

Journal of Rural and Community Development

Current Challenges and Realities For Forest-based Businesses Adjacent to Public Lands in the United States

Authors: Emily Jane Davis, Jesse Abrams, Eric M. White, &
Cassandra Moseley

Citation:

Davis, E. J., Abrams, J., White, E. M., & Moseley, C. (2018). Current challenges and realities for forest-based businesses adjacent to public lands in the United States. *The Journal of Rural and Community Development*, 13(1), 125–142.



Publisher:

Rural Development Institute, Brandon University.

Editor:

Dr. Doug Ramsey

Open Access Policy:

This journal provides open access to all of its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. Such access is associated with increased readership and increased citation of an author's work.



Current Challenges and Realities For Forest-based Businesses Adjacent to Public Lands in the United States

Emily Jane Davis

Department of Forest Ecosystems and Society, Oregon State University
emilyjane.davis@oregonstate.edu

Jesse Abrams

Institute for a Sustainable Environment, University of Oregon
jabrams@uoregon.edu

Eric M. White

Pacific Northwest Research Station, USDA Forest Service
ericwhite@fs.fed.us

Cassandra Moseley

Institute for a Sustainable Environment, University of Oregon
cmoseley@uoregon.edu

Abstract

Through contracting and timber sales, the private sector is engaged in management of national forest lands and local community economies in the United States. But there is little recent research about current relationships between these lands and timber purchasers that could better inform future timber and biomass sale and business assistance policies and programs. We conducted a survey of timber-purchasing businesses active in six USDA Forest Service regions where ecosystem restoration and wildfire risk reduction policies have been prevalent to examine their characteristics, reliance on federal lands, challenges, and needs for assistance. We found that a majority of respondents in all Forest Service regions purchase small diameter timber (8 inches dbh or less) and had sought business assistance, most commonly from accountants and lending institutions. Those with the greatest dependence on federal timber—76 percent or more of their supply from federal sources—were less likely to have sought assistance of any kind. We also found several differences between businesses located in different Forest Service regions that could indicate a need for region-specific pilots, programs, or resources that focus on the particular characteristics of businesses in those areas; or flexibility in implementation of national-level programs to allow regional adaptation. Results suggest that more attention to the timing, quantity, and types of supply that federal lands offer and how this may affect business success is needed, particularly to understand how design of timber sales, service contracts, and stewardship contracts and sales may better serve businesses and allow them to produce community economic outcomes.

Keywords: forest-based businesses; public lands, USDA Forest Service; timber purchasers; timber; business assistance

1.0 Introduction

The United States Forest Service has long been tied to the concept of ‘community stability’ through multiple policy efforts to sustain the yield of timber to its adjacent communities (Daniels et al. 1991) and more recently, to help communities adjust to an ecosystem management paradigm. Pivotal in the delivery of community stability has been this agency’s relationship with forest products mills and other private sector businesses. The Forest Service works with the private sector in three significant ways: (a) selling government property by offering timber sales for bid by private businesses, (b) offering permits for uses such as recreational businesses and grazing cattle, and (c) offering opportunities to perform a variety of resource management tasks on national forest lands through service contracts (Moseley & Reyes, 2008). Some businesses that purchase timber may rely significantly on federal timber sources, depending on the biophysical and land ownership context of their region. Since the 1990s, many scholars and practitioners considered the evolving relationship of communities and federal lands (e.g. Lee, Field, & Burch, 1990; Carroll, Cohn, Seesholtz, & Higgins, 2005; Donoghue & Sturtevant, 2008; Chen & Weber, 2012), but often focused on community impacts and perspectives, or policy changes. The role of the private sector in helping manage federal lands and contributing to local communities remains significant, but scholarly analysis of this sector is lacking. More research is needed on today’s relationship between national forest lands and timber purchasers to better inform future timber and biomass sale and business assistance policies and programs. In particular, the perspectives of business representatives themselves are needed.

The type, quantity, and availability of federal timber sale opportunities have shifted over time. In the 1990s, the Forest Service transitioned to an ‘ecosystem management’ and wildfire risk reduction paradigm, particularly on the agency’s vast western landholdings. Social acceptability of harvesting larger, older trees declined, and new policies and programs such as the Northwest Forest Plan emphasized science-based management to restore ecosystems and protect biodiversity (Spies & Duncan, 2008). Concerns about wildfire were also growing, however, and a series of policies including the National Fire Plan and Healthy Forests Restoration Act followed in the early 2000s to focus on removing hazardous fuels and restoring forest health to reduce wildfire risk (Steelman & Burke, 2007). The net effect of these shifts was that although traditional timber sale opportunities were still available, much work in the western states shifted toward ecosystem restoration and wildfire risk reduction (Kelly & Bliss, 2009). Contracting opportunities that previously focused on activities such as constructing roads for logging moved instead toward, for example, surveying wildlife, thinning small trees to reduce wildfire risk, improving fish habitat, and restoring streams and rivers. Timber sales were often lower in volume and differed in the value and size of timber offered from previous decades. Although what is considered ‘non-saw timber’ varies by area, market, and facility, the proportion of smaller-diameter material not suited for traditional forest products facilities increased. Some traditional forest products manufacturing facilities closed, and interest increased in new businesses that could use small-diameter timber and woody biomass for products such as posts and poles, pellets, bricks, and chips (Becker & Viers, 2007).

As the Forest Service shifted in this direction, other technological and market trends also combined to shake many communities accustomed to the old paradigm. Economic activity declined, and there was heightened unemployment, poverty, a

lack of business opportunities, and associated social challenges (Winkel & Moseley, 2014; Charnley, Donoghue, & Moseley, 2008). Declines occurred in government employment, school enrollment, and other facets of these communities that previously experienced extensive public sector support. To help businesses and workers adapt to this new environment, the Forest Service developed or enhanced several economic assistance programs. These provided an array of market development, business assistance, and retooling of forest products business towards smaller-diameter timber and biomass energy (Becker et al., 2009). Recently, most of this funding has been dedicated nearly entirely to biomass energy development, with the Forest Service not taking any larger role in economic development or direct business assistance.

Some advocates have argued that the Forest Service should increase the volume and diameter of federal timber offered (e.g. Imbergamo, 2012). Others have suggested that the Forest Service should take a more direct economic development role, and that its current programs are not sufficient to support businesses and communities that still rely on federal forest lands (e.g. Rural Voices for Conservation Coalition, 2009). They have also suggested that USDA Rural Development, the federal agency that offers rural business assistance and other services, coordinate more closely with the Forest Service to serve restoration and timber businesses as it currently focuses on agriculture, energy, and other sectors far more than forestry and related activities (Davis, Sundstrom, & Moseley, 2012).

However, there has been little recent systematic examination of the timber-purchasing businesses currently active on federal lands to identify their characteristics, reliance on federal lands, challenges, and needs for assistance. Although many of federal timbers purchasers are traditional forest products mills, others are logging, forestry, or biomass-focused businesses. Limited research does suggest that biomass utilization from federal lands remains extremely challenging (Sundstrom, Nielsen-Pincus, Moseley, & McCaffrey, 2012). There has been some research on the economic programs of the Forest Service (e.g., Becker et al., 2009), but this has only examined grant recipients in these programs rather than all businesses that utilize federal timber and biomass. To address this gap, we conducted a survey of businesses that purchased Forest Service timber sales in six Forest Service regions where ecosystem restoration and wildfire risk reduction policies have been prevalent. We focused on understanding three primary dimensions: (a) reported reliance on federal timber sales, (b) challenges and limiting factors to the success of their businesses, and (c) whether they have sought business assistance, and from which sources. Our objective was to better illuminate the needs and current context of businesses that operate using national forest lands, particularly those that report depending on federal timber sales for a large proportion of their supply. This can help inform policies and programs that may assist these businesses and allow them to provide community economic impacts.

2.0 Context: The Forest Service–Community/Business Relationship

Today, the federal government owns approximately 20% of forestlands in the U.S., constituting about 30% of the U.S. timber inventory as a whole and 44% of the softwood inventory, with the vast majority of federal holdings located in the Western U.S. (Gorte, 2003). Most of this forestland is managed by the U.S. Forest Service, an agency in the Department of Agriculture. The Forest Service has, from its

inception, focused on the role that its lands play in ‘community stability’. The first Forest Service chief, Gifford Pinchot, wrote that “the National Forests exist not for the sake of revenue to the government, but for the sake of the welfare of the public. The timber-sale business is managed to give stability to the industry and promote the upbuilding of the country” (Pinchot, 1908 as quoted in Parry, Vaux, & Dennis, 1987, p. 24). Through the 1920s, private foresters and industry advocated for the Forest Service to produce a ‘sustained yield’ of timber designed to serve the needs of mills and therefore communities in its local areas, but the Sustained Yield Forest Management Act addressing this was not passed until 1944. The six ‘sustained yield units’ that it created mostly did not endure. But the agency focused on producing an ‘even flow’ of timber from national forests for several more decades especially in the post-World War II era when domestic housing markets increasingly demanded wood products from federal lands (Le Master & Beuter, 1989).

By the late 1970s, however, the US forest industry was changing. Restructuring—for example, technological mechanization and consolidation—and geographic redistribution would begin to shift industry away from areas such as the U.S. West and towards other regions such as the Southern states and Alaska. The Forest Service did have a role in providing technical assistance and marketing to industry through the Cooperative Forestry Assistance Act of 1978. In the Pacific Northwest, traditionally the Forest Service’s ‘timber basket’, the listing of northern spotted owl as an endangered species and policy changes under the Northwest Forest Plan of 1994 drastically reduced timber harvest. Similar environmental concerns triggered changes to national forest management across other parts of the West (Donoghue & Sturtevant, 2008). After the challenges of the 1982 recession, a great contraction occurred in the forest products sector, with cascading effects for secondary manufacturers, loggers, truckers, and other related businesses (e.g. Cook, 1995). This led to subsequent high unemployment, social conflict, out-migration of working-age families, and steep declines in the federal government workforce. In addition, wildfire became a significant policy focus. The National Fire Plan (2001), Healthy Forests Restoration Act (2003), and other policies and programs emphasized removing hazardous fuels and planning for community wildfire protection (Vaughn & Cortner, 2005). This meant that timber sales and restoration activities increasingly yielded smaller-diameter timber or non-sawtimber biomass that required different kinds of processing and resulted in different products than the traditional lumber sector (Nechodom, Becker, & Haynes, 2008). In addition, stewardship contracting authorities were introduced that helped facilitate restoration timber sales and contracts in several ways, including allowing exchange of goods for services, requiring contracts to be awarded based on best value, and allowing contracts of up to ten years in duration for a more reliable flow of sale and contract opportunities for businesses.

In addition to its timber sale and contracting activities, the Forest Service also has had several economic assistance and business development programs. As described by others (Becker et al., 2009), the 1990 Farm Bill led to the combination of several previous business and technology-related programs from the 1970s and 1980s into a single Economic Action Program (EAP). Under the EAP, assistance came for both post-Northwest Forest Plan workforce training and community development, as well as for small diameter biomass business development following the National Fire Plan. Business assistance came to focus largely on the latter. The Forest Service’s Woody Biomass Utilization Grant (WoodyBUG) program is the primary mechanism for this investment. Congress created the WoodyBUG program in 2005 and funded

it as part of the Forest Service's hazardous fuels reduction budget. The program's goals were to support biomass utilization and decrease hazardous fuels reduction costs by encouraging business development capacity near fire-prone national forests. Since 2005, Congress has annually authorized \$5 million of WoodyBUG funding for the entire country. From 2005 to 2010, WoodyBUG provided funds for equipment purchases and technical assistance. Beginning in 2011, the program's focus shifted to feasibility and engineering studies for biomass energy facilities. This was a unique program for the Forest Service in that it allowed the agency to invest directly in business capacity (Davis et al., 2014).

It is evident that the Forest Service in the U.S. West shifted over time from a broad focus on sustaining timber yield for communities and businesses towards a range of multiple values and products beyond timber. Its timber-specific policies and programs have narrowed from broader notions of 'community stability' and now primarily emphasize biomass business development to utilize smaller-diameter wood (Becker & Viers, 2007), as well as stewardship contracting. In some places, application of these programs has begun to foster business development, while in other areas businesses have continued to struggle (Becker, Moseley, & Lee, 2011). At the scale of the individual business, these kinds of investments may make a difference by providing resources to obtain engineering studies, or new equipment that would not otherwise exist. However, it is not clear how these programs may have impacts across regional biomass and forest products sectors; and in particular, if program investments match the needs of businesses that purchase federal timber and biomass. Our objective in the present study is to provide an understanding of the structure of western businesses that purchase federal timber, including their dependence on federal supplies, their engagement in small-diameter utilization processes, challenges faced by these businesses, and their business assistance needs, in order to better inform the design of public policies and business support programs.

3.0 Methods

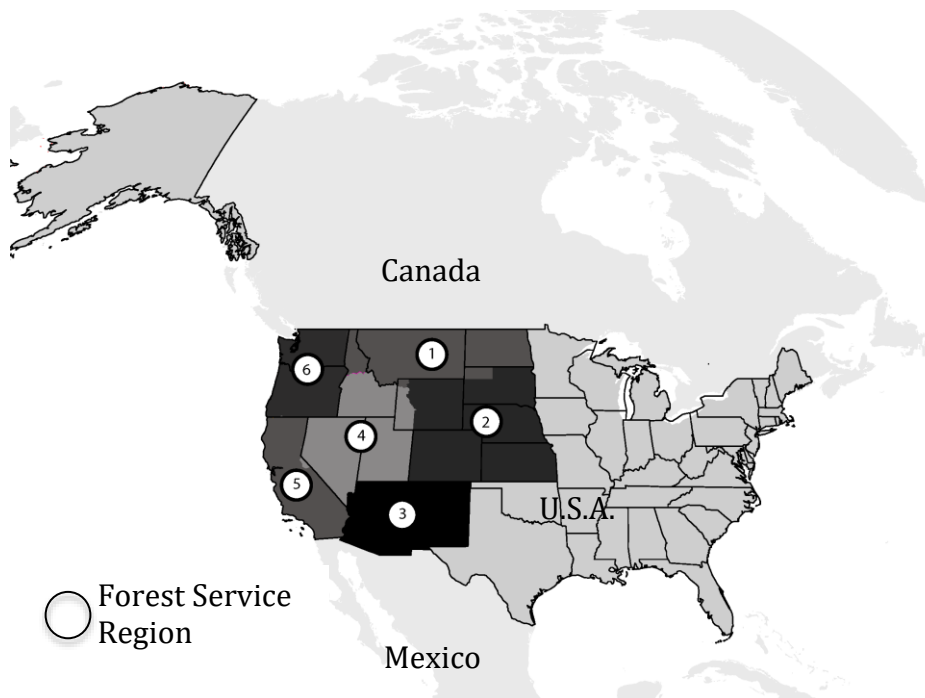
We designed a survey questionnaire adapted for the timber purchaser context from a questionnaire used in a previous project on Forest Service contractors. We developed a series of closed-ended, multiple-choice questions about business characteristics, reliance on federal timber, challenges encountered, and sources of business assistance, along with a limited number of open-ended questions. We did not access or analyze any other information about businesses. The data therefore reflect what was reported through the lens of the survey respondents.

We identified timber purchasers from a database of federal timber sales in Forest Service Regions 1 through 6 (see Figure 1) between 2009 and 2014 by obtaining records from the Timber Information Management System (TIMS) database. Each business is affiliated with a unique DUNS (Dun and Bradstreet) number; using the DUNS number ensured that we had a nonredundant database of relevant businesses. We found a total of 434 unique purchasers over that time period.

A team of university student workers conducted the survey under supervision of two faculty researchers. Students conducted pilot surveys that were reviewed and compared and were coached to ensure consistency across surveyors. We conducted the survey primarily by telephone but employed mixed modes as needed depending on respondent preference (Dillman, 2000). We randomly selected 25 potential respondents to take a pilot survey and provide feedback. The survey was not revised

following the pilot. For the full survey following the pilot, contact was made by telephone. If participants were available and willing to take the survey immediately, it was administered via telephone at that time; otherwise the survey was scheduled for a later date. The person answering the telephone was asked to provide their job title and indicate whether they were able to answer the types of questions on the survey. Participants were contacted up to six times in three weeks by telephone before being labeled non-respondents. If phone contact with potential respondents was not achieved, the final voicemail message provided details for taking the survey online, and a paper version was also sent to the business address with a cover letter. Through survey implementation, we monitored the response rate from each Forest Service region and sought to obtain a representative sample of each. As the telephone survey was being administered, we entered responses into Qualtrics, an online survey program commonly used in social science research. Survey data were downloaded from Qualtrics, entered into Microsoft Excel, and cleaned. Basic descriptive statistics and statistical testing were performed SPSS. Open-ended survey responses were entered into Microsoft Excel and coded based on the survey questions.

Figure 1: Forest Service Regions, U.S.A.



Source: Ecosystem Workforce Program, University of Oregon.

4.0 Findings

The total of completed, usable surveys was 232, for a response rate of 53.5 percent. Of the completed surveys, 94 percent were completed by telephone and the remainder over the Internet using survey software. No paper surveys were returned via postal mail. Total sample size varies on some questions, as not all questions applied to all respondents depending on their business type—for example, logging contractor versus forest products manufacturer. Nearly one-quarter of the respondents were from Region 6, while only five percent—12 total responses—were

from Region 3 (see Table 1). This likely reflects differences in the forest industry sectors in these regions, as the Northwest had far more forest products businesses at this time than other regions.

Table 1. *Geographic Location of Survey Respondents by Forest Service Region*

Forest Service Region	R1	R2	R3	R4	R5	R6	Multiple	Total
Number of responses	47	43	12	29	41	56	4	232
Percent of total respondents	20.3	18.5	5.2	12.5	17.7	24.1	1.7	100

4.1 Business Characteristics and Distribution

We asked respondents a series of questions about their business. First, we asked them to characterize the types of forestry and forest products activities in which they engage, from logging to hauling logs to processing and producing materials in a facility—such as a sawmill—(see Table 2). Respondents could choose more than one answer if applicable. Nearly two-thirds of the respondents reported that their business performed logging or other forestry operations. Only about one-quarter of the timber purchasers reported that their business did the processing of harvested timber or biomass. The prevalence of logging–forest operations as an activity over processing may suggest either that these businesses are logging or forestry businesses who purchase and harvest the actual sale before themselves selling the material to a processing facility; or, that some businesses are integrated, possessing harvesting as well as processing capacities. This may also indicate that there are fewer forest products processing facilities and more loggers overall in the study area. Very few respondents performed firewood processing or dealing.

Table 2. *Percent of Respondents Indicating That Their Business Engaged in a Given Activity*

Type of activity	Percent of respondents*
Logging–forest operations	62.1
Timber or biomass processing facility	36.2
Log hauling	17.7
Firewood dealer–processor	4.3
Other	10.8

*Note that respondents could choose more than one, so totals amount to more than 100%.

Nearly three-quarters of respondents indicated that they utilized small diameter wood—defined here as smaller than 8 inches diameter at breast height (dbh) (see Table 3). These businesses are likely the best positioned to use the smaller diameter logs that come from forest health and hazardous fuels reduction projects. However, this does not reveal the extent to which utilizing small diameter material was a major component of their business, was profitable or marginal, or if they had retooled their operation to handle this material. A majority of respondents in each Forest Service region reported utilizing small diameter wood and there were no statistically significant differences in propensity to use small diameter wood between regions. However, timber purchases in Region 5 were the least likely to report using small diameter material; respondents in Region 2 and 3 were the most likely to report using small diameter timber.

Table 3. *Percent of Respondents in Each Surveyed Region Who Report Harvesting or Utilizing Small-Diameter Timber**

Forest Service Region	R1	R2	R3	R4	R5	R6	Overall
Percent of respondents that harvest or use small-diameter timber (8" or less)	78.7	81.4	81.8	75.9	62.5	71.4	74.3

*Defined as 8 inches in diameter or smaller. Detailed data for businesses active in multiple regions are excluded due to small *n*.

We also asked respondents to identify the types of wood products that their business produced, or in the case of logger–forestry purchasers that were eventually produced by another company after the logger had completed the timber sale and sold the material to a processing facility (see Table 4). Approximately 28 percent of respondents stated that purchased material was used to produce dimensional lumber and studs. That finding suggests these purchasers likely still need sawlogs of certain minimum diameters to produce lumber, and that they are still tied to the housing market. Twenty-nine percent of respondents reported that material they purchased was used to produce at least one of the relatively low value products considered in our study—posts and poles, chips and hog fuel, or firewood and energy products. About half of those businesses reported material was used to produce just one of those lower value products; about one-third of those businesses stated material was used to produce two of the lower value products. This relatively low rate of using wood to produce lower value material is juxtaposed against the relatively high share of respondents—74 percent—who reported purchasing small diameter timber that is typically used to make these lower value products. The disparity suggests that other purchasers of small diameter material must be using that material to produce traditional lumber or selling that material into the pulp and paper markets. A small share of timber purchasers—just four percent—reported that purchased material was being used to produce engineered or composite wood products. This finding likely reflects U.S. regional differences in manufacturing of construction panels and the relative popularity of oriented strand board produced in the U.S. South relative to plywood commonly produced in the U.S. West.

Table 4. *Percent of Respondents Indicating That Their Business Produces Each of the Given Products*

Type of wood product	Percent of respondents producing
Dimensional lumber and studs	28.0
Chips and hog fuel	21.1
Firewood, densified energy products, etc.	14.2
Other	10.8
Posts, poles, pilings	10.8
Particleboard, plywood, engineered products	3.9
Veneer, laminates	3.4
Pulp and paper	3.0

Note: Respondents could choose more than one.

4.2 Limiting Factors for Business Success

To better understand the operating environment of timber purchasers, we asked respondents to identify how much various factors limited their business's success using a Likert scale from 1=extremely limiting to 5=not at all limiting (see Table 5). The most limiting factor overall was federal timber volume offered. Respondents in Regions 1 and 6 ranked this factor as more limiting than respondents from other regions. The second most limiting factor overall was availability of qualified workers, and respondents in Regions 3 and 5 ranked this factor as more limiting than other respondents. Current wood products markets was a close third as a limiting factor and was perceived as more limiting by respondents in Regions 3 and 4. Opportunity for skills and training and access to capital or loans had the lowest ratings as limiting factors.

4.3 Sources of Business Assistance

We examined if businesses are seeking any assistance with their challenges, and if so, what types of assistance they pursue (see Table 6). Thirty-five percent of respondents reported not seeking any assistance at all. Of the respondents that had sought assistance, 40 percent had sought financing assistance and 22 percent financial advice. Despite availability of federal timber sales being ranked as the most limiting factor, only 12 percent of respondents reported seeking assistance with accessing federal timber or biomass sales. Workforce availability was also among the higher-ranked limiting factors, yet only 17 percent of respondents had sought assistance in this area. It is not clear why assistance is not sought for these concerns—for example, whether there is a lack of service providers or other resources to assist with federal timber supply or workforce, if businesses are not aware of them, or if they are not comfortable interacting with them.

Table 5. *Mean Responses—and Standard Deviation—by Region to a Series of Questions Regarding Limitations on Business Success*

	Forest Service Region	R1	R2	R3	R4	R5	R6	Overall mean
Limiting factors to business success	Current wood products markets	2.93 (1.30)	3.12 (1.35)	3.42 (1.38)	3.04 (1.16)	2.78 (1.31)	2.76 (1.37)	2.94 (1.32)
	Federal timber volume offered	1.51 (.80)	2.43 (1.31)	2.25 (1.66)	2.11 (1.23)	2.20 (1.38)	2.00 (1.22)	2.05 (1.25)
	Private timber volume offered	3.02 (1.00)	3.29 (1.35)	3.80 (1.48)	3.08 (1.38)	3.41 (1.29)	3.53 (1.32)	3.32 (1.28)
	Availability of qualified workers	2.76 (1.09)	3.23 (1.35)	2.67 (.985)	2.81 (1.30)	2.61 (1.26)	3.09 (1.48)	2.90 (1.30)
	Opportunity for skills and training	3.65 (1.01)	3.77 (1.33)	2.58 (1.24)	3.57 (1.44)	3.03 (1.24)	4.04 (1.15)	3.59 (1.28)
	Access to capital or loans	3.44 (1.28)	3.67 (1.45)	2.55 (1.51)	3.61 (1.47)	3.17 (1.46)	3.66 (1.56)	3.46 (1.46)
	Ability to purchase or upgrade equipment	3.57 (1.37)	3.30 (1.27)	2.58 (.996)	3.04 (1.37)	3.20 (1.38)	3.78 (1.44)	3.39 (1.38)
	Regional or local competition	3.33 (1.08)	3.40 (1.29)	3.75 (1.22)	3.44 (1.22)	2.97 (1.31)	3.29 (1.24)	3.31 (1.23)

Response categories were 1=Extremely limiting; 2=Very limiting; 3=Somewhat limiting; 4=A little bit limiting; 5=Not at all limiting. Detailed data for businesses active in multiple regions are excluded due to small *n*.

Table 6. *Percent of Respondents That Reported Having Sought Various Kinds of Assistance*

Type of business assistance	Percent of respondents who had sought this assistance
Financing assistance	39.7
Financial advice	22.4
Workforce recruitment and training	16.8
Business management and planning	12.5
Accessing federal timber or biomass sales	12.1

We also asked an open-ended question about the source of the assistance of those businesses that respond as seeking assistance. We received 145 responses, which were typed in summary form by the person administering the survey and entered into a Microsoft Excel spreadsheet (see Table 7). Coding of these responses to identify entities providing assistance indicated that the majority of respondents to this question had sought the help of a bank or loaning institution or from an accountant. About 12 percent had sought assistance from the Forest Service, their peers, or others. Very few mentioned seeking assistance from a small business association, university extension, nonprofit organization, or workforce training program.

Table 7. *Sources of Business Assistance Reported by Respondents in Open-ended Question*

Source of business assistance*	Percent of respondents (n=145)
Bank, lending institution, and/or accountant	54
Peers–colleagues	12
US Forest Service	12
Professional association	9
State agency	8
University	4
Employment agencies	4
Small Business Administration	3
Other federal agency	1
Economic development entity	<1
Procurement Technical Assistance Center	<1
Nonprofit organization	<1

*Respondents could report more than one source.

These responses, although qualitative and limited in scope, do further confirm that financial and financing assistance is the most commonly sought type of business assistance for timber purchasers. Within the responses indicating loans had been sought, several businesses described the challenges of obtaining loans as a logger or forest products business, and that access to equipment was a significant barrier to them. They perceived a lending environment that did not understand or was indifferent to the forest products industry and forestry. The respondents that sought assistance from the Forest Service typically described speaking with timber staff and others about timber sale rules and opportunities and about grants, indicating that some timber purchasers do work directly with this agency on access to public timber. The majority of these responses described the direct interaction with agency staff as helpful in increasing their understanding of timber sales.

4.4 Businesses Highly Dependent on Federal Timber

To measure the degree of reliance on timber–biomass from federal sources (i.e., Forest Service and/or Bureau of Land Management (BLM) lands), survey data were analyzed according to the respondents’ dependence on federal lands for supply. More than half of respondents reported that more than 50 percent of the volume they purchased came from federal sources (see Table 8). About 42 percent of respondents reported that over three-fourths of the timber volume they purchased was sourced from federal lands. Reliance on federal timber–biomass sales showed some variability across Forest Service regions. A majority of purchasers in Regions 1 and 6 reported that less than half of their timber volume was purchased from federal lands. Purchasers were most reliant on federal timber volume in Forest Service Regions 2, 3, 4, and 5. In each of those regions, well over half of respondents stated that more than 50 percent of the timber volume they purchased came from federal lands. In Regions 3, 4, and 5, more than 50 percent of respondents reported that three-quarters of their purchased timber volume came from federal lands. This pattern could reflect differential (un)availability of other sources of timber (e.g., private forestlands), the extent and location of federal lands, and the productivity of forest types in each region.

Table 8. *Percent of Respondent Companies Purchasing More Than 50% and 75% of Their Timber Volume from Federal Lands*

Percent of volume sourced from federal lands	R1	R2	R3	R4	R5	R6	All regions
More than 50%	40.4	67.4	75.0	62.1	58.5	37.5	53.0
76% or more	29.8	46.5	66.7	58.6	51.2	30.	42.5

Detailed data for businesses active in multiple regions are excluded due to small *n*.

We examined the characteristics of those businesses reporting the greatest reliance on timber volume from federal forests. Those with the greatest reliance on federal timber volume were more likely to be sole proprietorships and less likely to be organized as corporations (see Table 9). Firms with the greatest dependence on federal timber sales were smaller in size and had fewer years in operation than other firms. Those with the highest dependence on federal timber were slightly—although not statistically significantly—more likely to have been paid for work by the Forest Service via a service contract—as opposed to paying the Forest Service for timber—in the last five years. Service contracts, unlike timber sales, are used when the government pays a contractor for work in support of national forest management. Those activities can include work that the timber harvesting contractors may have skills and equipment to do, such as pre-commercial thinning, grappling and piling of small diameter material, or road work. Despite being slightly more likely to enter into service contracts, those businesses most dependent on federal timber volume were not more likely than other firms to have entered into a stewardship contract—which typically integrates timber and service work—with the Forest Service in recent years.

Table 9. *Characteristics of Businesses Most Dependent on Federal Timber Volume*

Characteristic	Federal timber dependent group	
	76% or more of purchased volume from federal sources	75% or less of purchased volume from federal sources
^a Business is a sole proprietorship*	31.0%	20.5%
^a Business is a corporation***	37.0%	58.3%
^b Maximum number of employees in a year (median)***	6	10
^b Years in operation (median)***	23	30
^a Entered into a service contract with the Forest Service in last 5 years	66.0%	55.3%
^a Entered into a stewardship contract with the Forest Service in last 5 years	36.0%	37.9%

*** p-value < 0.01, ** p-value < 0.05, *p-value < 0.10

^a For succinctness, only the share of respondents reporting ‘yes’ are shown. Chi-square statistical tests—with continuity correction—were completed for each characteristic based the numbers of individuals stating ‘yes’ and ‘no’ to that characteristic.

^b Statistical comparisons were performed as Wilcoxon rank-sum tests.

We also examined the distance traveled to obtain federal timber and the type of timber that was purchased. Compared to other firms, those with the greatest dependence on federal timber supply purchased a greater share of their federal volume close to the location of their businesses (see Table 10). Nearly two-thirds of the federal timber volume purchased by federal timber dependent firms came from Forest Service land within 50 miles of the business location. Other firms reported lower shares of federal timber purchased in their immediate vicinity. Similar to other firms, the vast majority of those firms with the greatest dependence on federal timber sales had purchased sawlogs from the Forest Service in the last five years. Posts and poles, pulpwood, and firewood are typically lower value material than sawlogs. Of that material, those firms most dependent on federal timber were less likely to have purchased pulpwood but more likely to have purchased firewood from the Forest Service, compared to other firms.

Table 10. *Timber Purchased by Businesses Most Dependent on Federal Timber Volume*

Characteristic ^a	Federal timber dependent group	
	76% or more of purchased volume from federal sources	75% or less of purchased volume from federal sources
^b Percent of federal timber supply purchased from Forest Service land within 50 miles***	66.2%	52.7%
Firms purchasing sawlogs from the Forest Service in last five years	81.0%	86.4%
Firms purchasing veneer logs from the Forest Service in the last five years	12.0%	19.7%
Firms purchasing posts and poles from the Forest Service in the last five years	27.0%	28.0%
Firms purchasing chips or hog fuel from the Forest Service in the last five years	20.0%	25.8%
Firms purchasing pulpwood from the Forest Service in the last five years*	22.0%	33.3%
Firms purchasing firewood from the Forest Service in the last five years**	45.0%	28.0%

*** p-value < 0.01, ** p-value < 0.05, *p-value < 0.10

^a For succinctness, only the share of respondents reporting ‘yes’ are shown. Chi-square statistical tests—with continuity correction—were completed for each characteristic based the numbers of individuals stating ‘yes’ and ‘no’ to that characteristic.

^bWilcoxon signed rank test used to test for differences.

There was little relationship between share of purchased volume that comes from federal forests and perceived limitations to business success, with three exceptions. As the share of purchased timber from federal lands increased for the business, the perceived limitation of supply from federal forests declined (Spearman’s rho=0.182, p-value <0.01). This may indicate that those businesses that use relatively high shares of federal timber are doing so either because local forests are selling large volumes of timber or that these businesses have found niches they can fill based on the volume sold from local federal agencies. Additionally, as the share of purchased timber that comes from federal lands increased for the business, ‘opportunity for skills and training’ (rho=-0.171, p-value<0.05) and ‘ability to purchase or upgrade equipment’ (rho=0.144, p-value<0.05) were reported as increasingly limiting to business success. Despite these limitations to success, and similar to other firms,

those with the greatest dependence on federal timber were unlikely to have sought business assistance. We found no statistically significant differences between firms with differing dependence on federal timber in the likelihood of seeking assistance.

5.0 Discussion and Implications

We surveyed federal timber sale purchasers in the U.S. West to learn more about their business types, perceived challenges, and sources of assistance. Although the survey obtained reported respondent perceptions rather than direct analysis of business records such as supplies, sources, correspondences, or sales, these data can help provide an important sense of the perspectives of these businesses. Here we highlight several findings that may be most informative for understanding implications for future policy and program design for technical assistance, marketing, technological development, and other arenas in which the Forest Service has historically acted through timber sales and economic assistance programs.

First, a majority of respondents in all Forest Service regions purchase small diameter timber—8 inches dbh or less. This suggests that businesses are purchasing the types of material available from forest restoration and fuels reduction projects, where smaller trees are thinned. More research could explore how important small diameter material was to their overall supply, if it was profitable or marginal, or if they had retooled their businesses to handle it. The specific challenges of developing biomass businesses—and markets—have been fairly well understood. Previous studies of businesses in grant programs for biomass utilization have suggested that it remains challenging to initiate and grow small diameter-focused businesses because multiple strategies are needed, from planning to foster a more steady supply of biomass, to feasibility studies, to infrastructure investment (Becker et al. 2009). Forest Service strategies have included stewardship contracting, but a majority of businesses had not entered into a stewardship contract or sale and are therefore not utilizing an authority that is intended to facilitate restoration and small diameter utilization. It is not clear if this is because they chose not to, or if the Forest Service units in their local areas did not use stewardship contracting. More research could illuminate this.

Second, a majority of businesses had sought assistance, most commonly for financial management and financing issues. Accountants and lending institutions were the most common sources of this assistance. Those with the greatest dependence on federal timber—76 percent or more of their supply from federal sources—were less likely to have sought business assistance of any kind. The businesses most dependent on federal timber appear to see ‘opportunity for skills and training’ and ‘ability to purchase or upgrade equipment’ as increasingly limiting to business success. It may be that these businesses are attempting to innovate or retool to adjust to the types of material and sales offered by federal agencies and are in greater need of new skills and equipment. Overall, fewer respondents reported obtaining assistance with federal lands supply or workforce development. It is not clear if this is because there are no entities working to provide these services, or if businesses are somehow not able or not comfortable to pursue assistance in this vein. Supply and workforce issues may be areas where future policies and programs could focus.

Finally, we found several differences between businesses located in different Forest Service regions. Differences may be expected given regions’ differing biophysical characteristics, forest types, and levels of established infrastructure. Interestingly, purchasers were most reliant on federal timber volume in Forest Service Regions 2, 3, 4, and 5. Yet respondents in Regions 1 and 6 ranked federal timber availability as

more limiting to their business success than respondents from these other regions with more reported dependency on federal timber. More research could examine why this may be; for example, has timber availability declined in these regions more than others? Overall, the regional differences we found could indicate a need for region-specific pilots, programs, or resources that focus on the particular characteristics of businesses in those areas; or flexibility in implementation of national-level programs to allow regional adaptation.

Historically, the U.S. Forest Service's policies emphasized sustaining timber yield and, at times, ensuring businesses local to its lands had access to timber sales. In more recent decades, policies and programs have been more focused on supporting business development and retooling, particularly to plan hazardous fuel projects and utilize the resulting smaller-diameter materials. We suggest that a multifaceted approach is warranted. More attention could be paid to the timing, quantity, and types of supply that federal lands offer and how this may affect business success; and to understand how the structure and procedures of timber sales, service contracts, and stewardship contracts and sales may better serve businesses and allow them to produce community economic outcomes. In addition, they may continue to direct assistance through grants and services for business innovation, although these assistance programs remain somewhat small in size and scope. Further, a multi-agency strategy may be considered. If other agencies beyond the Forest Service, such as USDA Rural Development, have established infrastructure for direct business assistance in areas such as financing or workforce development, these entities could partner more closely to meet the needs of federal timber purchasers.

References

- Becker, D. R., & Viers, J. (2007). Matching the utilization of the by-products of forest fuel reduction with community development opportunities. Pp. 157-170 in *People, Fire and Forests: A Synthesis of Wildfire Social Science*. Eds. Daniel, T.C., Carroll, M.S., Moseley, C., & C. Raish. Corvallis: Oregon State University Press.
- Becker, D. R., Nechodom, M., Barnett, A., Mason, T., Lowell, E. C., Shelly, J., & Graham, D. (2009). Assessing the role of federal community assistance programs to develop biomass utilization capacity in the western United States. *Forest Policy and Economics*, 11(2), 141–148.
- Becker, D. R., Moseley, C., & Lee, C. (2011). A supply chain analysis framework for assessing state-level forest biomass utilization policies in the United States. *Biomass and Bioenergy*, 35(4), 1429–1439.
- Carroll, M. S., Cohn, P. J., Seesholtz, D. N., & Higgins, L. L. (2005). Fire as a galvanizing and fragmenting influence on communities: The case of the Rodeo–Chediski fire. *Society & Natural Resources*, 18(4), 301–320.
- Charnley, S., Donoghue, E. M., & Moseley, C. (2008). Forest management policy and community well-being in the Pacific Northwest. *Journal of Forestry*, 106(8), 440–447.
- Chen, Y., & Weber, B. (2012). Federal policy, rural community growth, and wealth creation: The impact of the federal forest policy and rural development spending in the Pacific Northwest. *American Journal of Agricultural Economics*, 94(2), 542–548.

- Cook, A. K. (1995). Increasing poverty in timber-dependent areas in Western Washington. *Society & Natural Resources*, 8(2), 97–109.
- Daniels, S. E., Hyde, W. F., & Wear, D. N. (1991). Distributive effects of Forest Service attempts to maintain community stability. *Forest Science*, 37(1), 245–260.
- Davis, E. J., Sundstrom, S., & Moseley, C. (2012). *Federal investments in natural resource-based economic development in Oregon* (Ecosystem Workforce Program Working Paper #40). Eugene: University of Oregon.
- Davis, E. J., Mottek Lucas, A., Moseley, C., Kim, Y.-S., Nielsen-Pincus, M., & Bilek, T. (2014). *The impacts of the Woody Biomass Utilization Grant Program in eastern Oregon and eastern Arizona* (Ecosystem Workforce Program Working Paper #46). Eugene: University of Oregon.
- Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method* (Second edition). New York, NY: Wiley.
- Donoghue, E. M., & Sturtevant, V. E. (Eds.). (2008). *Forest community connections: Implications for research, management, and governance*. Washington, DC: Resources For The Future.
- Gorte, R. W. (2003). *National forests: Current issues and perspectives*. New York, NY: Nova Science.
- Imbergamo, W. (2012). *Testimony Before the Subcommittee on Interior, Environment, and Related Agencies, Committee on Appropriations U.S. House of Representatives Regarding the Fiscal Year 2013 President's Budget Request for the U.S. Forest Service*. Retrieved from <http://appropriations.house.gov/uploadedfiles/hhrg-112-ap06-wtestimony-bimbergamo-20120322.pdf> . Date retrieved: 15 January 2014.
- Kelly, E. C., & Bliss, J. C. (2009). Healthy forests, healthy communities: An emerging paradigm for natural resource-dependent communities? *Society & Natural Resources*, 22(6), 519–537.
- Lee, R. G., Field, D. R., & Burch, W. R. (1990). *Community and forestry: Continuities in the sociology of natural resources*. Boulder, CO: Westview Press.
- Le Master, D. C., & Beuter, J. H. (Eds.). (1989). *Community stability in forest-based economies: Proceeding of a conference in Portland, Oregon, November 16–18, 1987*. Portland, OR: Timber Press.
- Moseley, C., & Reyes, Y. E. (2008). Forest restoration and forest communities: Have local communities benefited from Forest Service contracting of ecosystem management? *Environmental Management*, 42(2), 327–343.
- Nechodom, M., Becker, D. R., & Haynes, R. (2008). Evolving interdependencies of community and forest health. In E. M. Donoghue & V. E. Sturtevant (Eds.), *Forest community connections: Implications for research, management, and governance* (pp. 91-108). Washington, DC: Resources For The Future.
- Parry, B. T., Vaux, H. J., & Dennis, N. (1989). Development of early Forest Service sustained-yield policy. In D.C. Le Master & J. H. Beuter (Eds.), *Community stability in forest-based economies: Proceedings of a conference in Portland, Oregon, November 16–18, 1987* (p. 23). Timber Press.

- Rural Voices for Conservation Coalition. (2009). *Economic stimulus proposal: the first steps towards building a rural green economy* (Issue Paper, January 2009). Retrieved from <https://static1.squarespace.com/static/562e839ee4b0332955e8143d/t/56be64a827d4bddbb1700389/1455318186548/Issue+Paper+2009-+StimulusGreenEcon.pdf>. Date retrieved: 10 January 2012.
- Spies, T. A., & Duncan, S. L. (Eds.). (2008). *Old growth in a new world: A Pacific Northwest icon reexamined*. Washington, DC: Island Press.
- Steelman, T. A., & Burke, C. A. (2007). Is wildfire policy in the United States sustainable? *Journal of Forestry*, 105(2), 67–72.
- Sundstrom, S., Nielsen-Pincus, M., Moseley, C., & McCaffery, S. (2012). Woody biomass use trends, barriers, and strategies: Perspectives of US Forest Service managers. *Journal of Forestry*, 110(1), 16–24.
- Vaughn, J., & Cortner, H. (2005). *George W. Bush's healthy forests: Reframing the environmental debate*. Boulder: University Press of Colorado.
- Winkel, G. & Moseley, C. (2014). Resource Management Paradigms, Environmental Strategies and Diverging Policy Paths. Comparing forest environmental policy evolution in Germany and the US Pacific Northwest. Paper presented at XXIV IUFRO World Congress 2014: Sustaining Forests, Sustaining People: The Role of Research. 10-10-2014, Salt Lake City.