LANE REGIONAL AIR POLLUTION AUTHORITY SURVEY

Summary of Survey Methodology and Results

by Stephen M. Johnson, Ph.D.

APRIL 1999

OSRL
OREGON SURVEY RESEARCH LABORATORY
UNIVERSITY OF OREGON
EUGENE OR 97403-5245
541-346-0824
fax: 541-346-5026
Internet: OSRL@OREGON.UOREGON.EDU
World Wide Web: http://darkwing.uoregon.edu/~osrl

Introduction

The Lane Regional Air Pollution Authority (LRAPA) monitors air quality and regulates air emmissions. As part of LRAPA's efforts to evaluate air quality, LRAPA contracted with the Oregon Survey Research Laboratory (OSRL) to conduct research on residential use of wood fuels for home heating Working closely with LRAPA staff, OSRL planned, pre-tested and implemented a telephone survey of 710 residents in the urban areas of Eugene/Springfield and Oakridge. This report summarizes the survey methodology and results.

Survey Methodology

Survey Instrument

The broad goals of the survey were to obtain valid and reliable information from residents in Eugene/Springfield and Oakridge on their annual use of wood fuels for home heating.

In designing the survey instrument, OSRL used a multi-path approach which included: reviewing previous LRAPA surveys; creating original survey questions with the assistance of LRAPA's staff; and extensively pre-testing individual questions and the entire survey instrument with members of the survey population, and potential users of the data from LRAPA. Most of the survey questions are direct parallels to those from previous LRAPA surveys, but some are OSRL/LRAPA originals.

The survey instrument was programmed into OSRL's computer-aided telephone interviewing (CATI) system and further pre-tested. A facsimile of the survey instrument is provided in Section 2 of this documentation. All interviews were completely anonymous, and human subjects approval was obtained.

Sample and Data Collection

Interviewer training was conducted on February 16, 1999; see Section 3 for interviewer instructions. Interviewing was conducted from 9:00 AM until 9:00 PM, Monday through Sunday, until the sample target sizes of 700 was exceeded. Altogether, OSRL interviewers made 11,668 random-digit-dialed telephone calls to complete 710 interviews between February 17 – March 11, 1999. Up to 20 calls were made to each valid telephone number. All residents with telephones had an equal chance of being selected. The net response rate was 78% and the refusal rate was 11%; see Section 5 for the sample and response rate report. The average length of the interviews was 11 minutes.

Survey sampling errors are calculated to assist data users in assessing how much confidence to place in a particular survey result. Large random samples, as in this study, reduce sampling error. Results for survey questions in which there is low variability also have less sampling error; for example, a variable with a 50/50 proportional split has wider confidence intervals than a variable with a 5/95 proportional split. For this study of 391 residents of Eugene/Springfield and 319 residents of Oakridge, the sampling error, when either population of households is used, is $\pm$5.0 percentage points on a variable with a 50/50 proportional split (at the 95% confidence level). For a variable with a 5/95 proportional split, the sampling error is $\pm$2.0 percentage points.

Survey Results

The presentation of the survey results is organized around the subject areas identified on pages 1 - 3. Readers of this report may refer to the 29 banner-style tables in Section 6 for more detail. In the banner tables, the contents are cross tabulated by other home heating questions and demographic information. The banner data include counts and percentages for each question overall, and counts and percentages for each row and column of the cross-tabulation. See Section 5 for instructions on how to read banner tables.

The Use of Wood as a Home Heating Fuel

The use of wood as a fuel for partial or complete home heating is common in the communities of Eugene/Springfield and Oakridge. Fifty one percent of the residents in Eugene/Springfield and 60% of the residents of Oakridge own a wood burning device of some sort (see Banner Table 2).

The owners of these wood burning devices use them frequently. In Eugene/Springfield 14% of the owners of wood burning devices use them daily during the heating season and an additional 12% use the devices several times a week. In Oakridge the use of wood burning devices is even higher, with 54% of their owners using them daily and another 16% using them several times a week (See Banner Table 6).

For some people wood heating fuels are crucial. Twenty four percent of the owners of wood burning devices in Oakridge and 6% of the owners in Eugene/Springfield have no other source of home heat. Most of the respondents with no other source of home heat except wood fuels use their wood burning devices daily (77%).

Although there are many possible types of wood fuels, home heating is accomplished either by using wood or processed wood pellets. By far the most common method of home heating with wood in Eugene/Springfield is the fireplace, with wood stoves only about half as common. In Oakridge the situation is reversed, with wood stoves almost five times as common as fireplaces (See Banner Table 4).

The amount of wood fuel burned during the course of the winter heating season varies depending on whether or not the respondent used a wood stove or a fireplace and whether or not they lived in Eugene/Springfield or Oakridge. In both urban areas wood stoves used more fuel than fireplaces and in Oakridge respondents used more fuel than the respondents from Eugene/Springfield (see Banner Table 16).

In order to estimate the amount of air pollution originating from home heating with wood Figure 1, at the end of this report, shows the use of fireplaces, wood stoves, pellet stoves, and wood furnaces by the age of the device and by the urban area in which the device is located.

To use this figure each type of wood burning device is first listed in age brackets. Next the total number of the devices in the survey is given, followed by what percentage of the population is represented this number (this percent can be extrapolated to the total population of each urban area). Finally the average use of wood fuel for each device is given for each age bracket (this % can also be extrapolated to the population). To calculate the emissions for any specific device one would multiply the number (count) column by the number of households in either Oakridge (1371) or Eugene/Springfield (66,112) to estimate how many devices of that specific age are in the area under study. Next turn to the average column and multiply the average fuel use by the estimated number of devices. This result would then be an estimate of the total wood fuel used by all devices of that type and age. The appropriate emission factor can then be applied to devices of that type and age. This calculation can be performed for all age groups and types of devices to calculate the total emission from wood fuel for each geographic area.

Changing Residential Heat Source

Concerns have been raised that fear over possible energy shortages following the start of the year 2000 might lead people to switch to wood as a home heating source. In order to investigate this concern respondents who did not have wood burning devices were asked if they intended to acquire such a device within the nest year. Seven percent of the respondents without wood burning devices in Oakridge responded that they did intend to acquire such a device. In Eugene/Springfield 5% of such respondents also claimed that they intended to acquire a wood burning device.

At the same time respondents who currently own wood burning devices were asked if they plan to change from wood fuel to some other form of home heating. In Oakridge 10% of the owners of wood burning devices responded that they plan to switch heating fuels. In Eugene/Springfield 8% of respondents indicated the same intent to switch away from wood. A small percentage of those planning to switch fuels are planning to switch from wood to wood pellets or some other form of wood, however, 76% plan to switch away from wood entirely.

The net result of this investigation indicates that the use of wood burning devices is not likely to increase in the year 2000 (see Banner Tables 19 & 25).

Natural Gas

Oakridge residents are much more dependent on wood fuels for home heating than residents in Eugene/Springfield. Part of this dependency on wood may be due to the lack of fuel choices in Oakridge because natural gas in not available. Oakridge respondents were asked if they would use natural gas if it were available.

Fifty Four percent of Oakridge respondents replied that they would use natural gas if available. Among these Oakridge residents 62% said they would switch to natural gas as their primary source of heat. This means that 39% of Oakridge residents claim they would switch to natural gas as their primary heating source if it were available (see Banner Tables 23 & 24).

Home Wood Heating Advisory Program

Lane Regional Air Pollution Authority operates an advisory program for people who heat with wood. Under this program LRAPA attempts to communicate burning conditions to residents who use wood. Most people who heat with wood are aware of this program. In Oakridge knowledge about this program is almost universal, with 92% of respondents who use wood aware of the program. In Eugene/Springfield awareness is not as high, but still 77% of respondents who use wood were aware of the program.

Most respondents who were aware of the program relied on television as their source of information (62%), with newspapers (20%) and radio (9%) as a distant second and third source of information. Almost no respondents used the LRAPA advisory telephone line as a source of information (See Banner Tables 21 &22).

Conclusion

The results show that the use of wood as a home heating fuel is common in both Oakridge and Eugene/Springfield. However, the use of wood is more common in Oakridge, with a

higher percentage of wood burning devices and higher average fuel consumption. In addition, a high percentage of residents in Oakridge rely exclusively on wood for their heat. However, many Oakridge residents who currently use wood heat would switch to natural gas if it were made available.