'Working Forests for Home Heating' Initiative
New England Forestry Foundation

Survey of Wood Fuel Use
Among LIHEAP Clients in Western Massachusetts

Fall 2013

New England Forestry Foundation's "Working Forests for Home Heating" project was a 2-year initiative funded by the USDA, which was designed to encourage the use of efficient wood heat among low-income households in western Massachusetts, promoting the use of a less expensive, locally grown, and renewable heating fuel. Innovative Natural Resource Solutions, LLC (INRS) was hired to provide staffing and expertise for the project. A major focus of the project involved identifying opportunities and challenges associated with support for efficient wood heat within the federally funded Low-Income Home Energy Assistance Program (LIHEAP).

Background

Early in the project, it became apparent that there was a lack of sufficient data on existing levels of wood use among LIHEAP clients. LIHEAP program requirements dictate that eligible households must declare a single, primary fuel type. The total number of households that declared wood as their primary fuel was less than 500 for the entire state of Massachusetts and less than 2% of the individual client populations served by the western MA fuel assistance agencies.

However, local agency staff suggested that these numbers did not reflect actual levels of wood use. In fact, one fuel assistance agency suggested that perhaps up to 30% of their clients were using wood as a *secondary* fuel. While this kind of anecdotal evidence from agency staff indicates that wood fuel is an important supplemental heat source for low-income households, especially in rural parts of the state, it was necessary to undertake a representative survey to gather more concrete information about the nature and extent of wood use within this population.

Initial Survey – *Summer 2012*

An initial survey was carried out through Community Action of the Franklin, Hampshire, and North Quabbin Regions during the summer of 2012. This survey was a shorter version of the large-scale survey conducted in 2013 and it asked households whether they use wood as a heat source and, if so, how often, how much, and what type of appliance. The mailing went out to 108 households (69 in cities and 39 in more rural communities) that use *oil as their primary heating fuel.*

We received a 37% response rate (40 responses), where 17 respondents (~43%) indicated that they use wood and 23 did not. In addition, four of the non-wood users expressed at least some interest in using wood. Of the respondents who indicated that they use wood as a secondary heat source, the majority (65%) reported using a wood stove and the remainder were split between pellet stoves (12%) and fireplaces (18%). Notably, the majority of respondents in "cities" indicated that they use wood "once-in-a-while", whereas the majority of respondents from "rural" areas indicated that they use wood "every day."

The results indicated that a large percentage of LIHEAP-eligible households that heat with fuel oil are also using wood as a back-up heat source and that wood stoves were the most common heating appliance in those situations. However, due to the small sample size, it was determined that a larger survey should be undertaken to gather a more accurate and complete picture of wood fuel use among fuel assistance clients.

Large-Scale Survey – *Summer 2013*

This survey was carried out through Community Action of the Franklin, Hampshire, and North Quabbin Regions. This agency serves a client population of just over 8,000 households, 498 of which were randomly selected to receive the survey. The number of households with each primary fuel type, chosen through the random sample, roughly reflected the relative abundance of these fuel types among the larger client population, with 67% of households who received surveys listing oil or propane as their primary fuel.

Selected households received a one-page survey (page 4) asking them questions about whether they use wood, what kind of wood-burning appliance, the vintage of their wood-burning appliance, the amount of wood fuel they consume per year, their interest in burning wood, and their knowledge of recent wood stove changeout programs. The mailing also included a general flyer with information about the benefits of wood use (page 5).

Results

* The survey received a 33% response rate (164 respondents total), so overall results can be considered representative of the entire Community Action client population at the 95% confidence level with an 8% margin of error.

How many LIHEAP households are using wood for heating?

Overall, **19.5% of respondents indicated they use wood heat**, to some extent. Not surprisingly, households who reported using wood as a secondary heating fuel overwhelmingly use expensive fuels, such as oil and propane, as their primary heating fuel (Table 1).

Table 1: Secondary wood use among LIHEAP households.

Primary Fuel Type	Percentage that Use Wood
Oil	33%
Propane	29%
Electric	9%
Natural Gas	3%
Kerosene	0%
Heat Included in Rent	0%
Coal	0%

How often do these households use wood heat during the heating season?

The survey results supported anecdotal evidence that burning wood is a significant supplemental heat source for households in this region. Half of all respondents who reported using wood, indicated that they use it "every day," while roughly a quarter of them indicated "once-in-a-while," and the remainder said they use wood "rarely" (Figure 1).

Even among those households that do not currently use wood for heating, there was some interest in starting to use wood – 18% indicated "a lot" of interest and 12% indicated "some" interest. Among households that rely on oil as their primary fuel, this percentage was even higher, with 31% of oil heat households that *do not* use wood heat indicating "a lot" of interest in the possibility of using wood.

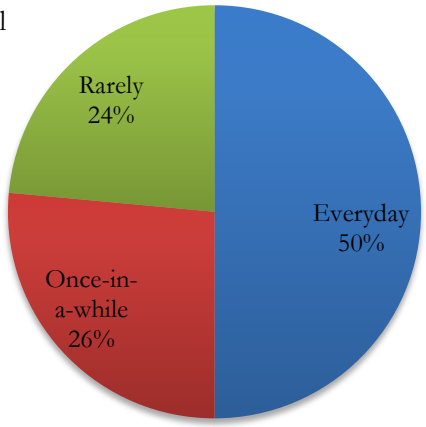

Figure 1: Frequency of wood heating, among respondents who indicate they use wood fuel.

What is the home heating profile of LIHEAP households that heat with wood?

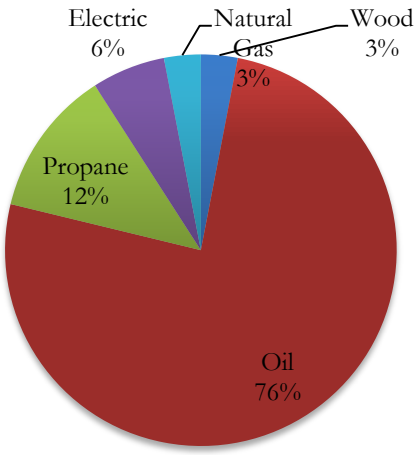

Figure 2: Distribution of primary fuel types, among respondents who indicated they use wood for heating.

The majority of households that reported using wood fuel as a component of their home heating have an expensive fossil fuel as their primary fuel designation within the LIHEAP program. In fact, 76% of all the households that reported using wood rely primarily on fuel oil to meet their home heating needs (Figure 2). Among all wood-heat households, the average amount of wood pellets consumed per year was 2.4 tons and the average amount of firewood consumed was 2.4 cords.

What kinds of wood-heating appliances are people using?

Of the households that use wood, 55% have a wood stove, 27% have a pellet stove, and 21% use a fireplace. While **wood stoves were revealed as the most commonly used wood-burning appliance**, the survey also revealed that at least 4 of the 18 of reported wood stoves (22%) were non-EPA compliant (built prior to 1988).

What is the level of knowledge/interest in current and future wood stove changeout programs?

In total, 66% of respondents who reported using wood heat indicated that they would be interested in participating if another wood stove changeout program was offered. Among all respondents, 32% indicated interest in a changeout program. The number of non-EPA compliant stoves that are currently in use, combined with the high percentage of respondents who indicated interest in future changeout programs, highlights a need for the continuation of programs to help subsidize the swap-out of older, polluting wood stoves for newer, more efficient models.

In the future, if changeout or grant programs are offered, it will be important for program administrators to make a special effort to reach out to LIHEAP recipients because our survey also indicated that 77% of respondents did not know about the recent changeout offered by MA DOER and the Massachusetts Clean Energy Center.

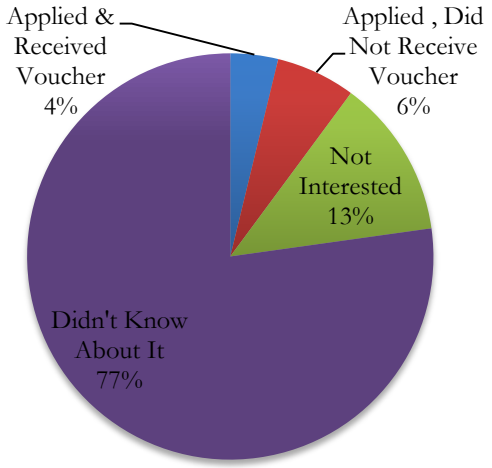

Figure 3: Respondent experience with the recent wood stove changeout program.

For questions, contact:
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Dear Community Action client,

Community Action and our Fuel Assistance Program are working in collaboration with New England Forestry Foundation to find out information about the use of wood and wood pellet heat in Franklin and Hampshire Counties. Our records indicate that you have [insert primary fuel type here] and you are one of a number of clients who were randomly selected to receive this survey. Please take a moment to complete the questions and return the survey in the enclosed envelop, the postage has been paid. *Note: Your survey response will remain confidential unless you choose to share your name and address on this sheet.*

For each question, please circle the response(s) that best fit your wood usage:

I occasionally use wood to heat my home: **YES** or **NO**

If YES, I use:

- A woodstove
- A pellet stove
- A fireplace

If you have a woodstove, when was it manufactured?

- Before 1988
- After 1988
- I have no idea how old my stove is

I use wood to heat my home:

- Everyday
- Once in a while
- Very rarely

If NO, I have:

- No interest in using wood to heat my home
- Some interest in using wood to heat my home
- A lot of interest in using wood to heat my home

If you use some amount of wood or wood pellets for heat, approximately how many cords of wood or how many bags of pellets do you use per winter? _____

Where do you get your firewood? _____

If you buy firewood, do you buy it:

- cut and split
- log length

What was your experience with the recent woodstove change-out program from the Massachusetts Clean Energy Center?

- I applied to the program and I received a voucher for a new stove.
- I heard about the program, but I was not able to obtain a voucher.
- I heard about the program, but I was not interested.
- I did not know about the program.
- Other: _____

Would you be interested in participating if another woodstove change-out program was offered, which would provide financial assistance for replacing an older woodstove with a new, EPA-certified wood or pellet stove? **YES** or **NO**

We appreciate you taking a moment to complete this survey and mail it back in. Also, we want to thank you for applying for fuel assistance through Community Action last winter. The re-application for this winter's program will be mailed to you later this summer. Please use the back of the page if you have any additional comments.

Sincerely,

Peter Wingate
Energy Director

The benefits of heating with wood…

Cost Effective

Wood fuel is about **½ the cost of heating oil** per unit of heat output and has a history of more **stable and predictable pricing** than volatile fuel oil prices.

Fuel Type	Price	$ per Million BTU*
#2 Fuel Oil	$3.65/gallon	$31.74
Wood Pellets	$250/ton	$18.38
Dry Cordwood	$250/cord	$16.34

** BTU (British Thermal Unit) is a measure of the heat value (or energy content) of fuels.*
** Values from USDA Forest Service, Fuel Value Calculator*

Local

Wood for energy is produced locally within our region, which helps the local economy by…

- Enhancing markets for low-grade wood & promoting small-scale forestry.
- Increasing the economic viability of working forests & helping to protect forests from development threat.
- Keeping dollars spent on fuel in the local economy.

Renewable

Wood is a renewable resource that regenerates naturally in our forests after harvesting. Wood for energy is produced as part of existing timber harvests, which are at sustainable levels – each year our forests grow more volume than we cut. The chart to the left shows this trend in Massachusetts.

Source: USDA Forest Service, Forest Inventory & Analysis Data

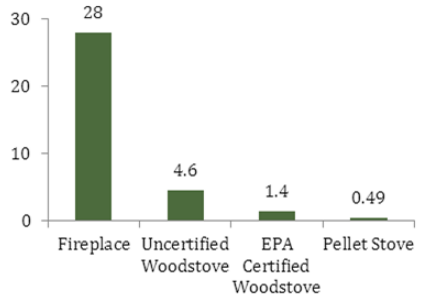
New Technology = Cleaner Burn

Wood stoves manufactured after July 1, 1988 must comply with new EPA air quality regulations. Better insulation and improved air flow allow these stoves to burn the wood material and smoke more completely, resulting in improved energy efficiency and much lower emissions.

Replacing an inefficient wood stove can*:

- Improve energy efficiency by 50%, using 1/3 less wood to produce the same amount of heat.

- Reduce fine particle and toxic air pollution by 70%.



Average Emissions of Fine Particles
(lbs/MMBtus of heat output)*

Modern wood-burning boilers and furnaces for central heating can also achieve efficiency ratings of 85–90%+.

*Source: US Environmental Protection Agency

This information is provided as part of a project funded by the USDA Forest Service and carried out by Innovative Natural Resource Solutions, LLC for New England Forestry Foundation, in collaboration with the LIHEAP and HEARTWAP fuel assistance programs in Massachusetts.

New England Forestry Foundation

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