

A Structural Assessment of the Logging Contract
Business in the Inland Northwest for 2004

A Thesis
Presented in Partial Fulfillment of the Requirements for the
Degree of Masters of Science
with a
Major in Forest Products
in the
College of Natural Resources
University of Idaho

by

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ABSTRACT

Logging contractors supply raw material (i.e., sawlogs and wood chips) to the forest products manufacturing sector and are an integral component of the Inland Northwest's forest products industry. However, a lack of information exists describing the structure and systems of the logging contracting sector. A mail survey was administered to assess the logging contractor sector in Idaho, Montana, and Eastern Washington, focusing on employment characteristics, capital investments, operational characteristics, and business constraints. Of the 1,202 surveys that were mailed, 349 useable surveys were returned. Respondents indicated that the constraint that most adversely affected their business in 2004 was timber sale availability followed by quality employees. The mean age for logging contractors was 51, while 58 percent of the firms' employees were 40 years or greater in age. Firms producing more than 10 million board feet (mmbf) in 2004 only accounted for 10 percent of the total firms, but represented 53 percent of the total harvest. There was a positive correlation found between months of scheduled work a contractor had and their level of innovativeness. In addition, there was also a high level of skepticism and uncertainty among respondents on the topic of fuel reduction harvesting contracts.

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INTRODUCTION

During the 1990s and into the 2000s, the forest products industry of the Inland Northwest experienced a dramatic decline in available timber from National Forest lands. According to O’Laughlin (2005), in 2001 the National Forest harvest for Idaho was the lowest on record, representing only 11 percent of the volume that was harvested in 1990. In addition to the declines, mill closures, and increased operating costs have had a great impact on logging contractors in this region and, in some cases, account for the demise of these small businesses.

Despite declines in the 1990s, the forest products industry remains a major component of the region’s economic base. Idaho ranks second among the 50 states in its dependence on the forest products industry with 4.5 percent of the state’s labor income derived from the wood and paper products manufacturing sectors (O’Laughlin 2005). Logging contractors are an important subset of the industry. They are firms primarily engaged in timber harvesting on a fee or contract basis, using their own crew and equipment on forests owned or leased by others (Sunderman 1998). These businesses include sole proprietorships, partnerships, and corporations that vary in size (i.e., capital investments and or number of employees) and in the type of harvesting systems that are used. The forest products manufacturing sector of the Inland Northwest depends almost exclusively upon independent logging contractors to supply such raw material as sawlogs, pulpwood, tonwood, and poles. Despite their importance to the forest products industry and the regional economy, little is known about the profile of these independent logging contract businesses. Without historical and current structural information such as

demographics, productivity, and systems in use, it is difficult to assess how current constraints have affected these businesses.

Professional reports are published on an annual basis that assess the forest products industry in this region, but are limited to the primary processing of logs into lumber and value added processes that follow (Keegan et al. 2006, 2005; Blatner et al. 2004). Hence, there is a lack of detailed information describing the initial operations of harvesting raw material from the forest. There is a need for a better understanding of the business capacity, structure, and the current profile of harvesting operations of the Inland Northwest. Policy makers may use the current status of these businesses to evaluate how this sector may be affected by new regulations or policy changes. Lobbyists may use the updated information when stating their case to policy makers. Additionally, the results provide valuable information to educators in the field and help with the development of outreach projects. Moreover, the information also allows specialists to track the changes of the industry that acts as a major component to the Inland Northwest's economic base.

OBJECTIVES

The overall goal of this study was to understand the characteristics and current condition of the independent logging contract businesses of the Inland Northwest.

The specific objectives were to:

1. Identify the types of systems used and associated attributes: crew size, number of crews, productivity, and employment characteristics.
2. Obtain owner characteristics: mean age, education, capital investment of operations, and years in business.
3. Assess the current business characteristics and constraints.
4. Understand contractors' perception of fuel reduction harvests and their associated contracts.

METHODOLOGY

Survey Development and Implementation

The target population for the study was logging contract businesses in the Inland Northwest: Montana, Idaho, and Eastern Washington (east of the Cascade Mountain Range). Logging contractors in the Inland Northwest use similar harvesting systems and methods to produce sawlogs, as well as wood chips for the pulp and paper sector. Contractors often cross state boundaries for harvesting jobs and to market their products; therefore, our survey aggregated these three states rather than focusing on each state independently. The harvesting operations on the west side of the state of Washington and including the Cascade Mountain Range are much larger in size and vary substantially from the operations located within the Inland Northwest, thus, were not assessed in this study.

The sampling frame for Idaho was in the form of a master list generated by combining mailing lists from Idaho's Logging Safety Bureau, the Idaho's Associated Logging Contractors, and the University of Idaho's Cooperative Extension outreach program. This process resulted in identifying 695 contract logging firms located in Idaho. In Montana and Eastern Washington, these lists were not available; therefore, mailing lists were purchased from an online industry database. The list for Montana included 298 contract logging businesses, while Eastern Washington's list yielded 209. For each state, contractor and business names were cross checked to ensure that firms were not repeated. The total sample frame for this study included 1,202 firms. Similar to Greene et al. (2001), Luppold et al. (1998), and Munn et al. (1998); a survey was mailed to every contract logging firm on the list.

An inductive and qualitative research approach was needed to become familiar with the constraints that contractors are faced with as business owners. The method used for this study involved interviewing logging contractors at association meetings and by telephone to find out what environmental, business, and regulatory constraints hinder them as small business owners. From these discussions it was possible to formulate questions that could be used in a quantitative approach to assess the constraints.

A mail survey was used to collect data for this study. Although telephone surveys can be effective, it was determined that it would be inefficient to contact contract logging firms at their residences since they often work away from home for extended periods of time. Shook and Eastin (2001) reported that an additional advantage of using a mail survey includes the reduced bias that results compared to using a telephone survey or personal interview. Moreover, participants are able to exercise greater care and take more time in completing mail surveys (Brown 1937; Malhotra 1993; Mangione 1995). The survey instrument was pre-tested during the 2005 Idaho Associated Logging Contractors annual board meeting. Contractors were asked to complete the survey and to make suggestions and comments on the format, terminology, and question flow so as to improve the readability and comprehension of the questions used in the instrument. After reviewing contractors' critiques captured by the pretest, questions were revised and a final survey questionnaire was prepared.

The mail survey was designed and administered using a modified Tailored Design Method for mail surveys (Dillman 2000). To increase the response rate,

surveys were mailed during the spring breakup season, a period of time between March and May when most harvesting operations have ceased due to adverse harvesting conditions (i.e., high soil moisture content in the harvest site) and limitations on road use.

A survey booklet and cover letter were mailed to 1,202 logging contractors in mid-March of 2005. The cover letter explained the importance and objectives of the study, ensured confidentiality, included contact information, and provided instructions for completing the survey. In addition, the cover letter pointed out that the survey could be returned using the enclosed postage-paid return envelope, and that an incentive existed for those who returned a completed survey. For completing the survey, each respondent was entered into a free drawing for a new STIHL chainsaw. One week after the initial mailing, a postcard was sent out thanking those who had responded and was used as a courteous reminder to non-respondents to complete their survey. Two additional waves that included a survey booklet and cover letter requesting participation from non-respondents were sent out four and nine weeks after the initial mailing.

RESULTS AND DISCUSSION

Response Rate

Of the 1,202 surveys that were sent out to logging contract businesses, 35 were undeliverable and 182 respondents did not manage or own a contract logging business in 2004 (i.e., retired, out of business, another occupation, etc.); reducing the sample frame to 985. Therefore, the overall gross response rate was 53.9 percent¹ and the effective response rate was 35.4 percent². These response rates compare favorably to other studies examining contract logging firms (Montgomery et al. 2005; Greene et al. 2001; Greene et al. 1988; Luppold et al. 1998; Powers 2004; Milauskas and Wang 2006). By state, Montana contractors represented the highest effective response rate of 42.2 percent, followed by Idaho with 33.3 percent, and Eastern Washington with 32.0 percent. Idaho contractors had the highest number of returned and usable surveys, followed by Montana and Eastern Washington. This was expected since the total number of surveys that were sent to each state followed the same trend.

Non-response and Regional bias

The evidence of non-response bias can greatly impact the validity of a survey research study. According to Fowler (1984), respondents who respond to follow-up appeals are often assumed to behave more like non-respondents. To assess whether non-response bias existed in the results of this study, a modified Armstrong and Overton (1977) test method was utilized. Using a paired sample t-test at an

¹ Gross response rate includes all surveys that were returned by respondents.

² Effective response rate includes the 349 validated returned surveys that were used in the data analysis for this study.

alpha level of 0.05, the first 25 percent of respondents to the mail survey were compared to the last 25 percent of respondents using five questions³ within the survey instrument. None of these comparisons identified a statistically significant difference (p-value < 0.05), suggesting that late respondents behave like that of early respondents.

The impact of regional bias was another factor that needed to be assessed in this study given that the number of respondents varied between the three states surveyed. Using one-way analysis of variance (ANOVA) and Scheffe's post hoc test at alpha level of 0.05, the same five questions used previously were again analyzed to find whether respondents from contract logging companies from one state responded differently than their peers located in the other two states. Again, none of these comparisons showed a statistically significant difference (p-value >0.05), suggesting that contract logging firms operating within the Inland Northwest responded similarly to the survey regardless of their state of operation.

Operational Characteristics

The general characteristics found among contract logging firms based on the percentage of harvest volume for 2004 are summarized in **Table 1**. The total harvest volume for the Inland Northwest reported by respondents for 2004 was 1,586,147 thousand board feet (mbf). According to Keegan et al. (2006), the 2004 annual harvest volume for Idaho and Montana was 1,236,985 mbf and 702,394 mbf, respectively. Therefore, the contract logging firms surveyed in this study were

³ Questions were randomly selected from the survey instrument. To avoid compounding variables, results from questions that could be influenced by firm size were not used in the non-response and regional bias analysis.

representative of 87 percent of the Idaho harvest volume and 55 percent of the Montana harvest volume in 2004. Actual 2004 harvest volume for Eastern Washington was not available for assessment.

Nearly 75 percent of responding firms' harvest volume originated from private and industrial lands, while 21.6 percent of the harvest volume came from publicly managed lands (**Figure 1**). Although harvest volumes on National Forest land have been on the decline since the early 1990s, private and industrial volumes have been relatively stable with increases in parts of the Inland Northwest region over the past few years (Keegan et al. 2006, 2005). On a volume basis, less than 11 percent of the 2004 harvest was reported to be clearcuts, while other regeneration harvests represented 51 percent of the harvest volume (**Table 1**). Ground-based harvesting systems accounted for 72.6 percent of the harvest volume followed by cable logging operations with 23.5 percent and helicopter yarding at 3.9 percent. Nearly three-quarters of the product was transported to landing areas by whole tree operations with the remainder in log length. When assessing the level of machine use in harvesting operations, over two-thirds of the 2004 annual harvest volume was implemented by mechanized limbing and bucking technology (**Table 1**). This result is consistent with the harvesting systems used in the region: cable and helicopter logging operations that represent 27.4 percent in the region mainly use a chainsaw for felling and processing trees at the stump.

Table 1. – Operational characteristics based on the 2004 timber harvest for the Inland Northwest.

Characteristics	Number of responses	2004 harvest (mbf)	Percent of total harvest surveyed
State (n = 327)			
Idaho	185	1,075,524 ^a	68.0
Montana	100	387,768 ^a	24.0
Washington	42	122,855 ^a	8.0
Harvest type (n = 597) ^b			
Clearcut	118	162,961	10.6
Thinning	250	586,616	38.0
Other regeneration cuts (seed tree, shelterwood, etc)	229	792,377	51.4
Stump-to-landing product (n = 497) ^b			
Whole tree	305	1,132,450	74.0
Log length	192	397,557	26.0
Log transportation type (n = 417) ^b			
Skidding	285	996,809	62.9
Skyline	70	295,772	18.7
CTL forwarding	21	154,648	9.7
Groundlead	37	75,775	4.8
Helicopter	4	61,819	3.9
Manual operations (n = 801) ^b			
Felling	280	651,566	45.3
Limbing	255	397,056	27.9
Bucking	266	412,130	29.2
Mechanized operations (n = 474) ^b			
Felling	141	787,491	54.7
Limbing	176	1,024,926	72.1
Bucking	157	999,586	70.8

^a Conversion factors:

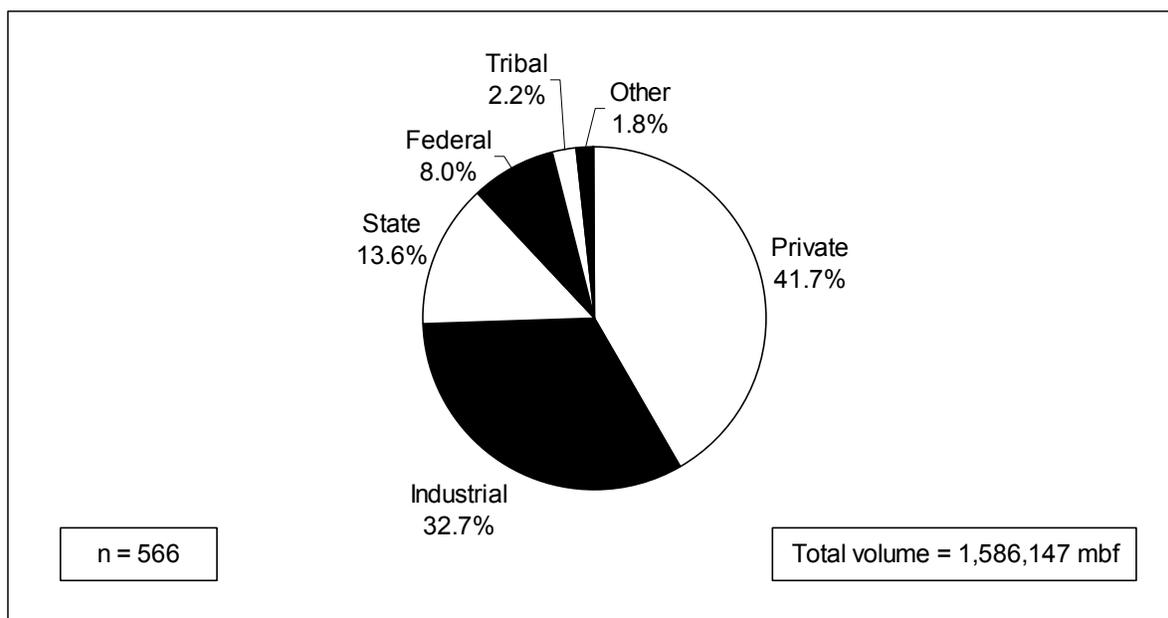
- Tons to mbf, $((\text{tons} \times 2000) / \text{wood density } 57 \text{ lbs per ft}^3) \times 4.77 \text{ bf per ft}^3 / 1000$

- Lineal ft. to mbf, $(((((\text{Lin. ft.} / 1250) \times 26) \times 2000) / \text{wood density } 43 \text{ lbs per ft}^3) \times 4.77 \text{ bf per ft}^3) / 1000$

^b Respondents could give multiple responses, thus, (n) may exceed the total number of surveys that were returned.

Conversion sources: Petaisto (2002); Spelter (2002); Idaho Department of Lands (2005)

Figure 1. – The 2004 timber harvest volume by land ownership for the Inland Northwest Region.



Contract logging respondents averaged 51 years of age and had been in the harvesting business for an average of 23 years. Of the personnel employed by logging firms, 58 percent were found to be 40 years or greater in age. The sawmill industry in the Inland Northwest is concerned that there is an aging workforce among contracting firms that may someday limit their supply of raw material. However, this concern is not limited to the forest products industry. Carroll and Taeuber (2004), reported that from 1992 to 2002, an increasing percentage of Idaho's workforce was 45 years and older. The report also indicated that the proportion of individuals 65 years and older who continue working has also increased slightly. Trends regarding an aging contract logging sector may not be answered by the results of this study; yet, the age characteristics provide a baseline for future studies where trends can be identified. Nearly 90 percent of the

responding contractors were found to be high school graduates; in addition, 44 percent had also received higher education such as technical training and college course work.

The harvesting firms within the region surveyed vary in their operating systems (i.e., ground-based, cable, helicopter) and in size (i.e., annual harvest volume). In fact, surveyed firms ranged from 10 to 81,538 mbf for their total 2004 harvest volume. Business characteristics and constraints often vary according to firm size. Luppold (1998) found that barriers to increasing production, such as workers' compensation, taxes, and regulations, impacted businesses differently depending on firm size. Recognizing this, firms were classified by their annual production to assess characteristic and constraints based on firm size: small (0 to 1.00 mmbf), medium (1.01 to 5.00 mmbf), large (5.01 to 10.00 mmbf), and very large (≥ 10.01 mmbf).

Survey results indicate that the contract logging industry in the Inland Northwest is dominated by small and medium sized harvesting firms, representing 74 percent of the responding firms in this study. Despite the large number of small and medium sized firms located in the Inland Northwest, they produce only 23.7 percent of the annual harvest on a volume basis (**Table 2**). Although very large firms only accounted for 10.1 percent of the total firms surveyed, they produced 53.0 percent of the annual harvest volume. This firm size-harvest volume relationship has been observed in other past studies (Powers 2004; Rickenbach et al. 2005). **Table 3** summarizes the production characteristics by firm size classification for 2004. Aggregate results derived from median values show that logging contractors

employed a total of four workers, had one three-worker crew, and had a monthly production rate of 539 mbf in 2004.

As one might expect, capital investment in operations varied by firm size. The categorical median values for small and medium firms were identical at \$100,000 to \$500,000, \$1 to \$1.5 million for large firms, and greater than \$1.5 million for very large firms. Small firms reported having two to four months of scheduled work, while medium, large, and very large firms reported having four to 16 months of scheduled work (based on median logarithmic response categories).

Table 2. – Firm size classification and characteristics for the Inland Northwest for 2004.

Firm Size^a	Number of Firms	Percentage of Firms	Months of Harvesting^b	Volume Harvested (mbf)	Percent of Total Volume Harvested
Small	118	36.1	7	54,221	3.5
Medium	124	37.9	9.5	320,942	20.2
Large	52	15.9	10	369,551	23.3
Very Large	33	10.1	10	841,433	53.0
Overall	327	100.0	9	1,586,147	100.0

^a Small (0 to 1.00 mmbf); Medium (1.01 to 5.00 mmbf); Large (5.01 to 10.00 mmbf); and Very large (≥ 10.01 mmbf)

^b Median values

Table 3. – Production by firm classification for the Inland Northwest for 2004.

Firm Size^a	Number of Employees^b	Number of Logging Crews^b	Number of Employees per Crew^b	Median Monthly Production Rate (mbf)^b
Small	1	1	2	66
Medium	5	1	3	272
Large	9	2	4	711
Very Large	21	3	5	2,550
Overall	4	1	3	539

^a Small (0 to 1.00 mmbf); Medium (1.01 to 5.00 mmbf); Large (5.01 to 10.00 mmbf); and Very large (≥ 10.01 mmbf)

^b Median value

Business Constraints

Contract logging business performance is highly influenced by several external factors. Respondents were asked to rate a number of potential constraints that adversely affected their business in 2004 utilizing a scale ranging from 1 to 6 (1 = not applicable, 2 = no limitation, 3 = some limitation, 4 = moderate limitation, 5 = strong limitation, 6 = critical limitation). The values presented in **Table 4** are the mean scores and rankings for each constraint evaluated based on firm size. The results indicate that timber sale availability was perceived by respondents to be the highest ranked business constraint. It is speculated that this ranking is partially attributable to the overall decline in the annual harvest since the late 1980s and early 1990s in the region, especially on publicly owned lands.

The second highest rated business constraint as reported by survey respondents was finding and keeping quality employees. This concern was expressed on several occasions while interviewing contractors prior to the survey. The major issue stated by contractors during these interviews was finding younger employees that were interested in the profession. If the forest products workforce is indeed aging, this issue maybe a contributing factor.

Stumpage cost and workman compensation shared the same mean business constraint value, representing the third/fourth ranked constraints. Equipment availability and credit availability ranked sixth and seventh, respectively, as perceived business constraints; however, the results in **Table 4** suggests that small and medium sized businesses may have more difficulty attaining credit compared to larger firms.

Table 4. – Constraints adversely affecting contractors in 2004.

Firm Size ^a	Workman Compensation	Quality Employees	Timber		Credit Availability	Equipment Availability	Equipment Breakdown
			Sale Availability	Stumpage Costs			
Small	3.52	3.64	4.26	3.67	2.80	2.56	2.97
(ranking)	4	3	1	2	6	7	5
Medium	3.84	3.77	4.28	3.82	2.84	2.71	3.25
(ranking)	2	4	1	3	6	7	5
Large	3.68	3.81	4.02	3.61	2.29	2.72	3.11
(ranking)	3	2	1	4	7	6	5
Very_Large	3.43	3.43	4.07	3.48	2.24	2.77	3.13
(ranking)	3,4	3,4	1	2	7	6	5
All firms	3.68	3.73	4.18	3.68	2.64	2.67	3.11
(ranking)	3,4	2	1	3,4	7	6	5

^a Small (0 to 1.00 mmbf); Medium (1.01 to 5.00 mmbf); Large (5.01 to 10.00 mmbf); and Very large (≥ 10.01 mmbf)

Business Characteristics

Survey participants were asked to indicate, via a categorical response item, their current total months of scheduled future contract logging work. This question was followed by two Likert-like scale questions. The first of these questions asked respondents to rate their level of innovativeness on a scale from 1 to 5 (1 defined by never investing in the newest technology available and 5 defined by always investing in the newest technology available). The second question was used to rate their level of financial risk aversion on scale from 1 to 5 (1 indicating that they never assume risk and 5 indicating that they readily assume risk). Using Multivariate Analysis of Variance (MANOVA) and Scheffe's post hoc test at an alpha level of 0.05, a statistically significant relationship was found whereby an increased respondent perception of innovativeness was positively correlated to the level of scheduled work. A statistically significant Pearson's bivariate correlation (0.199) indicated that logging contractors were more likely to invest in newer technology as their level of scheduled work increased. Although no statistically significant relationship was found between a firm's level of scheduled work and risk aversion,

firms with increasing levels of innovativeness were found to be more willing to accept financial risk (Pearson's bivariate correlation of 0.465).

Contract logging firms were prompted to give a breakdown of their 2004 harvest volume by percentage given the following sale size categories: less than 100 mbf, 100 mbf to 1 mmbf, 1 mmbf plus to 2 mmbf, and more than 2 mmbf. A follow-up question embedded later in the survey asked respondents to select the sale size that was most efficient given their current harvesting system based on the same categorical volumes. A Chi-square analysis (alpha level of 0.5) indicated firms that checked the < 100 mbf and the 100 mbf to 1 mmbf categories for most efficient sale sizes were predominantly harvesting tracts well suited for their operations. However, firms that claimed to be most efficient on sales from 1 mmbf plus to 2 mmbf were only marginally significant (p-value = 0.084), suggesting they were harvesting some tracts that were inefficient for their operational capacity. Firms most efficient on sales > 2 mmbf showed no statistical significance (p-value = 0.854), indicating that they often harvest tracts that are too small for their operations, thus running capacity-inefficient operations.

During the interviewing process, one of the contract loggers owning a small-sized operation suggested that firms that primarily contract out to a specific mill were more likely to have a higher degree of flexibility within their harvesting contracts relative to firms that do little to no contract work for a specific mill. Two questions were asked in the survey to investigate this owner's hypothesis. The first question asked contractors to provide the percentage of their 2004 harvest volume that was contract work for a specific mill (a categorical breakdown was provided). The second

question requested that survey participants indicate the degree of flexibility (0% to 100%) existed in their contracts with specific mills, based on three attributes: environmental, financial (i.e., \$/mbf), and scheduling (i.e., contract deadlines). A Chi-square analysis was then implemented to determine if flexibility within contracts based on the individual attributes were related to the amount of work a contracting firm does for a specific mill. The Chi-square analysis showed no statistically significant difference at the 0.05 alpha level for the environmental and financial attributes; however, statistical significance (p -value = 0.032) suggests an association between scheduling flexibility and the amount of work a contractor does for a specific mill. A Pearson's bivariate correlation (-0.272) indicated a negative correlation, suggesting that contractors that harvest a higher percentage of their annual volume for a specific mill are less likely to have scheduling flexibility relative to firms that do little to no work for a specific mill, a relationship that is opposite of what was hypothesized.

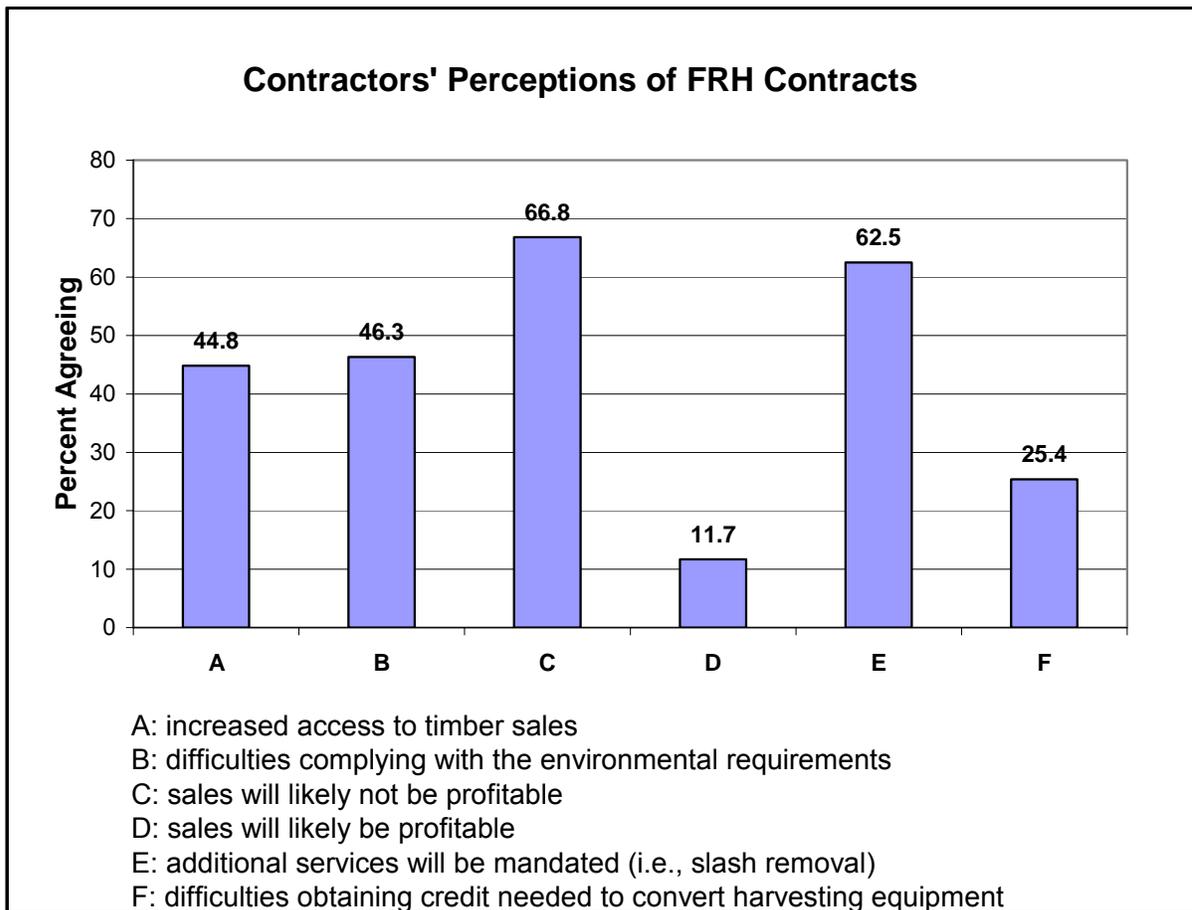
Fuel Reduction Harvesting Sales

The Forest Restoration Act was introduced in 2003 to help reduce the risk of catastrophic wildfires and to streamline the complexities of environmental analyses on federally managed lands for forest fuel reduction sales (The White House 2003). As part of this study, contract logging firms were asked a series of questions focusing on fuel reduction sales that could potentially provide many new timber sale opportunities for bid. Although contract loggers rated timber sale availability as their highest perceived business constraint that adversely affected their business in 2004,

only 62 percent of contractors reported that they were considering participating in these fuel reduction sales. Of the contract logging firms that responded to this question, two-thirds indicated that the minimum sale volume that they would bid on would be between 100 mbf and 1 mmbf, while the remaining respondents indicated that they would bid on harvest sales with lesser volume.

Contract logging firms were provided a list of six issues related to contracts involving fuel reduction harvesting operations on federal forest land and were asked to check the box next to any one of these issues that they perceived existed in these contracts. The highlighted results indicated that two-thirds of the respondents believed that these federal harvest sales would not be profitable, while 11.7 percent of respondents believed the sales would be profitable. In addition, 62.5 percent of responding contract logging firms believed that there would be additional services mandated (i.e., slash removal) in these federal timber sales that would increase overall operational costs **(Figure 2)**.

Figure 2. – Contractors' perception of fuel reduction harvest contracts.



Fifty-three contractors responded to an open-ended qualitative question asking for “other issues and concerns that you perceive exist in contracts involving fuel reduction harvesting operations on federal lands” (**Table 5**). US Forest Service politics was the most frequent concern reported by contract logging respondents, followed by difficulties in fulfilling contract requirements, marketability of product, and whether there would be enough volume allocated by the US Forest Service to convert to a small log harvesting operation. Other issues mentioned by responding

contractors included lawsuits ceasing operations (9 percent) and profitability uncertainty of fuel reduction sales (9 percent).

Table 5. – Additional concerns of fuel reduction sales and contracts on “US Forest Service lands.

Issues and Concerns	Percent of Respondents^a (n = 53)
US Forest Service politics	32
Difficulties fulfilling contract requirements	25
Marketability of product	15
Enough work to convert to a small log operation	13
Lawsuits ceasing operations	9
Profitability of sales	9
Other ^b	38

^a Percentages total exceed 100 due to multiple responses by contractors.

^b Other includes: bidding competition among contracting firms, bidding competition with mills, bonding issues, sale size, insurance cost for fuels jobs, and vandalism.

CONCLUSIONS

This study profiled the current status and conditions of the contract logging sector within the Inland Northwest by assessing operational characteristics, demographics, business constraints, and contractors' perceptions of fuel reduction harvesting sales based on respondents 2004 harvest information. The study's 349 responding contractors harvested more than 1,586 mmbf in 2004: 1,075 mmbf in Idaho, 0.388 mmbf in Montana, and 0.123 mmbf in Eastern Washington. Nearly 75 percent of this volume was harvested from private and industrial lands, while 21.6 percent of the harvest volume originated from publicly managed lands.

Contractors averaged 51 years of age and had been in the harvesting business for an average of 23 years. Of the personnel employed by logging firms, 58 percent were found to be 40 years or greater in age. It is suggested that future research could place greater emphasis in assessing the aging workforce and the associated policy implications within the contract logging sector.

Responding firms ranked timber sale availability as their highest perceived business constraint for the 2004 harvest year. However, only 62 percent of the contract logging firms surveyed were considering participating in fuel reduction harvesting sales. One would tend to believe that this percentage would be much higher since these sales could potentially open up harvestable volumes on federal lands that have recently been on the decline. A closer examination at the results indicates that contractors remain very skeptical of these contracts and the associated sales. Two-thirds of respondents believed that these sales would not be profitable, while 62.5 percent believed that there would be additional services

mandated (i.e., slash removal) that would consequently increase overall operational costs. Other concerns stated by contractors regarding fuel reduction sale contracts included the bureaucratic nature of the US Forest Service, difficulties fulfilling contract requirements, and the marketability of the product to be harvested.

The results of this study suggest that small and medium sized firms predominantly harvest tracts well suited for their operations, while large firms harvest some tracts that are inefficient given their operational capacities (i.e., tracts are too small). The information provided by contract logging firms during interviews suggest that because of increased competition on sales, firms are bidding on sales that they would not normally harvest, but have done so in order to generate appropriate cash flow to service debt payments and remain in business.

Future survey research similar to this study is necessary to track the changing characteristics (i.e., demographics, operational characteristics, and business constraints) of the logging contract business of the Inland Northwest. A separate in-depth study focusing solely on US Forest Service fuel reduction harvesting contracts and sales would provide federal land managers information needed to increase the number of contractors bidding on these sales.

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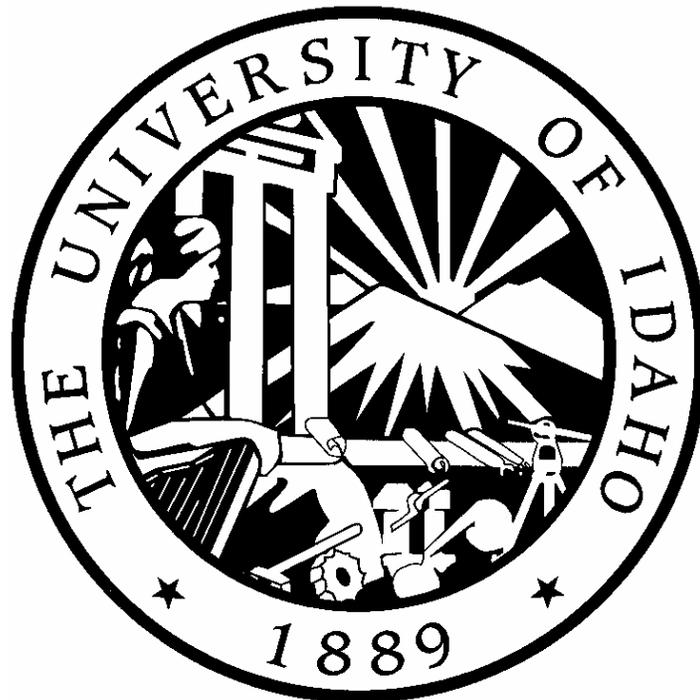
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APPENDIX I – 2005 LOGGING CONTRACTORS QUESTIONNAIRE

2005 Montana Logging Contractors Questionnaire



**University of Idaho
Department of Forest Products**



The Department of Forest Products at the University of Idaho is interested in characterizing the logging industry of Montana. We are interested in assessing the current conditions of this industry by focusing on employment characteristics, capital assets, business constraints, and the future of the industry. We are also interested in your opinions and perceptions on current issues.

All information provided by respondents will remain strictly confidential and will not be identifiable in any resulting documents.

As a token of our appreciation, your name will be entered into a drawing for a STIHL chainsaw provided you complete and return this self-addressed, postage-paid questionnaire.

Please complete the questionnaire by placing a check in the box next to the response that best matches your answer or by writing your answer in the space provided.

Do you own or manage an independent logging business?

____ YES → Please continue to question #1.

____ NO → Please stop now and return this questionnaire.

*If No, what is your occupation? _____

1. Where does most of your harvesting take place, based on volume?
(Check One)

- Montana
 Out of State

2. Please estimate the percentage volume of your 2004 harvest that originated from each land ownership group. Total = 100%

Private lands____%, Industrial lands____%, State____%
Federal____%, Tribal lands____%

3. Please estimate your 2004 harvest.

Sawtimber: _____ MBF and/or _____ Tons and/or _____
Cubic feet

Pulpwood: _____ Tons

Tonwood: _____ Tons (small diameter logs, stud material)

Cedar product: _____ Tons (shake & rail material)

Poles: _____ Lineal feet

4. Estimate the type of harvesting operations that you performed in 2004.
Total = 100%

_____ % Stand regeneration cut (seed tree, shelterwood, etc.)

_____ % Thinning

_____ % Clearcut

5. Please check one box for each potential constraint listed below that adversely affected your business in 2004.

Potential Constraints	Not Applicable	No Limitation	Some Limitation	Moderate Limitation	Strong Limitation	Critical Limitation
Workman Compensation						
Quality Employees						
Credit Availability						
Stumpage Cost						
Equipment Available						
Timber Sale Availability						
Seasonality Issues						
Equipment Breakdown						

6. Please estimate the percentage of your primary log transportation (stump-to-landing), by system based on your 2004 harvest volume.
Total = 100%

Skyline _____ % Groundlead _____ % Skidding _____ %
CTL Forwarding _____ % Helicopter _____ %

7. Please estimate the percentage of the following operations, manual versus mechanized based on your 2004 harvest volume. Total = 100%

Harvesting Operation	Manual	Mechanized	Contracted out
Felling	%	%	%
Limbing	%	%	%
Bucking	%	%	%

8. What percentage of your 2004 harvest volume fell under the following categories when skidded from stump to landing? Total = 100%

Whole tree _____% Log length _____%

9. In 2004, what percentage of your harvesting jobs fell under each of the volume categories? Total = 100%

_____ % <100 mbf

_____ % 100+ mbf – 1mmbf

_____ % 1+ mmbf – 2 mmbf

_____ % >2 mmbf

10. Do you perform any of your own road construction operations?

_____ Yes _____ No

11. Do you contract out the trucking of your logs?

_____ Yes _____ No

12. How many logging crews did your company manage in 2004? _____

13. Average workers per crew? _____

14. How many people did your company employ in each of these primary job categories in 2004?

_____ woods workers _____ truck drivers _____ office workers

_____ foreman/supervisors _____ timber cruisers _____ owners

_____ mechanics _____ other (specify) _____

Total number of employees in 2004 _____

How many of the total employees are part-time workers (excluding seasonal layoffs)? _____

15. How many of your employees in 2004 fell under each of the age categories?

___ under 18 ___ 18-29 ___ 30-39 ___ 40-49 ___ 50-59 ___ 60+

16. In 2004 how many months did you harvest? _____ months

17. What is your age?

_____ years

18. How many years has your company been in the logging business?

_____ years

19. Describe your level of formal education. (Check One)

_____ some high school _____ high school graduate _____ trade school

_____ some college _____ college graduate

20. Please estimate the total capital investment of your operation.
(excluding building and land assets)

- < \$99,999
- \$100,000 - \$499,999
- \$500,000 - \$999,999
- \$1,000,000 - \$1,499,999
- > \$1,500,000

21. Currently, how many months of scheduled work do you have?

___ 0 months ___ 0-1 months ___ 1-2 months ___ 2-4 months
___ 4-16months ___ 16+

22. Please rate your level of innovativeness, 1 indicating that you never invest in the newest technology available and 5 indicating that you always invest in the newest technology available. (Circle One)

<u>Never</u>		<u>Frequently</u>		<u>Always</u>
1	2	3	4	5

23. Please rate your level of financial risk aversion, 1 indicating you never assume risk and 5 indicating you readily assume risk. (Circle One)

<u>Never</u>		<u>Frequently</u>		<u>Readily</u>
1	2	3	4	5

24. What percentage of your 2004 harvest volume was contract work for a mill? (Check One)

___ 0% ___ 1-25% ___ 26-50% ___ 51-75% ___ over 75%

*If you checked 0% for question 24 please skip to question 26.

25. How much flexibility is there within your contracts with mills, for each variable please give a percentage of your contracts that fell under either fixed or flexible in 2004?

Variables	Fixed Contracts	Flexible Contracts
Environmental Issues	%	%
Financial (ex. \$/MBF)	%	%
Scheduling (ex. contract life)	%	%

26. Are you considering participating in fuel reduction harvesting operations that will soon be available on federal forest land?

_____ Yes _____ No

27. What is minimum sale volume that you would bid on for a fuel reduction harvest?
(Check One)

- <100 mbf
 100+ mbf – 1 mmbf
 1+ mmbf – 2 mmbf
 >2 mmbf

28. What issues do you perceive exist in contracts involving fuel reduction harvesting operations on federal forest land? Check all that apply.

- increased access to timber sales
 difficulties complying with the environmental requirements
 the sales will likely be profitable
 the sales will likely not be profitable
 there will be additional services that will be mandated (ex. slash removal)
 difficulties obtaining credit needed to convert to new harvesting equipment
 other issues _____
-

29. Please select the sale size that is most efficient for your harvesting system.
(Check One)

- <100 mbf
- 100+ mbf – 1 mmbf
- 1+ mmbf – 2 mmbf
- >2 mmbf

30. Would you like a copy of the results of this questionnaire as soon as they are available?

____ Yes ____ No

*If Yes, please provide your contact information below:

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Thank you for completing this questionnaire. Please tape or staple close your questionnaire and return it to the University of Idaho as soon as convenient.

Thanks again for your participation in this study.