



The Role of Loggers in Providing Vermont's Wood Energy

Community Biomass Project

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Introduction

As demand for wood energy grows, little is known about the loggers and processors that harvest wood from the forest in Vermont. Yet, without this network of forest workers biomass energy would not be available. Ensuring a sustainable supply of wood fuel in Vermont requires understanding how these businesses operate and the conditions that affect their future success. We provide this analysis as a step toward such understanding with hopes that it will help inform and facilitate the growth of emerging wood fuel markets and ensure that the production system for these energy products is maintained and improved.

The purpose of this report is to understand the network of suppliers and forest workers that provide Vermont's wood energy. We examined existing logging and wood processing operations, including their operators' business models, perceptions of biomass markets, access to different components of the biomass market (e.g., firewood, chips, pellets), and the constraints and opportunities that they faced. We also sought to test our own assumptions about workers compensation concerns and Accepted Management Practices (AMP) compliance. The report should serve to help the logging community voice its knowledge, concerns, and opinions about wood energy. This project is part of a larger study on sustainable wood energy among nine towns in Northeastern Addison County and the Mad River Valley, where communities are exploring the possibilities for sustainably produced local wood energy. The current study also focuses on these regions.

1. Methods

To collect the required information, we conducted phone interviews with 15 loggers and other operators who worked in or drew wood from the project area (Figure 1). Respondents came from a list of 46 known operators compiled from logging operator databases from the Addison and Washington County foresters. Since the County Forester databases were meant to serve a much larger land base than our project area only those operators based in the project towns or otherwise known to operate in the project towns were included in the call list. Ten additional operator contacts were received via snowballing (i.e., asking respondents to suggest other people to interview) and were added to the call list for a total of 56 operators. Those that were reached within five call attempts were interviewed. Call attempts were made primarily between 7:30am and 1pm with some attempts yielding scheduled interview times in the evening at the operator's convenience. Interviews were conducted in April and May 2009. Only one respondent who was reached declined to be interviewed. A deliberate attempt was made to gain a diversity of perspectives from different types of operations. Roughly equal numbers of respondents were reached from each subunit of the project area (Northeastern Addison County and the Mad River Valley), but precise enumeration of this is problematic due to some operators working in both subunits or working in the project area only in some years, dependent on where available work is located. Interviews were conducted using a set of open-ended questions to guide the conversations and they ranged from 20 to 90 minutes depending on the interest of the respondent.



Figure 1. Map of project area, subunits highlighted in red. Black lines indicate town boundaries, wider gray lines indicate county boundaries.

Source: http://maps.vermont.gov/imf/imf.jsp?site=ANR_NATRESViewer

2. Overview of operations

Of the 15 respondents, 10 were primarily loggers, three were primarily firewood processors, one was primarily a log trucker, and one emphasized draft horse work that occasionally included skidding logs. Most respondents were diversified to some degree, with loggers often engaging in firewood processing, as well as excavation, construction, farming or milling. Processors and truckers also engaged in logging as well as other businesses and product lines including, landscaping products (e.g., bark mulch) and service, small motor repair, condo maintenance, etc.

Fourteen of the 15 respondents engaged in some degree of logging activity (not necessarily their primary focus). Eleven of these were small-scale logging operations, typically composed of a sole proprietor who works alone, or with occasional hired help, harvesting wood with a chainsaw and skidder. Some also used dozers, tractors, and/or forwarders. Two additional respondents own larger-scale logging operations with at least one employee who harvests using heavily mechanized equipment, including fellerbunchers, delimbers, and grapple skidders. The one respondent engaging in horse logging works alone and exclusively pulls trees out of the forest (does not fell or otherwise cut them).

Of the three primary firewood processors, two are larger multi-employee businesses with a variety of product and service lines including other wood products, land clearing, and land or condo maintenance. One of these operations emphasizes kiln-dried firewood. The remaining primary firewood processor is a sole proprietor working alone, exclusively selling split and delivered firewood.

3. Business Challenges for Operators

As small businesses, these loggers and processors face the challenges confronted by many types of small businesses, including expenses for workers compensation and liability insurance, training and certification needs, and issues of regulatory compliance with Acceptable Management Practices (AMPs). Prior experience led us to assume all these areas were challenges that loggers viewed as threats to the viability of their businesses and thus potential threats to the biomass fuel supply.

As sole proprietors with no employees, a majority of the respondents did not need to carry workers compensation coverage. The few that did have regular employees, as opposed to occasional help, all provided workers compensation coverage. Few respondents expressed concerns about workers compensation coverage. One noted the cost of providing workers compensation was a large hurdle that prevented him from hiring help and expanding his business. He avoided it by subcontracting the help he needed. Another young logger with a growing mechanized operation expressed frustration over the mandatory expense of workers' compensation, feeling that his employees would get a better value if he could provide basic health insurance coverage instead, but he could not afford to provide both.

The larger unstated issue was that while sole proprietors may not be troubled by requirements to maintain workers compensation they may often remain unprotected in the event of a work related injury. Ensuring some form of personal and business protection in such an event may be a primary unaddressed challenge for these small businesses in a dangerous line of work.

The majority of respondents carried liability insurance. A few carried it only on a periodic basis depending on the requirements of jobs they were currently working (i.e., contracts requiring insurance). Only one small, new operator reported avoiding liability insurance altogether. Most respondents felt this coverage was a financial burden, but generally regarded it as a necessary cost of doing business. Several noted the structure of liability insurance created an incentive to become more heavily mechanized, since having all workers under equipment canopies (i.e., inside cabs), with no one operating a chain saw greatly reduces insurance rates. When asked for suggestions, some offered the hope for pooled coverage to reduce workers compensation and liability costs and make personal health care more affordable.

Most respondents said that they had no needs concerning training and certification. This may in part be because most respondents have been in the business for multiple decades, betraying the generally aging demographic of forest workers. Several respondents expressed a desire to gain LEAP certification (Logger Education to Advance Professionalis- a certification satisfying the requirements of the Sustainable Forestry Initiative (SFI)), though some reported no lack of business for not having the certification. Many respondents had opinions about available training and certifications that were not positive, with the exception of several valuing the first aid

component of trainings. Many expressed the opinion that trainings and certifications were hoops or rubber stamps that provided little useful information because instructors were generally young and inexperienced or provided too much irrelevant information, such as horse logging information to a mechanized operator. Overall they felt it was more useful to learn on the job, as most of them had. Furthermore, many felt that continuing education, such as LEAP certification, gave them no business advantage. They stated a belief that such programs were driven by corporate needs for a greener image, and that while big industry received the image benefit, small loggers incurred the costs in time and money.

While we expected regulatory compliance with Accepted Management Practices (AMPs) and certification standards to be a significant issue, the general consensus (11 respondents) was that the rules were easy to follow and much of it was common sense and part of “doing a good job in the woods.” A few respondents had had compliance issues relating to wetlands and expressed that it can sometimes be difficult to determine what counts as a small wetland. While the fact that few respondents felt following AMPs was a challenge seems to indicate no regulatory problems from the loggers’ standpoint, this does not necessarily mean that all logging is in compliance with AMPs and certification standards or that impacts to the land are not happening. Rather it could reflect issues related to self-reporting, or indicate that enforcement is not prevalent enough for any non-compliance to be noticed. It should be noted that loggers themselves may not provide a reliable gauge of the impacts of non-compliance, since erosion and other impacts often occur during storm events and may happen after the logger has left a job, thinking all is well.

The challenge of the spread of invasive insect pests, such as emerald ash borer and the Asian longhorned beetle, was raised by a respondent. These insects could cause extensive damage to our forests, impacting harvestable wood supplies, among many other concerns, and could also lead to transportation bans on wood products in the effort to prevent the insects’ spread. This issue is addressed further in the *Markets and Business Trends* section below, as it may present market and efficiency opportunities as well as major challenges.

4. Wood Supply Chains

Even at a local level, the wood supply chains that provide the vital link between the forest and dependable biomass energy prove to be surprisingly complex, involving many parties and numerous regional and global markets. Actors include landowners, loggers, foresters, truckers, and wood processors of all sorts. It is difficult to generalize about the system. There are many variations and most operators make different arrangements for different jobs depending on the preferences of all involved. Figure 2 attempts to diagram some of the variations within the supply chain.

Understanding the supply chain begins with understanding the relationship between a landowner and a logger. Most respondents dealt directly with landowners and did not use a forester. Only two respondents reported working exclusively with foresters. Landowners were compensated by the logger for their wood in various ways, including receiving a percentage of mill receipts or a set price per 1000 board feet.

Most logger respondents generally cut the trees, moved them to the landing and participated significantly, if not exclusively, in the sale of the wood to other parties, sometimes with help

from a forester. A few operators, particularly the two heavily-mechanized ones, reported harvesting under contract to a wood buyer at times, e.g., cutting for a specific mill who has purchased stumpage, and thus the operator was not directly involved in the sale of the wood. Some respondents also took jobs just harvesting (not selling) wood, especially firewood for landowners or other operators. Many logger respondents harvested wood without marking trees first or did the marking themselves.

Respondents reported that some wood buyers or landowners stipulate that the logger must have liability insurance, meet certain certifications or meet other specific qualifications to be eligible for the job. Additionally, in terms of the agreement between landowner (or stumpage owner) and the logging operator, it is not uncommon for firewood to be dealt with differently than the sawtimber, with many operators buying the log-length firewood themselves and processing/marketing it directly rather than selling the logs to another entity. In some cases the logger may also just pull firewood to the landing and leave it for the landowner to process.

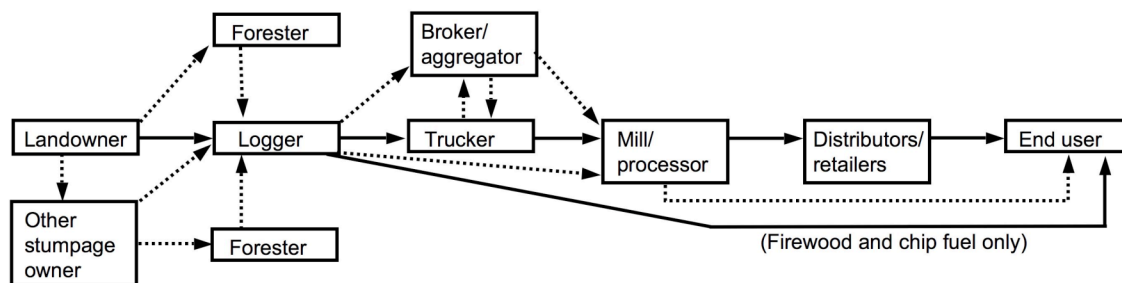


Figure 2. Supply chain diagram. Depicts a standard supply chain for all wood products with common variations as reported by respondents. Boxes represent all significant entities in the supply chain; arrows represent the chain of ownership, handling, or influence over the wood products (influence is included because foresters rarely own the wood but can be an important intermediary). Solid arrows represent the more common paths through the supply chain based on interpretation of this study alone; dashed arrows are less common paths. All paths can include any wood product unless otherwise specified. Duplicate “forester” boxes represent the scenario of different foresters employed by the “landowner” and “other stumpage owner” simultaneously influencing a harvest operation.

Few (two) of the small logging operators interviewed had their own capacity to transport logs, making their businesses dependent on truckers and the trucking capacity of concentration yards. Trucking from the log landing is sometimes built into the purchase price of the logs. Truckers also often provided a crucial information link helping connect loggers in the woods to the latest prices. Logger respondents did not generally store logs apart from on the log landing, storage occurs primarily at the mills and concentration yards which were often the major wood purchasers and processors.

The number of different wood buyers and markets used by respondents was surprisingly high. Buyers varied significantly depending on the type of wood product. There were more large

(business/institutional type) buyers (14) for sawtimber than for any other product type. Log-length fuel wood, chips, and pulpwood each had only one to a few large buyers and processed firewood has mainly small buyers in the multiplicity of homeowners using it (Table 1). Since most of the buyers for fuel wood seem to be small to moderate volume purchasers, it seems this would be a more complicated market for loggers to deal with, as opposed to numerous large buyers for sawtimber.

Table 1. Wood buyers used by respondents.

Product type	Wood buyer	Buyer Type	Location
Processed firewood (including kiln dried)	Condo associations/visitors	condo associations/visitors	project area
	Firewood distributors (kiln dry only)	firewood distributors	Boston area, MA
	Homeowners	homeowners	project area
Log-length firewood	Colton Enterprises	firewood processor	Pittsfield, VT
	Tom Shepard	firewood processor	project area
	Unspecified local processors	firewood processor	project area
Log-length for chips	Jim Lathrop	chip supplier	Bristol, VT
Chips	BED McNeil Generating Plant	power utility	Burlington, VT
Pulpwood (generally log-length)	International Paper/Ticonderoga	paper mill	Ticonderoga, NY
	Verso Paper-Androscoggin Mill	paper mill	Jay, ME
	Buffalo Mountain	concentration yard	Hardwick, VT
	Canopy Timber Alternatives	concentration yard	Middlebury, VT
	Logpro	concentration yard	New Haven, VT
	TRG	concentration yard	Hardwick, VT
	A.Johnson Company	sawmill	Bristol, VT
	Ames True Temper (ash only)	sawmill	Wallingford, VT
	Canadian markets (spruce)	sawmill	Canada
	Clifford Lumber, LLP	sawmill	Hinesburg, VT
	Cyr Lumber	sawmill	Milton, VT
	Lamell Lumber (pine)	sawmill	Essex, VT
	Manchester Lumber, Inc	sawmill	Johnson, VT
	P&R Lumber	sawmill	Wolcott, VT
	Stanley Tool, Inc	sawmill	Pittsford, VT
	Unspecified New Hampshire mills	sawmill	NH

5. Fuelwood Markets and Business Trends

Wood energy markets have generally been growing in the region; these interviews offered insights into recent trends in the fuelwood markets and highlighted a variety of factors affecting supply and demand for fuelwood. The demand and supply of firewood and chip fuels were perceived to expand through 2008 in spite of difficult logging conditions that summer. Many

respondents thought demand would continue to grow due to generally increasing fuel costs and the increasing popularity of wood fuel, however they also expressed concerns about the tightening of supply relative to demand.

Most respondents explained this tightening in the wood supply as due to lack of access to timber sales for both short and long term reasons. In the short term, they expected a reduction in supply because they consider to be largely produced as a byproduct of harvesting sawtimber, which is down due to the general collapse of markets. The lack of markets for sawtimber reduces many landowners' interest in any harvesting, thus cutting off access to fuelwood. In response to this trend several respondents noted they were now looking for fuelwood-only woodlots or are even attempting to return to previous harvest sites to remove firewood that was not previously worth extracting.

Respondents also noted longer-term wood access issues, including the reduction in timber sales on public lands, especially National Forest lands, and reduction in private lands timber sales due to the anti-logging, or at least not pro-logging, inclination of increasing numbers of new landowners from outstate. Additional supply restrictions may arise due to recently unsustainable levels of harvest by large landowners in the area, according to one respondent who was a large-volume firewood processor.

Another dynamic several respondents noted in relation to firewood markets was the sudden appearance of many small firewood producers due to increased unemployment, good firewood prices, and low cost of entry into the business. Many felt these new, opportunistic operations were often "fly by night" outfits that shortchanged customers in a variety of ways, and generally undercut prices for established producers.

Numerous opportunities and constraints exist for wood fuel suppliers in their attempt to take advantage of expanding wood energy markets. One respondent involved in long distance firewood transport noted exotic invasive insect pests as a major emerging issue that could be either an opportunity or a constraint for wood fuels. He explained transport bans on firewood and other unheated (ie. not kiln dried) wood products could hurt some long distance producers and transporters (not to mention buyers) of firewood, chips and other wood products. However, he viewed the issue as an opportunity for kiln dried firewood producers to gain market share from other wood producers because kiln drying kills any insect pests in the wood, allowing these producers to sidestep emerging transport restrictions. Looking at the invasives issue from an energy system perspective we can also see possible opportunities for efficiency improvements to the existing wood fuel system. Transportation bans on wood could encourage localization of fuelwood production and consumption, thus reducing fossil fuel energy expenditures for transporting fuelwood. Such a contraction of our "woodsheds" not only increases energy return on energy invested for the fuel system, it may also make users more sensitive to the landuse impacts of their wood consumption. Further, it is possible that increased market share for kiln-dried firewood (explained above) could improve heating efficiency in the home to the extent that it replaces insufficiently dried or seasoned wood (green or insufficiently seasoned wood yields drastically reduced heat because much of the energy released is consumed in evaporating moisture from the wood, rather than in heating the home).

One respondent noted that the continued growth in firewood demand has allowed him to shrink his delivery area while still selling all of his wood. As mentioned above this localization helps make trucking and the entire wood energy supply system more efficient, and, in the process, opens up opportunities for other producers in different locations to create an expanded network of small, local energy providers.

Additionally, a few respondents also noted road restrictions (especially I-89) for log trucks as a constraint to logging activity in general, with interstate highway weight restrictions preventing full truck loads, reducing efficiency and increasing costs. Local road permitting and enforcement issues were also noted. This constraint may have been partially alleviated with changes in weight restrictions for parts of the interstate system since the time of the interviews.

6. Chip Fuel Markets

While wood energy markets have generally been growing in the region, these interviews showed that many respondents, particularly small logging operations, were not able to access all of these growing markets. All logger respondents sold wood into firewood, sawtimber, veneer, and pulp markets (or had at some time), but only three had sold wood into markets for wood chip fuels.

Of the three who had accessed chip fuel markets two were larger mechanized operations capable of harvesting a large volume in a short time; one of these larger operators has a chipper, producing the chips himself on contract to Burlington Electric (McNeil Generating Plant). The remaining two operators had sold low-grade logs to Jim Lathrop, whose business has extensive chipping and chip transport equipment and provides much of the regional chip supply.

Other logger respondents were aware of the chip fuel market and had some interest in accessing it, but were not able to. The primary hurdles they identified were large volume requirements, lack of appropriate equipment (especially chippers and chip transport trucks), need for on-demand delivery capability (due to limited storage capacity at fuel user sites), existing contracts being given to a few large producers, and little or no purchasing log length wood for fuel chips (e.g., logs purchased by Jim Lathrop for chipping and resale to end user or “two-stage” procurement by end user who buys logs and hires someone to chip them). It is also notable that none of the respondents had any experience with wood pellet markets because pellet producers are apparently still meeting their raw material needs with mill residues (sawdust).

There is clear differentiation between the chip fuel and firewood markets in terms of the operators that supply them. The consensus among all respondents was that chip markets require large volumes in a short and specific time period, making them unsuitable for small, less-mechanized operators at this time. The few (three) respondents actively involved in chip markets confirmed that chip suppliers tended to need more large expensive equipment, have larger operations, harvest from larger parcels, and over a larger landbase (less local), whereas firewood suppliers can be smaller, drawing from smaller lots and a more local landbase.

Respondents involved in the chip market also explained that it was much more volatile than other wood markets, in part because the demand is highly seasonal and users want chips delivered on demand. They illustrated this point, saying that chip fuel demand was very low in

spring 2009 because the Burlington Electric Department stocked up in 2008 when chip supplies had gotten tight and the heating demand for chips had dropped off for the season. They noted additional dynamics in that high prices for chips in 2008 attracted many large chip producers to transport wood from afar making the market more competitive and constraining local/ regional production. Conversely, the competition of pulp and biomass markets for wood can be an opportunity for local suppliers to get better prices.

In response to these and other changing trends in wood and wood fuel markets logger respondents articulated and/or appeared to follow four strategies:

- (1) Find a small niche and diversify income streams,
- (2) Be small and just hold on as long as possible,
- (3) Get big,
- (4) Get out.

Some (seven) loggers said (or seemed to follow the mode of) staying small, being flexible, and keeping their overhead down was the best way to weather current difficult times, especially when combined with a focus on emerging fuelwood markets. Others (two) were small operations but voiced only a desire to hold on as long as possible with little expectation of long-term survival. Two were embracing the various pressures, including that from chip markets, to get big and mechanized, and one logger expressed his frustration and desire to get out of the business altogether. This range of responses is perhaps a hopeful sign as it indicates a variety of types of suppliers and logging operations will continue to exist and offer possibilities for evolution of the new energy supplies through diverse uses for forest biomass.

6. Harvest Volumes

Through these interviews we attempted to gather harvest data for our nine-town project area to help meet the need for detailed and comprehensive harvest data available at local (town and county) scales for planning purposes. Local harvest data is part of a baseline and starting point for determining the possibilities for expanding local wood use in a given region such as our project area. Such information can inform efforts to understand the feasibility of biomass energy projects such as heating schools or large facilities with local wood, or simply the possibility of expanding home wood heating. Harvest data in our area were readily available only at larger state and regional scales unsuitable for our analysis. These interviews were one of multiple approaches we aimed to use to begin to fill this gap (see Peters et. al. 2009 for UVA harvest data analysis), however, it proved difficult to draw solid conclusions about harvest volumes from these interviews. Some respondents did not have the information readily available. None could provide exact figures off hand. Some seemed reluctant to give specific information. Volume information was not comprehensive since not all loggers in the project area were reached, and the task is further complicated by year-to-year variation in loggers' operating areas (i.e., a logger may work in a given town one year but not the next). Detailed tracking of harvesting at local scales for "woodshed analysis" and planning purposes remains a challenge given the geography of the wood supply chain in which an operator from one town may harvest wood from another and sell it into a potentially global marketplace.

7. Conclusion

This analysis found the production system to be populated primarily by a diversity of small operators facing common small business challenges around obtaining personal and business

protection in the event of an injury. Combined with overhead costs of liability insurance operators' main hope is for the emergence of some form of pooled coverage to lower rates for small businesses, helping them to do their job with a sense of security. As these small operators endeavor to weather the current economic storm that has collapsed general wood markets, many are turning increasingly to wood energy products, firewood and chips, to help maintain their livelihoods. While firewood markets are readily accessible to producers at almost any scale, the growth of large chip fuel markets, supported by programs such as the Fuels for Schools initiative, has been out of reach for most small operators who cannot meet the demands for large volumes in specific timeframes, due to high equipment costs and uncertain prospects for success in volatile markets. While not all small producers are interested in entering the chip fuel markets, some respondents noted increased purchasing of log length wood for chip fuels would let them enter this market, but such a practice is not common at this time. So-called "two stage procurement," whereby a chip burning facility buys and amasses logs directly, then hires another entity to chip and deliver them, could create this opportunity while increasing end users' options to meet internal procurement guidelines.

Despite the apparent abundance of wood resources in Vermont's forests, the loggers we interviewed reported difficulty in securing a sufficient supply of wood products to meet wood energy demands and their internal production requirements (driven by overhead costs). According to the respondents limited supply is largely a result of current market conditions that leave sellers (landowners) uninterested as long as fuelwood is a byproduct of sawtimber harvest. It appears that higher energy prices will be needed to make fuelwood harvests viable on their own. Surprisingly, respondents did not feel regulatory compliance with AMPs was a major challenge or concern; while a good sign, this leaves open the question of how effective the regulation is in protecting our forest, water, and soil resources. In response to these and other changing trends in wood and wood fuel markets, respondents tended to follow four strategies: (1) Find a small niche and diversify income streams; (2) Be small and just hold on as long as possible; (3) Get big; or (4) Get out. This range of responses is perhaps a hopeful sign as it indicates a variety of types of suppliers and logging operations will continue to exist and offer possibilities to localize energy supplies through diverse uses for Vermont's forest biomass.