



Station Note

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Understanding Firewood Use In Idaho

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The typical firewood collector on one of the ten national forests in Idaho is a 44-year-old male who owns a single family home in a city of 1 to 5 thousand population. He is most likely to have a professional occupation and a family income slightly over \$21,000 a year. He drives a half ton truck an average of 50 miles one way each trip to cut almost 6 cords of wood on a summer or fall Saturday. Although many forest managers view firewood collecting activities as a form of recreation, the collector says that the primary reason he is collecting is to save money. According to the firewood collecting and wood heating behaviors examined in this 1981 mail survey, the actual monetary savings may be quite small in many cases.

OBJECTIVES

Firewood collecting is rapidly increasing on our national forests (N.F.), yet little is known about this historically important and recently renewed use of our forest resources. The three objectives of this study are: 1)

to construct a profile of this forest user; 2) to better understand the firewood collecting activities on national forests; and 3) to provide information for foresters who are responsible for managing this forest resource. This report, largely descriptive, is primarily for the survey respondents, and, therefore, mainly addresses objectives one and two. A complete statistical analysis will be published at a later date.

METHODS

According to USDA Forest Service supervisor's offices, 80,902 personal use firewood permits were given out during 1980 in Idaho. In April 1981, a randomly selected sample of 1096 individuals from this population was sent questionnaires. The sample was stratified by forest to assure statewide representation. In most cases, one ranger district from each of the forests was randomly selected. At least 2.5 percent of the permit holders on the ranger districts which were sampled was selected by using a random start and selecting every yth name. In order to have at least 40 names per subpopulation, larger percentages were taken on several districts.

Of the 1096 questionnaires which were mailed, 53 were not delivered, leaving 1043 eligible respondents. Responses were received from 858 (82%) people. Six (0.6%) reported that although they had gotten a permit,

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they had never collected any firewood; 22 others were returned blank, were returned too late, or were not able to be coded. The results reported here are based on 830 (80%) usable questionnaires. Response rates by districts ranged from 70 percent to 89 percent.

Dillman's (1978) Total Design Method (TDM) was followed to develop the questionnaire and to carry out the survey. This method is based on social exchange theory and careful administration of the survey instrument. Two versions of the questionnaire were developed to expand the information available without unduly taxing an individual respondent. Thirty-nine questions were on every questionnaire; 31 additional questions were on the version A questionnaire, and 28 additional ones were on version B. Response rates for the two versions were 79.6 percent and 80.7 percent, respectively.

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) developed by Nie et al. (1975) and updated by Hull and Nie (1981).

Although the response rate was very high, 28 of the 185 nonrespondents were randomly selected and reached by telephone. Ten questions were asked, and the results were compared with the responses of those who mailed back the questionnaire. Three (11%) did not receive the questionnaire, three others could not complete it, and 5 (18%) received it but did not cut any wood on a national forest. For those nonrespondents who did cut wood, there was no statistically significant difference ($\alpha = .05$) between them and respondents on the following variables measured:



Figure 1. Areas of Idaho used for selected variables. The identified towns are the location of national forest supervisors' offices.

sex, education, current residence, number of cords cut, use of wood as a main heating source, and average one-way miles driven to obtain wood. The nonrespondents were younger than respondents and a higher proportion were in forest-related occupations. Thus, the demographic characteristics of nonrespondents may be slightly different, but it appears that the wood use and collecting behavior of nonrespondents is accurately reflected by respondents.

In the analysis, some variables were examined according to the geographic area of the state in which the respondent lived. The areas are delineated in Figure 1. Areas 1 and 2 include forests in Region 1 of the Forest Service. The others are in the Forest Service's Region 4.

RESULTS

Demographic Characteristics of Firewood Collectors

At the time of this writing the 1980 Census of the Population is not available. The preliminary Census reports state that the population of Idaho has increased over 32 percent in the last decade (U.S. Dept. Commerce 1980). Because of this sizeable increase, it is of little use to make comparisons between firewood collectors of 1980 and the general population of Idaho in 1970. The Bonneville Power Administration and the Pacific Northwest Utilities Conference Committee (1980) conducted the Pacific Northwest Residential Energy (PNRE) Survey between October 1979, and February 1980. Idaho firewood collectors will be compared to Idaho respondents in the residential energy survey on several variables, as this statewide survey of residential electric utilities' customers should be fairly representative of the general population of adult Idahoans.

The average age of firewood collectors in Idaho is 44.2 years with a range of 16-88 years. The age distribution is fairly even between 25 and 45 years with slightly over half of the respondents in this bracket. There is a slight drop, but still a fairly even distribution between 45 and 70 years (about 40%). The PNRE Survey reported a slightly larger percentage of respondents in the over 65 age group. In general, it appears that firewood collectors are fairly representative of the statewide adult population, except for a somewhat smaller proportion of senior citizens.

The most frequent category for 1980 household income of firewood collectors was \$25,000-49,999 (24.5%), although the arithmetic mean of the grouped data was \$21,198. Since the PNRE Survey reported 1978 household income, there are not sufficient data available at this time to say whether firewood collectors have an annual household income different from that of the general population. Occupational categories of firewood collectors are presented in Table 1.

Forty-nine percent of the respondents have some education beyond high school. The average number of years of education is 13.2 years. A higher proportion of

Table 1. Occupational categories of firewood collectors.

Category	Number of respondents	Relative frequency %
Professional (medical, teacher lawyer, engineer, managers)	175	21.5
Forest related	45	5.5
Clerical	24	2.9
Craftsman (carpenter, electrician, plumber)	101	12.3
Farmer/rancher	48	5.9
Laborer	66	8.0
Student	5	.6
Retired	122	14.9
Salesman	28	3.4
Factory/mill worker	33	4.0
Truck driver	33	4.0
Housewife	28	3.4
Other	111	13.6
No information	11	—
Total	830	100

firewood collectors than respondents in the PNRE Survey (24% vs. 20%) have at least a college degree.

The PNRE Survey reported 27 percent of the Idaho respondents living in rural areas (population 2500 or less). Among firewood collectors, 16 percent live on a ranch or farm, 19 percent in a town less than 1000 population, and 23 percent in an urban area of 1000 to 5000 population. This difference in rural vs. urban residence is not surprising, given the equipment and expertise necessary to collect firewood, the storage space needed, and proximity to forested areas.

The vast majority of questionnaires (93%) were completed by men. Although the questionnaire was addressed to the person who obtained the permit from the Forest Service, it is assumed that when it arrived, the household member who was primarily responsible for firewood collecting filled out the questionnaire. No questions were asked about the involvement of other household members in the firewood collecting activities.

Idaho firewood collectors are generally not new residents of the state. Twenty-eight percent have lived here all their lives. Both the mean and the median (the 50th percentile) are 30 years of residence. Twenty-three percent of the respondents have lived in Idaho less than 10 years.

The PNRE Survey reported 76 percent of the Idaho respondents lived in single family dwellings, 13 percent in mobile homes, and the remainder in multi-family dwellings. The percentages for firewood cutters were 81, 12, and 6,

respectively. As might be expected, more firewood collectors own their homes (90%) than PNRE Survey respondents (77%).

Collecting Behaviors and Preferences

Firewood collectors are willing to invest a considerable amount of time and money to obtain firewood available on national forests. In addition to purchasing wood-burning equipment, 85 percent of the respondents reported purchasing their chain saw primarily for firewood cutting. Two-fifths have a saw with a 16- or 18-inch bar and over one-fifth have a saw with a 20- or 22-inch bar. It is likely that over half of the firewood collectors invest at least \$250 in the purchase of a chain saw. The respondents were equally split between repairing their own saws and taking them to repair shops for maintenance.

Three-fourths of the respondents state that they spend one-half day or less cutting a cord of wood and another half day splitting and stacking the cord. Only 18 percent of the respondents are *willing* to walk more than 300 feet from their vehicle to collect firewood. At the same time, firewood decks or slash piles, which would be most likely to be near the road, are the least preferred form of firewood. Seventy-five percent of the respondents most prefer *standing dead* for their firewood, and 21 percent chose it as their *second most preferred*. The first and second preferences for *dead and down* were 20 percent and 68 percent, respectively. Two possible explanations are: collectors enjoy felling trees; or they believe the wood has a higher quality and is cleaner if they remove it from the woods themselves. These preferences need to be considered or investigated more thoroughly if forest managers are considering yarding firewood to the road and/or encouraging firewood collectors to restrict themselves to slash piles.

The preferred species of wood for residential heat varies with the forest where the respondent collects firewood and often reflects the most common species of wood available. Those who collect on the Boise N.F. listed Douglas-fir as the most preferred species. Western larch (tamarack) is the most preferred species on the Idaho Panhandle, Nezperce, Clearwater, and Payette national forests. The permit holders on the 5 other Idaho national forests listed lodgepole pine as the most preferred.

Considering that the reason to collect firewood having the highest relative importance is *to save money*, today's cost of gasoline, and the average miles per gallon for most trucks, one of the most surprising results of this survey is the distances driven to obtain firewood. Statewide the arithmetic mean¹ for the average number of miles driven, one way, to collect firewood is 50.5 miles. The median

¹This is the sum of all responses divided by the number of responses.

(50th percentile) is 44.6 miles. One-fourth of the respondents drive 70 miles or more, one way, on the average and also stated that the farthest they have driven is 90 miles or more, one way. The arithmetic means for responses to the questions, "What is the farthest you have driven, one way, to collect firewood?" and "How far are you willing to drive, one way, to collect firewood?" are almost equal: 68.5 miles and 67.5 miles. The medians are both 60 miles. Thus, the obvious conclusion is that on the average people are willing to drive as far as they have ever had to drive at this time.

The distances driven vary considerably among regions of the state. Those in northern Idaho (Areas 1 and 2) and in Area 4 drive less than 30 miles one way to obtain their wood, whereas those in the rest of the state drive considerably farther. The average one-way driving distance is statistically significantly different ($\alpha = .10$) between respondents who use wood as a main heat source (47.7 miles) and those who use it as a secondary source (53.5 miles). The average miles driven and the miles willing to drive for the various groups are shown in Table 2.

Nearly half of the respondents collect their wood in a half-ton truck and one third use a three-quarter-ton truck. One-ton and two-ton trucks are used by 7 and 8 percent, respectively. Thirty-six percent of the respondents use 4-wheel drive vehicles. Thirty-six percent also use a trailer. Although the range in the size of the trailer varies from a 500-pound capacity to over 10,000 pounds, 60 percent of the trailers have a capacity of one ton or less. Owners of three-quarter-ton trucks are more likely to use a trailer than are owners of other vehicles.

The average number of trips necessary to collect enough firewood for a heating season is 6. Thus, the average

Table 2. Average one-way miles driven to collect wood and miles willing to drive one way to collect wood by area and heat source.

	Average miles driven			Miles willing to drive		
	Mini- mum	Median ^a	Maxi- mum	Mini- mum	Median ^a	Maxi- mum
All respondents	3	44.6	200	10	59.7	350
Area 1	5	24.7	60	10	21.0	80
Area 2	5	24.6	100	10	37.5	110
Area 3	3	59.6	191	15	75.0	250
Area 4	7	22.5	120	10	26.0	120
Area 5	12	40.3	200	20	50.6	350
Area 6	4	50.1	120	18	60.4	150
Area 7	5	80.0	200	10	100.4	200
Wood is main heat source	3	40.0	150	10	59.4	200
Wood is second- ary heat source	3	49.6	200	10	59.7	350

^a The value of one-half of all responses are below the median and one-half are above it.

firewood collector on national forests in Idaho drives about 600 miles to obtain enough firewood to meet his heating needs. Using an average cost of operating a truck (including depreciation, maintenance, and fuel) of 30¢ per mile, the typical wood collector spends approximately \$180.00 to transport his wood from the forest to his home.

Motivation

The widespread use of wood heat in Idaho homes is a recent phenomenon. In 1970, only 2.7 percent of the homes in the Pacific Northwest were heated with wood (U.S. Dept. Energy 1980). The PNRE Survey (1980) reports that 45 percent of the Idaho respondents used wood as their main or secondary source of heating fuel in 1980. This recent change in the role of wood heat is also reflected in the results of this firewood survey. Over three-fourths of the respondents started using wood as a heat source in the last five years, and over 50 percent purchased their present wood-burning equipment in 1979 or 1980. Both the number of people who began using wood as a heat source and the number purchasing their present wood-burning equipment were greatest in 1979 and declined slightly in 1980.

There is much speculation by forest managers and others about the motivating factors underlying the recent large increased use of firewood. The most frequent hypothesis is that people are collecting firewood primarily as a form of family recreation and because it is convenient in Idaho. Many forest managers do not see it as an economical activity for most citizens. These beliefs are not supported by survey respondents.

The survey participants were asked to rate nine reasons for using wood to heat their homes and nine reasons for collecting their own firewood on a 6-point scale ranging from extremely important to not important. The relative importance of these reasons are exhibited in Figure 2.

Fifty-five percent of the respondents say that it is *extremely important* to save money in both cases: using wood heat and collecting their own firewood. Twenty-seven percent say it is *very important*. "To reduce my use of utility company fuels" is rated *extremely important* by 50 percent of the respondents. Since utility company rates have been steadily increasing in recent years, the desire to reduce the use of such fuels may be related to economic reasons. However, the desire to be energy self-sufficient may also be part of the high rating given this reason. The fact that self-sufficiency is rated second highest as a reason to collect their own firewood supports this interpretation. More discussion on the economics of firewood collecting will be presented later in this paper.

Enjoyment of wood collecting as recreation has the lowest relative rating as a reason to use wood heat, according to survey respondents. However, 50 percent of the respondents say the enjoyment of wood heat in their homes is *very important* or *extremely important*. Also, "to be in

the woods," "to be with my family," and "to get some exercise" are all moderately important reasons to collect firewood and are recreation-related motivations.

The motivations for using wood heat were also analyzed for persons stating that wood is their primary source of heat versus a secondary source and according to various areas of the state. The relative importance of the reasons changed very little when respondents were broken into these different groups. The top two reasons and the bottom one did not change for any group. The only difference between those using wood as a main heating source and those using it as a secondary source is that the relative importance of enjoying the use of wood heat is lower for those using wood as a main heating source.

The enjoyment of wood heat is also relatively less important to citizens in southeastern Idaho (Areas 6 and 7). It is more important to citizens in Areas 3 and 5 "to take advantage of firewood on public lands." The citizens in Areas 4 and 7 rate the reason "to help reduce America's consumption of oil and gas" as more important than respondents in other regions. The opportunity to use a convenient Idaho fuel source is relatively less important to Idahoans living in Area 4 than to other Idahoans.

Respondents were also asked to list other reasons that were important to them besides those mentioned on the questionnaire. Ten percent of the respondents did so. The reasons most frequently given were "to keep warm," "to use an alternative energy source" and "to clean up the forest."

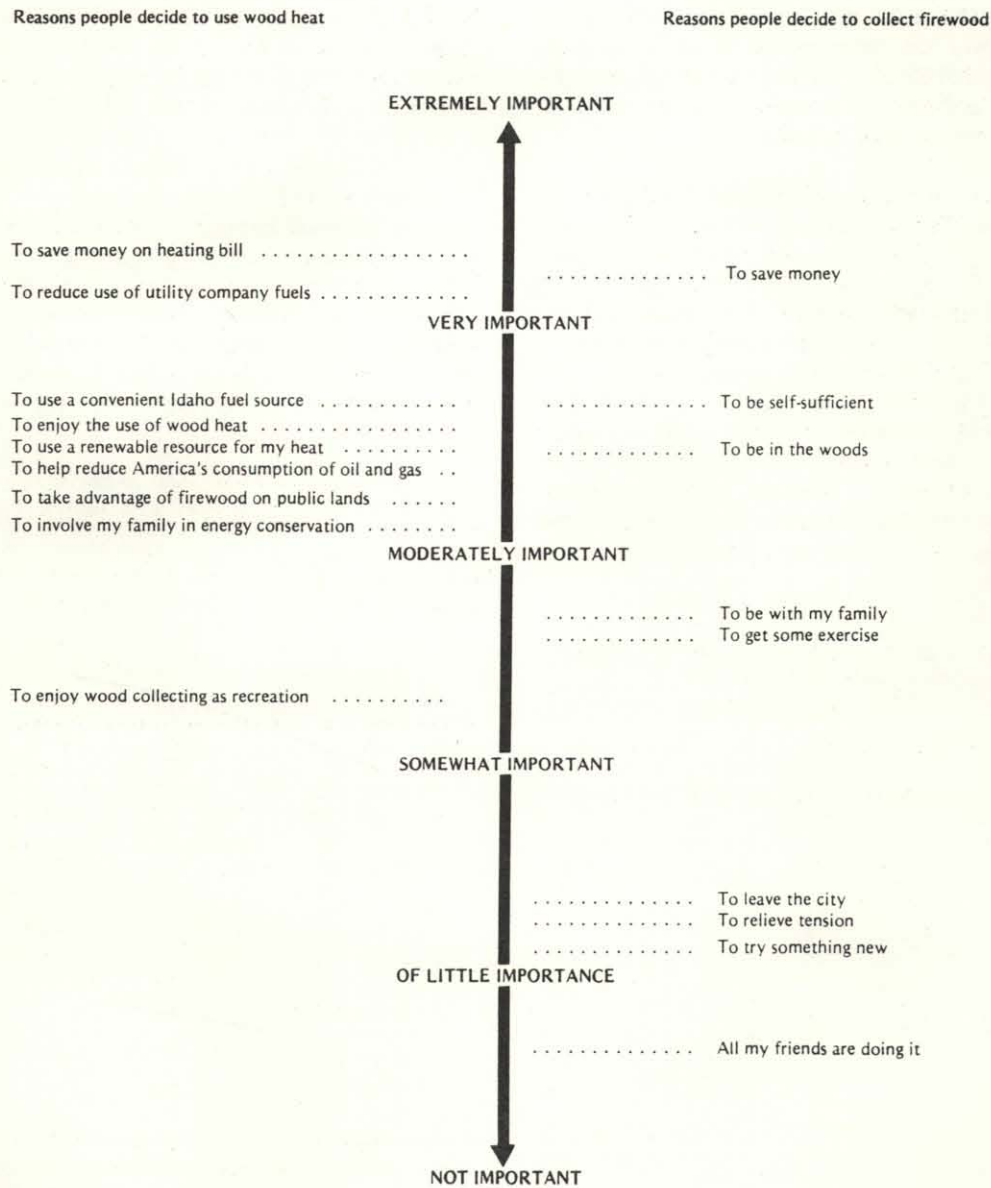


Figure 2. Relative importance of the various reasons people decide to use wood heat in their homes and collect their own firewood.

Amount of Wood Burned and Cut

The number of cords of wood burned in 1980 and the number of cords cut were reported by respondents. The arithmetic mean for the number of cords burned is 4.7, and 5.9 cords are cut. The medians are 4.0 and 5.0 cords, respectively (see Table 3). This 1+ cord difference between burning and cutting is consistent for most subgroups examined. The cords burned and cut were calculated for the various areas and for the two types of heat source. In general, given the climatic conditions, the differences among areas are as expected: respondents in Areas 1 and 6 burn the most wood, and those living in Areas 3, 5, and 7 burn the least. Overall, the best estimate of the total number of cords of firewood cut on national forests in Idaho in 1980 is 480,000 cords.

Although the dimensions of a cord were given on the questionnaire, some respondents may have overestimated the number of cords cut. An examination was done on the number of cords cut divided by the number of trips for each respondent and grouped according to size of vehicle used. The results are reported in Table 4.

Respondents were also asked about purchasing any of their firewood. Twenty percent reported doing so at some time during the past 3 years. The most frequent number of cords purchased was 1, and the median was 1.9 cords. The most frequent kind of wood purchased was pine, and the average price per cord ranged from \$47 in 1980 to \$42 in 1978. Twenty-five percent of those purchasing wood in 1980 paid \$60 or more. Nearly half (43%) of the respondents reported that the *most important* reason they might purchase wood in the future is a "decline in personal health." Other frequently given reasons (in order) were: less wood available in the forests; higher prices for oil, gas, or electricity; and having to drive further to firewood areas.

Table 3. Number of cords of wood burned in 1980 and number of cords of wood cut in 1980 by region and heat source.

	No. cords burned			No. cords cut		
	Minimum	Median	Maximum	Minimum	Median	Maximum
All respondents	0.3	4.0	20	0.4	5.0	40
Area 1	1.0	5.0	15	2.0	6.1	15
Area 2	0.3	4.4	10	1.0	6.0	30
Area 3	0.3	4.0	10	0.5	5.0	40
Area 4	0.5	4.0	12	0.5	5.0	40
Area 5	0.5	3.6	12	1.0	4.0	30
Area 6	0.3	5.0	20	0.4	6.0	20
Area 7	0.5	3.9	20	0.4	5.0	25
Wood is main heat source	0.3	5.0	20	0.5	6.0	30
Wood is secondary heat source	0.4	4.0	12	0.4	4.0	40

Table 4. Number of cords per trip according to type of vehicle used by firewood collectors.

	Number of cords per trip	
	Median	Most frequent
Half-ton truck, no trailer	0.75	0.5 & 1.0
Three-quarter-ton truck, no trailer	0.86	1.0
One-ton truck, no trailer	1.53	2.0
Two-ton truck, no trailer	2.47	1.7 & 2.5

Wood-Burning Equipment

The equipment used to burn wood is somewhat dependent upon the role of wood in a respondent's overall heating needs. Fifty-one percent of the firewood collectors consider wood as their main source of heat. The PNRE Survey reported that only 22 percent of those using wood consider it a main fuel source.

The wood-burning equipment used by respondents is presented in Table 5. A wood stove is much more common if wood is the main source of heat. However, a surprising number of such homes use a fireplace, and 7 percent have only a fireplace. Among those who consider wood heat a secondary source, 39 percent have only a fireplace. Slightly more Idaho residents use wood stoves than reported by Dalton et al. (1977) in a study of fuelwood use in New Hampshire (62% vs 57%).

Table 5. Wood-burning equipment and other sources of heat for all respondents, those using wood as a main heat source, and those using wood heat as a secondary heat source.

	All respondents (%)	Wood is main (%)	Wood is secondary (%)
Wood-burning equipment^a			
Fireplace	46	32	58
Wood stove	62	80	46
Wood furnace	5	6	2
Fireplace insert	12	11	13
Other sources of heat			
Electricity	53	50	53
Natural gas	21	17	26
Fuel oil	17	19	14
Coal	3	1	5
Propane or LP gas	3	5	2
Sunlight ^b	—	—	—
Geothermal ^b	—	—	—
No other source	4	8	0

^a Percentages sum to more than 100 percent because many respondents have 2 or more types of wood-burning equipment.

^b Less than 1 percent of respondents.

Table 5 also shows the alternate sources of heat available in respondents' homes. More firewood collectors have electricity available and fewer have natural gas than reported in the PNRE Survey (40% and 28%, respectively).

Sixty percent of respondents' fireplaces have glass doors, and 57 percent have a heat exchanger. The PNRE Survey reported 44 percent and 28 percent respectively. Three-fourths of the stoves are considered airtight by the respondent. Only 18 percent of the respondents are considering an equipment change before the next heating season. Another stove is being considered by over half of this group of respondents and glass doors and/or a heat exchanger by nearly one-third.

A larger percentage of those using wood as a main source of heat live on a ranch or farm or in a village of less than 1000 population (40% vs. 30% for secondary users) and are in forest-related professions (8% vs. 3%). Those using it as a main heat source are also slightly younger (42.7 yrs. vs. 45.2 yrs.) and have a lower average income (\$19,500 vs. \$23,000).

Information Needs

There are many opportunities to learn more about the use of firewood for home heating. The USDA Forest Service and other forest managers often provide such information, both in forest offices and through other communication channels. The Cooperative Extension Service is also a good source for such information (see Appendix).

Over 60 percent of the survey respondents stated that they would like to have more information on cleaning their chimneys, energy conservation in their home, and where they should cut firewood. Information on the kind of firewood to cut and firewood species identification is needed by nearly half of the respondents. Thirty-eight to forty-four percent of the respondents would like information on felling trees, chain saw safety, use, maintenance and repair, installing a wood stove or fireplace insert and types of wood burning equipment. Half of the respondents would most prefer to receive firewood information via brochures and one-fourth prefer the newspaper.

Fees

Statewide, 57 percent of the respondents are willing to pay a permit fee to cut firewood. Fifty-two percent prefer that the fee be charged per cord, and 48 percent prefer it be a one-time charge. Only 30 percent of those responding are willing to pay a fee to be used to yard wood to the roadside or for road oiling and maintenance. There is considerable variation in these responses when analyzed by area of the state and by forest district where the permit was obtained. There were also a number of comments, both pro and con, written on the questionnaires about fees. A more complete analysis of the fee questions and other forest management-related issues is being prepared for another publication.

Safety Factors

One out of six respondents reported having had a chimney fire. The chimney cleaning behaviors of this group are not obviously different from those who did not have a fire: 38 percent of all respondents state that they clean the chimney "as needed"; one-fourth do so once a season; 17 percent have never cleaned the chimney; and the other respondents do so every month or every other month. When the data were analyzed according to those who had had a fire and those who had not, none of the above responses changed by more than one percent. In both cases, 14 percent of the respondents hire a chimney sweep and pay an average of \$40 for this service. The respondents who clean their own chimney spend about one hour on this task and their investment in chimney cleaning equipment averages \$36. A more in-depth investigation of the occurrence of chimney fires is necessary to establish or refute any relationship between fire occurrence and type of equipment used or species of wood burned or other variables.

Chain saw use was the other safety related topic investigated. Although only 3 percent of the respondents have been injured seriously enough to require a doctor's care and none required hospitalization, few use the standard protective equipment available to loggers. Two-thirds of the respondents *never* wear hard hats or ear plugs, 93 percent *never* wear leg chaps, and 42 percent *never* wear safety glasses. Most respondents wear long-sleeved shirts and gloves. However, this is often for warmth rather than safety.

Vandalism

Several private and public forest managers are concerned that increased vandalism and other forest damage is occurring as a result of firewood gathering. Survey participants were asked to indicate how often they had observed or seen evidence of a number of improper activities when they had been collecting firewood.

Twenty percent of the respondents reported seeing other firewood collectors *frequently* driving off roadways and leaving high stumps. Over half of the respondents reported observing the following activities from *once* to *occasionally*: cutting live trees, driving on very wet roads, and leaving a mess on the road. Improper felling of trees, such that equipment, roads or culverts were damaged, was *never* observed by 73 percent of the respondents. From 82 to 92 percent of the respondents stated they had *never* seen evidence of other firewood collectors driving past or removing road barricades (82%), taking logs from logging operation log decks (87%), or using logging equipment which was left in the woods (92%).

Although these data can provide a benchmark of citizens' reported observations of such activities in 1980, additional research and analyses of both private and public forest records are required to determine if known damage and real dollar losses have been adversely affected by increased firewood collecting in Idaho's forests.

CONCLUSION

Although an examination of the economics of firewood collecting was not a specific objective of this study, the results of the study raise many economics-related questions. The most important reason survey respondents gave for their engaging in firewood activities was the desire to save money. Slightly over half of the respondents believe they are saving \$300 or more a year on their heating bill by burning wood. However, if we use the figures and assumptions suggested by Hanley (1981) and the average round trip miles driven by respondents, the average cost of collecting and burning a cord of wood is \$59.90 (\$11.67/cord for purchasing and self-maintenance of the wood-burning unit; \$7.83/cord for chain saw costs; and \$40.40/cord to drive a half ton truck 101 miles, round trip). Since the average collector cuts 5.9 cords, his estimated cost of collecting is \$353.41 per year. More research and analysis is needed, including obtaining utility rates, before the break-even values of the wood and the maximum allowable transportation cost can be determined.

Firewood availability and its management on the national forests of Idaho is a serious concern of many Idahoans. This is evidenced not only by the results of and interest in this study, but also by the presence of firewood as one of the current forest planning issues on many of the forests. It is hoped that this study will serve as a useful reference both now and in the future for understanding firewood use in Idaho in 1980.

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APPENDIX

Twenty small publications are available on a variety of firewood related subjects as part of the University of Idaho Cooperative Extension Service "Wood-as-a-Fuel" Program. These publications can be obtained from your local county agent or from the Department of Agricultural Information, Agricultural Science Building, Room 10, University of Idaho, Moscow, Idaho 83843, for a cost of 5 to 25 cents. The entire packet is \$2.50. The order number, title and cost of each publication are listed below:

<i>Number</i>	<i>Title</i>	<i>Cost</i>
CIS 472	Firewood Selection	5¢
CIS 473	Firewood Gathering Permits	10¢
CIS 474	Wood Storage	5¢
CIS 479	Chimneys	10¢
CIS 480	The Creosote Problem	10¢
CIS 481	Smoke Problems and Their Cures	5¢
CIS 482	Wood-Burning Furnaces	5¢
CIS 485	Wood Stove Installation and Safety	10¢
CIS 486	Building Your Own Wood Stove	10¢
CIS 487	Fireplace Safety	5¢
CIS 493	Fireplaces	10¢
CIS 494	Fireplace Adaptations and Efficiency Boosters	10¢
CIS 495	Building An Easy Starting Fire	5¢
CIS 511	The Beauty of Warming with Wood	10¢
CIS 520	Installation of Wood Stoves in Fireplaces	10¢
CIS 604	Firewood Economics	10¢
M.S. 53	Wood-Burning Stoves	25¢
WRAES 65	Wood Stove Installation Safety	5¢
WRAES 66	Chain Saw Safety	10¢
WRAES 104	Improving Fireplace Efficiency	10¢