



NORTHWEST FOREST PLAN

THE FIRST TEN YEARS (1994–2003)

Procurement Contracting in the Affected Counties of the Northwest Forest Plan: 12 Years of Change

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Abstract

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As part of the 10-year socioeconomic monitoring of the Northwest Forest Plan, this report evaluates changes in Forest Service and Bureau of Land Management (BLM) procurement contracting between 1990 and 2002 by asking, (1) How much and what kind of work did the Forest Service and BLM contract during this period, and (2) who received economic benefits from this procurement contracting? Procurement contracting is a particular focus of the socioeconomic monitoring because one expectation of the Northwest Forest Plan was that the Forest Service and BLM would create high-skill, high-wage private sector jobs in public land restoration through contracting to partially offset job losses in timber production, harvesting, and processing. This report finds that, to the contrary, the Forest Service reduced its contracting of land management activities on national forests in the Northwest Forest Plan area from a high of \$103 million in 1991 to a low of \$33 million in 2002. By contrast, BLM spending was fairly constant at just under \$20 million annually. Both the Forest Service and the BLM changed the type of activities that they contracted, shifting from activities associated with intensive forest management such as tree planting in clearcuts to activities associated with ecosystem management. Contractors located near national forests and BLM lands and rural communities captured a similar proportion of contracts in both the earlier and later parts of the study period. However, the significant decline in Forest Service contract spending resulted in considerable decline in the amount of money flowing to rural communities through contracting. Thus, it is unlikely that federal land management contracting created a net increase in jobs to replace jobs lost in mills and logging operations in public lands communities.

Keywords: Northwest Forest Plan, monitoring, procurement contracting, U.S. Forest Service, Bureau of Land Management, ecosystem management, restoration, rural communities.

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Introduction

The Northwest Forest Plan (also the Plan) proposed an annual average timber sale volume of 1.1 billion board feet in the territory of the northern spotted owl (*Strix occidentalis caurina*), a reduction from the annual average harvest of 3.9 billion board feet between 1979 and 1989 (Warren 2003). However, in creating principles for the Plan, President Clinton said that, where possible, ecologically sound timber sales should go forward and, “where this cannot be met, we need to do our best to offer new economic opportunities for year-round, high-wage, high-skill jobs” (USDA and USDI: 1994, 3). Ultimately, the Secretaries of Agriculture and the Interior chose the particular features of the Northwest Forest Plan because they felt it was “the best alternative for providing a sustainable level of human use of the forest resources while still meeting the need to maintain and restore the late-successional and old-growth ecosystem” (USDA and USDI: 1994, 26-27).

The Plan aimed to restore old-growth forests and the habitats of old-growth-dependent species. Achieving these outcomes required that the Forest Service and the Bureau of Land Management (BLM) undertake new kinds of activities ranging from surveying for spotted owls to thinning plantations in ways that would restore old-growth characteristics. In addition, the Northwest Forest Plan called for the Forest Service, BLM, and other federal land management agencies to contribute to the well-being of rural communities by assisting them with long-term economic development and diversification in order to mitigate the loss of timber jobs. One way in which the agencies were to accomplish this was by creating new jobs in the woods through procurement contracting through which contractors would undertake the restoration and maintenance activities associated with ecosystem management.

Given the considerable change in the management priorities of the federal land management agencies mandated by the Northwest Forest Plan and the stated goal of compensating for timber job losses, especially in the late 1990s, this report focuses on two central questions:

1. How much and what kind of work did the Forest Service and the BLM contract between 1990 and 2002, and how did this work change over time?
2. Who received economic benefits from procurement by the two agencies, and how did this change over time?

This study answers these questions by evaluating Forest Service and BLM land management procurement contracting from 1990 through 2002 as part of the larger 10-year socioeconomic monitoring of the Northwest Forest Plan (Charnley et al. 2005). It looks particularly at changes in spending, the types of work contracted, and where the contracting activities occurred. In addition, it examines changes in the number of contractors who performed land management activities for the Forest Service and BLM and the extent to which they were located in rural communities in areas dominated by public land.

Background

Procurement contracting—purchases of goods and services—is one of the ways that the Forest Service and the BLM could accomplish restoration and economic development. Federal land management agencies could also use in-house crews, timber sale contracts, and, in some cases, grants and cooperative agreements to undertake land management activities. In addition to timber removal, timber sale contracts had historically included road construction and maintenance when roads were required for the removal of timber. However, most tasks associated with intensive forest management such as site preparation, tree planting, and thinning, were performed by in-house crews or contracted out to businesses who hire crews of workers to perform contracted activities. In addition, other activities associated with recreation, facilities maintenance, restoration, or monitoring were historically performed by in-house crews, via contracts or, more rarely, through cooperative agreements.

The Northwest Forest Plan called for a sharp reduction in timber sales. It was assumed that procurement spending on activities related to the associated intensive timber

management would diminish with the decline in timber sales. Procurement spending on service activities associated with intensive timber management was to have been replaced with spending on activities such as species surveys and habitat restoration. Before the Northwest Forest Plan, for example, large crews of contract workers traveled throughout the region planting trees in clearcut areas (Brown 2000, Hartzell 1987). With the virtual end of clear-cutting, large-scale tree planting became unnecessary. However, it was assumed that tree planting associated with, for example, riparian restoration or postfire restoration might continue or increase. Similarly, road building would likely diminish under the Northwest Forest Plan, but road decommissioning and road maintenance might increase. Also, with fewer timber sales, the road maintenance, construction, and decommissioning that occurred as part of timber sales would now have to be done separately through procurement contracting. The demand for restoration of late-successional reserves, salmon (*Oncorhynchus*) habitat, and fire-adapted ecosystems, new surveying requirements, and the need to pay for road work outside of timber sales suggests that funding for procurement contracting should have at least remained constant if not increased through the 1990s.

If the agencies were shifting to procuring different types of work, it would be logical to expect a shift in the contractors who performed this work. We know that contractors traveled long distances to undertake labor-intensive activities such as tree planting, precommercial thinning, and site preparation. In contrast, contractors performing equipment-intensive contracts more often worked close to home. Technical contracting patterns were less consistent (Moseley 2002, 2003; Mosley and Shankle 2001). If the Forest Service and the BLM have shifted their contracting emphasis from labor-intensive activities to equipment-intensive activities, it would be expected that contractors located closer to federal lands would be awarded proportionately more contracts than was the case before the Northwest Forest Plan was put into place.

The record of decision of the Northwest Forest Plan changed management priorities for the federal land management agencies. At the same time, President Clinton created the Jobs-in-the-Woods Program, followed shortly thereafter by the Hire-the-Fisher Program. These programs sought to create employment opportunities for people who had been displaced by the new management priorities that focused on endangered species protection and ecosystem management. These new programs did not come with additional funding for the federal land management agencies but, rather, redirected existing Forest Service and BLM funds to restoration projects in the Northwest Forest Plan area.

Implementation of the Jobs-in-the-Woods Program took two forms. First, a number of training programs were created in western Oregon and Washington and northern California that were designed to retrain displaced timber workers to perform new types of restoration and technical activities. Typically, these training programs involved a nonprofit organization, a community college, federal land management agencies, and a local Job Partnership Training Act agency. Normally, federal land management agencies provided restoration projects and the money to implement them by using the training crews. Some of these training programs only lasted a season or two, whereas others, such as those created by the Rogue Institute for Ecology and Economy, the Watershed Research and Training Center, Redwood Community Action Agency, Columbia-Pacific Resource Conservation District, and their partners, lasted for many seasons. Although it is beyond the scope of this project to discuss these programs in detail, their central purpose was to create a trained workforce that could undertake new activities for the federal land management agencies while creating high-skill, high-wage jobs for displaced workers (Anderson 1999, Brodsky and Hallock 1998).

Second, the federal land management agencies intended to implement the Jobs-in-the-Woods Program through procurement contracting. The Forest Service and BLM were exempted from some free and open competition procurement requirements and allowed to set aside so-called Jobs-in-the-Woods contracts to contractors located in

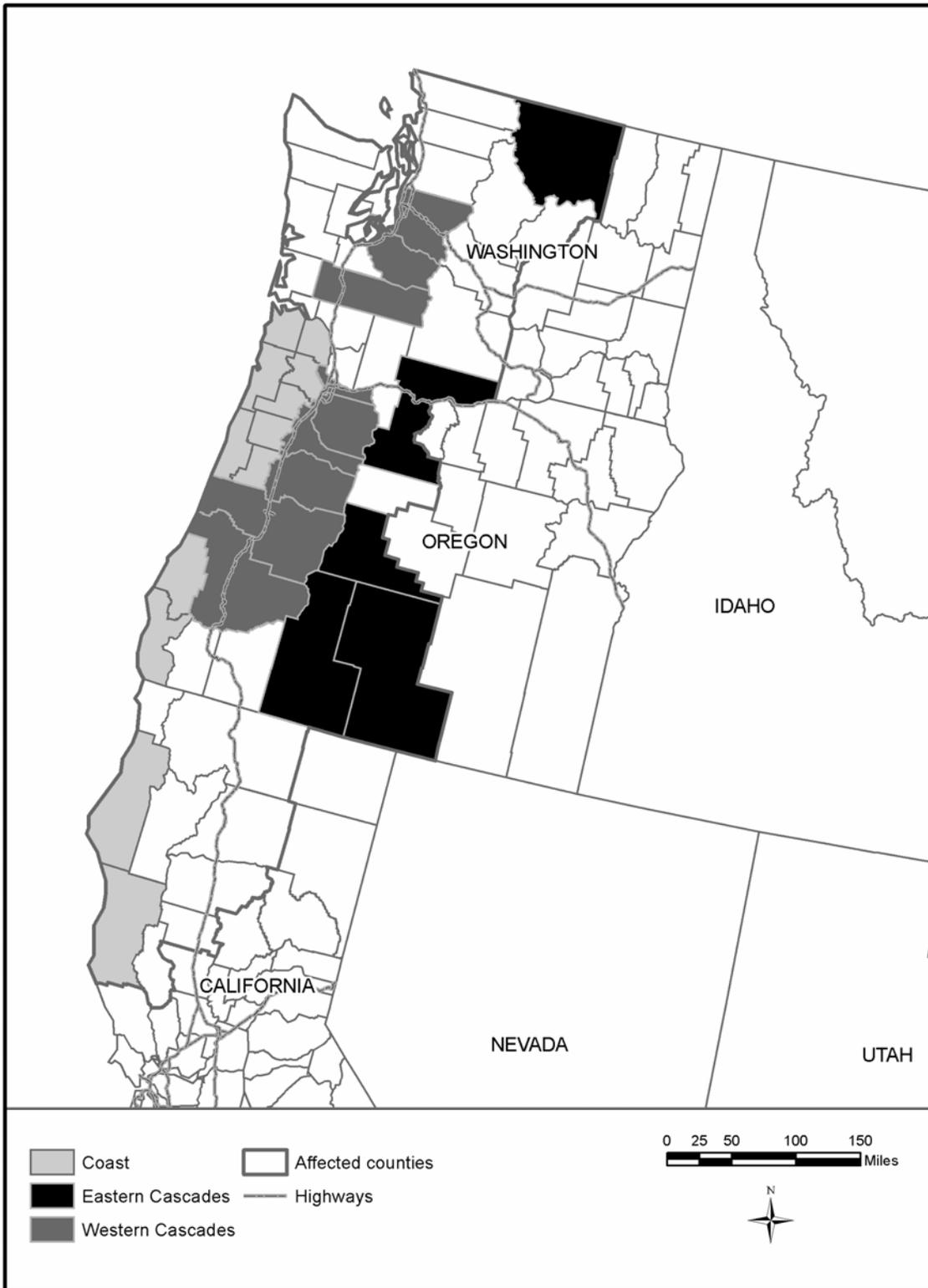


Figure 1—Affected counties containing Bureau of Land Management lands, by subregion.

the Northwest Forest Plan's affected counties (fig. 1). In retrospect, it is an open question whether the exemption had any impact because we now know that most of the contracting capacity in the Pacific Northwest is located in these counties (Moseley and Shankle 2001). Nonetheless, if the exemption did have an impact we would expect contractors in the affected counties to have been awarded a larger percentage of contract dollars in the mid-1990s than was the case beforehand.

During the 1990s, summary reports of the Northwest Forest Plan included information about Forest Service spending on Jobs-in-the-Woods activities (e.g., USDA Forest Service 1995). By and large, these documents reported the amount of money spent to perform forest restoration activities that the agencies designated as Jobs-in-the-Woods projects. In addition, these reports typically provided a handful of case studies to highlight agency efforts. Although the Jobs-in-the-Woods contracts were supposed to include reporting requirements in which the contractor was to provide information about the wages they paid to their workers, this information was never systematically collected or compiled. However, a 1996 report provided detailed lists of some fiscal year 1995 projects and, in a few cases, wages associated with those jobs (USDA and USDI 1996). The document reports that forest workers were paid an average of \$13.48 per hour including benefits for vegetative management (e.g., thinning, tree planting) with contracts lasting an average of 18 days. For road work, the average wage was \$21.60 per hour, including benefits, and contracts lasted an average of 27 days. In stream restoration workers received an average of \$20.43 per hour including benefits, and contracts lasted an average of 18 days (USDA and USDI 1996: app. vi). Although interesting figures, the wage reporting was sporadic, and there is no way of knowing if it is representative of all such work. It is simply too sparse to draw reliable conclusions about jobs created or wages paid.

In addition to these reports, a number of nonprofit organizations and consultants documented the displaced worker training programs. The Ecosystem Workforce Project's 1995 and 1996 reports described in some detail the

programs in Oregon including the number of people trained and their wages. During 1996, in Oregon, for example, the Jobs-in-the-Woods training programs employed 19 Hispanics and 38 Whites, including 3 women and 54 men for an average of 36 weeks at \$11.09 per hour plus health insurance for crew members and \$14.30 per hour plus health insurance for crew leaders (Ecosystem Workforce Project 1996, 1997). In addition, these reports provided recommendations about how to improve the training programs based on interviews with training program steering committee members and trainees. However, these reports did not continue beyond the 1997 field season, focused only on training programs, and rarely provided information about contracted activities (e.g., Hallock 1998).

After the Jobs-in-the-Woods Program, a number of other administrative and congressional programs sought to create economic benefit by using procurement contracting. A memorandum of understanding between the Forest Service Pacific Northwest Region, the BLM in Oregon and Washington, and the Governor of Oregon; the National Fire Plan (Western Governor's Association 2001); the Secure Rural Schools and Community Self-Determination Act of 2000; and the stewardship contracting pilot program all attempted to create rural community benefit by using procurement contracting as a source of employment and business opportunities (Moseley et al. 2002, Moseley and Toth 2004). If these programs were effective, we would also expect to see contractors in rural communities and near federal forest lands capturing proportionately more of the contract dollars than was the case in the early 1990s. In addition, with the emphasis of creating rural community benefit through procurement contracting, we would expect that spending on procurement contracting would have remained unchanged or increased.

Hypotheses

With this background information, I developed a set of hypotheses based on the goals, objectives, and requirements of the Northwest Forest Plan, the Jobs-in-the-Woods Program, and subsequent federal efforts to create rural community benefit for public lands communities. I hypothesized that:

- Money spent on procurement contracting would be constant or increase between 1990 and 2002 because of the increased need for forest restoration activities associated with the Northwest Forest Plan and associated requirements to restore the habitat of endangered species.
- The type of work procured over time would shift away from activities associated with intensive timber management (e.g., tree planting, timber stand improvement, site preparation) and toward activities associated with ecosystem management (e.g., road decommissioning, surveys, and assessments).
- Procurement contracting for equipment-intensive work would increase because the need for road maintenance and decommissioning would remain the same or increase in order to restore salmon habit and habitat connectivity and because road work would be increasingly difficult to fund as part of a timber sale contract, as there would be fewer timber sales.
- The location of contracted activities would shift over time as management priorities changed.
- A change in the type of work would cause a change in the contractor base, with contractors who focused on activities associated with timber-intensive management dropping out of the contracting pool while those providing ecosystem-management activities increased.
- Contract money would be increasingly concentrated in designated affected counties of the Northwest Forest Plan because the Jobs-in-the-Woods Program called for increasing contract awards to contractors located in these counties.
- Agencies would award an increasing proportion of contract dollars to contractors located in rural communities and in proximity to national forests and BLM lands in order to provide community benefits, increase community-well being, and mitigate the job loss associated with reductions in timber harvesting.

Methods

Given the limited information that was collected about the Jobs-in-the-Woods program and its impact, we had to rely on existing data sources that were not specific to the Jobs-in-the-Woods Program to understand how forest management services changed, and whether these changes created new job opportunities undertaking forest restoration to replace job loss associated with the end of intensive timber management. Consequently, in this report, we look at forest management contracting across the affected counties of the Northwest Forest Plan. Unfortunately, the data available cannot provide information about employment, wages, or job quality. Instead, we can examine Forest Service and BLM contracting patterns and the businesses that undertook these contracts.

Data

The data for the analysis are drawn from the Federal Procurement Data Center's database, which includes information from all federal agencies compiled from the SF-279 form that each federal agency must fill out for contracts with an estimated value above \$25,000. Our data set includes procurement contracts from the Forest Service and BLM in western Oregon and Washington and northwestern California awarded between fiscal years (FYs) 1990 and 2002. All data are reported by federal fiscal year. The analysis does not include any timber sale data.

More specifically, the data set includes contracts involving land management work in the Northwest Forest Plan's affected counties, as defined by the Jobs-in-the-Woods Program (fig. 1). The data set includes product service codes that were related to land management, broadly defined, by using the same criteria as Moseley and Shankle (2001), Moseley et al. (2002), and Moseley and Toth (2004). That is, the data set includes contracts related to forestry and watershed management such as thinning, brushing, piling, noxious weed control, biological surveying, riparian restoration, and road construction and maintenance. The data set does not include activities such as building construction or copier repair, nor does it include

any purchases of goods. Contracts involving fire suppression are also excluded because they are rarely included in this database. Unfortunately, prescribed burning is reported in the same product service code as fire suppression, and therefore is also excluded.

Measures

The Federal Procurement Data Center records track data by task order. We defined the value of a contract to be the total amount of money entered into the database with the same contract number within each year. We counted a contract meeting these criteria as a single contract regardless of how many task orders were involved. The value of the contract is the sum of the dollars obligated with each task order. We corrected the contract values for inflation and report data in 2002 dollars.

The Federal Procurement Data Center records the location of work at the county level. Consequently, we report most information about procurement at the county level rather than at the forest or BLM district level. At times we aggregate information at the state or subregion level. To identify regional variation within the Northwest Forest Plan area, we created four subregions: west Cascades, east Cascades, Coast, and Klamath-Siskiyou (fig. 2). Bear in mind that the subregion categories only include affected counties of the Northwest Forest Plan. For example, the east Cascades category does not include all of what might, more generally, be considered the eastern Cascades. It was not possible to use Northwest Forest Plan planning provinces because they were not well correlated with the county or national forest boundaries, which was how the place of performance was recorded.

To understand the extent to which local contractors were awarded contracts, my research assistants and I calculated the distance between the contractors' headquarters and the national forests where the work occurred by using an approach similar to that used by Moseley and Shankle (2001). We calculated this distance rather than defining "local" because the definition of local is context-specific and a regionwide definition would be too arbitrary for the purposes here. We calculated these distances by

using Environmental Systems Research Institute (ESRI's) ArcView 8.3 GIS software.¹ For the Forest Service, we were able to impute the national forest in most cases from the county of performance, information about the office that wrote the contract, or the contract numbers. After deriving the national forest, we calculated the distance by averaging the distance in air miles between the weighted center of the zip code (as provided by ESRI) where the contractor has its headquarters and 25 random points within the national forest. Because BLM contracting is more centralized, we could not derive the BLM district from the information available. Consequently, for BLM contracts, we measured distance between the contractors' headquarters and 25 random points on the BLM land within the county where the work was performed. It is important to keep in mind that these distances are measured in air miles and are likely to be considerably shorter than road miles and to vary considerably in travel time because of topography. For example, the distance from Redding, California, to Ashland, Oregon, is 120 air miles and 135 road miles. By contrast, the distance from Redding, California, to Crescent City, California, is 123 air miles and 212 road miles (Moseley et al. 2003). Although somewhat less accurate information than a contractor would have available when considering whether and how to bid, this was the most accurate information I could calculate from the available data.

In addition to analyzing distances between the contractors' headquarters and the national forests or BLM lands as a measure of local benefit, I also examined awards to contractors based on the population of the community where they were located. Following Census Bureau definitions, I defined a rural community as a city having fewer than 5,000 residents (U.S. Census Bureau 2002). I included unincorporated communities in this category as well. Again following Census Bureau definitions, I defined urban areas to be cities with populations above 50,000. I created two additional categories: 5,000-9,999 and 10,000-50,000 to describe awards to contractors in midsized communities.

¹ The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

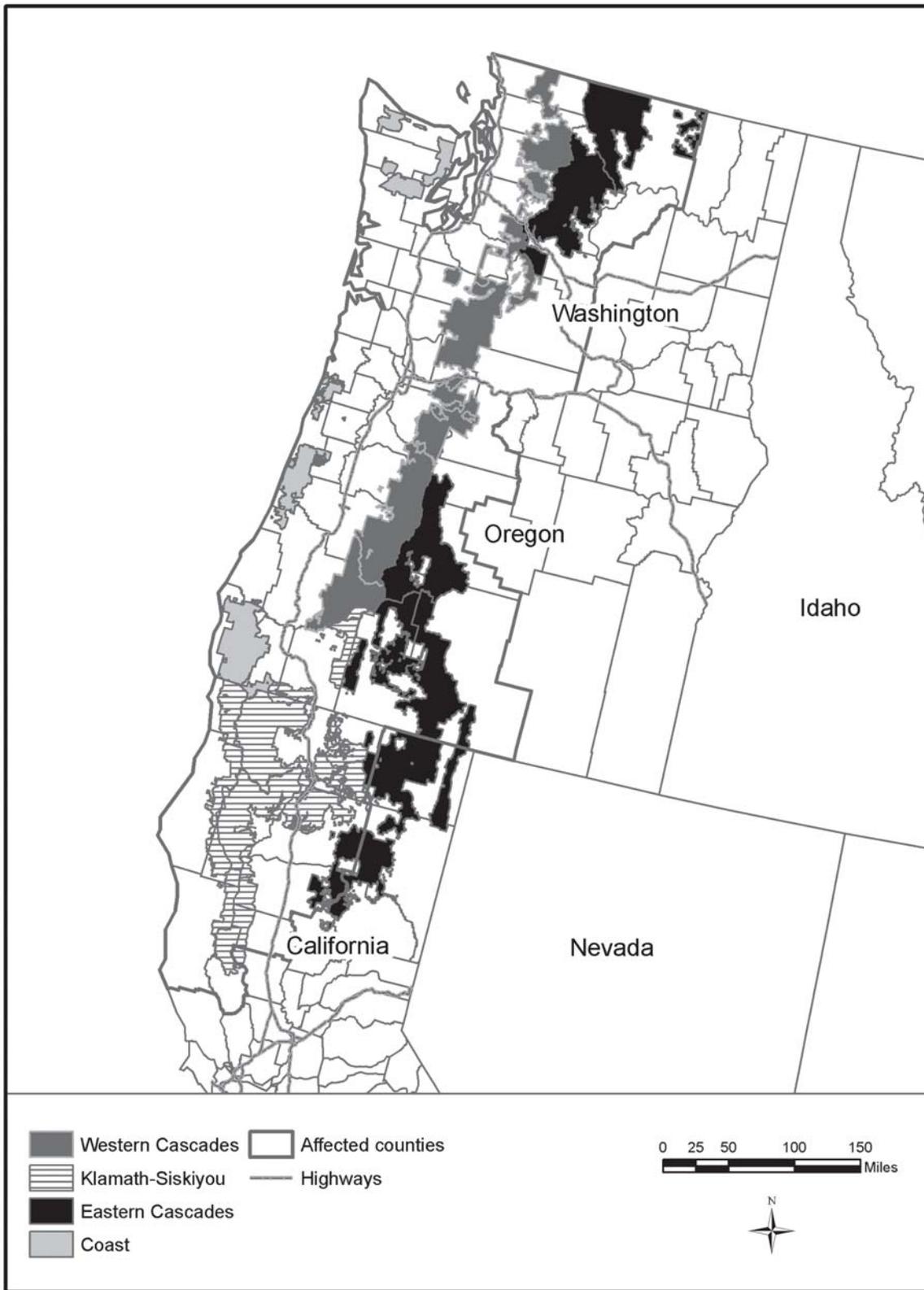


Figure 2—National forests within the affected counties of the Northwest Forest Plan, by subregion.

I divided the product service codes provided by Federal Procurement Data Center into three categories—labor intensive, equipment intensive, and technical—based on the type of work that contracts with particular product service codes were likely to involve. Activities such as tree planting and thinning were classified as labor intensive. Activities involving heavy equipment, such as road maintenance, were considered equipment intensive. Technical work includes activities such as species surveys or environmental assessments. This was a rough categorization that undoubtedly created error that is not easily estimated. My conversations with Forest Service and BLM procurement technicians suggested that some product service codes involve a wide variety of work types. For example, “other natural resource and conservation services” includes technical work such as species surveys, but also includes nontechnical work such as rock crushing. In addition, the way the agencies choose product service codes differs over time and from person to person.

In addition to reporting the data on an annual basis, I also chose three 3-year periods for detailed analysis: 1990-92, 1995-97, and 2000-2002. When analyzing data by using this format, I reported data in 3-year aggregations. I did this to increase my confidence that I was reporting trends and not the impact of random year-to-year changes, which can be considerable in procurement contracting. I chose the first 3-year period because it is the first 3 years of the study period. It is also prior to the Northwest Forest Plan. I chose the middle 3 years based on consultation with people who have long been observers of the Northwest Forest Plan and the Jobs-in-the-Woods Program. They believed that these 3 years were the years the Forest Service and the BLM were most focused on the Jobs-in-the-Woods Program. Finally, I chose 2000-2002 because these are the final years of data available and they represent years in which attention had largely shifted to other programs, especially the National Fire Plan, stewardship contracting, and county payments.

Analysis

To understand the regional contracting market and the contractors involved in it, we calculated a variety of descriptive statistics by using the value of contracts, the number of contracts, the type of contracts, and the distance between contractor headquarters and the location where the work occurred. Formal statistical tests were kept to a minimum.² Although the BLM and the Forest Service follow the same procurement laws, past studies have suggested that their procurement practices are quite different and thus the two agencies needed to be analyzed separately (Moseley et al. 2002).

Findings

Procurement Spending

To test the first hypothesis—that spending would remain constant or increase—I calculated total annual BLM and Forest Service spending on contracting. Between 1990 and 2002, the Forest Service and the BLM together procured \$1.06 billion in land management services in the Jobs-in-the-Woods affected counties. The Forest Service spent \$750 million and the BLM, \$256 million. Forest Service spending declined throughout the period, whereas BLM spending remained fairly constant (fig. 3). A time-series analysis confirmed what the figure suggests: the slope estimate for Forest Service funding was negative, large, and statistically significant, whereas the BLM funding showed no significant trend. Note that, in this trend over time and those discussed below, there are only 11 to 12 observations, which means that trends are unlikely to be statically significant simply because of the small number of years in the study. A lack of statistical significance does not necessarily imply a lack of a trend. Thus, from this point forward, the results of time-series analysis are not discussed explicitly, and trend results should be considered descriptive rather than predictive. It also is important to keep in mind that

² Moseley and Reyes (in prep) offer a more methodologically sophisticated analysis of changes in awards to public lands contractors.

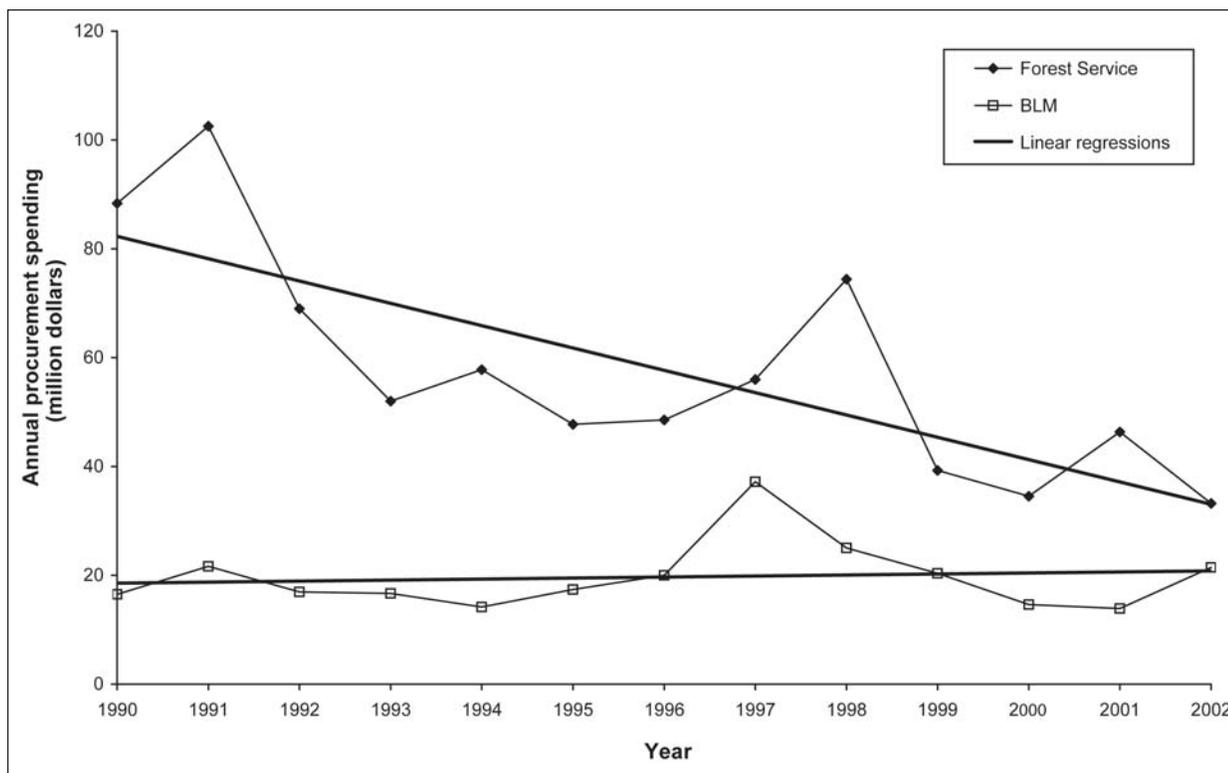


Figure 3—Total annual land management procurement spending, Forest Service and Bureau of Land Management (BLM), fiscal year 1990 through 2002.

we are not describing a sampling of contracts but rather the universe of ecosystem management contracts issued during the period, limited only by data entry errors and omissions. Thus we can be more confident of apparent trends than we might if the analysis were based on a small sample of the contracts.

Forest Service spending peaked in 1991 at \$103 million and then declined almost continually until 1998, when there was a brief increase before it began to decline again to a low of \$33 million in 2002. The 1998 peak may have been the result of funds for restoration made available after the January 1997 flood that occurred in western Oregon and northern California. The number of contracts that the Forest Service issued declined (fig. 4), as did the total dollar value of contracted work, although at a slightly faster rate. This can be seen by the number of contracts falling slower than the total spending by viewing the average contract value, which increased slightly over the study period (fig. 5)

Bureau of Land Management spending on procurement contracting was more consistent throughout the period, averaging just under \$20 million per year. However, spending bumped upward in the middle of the study period, with the BLM spending \$37 million in 1997. The BLM issued about the same number of contracts each year, but the level of procurement spending fluctuated from year to year. Consequently, average contract value varied with the value increasing whenever the agency spent more money procuring services (figs. 4 and 5).

Procurement by Type of Work

The Northwest Forest Plan shifted management priorities away from intensive forest management and toward ecosystem management, including increased requirements for species surveys. With these changes, as the second and third hypotheses suggest, we might expect to see a decline

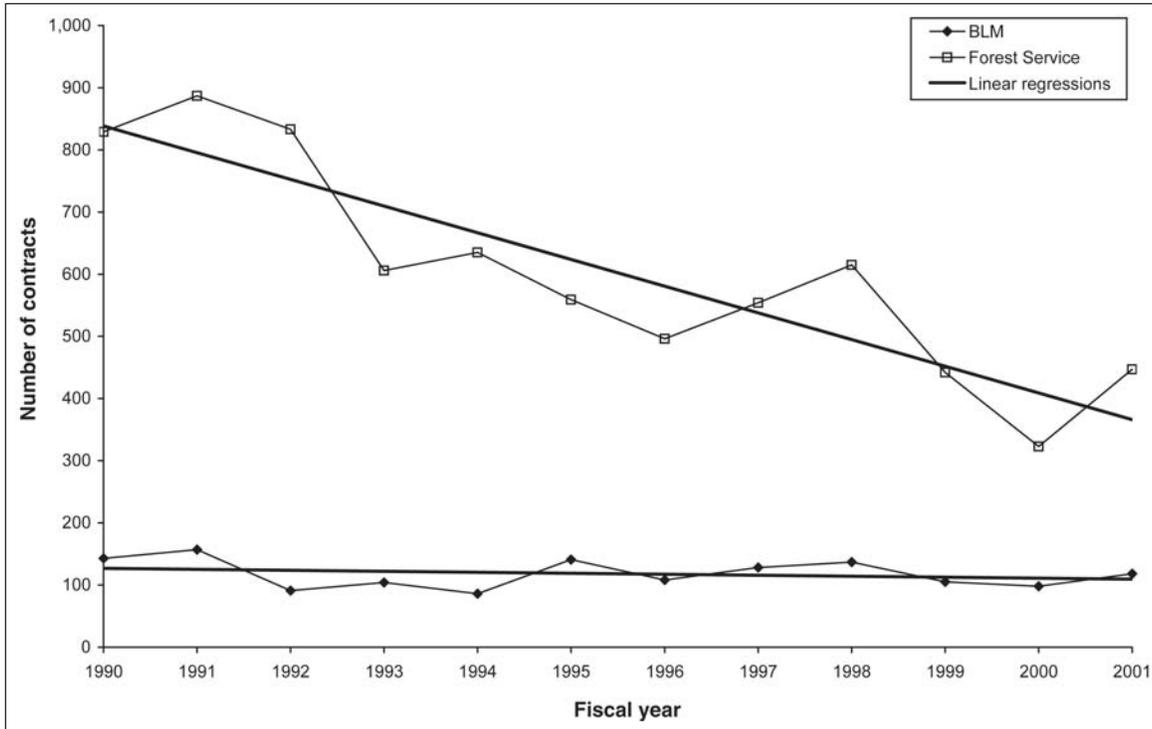


Figure 4—Total number of land management contracts, Forest Service and Bureau of Land Management (BLM), fiscal year 1990 through 2001.

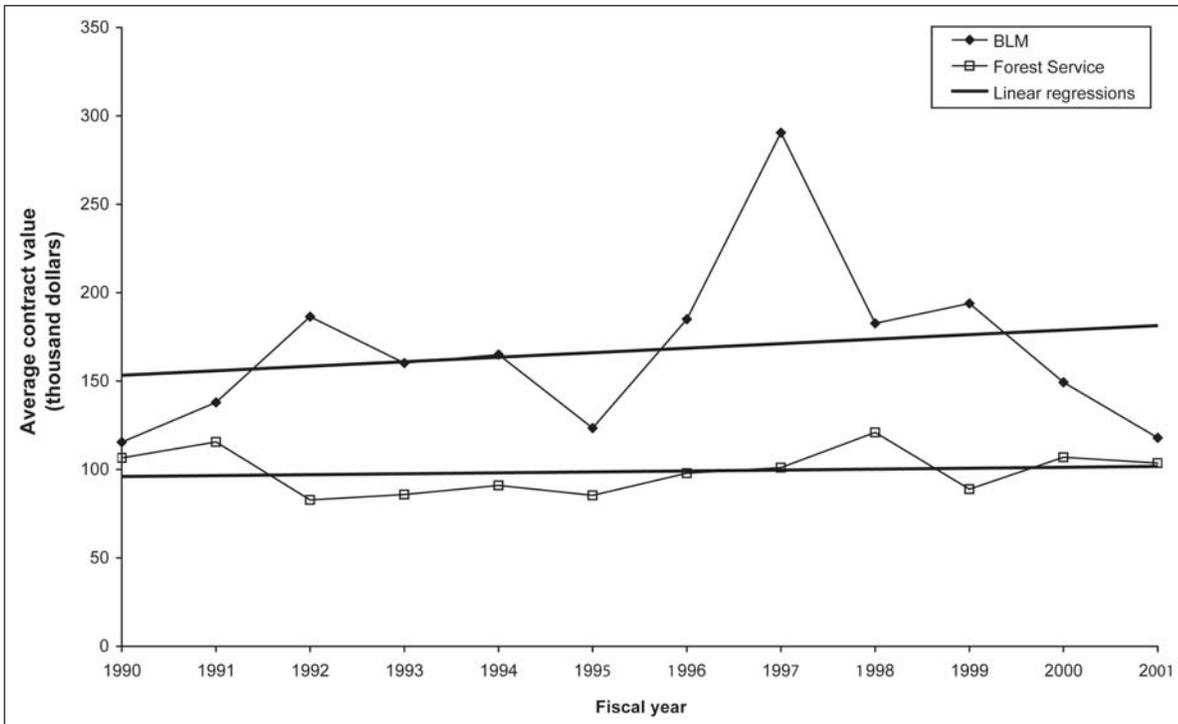


Figure 5—Annual average contract value, Forest Service and Bureau of Land Management (BLM), fiscal year 1990 through 2001.

in labor-intensive activities such as tree planting and site preparation and an increase in equipment-intensive activities such as road reconstruction and decommissioning and technical activities such as species surveys. This section explores how the type of work contracted by the Forest Service and BLM changed between 1990 and 2002. However, definitive analysis is difficult because product service codes are generalized and procurement staff may not be consistently classifying contracts across units. For example, some staff placed road work in “other forest and range improvements/nonconstruction,” whereas others used the category “maintenance/alteration/repair of roads, streets, and bridges.” In addition, some product service codes belied neat categorization because they include both technical activities such as surveys and equipment-intensive activities such as rock crushing. In addition, because terms are generalized, it is difficult to determine if an activity is performed for the purpose of intensive timber management or ecosystem management. For example, “tree

thinning” might include precommercial thinning, timber stand improvement, plantation thinning to improve timber production or to diversify habitat, fire hazard reduction, or aspen (*Populus* spp.) regeneration.

Forest Service—

Forest Service procurement spending in all three major categories (labor, equipment, and technical) declined during the 1990s (fig. 6). Contracting of labor-intensive work diminished most dramatically, from \$140 million during the 3-year period from 1990 through 1992 to \$37 million from 2000 through 2002, a 75-percent decrease. Equipment-intensive and technical contracting declined by one-third between 1990-1992 and 2000-2002. The Forest Service spent the most money on labor-intensive contracting in the early 1990s, but by the mid-1990s, spending on equipment-intensive work had surpassed labor-intensive contracting, although equipment-intensive contracting declined in absolute terms as well.

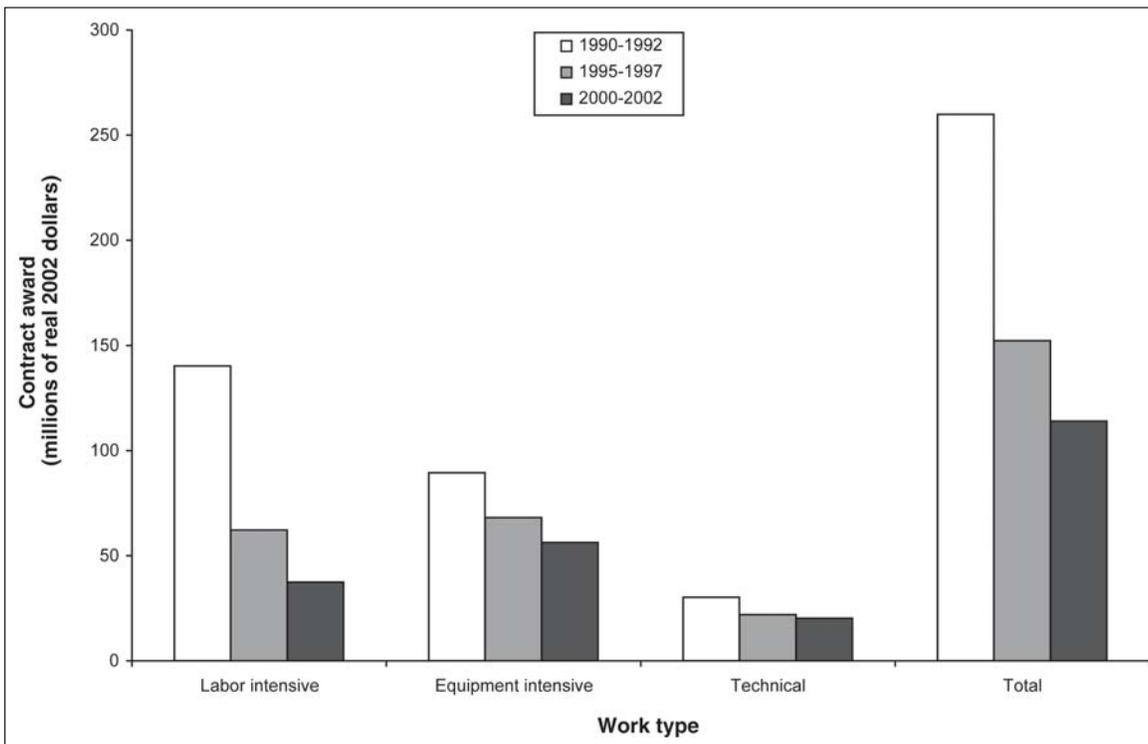


Figure 6—Contract dollars by work type, Forest Service, fiscal year 1990 through 1992, 1995 through 1997, and 2000 through 2002.

Spending in some product service codes declined, and spending in other codes increased. Tree planting decreased by the greatest percentage of any work type. Other types of labor-intensive work associated with intensive forest management such as seedling production and the vaguely defined “land treatment practices” also waned (table 1). Interestingly, tree thinning also declined despite the increasing emphasis on fire hazard reduction in the late 1990s and the funding of the National Fire Plan beginning in 2001. Although much of the Northwest Forest Plan area is temperate rain forest and therefore not particularly fire prone, the Klamath-Siskiyou Mountains and the eastern Cascades are fire-adapted ecosystems. Furthermore, much of the national forest land in northern California is located in fire-adapted ecosystems, but spending on thinning from 2000 through 2002 was less than spending in the early 1990s (Moseley et al. 2003). Similarly, the agency spent less on thinning in the Klamath-Siskiyou and eastern Cascades region in 2000-2002 than it did in 1990-1992, although spending on thinning rose from 1996 through 2002. In fact, comparing total contract spending with thinning contract spending, we see that thinning fell more quickly than other spending in the early 1990s, fell at the same rate as other spending during most of the study period, and only became a larger proportion of total spending beginning in 2001 (fig. 7).

Among the equipment-intensive activities, the Forest Service spent considerably more procurement dollars in the early 1990s on road construction than compared to later periods. In later years, road maintenance spending increased, although not enough to make up for the earlier decline in road construction procurement spending (table 2). This is contrary to what we might have predicted given the need to maintain and obliterate roads to protect and restore habitat. In technical contracting, contracting of endangered species surveys was greater in 1995-1997 than 1990-1992, but spending had fallen off by the early 2000s. Additionally, spending for contracted environmental

assessments was greatest during the early 1990s and declined after that (table 3). Other natural resource and conservation services was a large component of the technical contracting, but it is broadly and inconsistently used and may include activities ranging from owl surveys to rock crushing.

The patterns of decline in Forest Service land management procurement contracting suggest that, overall, the Forest Service did not replace procurement associated with intensive timber management with equivalent amounts of surveying, restoration, and maintenance activities to meet the requirements of the Northwest Forest Plan. Although the types of activities that the Forest Service contracted did change, and, after the mid-1990s, contracting was less related to intensive forest management and more related to restoration and maintenance, the overall decline in contract spending overwhelms these shifts.

Bureau of Land Management—

The BLM procurement spending remained fairly constant throughout the 1990s, but the type of work that the BLM procured changed. Contract labor, equipment, and technical work received fairly equal funding in the early 1990s and early 2000s. Despite the mid-1990s spike in spending, some finer grained shifts in emphasis occurred during the study period (fig. 8).

As with the Forest Service, labor-intensive work associated with intensive timber management declined for the BLM. But, thinning (probably largely associated with fire hazard reduction) largely replaced tree planting by the early 2000s. For example, spending on tree thinning more than doubled between 1990-92 and 1995-97, whereas spending on tree planting diminished to less than a third during the same period (table 4). As striking, the BLM procured little road construction or maintenance work in the early 1990s, probably because this sort of work was performed as part of timber sales or with in-house crews. However, by the mid-1990s, the BLM was procuring road

Table 1—Labor-intensive contracting by type of work, Forest Service

Type of work	Period (fiscal years)			Total
	1990-1992	1995-1997	2000-2002	
	<i>Dollars</i>			
Forest tree planting	64,245,564	15,010,386	5,698,765	84,954,715
Tree thinning	24,280,214	12,391,675	13,487,390	50,159,279
Other range-forest improvements/nonconstruction	16,106,851	13,552,183	6,692,122	36,351,155
Land treatment practices	15,816,828	6,925,658	4,124,375	26,866,862
Site preparation	5,039,510	5,200,455	2,598,344	12,838,308
Seedling production-transplanting	8,195,281	3,430,146	745,510	12,370,937
Other wildlife management	1,776,439	1,804,961	1,244,904	4,826,304
Seed collection-production	2,605,088	1,264,339	675,715	4,545,142
Forest-range fire rehabilitation	937,687	938,671	1,267,770	3,144,128
Maintenance repair alteration/restoration	0	1,096,901	127,000	1,223,901
Fisheries resources mangement	190,337	325,692	327,988	844,018
Pesticides support services	460,256	0	357,367	817,623
Recreation site maintenance/nonconstruction	394,718	66,786	0	461,504
Surface mining reclamation/nonconstruction	0	178,853	0	178,853
Survey line clearing	33,012	0	100,610	133,622
Landscaping-groundskeeping	107,158	0	11,090	118,248
Fire protection	32,051	0	14,228	46,279
Insect and rodent control services	28,886	0	0	28,886
Fish hatchery services	0	0	4,065	4,065
Total	140,249,881	62,186,706	37,477,242	239,913,829

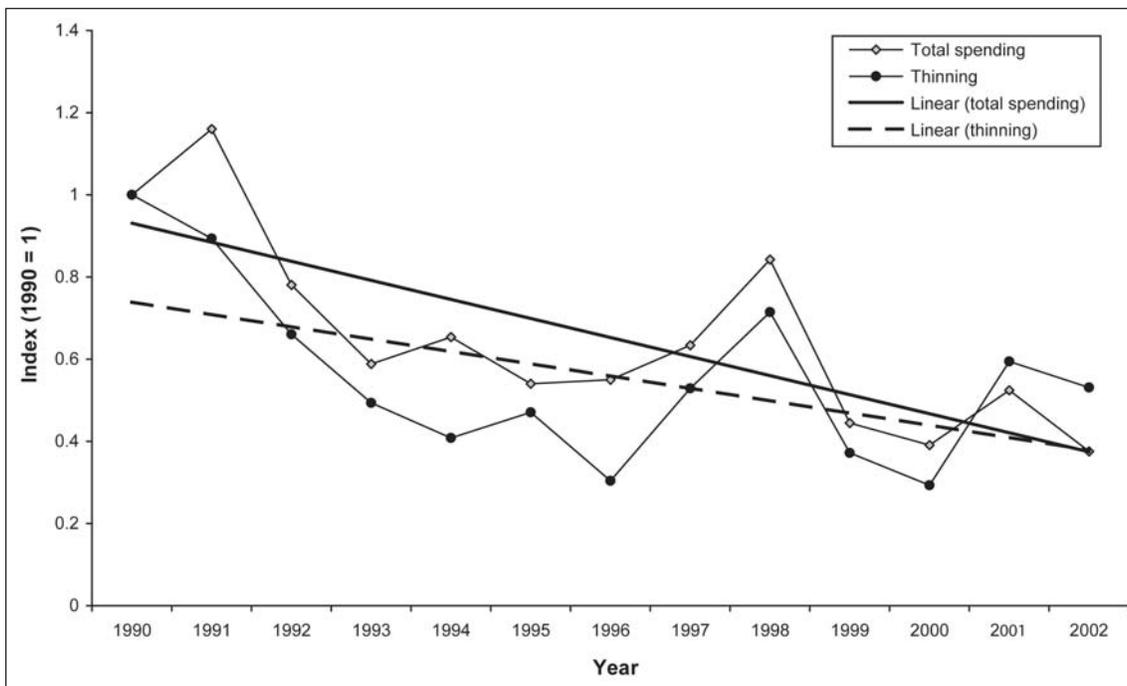


Figure 7—Indexed comparison of total land management procurement and thinning, Forest Service, fiscal year 1990 through 2002.

Table 2—Equipment-intensive contracting by type of work, Forest Service

Type of work	Period (fiscal years)			Total
	1990-1992	1995-1997	2000-2002	
	<i>Dollars</i>			
Construction/highways, roads, streets, bridges	44,487,080	34,289,706	27,538,187	106,314,973
Maintenance-repair-alteration/highways, roads, streets, bridges	15,748,807	26,698,318	22,231,944	64,679,070
Construction/recreation nonbuilding structures	12,026,855	4,991,407	3,353,793	20,372,056
Aerial fertilization-spraying	14,763,648	1,404,981	1,445,625	17,614,254
Construction/other conservation	1,425,189	446,273	132,145	2,003,607
Aerial seeding	517,503	0	504,066	1,021,569
Maintenance-repair-alteration/tunnels and subsurface structures	254,981	0	746,951	1,001,933
Construction/tunnels and subsurface structures	145,584	196,873	357,846	700,303
Range seeding-ground equipment	47,436	67,037	0	114,473
Maintenance-repair-alteration/other conservation structures	19,257	39,197	0	58,454
Total	89,436,342	68,133,791	56,310,557	213,880,690

Table 3—Technical contracting by type of work, Forest Service

Type of work	Period (fiscal years)			Total
	1990-1992	1995-1997	2000-2002	
	<i>Dollars</i>			
Other natural resource management and conservation	19,863,012	13,944,294	17,023,978	50,831,285
Professional services/land surveys-cadastral	2,797,729	1,007,662	134,146	3,939,537
Study/plant/animal	2,079,519	2,903,883	496,396	5,479,798
Study/environmental assessments	1,937,250	573,908	725,124	3,236,281
Other environmental services/studies/analytical support	568,780	1,573,643	319,243	2,461,667
Study/archeological-paleontological	1,537,029	165,022	53,797	1,755,848
Other special study and analyses	845,401	451,608	926,553	2,223,561
Study/natural resource	164,072	79,292	282,813	526,176
Study/scientific data	0	271,486	58,516	330,002
Research and Development (R&D)-natural resource-land-applied research	0	315,230	0	315,230
Study/soils	16,506	201,819	0	218,325
Study/feasibility-nonconstruction	72,655	101,535	0	174,190
Study/air/water quality	52,840	145,218	0	198,059
Study/recreation	135,335	0	0	135,335
Research-insect and disease control-basic research	0	134,529	0	134,529
Study/geotechnical	41,265	0	102,512	143,778
Independent investigation services/air/water pollution	0	57,851	86,382	144,233
R&D-other	70,513	0	0	70,513
Study/chemical-biological	0	0	70,122	70,122
Study/grazing-range use	0	35,419	0	35,419
Total	30,181,906	21,962,400	20,279,582	72,423,887

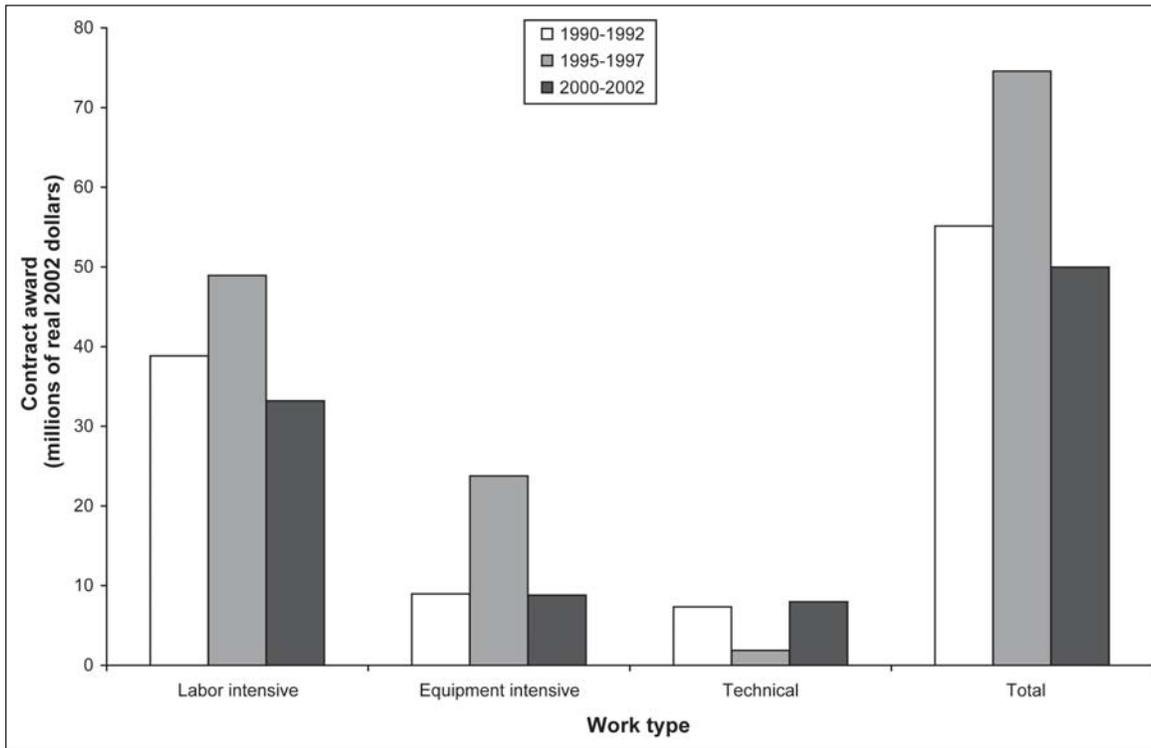


Figure 8—Contract dollars by work type, Bureau of Land Management, fiscal year 1990 through 1992, 1995 through 1997, and 2000 through 2002.

Table 4—Labor-intensive contracting by type of work, Bureau of Land Management

Type of work	Period (fiscal years)			Total
	1990-1992	1995-1997	2000-2002	
	<i>Dollars</i>			
Tree thinning	11,985,064	25,320,713	26,733,325	64,039,102
Forest tree planting	23,857,317	6,916,537	1,316,689	32,090,543
Land treatment practices	2,508,148	16,196,447	1,885,556	20,590,151
Other range-forest improvements/nonconstruction	37,290	106,772	1,988,981	2,133,043
Seed collection-production	47,436	1,121	451,387	499,944
Other wildlife management	283,461	0	101,911	385,372
Recreation site maintenance/nonconstruction	0	136,329	173,981	310,310
Seedling production-transplanting	78,985	193,949	0	272,934
Maintenance-repair-alteration/restoration	40,254	7,084	199,187	246,525
Wildhorse-burro control	0	0	189,000	189,000
Landscaping-groundkeeping	0	10,626	62,585	73,211
Survey line clearing	0	0	62,000	62,000
Tree breeding	0	30,697	0	30,697
Fisheries resource management	0	12,987	15,000	27,987
Surface mining reclamation/nonconstruction	0	0	13,584	13,584
Total	38,837,955	48,933,262	33,193,186	120,964,404

work while other equipment-intensive activities, such as aerial spraying, were declining (table 5). In addition, the BLM increased procurement of surveys and environmental assessments in 2000-2002, whereas they were rare earlier (table 6). The magnitude of this trend is difficult to measure, however, because of the practice of classifying surveys along with other types of work, under the product service code, “other natural resource management and conservation.” Spending on procurement in this category was high in the early 1990s but smaller in later years. It is not clear whether this change is a result of a change in contracting activities or categorization practices.

Forest Service and BLM compared—

The shift from timber management to ecosystem management changed the procurement contracting of both the Forest Service and the BLM. The type of work that both agencies procured changed in similar ways. Both agencies procured fewer services associated with intensive timber management, such as tree planting and site preparation, and bought more surveying and road maintenance services. Here, however, is where the similarities end. Procurement spending by the BLM was nearly constant and followed the pattern hypothesized at the beginning—that funding would hold steady to suit the requirement of the Northwest Forest Plan for ecosystem management. But, this was not the case for Forest Service; its spending declined from a peak of \$103 million in 1991 to a low of \$33 million in 2002.

Location of Procurement Spending

In addition to spending by type of activity, I also examined spending by geographical location, because I hypothesized that the agencies would shift the location of their land management activities as priorities changed, although it was not clear in advance in what ways geographic shifts would occur. I used spending per acre of Forest Service or BLM land to portray how spending differed across the region and over time. Forest Service and BLM procurement spending at the county level was not distributed evenly across the study area and changed over time. In this section, I examine Forest Service and BLM spending based on the location where the work was performed.

Forest Service—

Of the \$750 million that the Forest Service spent procuring land management services on national forest land in the Northwest Forest Plan’s affected counties between 1990 and 2002, \$368 million (49 percent) was spent on national forests in western Oregon, \$201.4 million (27 percent) in western Washington, and \$180.3 million (24 percent) in northern California. Procurement spending differed considerably by county. In counties with national forest land, Forest Service procurement spending ranged from a low of \$3 per acre in Jefferson County, Oregon, to a high of \$783 per acre in Thurston County, Washington, with a county-level average of \$70 per acre from 1990 through 2002.

Table 5—Equipment-intensive contracting by type of work, Bureau of Land Management

Type of work	Period (fiscal years)			Total
	1990-1992	1995-1997	2000-2002	
	<i>Dollars</i>			
Construction/highways, roads, streets, bridges	293,683	12,525,987	3,050,386	15,870,056
Maintenance-repair-alteration/highways, roads, streets, bridges	221,474	5,349,729	4,539,898	10,111,101
Aerial fertilization-spraying	4,998,988	1,586,878	0	6,585,866
Construction/recreation nonbuilding structures	3,329,655	25,785	642,961	3,998,401
Maintenance-repair-alteration/other conservation structure	3,963	3,300,984	241,000	3,545,947
Construction/other conservation	109,643	974,359	164,000	1,248,002
Range seeding-ground equipment	0	0	171,549	171,549
Total	8,957,407	23,763,722	8,809,793	41,530,922

Table 6—Technical contracting by type of work, Bureau of Land Management

Type of work	Period (fiscal years)			Total
	1990-1992	1995-1997	2000-2002	
	<i>Dollars</i>			
Other natural resource management and conservation	5,641,738	1,420,609	4,338,989	11,401,337
Study/environmental assessments	0	0	1,319,065	1,319,065
Study/wildlife	195,236	0	680,673	875,909
Research/other natural resource	872,977	0	0	872,977
Study/archeological-paleontological	109,698	35,792	516,159	661,649
Fire prevention and control	0	0	597,733	597,733
Other environmental services/studies/analytical	41,026	396,445	89,488	526,958
Study/endangered species-plant/animal	209,616	0	280,423	490,039
Professional services/land surveys-cadastral	261,392	0	7,000	268,392
Study/geological	0	0	103,123	103,123
Other special study and analyses	0	0	38,618	38,618
Research and development-subsurface mining	0	25,229	0	25,229
Total	7,331,684	1,878,075	7,971,271	17,181,030

Extremely high per-acre spending in areas such as Thurston County is likely the result of having Forest Service offices but relatively little acreage in a particular county. Among counties with more than 50 percent Forest Service land, the county-level average was \$27 per acre, whereas the county-level average spending per acre for counties with less than 50 percent national forest lands was \$80 per acre. This suggests that Forest Service procurement spending is not simply based on acreage of Forest Service land. In some cases, proportionately more spending occurred in counties with less Forest Service acreage than in counties with extensive Forest Service acreage.

In interpreting these results it is important to remember that the figures refer to procurement spending not national forest budgets or spending. Therefore, the differences in spending could be because, in areas with a higher concentration of Forest Service land, the national forests might be able to support in-house crews and rely less on contracting. Alternatively, less procurement spending per acre reflects lower per-acre national forest budgets for areas with a high concentration of national forest land.

Regardless of the differences in spending across the region, the total amount of spending dropped across the study region between 1990 and 2002. Spending in western Oregon declined slightly more quickly than spending in

western Washington and northern California (fig. 9). Between 1990 and 2002, Forest Service spending in western Oregon fell by 62 percent, whereas it declined in northern California by 56 percent and in western Washington by 60 percent. In addition to changes at the state level, spending declined at somewhat different rates in different subregions. Spending in the western Cascades and Klamath-Siskiyou regions diminished the most (71 and 62 percent, respectively), whereas the reduction was less pronounced in the coast and eastern Cascades, declining only by 41 and 54 percent, respectively (fig. 10). This variation is somewhat surprising given the National Fire Plan's focus on fire hazard reduction in the 2000s, which would have suggested that spending would have been increasing in the eastern Cascades and Klamath-Siskiyou regions. Finally, spending differed at the county level as well. It is striking that per-acre spending declined in nearly every county (fig. 11). In some counties, per-acre spending declined dramatically. For example, in Coos County, Oregon, national forest per-acre spending declined by about 80 percent, from \$42 per acre in 1990-92 to \$8 per acre in 2000-2002. In Gray's Harbor County, Washington, national forest spending fell from \$11 per acre to \$4 per acre. And per-acre spending fell from \$8 to \$3 per acre in Trinity County, California.

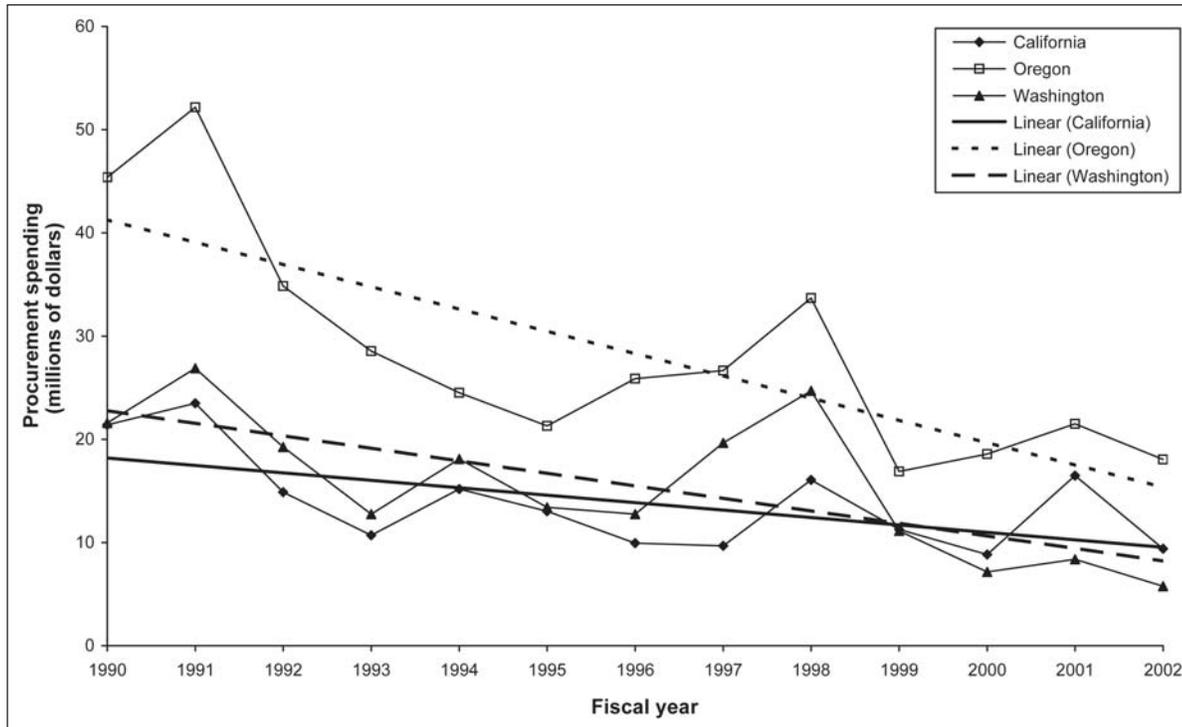


Figure 9—Annual procurement spending by state, Forest Service, fiscal year 1990 through 2002.

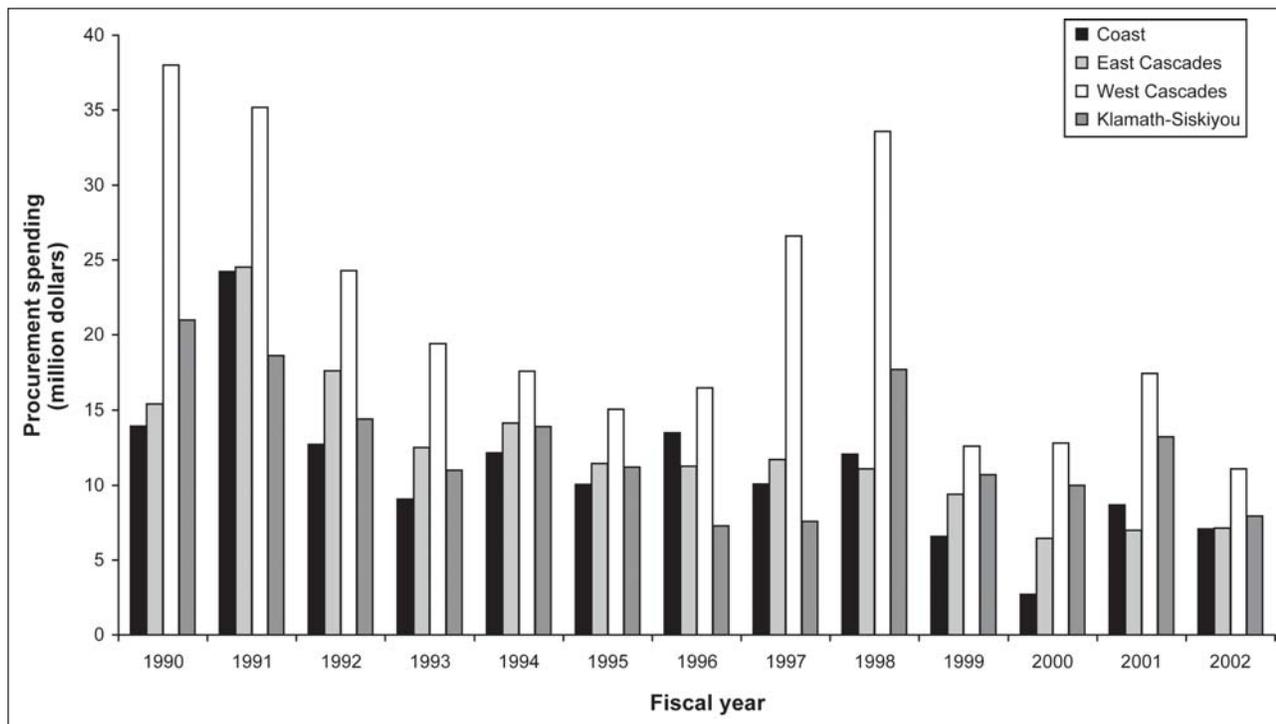


Figure 10—Annual procurement spending by subregion, Forest Service, fiscal year 1990 through 2002.

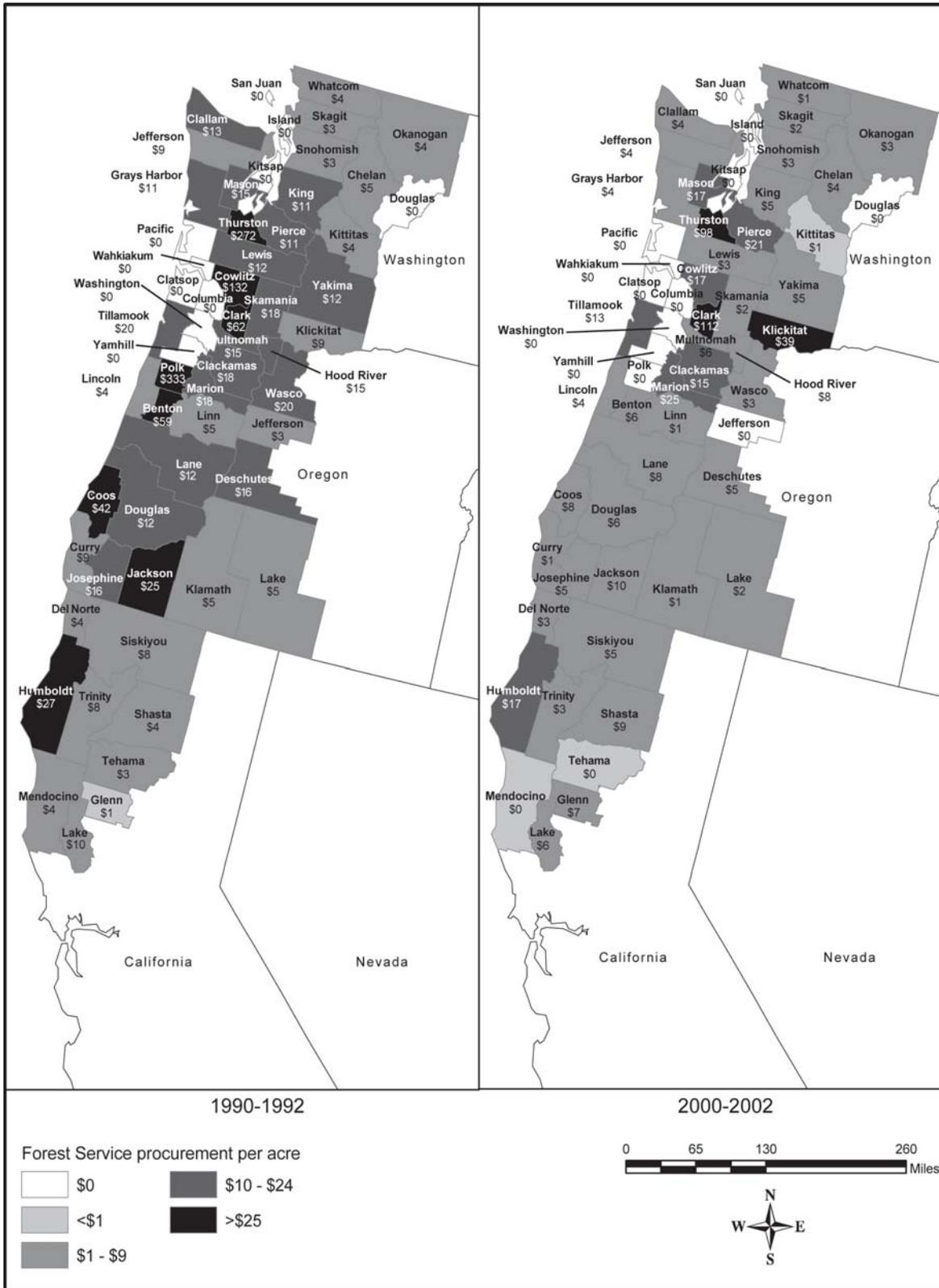


Figure 11—Procurement spending per acre, Forest Service, fiscal year 1990 through 1992 and fiscal year 2000 through 2002.

Bureau of Land Management—

The BLM concentrated its contracting procurement more heavily in Oregon than did the Forest Service. Virtually all (97 percent) of the \$256 million of procurement spending from 1990 through 2002 occurred for services performed in Oregon, where nearly all of the BLM forest land is located (fig. 12). Among the subregions, spending shifted from the wetter areas of the coast and western Cascades in the early 1990s to the dryer areas of the Klamath-Siskiyou and eastern Cascades by the 2000s. The BLM spent very little money in the east Cascades subregion in the early and mid-1990s, but spending began to increase after 1997 (fig. 13).

Although BLM focused its spending in Oregon, at the county level, the per-acre spending varied considerably and somewhat independently of the total BLM acreage in the county. Ignoring King County, Washington, which is where Seattle is located, spending in 1990-2002 ranged from \$1,319 per acre in Clatsop County, Oregon, to just 1 cent per acre in Deschutes County, Oregon, a county

where the BLM owns 30 percent of the land. This extreme range likely results because on one end are counties with BLM offices but limited acreage, and on the other are counties where BLM ownership is primarily rangeland. In six counties where BLM owns more than 1 percent of the land, the BLM made no procurement investments between 1990 and 2002, including one county with more than 15 percent BLM land. In addition, the BLM invested about \$2 per acre in Lake County, Oregon, where the BLM manages almost 60 percent of the land. In both Deschutes and Lake Counties, the BLM largely manages rangelands.

The variation in procurement across the counties shows that until the mid-1990s, the BLM concentrated its procurement spending in the Oregon and California (O&C) counties of Oregon that contained high-production forest lands. After the mid-1990s, funding became even more concentrated in the counties of southern Oregon, which are O&C counties but are more arid than counties farther north. For example, the BLM spent \$26 per acre in the early 1990s

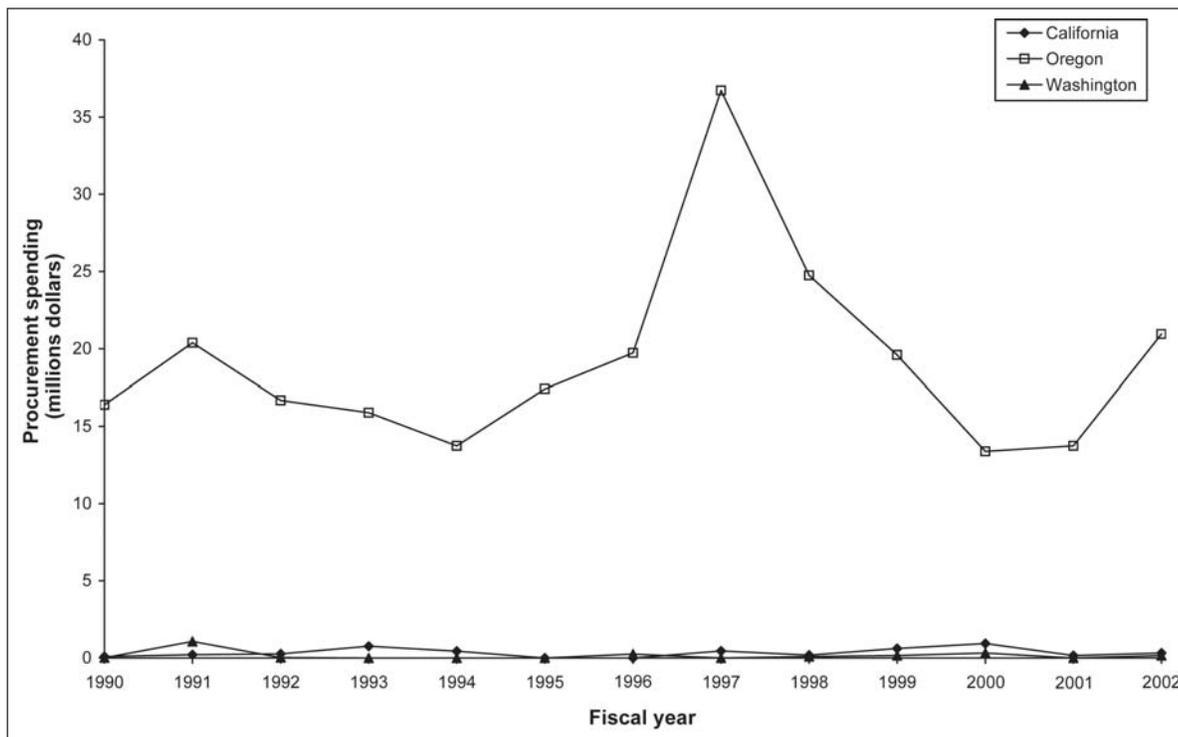


Figure 12—Annual procurement spending by state, Bureau of Land Management, fiscal year 1990 through 2002.

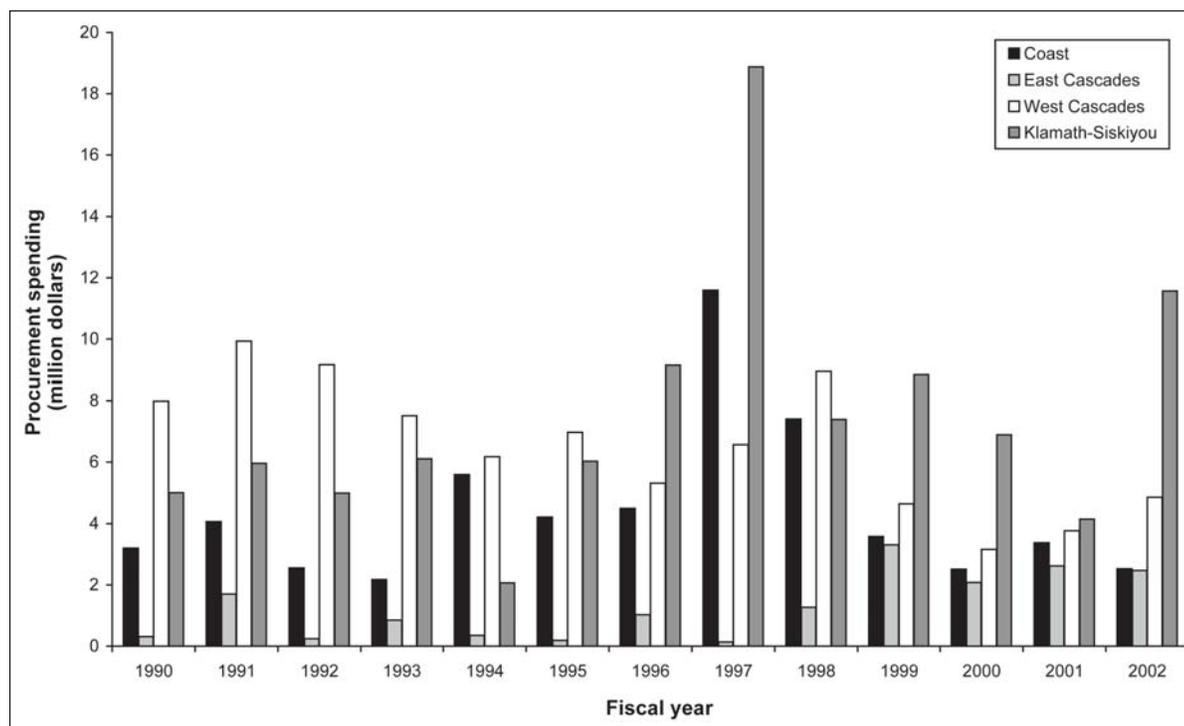


Figure 13—Annual procurement spending by subregion, Bureau of Land Management, fiscal year 1990 through 2002.

in Jackson County, but this figure rose to \$46 per acre in the early 2000s (fig. 14). By contrast, BLM spending in Coos County declined from \$44 per acre to \$25 per acre between the same two periods. This suggests that the BLM has shifted its focus from the most productive forest lands to those forests at higher risk of wildfire. This geographic shift in spending matches the changes in the type of work that the BLM is procuring, especially its increased spending on thinning.

The BLM and Forest Service compared—

Both the BLM and Forest Service spent their procurement dollars unevenly across the landscape. The BLM concentrated procurement spending on certain subregions more than did the Forest Service. In the early 1990s, the BLM directed spending toward the productive O&C lands, whereas in the 2000s, it shifted its spending south and east toward forests with higher fire hazard. The Forest Service, however, tended to spread procurement spending in counties across the study area. However, the Forest Service spent more per acre in counties with less national forest

land than it did in counties with larger amounts of Forest Service land. Regardless of where procurement spending occurred, the sharp drop in Forest Service procurement spending across the region remains the most salient trend.

Changes in contractors

With changes in contracting expected with the rise of ecosystem management, I hypothesized that contractors involved in contracting would change as well. To measure this expected change, I examined the number of contractors, contractor turnover, and market concentration over time.

Forest Service—

In addition to declining Forest Service spending on contracting regionwide, the number of contractors awarded contracts declined as well. During 1990-92, the Forest Service awarded contracts to 962 contractors. By 1995-97, that number had fallen to 684, a decline of 29 percent. By the early 2000s, the number had fallen further to 509, another 26 percent. This follows the pattern of Forest

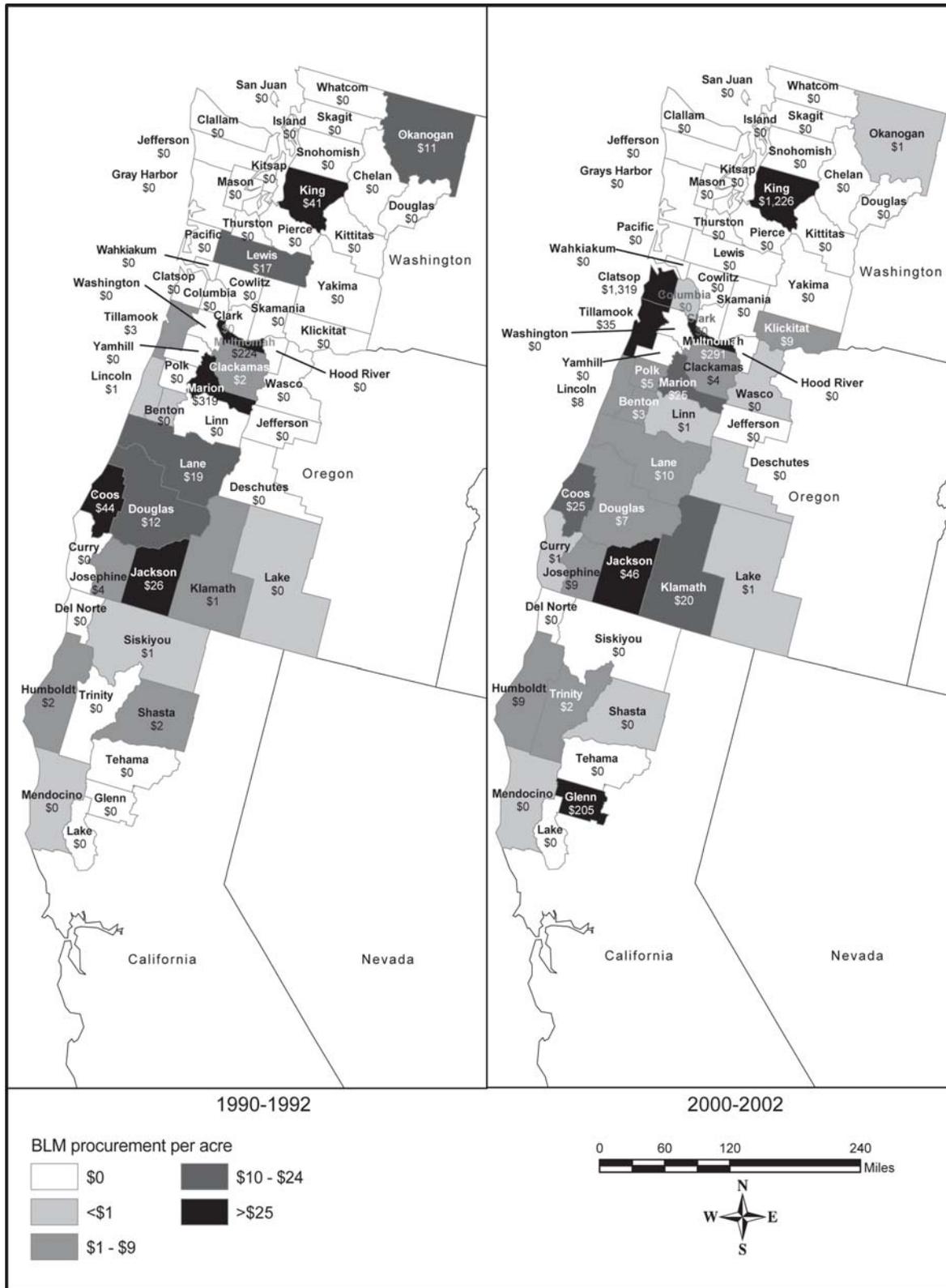


Figure 14—Procurement spending per acre, Bureau of Land Management (BLM), fiscal year 1990 through 1992 and fiscal year 2000 through 2002.

Service procurement spending, although spending fell more steeply than the number of contractors did. Forest Service procurement fell by 41 percent between the first two periods and 25 percent between the second two.

To understand more fully the reduction in the number of contractors working for the Forest Service, we matched contractors by their unique DUNS numbers or names and office locations and we compared contractors who worked in one period (e.g., 1995-97 only) with those who worked in two periods (e.g., 1990-92 and 1995-97). This method may underestimate the number of repeat contractors because a company could have changed its name and reapplied for a DUNS number during the intervening period.³ This allows for a calculation of contractor turnover; it does not, however, explain why contractor turnover occurred. These reasons could be many. Contractors could go out of business or they could stay in business but stop contracting with the federal land management agencies. These changes could be the result of natural attrition in forestry contracting, the result of changes in the amount of procurement that the agencies were undertaking, or changes in the type of activities the agencies were procuring.

By comparing businesses that appear in only one 3-year period with those that appear in two 3-year periods, we found that, of the 962 contractors awarded contracts during 1990-92, 213 (22 percent) were also awarded contracts in 1995-97 and 103 (11 percent) were awarded contracts during 2000-2002. Of the 760 contractors who stopped working for the Forest Service during 1990-92 and 1995-97, 415 (55 percent) were replaced by new contractors and 345 (45 percent) were not. Similarly, during 1990-92 and 2000-2002, of the 859 contractors that left the contracting market, 406 (47 percent) were replaced by other contractors and 53 percent of them were not replaced (table 7).

³ All contractors working for the federal government must have a DUNS number. A DUNS number is a unique number that Dun and Bradstreet issues that allows Dun and Bradstreet subscribers to track companies, their subsidiaries, and affiliates and check a company's credit records.

If we compare the awards to contractors that worked for the Forest Service for two periods with those that only worked for one period, we find a marked difference. In general, contractors who worked for the Forest Service during more than one period were likely to capture larger contracts and more contract value. The 202 contractors that worked for the Forest Service in both 1990-92 and 1995-97 earned an average of \$502,000 from 1990 through 1992, whereas contractors that only worked between 1990 and 1992 earned an average of \$204,000. This suggests that, as contracting declined in the early 1990s, the largest contractors were more likely to continue to work for the Forest Service than the smaller ones. Here, a "large contractor" means one that does a large amount of business for the Forest Service and a "small contractor" is one that does a small amount of business for the Forest Service measured in total dollars awarded during the period in question. We cannot identify the actual size of the contractor from the data available. Potentially, a small contractor could, in fact, be quite large, but only perform a small amount of work for the Forest Service. This pattern holds when we compare 1990-92 and 2000-2002 (table 7). Although the larger contractors appeared to survive from one period to the next, they too received less contract value from the Forest Service. For example, returning contractors earned an average of \$548,000 during 1990-92, but only an average of \$303,000 during 2000-2002.

Another way to consider changes among the pool of contractors working for the federal land management agencies is to examine market concentration, that is, the extent to which contract awards are concentrated in the hands of a few contractors or dispersed more or less evenly among many contractors. Examining the market concentration of contractors working for the Forest Service shows that fewer contractors appear in all size classes and the market concentration of contractors was largely unchanged during the study period (table 8). Ranking the contractors by the amount of money that they were awarded in each period, we find that 18 contractors (1.9 percent) were awarded 25 percent of the contract value region wide in 1990-92 and

Table 7—Comparison of contractors that appear in one period with those who appear in two periods, Forest Service

	Period (fiscal years)					
	1990-1992	1995-1997	1990-1992	2000-2002	1995-1997	2000-2002
Appearing in both periods						
Number of contractors	213	213	103	103	171	171
Percentage of contractors	22.1	31.1	10.7	20.2	25.0	33.6
Total dollars to those contractors	\$106,827,000	\$72,949,000	\$56,401,000	\$31,216,000	\$67,003,000	\$61,231,000
Average dollars to contractors	41% \$502,000	48% \$342,000	22% \$548,000	27% \$303,000	44% \$392,000	54% \$358,000
Appearing in one period						
Number of contractors	749	471	859	406	513	338
Percentage of contractors	77.9	68.9	89.3	79.8	75.0	66.4
Total dollars to those contractors	\$153,054,000	\$79,334,000	\$203,480,000	\$82,852,000	\$85,280,000	\$52,836,000
Average dollars to contractors	59% \$204,000	52% \$168,000	78% \$237,000	73% \$204,000	56% \$166,000	46% \$156,000

Table 8—Concentration of contracting awards by size of contractor, Forest Service

Quartile	Period (fiscal years)					
	1990-1992		1995-1997		2000-2002	
	<i>Number of contractors</i>	<i>Percentage of contractors</i>	<i>Number of contractors</i>	<i>Percentage of contractors</i>	<i>Number of contractors</i>	<i>Percentage of contractors</i>
1 st	18	1.9	17	2.5	10	2.0
2 nd	48	5.0	49	7.2	23	4.5
3 rd	128	13.3	113	16.5	64	12.6
4 th	768	79.8	505	73.8	412	80.9
Total	962	100%	684	100%	509	100%

Note: This table groups contractors by size of the contractors' awards. The largest contractors that together capture one quarter of the contract value are in the first quartile. The smallest contractors that together capture one quarter of the contract value are in the fourth quartile. Thus, for example, the largest 18 contractors in 1990-1992 captured the same total value as the smallest 768 contractors.

chi square $p < 0.932$.

the 768 contractors with the smallest total awards together were also awarded 25 percent of the total contract value. Again, contractor size is measured by total amount of Forest Service award. During 2000-2002, 2.0 percent of contractors were awarded 25 percent of the work, only a minor change from 1990-92. This implies that, in both periods, roughly 20 percent of the contractors received 75 percent of the contract value. A chi-square test confirms that there was no statistically significant change in the market concentration across the three periods.

The number of contractors working for the Forest Service declined over the course of the study periods as

Forest Service spending declined. The market concentration and high contractor turnover suggests that larger contractors (measured by how much business they do with the Forest Service) were more likely to survive the declining contracting opportunities, whereas smaller contractors were more likely to disappear from the Forest Service contracting market and be replaced with other contractors in later periods.

Bureau of Land Management—

Bureau of Land Management contracting shows a different pattern than that of the Forest Service. Instead of decreasing, the number of contractors working for the

BLM increased between 1990 and 2002. For 1990-92, the BLM awarded contracts to 162 contractors. In 1995 through 1997, that number dropped to 136, but increased to 198 for 2000-2002. This pattern is surprising because BLM spending peaked in the 1995-97 period.

During 1990-92, the BLM awarded 50 percent of the contract value to 10 percent of the contractors. By 2000-2002, the BLM awarded 50 percent of the contract dollars to 7.6 percent of the contractors, a 2.4 percentage point increase in concentration (table 9). However, this was not a statistically significant difference.

The BLM experienced similar rates of contractor turnover as the Forest Service (table 10). About 20 percent of contractors working for the BLM during 1990-92 were also working for the BLM during 1995-97, and 10 percent of contractors working during 1990-92 were still working for the BLM a decade later. Contractors that worked for the BLM during 1990-92 and 2000-2002 were awarded, on average, \$688,000 in the first period and an average of \$972,000 a decade later. By contrast, contractors that worked during only one period were awarded, on average,

a total of \$297,000 during 1990-92 and \$180,000 a decade later. The BLM's long-term contractors captured a much larger percentage of the BLM's procurement spending than did the Forest Service's long-term contractors.

Forest Service and BLM compared—

The Forest Service and the BLM had similar turnover rates in their contractor base throughout the study. In addition, market concentration did not change much for either agency, although it perhaps increased somewhat in the mid-1990s. The general decline in Forest Service procurement spending resulted in constant market concentration, suggesting that larger contractors did not dominate the Forest Service contracting market in the early 2000s to any greater degree than they did in the early 1990s.

Contracting for Both Agencies

Given the similarity of the activities that the Forest Service and the BLM contract, it may be that some of the same contractors work for both agencies. Working for both agencies could have created some stability as the Forest Service's contracting spending declined.

Table 9—Concentration of contracting awards by size of contractor, Bureau of Land Management

Quartile	Period (fiscal years)					
	1990-1992		1995-1997		2000-2002	
	<i>Number of contractors</i>	<i>Percentage of contractors</i>	<i>Number of contractors</i>	<i>Percentage of contractors</i>	<i>Number of contractors</i>	<i>Percentage of contractors</i>
1 st	5	3.09	1	0.74	2	1.01
2 nd	12	7.41	8	5.88	13	6.57
3 rd	24	14.81	15	11.03	31	15.66
4 th	121	74.69	112	82.35	152	76.77
Total	162	100%	136	100%	198	100%

Note: See note for table 8.
chi square p < 0.805.

Table 10—Comparison of contractors that appear in one period with those who appear in two periods, Bureau of Land Management

	Period (fiscal years)					
	1990-1992	1995-1997	1990-1992	2000-2002	1995-1997	2000-2002
Appearing in both periods						
Number of contractors	33	33	18	18	45	45
Percentage of contractors	20.4	24.3	11.1	9.1	33.1	22.7
Total dollars to those contractors	\$22,539,000	\$43,586,000	\$12,390,000	\$17,496,000	\$39,640,000	\$25,754,000
Average dollars to contractors	\$683,000	\$1,321,000	\$688,000	\$972,000	\$881,000	\$572,000
Appearing in one period						
Number of contractors	129	103	144	180	91	153
Percentage of contractors	79.6	75.7	88.9	90.9	66.9	77.3
Total dollars to those contractors	\$32,593,000	\$30,989,000	\$42,742,000	\$32,478,000	\$34,935,000	\$24,220,000
Average dollars to contractors	\$253,000	\$301,000	\$297,000	\$180,000	\$384,000	\$158,000

In 1990-92, 162 contractors worked for the BLM and 962 worked for the Forest Service. Consequently, up to 162 contractors could have worked for both agencies. Of those, 93 (57 percent) worked for both the BLM and the Forest Service. In 1995-97, 77 of 136 (56 percent) worked for both agencies, and in 2000-2002, 73 of 198 (37 percent) worked for both agencies. Thus, BLM contractors work fairly frequently for the Forest Service. However, most Forest Service contractors did not work for the BLM. This follows logic as there were many more Forest Service contractors than BLM contractors. This means, however, that most contractors worked for only one agency. In 1990-92, 91 percent worked for one agency, in 1995-97, 90 percent and in 2000-2002, 89 percent worked for one agency.

The contractors that worked for both agencies were awarded, on average, more contract value than those contractors that work for only one agency. For example, the average total award ranged from \$1.3 million in 1990-92 to \$900,000 in 2000-2002 for contractors who worked for both agencies, whereas contractors that only worked for one agency averaged between \$140,000 for the BLM in 2000-2002 to \$205,000 for the Forest Service in 1990-92. The contractors are larger than average, even when we consider their income from only one of the agencies (table 11).

Location of Contractors Over Time

Given the Northwest Forest Plan aim of providing jobs in the woods through procurement contracting to replace jobs

lost from cutbacks in federal timber harvesting, as well as the number of other policy initiatives over the last decade that have sought to create economic benefit for rural communities located near national forests through procurement contracting, I hypothesized that contractors in the Plan-affected counties and contractors near national forests and in rural communities would capture an increasing proportion of contracts and contract value over time.

Distances contractors travel to work—

One way to measure whether local communities are capturing contracting benefits is to measure the distance between the contractor office and the national forest or BLM district where the work was performed. If, over time, the average distance decreased, then this implies that contractors closer to national forests or BLM districts are getting more of the contracts.

Forest Service—

Throughout the study period, contractors working in western Oregon, western Washington, and northern California were concentrated along the Interstate-5 corridor (fig. 15). The amount of money captured by contractors declined nearly everywhere over time. However, figure 15 suggests that the reductions were greater for contractors with offices in the Willamette Valley of western Oregon and the central valley of California.

Table 11—Comparison of contractors that performed work for the Forest Service (FS) with those that performed work for the Bureau of Land Management (BLM)

	Period (fiscal years)		
	1990-1992	1995-1997	2000-2002
Performed work for both Forest Service and BLM			
Number of contractors	93	77	73
Percentage of all contractors	9.0%	10.4%	11.5%
Percentage of BLM contractors	57.4%	56.6%	36.9%
Percentage of FS contractors	9.7%	11.3%	14.3%
Average FS dollars to these contractors	875,002	530,318	454,814
Average BLM dollars to these contractors	469,691	759,537	445,063
Average combined dollars to these contractors	1,344,694	1,289,854	899,877
Performed work for Forest Service only			
Number of contractors	869	607	436
Average dollars to these contractors	205,415	183,605	185,472
Performed work for BLM only			
Number of contractors	69	59	125
Average dollars to these contractors	165,950	272,724	139,877
All contractors			
Number of contractors	1,031	743	634
Average dollars to all contractors	185,549	173,390	156,547

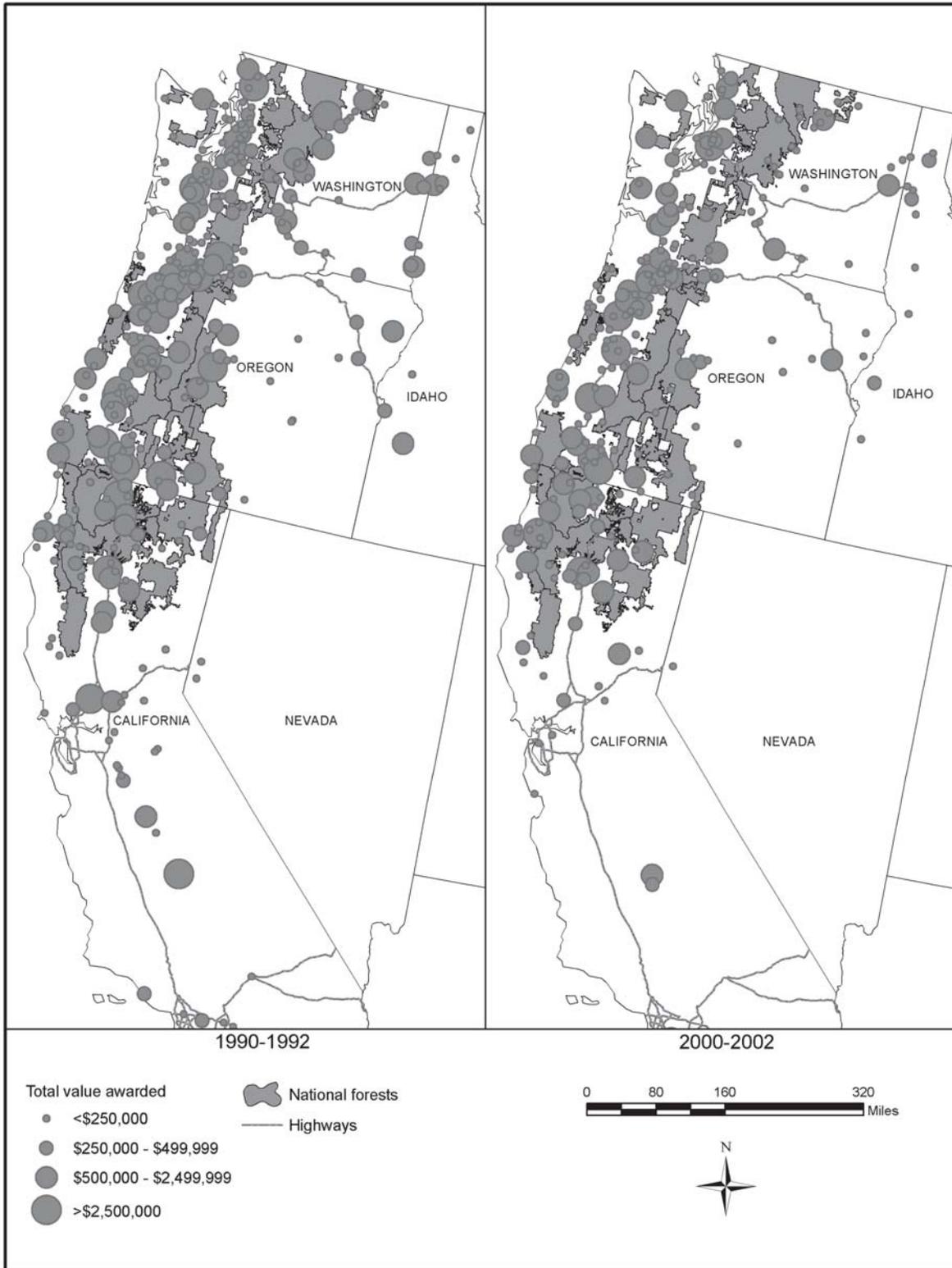


Figure 15—Location of contractors awarded contracts on national forests by total award per zip code, fiscal year 1990 through 1992 and fiscal year 2000 through 2002.

Consequently, in the affected counties, the mean distance that contractors traveled to work on national forest lands decreased from 131.1 air miles in 1990-92 to 107.9 in 1999-2001, a statistically significant difference ($p < 0.001$). This implies that the Forest Service, on average, awarded contracts to communities closer to national forests in 1999 through 2001 than was the case a decade earlier. Recall that I am measuring the distance between a contractor's headquarters and the national forest where the work occurred in air miles, and I could not calculate mean distances for 2002 because of a lack of contract numbers for 2002.

When looking at the data set as a whole, the distances that contractors traveled appeared to decline, making the Forest Service appear to have made proportionately more local awards. However, a more detailed statistical analysis, which is reported in Moseley and Reyes,⁴ shows that the overall decline in mean distance traveled is the result of the shift in work type and the location of work and not likely the result of efforts to increase local contractor capture of particular types of work. After controlling for work type, the location where the work was performed, and other factors, the expected distance actually increased compared to the control year of 1990. The apparent decrease in overall distance is largely attributable to a shift in the type of work that the Forest Service contracted over time. In particular the shift from labor-intensive to equipment-intensive activities reduced overall distance because equipment-intensive contracts are more likely to be awarded to nearby contractors than are labor-intensive contracts. Once we control for this shift, the decrease in distance disappears.

Bureau of Land Management—

Even more so than for the Forest Service, the contractors working on BLM districts in the study area appear to have been concentrated along the Interstate-5 corridor (fig. 16).

⁴ Moseley, C.; Reyes, Y.E. [N.d.]. Forest restoration and forest communities: Have local communities benefited from eco-system management? Manuscript in preparation. On file with: Cassandra Moseley, Ecosystem Workforce Program, 5247 University of Oregon, Eugene, OR 97403.

Compared with the 1990s, the maps suggest that contractors from southern Oregon performed more work on BLM lands in the study area in the early 2000s. This follows logic as the BLM greatly increased its procurement spending in southern Oregon in the 2000s compared to a decade earlier, and there has long been local contracting capacity in southern Oregon (Moseley and Shankle 2001). Similarly, fewer contracts were awarded to contractors located in the Willamette Valley of Oregon, although contractors from the Willamette Valley still received a considerable proportion of the contract value (fig. 16).

As with the Forest Service, the distance that contractors traveled to work on BLM lands appeared to decrease between the early 1990s and the early 2000s. Overall, the difference in mean distance that contractors traveled in 1990-92 and 1999-2001 was 47 air miles ($p < 0.009$). As with the Forest Service, however, this decline can largely be explained by a shift in the type of work contracted and the location where the work was performed. An analogous statistical test to the one performed for the Forest Service finds no statistically significant change in the distance the contractors traveled to work on BLM districts in the study area.

Forest Service and BLM compared—

The analysis of the distance between national forest and BLM units and contractor headquarters suggests that there was little if any increase in awards to local contractors over time. The Forest Service and the BLM initially appeared to increase awards to nearby contractors but statistical analysis suggests that this was not the case. Nearby Forest Service contractors may have suffered somewhat less than distant contractors as contracting declined because equipment-intensive contractors were more likely to be local than labor-intensive contractors, and equipment-intensive contracting declined more slowly than labor-intensive contracting. Still, local equipment and local labor contractors did not appear to be anymore likely to be awarded contracts at the end of the study period than they had been a decade earlier.

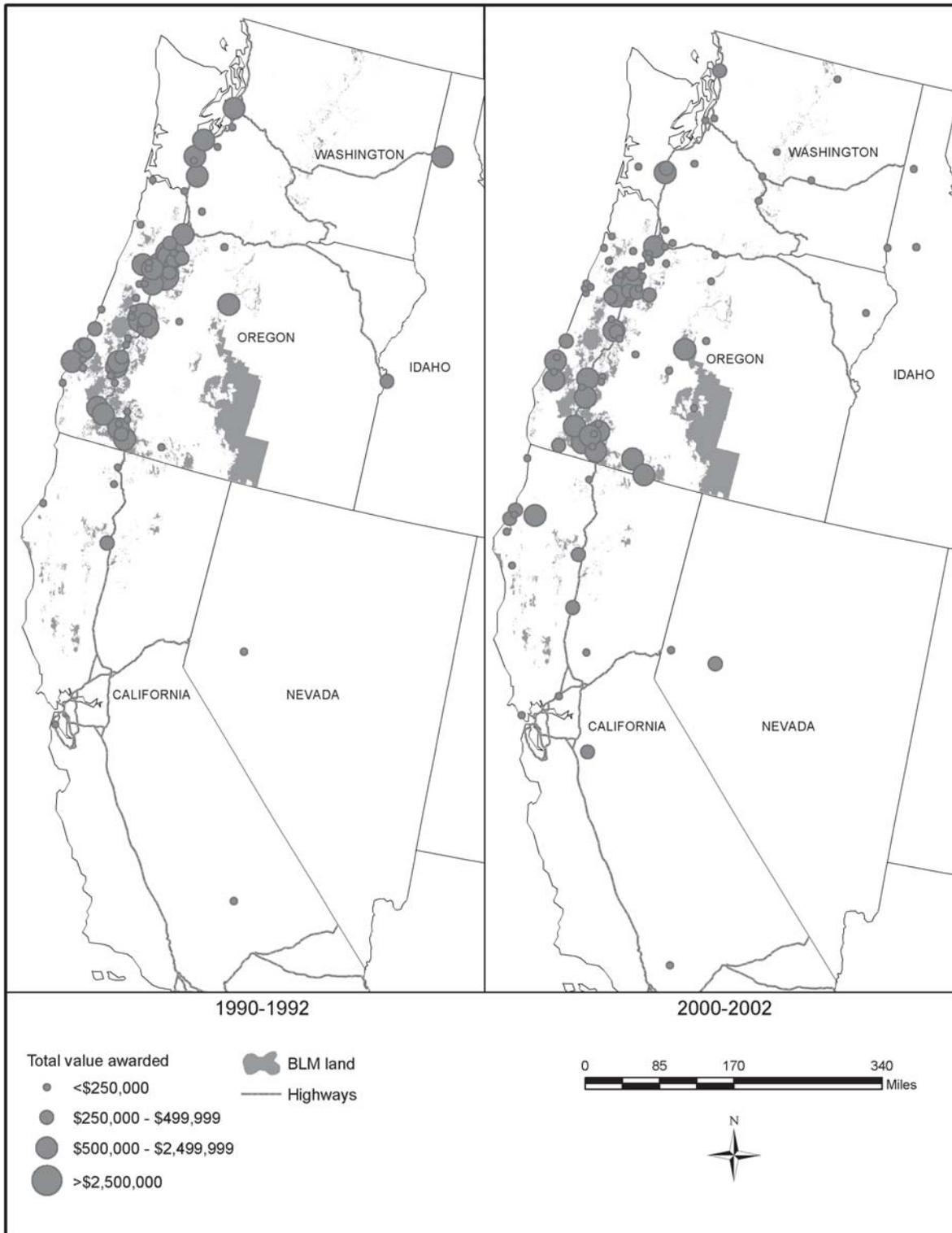


Figure 16—Location of contractors awarded contracts on Bureau of Land Management (BLM) lands by total award per zip code, fiscal year 1990 through 1992 and fiscal year 2000 through 2002.

Contract awards to rural communities—

One goal of the Northwest Forest Plan was to create economic benefits for rural communities that were affected by reduced federal timber harvests. Thus, it is important to understand not only whether local businesses came to capture more work, but also if businesses located in rural communities came to capture more work.

From 1990 through 1992, the Forest Service awarded 24 percent of its contract value to contractors in rural communities, whereas it awarded 25 percent of its contract value to contractors located in rural communities in 2000 through 2002. However, the percentage of the contract value awarded to contractors in towns with populations between 5,000 and 10,000 declined by one percentage point. Consequently, contractors located in communities of fewer than 10,000 captured the same proportion of Forest Service procurement dollars in the two periods. These shifts were not large enough to be statistically significant (table 12).

As with the Forest Service, the change was not statically significant for BLM contractors. In 2000-2002, contractors in rural communities captured seven percentage points

more contract value than they did in 1990-92 (table 13). At first glance, this appears to be a considerable shift. The percentage of contract value awarded to communities with unknown populations, declined from 10 percent in 1990-92 to 5 percent in 2000-2002. If most unknown communities are rural communities (because large communities are more likely to have been identified), then the actual shift over the study period would be much smaller.

Contract awards to affected counties—

From 1990 through 2002, the BLM awarded 93.2 percent of its contract value to contractors located in the Jobs-in-the-Woods affected counties. Between 1990-92 and 1995-97, the percentage increased from 89.1 percent to 95.8 percent. In 2000-2002, the percentage declined again to 92.5. The increase in awards to contractors from the affected area during the mid-1990s suggests that the Jobs-in-the-Woods Program had a small impact on the BLM contract awards (fig. 17). However, because the BLM already awarded the vast majority of its contract value to contractors located in affected counties, this component of the Jobs-in-the-Woods Program could only have had a limited impact.

Table 12—Percentage of contract value by contractor’s community size, Forest Service

Community population (1998)	Period (fiscal years)					
	1990-1992		1995-1997		2000-2002	
	<i>Real dollars</i>	<i>Percent</i>	<i>Real dollars</i>	<i>Percent</i>	<i>Real dollars</i>	<i>Percent</i>
<5,000	62,214,306	23.9	38,198,939	25.1	28,881,673	25.3
5,000-9,999	30,601,624	11.8	26,696,085	17.5	12,163,213	10.7
10,000-50,000	68,300,970	26.3	28,176,899	18.5	26,644,073	23.4
>50,000	63,567,462	24.5	37,461,403	24.6	35,952,384	31.5
Unknown	35,196,197	13.5	21,749,570	14.3	10,426,038	9.1
Total	259,880,559	100.0	152,282,897	100.0	114,067,381	100.0

chi square p < 0.6750.

chi square p < (excluding unknown) 0.540.

(performed on percentages).

Table 13—Percentage of contract value by contractor’s community size, Bureau of Land Management

Community population (1998)	Period (fiscal years)					
	1990-1992		1995-1997		2000-2002	
	<i>Real dollars</i>	<i>Percent</i>	<i>Real dollars</i>	<i>Percent</i>	<i>Real dollars</i>	<i>Percent</i>
<5,000	14,385,214	26.1	32,058,861	43.0	16,402,807	32.8
5,000-9,999	2,415,056	4.4	4,562,597	6.1	3,215,747	6.4
10,000-50,000	16,043,681	29.1	19,244,444	25.8	11,537,590	23.1
>50,000	16,952,290	30.7	16,358,451	21.9	16,355,417	32.7
Unknown	5,335,600	9.7	2,350,705	3.2	2,462,689	4.9
Total	55,131,841	100.0	74,575,059	100.0	49,974,251	100.0

chi square p < 0.1420.

chi square p < 0.2910. (excluding unknown).

(performed on percentages0).

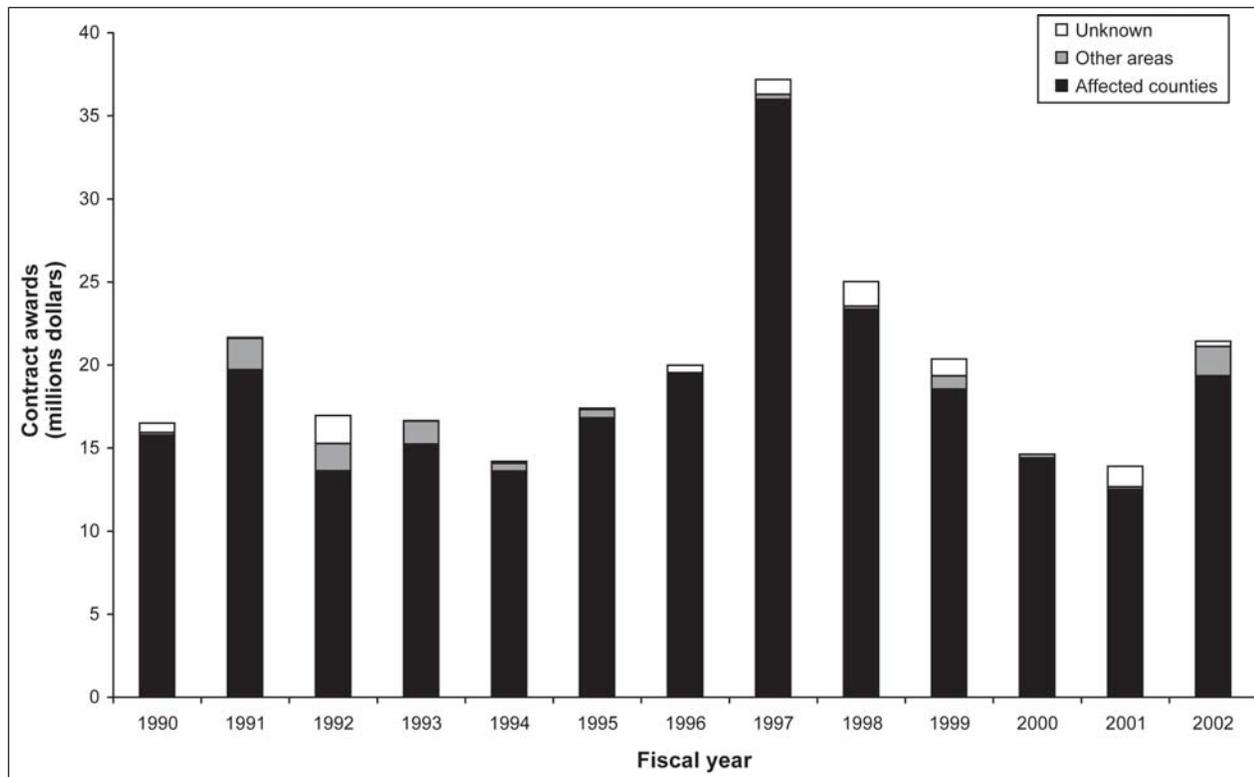


Figure 17—Contract awards to Jobs-in-the-Woods-affected counties, Bureau of Land Management, fiscal year 1990 through 2002.

Overall, the Forest Service awarded less contract value to contractors from affected counties than the BLM—83.0 percent and 93.2 percent, respectively. The percentage of contract value awarded to contractors from affected areas did not change appreciably between the early and mid 1990s. In 1990-92, the Forest Service awarded 82.7 percent

of its contract value to contractors located in affected counties, whereas in 1995-97, it awarded 82 percent. By 2000-2002, the Forest Service had increased its awards to contractors from affected counties to 85.0 percent of total contract value (fig. 18). These results suggest that the policies aiming for greater rural economic benefit through

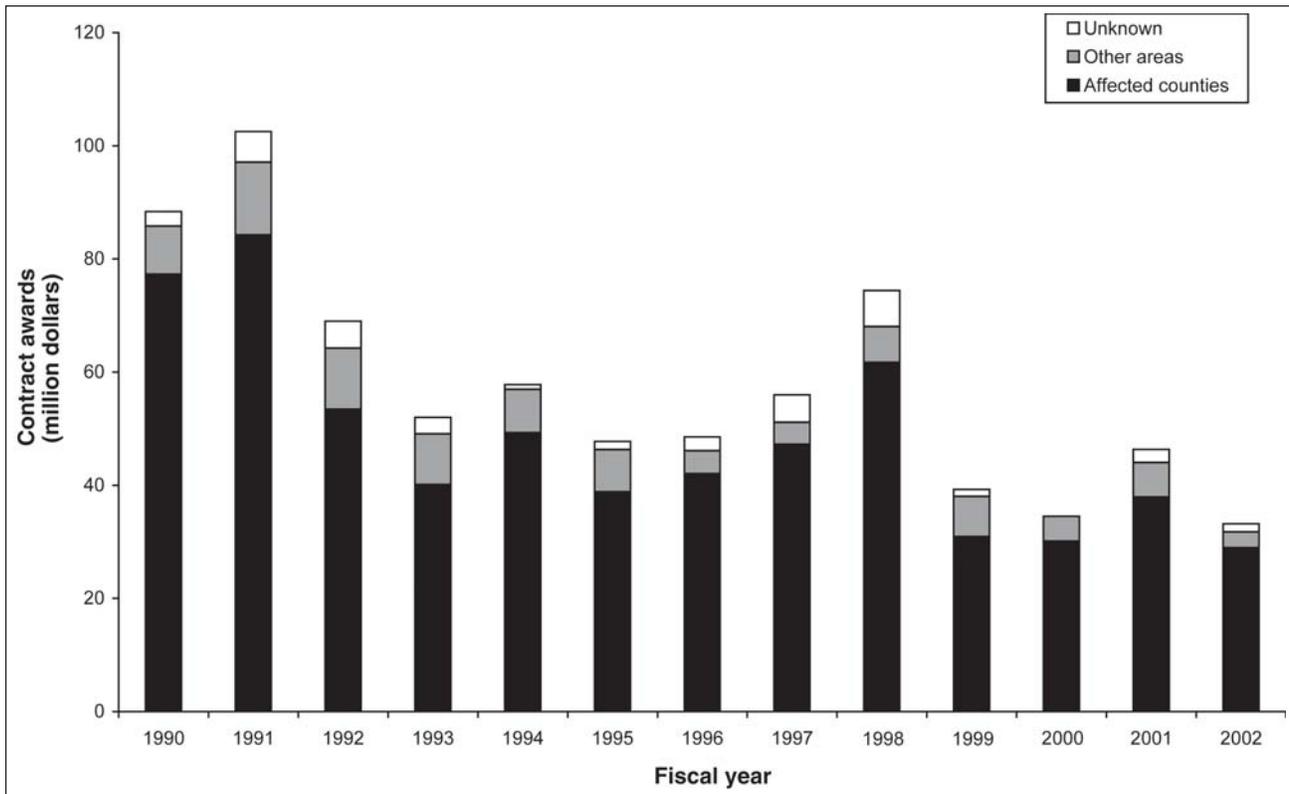


Figure 18—Contract awards to Jobs-in-the-Woods-affected counties, Forest Service, fiscal year 1990 through 2002.

increased procurement contracting targeted at affected counties had little impact.

Conclusions

The report began with seven hypotheses based on the goals and objectives of the Northwest Forest Plan and subsequent federal forest programs. The procurement habits and contracting markets of the BLM and the Forest Service changed considerably between 1990 and 2002. In some ways, procurement contracting changed as hypothesized, whereas in other ways, it did not.

Hypothesis 1 was that total spending would increase or remain the same. Contrary to this hypothesis, Forest Service procurement spending declined markedly. The decline in Forest Service spending was surprising because it was initially hypothesized that the Northwest Forest Plan

would lead to new demand for studies, surveys, and restoration activities, and a decline of timber sales to fund road maintenance and decommissioning. By contrast, the BLM maintained its procurement spending with some variation throughout the study period. The continuation of BLM procurement spending suggests that the hypothesized need for contracted services may have been correct and that the Forest Service faced other barriers to spending. Other studies suggest, in fact, that reductions in forest-level budgets were a primary cause of decreases in contract spending (see footnote 4) (Stuart, in press). This reduction in Forest Service contract spending is the dominant finding of the study and, in several instances, this decline overwhelmed other hypothesized changes that might have come with the Northwest Forest Plan, such as changing type of work or increasing opportunities for public lands communities.

Hypotheses 2 and 3 were that the type of work procured over time would change, in particular increasing equipment-intensive activities associated with road and salmon restoration. Both agencies reduced their procurement from activities associated with intensive timber management and shifted spending to activities associated with ecosystem management as expected based on the changing management priorities of the Northwest Forest Plan and other subsequent programs, such as the emergency funds that followed the 1997 flood and the National Fire Plan. Forest Service spending declined in nearly all categories but fell in categories associated with ecosystem management more slowly than in categories associated with timber management.

Hypothesis 4 was that the location of contracted activities would shift over time as management priorities changed. The BLM shifted its spending noticeably across the landscape over the study period. In particular, the BLM shifted its spending from the productive timber counties to the more arid areas with higher fire hazard in response to changing management priorities in the late 1990s. The Forest Service tended to spread its spending more evenly across its land, with little proportional shift over time. For the Forest Service, the most noticeable trend was the decline in contract spending across all national forests.

Hypothesis 5 was that a change in the type of work would cause a change in the contractor base. With the decline in Forest Service spending, the number of contractors working for both agencies declined from 1,031 in 1990-92 to 634 in 2000-2002. Although there was no increase in market concentration, the analysis of contractor turnover suggests that larger contractors were more likely to survive the declining contracting opportunities, whereas smaller contractors were more likely to disappear and be replaced by other contractors in later periods. Ultimately, however, the data available could not illuminate the causes of contractor turnover rates, and thus we do not know whether a change in contractor base was a result of natural changes in the industry or a byproduct of changing federal procurement habits.

Hypotheses 6 and 7 were that contract money would be increasingly concentrated in designated affected counties of the Northwest Forest Plan, and the Forest Service and BLM would award an increasing proportion of contract dollars to contractors located in rural communities and in proximity to federal lands. The variety of programs designed to create rural community benefit appear to have produced few results (see also Moseley et al. 2002 and Moseley and Toth 2004). The BLM slightly increased its awards to contractors from affected areas during 1995-97, compared to 1990-92. But, the increase had fallen away by 2000-2002. Moreover, the Forest Service did not increase its awards to affected counties during the same period. Neither the BLM nor the Forest Service significantly increased their awards to contractors in communities with fewer than 5,000 people. However, the BLM's procurement of land management services likely created an economic boost to rural and small communities in the mid-1990s. Unfortunately, the impact was also short lived; by the 2000-2002 period, the BLM's awards to rural contractors had declined to \$16.4 million from a high of \$32.1 million in the 1995-97 period. Both the BLM and the Forest Service increased their awards to nearby contractors and decreased their awards to distant contractors. However, this was attributable to a shift in the type of work that the agencies procured (see footnote 4). The Forest Service's dramatic decline in procurement spending far outweighed any proportional increases in contract capture that the rural and local contractors may have experienced.

Implications

The BLM's relatively consistent spending on land management contracting likely created a relatively stable economic environment for some contractors during an otherwise significant transition in the activities associated with federal land management, especially the decline in timber harvest on both national forests and BLM lands. The Forest Service's decline in investment in land management

contracting, however, is the most prominent trend in this monitoring project because the Forest Service had spent far more than the BLM at the beginning of the study period. Because of this decline in spending, it is likely that many contractors and their workers had to undergo the type of adjustments that loggers and other timber sale purchasers did. Rather than land management contracting being a source of economic opportunity for loggers and mill workers, the decline in spending may well have created additional worker displacement, although data are not available to measure such a potential trend directly.

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English Equivalents

When you know:	Multiply by:	To find:
Miles (mi)	1.609	Kilometers

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