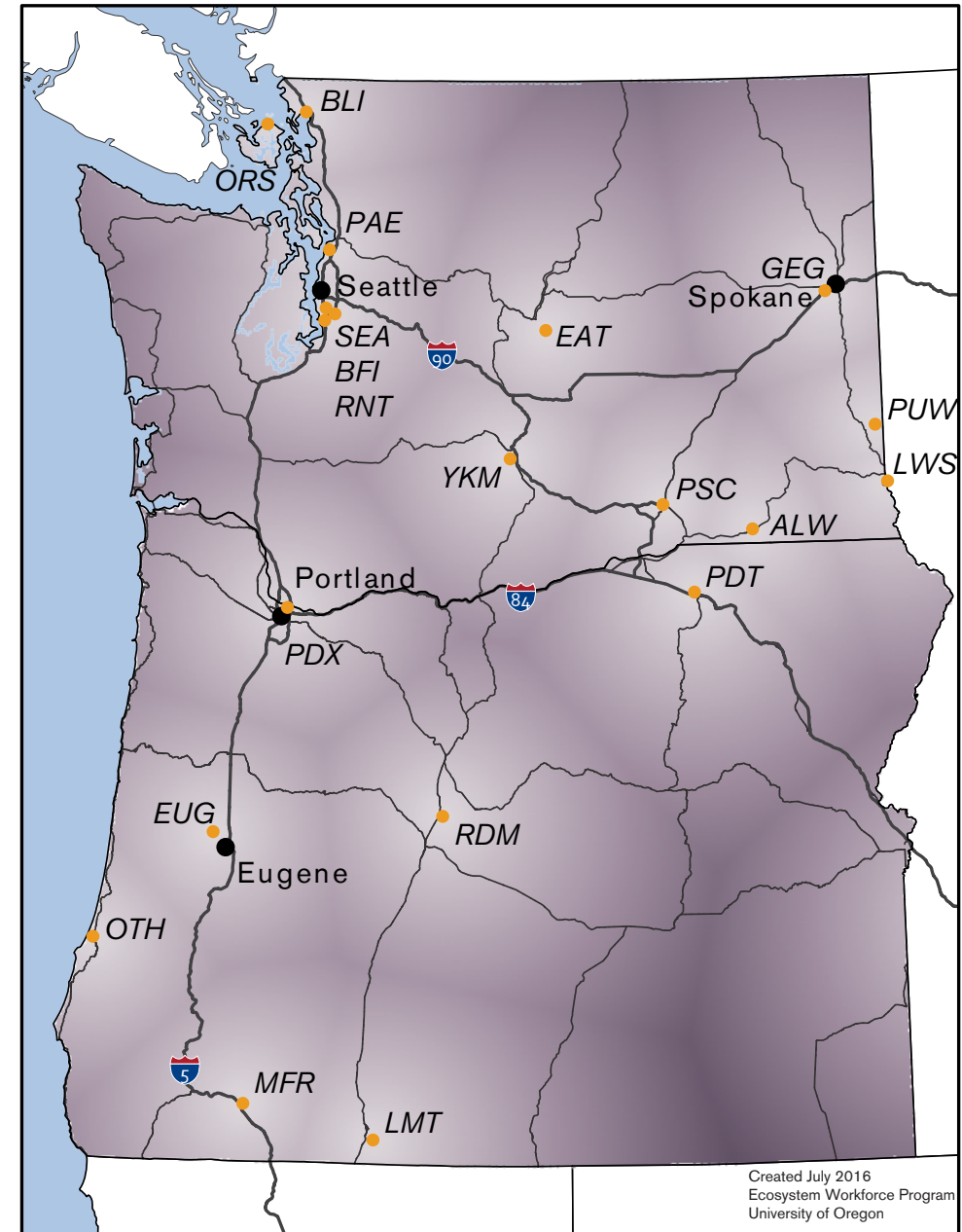
Across all of the isolation maps, southeastern Oregon (east of Fremont-Winema and south of Malheur) and northeastern Washington (between Okanagan-Wenatchee and Colville) are the most isolated, particularly from freeway on-ramps. Some of this isolation can be explained by the large

tracts of public lands in these regions (e.g. Colville National Forest in Washington and Bureau of Land Management lands in much of southeastern Oregon). Even with these explanations, portions of Oregon and Washington are still notably isolated. **This becomes even more striking when the reader considers that these isolation maps were calculated by distance “as the crow flies,” not by available road access. Complications regarding road access, mountain passes, rivers, and other features amplify the isolation represented in these maps.**

Map 2.10 Distance to nearest interstate freeway on-ramp



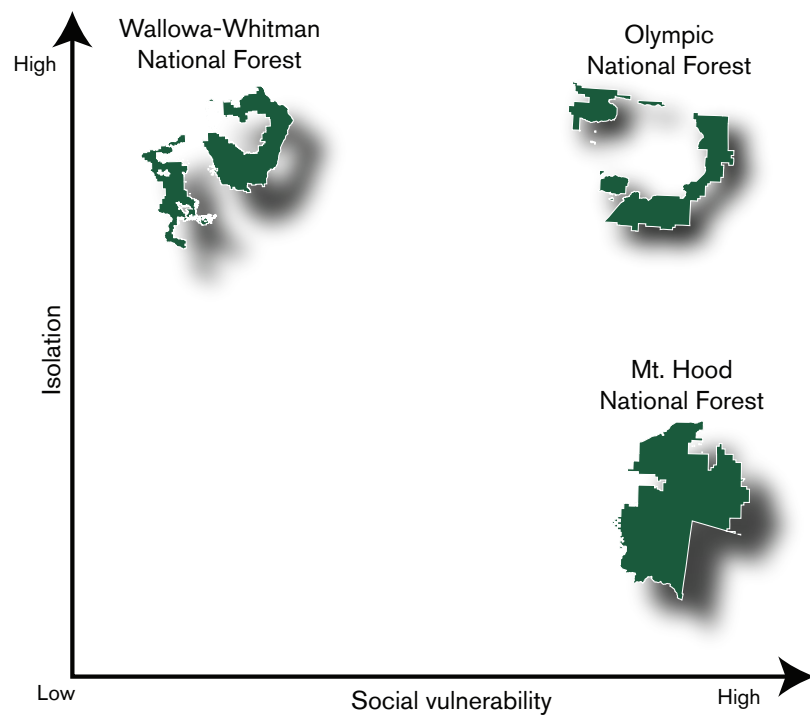
Map 2.11 Distance to nearest commercial airport



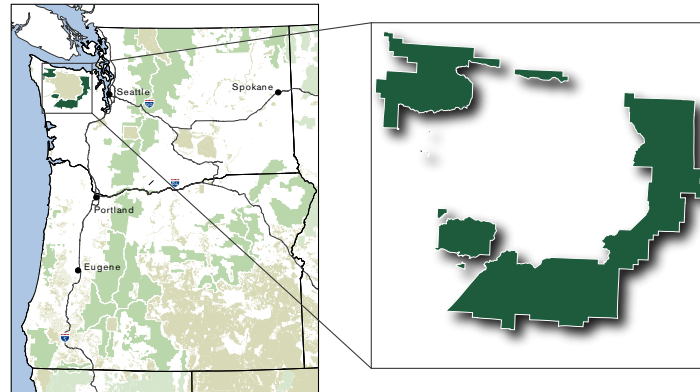
2.3 Forest spotlights

Although isolation and social vulnerability can overlap, the most socially vulnerable areas are not always the most isolated or rural areas. To demonstrate the variability of social and economic trends across the region and their relationship to national forests, we provide examples of the range of demographic and isolation conditions around three different forests within Oregon and Washington.

Figure 2.1 Examples of national forests by isolation and social vulnerability



Olympic National Forest



The Olympic National Forest is in a region of relatively high isolation and high social vulnerability.

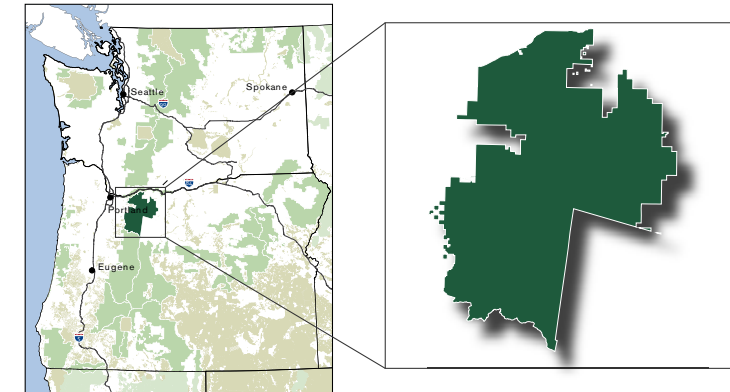
Social vulnerability:

The area surrounding the Olympic National Forest is in high poverty, with college attendance rates below the national average and single mother household rates exceeding the national (or at least regional) average. The region has a relatively low rate of non-English speaking households, with relatively low population density.

Isolation:

Surrounding federal and reservation lands (specifically the Quinault, Skokomish, Hoh, Quileute, Makah, and S’Klallam nations), the Olympic National Forest is located in a region that is difficult to access, with high population density only in the north-eastern portion of the area. Post offices, banks and hospitals are relatively limited in the area, only located in a few smaller towns. Access to large population centers such as Seattle, which are in close geodesic proximity, requires long trips on the only main road, Highway 101, which runs between and next to the Olympic National Forest and National Park. For example, the community of Neah Bay (on the northwestern tip of the state) must travel between 4-5 hours (150-250 miles) to reach Seattle, or 3.5 hours (170 miles+) to reach Tacoma.

Mt. Hood National Forest



The Mt. Hood National Forest is in a region of relatively low isolation but high social vulnerability.

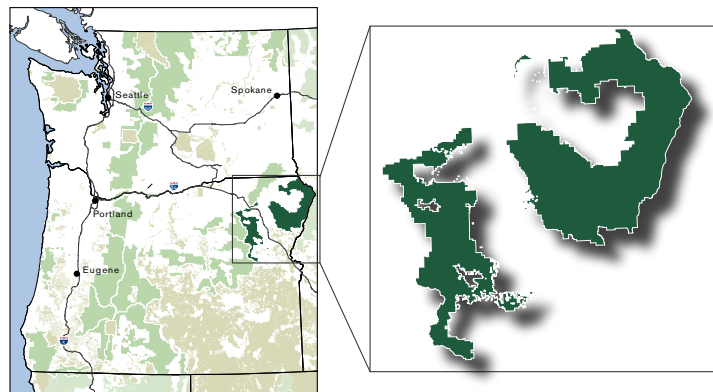
Social vulnerability:

The Mt. Hood National Forest, while only 30-40 miles (on the west side) from the greater Portland area, borders areas of relatively high social vulnerability, exceeding national non-English speaking households and poverty rates. The rate of college educated individuals is also below the national and regional averages. Single mother household rates are mixed, but generally higher than regional and national averages as well.

Isolation:

The forest borders the Warm Springs Reservation on the east side, and is surrounded by areas with high concentrations of seasonal, agricultural, and forest workers. Though not isolated on its west side, Mt. Hood serves as an example of a forest that borders isolated communities on its more sparsely populated east side. Communities east of Mt. Hood such as Pine Hollow require a 1.75-hour (90 mile) commute to reach Redmond, or 45 minute (38 miles) commute to The Dalles.

Wallowa-Whitman National Forest



The Wallowa-Whitman National Forest is in an area of relatively low social vulnerability but high isolation.

Social vulnerability:

The Wallowa-Whitman’s rate of college attendance and percent of single mother households are both close to the regional rate, and its rate of non-English speaking households is below the regional average. Similarly, the rate of individuals below the poverty line in communities around the forest is far below the regional average.

Isolation:

Although all the social and economic characteristics provided about the communities surrounding the Wallowa-Whitman show low levels of social vulnerability, their degree of isolation impacts communities in the area. The area is sparsely populated, with most towns along main highways. Enterprise, near the Wallowa-Whitman, is 2 hours (over 100 miles) from Pendleton, OR (also the nearest airport) or Walla Walla, WA. Banks, hospitals, and post offices are relatively accessible in the region, although very limited in number and location. In particular, mountains spread across Oregon and Washington are a limiting factor for isolation.

Data Takeaways:

Data	Considerations and lessons learned:
Demographics related to social vulnerability	<ul style="list-style-type: none"> Using these measures at the Census block group level masks variations occurring at a more local scale. The selected measures do not adequately link to local inequality or disparity considerations. If rolling measures together, consider what and how different measures should be considered. For example, does the variation in single mother households serve as a better or worse indicator of social vulnerability than the more limited variation in non-English speaking households? Add in additional measures that provide important demographic information, including income inequality/disparities, second vs. primary home, and free and reduced lunch.
Demographics related to isolation	<ul style="list-style-type: none"> Assess feasibility of making distance maps by roads, not in geodesic distance. Factor in road conditions and accessibility, weather, mountain passes, and additional miles of road around mountains, all of which impact isolation more than what is depicted on these maps. Explore potential to create index (a composite isolation measure). Add in Forest Service locations (Forest- and District-level offices) to show relationship between variables and Forest Service locations.
Both demographic/social vulnerability and isolation measures	<ul style="list-style-type: none"> Explore potential to create index (a composite demographic and a composite isolation measure). This includes exploring how much county-level or smaller variation would be lost in rolling measures together, and potential weighting of variables. Consider potential of Social-Economic Profiles for each national forest detailing the populations neighboring their forests to acquaint staff with the social and economic contexts of their forest. Further explore potential of linking demographic and isolation variables to Forest Service reported accomplishments data.

Chapter Takeaway:

Both demographic characteristics and access to services varies significantly across Washington and Oregon, even from one side of a forest to the other. Demographic conditions and isolation go hand in hand in the region, and therefore must be considered together. Understanding what communities surround a forest and their relative isolation has implications for community dependence on forest activities and opportunities, as well as for local forests understanding the context in which they are managing land.



CHAPTER III. PARTNERS

How are the Forest Service and its partners working together?

The Forest Service partners with numerous external federal and non-federal entities and private citizens to accomplish shared objectives. In this chapter, we present key areas where the Forest Service engages with partners in service of shared social and ecological restoration goals.

Given the landownership pattern in the region and the multiple-use mission of the Forest Service, it is logical that the agency works with a variety of organizations, businesses, and individuals to accomplish work on national forests. Partnerships vary considerably and include contracting with private businesses, engagements involving the exchange of funds, participation in forest collaborative groups, and the enrollment of volunteers in restoration activities. There are many kinds of financial partnerships that can be formed with both local and non-local entities.

The following sections of this chapter highlight five key areas where the Forest Service is engaged in partnerships. In each section we use Forest Service data to describe and illustrate how the agency works with organizations and individuals to accomplish their work. We also note that there are other types of partners and shared work, beyond those we describe here.

Partnerships explored in sections of this chapter

Section 3.1 Contractors

The Forest Service contracts with private businesses for restoration-related service work, timber sales, and wildfire suppression.

Section 3.2 Grants and Agreements awardees

The Forest Service uses grants and agreements with a diversity of partners (federal, state, and local government agencies; non-governmental organizations; individuals; and other entities) to accomplish work on national forests.

Section 3.3 Collaboratives and community capacity partners

The Forest Service engages with active forest collaboratives in Washington and Oregon who work on public lands issues, including representing diverse interests and providing recommendations to forests for planning, prioritization, and areas of agreement.

Section 3.4 Volunteers

The Forest Service relies on volunteers (individuals and organized groups of individuals) to perform many valuable services on the forests, such as maintaining trails and serving as hosts at campgrounds.

Section 3.5 Conservation education partners

The Forest Service partners with a variety of groups for environmental education and outreach, reaching a broad audience through a variety of initiatives, including programs geared towards gradeschool children, forest visitors, and the general public.

Data used in Chapter III: Partners

Data	Sources	Dates	Analysis	Considerations
Contractor businesses	TIM FPDS VIPR	2011-2015 2011-2015 2015	Mapped all businesses with at least one restoration related service contract, timber sale and/or preseason fire suppression equipment agreement by business location. Manually downloaded all Dispatch Priority Lists from the online VIPR system (http://www.fs.fed.us/business/incident/dispatch.php), and compiled information about businesses, equipment type and location into one database.	VIPR data (over 10,000 rows of data) must be downloaded individually and manually, we only have done this for a 2015 database.
Biomass facilities	OR and WA biomass lists (Ron Saranich, USFS; Chuck Hersey, Washington Department of Natural Resources; Dylan Kruse, Sustainable Northwest; Marcus Kauffman, Oregon Department of Forestry), and additional research.	2016	Compiled lists of biomass facilities from several entities tracking biomass across Oregon and Washington. Called all listed facilities on compiled list to see if still operating, and type of biomass. Used other research such as newspaper articles to identify relevant mill closures or other consolidations.	The master biomass facilities list is a living document; as of Oct. 2016 the list contains: 101 confirmed operational (66 OR, 35 WA), 12 unconfirmed (10 WA, 2 OR), and six idle facilities. Map shows confirmed operational facilities as of July 2016.
Grants and Agreements	Grants and Agreements (G&A): G&A Workload Report, Partnership Report, Mailing Labels August 24, 2016 from Jamie Lentz, Washington Office Acquisition G & A GA Mailing Labels GARP037L, GA MAIL LABEL, GARP037L, February 18, 2016 from Randall Wood, Grants and Agreements Region 6.	2011-2015	We assigned each grant and agreement from FY 2011-2015 a location. We were able to link multiple G & A reports together to obtain some city names, but this data was too incomplete for thorough analysis. We reviewed each G&A record from the past five years in the region and assigned city, state, and county. Once locations were assigned to all possible organizations, we assigned them "local" or "non-local" status, depending on the organization's proximity to the awarding national forest. Six of the total 836 recipients in the Grants and Agreements data did not contain sufficient information to be assigned a location and were thus treated as missing data. We used the following definitions/decision rules when assigning grant recipients a status: <ul style="list-style-type: none"> • "Local" grants and agreements: cooperators with an address located in a county that contains some portion of the national forest. • "Non-local" grants and agreements are those without any cooperators in the counties bordering the national forest. • Selecting a city and state for NGOs: we always picked the closest location to the national forest awarding the grant or agreement to decide whether they were local or non-local (e.g. we assigned The Nature Conservancy to their office in Bend, Oregon when the agreement was with the Deschutes, and to their office in Ashland when the agreement was with the Rogue River-Siskiyou). • Assigning state and federal agencies with main offices but multiple branches: assigned to their main location (e.g. Washington State departments in Olympia, federal agencies in Washington DC), unless the G&A data distinguished them as a specific local branch (e.g. "Bureau of Land Management, Lakeview"). State and federal agencies that were assigned to their capital location were assigned "multiple" locations rather than local/non-local. 	Reports vary depending on date pulled, filters applied, and other database particulars. Data presented here are our best available numbers based on the date and manner in which the reports were pulled. Despite working with our Forest Service partners, we were unable to obtain data from the Grants and Agreements (G&A) database that included both G&A award details and awardee locations on the same report. We were unable to find a set of reports that would generate the necessary information from G & A without large quantities of missing data. Working with contacts in the RO and WO we found that the three reports needed for our intended analysis were workload, mailing labels, and partnership reports, which we merged together into one linked database. Even with this merge and database creation, we still had significant missing data. We were unable to verify the G & A resulting numbers due to the varying ways in which G & A data can be pulled from the system, making comparison or verification difficult. We found that the number of G & A listed as "open" far exceeded the actions on agreements (modifications and new agreements totaled), often by several hundred, making "G&A open" unreliable for reporting.
Oregon and Washington collaboratives	Emily Jane Davis, Oregon State University	2016	Mapped spatial extent of collaboratives in Oregon and Washington by their defined boundaries.	Master list is a living document, updated annually, informed by collaboratives and those who study or work with them.
Community Capacity and Land Stewardship Program	National Forest Foundation	2016	Listed reported recipient name from NFF in Figure 3.8. Linked collaboratives to CCLS award recipients in Table 3.1 by identifying the collaborative associated with each award. Then linked awarded collaboratives to list of active collaboratives in region.	Linking of CCLS awards and collaboratives resulted in 25 linked to active collaboratives, 3 entities not listed as collaborative, and 1 inactive collaborative).
Volunteers	VPR: USFS Volunteer & Partner Reports. Data received from Emily Biesecker, FS-1800-16, July 19 2016. *other data presented on pg 7 (budget, FTE and acreage) sources listed on pg 4	2014-2015	<ul style="list-style-type: none"> • Compiled individual spreadsheets for each forest in R6 for both FY2014 & F Y2015 into a single dataset. • Totaled accumulated hours for FY2014 and FY 2015 for each forest for multiple variables. • Calculated total Volunteer Person Years by Forest for all functional areas combined. • Divided other variables (Acres, FTE, Visitors, Budget) by Person Years for each forest. Acres and Visitors are reported in 1,000s. Budget is reported in \$10,000s. 	Possible inconsistent reporting or categorization of volunteer time across programs. There are significant portions of Unknown data in Age and Race/Ethnicity data.
Conservation education	NatureWatch, Interpretation, and Conservation Education (NICE) Database, data received from Brenna White, September 22, 2016.	2011-2016	Note that data used was six years between 2011-2016. This was done deliberately to capture more complete data since data was inconsistently reported until recently. Quarterly reporting requirements for NICE just started in 2016, and by including 2016 data (through September 22, 2016) we aimed to capture more full forest reporting than previous years. Compiled data in places where multiple responses could be selected for one variable (e.g. subject, delivery method) Regional level: <ul style="list-style-type: none"> • Totaled audience type by FY for R6. • Audience categories were combined and simplified into 6 segments: 1) Youth, 2) Employees & Interns, 3) Teachers/Educators, 4) Forest Visitors, 5) Volunteers, 6) General Public & Other Forest level: <ul style="list-style-type: none"> • Totaled audience number and type by Forest for each Initiative, and each Subject. • Counted initiatives, subjects, and delivery methods each time they were listed (some events listed multiple initiatives, multiple subjects, and multiple delivery methods). • Separated partners lumped category into individual data entries to better sum partners by forest. 	<ul style="list-style-type: none"> • Inconsistent reporting across the region, including a broad range of estimated audience numbers. For example, one forest only entered four accomplishments in six years. • WO just added quarterly reporting requirements in FY2016. • Leave No Trace initiative reported audience numbers 10x the size of the second largest audience by initiative. As an outlier this program was reported separately.

Some partnerships that the Forest Service is engaged in, like those with restoration contractors or volunteers, might quickly come to mind when people envision how shared work is accomplished on national forests. Others, like those with grants and agreements cooperators or in shared efforts to build collaborative capacity, might not come to mind as quickly. Partnerships in all five of the key areas we present, however, help the agency accomplish different components of their work on the land. **In all of these areas, the Forest Service is working with organizations from all sectors and scales. This has myriad impacts locally and regionally.** Contracting with private businesses for restoration-related services, timber sales, and fire suppression, provides opportunities for job creation and retention. Forest Service work with forest collaboratives, volunteers, and education partners provides youth, veterans, community members, and other stakeholders interested in management on their local forests opportunities to engage with the agency and participate in shared learning.

Figures 3.1 and 3.2 provide an overview of the partnership areas we describe in the following sections, first for the region as a whole (Figure 3.1, at right), and then for each forest individually (Figure 3.2, page 23). These figures show the diversity of partners that the Forest Service works with. For both figures, the size of the circles are presented at the same scale, which allows us to see how partnerships within individual forests relate to both the region as a whole and to other forests in each partnership area. The following sections cover each of these areas in greater depth, describing partnerships and showing partnership data for both the region and forests within it through figures, maps, and text.

Figure 3.1 Forest Service partners, Pacific Northwest Region totals

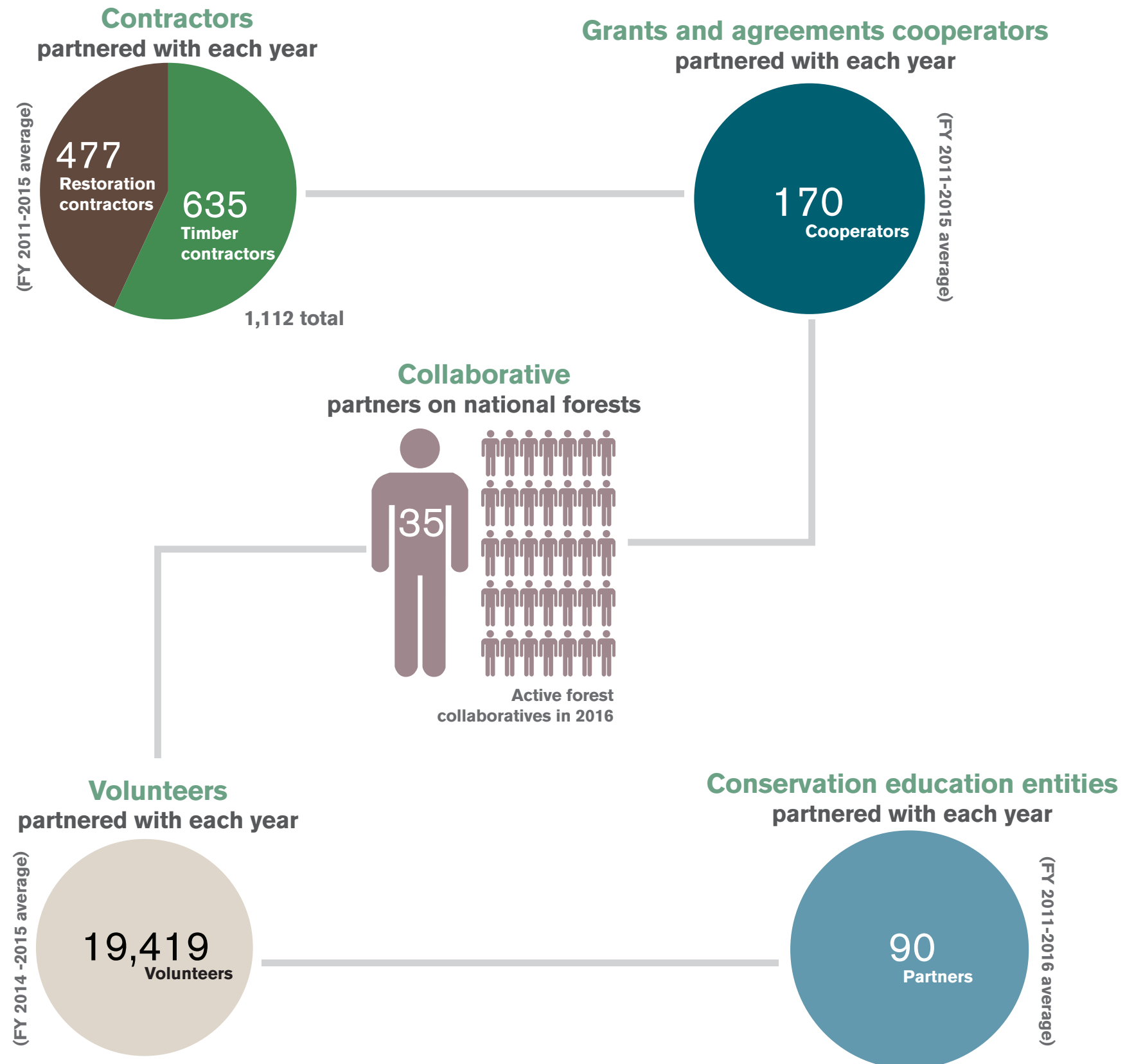
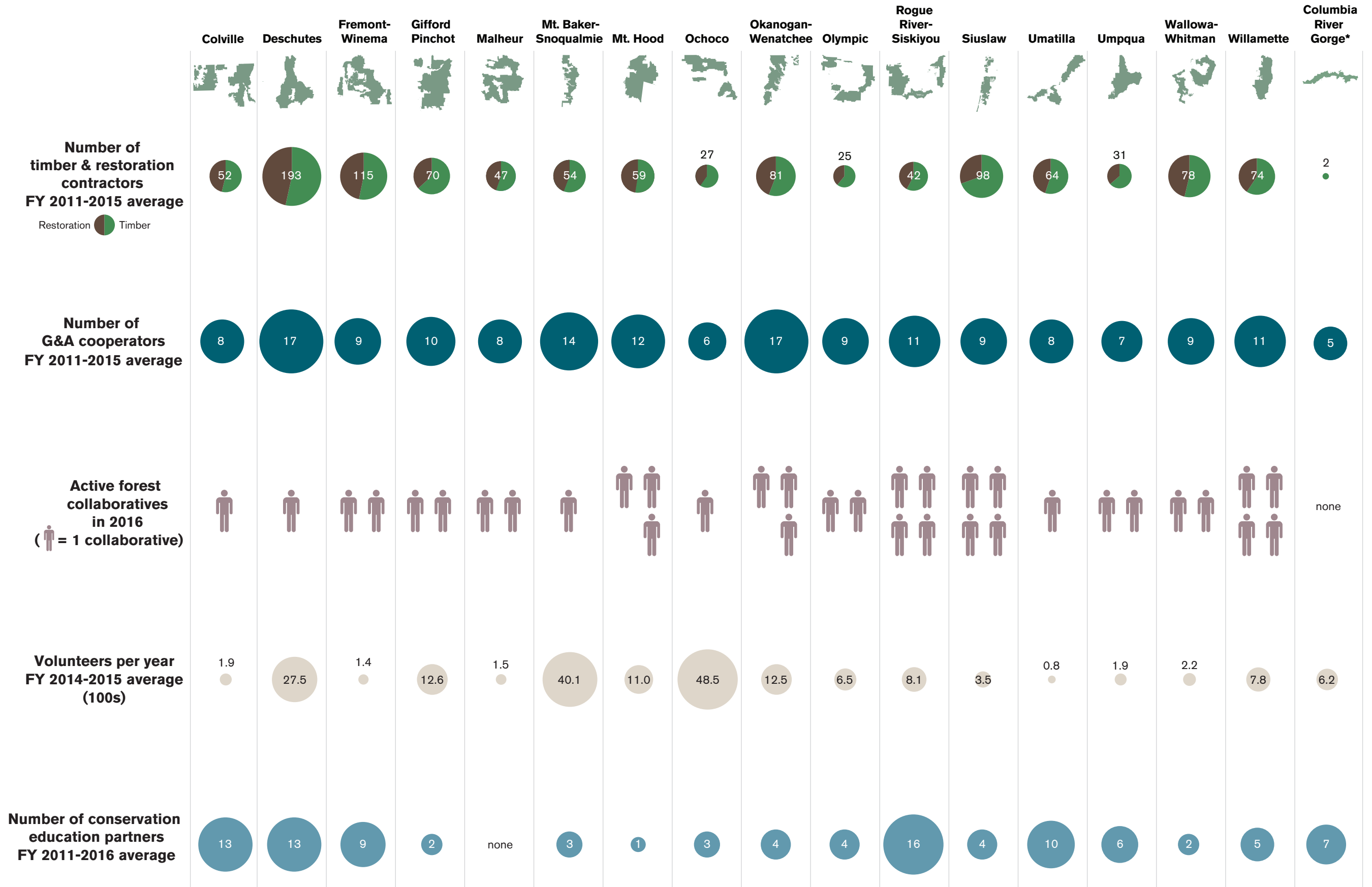


Figure 3.2 Forest Service partners, Pacific Northwest Region by forest



3.1 Contractor businesses

Business capacity for accomplishing Forest Service work

Companies engaging in timber sales, restoration, fire management services, and biomass utilization offer key business capacity for national forest management and contribute an important economic engine in rural communities. **Without local business capacity, local communities struggle to act on the opportunities generated from national forest management, and forest managers can struggle to find businesses able to perform restoration work.** At a forest and district level, agencies can use information about the businesses that have worked with them to better tailor skillsets, jobs, and other

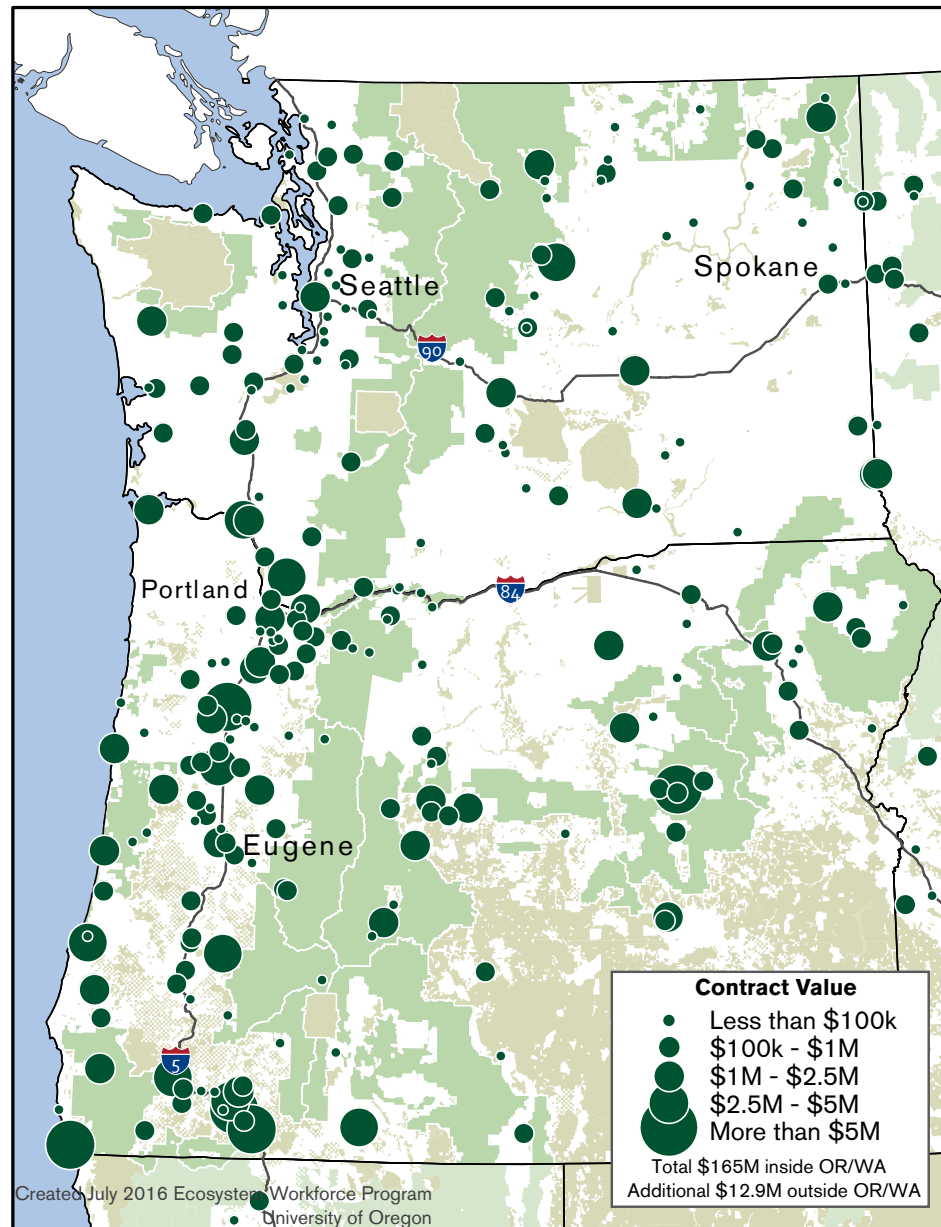
contracted work to match existing workforce availability. Here we present data that shows business capacity in the region, including restoration-related service contracts, preseason agreements for fire suppression, and timber sales. We also include the location and types of active biomass facilities in the region, which represent capacity that has been a major policy focus of the Forest Service in an effort to increase restoration capacity.

Restoration-related service contractors are the businesses that have contracted with the Forest Service for restoration services and forest-related management activities, such as reforestation, thinning, road and stream restoration, and other practices aimed at improving or restoring the health of the forest. These activities can sup-

port a variety of purposes, from forest and watershed restoration to timber management and wildfire mitigation. Contractors receiving restoration service contracts from forests in the region (FY 2011-2015) were located primarily in the region (68 percent), with 32 percent outside Oregon and Washington (see Map 3.1, below).

Fire suppression equipment contractors obtain preseason agreements for a variety of fire suppression resources (e.g. equipment like water tenders and engines, or mechanical services) and can be called for their services when needed during fire season. Map 3.2, below, shows fire equipment contractors in the region with preseason agreements in 2015. The Pacific Northwest has a long history of significant private sector forestry service and fire suppression hand

Map 3.1 Restoration-related service contractors, FY 2011–2015

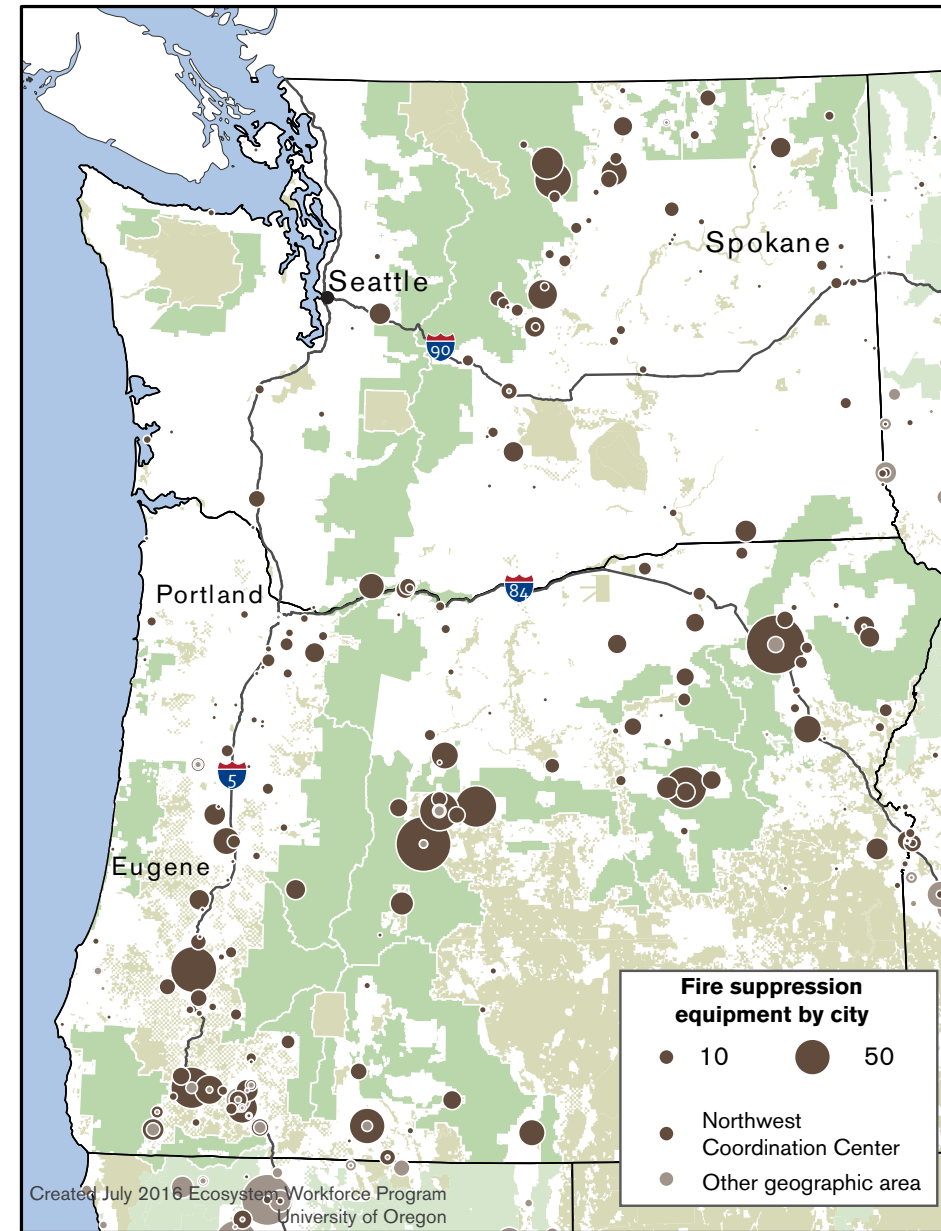


REGION TOTALS

Service contractors
2,378

Contract value
\$178 million

Map 3.2 Fire suppression equipment contractors, 2015

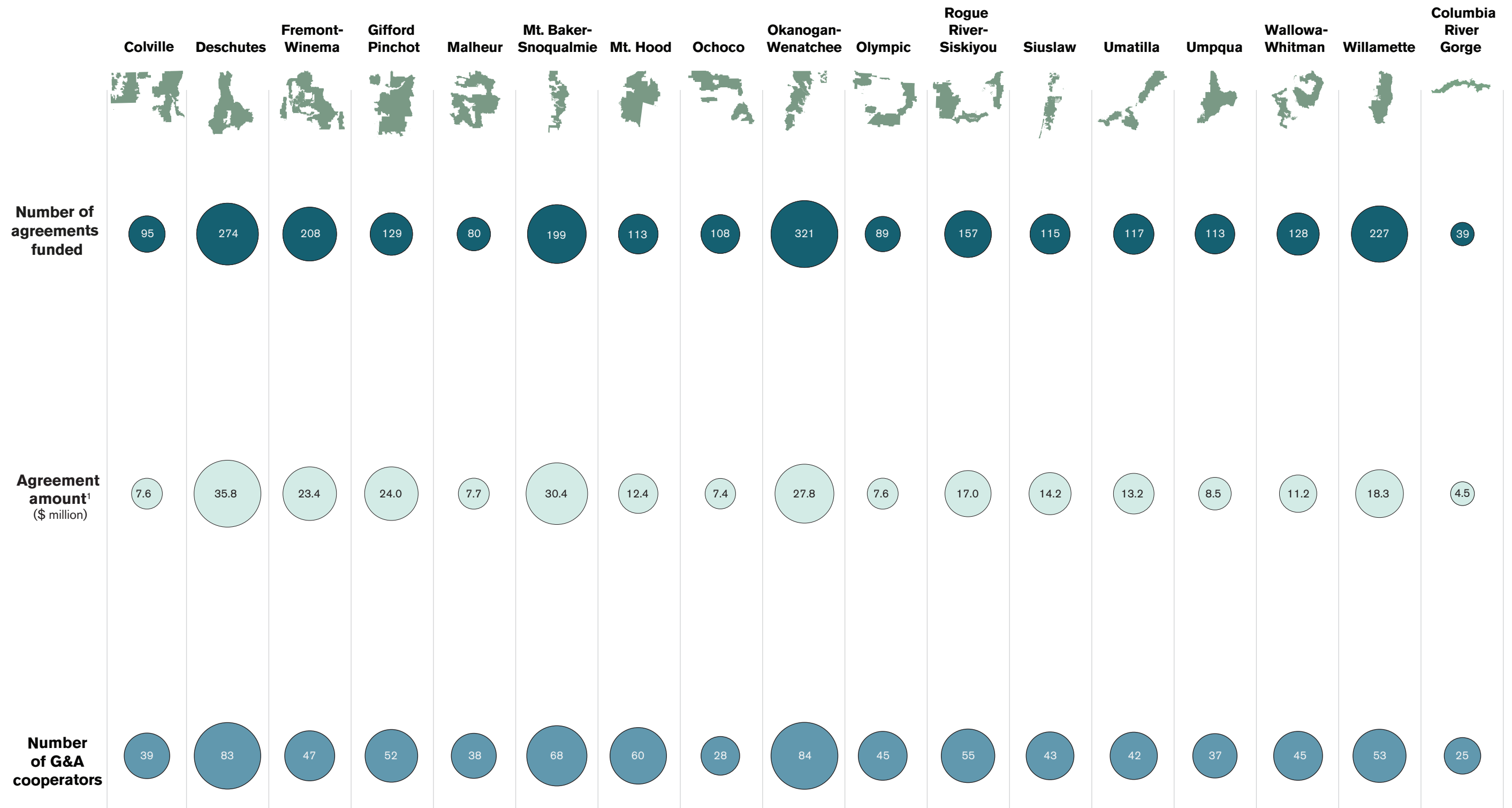


REGION TOTALS

Suppression businesses
630

Equipment pieces
2,437

Figure 3.3 Grants and agreements funded, FY 2011–2015



1. Total agreement amount is a sum of USFS and cooperator cash and other contributions

2011-2015 **REGION TOTALS**

Agreements funded: 2,512

Agreement amount: \$271,000,000

Cooperators: 844

3.2 Organizations receiving grants and agreements

Beyond contracting for specific services, the Forest Service has a broad portfolio of community engagement projects, activities and program areas. The Forest Service uses grants and agreements (G&A) to allocate funding to a variety of federal, state, local government, nongovernmental and other organizations to conduct projects of shared value to both the agency and its partners. We explored this grants and agreements data to understand how much money the Forest Service is allocating and how many organizations the national forests are working with, as well as to identify the mix of local and non-local partners. Much of what we learned is shared in the data story for this section, as G&A data can be challenging to organize and interpret.

In Figure 3.3 (see page 26), we created a summary of the ranges in number and size of grants and agreements, including the number of different organizations with which the Forest Service partners. **The size and number of grants and agreements, as well as the number of organizations, varies greatly by forest.** For example, some forests (e.g. Gifford Pinchot) award relatively more money to fewer organizations while other national forests (e.g. Deschutes) enter

into agreements with more organizations, suggesting a smaller average award size. Forests also award a range of sizes and number of grants and agreements. **The match that organizations often bring to grants and agreements with the Forest Service amplifies the scale, scope, and extent of work the agency is able to accomplish, and distinguishes the work done under grants and agreements from other contractual approaches such as procurement.**

We then explored how forests are awarding grants and agreements, specifically what proportion of their awards go to organizations local to the forest, larger-scale organizations with local subcontractors or local offices, and/or organizations outside the local area. **We define “local” grants and agreements as those with cooperators whose address is located in a county that contains some portion of the national forest. “Non-local” grants and agreements are those without any cooperators in the counties bordering the national forest.**

With this analysis we found that the largest number of grants and agreements are awarded to organizations local to each respective national forest in the region. The number of grants and agreements executed (Figure 3.4, below) shows that fewer were executed in recent years (2014 and 2015) than in prior years (2011). The reduction of grants and agreements executed shows fewer local organizations or organizations with multiple locations awarded grants and agreements by their nearby forest(s). The number of grants and agreements funded (Figure 3.5, below) has remained relatively constant year to year, with the exception of 2015 when fewer grants and agreements were funded. Taken together, these two charts show

that grants and agreements trends have remained relatively steady over the past five years, with more variation in the type of organization awarded. In particular, the number of grants and agreements funded and executed for local organizations has decreased more in 2015 than for non-local or even multiple local organizations.

Variations in the size and number of grants and agreements by forest are shown in Figure 3.6, below, which shows total value of grants and agreements awarded by forest. This figure also shows how grants and agreements were awarded by forests to local, multiple and non-local organizations. **There is variability in the composition of local, multiple and non-local awards; however, there are still some notable differences.** For example, forests with the most awarded funds (Deschutes and Mt. Baker-Snoqualmie) primarily fund grants for local organizations. On the other hand, the Okanogan-Wenatchee, which has the third largest awarded amount of any forest in the region and the largest number of grants/agreements, awards primarily to non-local organizations. The forests with the smallest awarded dollars have varying amounts of local, multiple, and non-local awards. The amount awarded to organizations with multiple locations is mixed, but the Gifford Pinchot awards more grants and agreements funds to organizations with multiple locations than any other forest. Eight of the 16 forests awarded the largest amount of their grants and agreements to local organizations, and another three forests awarded their largest amount to organizations with multiple locations. The remaining five forests (Olympic, Siuslaw, Umpqua, Wallowa-Whitman, and Okanogan-Wenatchee) awarded the largest portion of their grants and agreements to non-local organizations.

Figure 3.4 Number of grants and agreements executed, FY 2011–2015

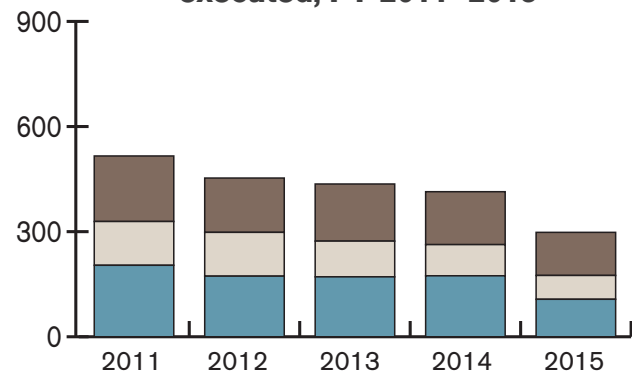
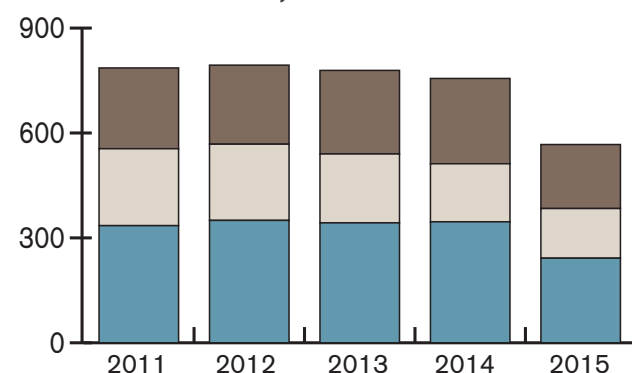
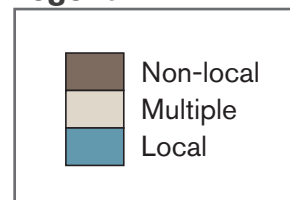


Figure 3.5 Number of grants and agreements funded, FY 2011–2015



Legend

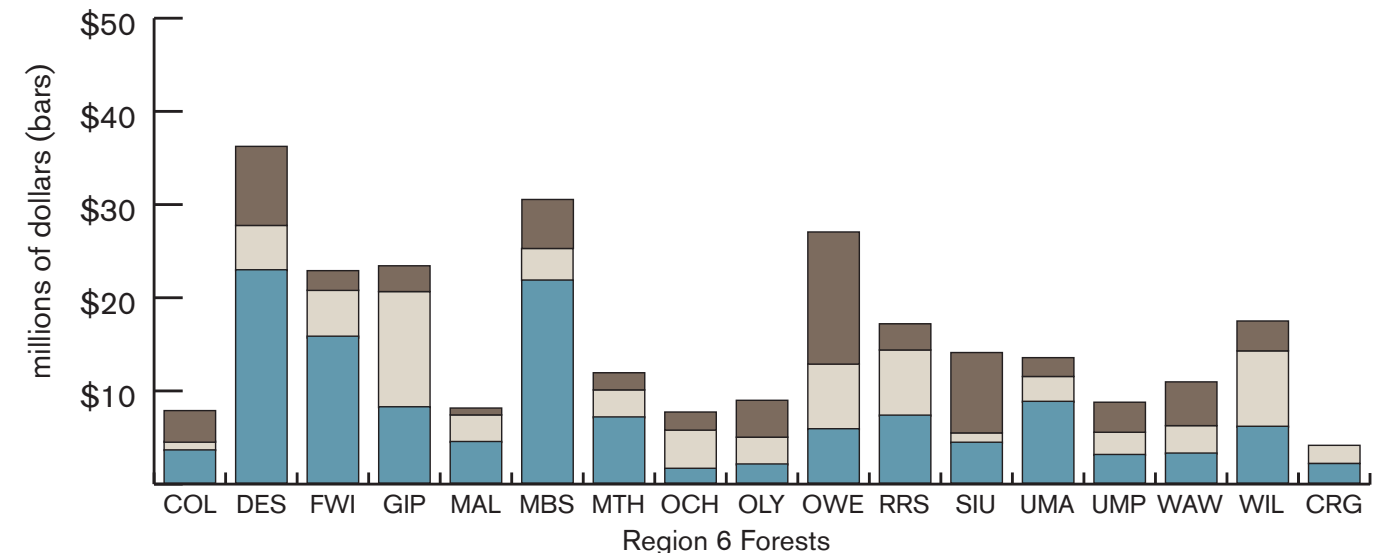


How is “local” defined?

Local= grants and agreements with cooperators whose address is located in a county that contains some portion of the national forest.

Non-local= grants and agreements without any cooperators in the counties bordering the national forest.

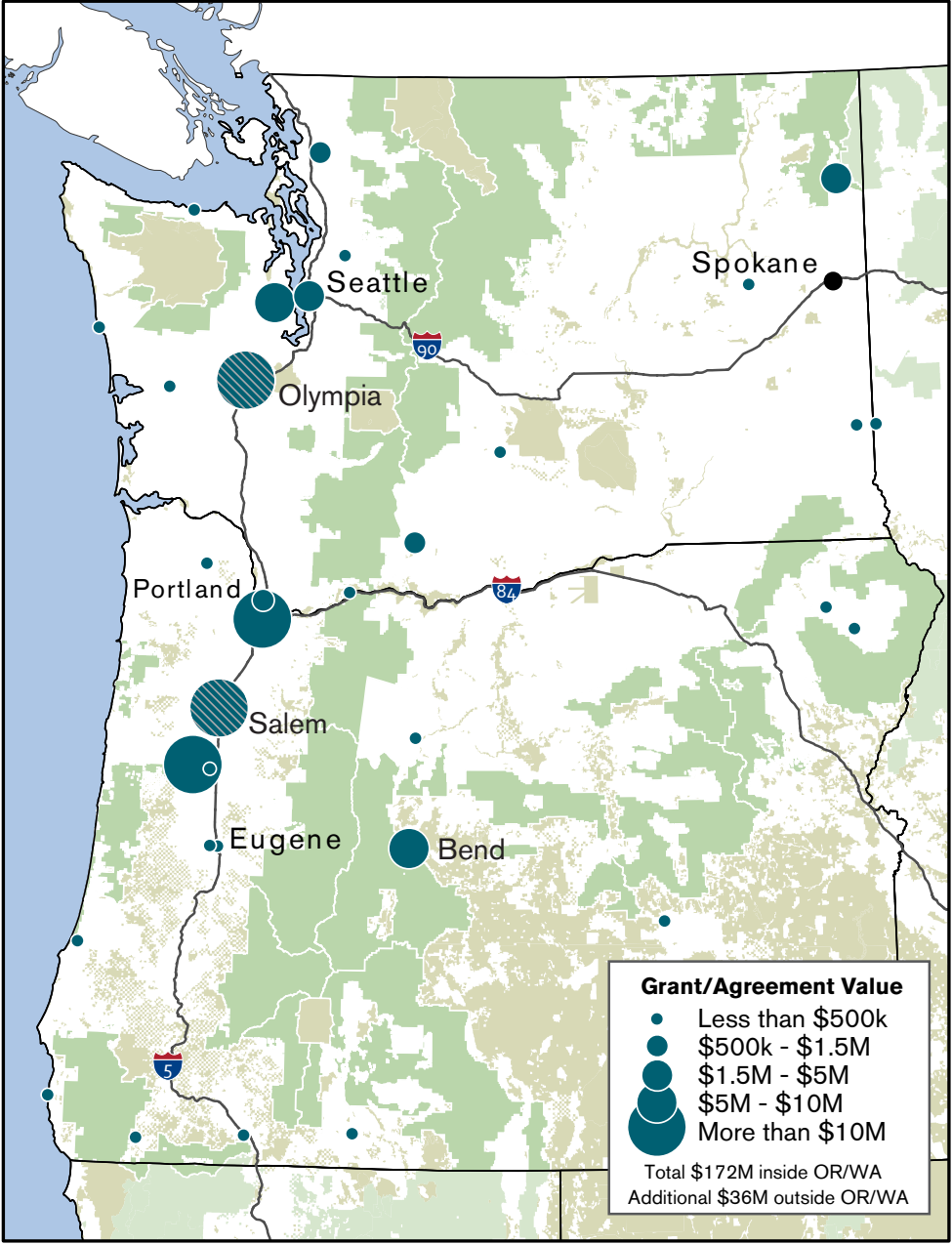
Figure 3.6 Grants and agreements awarded by national forest, FY 2011–2015



The maps below show the value of grants and agreements awarded by the Regional Office (Map 3.5) and individual forests (Map 3.6) within the region to organizations by organizational location. In these maps, the values awarded to state capitals (Salem, OR and Olympia, WA) are noted with diagonal lines in the award circles. The largest concentrations of awarded funds were in state capitals, since we linked state agency awards to their main branch. However, Bend, Oregon received the greatest number of awards. Most Regional Office funds are concentrated in large cities mainly in the western portions of Oregon and Washington. On the other map, funds from the national forests are more dispersed, particularly to locations bordering national forests. These

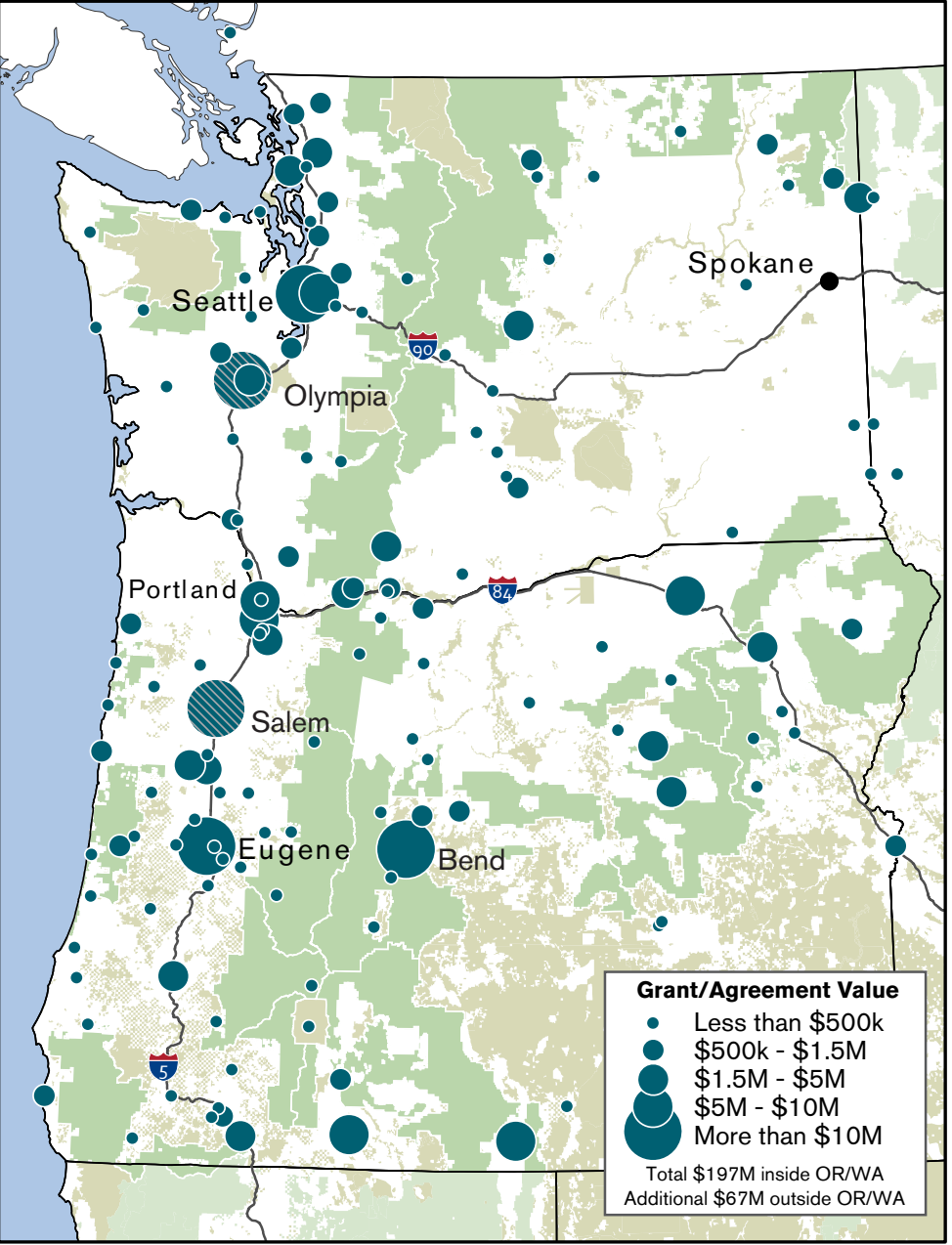
locations are typically population centers of some sort, a logical consequence given that most of these grants and agreements are awarded a government agency or NGO that is based in a town. When this map of grants and agreements holders awarded by national forests is compared to the map of service contractors (see Map 3.1 on page 24), or to a lesser degree, timber purchasers (Map 3.3, page 25), we can see that grants and agreements are more concentrated in more urbanized or larger population areas while service contractors and timber purchasers tend to be spread out in more places across the region, (many of which tend to be more rural or remote).

Map 3.5 Grants and agreements holders from Regional Office, FY 2011–2015



2011-2015 **REGION TOTAL** || Grants and agreements total value (RO) **\$208 million**

Map 3.6 Grants and agreements holders from national forests, FY 2011–2015



2011-2015 **REGION TOTAL** || Grants and agreements total value (NFs) **\$264 million**

3.3 Collaboratives

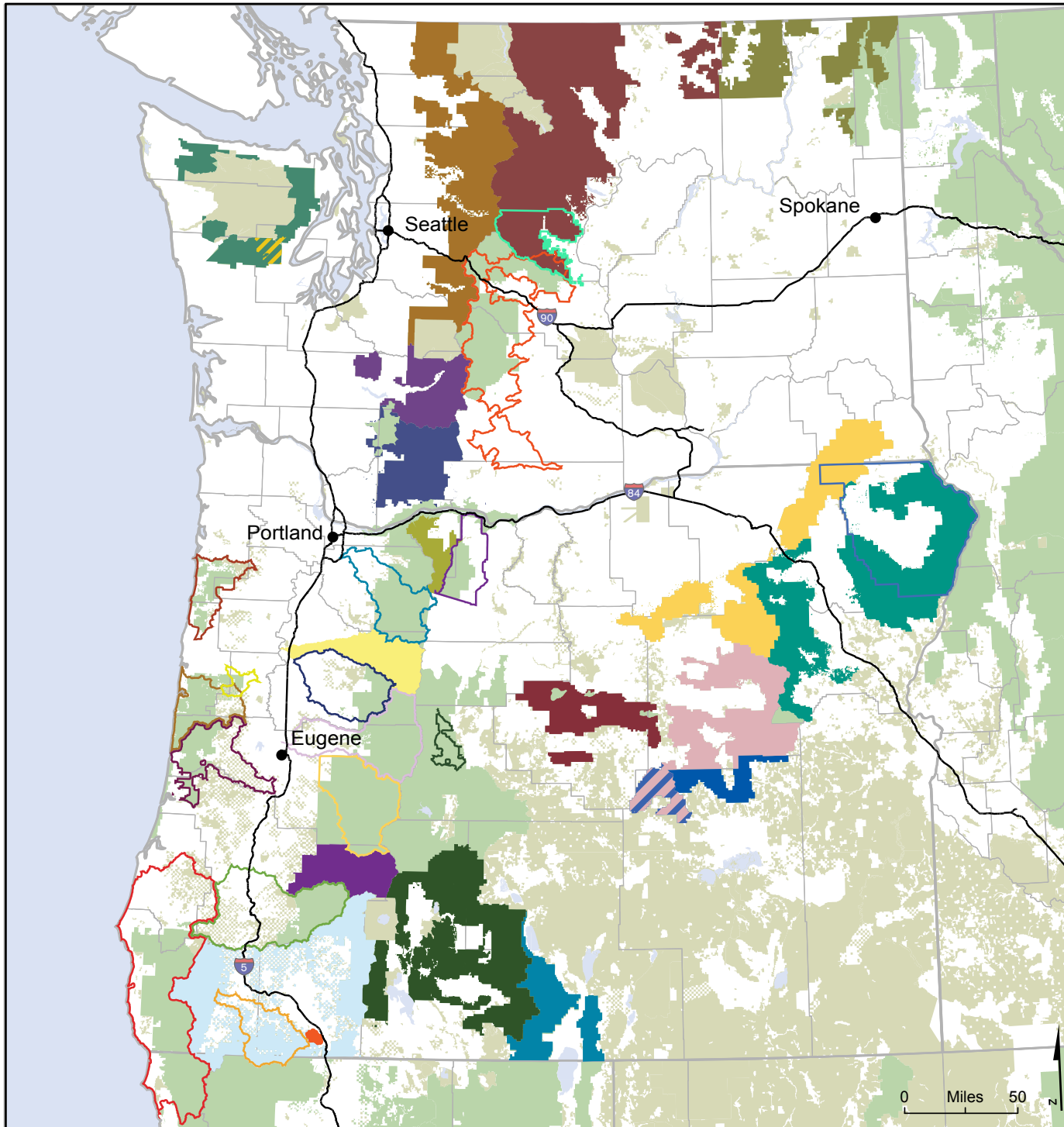
Collaborative engagement and community capacity investments

Community engagement in the form of collaboration can provide agency staff opportunities to address local community priorities, build community capacity, leverage resources, and increase accomplishments and benefits across the board. Oregon and Washington contain many forest collaboratives. **There are 35 collaboratives that work either exclusively or partially on national forestlands (see Map 3.7, page 30). All national forests in the Pacific Northwest Region are linked to at least one forest collaborative group.** Historically, collaboratives have played important roles in the Pacific Northwest in bridging rural and urban stakeholder needs and moving beyond bilateral relationships with diverse stakeholders to larger-scale, more integrated collaboration. Such integrated collaborative efforts are not appropriate for all contexts, but have the potential to work with Forest Service staff to effectively prepare for and plan restoration efforts that adhere to local and community values.

Collaboration is something that the Pacific Northwest Region is deeply committed to and has engaged in for decades. Forests engage with collaboratives linked to their forests in varying ways and to varying degrees. In addition to a long history of engagement with collaboratives, the Pacific Northwest Region is supporting collaborative groups by providing funding for organizational support. **In 2011, the Forest Service entered into a partnership with the National Forest Foundation to administer these funds through the Community Capacity and Land Stewardship (CCLS) Program (Map 3.8, page 31).** The grant program provides funding for activities such as meeting facilitation and monitoring, which are often difficult to fund. Forest collaborative groups depend on building and maintaining sufficient organizational capacity to address critical forest management issues in a timely manner. **Funds such as those provided by the CCLS program can provide opportunities to build local collaborative capacity to provide long-term forest management insights and support. This program has awarded \$1.05 million total from 2011-2016 to 29 different collaborative efforts in Oregon and Washington.**



Map 3.7 Forest collaboratives, Pacific Northwest Region, 2016



Public Lands Collaboratives

All Lands Collaboratives

Washington

Colville	Northeast Washington Forestry Coalition	
Gifford Pinchot	Pinchot Partners	
	South Gifford Pinchot Collaborative Group	
Mt. Baker-Snoqualmie	Darrington Collaborative	
Olympic	Olympic Forest Collaborative	
	Skokomish Watershed Action Team	
Okanogan-Wenatchee	N. Central Wa. Forest Health Collaborative	Chumstick Wildfire Stewardship Coalition
		Tapash Sustainable Forest Collaborative

Oregon

Deschutes		Deschutes Collaborative Forest Project
Fremont-Winema	Lakeview Stewardship Group	
	MSA on the Fremont-Winema NF	
Malheur	Blue Mountains Forest Partners	
	Harney County Restoration Collaborative	
Mt. Hood	Hood River Collaborative Stewardship Crew	Wasco County Forest Collaborative Group
		Clackamas Stewardship Partners
Ochoco	Ochoco Forest Restoration Collaborative	
Rogue River-Siskiyou	Ashland Forest Resiliency MSA	Applegate Partnership
	Southern OR Forest Restoration Collaborative	Wild Rivers Coast Forest Collaborative
Siuslaw		Alesea Stewardship Group
		Hebo Stewardship Group
		Marys Peak Stewardship Group
		Siuslaw Stewardship Group
Umatilla	Umatilla Forest Collaborative Group	
Umpqua	Umpqua Forestry Coalition	South Umpqua Rural Community Partnership
Wallowa-Whitman	Wallowa-Whitman Forest Collaborative	Wallowa County NRAC
Willamette	North Santiam Forest Collaborative	McKenzie Watershed Stewardship Group
		South Santiam All Lands Collaborative
		Southern Willamette Forest Collaborative

US Forest Service lands
 BLM and other federal lands

Created: 10/12/2016 Ecosystem Workforce Program, University of Oregon (2016)
 Data from Emily Jane Davis, Oregon State University
 R6 Forest Collaborative Groups
 Available online at: <http://ewp.uoregon.edu/publications/infographics>

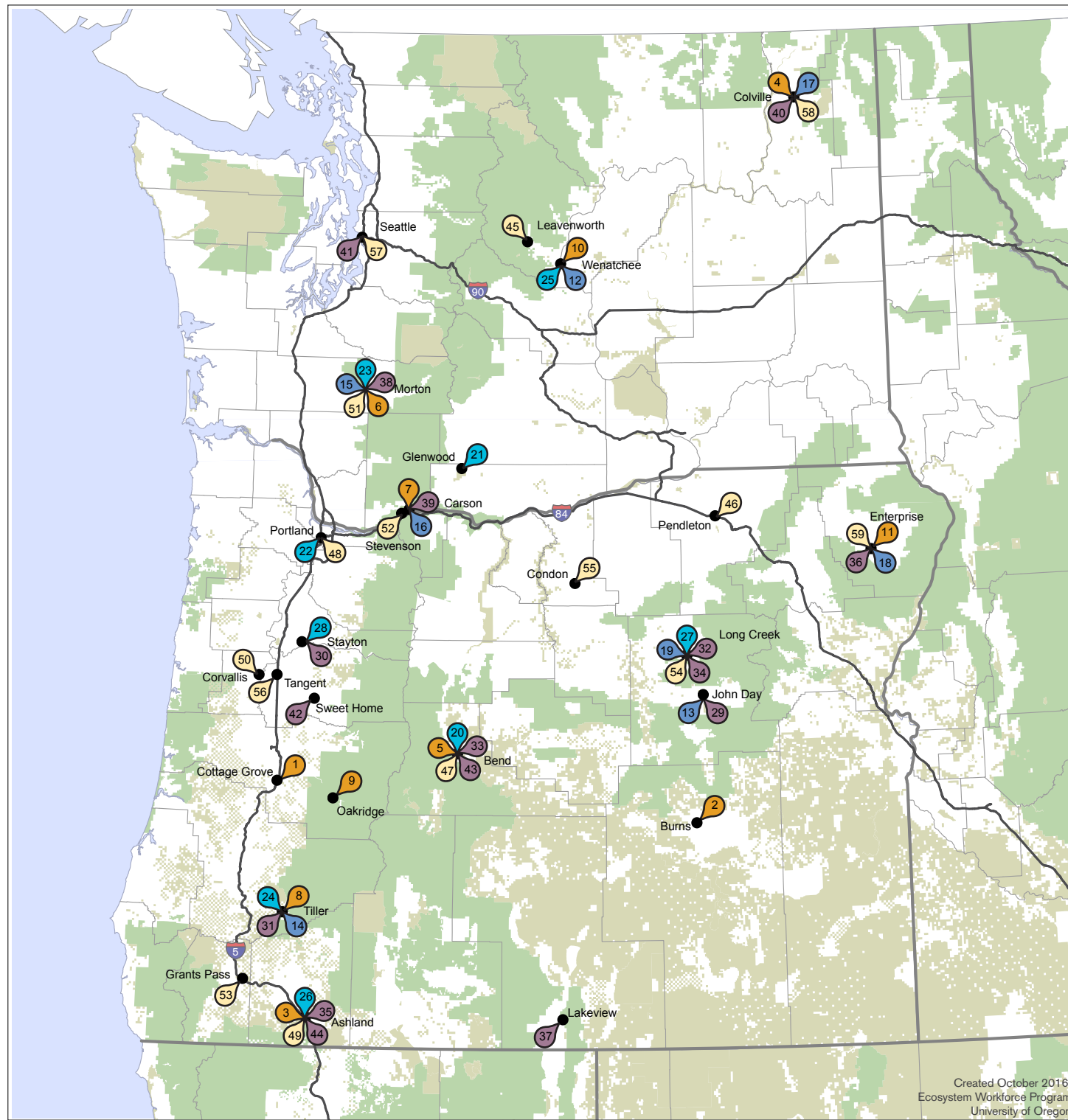


2016 REGION TOTAL




Active forest collaboratives

35

Map 3.8 Community Capacity and Land Stewardship Program awards, 2011–2016



The CCLS Program is administered by the National Forest Foundation

-  Community Capacity and Land Stewardship Awards
-  National forests
-  Other federal land

2011-2016	REGION TOTALS	Awards	Dollars awarded	Forests awarded
		59	\$1,050,315	14

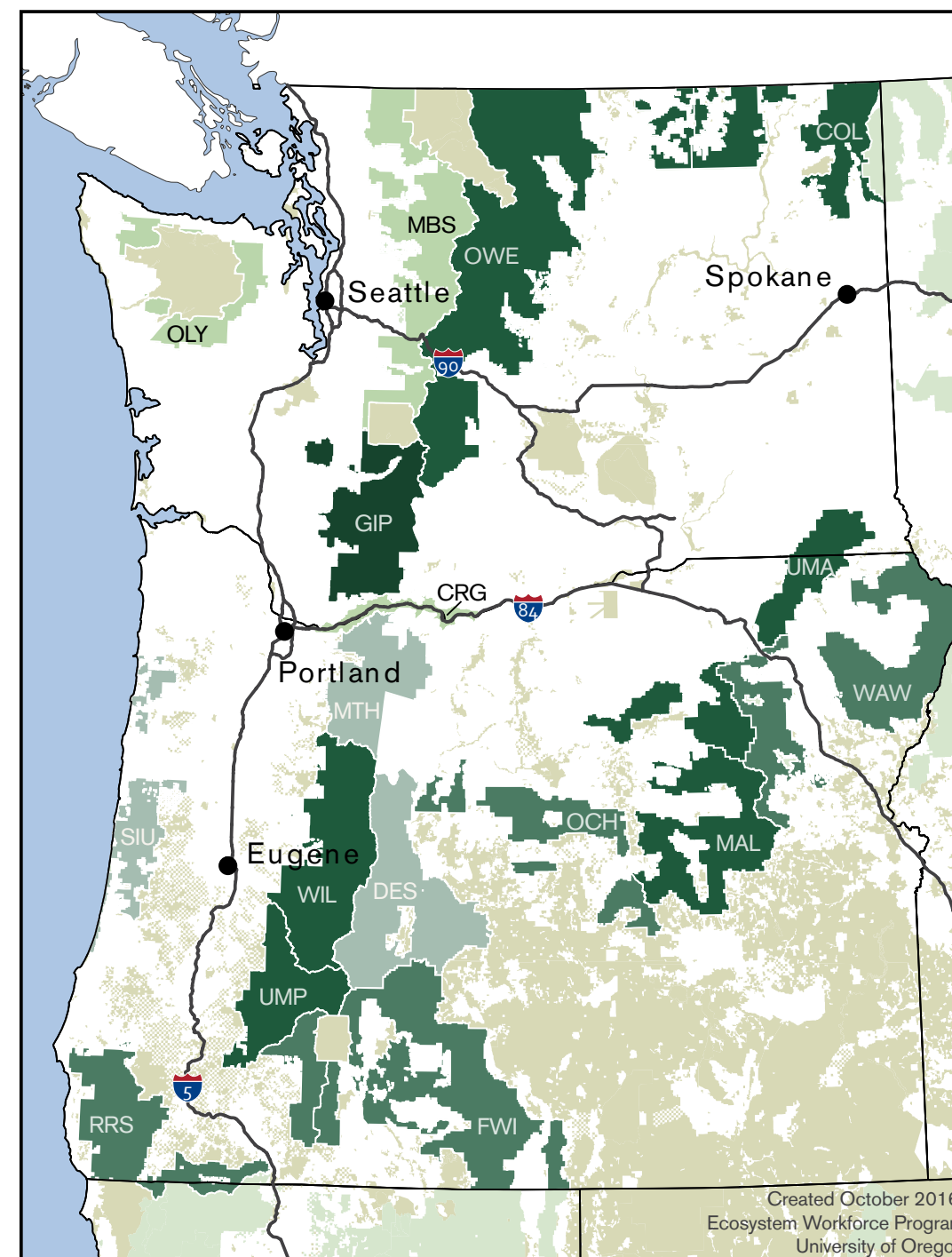
Year	Recipient	Award	Forest
2015-2016	1. Coast Fork Willamette Watershed Council	\$5,000	Umpqua National Forest
	2. High Desert Partnership	\$20,000	Malheur National Forest
	3. Lomakatsi Restoration Project	\$20,000	Fremont-Winema National Forest
	4. Northeast Washington Forestry Coalition	\$20,000	Colville National Forest
	5. Ochoco Forest Restoration Collaborative	\$20,000	Ochoco National Forest
	6. Pinchot Partners	\$5,000	Gifford Pinchot National Forest
	7. South Gifford Pinchot Collaborative	\$5,000	Gifford Pinchot National Forest
	8. South Umpqua Rural Community Partnership	\$5,000	Umpqua National Forest
	9. Southern Willamette Forest Collaborative	\$20,000	Willamette National Forest
	10. Upper Columbia Salmon Recovery Board	\$20,000	Okanogan-Wenatchee National Forest
	11. Wallowa Resources Inc.	\$14,420	Wallowa-Whitman National Forest
2014	12. Upper Columbia Salmon Recovery Board	\$24,000	Okanogan-Wenatchee National Forest
	13. Blue Mountain Forest Partners	\$23,892	Malheur National Forest
	14. South Umpqua Rural Community Partnership	\$21,175	Umpqua National Forest
	15. Pinchot Partners	\$12,000	Gifford Pinchot National Forest
	16. South Gifford Pinchot Collaborative	\$12,000	Gifford Pinchot National Forest
	17. Northeast Washington Forestry Coalition	\$24,000	Colville National Forest
	18. Wallowa Resources Inc.	\$20,000	Wallowa-Whitman National Forest
	19. North Fork John Day Watershed Council	\$21,175	Umatilla National Forest
	2013	20. Ochoco Forest Restoration Collaborative	\$23,980
21. Mt. Adams Resource Stewards		\$20,267	Gifford Pinchot National Forest
22. Clackamas Stewardship Partners		\$20,000	Mt. Hood National Forest
23. Pinchot Partners		\$20,000	Gifford Pinchot National Forest
24. South Umpqua Rural Community Partnership		\$24,000	Umpqua National Forest
25. Upper Columbia Salmon Recovery Board		\$11,200	Okanogan-Wenatchee National Forest
26. Josephine County Stewardship Group		\$8,000	Rogue River-Siskiyou National Forest
27. Umatilla Forest Collaborative Group		\$24,000	Umatilla National Forest
28. North Santiam Watershed Council		\$18,040	Willamette National Forest
2012	29. Blue Mountain Forest Partners	\$19,000	Malheur National Forest
	30. North Santiam Watershed Council	\$23,540	Willamette National Forest
	31. South Umpqua Rural Community Partnership	\$23,400	Umpqua National Forest
	32. North Fork John Day Watershed Council	\$24,000	Malheur National Forest
	33. Ochoco Forest Restoration Collaborative	\$23,947	Ochoco National Forest
	34. Umatilla Forest Collaborative Group	\$24,000	Umatilla National Forest
	35. Lomakatsi Restoration Project	\$24,000	Fremont-Winema National Forest
	36. Wallowa Resources Inc.	\$20,000	Wallowa-Whitman National Forest
	37. Lake County Resources Initiative	\$12,240	Fremont-Winema National Forest
	38. Pinchot Partners	\$24,000	Gifford Pinchot National Forest
	39. South Gifford Pinchot Collaborative	\$24,000	Gifford Pinchot National Forest
	40. Northeast Washington Forestry Coalition	\$24,000	Colville National Forest
	41. The Nature Conservancy in Washington	\$9,293	Okanogan-Wenatchee National Forest
	42. South Santiam Watershed Council	\$20,665	Willamette National Forest
	43. Deschutes Collaborative Forest Project	\$23,980	Deschutes National Forest
	44. Southern Oregon Small Diameter Stewardship Collaborative	\$24,000	Rogue River-Siskiyou National Forest
2011	45. Chumstick Wildfire Stewardship Coalition	\$15,000	Okanogan-Wenatchee National Forest
	46. Columbia Blue Mountain Resource Conservation and Development Council	\$9,192	Umatilla National Forest
	47. Deschutes Skyline Collaborative	\$15,000	Deschutes National Forest
	48. Clackamas Stewardship Partners	\$23,911	Mt. Hood National Forest
	49. Josephine County Stewardship Group	\$22,500	Rogue River-Siskiyou National Forest
	50. Marys River Watershed Council	\$23,720	Siuslaw National Forest
	51. Pinchot Partners	\$10,000	Gifford Pinchot National Forest
	52. Skamania County Economic Development Council	\$15,000	Gifford Pinchot National Forest
	53. Stream Restoration Alliance of the Middle Rogue	\$14,000	Rogue River-Siskiyou National Forest
	54. North Fork John Day Watershed Council	\$10,000	Malheur, Umatilla, and Wallowa-Whitman National Forests
	55. Lower John Day Conservation Workgroup	\$7,889	Ochoco, Deschutes, & Umatilla National Forests
	56. Cascade Pacific RC & D, Inc.	\$15,000	Siuslaw National Forest
	57. The Nature Conservancy in Washington	\$7,889	Okanogan-Wenatchee National Forest
	58. Northeast Washington Forestry Coalition	\$20,000	Colville National Forest
	59. Wallowa Resources Inc.	\$15,000	Wallowa-Whitman National Forest
Total awarded:		\$1,050,315	

Over the five years that the CCLS program has been providing awards, 14 of the forests in the region have had collaborative efforts linked to their forest awarded funds (Map 3.9, right). The Olympic and Mt. Baker-Snoqualmie National Forests and the Columbia River Gorge National Scenic Area have not received CCLS support to date. Table 3.1, on page 33, shows in greater detail the organizations, dollar amounts, and years that each forest received CCLS awards from 2011-2016. The years and amounts funded through CCLS vary, ranging from the two collaborative efforts on the Gifford Pinchot awarded over \$147,000, with two awards per program year, to the two collaborative efforts of the Siuslaw which were awarded \$38,720 total, all in 2011. In several cases, there were three collaboratives linked to a forest, all of which received CCLS funding, such as the Malheur, Okanogan-Wenatchee, Rogue River-Siskiyou, and Willamette National Forests.

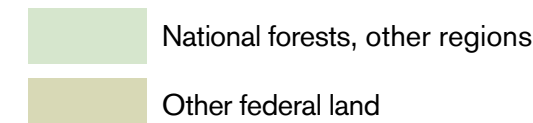
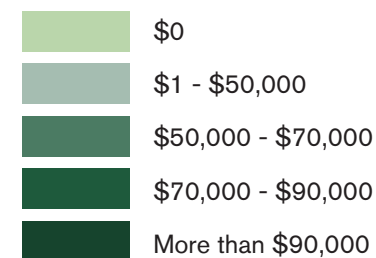
Overall, CCLS funds were linked to 29 different collaborative efforts. Of these, 27 link to collaboratives identified on the collaboratives map (one of which is an inactive/defunct group). This shows the direct connection between the Region's investments in collaboratives and the community capacity being built on and around national forests. The Mt. Baker-Snoqualmie National Forest has the youngest collaborative linked to their forest (established in 2015).

Two forests had collaboratives that received awards for every year CCLS was offered (Gifford Pinchot and Okanogan-Wenatchee). Most forests had collaboratives receiving funding on average three of the five years of CCLS. The needs for building and maintaining community capacity vary by forest, collaborative and existing social and economic conditions. While demand for funding from the CCLS Program exceeds the available resources, the program has been able to support organizational capacity for the vast majority of forest collaborative groups operating in the Region.

Map 3.9 Community Capacity and Land Stewardship award dollars by forest, 2011-2016



CCLS funds, 2011-2016



REGION TOTALS	Dollars awarded	Collaborative efforts awarded	Forests awarded
	\$1,050,315	27	14

Created October 2016
Ecosystem Workforce Program
University of Oregon

Table 3.1 Community Capacity and Land Stewardship awards by forest, 2011-2016

Forest	Awardees	2011*	2012	2013	2014	2015-2016	Total \$
Colville	Northeast Washington Forestry Coalition	\$20,000	\$24,000		\$24,000	\$20,000	\$88,000
Deschutes	Deschutes Collaborative Forest Project	\$15,000	\$23,980				\$38,980
Fremont-Winema	Lakeview Stewardship Group		\$12,240				\$56,240
	Lomakatsi Restoration Project		\$24,000			\$20,000	
Gifford Pinchot	Pinchot Partners	\$10,000	\$24,000	\$20,000	\$12,000	\$5,000	\$147,267
	South Gifford Pinchot Collaborative Group	\$15,000	\$24,000	\$20,267	\$12,000	\$5,000	
Malheur	Blue Mountains Forest Partners		\$19,000		\$23,892		\$86,892
	Harney County Restoration Collaborative					\$20,000	
	North Fork John Day Watershed Council		\$24,000				
Mt. Baker-Snoqualmie	—						\$0
Mt. Hood	Clackamas Stewardship Partners	\$23,911		\$20,000			\$43,911
Ochoco	Ochoco Forest Restoration Collaborative		\$23,947	\$23,980		\$20,000	\$67,927
Olympic	—						\$0
Okanogan-Wenatchee	N. Central WA Forest Health Collaborative			\$11,200	\$24,000	\$20,000	\$87,382
	Tapash Sustainable Forest Collaborative	\$7,889	\$9,293				
	Chumstick Wildfire Stewardship Coalition	\$15,000					
Rogue River-Siskiyou	Southern OR Forest Restoration Collaborative		\$24,000				\$68,500
	Josephine County Stewardship Group	\$22,500		\$8,000			
	Stream Restoration Alliance of the Middle Rogue	\$14,000					
Siuslaw	Hebo Stewardship Group	\$15,000					\$38,720
	Mary's Peak Stewardship Group	\$23,720					
Umatilla	Umatilla Forest Collaborative Group	\$9,192	\$24,000	\$24,000	\$21,175		\$78,367
Umpqua	South Umpqua Rural Community Partnership		\$23,400	\$24,000	\$21,175	\$5,000	\$78,575
	Coast Fork Willamette Watershed Council/Umpqua Working Lands Collaborative					\$5,000	
Wallowa-Whitman	Wallowa-Whitman Forest Collaborative	\$15,000	\$20,000		\$20,000	\$14,420	\$69,420
Willamette	North Santiam Forest Collaborative		\$23,540	\$18,040			\$82,245
	South Santiam All Lands Collaborative		\$20,665				
	Southern Willamette Forest Collaborative					\$20,000	
Columbia River Gorge	—						\$0
Total		\$224,101	\$344,065	\$169,487	\$158,242	\$154,420	\$1,050,315

* In 2011, two additional CCLS awards were made to multiple forests: 1) North Fork John Day Watershed Council for the Malheur, Umatilla, and Wallowa-Whitman National Forests (\$10,000); 2) Lower John Day Conservation Workgroup for the Ochoco, Deschutes, & Umatilla National Forests (\$7,889). These awards are reflected in the row of totals.



3.4 Volunteers

Who volunteers with the Forest Service, what work do they do, and how do forests report these efforts?

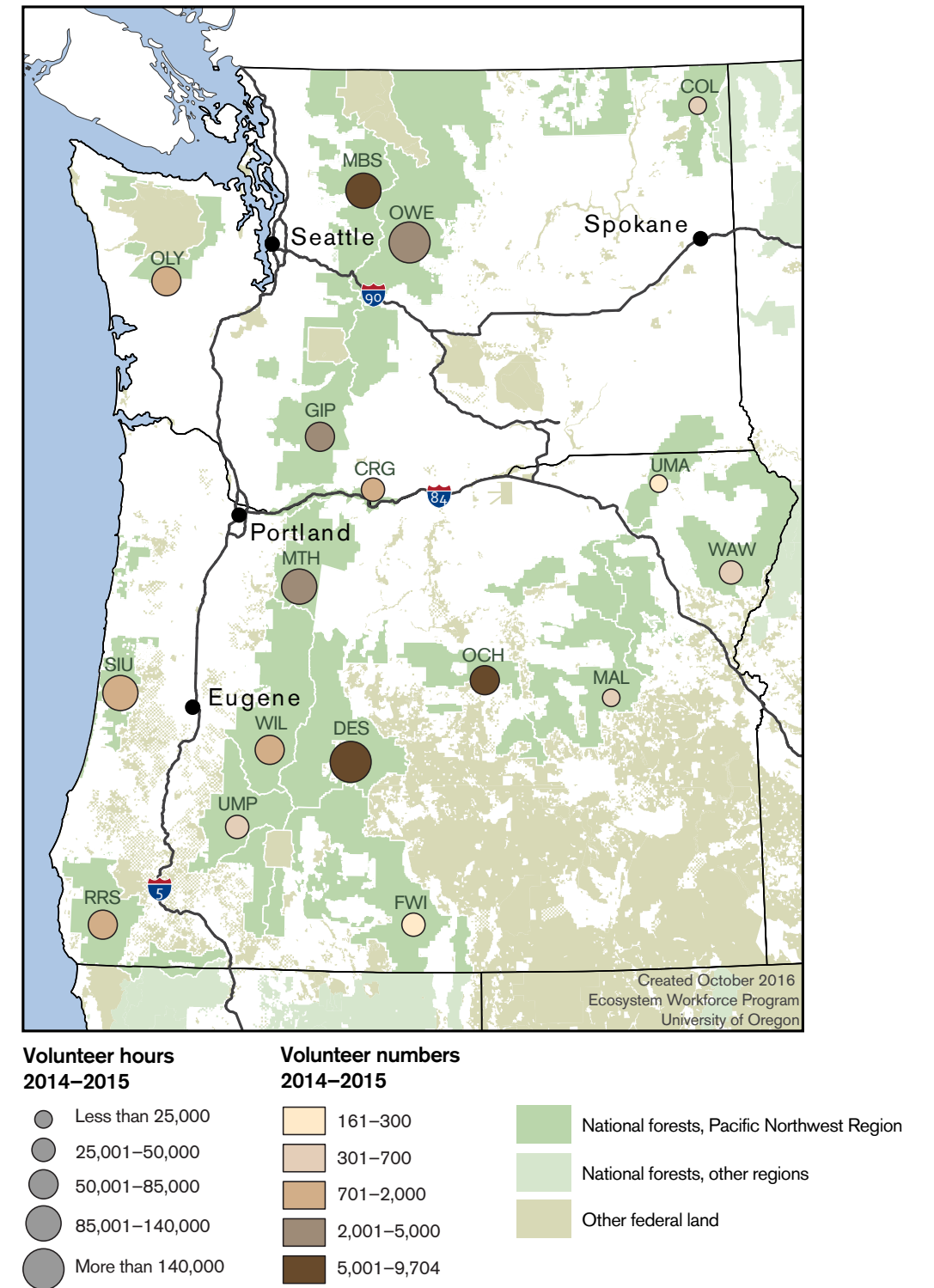
Volunteering provides opportunities for community members to help with many aspects of the agency’s work except law enforcement and firefighting, while learning about conservation, improving forests and grasslands, and giving back to the community. The Forest Service relies on volunteers to perform many valuable services, primarily related to recreation and wilderness. **The Pacific Northwest Region recorded over 1.3 million hours of volunteer time between FY 2014 and 2015.**

Both volunteer hours and number of volunteers varied by forest for FY 2014 and FY 2015, with the Ochoco National Forest/Crooked River National Grassland and the Mt. Baker-Snoqualmie National Forest reporting the highest number of volunteers (9,704 and 8,027, respectively), and the most volunteer hours reported by the Deschutes and Okanogan-Wenatchee (215,864 hours and 178,276 respectively).

In Map 3.10 (right) we report both the number (represented by circle size) and the hours (represented by circle color) of volunteers because in some cases, forests reported fewer numbers of volunteers contributing higher numbers of hours. This map shows that **volunteers provide a wide range of hours: although a forest had a large number of volunteers, they may have worked fewer hours on average than another forest with fewer people contributing more hours.** For example, although the Siuslaw reported one of the smaller number of volunteers (702), they constituted a larger number of volunteer hours (105,112), which equated to an average of 150 hours per volunteer. Conversely, the Ochoco/Crooked River had a large number of volunteers (9,704) as compared to their total contributed hours (67,622), which equated to an average of only 7 hours per volunteer.

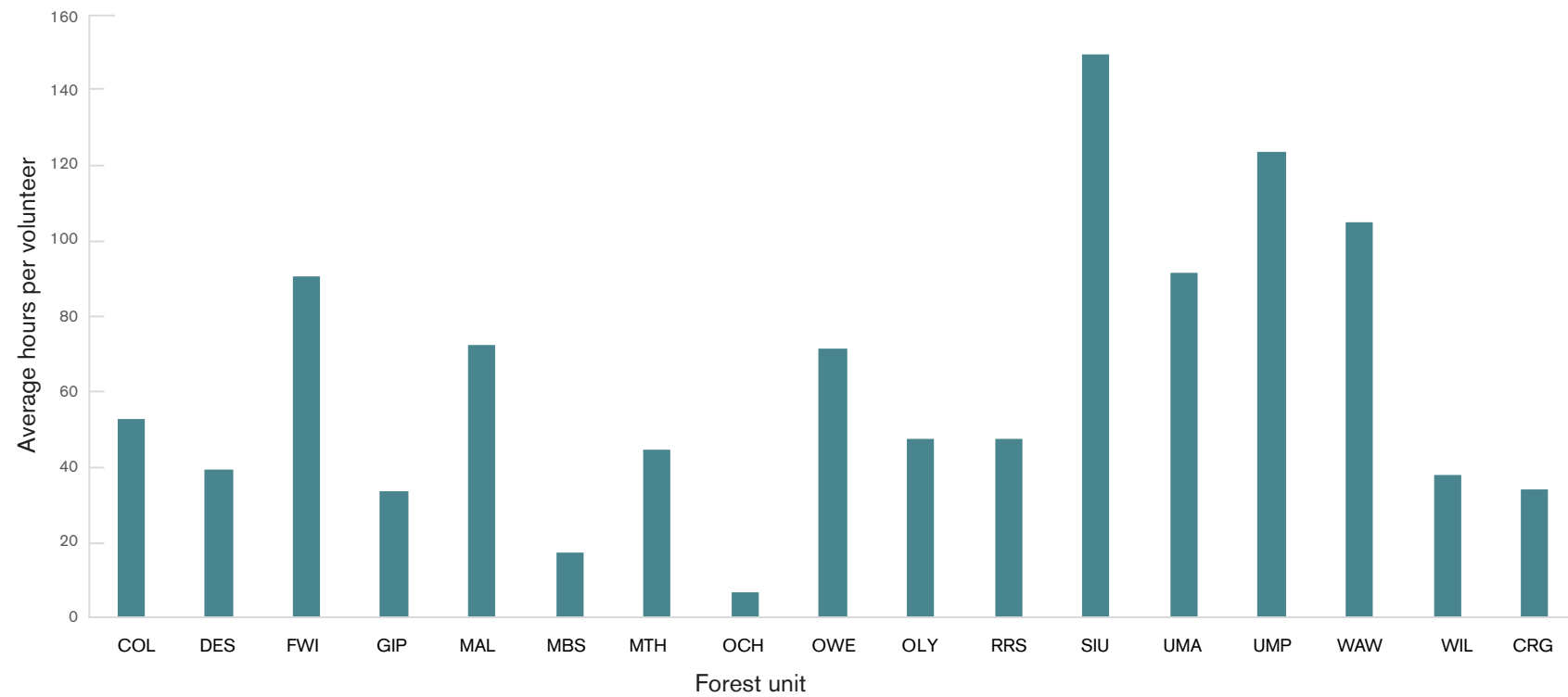
Variations between the number of volunteers and volunteer hours can be seen in greater detail in Figure 3.7 (page 35), which shows the **average** volunteer hours per volunteer for each forest.

Map 3.10 Volunteer numbers and hours by national forest, FY 2014- 2015



2014-2015	REGION TOTALS	Volunteer hours	Number of volunteers	Average hours per volunteer
		1,325,182	38,523	34

Figure 3.7 Average volunteer hours per volunteer, FY 2014-2015

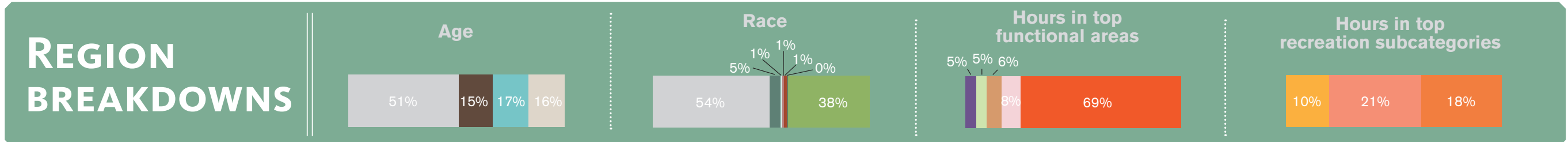
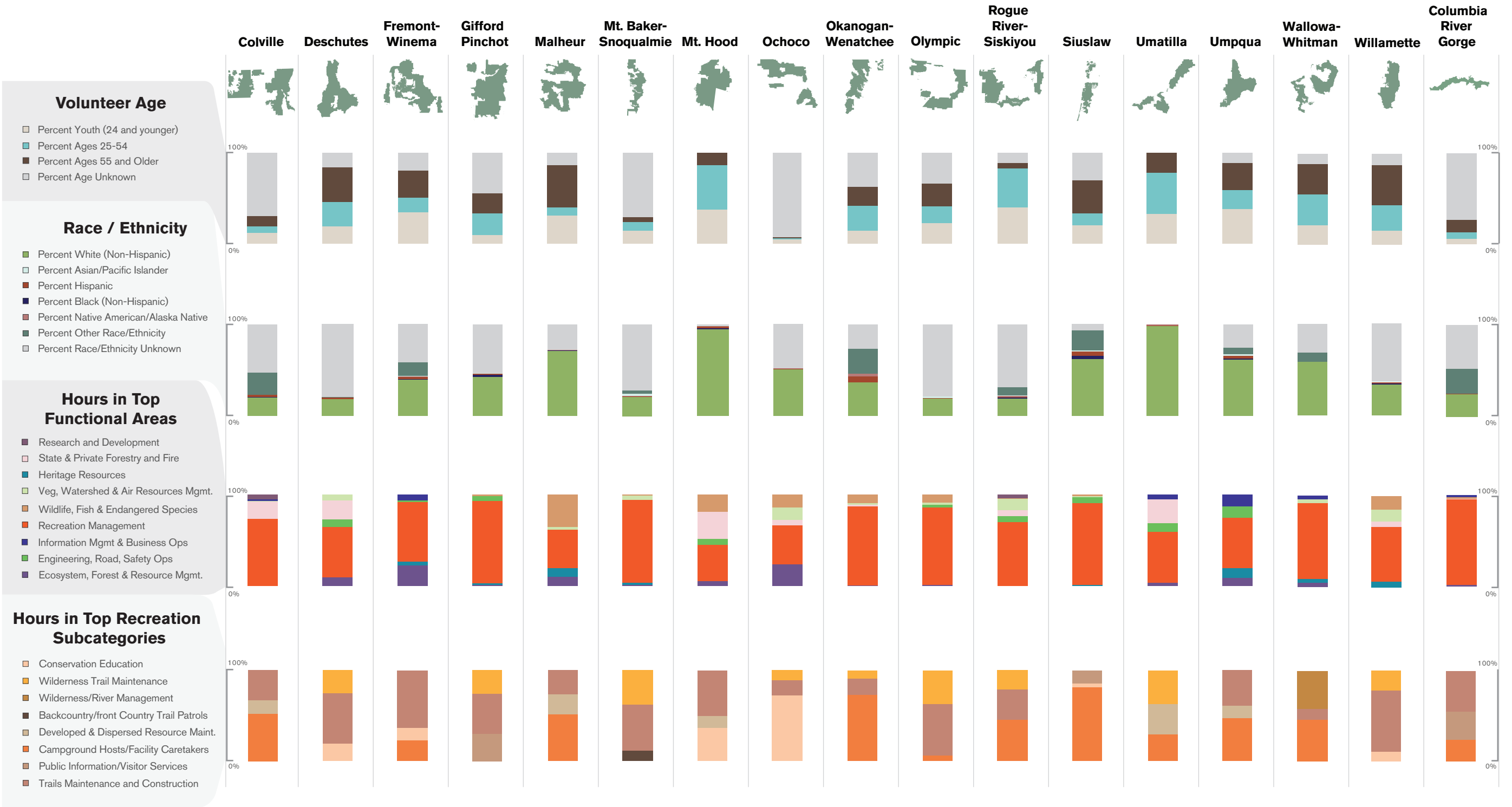


Data reported from forests across the region about the volunteers they partner with and the work they engage in is summarized in Figure 3.8 (page 36). We found that over half of demographic information about volunteers was listed as unknown during FY 2014-2015 across the region: 54 percent of all race/ethnicity data, and 51 percent of volunteer age data for the region in FY 2014-2015 reported as Unknown. The majority of volunteers for which race/ethnicity was reported listed race/ethnicity as White (Non-Hispanic) (38 percent of all volunteers), followed by the race/ethnicity category of Other (5 percent of all volunteers). Of the reported volunteer ages, ages 25-54 were reported most frequently (17 percent), followed by 16 percent youth, and 15 percent over 55.

This reporting of volunteer demographic characteristics varied by forest, meaning that some forests reporting high levels of unknown data contributed to the regional levels of unknown data. For example, the Umatilla and Mt. Hood reported less than 1 percent of their volunteer's race/ethnicity or age data as unknown. In contrast, three forests reported over 70 percent of volunteers' race/ethnicity and age as Unknown during FY 2014-2015.



Figure 3.8 Volunteer demographics and work types, FY 2014-2015



During FY 2014-2015, volunteers contributed 1,325,182 hours of time across Region 6. The top 5 functional areas (constituting 93 percent of all volunteer hours) in terms of accumulated volunteer hours were:

- Recreation (69 percent of total volunteer hours)
- State & Private Forestry and Fire (8 percent of total volunteer hours)
- Wildlife, Fish and Threatened & Endangered Species (6 percent of total volunteer hours)
- Vegetation, Watershed & Air, Natural Resources Management (5 percent of total volunteer hours)
- Ecosystem, Forest & Natural Resource Management (5 percent of total volunteer hours)

A majority of all volunteer hours during these two years went to functional areas within “recreation,” which is broken out by subcategory in Figure 3.8. Over two-thirds of the total volunteer hours in recreation went to: trail maintenance and construction (21 percent of total hours), campground hosts/facility caretakers (18 percent of total hours), and wilderness trails maintenance and construction (10 percent of total hours).

Volunteers with Veteran designation and volunteers with disabilities

The Pacific Northwest Region reported a total of 38,523 volunteers during FY 2014-2015, including 286 people with Veteran designation, and 190 people with disabilities (One percent of total volunteers between the two categories) (see Figures 3.9 and 3.10). Two forests reported the majority of individuals with Veteran designation for the region: the Gifford Pinchot (118 volunteers) and Okanogan-Wenatchee (60 volunteers). The Deschutes, Malheur, and Mt. Hood National Forests, and Columbia River Gorge NSA did not report any volunteers with Veteran designation.

The Mt. Baker-Snoqualmie and Deschutes National Forests reported the greatest number of volunteers with disabilities in FY 2014-2015 (85 and 52 individuals, respectively). Five national forests and the Columbia River Gorge NSA did not report any volunteers with disabilities during the timeframe. The small numbers reported for these two categories of underserved populations may be due to underreporting numbers as much as it is lack of engagement with small and hard to access populations. This distinction should be further explored before assessing if improved reporting or volunteer documentation or improved engagement strategies should be employed.

Figure 3.9 Average number of volunteers with Veteran designation, FY 2014-2015

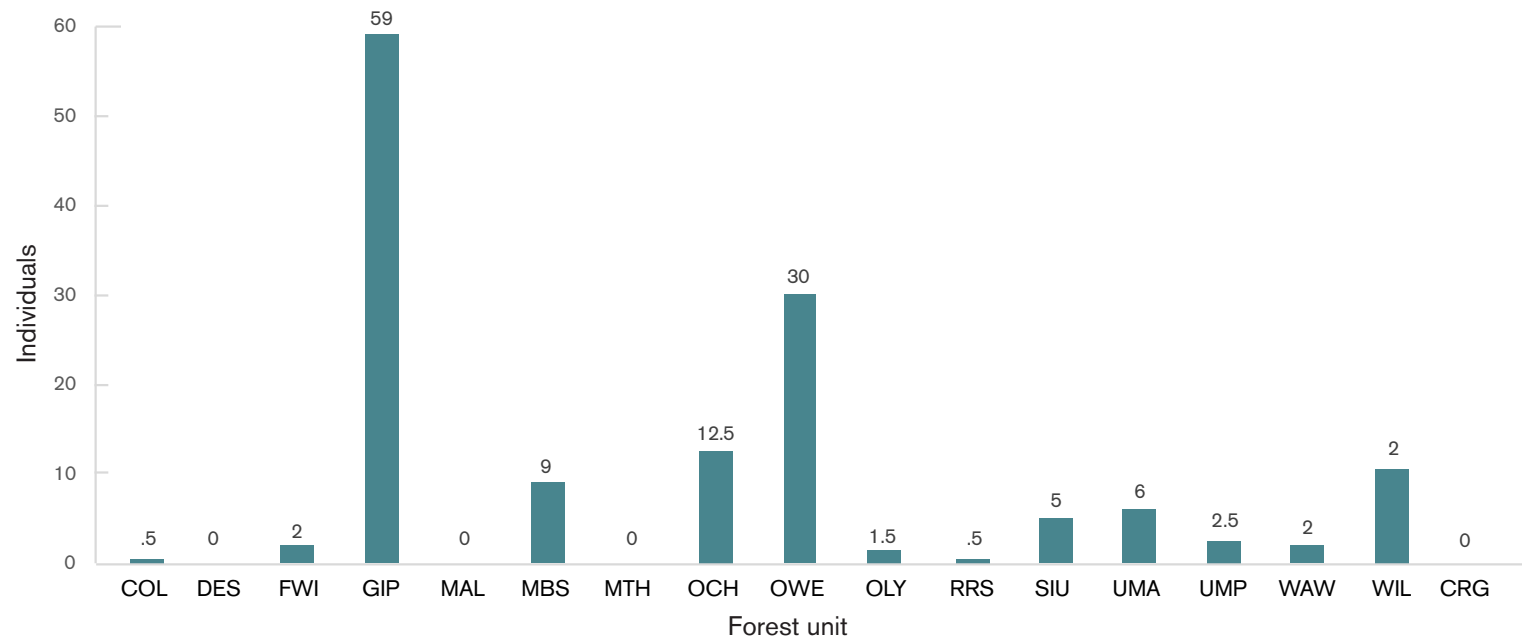
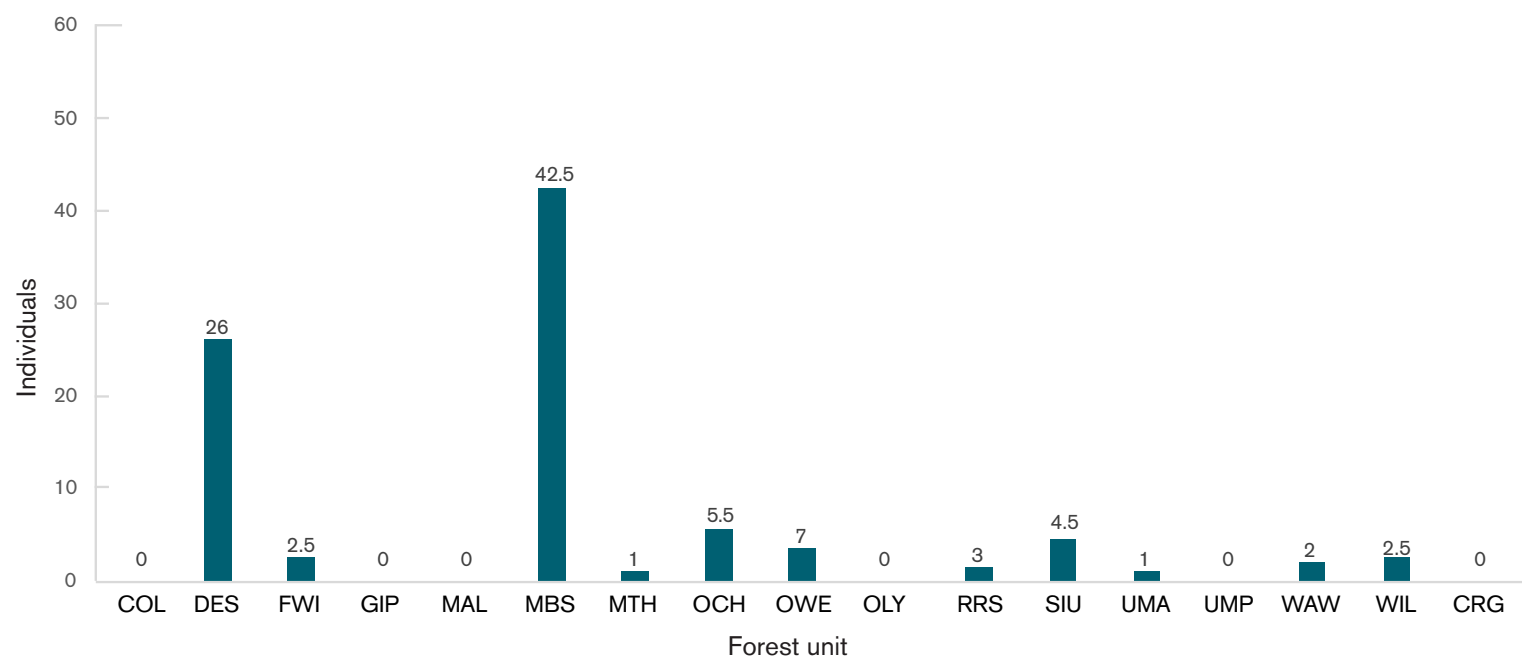


Figure 3.10 Average number of volunteers with disabilities, FY 2014-2015



2014-2015	REGION TOTALS	Volunteers with Veteran designation	Volunteers with disabilities
		286	190

Volunteer person years and how they relate to forest characteristics

Another way to conceptualize volunteers beyond count of people and hours is by person years. A person year is the hours served by one person in one year, if volunteering on a full-time basis. This concept is used to convert the hours served by many part-time or short-term volunteers into the hours served by a full-time volunteer. For the purposes of the Volunteers & Partners Accomplishments Database, 1,800 volunteer hours compose one volunteer “person-year.”

When we translate all volunteer contributions to person years, we still see wide variation across the region, from a high of 58 person years on the Okanogan-Wenatchee to a low of 4 person years on the Colville (See Figure 3.11, below). Other forests with greater numbers of volunteer person years included Deschutes (55 person years), Mt. Baker-Snoqualmie (34 person years), and

Okanogan-Wenatchee (58 person years). Forests with the smallest number of volunteer person years included Colville (4 person years), Malheur and Umatilla (8 person years each).

It is not surprising that the number of volunteers and hours are so varied across forests, as the forests themselves are varied in their size, uses, and administrative components. To demonstrate this, we scaled the person hours per forest to forest characteristics (acres, full-time personnel, visitors, and budget), to demonstrate the number of volunteer person years relative to different forest characteristics (Figure 3.12, page 39).

The units with 16 volunteer person years (Mt. Hood, Ochoco National Forest and Crooked River National Grassland, Olympic, and Columbia River Gorge NSA) have a range of person years per acres, ranging from 5,000 acres per volunteer person year in the Columbia River Gorge to 68,000 acres per volunteer person year on Mt. Hood. This shows for example that the Gorge has a large number of volunteer person years, given its size, exist-

ing staff and budget, but few volunteers in comparison to the number of visitors it receives, as one of the most visited areas. At the other end of this range, Colville has very few volunteer person years compared to its size, personnel, and budget, but a relatively small number of visitors per person year. Figure 3.12 shows that the size of the forest does not relate to the number of volunteers (larger forests don’t all have more volunteers), just as forests’ budgets don’t link consistently to volunteer years. The Mt. Baker-Snoqualmie and Mt. Hood are both popular recreation forests, with the highest reported annual visitors in the region. The Mt. Baker-Snoqualmie however has more than twice the number of volunteer person years as the Mt. Hood. Annual visitors per volunteer person year is the most constant size circles of the rows, with the exception of the Mt. Hood and Columbia River Gorge (124,000 and 85,000 visitors per volunteer person year, respectively).

Person year

The hours served by one person in one year, if volunteering on a full-time basis.

This concept is used to convert the hours served by many part-time or short-term volunteers into the hours served by a full-time volunteer. For the purposes of the Volunteers & Partners Accomplishments Database, 1,800 volunteer hours compose one volunteer “person-year.”

For the graphics on this page:  = 10 person years

Figure 3.11 Volunteer person years per unit, FY2015

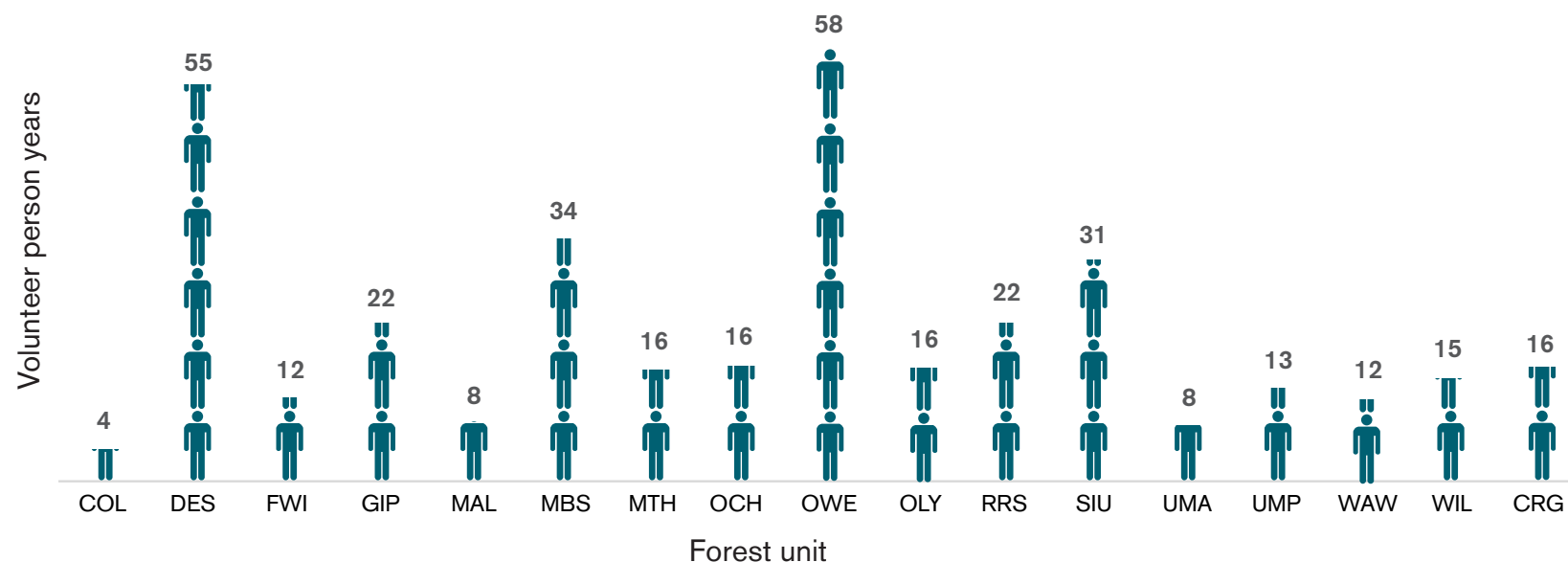
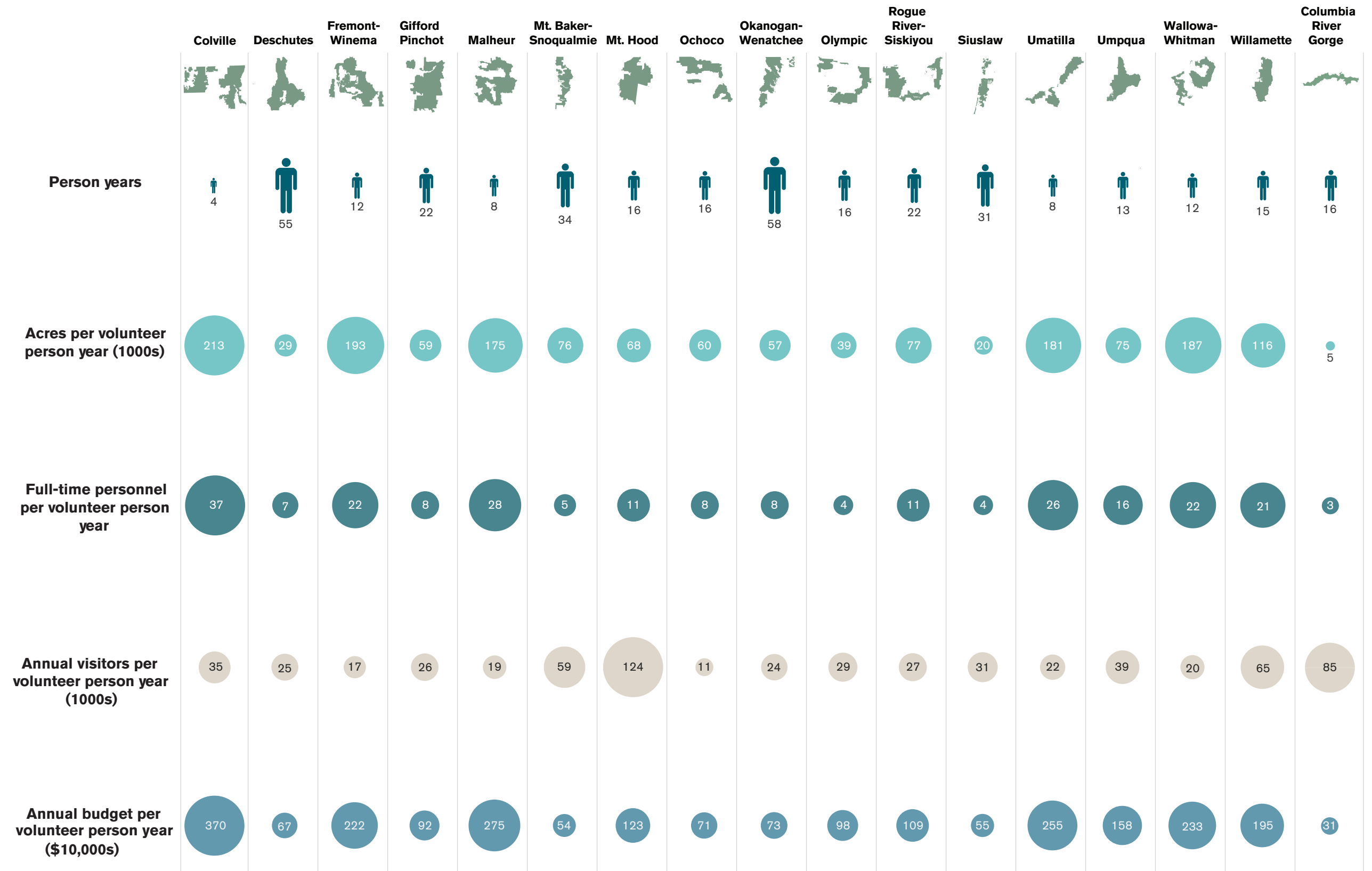


Figure 3.12 Volunteer person years per forest, as they relate to forest size and average personnel, visitors, and budget, FY 2015



2015 REGION TOTALS

- Person years: 369
- Acres per volunteer person years: 67,000
- USFS personnel per volunteer person year: 11
- Annual visitors per volunteer person year: 36,000
- Budget per volunteer person year: \$1,230,000

3.5 Conservation education and outreach

Accomplishments reported

The Forest Service also works with partners for education and outreach activities. These accomplishments are reported in the web-based NatureWatch, Interpretation, and Conservation Education (NICE) database, and shared with the public, partners and leadership. This database should be used for all outreach and education programs for which the Forest Service provides funds and/or staff time, as it is the primary way the Forest Service tracks and monitors conservation education activities nationwide.

Accomplishments in NICE are defined as: “an educational program, experience and/or activity that encourages people to understand and appreciate natural resources and learn how to conserve them for future generations.”

Between FY 2011-2016, the Pacific Northwest Region reported 949 events reaching a total audience of over 1.8 million people. These programs covered 20 different initiatives, 71 subjects and employed 19 different delivery methods. Although we report total numbers in this section, due to inconsistent reporting in NICE in the past we emphasize that the story we tell here about main themes is more important than the total numbers reported. The main types of audiences, subjects, initiatives and delivery methods vary across forests, with many of the initiatives being reported on less than five of the 17 units in the region. We do not know how much of the low numbers reported are due to forests not reporting relevant accomplishments versus forests not engaging in these particular efforts, but conversations with Forest Service personnel suggest that inconsistent reporting in previous years (prior to 2016) is a concern for numbers reported in this database.

Audience

We report audience for educational programs as the number of individuals that forests reported reaching with their educational programs. Across the region, forests reported reaching a total audience of more than 1.8 million individuals during FY 2011–2016. The Columbia River Gorge NSA reported reaching more than 950,000 people during this period, which constitutes over half the total audience for the Pacific Northwest Region (see Figure 3.13, right).

The audience for Columbia River Gorge NSA educational programs was primarily composed of forest visitors, with some

Conservation education accomplishment:
 “an educational program, experience and/or activity that encourages people to understand and appreciate natural resources and learn how to conserve them for future generations”

general public and a small portion (two percent) of youth audience (see Figure 3.14, right). The national forests most frequently reported the general public (46 percent) as their engaged audience, while 27 percent of reported audiences were made up of youth aged 25 and younger.

Across the forests individually (not including the Columbia River Gorge NSA), the total audience of NICE programs varied from a high of 229,566 individuals reported by the Deschutes to a low of 223 individuals reported by the Malheur NF during FY2011-2016 (see Figure 3.14, page 41). Forests reported on average 52,000 individuals in their outreach and education audiences. The Pacific Northwest Regional Headquarters (not shown in figure 3.14) reported an audience of 12,500 individuals over the six-year time period.

The type of reported audience varied widely between forests, with some forests reporting a much higher proportion of youth than others. The Olympic and Umatilla, for example, both reported over 70 percent of their audience as Youth. In contrast, Mt. Baker-Snoqualmie reported only 10 percent, and the Columbia River Gorge NSA reported just 2 percent of their audiences as youth. These regional variations, namely the low rates of youth reported in certain units (particularly those with large audience sizes) contributes to the low youth audience numbers reported when all accomplishments for the region are combined.

Subjects

Forests reported up to three different subjects for their educational efforts per event, totaling 71 different subject areas across the forests and years. Outdoor Recreation reached the largest audience (870,769, which was 90 percent forest visitors), compared to Photography which reached the smallest audience (5). Note that because forests reported multiple subjects per effort, total reach will be larger than the total audience number. Forest Service History was another popular topic, particularly for forest visitor audiences which constituted two thirds of the total 725,513 audience members. Reported subjects covered a broad spectrum of conservation education topics; the most common subjects (based on the size of the reported audience) are shown in Figure 3.15 (page 41).

Figure 3.13 Audience totals and type, conservation education and outreach programs, FY 2011–16

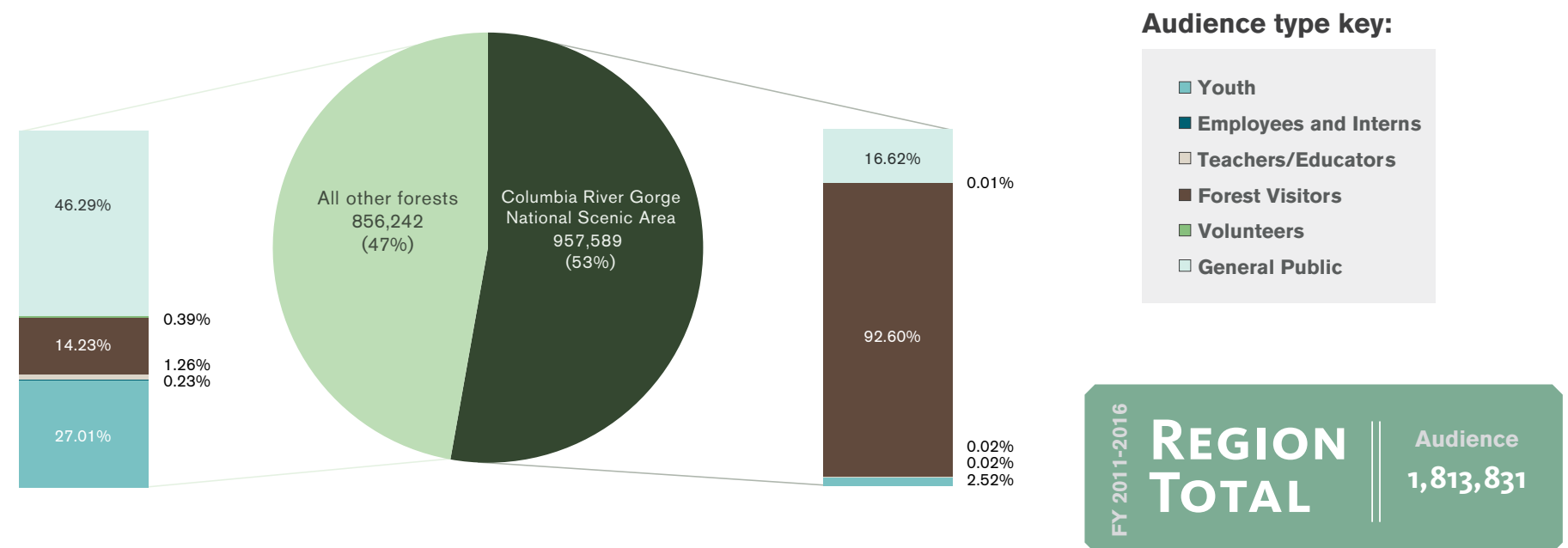


Figure 3.14 Conservation education audience totals by unit, FY 2011–16

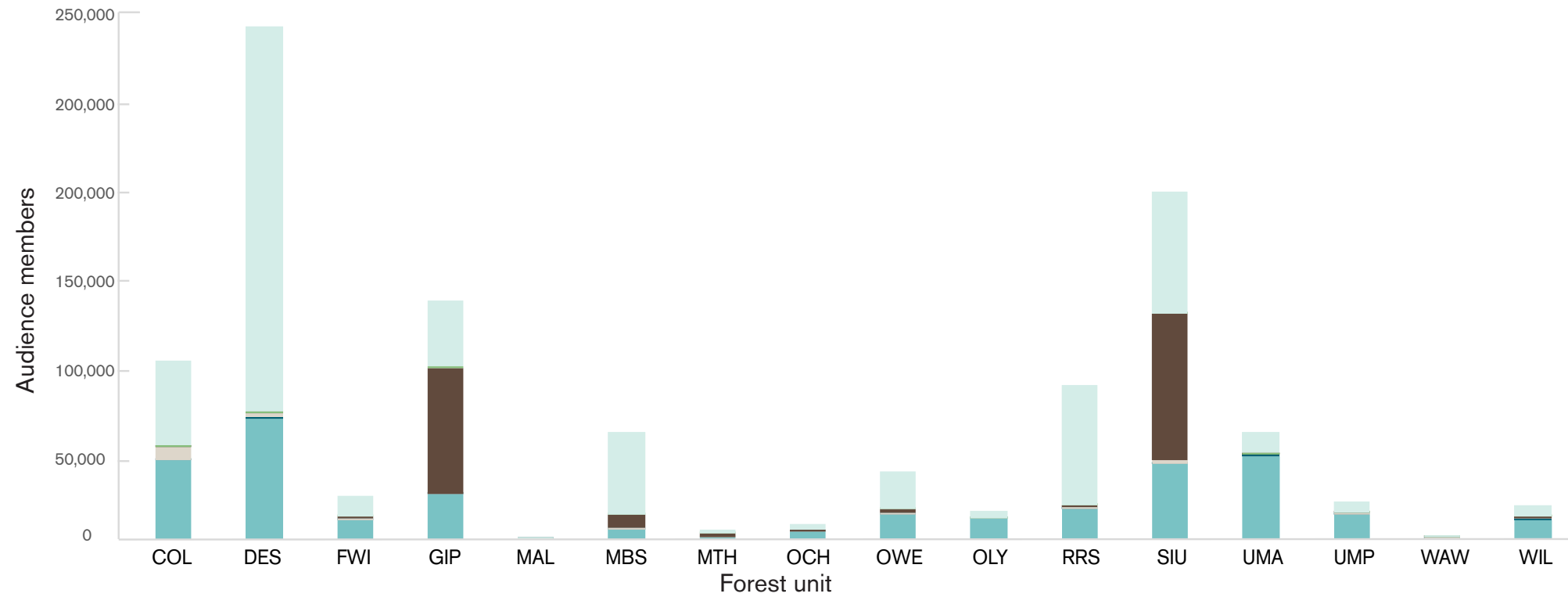
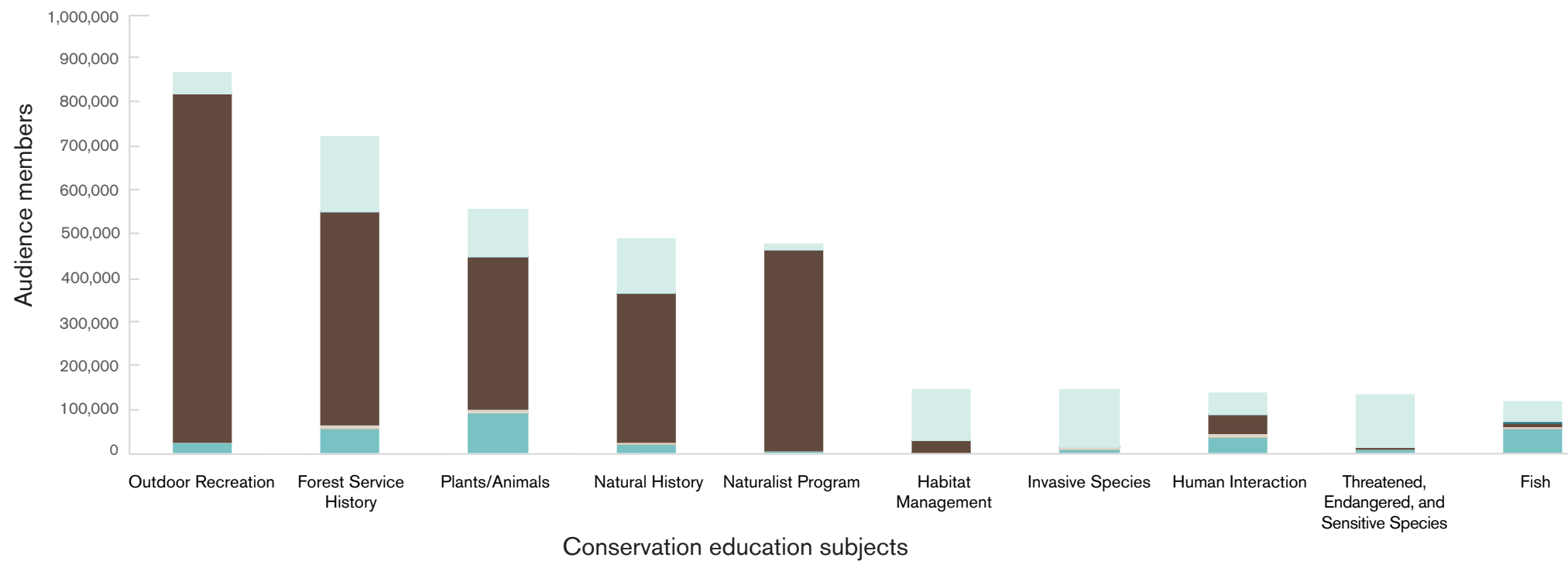


Figure 3.15 Top 10 conservation education subjects by audience size and type, FY 2011–16



Delivery method

Similar to subjects, forests could list multiple delivery methods for how they presented their information. Nineteen different delivery methods were reported by forests, with presentations and demonstrations as the most common approach (1.3 million individuals), and parades (700 people) as the least common (Figure 3.16, right).

Initiatives

Forests reported accomplishments linked to a total of twenty different initiatives. **The Leave No Trace initiative was the largest initiative (by a magnitude of over 10x) reported in the region between FY 2011-16, encompassing 23 percent of the total regional audience reported in NICE.** Ten units in the region reported accomplishments linked to Leave No Trace, the majority of which (93 percent of initiative audience) were reported by the Columbia River Gorge (Figure 3.17, below). The sheer size of audience for this initiative in comparison to other initiatives is further evident in Figure 3.18 (page 43).

Figure 3.16 Total audience by delivery method, FY 2011–16

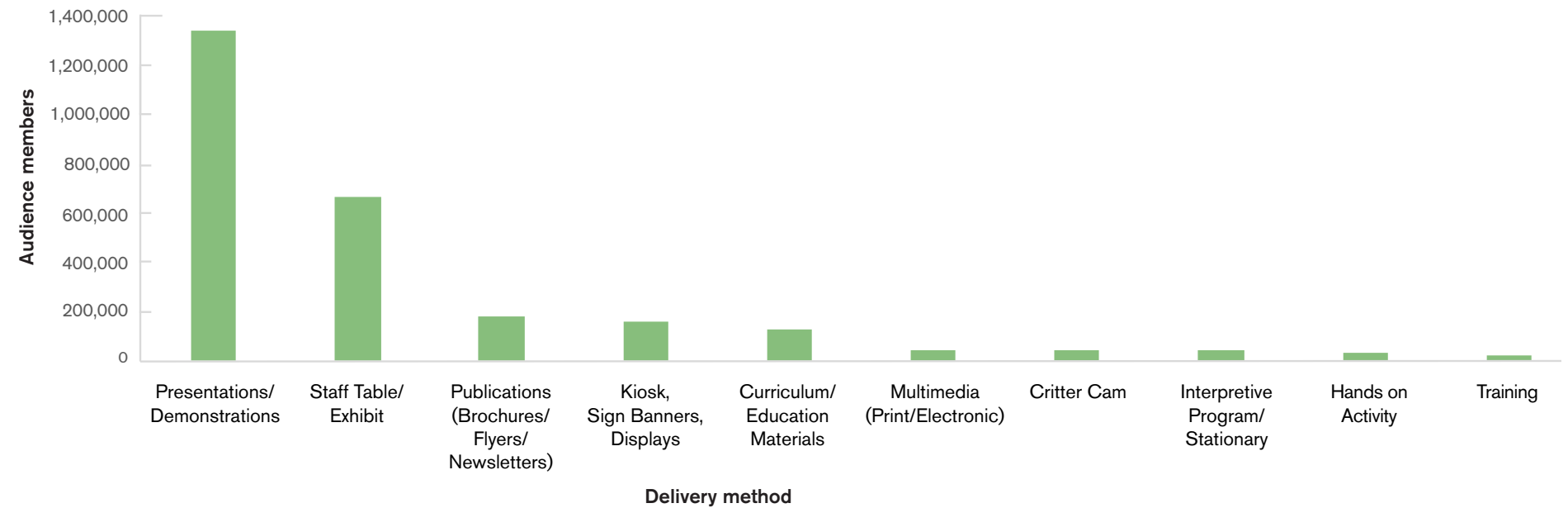
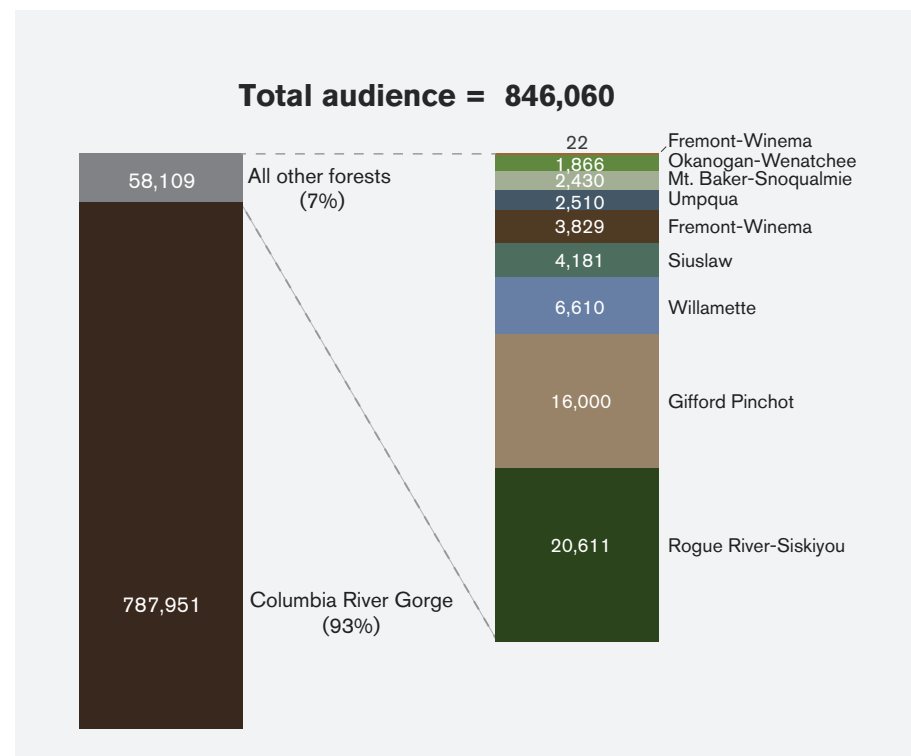


Figure 3.17 Leave No Trace Program, FY 2011-16



The other initiatives had audiences ranging from 14 individuals (Passport in Time and Hands on the Land) to 81,000 individuals (Children’s Forest, 71 percent of which were youth). The scaled pie charts in Figure 3.19 show the top 11 initiatives for the region, including the size of the audience (size of circle), type of audience (colors of the pie circle), and number of forests reporting the initiative (placement of pie on y axis). In this figure, we also include the Regional Office in our tally of units (y axis), as the Regional Office, along with forests, participated in some of these initiatives.

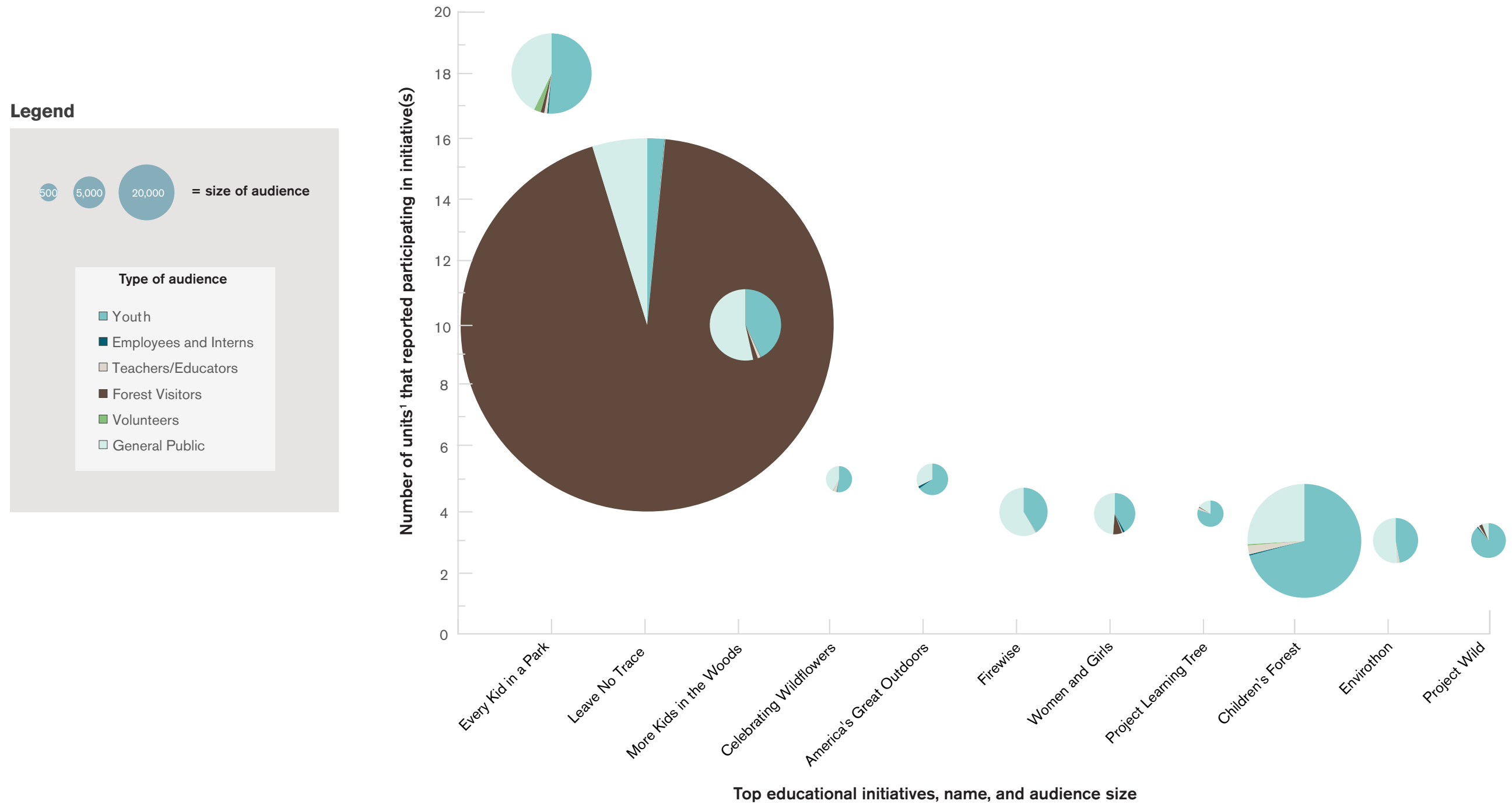
Figure 3.18 illustrates that initiatives vary in their size, not just by the number of forests reporting the initiative, but also the size and type of the audience. All 18 units (national forests, Columbia River Gorge NSA, and the Regional Office) reported programs in the “Every Kid in a Park” initiative; yet the audience total for this initiative was mid-size at 39,706 individuals. Similarly, the initiative More Kids in the Woods was reported by a high number of forests (10 forests), with an audience of 31,000 individuals. Even though Children’s Forests was the second largest initiative, only three Forests reported it in their accomplishments (Colville, Deschutes, and Ochoco). Even within these initiatives numbers varied, with Colville reporting

15,400 individuals compared to the Ochoco’s audience size of 330. Four forests reported events within the Firewise initiative, reaching a total audience of 14,465. The audience for this initiative was primarily General Public and Youth, which together make up 99.5 percent of the audience for the Firewise initiative.

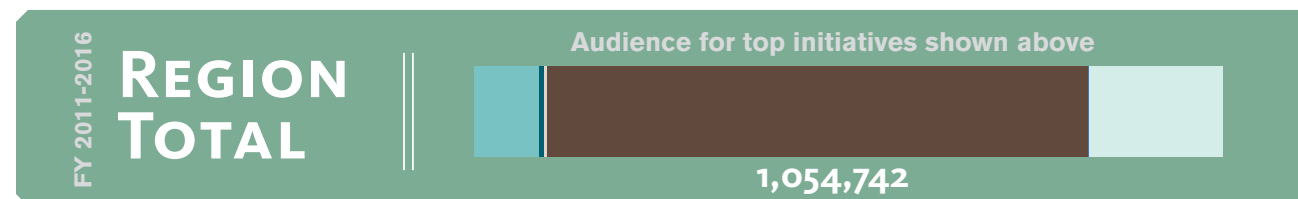
Several other initiatives were only reported by one or two forests between FY 2011-16, including: Be Bear Aware, Forests for Every Classroom, Hands on the Land, Head Start, Let’s Move Outside!, Nature Scope, Passport in Time, Project Wet, and Urban Connections. These nine initiatives reached a total audience of 16,228 people. The largest segment of this reporting was from the Umatilla, which reported a Project Wet audience of 6,180.

Even without complete data for conservation education and outreach, the diversity of the Forest Service’s conservation education and outreach portfolio is clear. These pages show that the size of audience, types of subjects and audience and even delivery methods vary by forests and by initiative. As we note in the data section, different reporting in the future may help more comprehensively tell the depth and breadth of agency education and outreach efforts.

Figure 3.18 Top conservation education initiatives by audience size, type, and the number of reporting units, FY 2011-16



¹ Reporting units include the 16 national forests, Gorge NSA, and the Regional Office



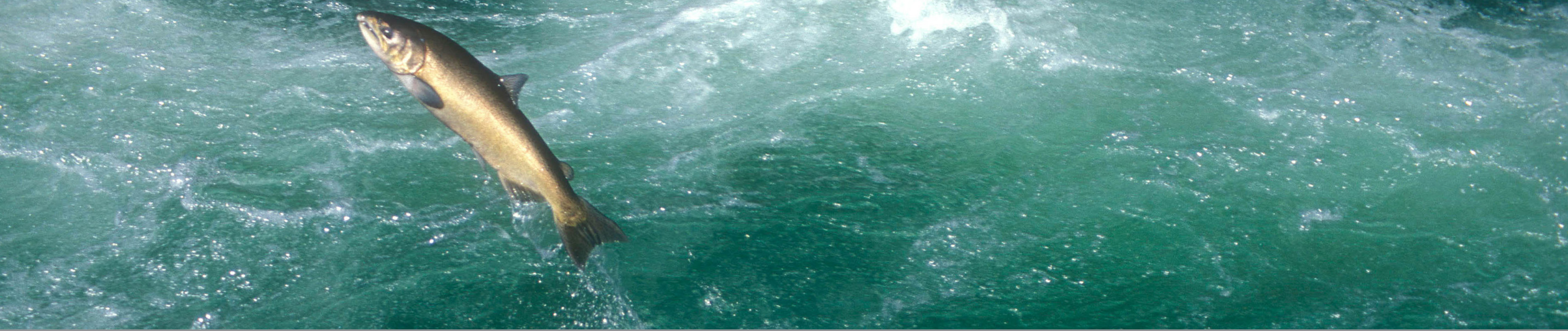
Data takeaways for Chapter III: Partners

Data	Considerations:	Lessons learned:
1. Service work, timber, and biomass	<p>Business capacity potential next steps:</p> <ul style="list-style-type: none"> Once biomass list is updated, consider feasibility of linking facilities and the sources of their products to explore what biomass facilities depend on materials from national forests for operation. 	<ul style="list-style-type: none"> Investigate overlap businesses in fire, restoration, and timber to look for contracting changes and track locations of businesses over time, including year-to-year variations and longer trends.
2. Community engagement/G & A	<p>In future stages of this work, linking accomplishments by forests to other factors such as their engagement with both local and non-local organizations might provide a deeper understanding of where and how partner organizations influence work accomplished. Moreover, using state and private forest data could show additional all-lands work, which could further demonstrate how Forest Service impacts cross national forest boundaries. Linking projects and acres impacted through Good Neighbor Authority or other boundary-spanning approaches will facilitate understanding and assessment of how forest management occurs at an all-lands scale, instead of stopping at administrative boundaries. Partnerships and collaborations with organizations are responsible for much of this work, although actual impacts have not yet been linked.</p>	<ul style="list-style-type: none"> Finding ways to use budget and job codes for awarded grants and agreements would allow us to group different activities to better understand how organizations are engaging with the Forest Service—e.g. for work on the ground in the forest, capacity building, or planning.
3. Volunteer data	<p>Data presented for both NICE and volunteers contained large amounts of missing or incomplete information, as noted earlier in this chapter. We suspect there is information missing beyond the race and ethnicity data unknowns, such as forests not reporting accomplishments under the relevant initiatives in NICE. This results in underreporting on these programs, which impacts regional understanding of where and how community engagement, partnerships and serving underrepresented populations are occurring.</p> <p>As data quality and reporting improves in these databases, tracking trends over time may add important information to how the agency is engaging and partnering with communities.</p>	<ul style="list-style-type: none"> Demographic data is unknown for large portions of volunteers (51% of Age is unknown, 54% of race/ethnicity is unknown). Recreation functional areas have the largest number of subcategories, and by far the largest number of hours. Data entry recommendations could encourage more robust collection of demographic information (age and race/ethnicity), and collecting of number of volunteers by functional area (not just number of hours) The low reporting of persons with disabilities or Veteran designation may be a combination of small populations in those categories and how forests are reporting information (perhaps forests are not asking about these designations with their volunteers).
4. NICE: Educational programs	<p>Data presented for both NICE and volunteers contained large amounts of missing or incomplete information, as noted earlier in this chapter. We suspect there is information missing beyond the race and ethnicity data unknowns, such as forests not reporting accomplishments under the relevant initiatives in NICE. This results in underreporting on these programs, which impacts regional understanding of where and how community engagement, partnerships and serving underrepresented populations are occurring.</p> <p>As data quality and reporting improves in these databases, tracking trends over time may add important information to how the agency is engaging and partnering with communities.</p> <p>The 3,861 volunteers reported in NICE may be double-counted from the volunteer and partner reports, but we are unable to determine if that is the case. Volunteers are primarily linked with the Gifford Pinchot (1,297 individuals, 707 of which were linked to Every Kid in a Park initiative). Since these databases do not link to each other we cannot see the overlap with any certainty, but there appears to be the potential for this issue to occur in reporting, depending on who is entering data, where and how.</p>	<ul style="list-style-type: none"> With a new reporting mandate in FY2016, data should be more consistently reported in future years. Recommendations: <ul style="list-style-type: none"> Require listing at least 1 (i.e., none should be left blank or N/A) <ul style="list-style-type: none"> Initiative Subject Delivery Method List Partner Names and categories as individual cells so as to analyze more easily.

Chapter takeaway:

The Forest Service is engaging with organizations from all sectors and scales to accomplish their work. The agency is contracting with private businesses, forming agreements for collective goals with cooperators, supporting and working with forest collaboratives, using volunteers to fill forest-specific needs, and partnering with schools and other entities for conservation education. More complete data from forests on work accomplished through volunteers and conservation education could improve reporting and understanding of the depth and breadth of the agency's community engagement portfolio.





CHAPTER IV. INTEGRATED RESTORATION













How is the Forest Service conducting integrated restoration? Could we link Forest Service partners to integrated restoration?

In a period of increased focus on effective landscape restoration efforts, understanding how restoration occurs across the landscape and how different activities are spatially related can better link agency work to communities and conditions surrounding the forests. Specifically, understanding how Forest Service’s accomplishments on the forests relate to communities with high social vulnerability and/or isolation can link both ecological priorities with social and economic realities, with the potential to inform management and planning.

Finding new and creative ways to represent complex management through available and routinely collected data would help both the Forest Service and their partners understand and articulate where and how agency work links to communities.

This chapter is the most exploratory part of this project to date, documenting our analysis and exploration of spatial Forest Service accomplishment measures, to understand: 1) if we could identify and understand the idea of “integrated restoration” from a performance reporting angle, and 2) if information gleaned from this exploration could be used in the future to link social and economic conditions on the landscape (e.g. Chapter 2), or link to agency partners (e.g. Chapter 3), to create clear linkages between agency work and impacts to communities. Because of the exploratory nature of these analyses, this chapter provides documentation of the process and lessons learned in examining whether and how integrated restoration is taking place in forests using the accomplishment measures that became spatially explicit in FY 2015. These measures are listed in Table 4.1, at right.

Table 4.1 Accomplishment measures and descriptions

	Measure	Abbreviation	Description (areas in acres)
	FOR-VEG-EST	Forest veg estb.	Forest vegetation established
	FOR-VEG-IMP	Forest veg imp.	Forest vegetation improved
	FP-FUELS-NON-WUI	Fuel (non-WUI)	Fuel treatment outside wildland urban interface
	FP-FUELS-WUI	Fuel (WUI)	Fuel treatment inside wildland urban interface
	HBT-ENH-TERR	Terr habitat	Terrestrial habitat restored
	INVPLT-NXWD-FED-AC	Nox weed	Noxious weeds treated on NFS lands
	RG-VEG-IMP	Range veg	Rangeland vegetation improvement
	S&W-RSRC-IMP	Water	Water or soil protection/enhancement
	TMBR-BRSH-DSPSL	Woody fuels	Harvest-related woody fuels treatment
	TMBR-SALES-TRT-AC	Timber treat	Forest land treatment (using timber sales)
	HBT-ENH-STRM	Stream	Stream habitat restoration*
	HBT-ENH-LAK	Lake	Lake habitat

*Measured in miles

Data used in Chapter IV: Integrated restoration

Data	Sources	Dates	Analysis	Considerations
Spatial data for gPAS	USFS gPAS from Ryan Gregg and David Green, Washington Office, Strategic Planning, Budget, and Accountability, USFS	Obtained March 2016	<p>Mapped all spatially explicit accomplishments, then counted acres where accomplishments overlapped spatially. Used overlap threshold of 10% (i.e. two polygons need to overlap by at least 10% to be considered).</p> <p>Initially, we sought to spatially correlate performance data on the landscape to develop methods to measure the extent to which restoration is occurring in an “integrated” fashion. Although this initial set of measures is limited, we hoped to create a proof of concept to measure integration. In a later phase, we anticipate linking these results to social and economic measures to understand relationships between on-the-ground work and social and economic conditions. For example, linking accomplished work and the extent of social vulnerability or isolation could show how the Forest Service may be contributing to community well-being. As more Forest Service accomplishment measures are geo-enabled, additional analysis can illuminate the extent to which national forests are prioritizing integrated restoration activities and understand how that work relates to communities around national forests.</p>	<p>Limited findings with only one year of data and only a few measures.</p> <p>Overlap could be due to how data was entered and drawn, or conducting a phased project; because activities are not necessarily independent accomplishments.</p>
Tabular data for gPAS measures	USFS Accomplishment acres by HUC 12 Watershed from John Maria, Washington Office, Business Operations, Strategic Planning, Budget and Accountability.	Obtained February 2016	<p>We removed Invasive/Noxious Spp from Management Accomplishments because it was unreliable.</p> <p>Missing and incomplete records were removed from the dataset prior to calculating summaries; the majority of these HUCs likely bordered Region 6, with headwaters outside of the region.</p> <p>For the final set of analysis looking at the concentration and frequency of treatment, we only used HUCs with management activity in them.</p>	<p>Invasive/Noxious Spp from Management Accomplishments is unreliable data (spatially off by 200%+).</p> <p>Unreliable measures impacted ability to use all measures for analysis.</p>
Watershed Condition Class and priority	<p>Watershed Condition Framework, USFS, Watershed Condition Framework USFS online database</p> <p>Watershed Condition Framework, USFS classification from Carol Boyd, Natural Resources, Regional Office</p>	<p>Downloaded April 2016</p> <p>Obtained May 2016</p>	<p>Counts of watershed condition class and identified HUCs with priority watershed classification. Linked watershed condition class and presence/absence of priority watershed classification to each HUC 12 watershed in tabular gPAS data.</p> <p>Analyzed location and frequency of accomplishments by watershed and respective condition class.</p> <p>We did not receive more complete watershed data at the time of publishing this document.</p>	<p>Both datasets contained missing data. WCF online data contained incomplete and outdated information on priority watersheds.</p> <p>Used second set of data to address missing data issues. This resulted in a more complete list of watershed condition class and priority by HUC 12 identifier, but still had missing data. Missing data were watersheds on the border with another region (e.g. watersheds in the Fremont-Winema that included some portion of Region 5). This may be due to how these data were sorted and deleted for our data request.</p>
Case study example	TIM FPDS FACTS	Obtained 2016, used for FY 2015	<p>Located timber sales by location information in timber sale description.</p> <p>Attempted to locate restoration-related service contracts by description of where and how work was conducted. Had limited success in finding physical locations for recorded service contract work.</p> <p>Attempted to link accomplishments from FACTS to location of timber sales and service contract work, to see where projects aligned with reported accomplishments.</p>	<p>Linking proved to be unfeasible. Timber data is reported with enough information about location of sale that the majority of timber sales could be linked. However the majority of service contract work could not be linked to the reported accomplishments, as demonstrated in maps 4.3 and 4.4.</p>

4.1. Developing an Accomplishments Explorer to understand accomplishment overlap

We used two different strategies for measuring integration. First, we calculated the spatial overlap of accomplishments by identifying places where two or more reported accomplishments overlapped by at least 10 percent with one another on the landscape. Second, we calculated the diversity of accomplishments within the same watershed at the same spatial scale as the Watershed Condition Framework (HUC 12) scale.

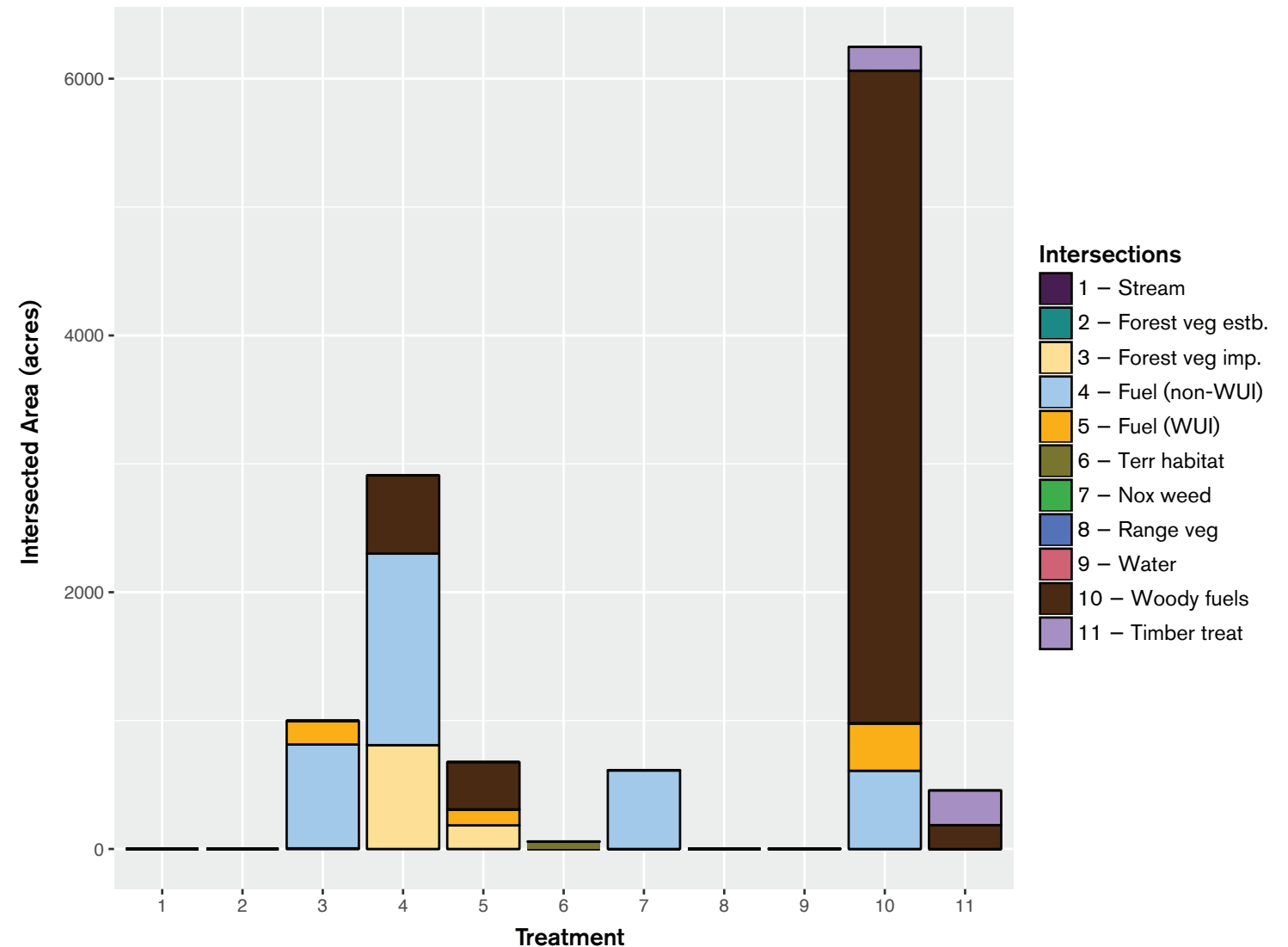
To explore the overlap of accomplishments, we created an interactive web-based “explorer” tool that allowed us to calculate the spatial overlap between the eleven different accomplishment measures (the 12th measure was only used in the watershed analysis discussed later on). This tool allowed us to see what treatments overlapped most often and zoom in to their locations on the landscape.

Of the eleven accomplishments used, ten were measured in acres. They totaled 59,766 acres in FY2015 across national forests in Oregon and Washington. Of these acres, 273 different accomplishments overlapped, representing 9,800 acres, or approximately 16 percent of the total treatment acres. The remaining accomplishment, measured in miles of stream, included 3,237 feet of overlap with other treatments. Treatments that overlapped the most were non-WUI fuels treated and acres of harvest-related woody fuels treated (Figure 4.1, right). That is, the most common overlaps were different types of non-WUI fuels treatments occurring in the same location. Acres of improved forest vegetation also overlapped with non-WUI fuels treated. Acres of forestland treated using timber sales and acres of fuels treated in WUI also overlapped with acres of harvest-related woody fuels treated. These five measures all contained the highest number of acres overlapping other treatments.

An example of this overlap in accomplishments is shown in Figure 4.2 (page 49). The area shown in Figure 4.2a shows a functioning-at-risk watershed on the Umatilla National Forest where harvest-related woody fuels were treated through low intensity underburns with both WUI and non-WUI fuels treatments. Another example is shown in Figure 4.2b in a functioning-at-risk watershed in the Fremont-Winema. The selected area includes acres of woody fuels treated (TIMBR-BRUSH-DISPOSAL), in which both burning of piled materials and fuel inventory were conducted on 47 acres. The same 47 acres were also listed as an accomplishment for acres of non-WUI fuels treated (FP-FUELS-NON-WUI).

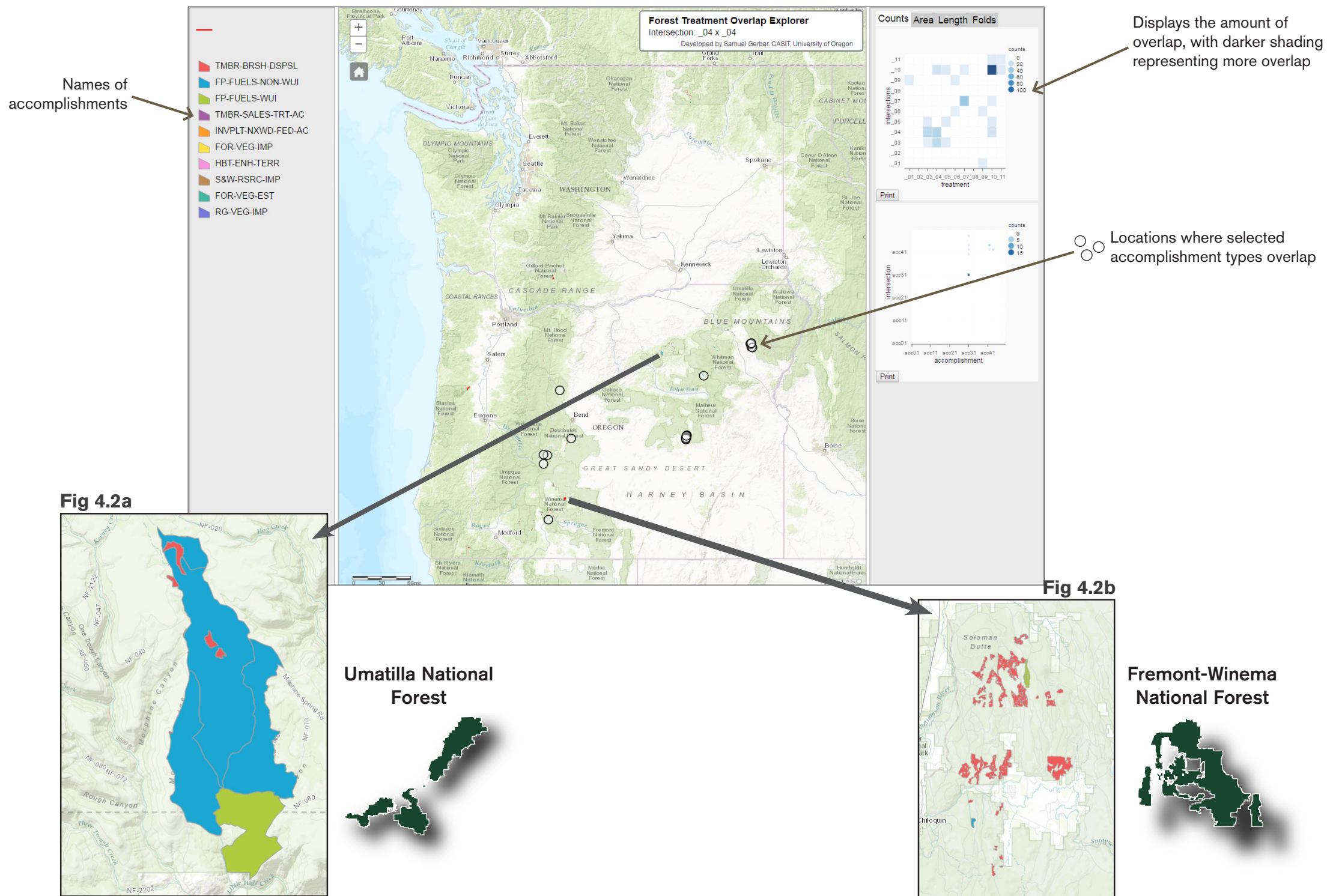
We found the explorer tool useful for spatial analysis and for understanding where and how certain measures overlapped with each other. However, our findings made it clear that understanding overlap was not enough. The infrequent spatial overlap suggested that either there was very little integrated restoration going on, or, as likely, that integration was occurring at a different spatial scale. Consequently, we discovered that we also needed to look at how work was being performed in close proximity within watersheds.

Figure 4.1 Accomplishment measure overlap



2015	REGION TOTALS	Acres with reported accomplishments	Different overlapped accomplishments	Percent of total treatment area with overlapped accomplishments
		59,766	273	16% (9,800 acres)

Figure 4.2 Forest Treatment Overlap Explorer and pull-outs



4.2. Watershed analysis to understand the proximity of Forest Service accomplishments

We investigated the number and types of treatments performed watershed by watershed. We conducted this analysis at the HUC-12 watershed level, which is the scale used for the Watershed Condition Framework. This analysis did not allow us to provide acreage numbers due to data limitations and the challenges posed by avoiding double (or triple) counting acres where similar sets of accomplishments were linked to the same polygons. Instead, we analyzed the frequency of the eleven accomplishment measures, along with an additional measure for acres of lake habitat enhanced.

Frequency of accomplishments

Of the 1,947 HUC-12 level watersheds in the National Forest System in Oregon and Washington, at least one of the twelve accomplishment types occurred in 1,601 (82 percent) of the region's watersheds in FY 2015 based upon the Spatial Accomplishments dataset. However, upon reviewing spatial data for accuracy, we determined that Noxious Weed Removal, the single most common management accomplishment, was recorded at scales larger than individual HUCs and was found to be unreliable, and we

removed it from the management accomplishments. With this activity removed, **we found that at least 1,234 (63 percent) of all watersheds received one or more treatments. Accomplishments are widespread, not concentrated in certain watersheds, as might have been expected given the focus on prioritizing particular watersheds for treatments.**

Of the watersheds that received treatments, 33 percent of watersheds benefited from a single management accomplishment, while 67 percent of HUCs received management activities with two or more benefits. Fully one-third of watersheds benefited from three, four, or five accomplishments, with only a handful of HUCs receiving integrated treatments that resulted in more accomplishments.

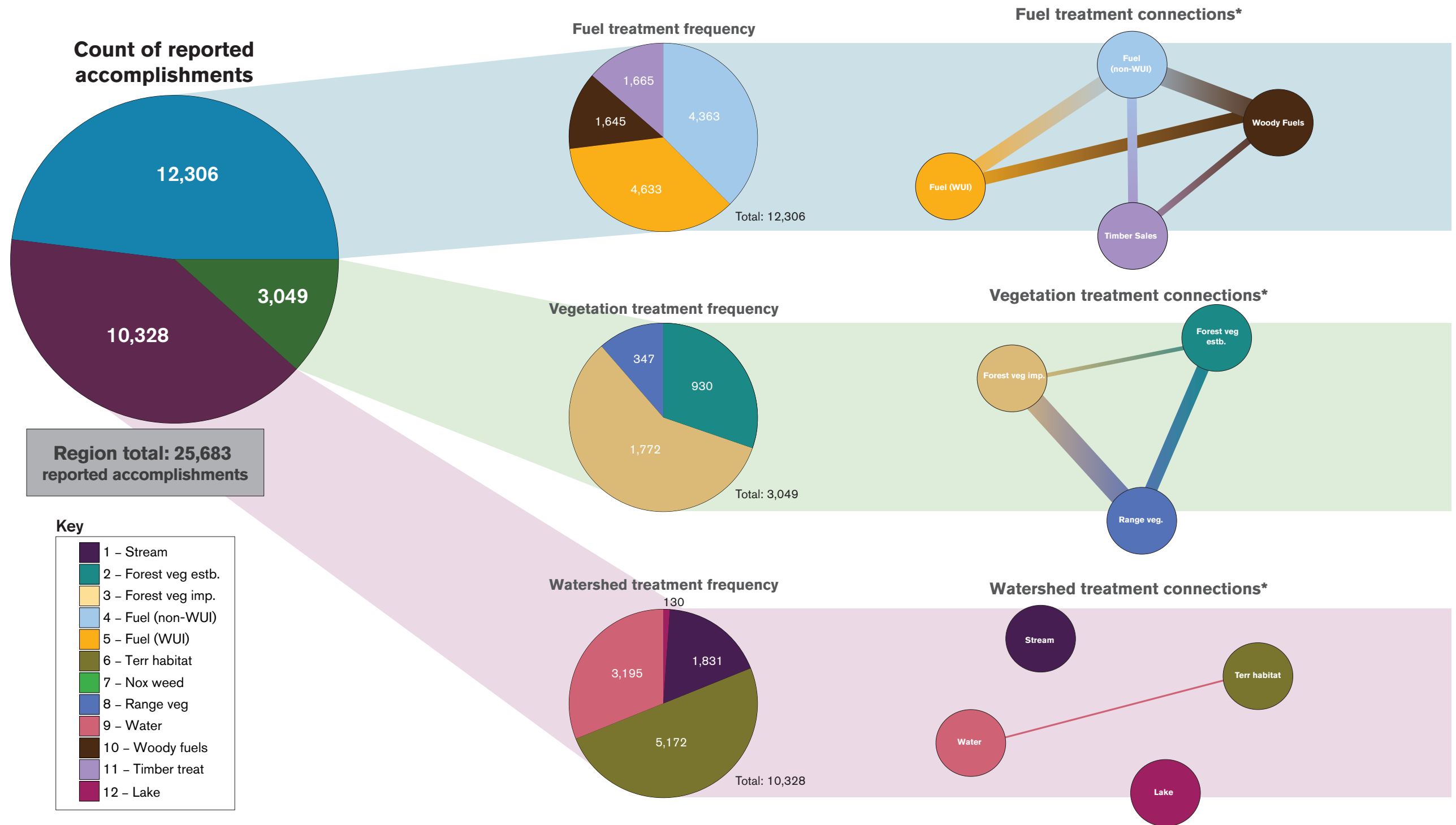
Frequency of accomplishments in the same watershed

The series of figures presented on the right (Figure 4.3) demonstrate how different accomplishments were linked to each other; in other words, they reveal where different accomplishments were listed most frequently in the same watersheds. The thickness of the lines

between treatments in these figures shows the relative frequency of which different activities occurred in the same watershed. As one might expect, accomplishments fell into different categories: fuels-related accomplishment measures most frequently occurred with other fuels measures, watershed and water related measures most frequently occurred together, and vegetation treatment formed the third group of accomplishments. Within the fuels measures, woody fuels, non-WUI, and WUI fuels occurred together in the same watershed the most frequently. In the watershed measures group, lake and stream accomplishments were nearly always conducted together in the same watershed (note that the total number of lake measures was relatively small). In the vegetation group, forest vegetation improved and rangeland vegetation improved occurred most frequently in the same watersheds. **Although we do not have sufficient data to know for certain, these connections and groupings suggest that related measures are still occurring most frequently in the same watershed(s), which raises questions about if and how accomplishments should be varied or combined in different ways.**



Figure 4.3 Frequency of accomplishments in the same watershed



* Thickness of line represents relative frequency of accomplishments reported

Watershed condition classification

Watershed condition classification is the process of describing watershed condition in terms of discrete categories (or classes) that reflect the level of watershed health or integrity.¹

The three watershed condition classes include:

- Class 1** = Functioning properly
- Class 2** = Functioning at risk
- Class 3** = Impaired function

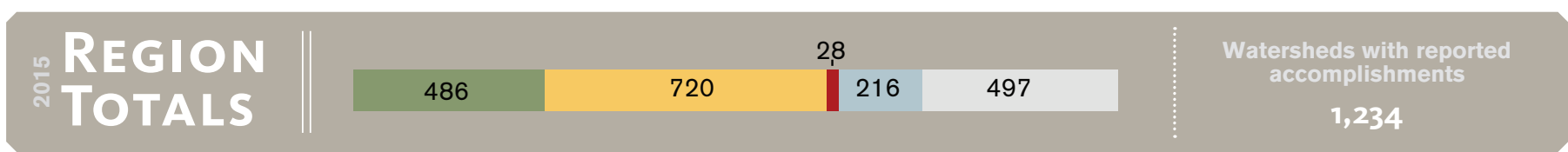
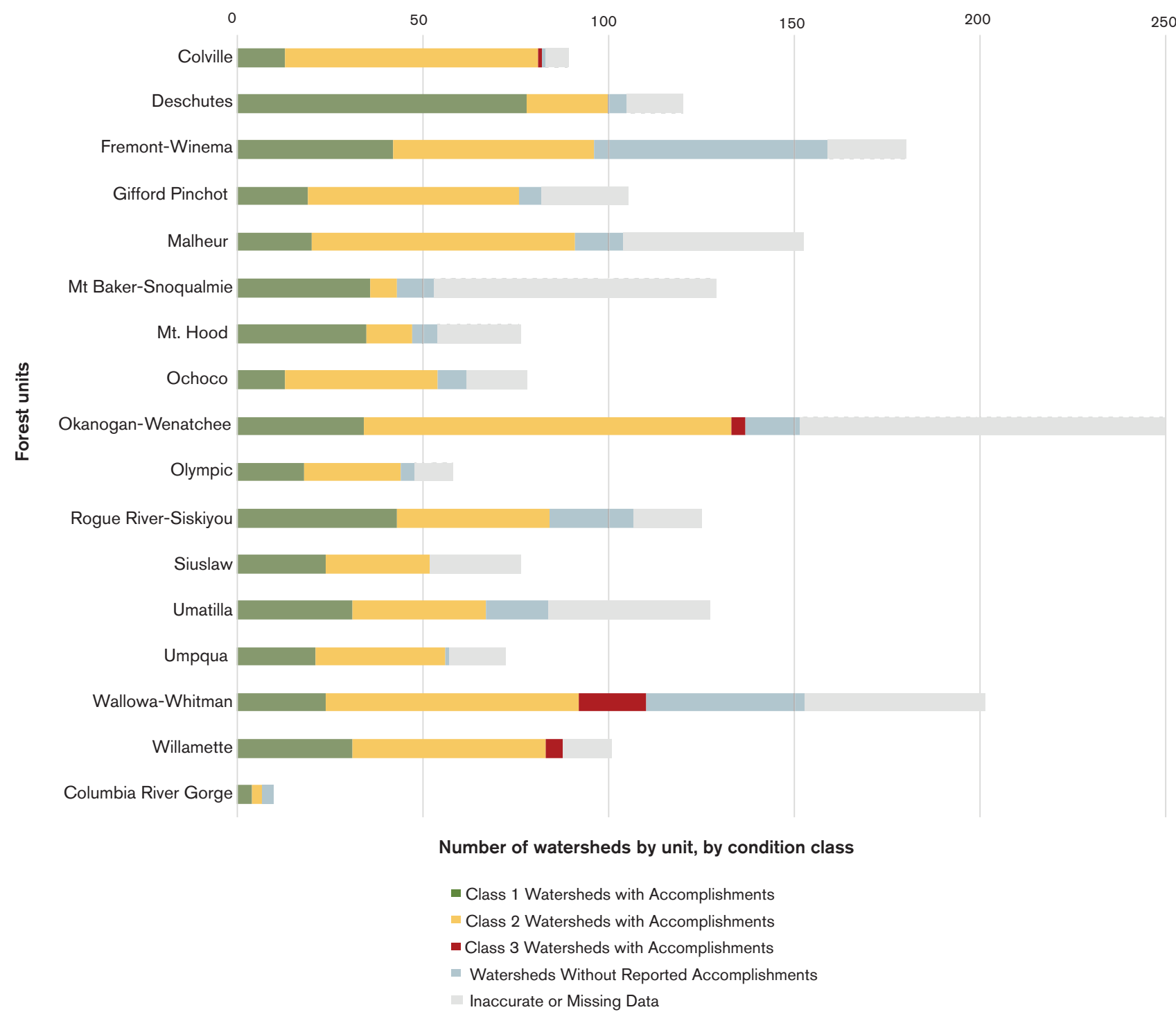
¹ USDA Forest Service Watershed Condition Classification Technical Guide, 2011, FS-978

Accomplishments linked to watershed condition

We explored how these activities related to the Forest Service's Watershed Condition Framework (WCF), which classifies watersheds into three categories based on a suite of 12 physical and biological indicators. We focused our assessment on 1,234 watersheds in Oregon and Washington that occur in whole or in part on national forests, and that had reported accomplishments. **Region wide, more than one-third of these watersheds (39 percent) are designated as functioning properly (Class 1), 58 percent are at risk (Class 2), and 2 percent are impaired function (Class 3) which we further broke down by national forest (Figure 4.4, right).** This figure shows the number of total watersheds per forest, broken into: 1) watersheds with at least one of the eleven reliable accomplishment measures reported (divided by condition class); 2) watersheds that we identified as not having any of the eleven management actions reported, and 3) watersheds that had inaccurate or missing data (only reported noxious weed removal or were missing from data we received).

The Wallowa-Whitman National Forest, which borders the Snake River, has 18 Class 3 watersheds, the most of any forest. In contrast, 13 of the forests contained no Class 3 watersheds. In addition to the WCF classes, watersheds may be prioritized by the Regional and Washington Offices for special, focused attention for restoration. **In the Pacific Northwest Region, 70 watersheds are designated as Priority, with every forest containing at least one Priority watershed and some having as many as 13.** Priority and WCF can be used together to identify watersheds in need of acute restoration. Fifty-five priority watersheds are coded as Class 2 and 15 are coded as Class 1. No Class 3 watersheds are currently designated as a Priority, suggesting the WCF framework is focused on improving the watersheds with the greatest chance of returning them to ecological function and health and keeping Class 1 watersheds from degrading.

Figure 4.4 Count of reported and non-reported accomplishments in watersheds by national forest

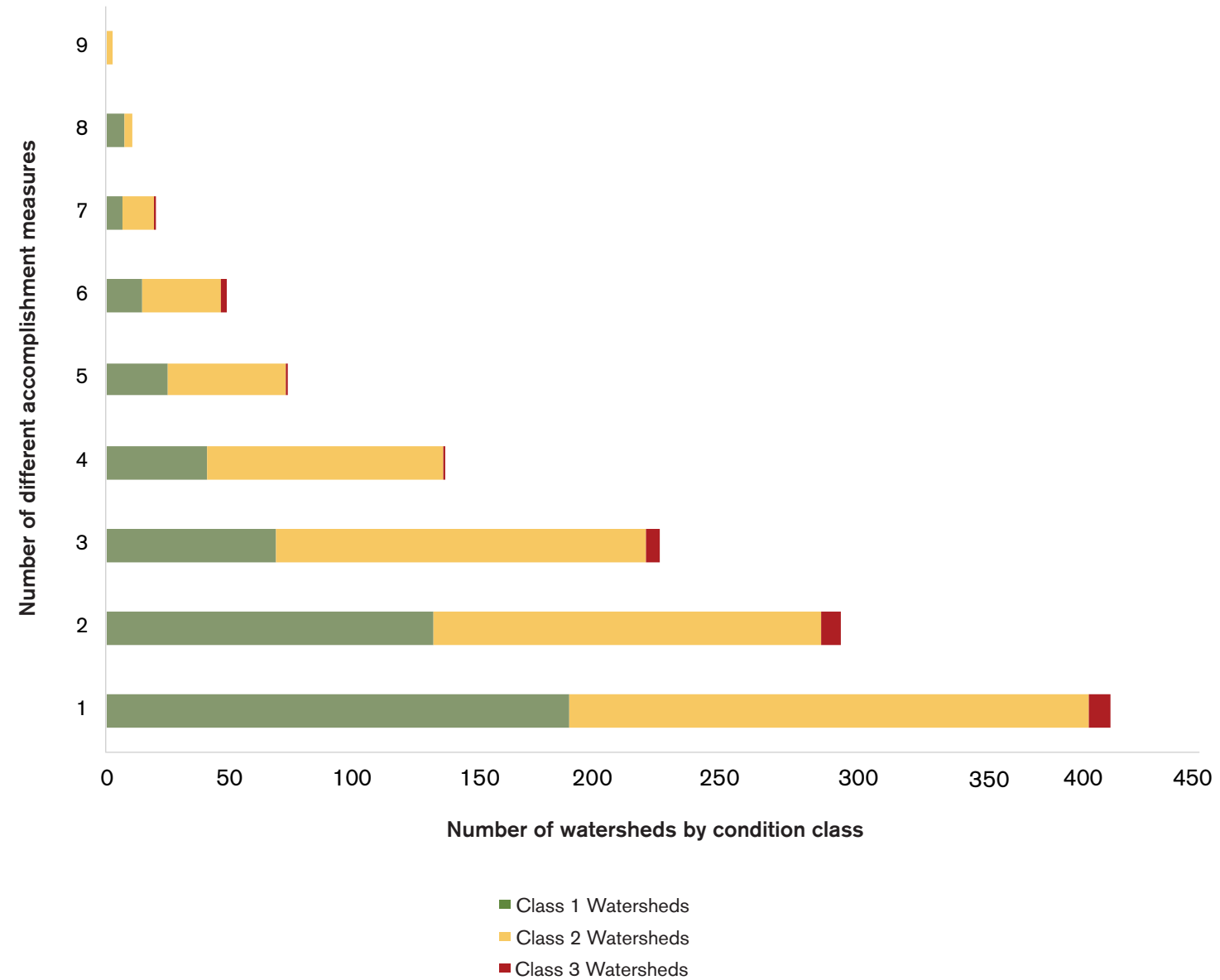


More than four hundred watersheds received only one type of activity, but the majority of treated watersheds had two or more types of activities. Figure 4.5 (right) shows the number of different activity types reported within the same watershed, with watersheds broken into the three classes. Only a handful of watersheds received more than five management activities, and no watershed had more than nine of the 12 different performance measures. **Higher-risk watersheds tended to have a greater diversity of accomplishments in them, suggesting management activities are benefiting multiple objectives in terms of ecological restoration. Watersheds designed as priority primarily contained two to five types of accomplishments, which was more than non-priority watersheds.**

Relating to management activity and accomplishments, a larger proportion of watersheds in more at-risk classifications (e.g. Class 2 or 3) were linked to larger numbers of different accomplishment measures. Watersheds rated as Class 2 and 3 accounted for 60 percent of the accomplishments. In other words, the watersheds of higher ecological risk tended to have accomplishments linked to them more frequently, suggesting concentration of activity and restoration intensity. All priority watersheds received at least one type of management treatment, based upon available data. These data seem to broadly align with the intent of the Watershed Condition Class and Priority designation for directing restoration and management activities. Restoration activities in these data are more likely to be centered on Class 1 and 2 which is in alignment with the new paradigm of the watershed condition framework: to remove risk factors that may threaten the integrity of a watershed, not to treat the “worst” watersheds first.

Our analysis finds that at-risk watersheds are generally receiving more attention—both in the number of watersheds linked to accomplishments and the diversity of accomplishments within the watersheds. Although the underlying data is not complete, the analysis of available data serves as a likely indicator of broader trends of ecologically prioritized watersheds and the manner in which land management actions are conducted. This work raises questions about the degree to which integrated, concentrated, and targeted restoration occurs across the region broadly, as well as within individual forests.

Figure 4.5 Count of different accomplishment measures occurring in the same watershed, by condition class



4.3. Linking activities and contractors: Which businesses perform what work?

Case example of potential for linking accomplishments to contractors

In continuing the theme of data exploration in this chapter, we explored **if we could better estimate how far contractors travel to perform forest and watershed restoration activities**. We originally intended to conduct a full case study to link contractor home locations with work they are doing on the forests. However, we were limited in how far we could connect data, and it became clear that such an analysis would require a more in-depth and concentrated look in a project-by-project manner. For now, we provide a summary of our efforts and lessons learned to provide some possible discussion points if such a direction were to be pursued in the future.

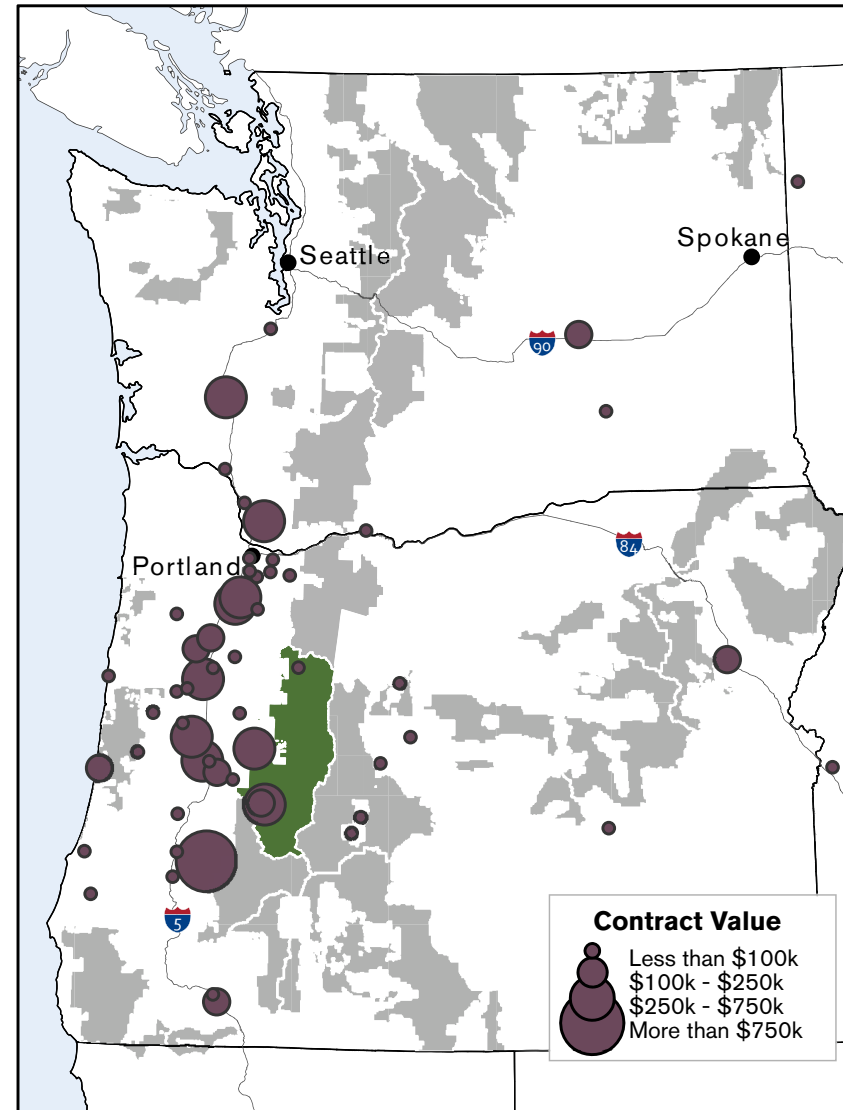
At the Ecosystem Workforce Program, we have investigated the location of forest and watershed restoration contracts and timber sales in relation to national forests in order to understand how these opportunities flow to communities near national forests. One limitation of this work has been that **we have not been able to connect the actual work location to contractor locations, making estimates of how far contractors travel to perform work a rough estimate at best**. Here, we hoped to improve these estimates of work location, of how these techniques could be applied to other Forest Service partners, and also of where and how they connect to work in the forests (e.g. volunteers and trail restoration, natural resource agreements with NGOs).

The two maps at right (Map 4.1 and 4.2) show our traditional look at the relationship between national forests and contractor and purchaser locations, using the Willamette National Forest. Circles on each map represent the communities where businesses are located that are working with the Willamette National Forest; the size of the circle represents the value of restoration service contracts and timber sales awarded to contractors in those locations.

Local contractors:

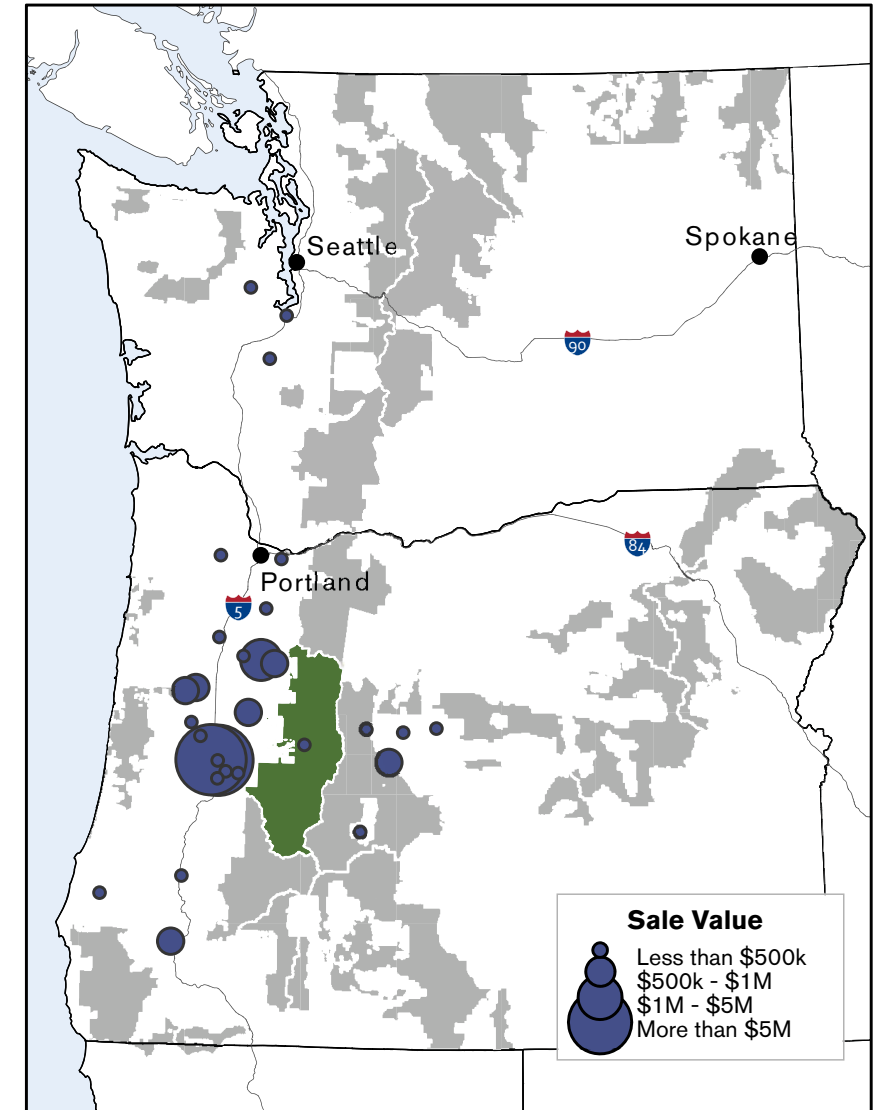
Contractors whose place of business located within a county which the national forest of interest touches. For the Willamette National Forest, these local counties include: Douglas, Lane, Linn, Marion, and Clackamas.

Map 4.1 Restoration-related service contracts on the Willamette, FY 2011-15



- Forty-one local businesses performed forest and watershed restoration treatments in the Willamette NF between FY 2011-2015.
- Another 20 businesses in other parts of Oregon have performed forest and watershed restoration treatments in the Willamette NF between FY 2011-2015.
- The total value of restoration contracts from the Willamette (FY 2011-2015) was \$8.7 million. Of this, approximately 86 percent (\$7.5m) was contracted by Oregon businesses, and 14 percent (\$1.2 million) was contracted by businesses outside the state. Businesses from outside the state were from California, Washington, Idaho, Missouri, New York, and Virginia.

Map 4.2 Timber sales on the Willamette, FY 2011-15

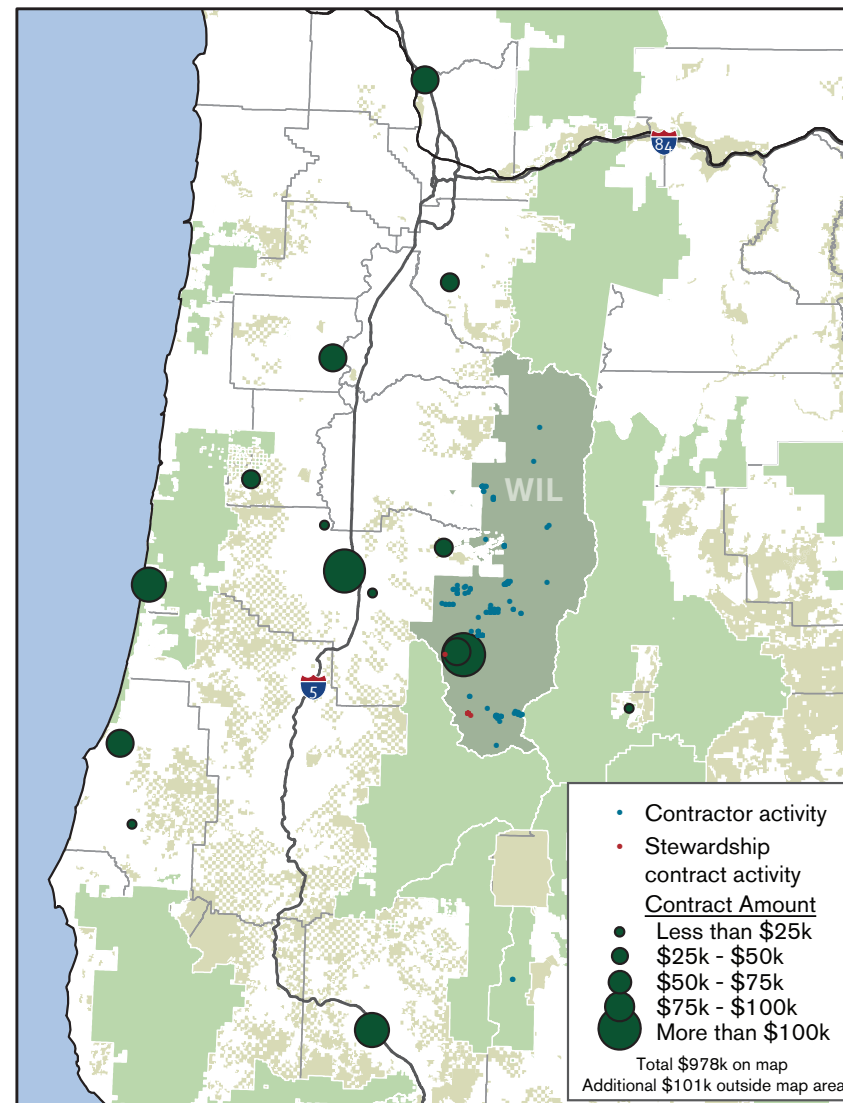


- Thirty-two Oregon businesses—timber mills, logging companies and individuals—purchased timber from the Willamette National Forest during FY 2011-2015. Of these, 18 businesses were local to the Willamette.
- The total value of timber sales in Oregon from the Willamette was \$30.9 million. Of this, approximately 99 percent (\$30.6 million) was purchased by Oregon businesses, and about 1 percent (\$391,000) was purchased by businesses in Washington.
- Approximately 89 percent (\$27.5 million) of the timber sale value went to local businesses.

The next two maps (Map 4.3 and 4.4, at right) show how our linking of Forest Service timber sale and service contract data to reported accomplishments aligned. The lines denote places where we were able to definitively make a link between contracts in FPDS and timber sales in TIM and accomplishments reported by the agency in FACTS. The remainder of the polygons on the maps shows the accomplishments we were unable to link back to a service contract or timber sale.

Now that we have approached this question from the perspective of database linking, we would propose that any future related work be done by starting at the relevant forest and ranger districts, in order to work with staff and their local knowledge to draw lines between these datasets. Our intent of exploring this from a database angle was to understand if it would be possible to do this linking at a large scale, across multiple years and forests at once, instead of needing the manual labor required to conduct this investigation accomplishment by accomplishment. As more and more measures become spatial and integrated into gPAS, there may be an opportunity to further develop this analysis, although we caution that may still be limited by data reporting on service contracts and timber sales.

Map 4.3 Linking restoration-related service contracts and FACTS data on the Willamette, FY 2011-15



Map 4.4 Linking timber sales and FACTS data on the Willamette, FY 2011-15

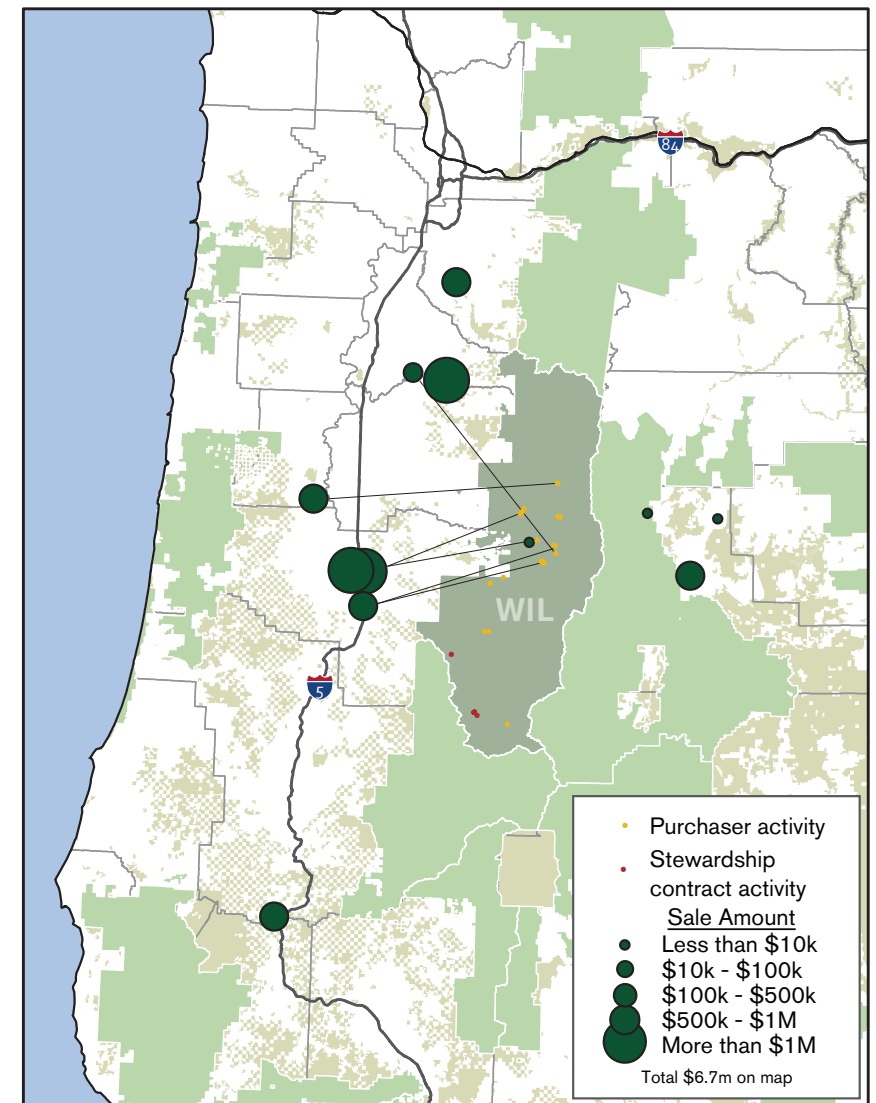
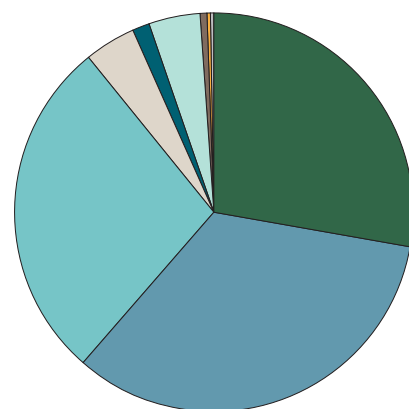


Figure 4.6 Type of workforce implementing accomplishments, by acres, FY 2011-2015 (draft)



Data takeaways:

- Tabular data proved more reliable to summarize measure of activity and proximity of activities near each other. Spatial data provides the ability to look at a smaller scale than HUC 12 level, but has its own challenges with data accuracy in reporting.
- Matrix figures show data in relative proportions. So measures that are the most tightly linked are not necessarily the ones occurring the most frequently.
- Other conditions could be linked to watershed classification, such as identifying classes of watersheds by social and economic factors (a combination of demographic conditions and isolation and service access resulting in a ranked system of watershed classification). This could link work accomplished to social and demographic conditions in the respective watersheds.
- Without complete data, or more years of data, we are limited in the conclusions that we can definitively draw from this exercise. We can see that treatments tend to cluster with others in the same management objective family (e.g. fuels, watershed and vegetation). Seeing treatments occurring in all priority watersheds also confirms what we should be observing on the landscape.

Chapter takeaway:

Altogether, our analysis of integrated restoration in each watershed shows considerable variability in the region, with at-risk watersheds generally receiving more attention. It is clear that there is potential to link agency accomplishments not only to ecological risk of watersheds, but also to social and economic risk factors. A larger question still exists, however, about the value and utility of tracking accomplishments on the landscape to understand integrated restoration. Given how agency management priorities and plans are determined, and the varying goals and priorities of different program areas, understanding integration of measures may not be as relevant as other avenues linking work to local social, economic, and ecological conditions, regardless of treatment integration.





CONCLUSION

As stewards of America's forests, grasslands, and scenic areas in the Pacific Northwest, Forest Service employees in the region face a complex management environment. At a time when resources to support basic management capabilities of the forest are decreasing, finding ways to sustain and provide benefits to both the land and the American people is a tall order, one which is clearly achieved through partnerships and collaborations. The degree to which the agency can engage with individuals, organizations and businesses to achieve collective goals impacts Forest Service planning and prioritization.

As this document demonstrates, the Forest Service collects a vast amount of data on the work being done, but the linkages between such work and the associated social and economic impacts are not always strong. To help the Forest Service and its partners better understand and communicate the social and economic contexts in which the agency operates, as well as to better document Forest Service impacts in advancing sustainable natural resources-based economies, we must first understand what information is being collected and how. This first project year provided a collaborative learning opportunity where we experimented with new ways to use, integrate, and

represent data, with a focus on Forest Service data, to understand potential applications of data already being collected and identify data gaps and strategize how to fill them. This book documents the first year of experimental work and reflects the questions asked, the data used to answer the questions, the interpretation of the resulting data, and the key insights from the learning process.

Data lessons learned

Data quality, consistency and access present challenges but also opportunities. We used data from over ten different Forest Service databases or distinctly different data sources, as well as several sets of data from outside the agency. We encountered several challenges inherent in any data synthesis effort at this scale, including: obtaining data, understanding what variables were available in given databases and their definitions (intent, how entered), addressing variations in and between data sets (including missing data), and inconsistently reported data. As documented throughout the data boxes in this document, in some cases we found ways to deal with these data challenges, and in others we found that we had gone as far as we could with a given set of data. We also recognize the additional burden our data requests place on agency employees already dealing with large and time-sensitive workloads. The time lag in some cases between making a data request and receiving correct data meant needing to re-run analyses or having to revise results already presented in layout. This document represents all data we had received by October 7, 2016, prior to our project deadline. One key lesson we have learned is that we need a data deadline for

agency data, as the time it can take to obtain, clean, organize, understand, and analyze data is significant and should not be underestimated (particularly with new sets of data such as the gPAS data). Moving beyond the challenges we encountered with data access and analysis, this project provided opportunities to access, understand and link a vast amount of data already collected by Forest Service staff. Although data clarification and improvement is always a moving target, it is important to acknowledge the sheer amount of data that exists within the agency's databases, due to decades of dedicated individuals tracking work across the region.

This project provides the opportunity to use data as a way to talk about current issues and challenges within the agency, answer questions, and explore new avenues of inquiry. Like Forest Service databases, staff in different program areas often operate separately from one another. The design and intent of this project to facilitate shared learning allowed us the opportunity to engage with Forest Service employees in a new way, working across levels of the Regional Office, and learning about questions many people have, from data analysts to program directors. Working with staff who routinely use the databases from which we analyzed data, we learned about their system restrictions and processes. By creating a largely unbounded space in which to work, we were able to explore a variety of avenues of data exploration, and ask a range of questions. Pulling all of our learning together into one cohesive document with threads connecting each section was also a learning process, as many of our results lead to more and more questions.

Understanding the opportunities and limitations with data provides understanding for the future. In many instances in our analysis, we found barriers to what we could do with Forest Service data, namely in how to link information sets together, and the amount of manual data cleaning that had to be done before analysis. Understanding the feasibility and application of different data sources helps us understand what can be asked of Forest Service work, given the manner in which certain data is collected, reported and stored. In addition, it allows us to identify potential avenues for further research (where we believe adequate data are available), as well as bound our expectations of what we might explore.

Reporting matters for obtaining the most comprehensive understanding of where and how work is accomplished, and for tracing impacts of that work. Similar to the previous data learning point, how data are obtained and reported can impact what analysis is appropriate. The recent transition toward adding location or spatial information to data is, we believe, a positive step towards addressing some of the current data limitations. In addition, geospatial information would allow the agency and its partners to better understand the connections between reported work and the communities in which they are operating. As Chapter 2 illustrates, social and economic community characteristics vary across the landscape, even from one side of a forest to another, so better understanding where work is being done more specifically would allow additional linkages between accomplishments, communities, and the ecological conditions in which work is done.

Conclusions

Working with communities is how the Forest Service Pacific Northwest Region operates, from providing employment opportunities in the forest in rural, natural-resource dependent communities, to engaging urban and rural youth in a diversity of programs connecting them to their natural areas, and partnering with governmental and nongovernmental organizations to accomplish common goals for work on the ground.

The varied landscape of the region needs the whole picture to tell a full story. Just as demographic data isn't complete without considerations of community isolation, community engagement isn't complete without considering the range of ways the agency engages, from contracting to granting and partnering. In many cases, talking about one set of data or reporting metrics in the absence of others only provides one snapshot of conditions, not the broader impact; nor does it adequately represent the full portfolio of activities in which the Forest Service engages to achieve its mission. Community engagement is how the Forest

Service communicates, whether it is sharing knowledge and information, or articulating impacts of work and partnership and collaboration opportunities. As noted in the Pacific Northwest Region State of the Region Report (2015), **“Community Engagement is an approach to ensure mutually beneficial dialogue and action around values, knowledge and resources to create shared vision and accountability. Community engagement informs decision-making in a meaningful and transparent manner. It can involve the full range of informal and formal partnerships, as well as collaborative processes. This is how we work.”** The depth and breadth of programs, initiatives, and activities reported in this document as community engagement echo the recent state of the region.

Much of the variation between forests on different metrics is a product of the social and ecological conditions in which each forest operates. Being a “timber” versus a “recreation” forest has different implications for income generated, issues worked on with partners, engaged interest groups, community values and uses, and visitor attendance. Similarly, a dry eastside forest has far different restoration objectives, and risks (e.g. wildfire) than a westside wet forest.

There are a diversity of ways in which forests are engaging in activities with social and economic impacts, both within and between program areas. From contracts and grants and agreements to education partnerships, the Forest Service has a diversity of instruments at its disposal to establish and develop relationships. Data presented in this document demonstrates these local impacts: from contractors located in rural communities with high public land bases to grants and agreements primarily with local organizations, to the inherent local nature of volunteers and their work.

This project provides insights into regional level conditions, and highlights variations across forests, but truly understanding those variations must be done at a forest level. The one consistency across all datasets and analysis in this document is the variation between forests on all fronts. The diverse social, economic and ecological settings in which these forests operate makes this diversity unsurprising. It also underscores the fact that when we “roll up” stories, accomplishments and impacts at the regional level, it masks many of the place-based impacts of the forests, and the unique ways in which they are addressing these challenges.

In future research we hope to use the themes and questions generated from this document to identify places to dive more deeply within a forest or a few selected forests to add another dimension of understanding to our work.

Forest Service perspective and insights

Across the Region there is a lot of information and associated stories of how we are working towards achieving integrated approaches to the management of the National Forests and Grasslands. The scale at which we examine our impacts and tell the stories of our work greatly influences what we see, how we understand what is happening, and how we determine where we need to go. By looking at each National Forest individually and displaying how it fits into an overall picture of the region, we move closer to describing conditions that are relevant to an individual place and to how those individual efforts then play out in a regional context.

The ability to analyze and understand conditions that span ecological, social, and economic sectors is important to achieving integrated outcomes that provide multiple benefit streams to the American public. The Forest Service collects considerable information that can help us learn, adapt, and be more strategic. We need to recognize that the data we collect and the systems we use to track our impacts were built to support more traditional objectives than the agency is charged with today. The challenge now is to determine how to most effectively and efficiently track information that relates to new ways of getting our work done, such as collaboratively driven projects and partnerships.

It is important to be able to identify gaps in programs, services, and partnerships. Analyzing data and presenting it in a format that visually illustrates what we are doing can also help point out what we are not doing. These data can help us see omissions and understand how we can prioritize outreach and relationship building. Only then will we be able to account for the true breadth and diversity of communities we hope to engage.

Producing a document that integrates data analysis and the principles of contemporary communication requires staff work across disciplines and staff areas. Working with a non-federal partner provided objectivity, creativity, and fresh perspectives. And we learned that internal coordination was equally important to the process. A document like this cannot be produced without collaboration across many staff units. The variety of disciplines engaged in this project provided a diversity of skills and perspectives and fostered new and complex ideas.

APPENDIX: DATA USED IN EACH CHAPTER

Data used in Chapter I: Overview

Data	Source(s)	Dates	Analysis and Considerations
Landownership shapefiles:	USGS	2015	Used shapefiles for map creation
▪ USFS lands	USGS	2015	
▪ Federal lands	State of Oregon	2015	
▪ Bureau of Indian Affairs lands	State of Washington	2015	
▪ State owned lands	Tigerline Files	2010	
▪ Oregon Urban Growth Boundaries		2014	
▪ Washington Urban Growth Areas			
▪ Interstates			
Forest Service acreage	Forest Service Land Area	Downloaded September 2016	Used acreage by forest, scaled each forest circle.
Forest Service budget	USFS: Budget and Financial Management, Donna Alwine	2015, received June 2016	2015 total by forest Total spent. Does not include fire suppression spending or working capital fund.
Forest Service personnel	USFS: Budget and Financial Management, Donna Alwine	2015, received June 2016	2015 total by forest
Forest Service timber sales	Timber Information Manager (TIM)	2011-2015	5 year average by forest
Forest Service visitors	National Visitor Use Monitoring (NVUM) Survey	Data collected 2011-2015	Total by forest Visitation estimates

Data used in Chapter 2.1: Social vulnerability

Data	Source(s)	Dates	Analysis	Considerations
Social vulnerability: <ul style="list-style-type: none"> ▪ Individuals below poverty line ▪ Single mother households ▪ Amount of college education ▪ Households speaking languages other than English 	U.S. Census Bureau, American Community Survey 5-Year Estimates	2010–2014	<p>Following spatial vulnerability approaches in the scholarly literature, we originally planned to create a social vulnerability index, essentially a rolled-up measure of different demographic data that previous social vulnerability research has identified as important. Our goal was to relate a social vulnerability index to where the national forests are conducting restoration to understand how forests' efforts to improve ecological conditions may relate to communities of potentially significant social vulnerability. We found that creating such a rolled-up index masked many of the variations in social conditions across the states.</p> <p>We decided to start instead by analyzing each potential variable separately, to look at the variation, range and geographic distribution of each variable, to understand how and what we might roll together into one larger indexed measure in the future.</p> <p>What we display here are each of these identified social vulnerability measures, with a scale comparing national rates and Oregon and Washington specific rates, in order to illustrate through shading which areas within the region are above (lighter shading) and below (darker shading) national and regional rates.</p>	<p>Analysis was conducted at the census block group level.</p> <p>Using social condition variables individually also allowed us to consider what sorts of additional variables we may want to include, in other words, what pieces of the social and demographic story were missing from our series of maps.</p> <p>As we describe in Chapter 4, the spatial information associated with accomplishments data (which we had originally intended to link to social conditions data) would require additional linking and analytical considerations before it could be connected to social vulnerability data, so we deemed such an analysis premature.</p>

Data used in Chapter 2.2: Isolation

Data	Source(s)	Dates	Analysis and Considerations
Isolation—Distance to nearest: <ol style="list-style-type: none"> 1. Post office 2. Bank or hospital 3. Interstate freeway on-ramp 4. Commercial airport 	<ol style="list-style-type: none"> 1. Bureau of Transportation Statistics, USDOT. 2. National Highway Planning Network, Bureau of Transportation Statistics, USDOT 3. Board of Geographic Names, managed by USGS 4. FDIC Current locations for all institutions. Health Resources and Services Administration Data Warehouse, US Dept of Health & Human Services 	<ol style="list-style-type: none"> 1. 2/12/2016 2. 2/15/2016 3. 02/2016 4. Hospitals downloaded 2/19/2016 <p>Data current as of 2/18/2016 (updated weekly).</p>	<p>Calculated distance to each identified service in GIS. Shaded from closest (light) to furthest (dark) from service(s).</p> <p>Point feature shapefiles were analyzed in ArcGIS 10.4 to create a distance layer for each variable. The distance layer was created using the Cost Distance tool in the Spatial Analyst toolbox, which calculates the Euclidian distance from each location in the study site to the nearest point feature.</p> <p>Banks: Bank locations were geocoded to convert street addresses to Lat/Long coordinates for use in GIS applications. Geocoding utility used was Goldberg DW. 2016. Texas A&M University Geoservices. Available online at http://geoservices.tamu.edu.</p> <p>Distances are calculated by geodesic distance (straight lines), not taking mountain ranges and accessible roads into account.</p> <p>Used path distance with cost surface-network model. Used US tiger files with drive times.</p>

Data used in Chapter III: Partners

Data	Source(s)	Dates	Analysis	Considerations
Businesses contractors	TIM FPDS VIPR	2011-2015 2011-2015 2015	Mapped all businesses with at least one restoration related service contract, timber sale and/or preseason fire suppression equipment agreement by business location. Downloaded all Dispatch Priority Lists from VIPR system (http://www.fs.fed.us/business/incident/dispatch.php), compiling business, equipment type, and location information into one database.	VIPR data (over 10,000 rows of data) must be downloaded individually and manually, we only have done this for a 2015 database.
Biomass facilities	Ron Saranich, USFS; Chuck Hersey, Washington Dept. of Natural Resources; Dylan Kruse, Sustainable Northwest; Marcus Kauffman, Oregon Dept. of Forestry, additional research.	2016	Compiled lists of biomass facilities from several entities tracking biomass across Oregon and Washington. Called all listed facilities on compiled list to see if still operating, and type of biomass. Used other research such as newspaper articles to identify relevant mill closures or other consolidations.	The master biomass facilities list is a living document; as of Oct. 2016 the list contains: 101 confirmed operational (66 OR, 35 WA), 12 unconfirmed (10 WA, 2 OR), and six idle facilities. Map shows confirmed operational facilities as of July 2016.
Grants and Agreements	Grants and Agreements (G&A): G&A Workload Report, Partnership Report, Mailing Labels August 24, 2016 from Jamie Lentz, Washington Office Acquisition G & A GA Mailing Labels GARP037L, GA MAIL LABEL, GARP037L, February 18, 2016 from Randall Wood, Grants and Agreements Region 6.	2011-2015	We assigned locations to each grant and agreement from FY 2011-2015 a location. G&A reports were linked to obtain city names, but resulting data were too incomplete. We reviewed each G&A record from the past five years in the region, assigning city, state, and county. Once locations were assigned to all organizations, "local" or "non-local" status was assigned, based on proximity to the awarding NF. 6 of the total 836 recipients in the G&A data contained insufficient information to be assigned a location and were thus treated as missing data. We used the following terms when assigning grant recipients a status: <ul style="list-style-type: none"> ▪ "Local" grants and agreements: cooperators with an address located in a county that contains some portion of the national forest. ▪ "Non-local" G&A's: G&A's without cooperators in counties bordering NF. ▪ Selecting a city and state for NGOs: we picked the closest location to the NF awarding the grant or agreement to decide whether they were local or non-local (e.g. The Nature Conservancy was assigned to their office in Bend, Oregon when the agreement was with the Deschutes; to their office in Ashland when the agreement was with the Rogue River-Siskiyou). ▪ Assigning state and federal agencies with main offices but multiple branches: assigned to their main location (e.g. Washington State departments in Olympia, federal agencies in Washington DC), unless the G&A data distinguished them as a specific local branch (e.g. "Bureau of Land Management, Lakeview"). State and federal agencies that were assigned to their capital location were assigned "multiple" locations rather than local/non-local. 	Reports vary depending on date pulled, filters applied, and other database particulars. Data presented here are our best available numbers based on the date and manner in which the reports were pulled. Despite working with our Forest Service partners, we were unable to obtain data from the G&A database including both G&A award details and awardee locations on the same report. Reports which would generate necessary information from G&A without large quantities of missing data were absent. Working with contacts in the RO and WO we found that the three reports needed for our intended analysis were workload, mailing labels, and partnership reports, which we merged together into one linked database. Even with this merge and database creation, we still had significant missing data. We were unable to verify the G & A resulting numbers due to the varying ways in which G & A data can be pulled from the system, making comparison or verification difficult. We found that the number of G & A listed as "open" far exceeded the actions on agreements (modifications and new agreements totaled), often by several hundred, making "G&A open" unreliable for reporting.
Oregon and Washington Collaboratives	Emily Jane Davis, Oregon State University	2016	Mapped spatial extent of collaboratives in OR and Washington by their defined boundaries.	Master list is a living document, updated annually, informed by collaboratives and those who study or work with them.
Community Capacity and Land Stewardship Program	National Forest Foundation	2016	Listed reported recipient name from NFF in Figure 3.8. Linked collaboratives to CCLS award recipients in Table 3.1 by identifying the collaborative associated with each award. Linked awarded collaboratives to list of active collaboratives in region.	Linking of CCLS awards and collaboratives resulted in 25 linked to active collaboratives, 3 entities not listed as collaborative, and 1 inactive collaborative).
Volunteers	VPR: USFS Volunteer & Partner Reports. Data received from Emily Biesecker, FS-1800-16, July 19 2016. *other data presented on pg 7 sources listed on pg 4	2014-2015	<ul style="list-style-type: none"> ▪ Compiled data for each forest in R6 for FY2014 & F Y2015 into a single dataset. ▪ Totaled cumulative hours for each forest in FY2014 and FY2015 for multiple variables. ▪ Calculated total Volunteer Person Years by Forest for functional areas combined. ▪ Divided other variables (Acres, FTE, Visitors, Budget) by Person Years for each forest. Acres and Visitors reported in 1,000s. Budget is reported in \$10,000s. 	Possible inconsistent reporting or categorization of volunteer time across programs. There are significant portions of Unknown data in Age and Race/Ethnicity data.
Conservation education	NatureWatch, Interpretation, and Conservation Education (NICE) Database, data received from Brenna White, September 22, 2016.	2011-2016	Data used was six years between 2011-2016, to capture more complete data. Quarterly reporting requirements for NICE just started in 2016; by including 2016 data (through September 22, 2016) we captured fuller forest reporting. We also Compiled data where multiple responses could be selected for one variable. Raegional level: <ul style="list-style-type: none"> ▪ Totaled audience type by FY for R6. ▪ Audience categories were combined and simplified into 6 segments: 1) Youth, 2) Employees & Interns, 3)Teachers/Educators, 4) Forest Visitors, 5) Volunteers, 6) General Public & Other Forest level: <ul style="list-style-type: none"> ▪ Totaled audience number and type by Forest for each Initiative, and each Subject. ▪ Counted initiatives, subjects, and delivery methods each time they were listed (some events listed multiple initiatives, multiple subjects, and multiple delivery methods). ▪ Separated partners, lumped category into individual data entries to better sum partners by forest. 	<ul style="list-style-type: none"> ▪ Inconsistent reporting across the region, including a broad range of estimated audience numbers. For example, one forest only entered four accomplishments in six years. ▪ WO just added quarterly reporting requirements in FY2016. ▪ Leave No Trace initiative reported audience numbers 10x the size of the second largest audience by initiative. As an outlier this program was reported separately.

Data used in Chapter IV: Integrated restoration

Data	Source(s)	Dates	Analysis	Considerations
Spatial data for gPAS	USFS gPAS from Ryan Gregg and David Green, Washington Office, Strategic Planning, Budget, and Accountability, USFS	Obtained March 2016	<p>Mapped all spatially explicit accomplishments, then counted acres where accomplishments overlapped spatially. Used overlap threshold of 10% (i.e. two polygons need to overlap by at least 10% to be considered).</p> <p>Initially, we sought to spatially correlate performance data on the landscape to develop methods to measure the extent to which restoration is occurring in an "integrated" fashion. Although this initial set of measures is limited, we hoped to create a proof of concept to measure integration. In a later phase, we anticipate linking these results to social and economic measures to understand relationships between on-the-ground work and social and economic conditions. For example, linking accomplished work and the extent of social vulnerability or isolation could show how the Forest Service may be contributing to community well-being. As more Forest Service accomplishment measures are geo-enabled, additional analysis can illuminate the extent to which national forests are prioritizing integrated restoration activities and understand how that work relates to communities around national forests.</p>	<p>Limited findings with only one year of data and only a few measures.</p> <p>Overlap could be due to how data was entered and drawn, or conducting a phased project; because activities are not necessarily independent accomplishments.</p>
Tabular data for gPAS measures	USFS Accomplishment acres by HUC 12 Watershed from John Maria, Washington Office, Business Operations, Strategic Planning, Budget and Accountability.	Obtained February 2016	<p>We removed Invasive/Noxious Spp from Management Accomplishments because it was unreliable.</p> <p>Missing and incomplete records were removed from the dataset prior to calculating summaries; the majority of these HUCs likely bordered Region 6, with headwaters outside of the region.</p> <p>For the final set of analysis looking at the concentration and frequency of treatment, we only used HUCs with management activity in them.</p>	<p>Invasive/Noxious Spp from Management Accomplishments is unreliable data (spatially off by 200%+).</p> <p>Unreliable measures impacted ability to use all measures for analysis.</p>
Watershed Condition Class and priority	<p>Watershed Condition Framework, USFS, Watershed Condition Framework USFS online database.</p> <p>Watershed Condition Framework, USFS classification from Carol Boyd, Natural Resources, Regional Office</p>	<p>Downloaded April 2016</p> <p>Obtained May 2016</p>	<p>Counts of watershed condition class and identified HUCs with priority watershed classification. Linked watershed condition class and presence/absence of priority watershed classification to each HUC 12 watershed in tabular gPAS data.</p> <p>Analyzed location and frequency of accomplishments by watershed and respective condition class.</p> <p>We did not receive more complete watershed data at the time of publishing this document.</p>	<p>Both datasets contained missing data. WCF online data contained incomplete and outdated information on priority watersheds.</p> <p>Used second set of data to address missing data issues. This resulted in a more complete list of watershed condition class and priority by HUC 12 identifier, but still had missing data. Missing data were watersheds on the border with another region (e.g. watersheds in the Fremont-Winema that included some portion of Region 5). This may be due to how these data were sorted and deleted for our data request.</p>
Case study example	TIM FPDS FACTS		<p>Located timber sales by location information in timber sale description.</p> <p>Attempted to locate restoration-related service contracts by description of where and how work was conducted. Had limited success in finding physical locations for recorded service contract work.</p> <p>Attempted to link accomplishments from FACTS to location of timber sales and service contract work, to see where projects aligned with reported accomplishments.</p>	<p>Linking proved to be unfeasible. Timber data is reported with enough information about location of sale that the majority of timber sales could be linked. However the majority of service contract work could not be linked to the reported accomplishments, as demonstrated in maps 4.3 and 4.4.</p>



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