DCE/AD/01616-T5

→ M&R
file 8-1
Contract 1616

QUARTERLY TECHNICAL STATUS REPORT NO. 3

For The Period Covering

March 19 - June 19, 1978

MAINE FIREWOOD STUDY

Grant No. ~~EC-77-G-03-1616~~
FG03-77AD01616

Prepared By

Elizabeth W. Swain
Maine Audubon Society
Falmouth, Maine

June 20, 1978

DISCLAIMER

The following pages are an exact representation of what is in the original document folder.

Contract Objective

The Maine Firewood Study was designed in response to rising demand for fuelwood and the resultant inability of the supply of wood to meet the demand for home heating fuel. The planned surveys of the consumers and suppliers of firewood and the marketing analysis will generate valuable information. This information will be used to organize the firewood market and increase firewood availability.

An additional aspect of this study involves a provision of service to small woodlot owners who wish to manage their land for firewood production. To insure correct management and utilization of the firewood resource, Maine Audubon is administering six "firewood specialists" to work with landowners who own and harvest their supply of fuelwood.

The combined practical and research aspects of the Maine Firewood Study should result in a well managed supply of fuelwood which can better supplement Maine's energy needs.

Progress Summary

During the past few months the Maine Firewood Study has expanded its scope of activities and achieved results from work initiated at the outset of the study. It has been a very busy and satisfying time.

The Firewood Consumption Survey is completed, although cross-tabs have not yet been made. The informal survey of firewood producers is as complete as possible based on information presently available.

A considerable amount of work has already been done on the marketing mechanism analysis. As expected, however, this information will not be in final form until middle or possibly late summer.

Perhaps the most exciting aspect of the past few months has been the many new activities in which we have become involved. The Maine Firewood Study is well known and respected in wood fuel circles throughout New England. This high profile is a major asset, both to successful completion of this year's work and to the organized, thoughtful development of next year's work schedule.

Program I; Demand Survey

1.5 The firewood consumption survey is completed and has generated some fascinating and useful information. Although I am very pleased with the work of the survey firm, Northeast Markets, they have been disappointingly slow to deliver the final product with cross-tabs.

1.6 Therefore, we have made maximum use of the survey itself and we are anxiously waiting to analyze the additional information which the cross-tabs generate. (See Exhibit I for a list of proposed cross-tabs.) We have publicized the results of the survey only on an informal basis. Many decision-makers and interested citizens are looking forward to receiving fully documented information on firewood consumption in Maine. As soon as we receive the final product from Northeast Markets, I will initiate complete media coverage of the survey findings. Highlights of of the survey follow:

HIGHLIGHTS OF THE MAINE FIREWOOD CONSUMPTION SURVEY

---

46 percent of the population of Maine burned firewood during the winter 1977-78.

1. Question: For what reasons have you decided to burn firewood?

   Response:

46%	to cut down heating costs
32.4%	it was a habit or convenient to do so
9.7%	enjoy burning wood
20%	other reasons

2. Question: Do you intend to continue burning firewood?

   Response: 97.7% plan to continue using wood.

3. Question: What type of stove, wood furnace or fireplace do you utilize?

   Response:

28.7%	fireplace
12.3%	airtight
13.3%	Franklin
4.3%	furnace
42.4	other

4. Question: Are you satisfied with what you are using to burn wood?

   Response: 90.3% are satisfied with their burning device.

5. Question: Who installed your (stove/wood furnace)?

   Response:

76.4%	self installed
.9%	neighbor
3%	already there
2.1%	mason
7.3%	contractor-carpenter
3%	relative
3.9%	other
3.4%	didn't know

6. Question: If self-installed or done by a neighbor, were any formal guidelines followed while installing your stove/wood furnace?

   Response:

60%	used guidelines
31.8%	did not use guidelines
2.2%	didn't know

7. Question: How long have you been burning firewood?

   Response:

10%	used wood less than one year
22%	1 - 2 years
21.7%	3 - 4 years
9%	5 - 6 years
37.3%	over 6 years

8. How many cords did you burn in 1976-77 and how many do you expect to burn this year (1977-78)?

Response: Burned in 1976-77	Expect to burn in 1977-78	
27.5%	22.8	1 cord or less
20.1%	16.3	2 cords
17%	19.4%	3 cords
10.5%	12.5%	4 cords
9.2%	10.3%	5 cords
12.6%	13.6%	6 - 8 cords
1.8%	3.1%	9 - 10 cords
1.2%	2%	10 or more cords

9. Question: How do you obtain your firewood?

Response:	
33.3%	cut on own land
15%	cut on someone else's land
23%	had a local source
10%	dealer
18.7%	combination

10. Question: Based on your agreement with your source of firewood, do you feel you received the agreed upon amount?

Response: 92.9% received agreed upon amount of wood.

11. Question: How much money in terms of fuel costs do you feel you save by burning firewood?

Response:	
20.3%	$100 and under
29.4%	$125 - $200
23.1%	$215 - $300
19.6%	$300 - $375
24.3%	$400 and up

12. Question: What age bracket are you in?

Response:	
3.3%	18 - 24 years
23%	25 - 34 years
26.3%	35 - 44 years
18%	45 - 54 years
13%	55 - 64 years
16%	65 and over

13. Question: Which of the following levels of schooling is the highest level you have completed?

Response:	
12.5%	some high school
40.7%	high school graduate
23.7%	some college
15.9%	four-year college graduate
7.1%	graduate study

14. Question: Which of the following categories best describes your family income?

Response: 17.1%	under $7,500
14.9%	$7,500 - $9,999
31.2%	$10,000 - $14,999
34.6%	$15,000 and up

15. For those who did not burn wood:

68.3%	cited inconvenience
8.1%	afraid of fire
10.6%	too expensive
13%	other
38.6%	said nothing would encourage them to use firewood
20.7%	said increased fuel costs and shortages would give them reason to burn wood
13.8%	having money to own a stove would allow them to burn wood
7.6%	cited not owning a house
2.1%	knowing a source of wood would help them to burn wood
18.2%	other reasons and didn't know
48.8%	said they did not know where to look for information on wood heat
84%	said they felt more education and information is needed.

Program II: Firewood Suppliers Survey

2.3 The firewood suppliers survey has progressed considerably since the last reporting period. Information has been collected on firewood producers in all six counties. To hasten this effort, we used a revised and shortened survey form (see Exhibit II). The data collected by the firewood specialists has been organized and catalogued by county. However, I will wait until my final report to submit the results because we hope to learn of more firewood producers this summer; this information will also contribute to the survey.

Program III: Firewood Management Assistance

3.3 As we anticipated, the arrival of summer has brought a surge of new clients to the firewood specialists. The Cumberland, Kennebec and Oxford County foresters have been seeing firewood clients on a daily basis. In addition to these activities, they also continue to aid the state foresters and mark trees for commercial firewood producers.

Within the past fortnight two of the five foresters have found what CETA terms "positive employment". The Sagadahoc County forester (Ph.D. Zoology) has accepted a teaching job at a college in southern Maine and the forester in York County has joined Officers Candidates School in the U.S. Army.

These losses will undeniably affect the program. However, we plan to refill the positions in three months with new CETA foresters, who will benefit greatly from the publicity and fine reputation the departing foresters have achieved.

3.4 The firewood specialists continue to be well received in their respective communities. They have participated in a forestry training workshop sponsored by the Cooperative Extension Service, lectured to an enthusiastic Conservation Commission and spoken to high school level school groups.

Several articles are enclosed (see Exhibit III) to document the favorable media support we continue to receive.

Program IV: Marketing Mechanism Analysis

4.4 This aspect of the Maine Firewood Study is progressing on schedule and to my complete satisfaction. The two consultants, Dr. Stephen Andersen and Christopher Cheatham, are generating important and useful data, which will be organized into a final product during the next two months.

Chris Cheatham is analyzing the costs of the following: land (stumpage), equipment, advertising, transportation, storage, operating capitol. (See Exhibit IV for further details on his participation.)

Steve Andersen is compiling papers on each of the following topics: small woodlot management, woodstove operation, firewood marketing, wood supplying, firewood equipment maintenance. (See Exhibit V for a rough bibliography of material used so far.)

When the data gathering activities are completed, this information will form the basis of the marketing mechanism analysis as described in the original grant proposal.

Toward the Next Reporting Period

The next technical status report will be the last in a series of four reports. It will precede submission of my final report by no more than one month.

The last three months of this year's program will witness completion of each of the four projects. As anticipated, the majority of my time will be spent on the marketing mechanism analysis.

I look forward to obtaining the results of the Maine Firewood Study and foresee no problems in meeting our original work schedule. The grant proposal for continuation of the Maine Firewood Study will be completed and sent in the next two weeks.

Related Activities

As I mentioned earlier in this report, the scope of wood fuel related activities in which I have become involved has broadened considerably since the beginning of the project.

In addition to those anticipated activities I have undertaken as project director, I have also done the following:

1) Met with Dr. John Hystrom and Dr. Myron Zwiedling of the Northeast Solar Energy Center (funded by D.O.E.) to discuss their role in wood energy development.

2) Attended in Madison, Wisconsin, the third annual Wood Heating Seminar and Trade Show sponsored by the Wood Energy Institute. At this meeting I was elected to the Executive Committee of W.E.I.

3) Met with representatives of the Maine Department of Environmental Protection to discuss a fall conference for small and large scale commercial users of wood energy.

4) Delivered a speech to the wood section of the Conference of New England Governors and Northeastern Canadian Premiers. (See Exhibit VI for a copy of the speech, a list of attendees, and a summary of the recommendations. I have also been asked to participate in a steering committee to oversee implementation of the proposals submitted by the wood workshop to the governors and premiers.

5) Accepted an appointment to the Maine Forest Service RPA (Resource Planning Act) Advisory Committee. The purpose of this committee is to guide and monitor the state's participation in the nationwide effort to catalogue and assess the forest resource.

6) Joined a planning committee, sponsored by the Community Services Agency, to develop strategies for marketing firewood to low income people.

7) Delivered a report on the Maine Firewood Study to the annual meeting of the Maine Audubon Society.

8) Accepted an appointment to the Northeast Wood Energy Advisory Council. (See Exhibit VII for information on the Council.) Our first meeting will be in early July.

Problem Areas

Several months ago I submitted a formal request to D.O.E. for $1,200, which we had originally expected from the New England Regional Commission. Although I had understood that this money would be forthcoming, we have not yet received it. Please notify me if additional information or forms are required. We will soon be in need of those funds.

Reproduce page 21 table using new county clusters

Table 1

Distribution of Survey Sample by County Groups

County Group	Absolute freq	Relative freq	Adjusted freq	Cum freq
Androscoggin, Franklin, Oxford				
Aroostook, Washington				
Cumberland, Kennebec, York				
Hancock, Penobscot				
Knox, Lincoln, Sagadahoc, Waldo				
Piscataquis, Somerset				
Total				

Create two new tables from data on page 22 and 23 merging responses and relabeling as follows.

Tables 2 and 3

1st (and 2nd) Reason Decided to Burn Firewood

Category label	Code	absolute frequency	relative frequency	adjusted frequency	cumulative frequency
Save money[1]					
Habit-convenience[2]					
Enjoyment-atmosphere[3]					
Other[4]					
No specific reason[5]					

---

[1]merge "cut down heat costs" & "save money--cheaper"

[2]merge "always used wood";"heat to keep warm"; "have fireplace stove"; "availability--wood"

[3]same as last printout

[4]"other"; "supplementary heat"

[5]same as last printout

Create a new table as follows from data on pages 22 and 23. Allow analysis of joint first and second reasons to burn wood. In each case list absolute frequency and adjusted frequency (pct) as indicated below in cell one.

Table 4

Reasons Maine People Give for Burning Firewood

2nd reason R decided to burn firewood	1st reason R decided to burn firewood				
	Save money	Habit-convenience	enjoyment atmosphere	Other	No specific reason
Save money	(absolute freq.) (adj. freq. pct.)				
Habit-convenience					
enjoyment-atmosphere					
other					
No specific reason					

Create a new table from data on pages 25-27. Merge categories as below. In each cell list absolute and adjusted pct. frequency.

Table 5

Woodstove Ownership in Maine

1st type of burning device R uses	2nd type of burning device R uses				
	Airtight	Franklin	Fireplace	Kitchen	Other
Airtight[1]	(absolute) (adjusted)				
Franklin					
Fireplace[4]					
Kitchen[3]					
Wood Furnace					
Other[2]					

[1]merge "Jotul", "Asley", "Atlantic", "airtight", "Morso", "Fisher", "Woodmaster"

[2]all other categories not included above

[3]merge "Colonial Clarion" "Glenwood stove"

[4]merge "fireplace", "fireplace-heatilator"

data pages 25, 34-37

Create one new table for each of the four time intervals (1974-1975; 1975-1976; 1976-1977; and estimated 1977-1978), cross-tabulating stove type and number of cords burned. Clarify the volume of wood: i.e., are the first two categories "1 cord or less", "1 cord to 2 cords", etc. Same stove categories as last table.

Tables 6, 7, 8, 9

Wood volume burned by stove type

(by year)

# of cords burned	Airtight	Franklin	Fireplace	Kitchen	Other
	(absolute freq.)				
1 cord or less	(adjusted freq.)				
1 to 2 cords					
3 cords					
4 cords					
5 cords					
6 cords					
7 cords					
8 cords					
9 cords					
10 cords					
11 cords					
16 cords					
INAP					
DK					
REF - NA					

Create a new table data p. 25, 29

Table 10

Is R satisfied with burning device?

Response	Stove Type				
	Airtight	Franklin	Fireplace	Kitchen	Other
Yes					
No					
DK					
NA					

Also print out the following information for each respondent dissatisfied with their burning device

Table 11

Social Profile of Dissatisfied Woodburners

ld#	town	# cords 1974-5/1975-6/1976-7/1977-8 est	age	income	home type	other heat source

data pp 34-37, 44

Table 12

Cords burned according to wood source and county

	purchased wood				cut own wood			
	1974-5	1975-6	1976-7 est	1977-8	1974-5	1975-6	1976-7 est	1977-8
Androscoggin, Franklin, Oxford[1] (absolute)								
less than 1 cord								
1-2								
3-5								
6-10								
11-15								
15+								
Aroostook, Washington								
.								
.								
.								
Maine (totals)								
.								
.								
.								

[1]This table should list each county plus totals for the state using the same county groups as Table 1.

data pp 44, 83

Table 13

Fuelwood source by age of respondent

Age	Cut own land	Cut other land	Bought some[1]	bought all[2]
18-24				
25-34				
35-44				
45-54				
55-64				
65 and over				

[1]merge "combination 1 & 3" and "combination"

[2]merge "local source" and "dealer"

Individual records of firewood burning

(1a)	(1b)	(2)	(3)		(4)		(5)	
Id #	how long woodburner[1]	1974-75	1975-76		1976-77		est 1977-78	
		# cord	# cord	% change (col 3 - 2 ÷ 2)	# cord	% change (col 4 - 3÷3)	# cord	# change (col 5 - 4÷4)

Note: For each respondent, be sure to list sign of % change

[1]listed from response to question page 32

please order this list according to number of years they have been burning wood beginning with the most recent woodburners

Table 15-18

Price vs. Volume of Wood Burned

(one table for each year and est. 1977-78)

	Amount burned (cords)					
Price paid	less than 1	1-2	3-5	6-10	11-15	15+
$25 or less						
$26-35						
$36-45						
$46-55						
$56-65						
$66-75						
$75 and up						
cut own						

Note: for one cord or more round to the nearest whole number

Table 19

Wood purchased vs. ideal wood to purchase

	Wood purchased					Ideal purchase					willing to pay-
Id #	# cords burned	dry/wet	length	split-unsplit	price	# cords	dry/wet	length	split-unsplit	willing to pay	price paid

Table 20

Wood Burned vs Backup Fuel Type

# Cords burned 1976-77	Backup Fuel Source (absolute frequency) Oil	Gas	Electricity
less than 1			
1-2			
3-5			
6-10			
11-15			
15 +			

Tables 21-33

Prices Paid for Firewood, 1976-77

For each of six county groupings[1] produce one table for wet and one for dry wood (6 counties x 2 tables = 12 tables). List absolute frequency and adjusted frequency in each cell

	Delivered						Undelivered					
	Split			Unsplit			Split			Unsplit		
Price paid	tree	4' lgth	stove lgth	tree	4' lgth	stove lgth	tree	4' lgth	stove lgth	tree	4' lgth	stove lgth
(abs. freq.)												
$25 or less (adj. freq.)												
$26-35												
$36-45												
$46-55												
$56-65												
$66-75												
$75 and up												

[1] Androscoggin, Franklin, Oxford
Aroostook, Washington
Cumberland, Kennebec, York
Hancock, Penobscot
Knox, Lincoln, Sagadahoc, Waldo
Piscataquis, Somerset
Maine

For all respondents having difficulty in getting firewood

Table 34

Social Characteristics of Those Having Difficulty in Getting Firewood

Id #	Town/county	age	income	ideal wood[1]	Price Paid	Purchased wood[1]	willing to pay

[1]Use one letter codes in each of four column spaces:

- s - split
- u - unsplit

- t - tree length
- f - 4-ft
- c - stove length

- g - green
- w - wet

- d - delivered
- u - undelivered

example: sfgd = split, four-foot, green, delivered

Tables 35-41

How People Buy Wood by County Groupings

Delivered	Split						Unsplit					
	Dry			Wet			Dry			Wet		
# cords	tree	4'	stove	tree	4'	stove	tree	4'	stove	tree	4'	stove
half cord												
cord or more												
DK												
REF-NA												
Undelivered (repeat above)												
Totals (repeat above)												

Use county groups from Table 1 plus totals for state

data: p 23 and 24 non-woodburner

Table 1 n-w and 2 n-w

1st (2nd) Reason R Decided to Not Burn Firewood

	absolute freq.	relative freq.	adjusted freq.	cumulati freq.
Physical and ownership barriers[1]				
Convenience[2]				
Afraid of fire				
Too expensive				
Other				
No specific reason				
INAP				

[1]merge "don't have stove", "no place for stove", "live in trailer/apt."

[2]merge "I'm too old", "too much trouble", "can't get stove wood"

data: p 23 and 24 non-woodburners

Table 3 N-W

Reasons Maine People Give for Not Burning Firewood

2nd reason R decided not to burn firewood	1st Reason R decided not to burn firewood: Physical and ownership barrier	Convenience	Afraid of fire	Too Expensive	Other	No specific reason	INAP
Physical and ownership barrier							
Convenience							
Afraid of fire							
Too expensive							
Other							
No specific reason							
INAP							

For each respondent answering "nothing" on page 25 list the following information

Data p 25 - non-woodburners

Table 4 nw

Social Characteristics on Non-woodburners who say Nothing Would Encourage them to Burn Wood

ID #	1st reason not burning	2nd reason not burning	Town/country	Heat source	Age	Education	Income	Sex

For each individual responding in any way except "nothing" on p 25

Table 5 nw

Social Characteristics of Non-woodburners Who Might Burn Wood

ID #	1st reason not burning	2nd reason not burning	stated incentive to burn[1]	intends to burn[2]	town/ country	heat source	age	education	income	sex

[1] response to question p 25 about what would encourage them to use firewood

[2] response to question p 29

Table

using both samples

	Woodburners							Non-woodburners							
	1st reason for burning							1st reason for not burning							
Income	abs. freq.	adj. freq.	save money	habit/ conven.	enjoy atmos.	other	NSR	abs. freq.	adj. freq.	phys. own.	con- ven.	fire	too exp.	other	NSR	INAP
Under $7,500																
$7,500-9,999																
$10,000-14,999																
$15,000 and over																
DK																
REF-NA																

EXHIBIT D

WHERE DID YOU SELL YOUR WOOD DURING THIS PAST SEASON? # _____
Within the state: In which counties?_____
Outside the state: In which states? _____

FIREWOOD:	TREE LENGTH	4 FOOT	FITTED	
'77-78				SPLIT
				UNSPLIT
'76-77				SPLIT
				UNSPLIT
'75-76				SPLIT
				UNSPLIT
'74-75				SPLIT
				UNSPLIT

IN WHAT FORMS DO YOU SELL FIREWOOD? green dry standard cord face cord

HOW MANY ADDITIONAL CORDS MIGHT YOU HAVE SOLD LAST SEASON?_____('76-77)

WHAT TYPES OF WOOD DO YOU SELL? beech poplar birch ash sugar maple hemlock fir spruce oak red maple pine other_____

HOW DO YOU SELL YOUR WOOD? Direct to customers through your farm/ store/ home. From stump to customer. To other dealers. Other_____

HOW DID YOU ADVERTISE LAST SEASON? nothing at all put up signs newspaper other

HOW MANY FULL TIME AND PART TIME EMPLOYEES DID YOU HIRE DURING THE 1976-1977 SEASON TO CUT AND SELL FIREWOOD (including yourself)?_____

DO YOU SELL WOOD TO THE: lumber industry-----board feet_____('76-77)
pulp and paper -----# of cords_____

ARE YOU SELLING LESS WOOD TO THE PULP AND PAPER INDUSTRY BECAUSE OF YOUR SALE OF FIREWOOD TO CONSUMERS? yes no

DO YOU GET THE WOOD YOU SELL: FROM YOUR OWN LAND? # of acres_____ where_____
BUY STUMPAGE FROM SOMEONE ELSE? yes no
short term lease(1-5 years) long term lease timber sale agreement other_____

IF YOU ONLY CUT WOOD TO SELL AS FIREWOOD, WHAT DID YOU DO LAST SEASON?
cut all of the trees cut for thinning purposes cut only marked trees

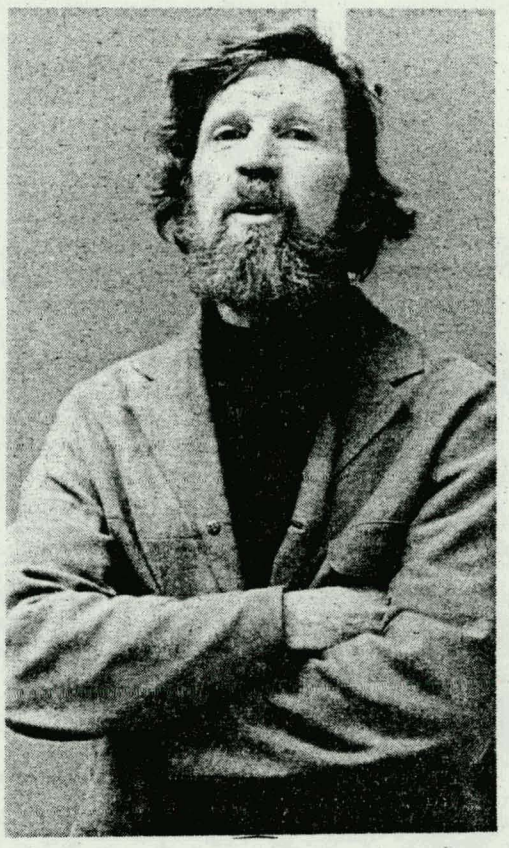
IF YOU HAVE ATTEMPTED TO EXPAND YOUR FIREWOOD BUSINESS, HAVE YOU HAD ANY PROBLEMS? yes no
(labor, financing, insufficient supply of stumpage)

HAVE YOU WORKED ON LANDS MARKED BY THE MAINE FOREST SERVICE? yes no

WHAT WILL HAPPEN TO THE PRICE OF WOOD NEXT YEAR?

3/28/78

EXHIBIT III



Woodlot experts

David Brooks, left, of St. George, a Time & Tide Resource Conservation and Development forester, and Garrett Clough of Arrowsic, a Maine Audubon Society woodlot consultant, spoke Tuesday night at the second in a series of workshops on small woodlot management. Clough, who is available on a consulting basis, discussed fuel wood management, while Brooks talked about chain saw safety. The workshops are held Tuesday nights at 7 at Morse High School in Bath, sponsored by Time & Tide. (Faith Woodman photos) Times Record Mar 9, 78

Second woodlot workshop March 8

WALDOBORO–The second in a series of four workshops on small woodlot management will be March 8 at 7 p.m. at Medomak Valley High School, Waldoboro.

Garrett Clough, Audubon Firewood Specialist, will speak on fuelwood management, and Bud Blumenstock, Cooperative Extension Service Safety Specialist, will give a presentation on chainsaw safety.

The public is invited and there is no charge.

The same program will be given at Morse High School in Bath Tuesday night and at Waldo Regional Vocational Center, Waldo, Thursday night.

For more information, contact the Time & Tide Resource Conservation & Development office, Waldoboro, 832-5348.

Coastal Journal

Energy page - weekend paper

New markets for wood energy called vital

By David Platt
Of the NEWS Staff

BOSTON — New England's energy future will depend on a combination of economic and technical factors which are difficult to predict. But experts gathered for a New England - Canadian province conference Thursday agreed that as far as wood is concerned, most of the technology is here and what is needed is the organization of a market.

Speakers representing both the large and small perspectives said it's now possible to harvest large quantities of wood for energy purposes economically in both northern New England and the Maritime Provinces, but that the markets don't yet exist to sell it.

One effect the growth of a wood-energy market would have, pointed out Professor Harold Young of the University of Maine, would be a shift in the priorities of large land owners and wood-producers. Now geared to pulp production for the most part, the large landowner in the future will find it increasingly profitable to use more of each tree he cuts. To succeed, Young said, the landowner will need to do a sophistocated inventory of the forest biomass, to learn just what he has. Young described such inventories he and at least one Maine land-management firm have done.

Young said he thought wood producers now in pulp production could increase their output by at least 50 percent, given the use of the "complete tree" and the development of an energy market.

Elizabeth Swain of the Maine Audubon Society, which has been studying the Maine market for firewood for residential heating, her two major concerns were developing economical ways to produce firewood of the proper length, and the organization of the market.

"For firewood dealers," Swain said, "existing equipment is only partially satisfactory. It gets the wood from the forest to the road, but most people require fully processed wood, and that is a little beyond the powers of an ordinary skidder."

Her organization is working on a study to determine the past, present and future demand for firewood in Maine. The study also will identify the costs associated with producing firewood, she said.

On a larger scale, Dr. John Fernandes of Cumbustion Engineering, a firm which designs heating systems for industrial plants, described large resource-recovery systems which burn municipal waste, wood chips, and animal waste. The degree to which such systems will apply to New England's energy future, he said, will depend entirely on economics: "when oil goes to $1.50 a gallon," he said, "we'll be able to sell you something for your house."

Young was critical of engineers for "telling us foresters we have to change everything around," but he said the best way to develop new equipment appropriate to energy wood-harvesting would be through government assistance.

"We need the money to get engineers to do the things we need to make energy available. The key to the tremendous biological potential in the forest is equipment," Young said.

Responding to those who contend that utilizing the complete tree, from roots to needles, would deplete the soil, Young said his research indicated that the merchantable bole (which is now harvested commercially, leaving the rest of the tree behind) accounted for 50 percent of the nutrients in the tree.

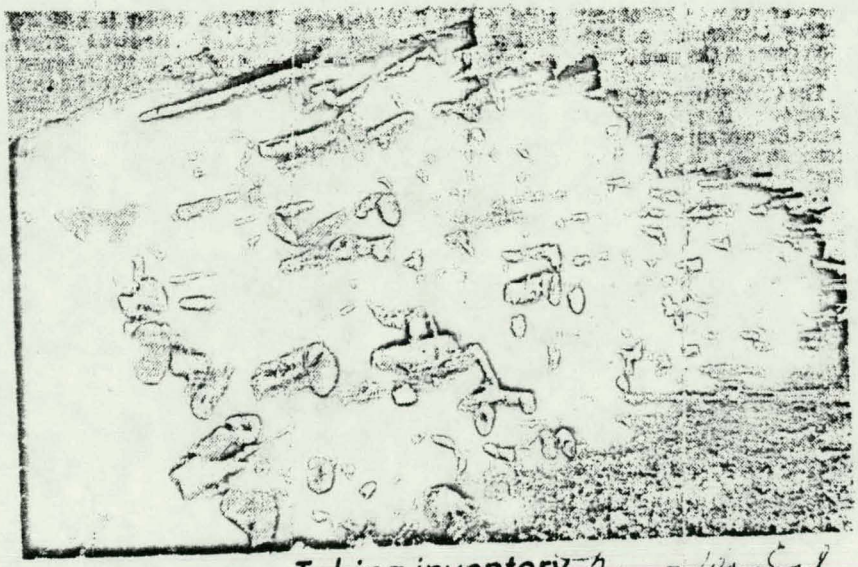
APR 29 1978

"We should replace what we take out," Young said, adding that wood-producers "should be more like farmers."

Kirk Brown of Prince Edward Island described a government experiment there which showed that wood chips could be produced from waste trees for about $15 per ton, wet. The same plot which was clearcut using existing technology, also produced 17 cords of saw timber, principally studs, per acre.

"The wood chips were competitive with oil on a cost-per-btu basis," Brown said, "but of course there would be added costs for equipment in a wood-burning operation, plus transportation.

Asked about the market for the wood chips produced in the experiment, Brown responded that the market was "a pile at the site."



Taking inventory

Chet Littlefield, administrator of the Bangor Christian School on Outer Broadway, surveys at least 100 cords of hardwood that will be used next winter to heat the school and the Bangor Baptist Church. The church and school have just completed their second winter of wood heating — a program that consumes 200-300 cord of wood per season. (NEWS Photo by Danny Maher)

APR 29 1978

State page - day after conference

Panelists declare wood energy firewood forestry gen.

APR 28 1978

Wood can ease energy crunch

By Dave Platt
Of the NEWS Staff

BOSTON — New England's energy future will depend on a combination of economic and technical factors which are difficult to predict. But experts gathered for a New England - Canadian provinces conference Thursday agreed that as far as wood is concerned, most of the technology is here and what is needed is the organization of a market.

Speakers representing both the large and small perspectives said it's now possible to harvest large quantities of wood for energy purposed economically in both northern New England and the Maritime Provinces, but that the markets don't yet exist to sell it.

One effect the growth of a wood - energy market would have pointed out Prof. Harold Young of the University of Maine, would be a shift in the priorities of large land owners and wood - producers. Now geared to pulp production for the most part, the large landowner in the future will find it increasingly profitable to use more of each tree he cuts. To succeed, Young said, the landowner will need to do a sophistocated inventory of the forest biomass, to learn just what he has. Young described such inventories he and at least one Maine land - management firm have done.

Young said he thought wood producers now in pulp production could increase their output by at least 50 percent, given the use of the "complete tree" and the development of an energy market.

Elizabeth Swain of the Maine Audubon Society, which has been studying the Maine market for firewood for residential heating said her two major concerns were developing economical ways to produce firewood of the proper length, and the organization of the market.

"For firewood dealers," Swain said, "existing equipment is only partially satisfactory. It gets the wood from the forest to the road, but most people require fully processed wood, and that is a little beyond the powers of an ordinary skidder."

Her organization is working on a study to determine the past, present and future demand for firewood in Maine. The study also will identify the costs associated with producing firewood, she said.

On a larger scale, Dr. John Fernandes of Combustion Engineering, a firm which designs heating systems for industrial plants, described large resource - recovery systems which burn municipal waste, wood chips, and animal waste. The degree to which such systems will apply to New England's energy future, he said, will depend entirely on economics: "when oil goes to $1.50 a gallon," he said, "we'll be able to sell you something for your house."

Young was critical of engineers for "telling us foresters we have to change everything around," but he said the best way to develop new equipment appropriate to energy wood - harvesting would be through government assistance.

"We need the money to get engineers to do the things we need to make energy available. The key to the tremendous biological potential in the forest is equipment," Young said.

Responding to those who contend that utilizing the complete tree, from roots to needles, would deplete the soil, Young said his research indicated that the merchantable bole (which is now harvested commercially, leaving the rest of the tree behind) accounted for 50 percent of the nutrients in the tree.

"We should replace what we take out," Young said, adding that wood - producers "should be more like farmers."

Kirk Brown of Prince Edward Island described a government experiment there which showed that wood chips could be produced from waste trees for about $15 per ton, wet. The same plot, which was clear-cut using existing technology, also produced 17 cords of saw timber, principally studs, per acre.

"The wood chips were competitive with oil on a cost - per - btu basis," Brown said, "but of course there would be added costs for equipment in a wood - burning operation, plus transportation.

Asked about the market for the wood chips produced in the experiment, Brown responded that the market was "a pile at the site."

MORNING SENTINEL
Second Section

Audubon's Wood Fuel Program Aids 50 Kennebec Landowners

By PHILIP NORVISH
Sentinel Staff

More than 50 small landowners in Kennebec County have received assistance this winter from a firewood specialist working with the Maine Audubon Society's Wood Fuel Program.

Peter Klachany of Augusta explained that the purpose of the program which began last fall, is to provide management assistance to small woodlot owners in managing their woodlots for firewood production.

A registered professional forester, Klachany said upon request he will go out to a woodlot, and walk it with the owner to see what there is.

"I'LL TALK WITH the owner to see how to improve the lot with the harvesting of firewood," he said. "I'll also mark trees that could be harvested for firewood for the owner."

The program came about in response to the rising demand for firewood. It is geared to the owners of small woodlots, five to 15 acres in size.

If an owner has a volume of commerically saleable wood, he will be referred to the Kennebec County Service forester, Kalchany said.

He will also explain the Agricultural Stabilization Conservation Service's (ASCS) cost-share programs, in which the ASCS will pay part of the cost for timber stand improvement work such as pruning, weeding, cleaning and thinning.

KALCHANY HAS advised owners about managing their lots for wildlife and recreational purposes.

One part of the Wood Fuel Program is to survey firewood producers in Kennebec County to determine the locations and whether the supply of firewood is being managed to meet the demand for wood.

Another part of the program will be a statewide homeowner survey to pinpoint present and anticipate future consumption of fuelwood in Maine. Results of the survey will be made known following its completion next September.

A marketing analysis will also be conducted to analyze the costs and profits associated with producing firewood, Klachany, an employee of the Comprehensive Employment and Training Act, said.

IN ADDITION TO advising small woodlot owners on meeting their home heating needs, the firewood specialists can help consumers save money on their fuel bills by providing information on wood burning equipment, BTU ratings, insulation and alternate energy.

"We ask for $5 to help meet the costs of paint and equipment used on the job," he said.

Klachany observed that each lot he has seen has its own problems, "but most can be improved upon. Many people don't understand which trees should be cut for firewood and which should be reserved for crop trees for future growth."

He said he is trying to educate Kennebec County residents about basic forest management. "I'm glad to advise them on the removal of poor quality stems (trees) in the woodlot for firewood, leaving behind the better quality trees to mature and appreciate in value.

HE WORKS WITH THE Kennebec County Service forester on cost share programs, on timber stand improvement, and in the marking of wood in commercial harvesting operations.

Knowledgeable on the subject of woodburning stove safety, Klachany said oaks and beech are the best burning woods. He also expects the price of fire wood to continue to rise.

While most of his work has been in the southern part of the county, Klachany has assisted several landowners in Sidney and is scheduled to talk to a Winslow resident next week.

One of six firewood specialists working in six southern Maine counties, Klachany may be contacted at 23 First Ave., Augusta, or at the Maine Audubon Society, 118 U.S. Rte. 1, Falmouth, Me. 04105.

a four group that was part of the ... program at the college. The home being ... the latter. (NEWS Photos by Chris Spruce).

Need marketing techniques to meet firewood demand

5/13/78

By David Platt
Of the NEWS Staff

The growing interest in heating with wood has revealed a major problem: the lack of a well developed market in the wood energy area.

Sellers of firewood find themselves in a market dominated by the pulpwood industry, which largely dictates prices and determines where most of the wood cut each year goes.

Buyers of firewood, likewise, confront a market which isn't geared to their needs. Looking for the right source of firewood generally boils down to asking neighbors and friends, searching the classified ads and dealing with the woods operator who find it profitable to sell his wood for home consumption rather than as pulp.

Given the rising price of oil and the ready availability of wood in Maine, it's likely that the firewood market will develop significantly during the next few years.

That is the assumption of the Maine Audubon Society, which has commissioned a year-long study of the firewood market in the state. The society expects to release a report soon, and presented a preview at a recent New England energy conference in Boston.

Elizabeth Swain of Maine Audubon described the survey as focusing principally on firewood consumption by residential users in six southern Maine counties.

The idea of the study, which was limited to residential firewood consumption, was to "try to help the supply better meet the demand, and to improve the resource," Swain said.

It was funded by the U.S. Department of Energy and the Maine Office of Energy Resources.

Dr. Harold Young, a forest-biomass expert at the University of Maine believes it is only a matter of time before the production of energy becomes a major interest of the state's major landowners.

These landowners, presently producing wood for paper, are investigating the possibilities of becoming more diversified, according to Young.

"Now they're mill-based companies," he said recently. "They're becoming land-based."

Young also spoke at the energy conference in Boston, which was jointly sponsored by the New England Regional Commission and the Eastern Canadian Provinces. His remarks there focused on the technology required to harvest complete trees, so that their energy potential, as well as their potential for producing lumber and pulp, could be realized.

Young pointed out that in Norway, as well as at several Maine paper mills, chips, bark and scrpas, already account for a significant amount of the energy produced for heating.

Just this week Scott Paper Co. in Winslow asked the U.S. Department of Energy for permission to convert to burning wood rather than coal in one of its boilers.

The Cooperative Extension Service of the University of Maine is presenting a special program May 18 on wood-waste burning for steam production.

Richard Hill of the University of Maine's Department of Industrial Cooperation, who chaired the wood-energy discussion at the Boston conference, wrote in a pre-conference report that "surprisingly enough, there are no major engineering problems associated with using wood energy in its various forms.

Off the shelf equipment with modifications can be used."

But Hill also noted the marketing problem: "Large scale use of wood necessitates large scale marketing of wood. Presently wood sellers are small businessmen that lack sophistocation and coordination to match the supply with need. The result is an unpredictable supply and rising prices."

Hill suggested that inventories might help, along with improved forest management and harvesting techniques.

A Massachusetts firm's plans to publish a "Waste Wood Resource Directory" indicate that the private sector may be getting interested in sophistocated marketing of wood fuel.

The firm, the G. and S. Mill of Northborough, Mass., plans to publish the directory this year.

For $7, a supplier gets a listing in the directory and a copy of the directory.

The company, which manufactures and markets wood-fired furnaces and stoves, says the directory's purpose is "to help users and suppliers of wood locate each other, thereby making wood in all its forms as readily and reliably available as other fuels."

The directory will contain information about cordwood suppliers, waste-wood suppliers and the amounts they have available per week at different times of the year.

should have high priority is caring for aluminum storm windows and screens.

Poorly constructed windows can nullify much of a home's insulation, with resulting heat loss as high as 40 per cent.

According to the U.S. Government Committee on Fuel Conservation, storm windows are the biggest heat-and money-savers; they return about 13 per cent or more savings on monthly fuel bills.

Here's how to care for your storm windows and screens so you can ensure that they will save money for you this winter:

Before setting the windows and screens in place for the season, remove, clean, and carefully check them for repairs.

Outdoors is the most ideal place to wash your windows and screens, but the bathtub will also give you enough room to do a good job.

Begin by brushing the screens and aluminum frames to remove the dust and caked-on dirt. If you notice troublesome rust spots, rub them gently with a wet rag so as not to scratch the frames. Pitted surfaces can be cleaned with naval jelly; it's brushed on, then wiped off with a clean rag.

To clean away greasy grime and soot, scrub surfaces with a good, stiff-bristled brush and a solution of industrial-strength cleaner and hot water. Be sure to rinse them well with clear water or , if possible,

Tips for dishwashing

Operate your dishwasher with a full load of dishes.

Load the dishwasher correctly in order to ensure operating efficiency.

Debris in the dishwasher pump can hamper the machine's efficiency. Scraping excess food from plates before putting them in dishwasher can prevent this accumulation. Also check the filter screen over the drain in the dishwasher regularly and remove any food particles.

Use the correct amount of detergent necessary to soften the water and clean dishes without overloading with suds.

WORKPLAN ACCORDING TO CHEATHAM

Principles:

1. It is desirable to preserve the positive aspects of the present situation in firewood production, which are:

   (a) easy producer entry into and exit from the industry

   (b) low capital and overhead

   (c) diffuse industry - small producers

2. It is desirable to mitigate the negative aspects of the present situation in firewood production, which are:

   (a) non-distinct price levels

   (b) widely time-variant price levels

   (c) high capital cost of processing and delivery

   (d) scarcity of, or difficult to reach stumpage

   (e) unstable cash flow, difficulty of attracting capital

   (f) high storage costs

Therefore,
3. A marketing mechanism should be established, whereby

   (a) high capital and overhead costs are transferred, to the extent possible, from primary producers to the mechanism

   (b) the mechanism should be scaled large enough to

      (1) afford capital economies (be sufficiently stable to attract capital)

      (2) absorb storage costs

      (3) absorb wide fluctuations in supply

      (4) offer stable price levels to both primary producers and consumers

Primary supply (stumpage) problems need to be examined. Small (weekend) operators need access to stumpage. Lack of access puts them at a competitive disadvantage to larger, well established operators; full-time pulp cutters, for instance. A marketing mechanism created in the absence of some provision for public access to stumpage would be useful only to large operators, who would negotiate for stumpage with landowners as they always have, and sell a portion of the product as firewood depending on relative firewood-pulp prices and other market forces. Weekend operators would be denied access to the market because of lack of capital, no longevity in the business, no leadership. It is as essential to create a sound forest management policy that provides uncomplicated access to stumpage as it is to include small operators in any firewood marketing strategy. Such policy might include:

(a) access to public lands for small producers

(b) trained service forester (either State or hired and paid by the marketing mechanism) to act as go-between, supervisor and contract negotiator on behalf of small producers for stumpage on private land.

(c) involvement of small operators, through the offices of the marketing mechanism, in State-sponsored TSI work on private land, wherein removal of weed trees by the small operators is written into the State contract.

Workplan:

1. Determine minimum capital requirements for firewood production.

2. Determine average costs per unit of production.

3. Determine 'breakeven' price per cord (for small producer) which would cover all costs.

4. Evaluate and compare primary producer capital requirements vis a vis alternate marketing strategies, including:

High
to
Low

- Wood listing service
- Appending firewood processing to existing bulk wood buyers (pulp mills, etc.)
- Door-to-door firewood processing service
- Investor-owned concentration (processing and delivery) yards

EXHIBIT V

GOOD PUBLICATIONS

Bibliography

1. Tree Classification - Terry C. Pader, Penn. State University.
2. Water-forest Originated - Terry C. Pader, Penn. State University.
3. Maine Tree Farm Program - Wilbur Wolf, Carlisle, PA.
4. How You Can Become A Tree Farmer - American Forest Inst., Washington, D.C.
5. Small Woodlot Management - U.M.O. Coop. Ext. Service, Orono, Maine.
6. When To Gather Tree Seeds - U.M.O. Coop. Ext. Service, L.P. Bissell.
7. M.F.S. Tree Pruning Information.
8. Use of Sodium Arsenate - M.S.F. Forest Management Division.
9. Woodlot Management Available To You - M.S.F. Division.
10. Improve Your Woodlot By Cutting Firewood - U.S.D.A., N. Fast Upper Darby, PA, Ken Lancaster and Clyde Hunt.
11. Obtaining Tree Seedlings For Reforestation - State Department of Forestry, State Forest Nursey, Greenbush, Maine.
12. Forest Tree Pruning Guide - Coop. Ext. Service, Univ. of Mass., Pub. #361.
13. Thinning Forest Stands - Coop. Ext. Service, Univ. of Mass., Pub. #367.
14. Is Nature Always Right - U.S.D.A., June 1974.
15. How Profits Are Left In The Woods - U.S.D.A., 1975.
16. Tree Farm News - Winter 1978.
17. Timber Harvesting And Forest Aesthetics - Coop. Ext. Service, Univ. of Mass., Pub. #440.

18. The Maine Forest - The Use And Conservation Of Our Natural Resources - Coop. Ext. Service, U.M.O. Orono, Maine.

19. Un-even Aged Management Of Northern Hardwoods In New England - Forest Service, U.S.D.A.

20. Woodlands, Highways And People - John H. Noyes, Coop. Ext. Service, Univ. of Mass., Publ. #33, February 1969.

21. Forest Ownership For Pleasure And Profit - by Hardly L. Shirley and Paul F. Graves, Syracuse University Press, Syracuse, N.Y. 1967.

Baumback, Clifford M. How To Organize and Operate a Small Business Prentice-Hall Inc., Englewood Cliffs 1973.

Frantz, Forrest H. Successful Small Business Management Prentice-Hall Inc.,Englewood Cliffs 1978.

Kohls, Richard L. Marketing of Agricultural Products Macmillan Company, New York 1972.

Lipson, Harry A. Introduction to Marketing John Wiley and Sons, New York 1972.

Mulford, Walter. The Management of Farm Woodlands McGraw Hill, New York 1939.

Rotch, William. Management of Small Enterprises University Press of Virginia, Charlottesville 1967.

Stasch, Stanley F. Systems Analysis for Marketing Planning and Control Scott, Foresman and Company, Glenview 1972.

Wish, John R. The Consumer Prentice-Hall Inc., Englewood Cliffs 1978.

BIBLIOGRAPHY

John Viele — Chapter Six: _____ and the Installation and Operation of your Woodstove

Books

Shelton, Jay. The Woodburners Encyclopedia (Vermont Crossroads Press, Westfield, Vermont) 1976.

NFPA STANDARDS

NFPA Standard No. 211, Chimneys, Fireplaces, and Vents.

NFPA Standard No. 89M, Heat Producing Appliance Clearances

NFPA
470 Atlantic Ave.
Boston, Massachusetts 02210

Various Pamphlets on the Subject from UMO Extension Service, FmHA, Insurance companies.

Letters from Insurance Companies.

Booklet: Burning Wood, Northern Regional Agricultural Engineering Service of Cornell University, Ithaca, N.Y., 1977.

Periodical: Smoke Detectors, Consumer Reports 41 (Oct. 1976) pp 555-559.

REFERENCES, FURTHER READING:

Forest Trees of Maine, Me. Forestry Dept., Bull. 24, 1968.

WHY TSI?, Forest Service Dept., 1969.

Mills, Brooks. Forest Mft. at Edgewood Tree Farm, Farmstead Mag., Fall 1976.

Noyes, J. H. Timber Harvesting & Forest Aesthetics, Cooperative Extension Publication #440, Coll. of Ag., U. Mass.

Lancaster, K., & C. Hunt. Improve Your Woodlot by Cutting Firewood, USDA Forest Service, N.E. Area.

Bulger, J. From Stump to Stove, Farmstead Mag., Fall 1977.

Dimmick, R. S., & G. G. Mark. Managing the Family Forest, USDA Forest Service, Farmers Bulletin 2187, 1962, 1971.

Leak, N. B., & S. M. Filip. Uneven-age Management of Northern Hardwoods in New England, USDA Forest Service.

Minckler, L. S. Hardwood Ecology, Environmental Forestry for the Small Owner, Syracuse U. Press, 1975.

Bruce, R. W. Logging Managed Forests, Washington State U., 1966.

Ferguson, R. H., & N. P. Kingsley. The Timber Resources of Maine, USDA Forest Service Bull. NE-26, 1972.

Dickson, Alex. Growing Trees for Timber in N. Y.'s Small Woodlands, Cornell U. Information Bull. 67, 1973.

CREOSOTE AND CHIMNEY FIRES BIBLIOGRAPHY

The Woodburners Encyclopedia
Jay Sheldon & Andrew B. Shapiro
Vermont Crossroads Press 1976

Safe Installation and Use of Wood Stoves
Robert W. Martin
U. Mass. Cooperative Extension Service, U.S. Dept. of Agri. & County Extension Services cooperating

Suggested Procedure for Installation of Woodburning Stoves
by ??
Maine Bonding & Casualty Co.

Fireplaces and Chimneys
Farmers Bulletin #1889 U.S. Dept. of Agriculture

Wood Stove Installation & Operation
Farmers Home Administration (almost identical to pamphlet from Maine Bonding & Casualty)

Burning Wood
L. D. Baker, J. W. Bartok, L. S. Hamilton, J. P. Lassoie, E. L. Palmer, D. W. Taber, & S. A. Weeks
Northeast Regional Agricultural Engineering Service 1977

The Chimney Brush
Eva Horton
Krista Associates (published(1977

Woodburning Stoves for Modern Home Heating
Eldridge R. Collins, Jr.
Energy Management Series #752, U.S. Dept. of Agriculture

Heating With Wood
Larry Gay
Garden Way Publishing, Charlotte, Vermont 05445 1974

The Woodburners Handbook
David Havens
Harpswell Press, Brunswick, Maine 1973

The Cause, Control and Cure of Creosote Deposits with Automatic Woodburning Equipment
Riteway Manufacturing Co., Waynesboro, Virginia

And So You're Thinking About Wood for Fuel
David M. Boothe & Frank Newell
Ohio Forestry Assocation Annual Meeting

Dirk S. Thomas. If you Would Cut Wood, Country Journal 2:10, 34-37, October 1975.

Dirk S. Thomas. Felling a Tree, Country Journal 4:10, 57-63, October 1977.

Dirk S. Thomas. How to Choose a Chainsaw, Country Journal, 4:10, 64-71, October 1977.

Thomas A. Rumpf, Safety in Logging, Cooperative Extension Service, Univ. of Mass.

Forestry Notes, Cooperative Extension Service, Univ. of Maine at Orono. (sources of safety equipment)

Rockwell Stephens, Axes and Chainsaws, Use and Maintenance, Garden Way Associates, Inc., Charlotte, Vermont, 1977.

John Vivian, How to Select, Cut and Season Good Firewood, Customer Service Dept., Stihl Inc., Virginia Beach, Virginia, 1977.

EXHIBIT VI

WOOD WORKSHOP LIST

CO-CHAIRMAN

Richard Hill
Boardman Hall
University of Maine
Orono, ME 04473

CO-CHAIRMAN

C. Kirk Brown
Institute of Man & Resources
P.O. Box 2008
Charlottetown, Prince Edward Island
CIA IA4

Larry D. Bogan
Ecology Action Centre
P.O. Box 753
Wolfville, Nova Scotia
BOP IXO

Sandra J. Bodmer-Turner
Mass. Energy Policy Office
73 Tremont Street
Boston, MA 02108

J. M. Kittelson
International Paper Co.
220 East 42nd Street
New York, NY 10017

Gary Allison
President
Wheelbrator Clean Fuel Corp.
Liberty Lane
Hampton, NH 03842

R. E. Hanusiak
Deputy Minister
Department of Natural Resources
P.O. Box 6000
Fredericton, New Brunswick

Gerald G. Dawbin
Office of Energy Resources
55 Capital Street
Augusta, Maine 04330

Emery M. Fanjoy
Secretary
Council of Maritime Premiers
P.O. Box 2044
Halifax, Nova Scotia
B3J 2Z1

Richard A. Farley
Adviser, Alternative Energy Policy
Department of Mines and Energy
95 Bonaventure Avenue
St. John's, Nfld.
A1C 5T7

George T. Felbeck
Dept. of Science & Tech.
Nutrition & Dietetics
121 Woodward Hall
University of R.I.
Kingston, R.I. 02881

Dr. John H. Fernandes
Combustion Engineering, Inc.
1000 Prospect Hill
Windsor, CT 06095

Elmer L. Gaden, Jr.
University of Vermont
Burlington, Vermont 05401

David Gosselin
Wheelabrator-Frye, Inc.
Liberty Lane
Hampton, N.H. 03842

John Hutchinson
N.S. Research Foundation
P.O. Box 790
100 Fenwick Street
Halifax, Nova Scotia

Mr. Doug C. Inkster
Director Energy Resources
Dept. of Mines and Energy
P.O. Box 4750
St. John's, Newfoundland

WOOD WORKSHOP LIST (CONT.)

Robert Kasvinsky
Senior Staff Associate
New England River Basins Comm.
53 State Street
Boston, MA 02106

Dr. Dennis L. Meadows
Thayer School of Engineering
Dartmouth College
Hanover, NH 03755

Curtis Mildner
New England Regional Commission
53 State Street
Boston, MA 02109

John M. Nystrom
Northeast Solar Energy Center
70 Memorial Drive
Cambridge, MA 02142

Abbie Page
MITRE Corporation
P.O. Box 208
Bedford, MA 01730

Pierre O. Perron
Centre Recherche Industrielles
Du Quebec
333 Rue Franquet
Ste. Foy, P.Q. G1V 4CD

Robert E. Philpott
Department of Energy, Region I
150 Causeway Street
Boston, MA 02114

Tom Quink
Department of Envir. Mgt.
Division of Forest and Parks
100 Cambridge Street
Boston, MA 02202

John Joseph
Director
Office Energy Resources
55 Capital Street
Augusta, Maine 04330

William W. Rice
Professor Wood Science & Tech
University of Massachusetts
126 Holdsworth Hall
Amherst, MA 01003

Dr. John G. Riley
Dept. of Agriculture Eng.
University of Maine
Orono, ME 04473

P. Carey Ryan, P. Eng.
Nova Scotia Energy Council
P.O. Box 1087
Halifax, Nova Scotia
B3J 2X1

Gilles Saint-Hilaire
Direction Energies Nouvelles
1305 Chemin Ste-Foy
Quebec, G1S 4N5

Robert H. Shropshire, Pres
Wood Producers Association of CT
P.O. Box 368
Litchfield, CT 06759

Dr. John G. Sinclair
Seven Islands Land Co.
15 Columbia Street
Bangor, Maine 04401

Elizabeth W. Swain
Maine Audubon Society
118 Old Route 1
Falmouth, ME 04105

Allen Turner
Vermont State Energy Office
Pavilion Office Building
Montpelier, Vermont 05602

R. E. Tweeddale
Consulting Engineer
ADI, Lt.
P.O. Box 44
Fredericton, New Brunswick
EOH 150

WOOD WORKSHOP LIST (CONT.)

James E. Wilkinson, Jr.
Commissioner
Forests, Parks and Recreation
Vermont Environmental Agency
Montpelier, Vermont 05602

Dr. Harold E. Young
Professor of Forest Resources
233 Nutting Hall
University of Maine
Orono, ME 04473

David Murphy
Pres. P.E.I. Branch
Solar Energy Society of Canada
Crapaud, R.R. #1
P.E.I. COA 1JO

John Sheehan
Maritime Energy Coalition
158 Odell Avenue
Fredericton, New Brunswick

Chris Hutchins
Maine Wood Fuel Corp.
84 Harlow
Bangor, Maine 04401

James Hornby
R.R. #1 Hunter River
Cavendish
Prince Edward Island

Norman VanderNoot
Governor's Council on Energy
26 Pleasant Street
Concord, NH 03301

Thomas F. Weaver
Dept. of Resources & Economics
136 Woodward Hall
University of R.I.
Kingston, R.I. 02881

GOOD AFTERNOON

I HAVE BEEN ASKED TO SAY A FEW WORDS ABOUT HARVESTING AND TRANSPORTATION. SINCE I KNOW RELATIVELY LITTLE ABOUT HARVESTING EQUIPMENT I CAN BE QUITE BRIEF ON THAT SUBJECT. TRANSPORTATION, HOWEVER, OPENS A CAN OF WORMS, SO I WILL ADDRESS THAT IN A MORE INVOLVED FASHION.

HARVESTING OF WOOD, AND I WILL SPEAK ONLY ABOUT FIREWOOD, EXISTS ENTIRELY IN THE CONTEXT OF FOREST MANAGEMENT. INDEED, IN MOST CASES, HARVESTING COMPRISES THE ONLY FORM OF FOREST MANAGEMENT BEING PRACTICED ON MOST PRIVATELY OWNED LOTS. SO THE WAY IN WHICH HARVESTING IS ACCOMPLISHED IS VITALLY IMPORTANT TO THE FUTURE PRODUCTIVITY AND HEALTH OF THE STAND.

WE ALL KNOW THAT HARVESTING FIREWOOD CAN AND SHOULD IMPROVE THE OVERALL QUALITY OF A WOODLOT. THE CHALLENGE IS TO DEVISE A PROGRAM, SYSTEM OR SERIES OF INCENTIVES TO INSURE THAT THE LANDOWNER IS A CONSCIENTIOUS TENANT OF THE PROPERTY. THIS IS A SOCIO-ENVIRONMENTAL ISSUE, AND I WILL TALK ABOUT THE WAY WE AT MAINE AUDUBON ARE ADDRESSING THIS ISSUE IN A FEW MINUTES.

FROM MY POINT OF VIEW AS ADVOCATE FOR THE FIREWOOD CONSUMER AND SUPPLIER, AS WELL AS THE FOREST RESOURCE, THE TWO MAJOR HARVESTING CONCERNS ARE THE NEED TO DEVELOP WAYS FOR THE FIREWOOD (HERETOFORE OFTEN PULPWOOD) DEALER TO ECONOMICALLY TRANSFORM TREE LENGTH WOOD TO SALABLE FIREWOOD, AND THE NEED FOR NEW (OR OLD) SMALL SCALE EQUIPMENT TO BE INTRODUCED TO LANDOWNERS WHO WISH TO DO A RESPONSIBLE FIREWOOD HARVEST ON THEIR PROPERTY.

FOR FIREWOOD DEALERS, EXISTING EQUIPMENT IS ONLY PARTIALLY SATISFACTORY. WHILE THE SKIDDER IS A MOST VALUABLE PIECE OF EQUIPMENT, IT ONLY MEETS HALF OF THE FIREWOOD PRODUCER'S NEEDS. IT GETS THE WOOD FROM THE FOREST TO THE ROAD, BUT MOST PEOPLE STILL REQUIRE FULLY PROCESSED WOOD, AND THAT IS A LITTLE BEYOND THE POWERS OF AN ORDINARY SKIDDER. WHAT IS NEEDED IS MACHINERY TO TRANSPORT AND TRANSFORM TREE LENGTH WOOD TO THE SPECIFICATIONS AND LOCATION WHERE CONSUMERS CAN PURCHASE IT.

FOR LANDOWNERS, WHO WANT TO CUT THEIR OWN WOOD, THE DIFFICULTIES ARE EVEN GREATER. EQUIPMENT USED FOR PULP OPERATIONS IS OFTEN UNSUITABLE OR UNDESIRABLE IN THE BACK FORTY. RUMOR HAS IT THAT SMALL SCALE EQUIPMENT DOES EXIST IN SCANDINAVIA, AND I WOULD HOPE THIS COULD BE IMPORTED AND/OR MODIFIED TO MEET THE NEEDS OF NEW ENGLAND WOODLOT OWNERS. AT PRESENT, THE HORSE IS BEING REDISCOVERED WITH CONSIDERABLE SATISFACTION.

NOW FOR THE TOPIC OF TRANSPORTATION. FOR FIREWOOD PURPOSES IT IS IMPOSSIBLE TO TALK ABOUT TRANSPORTATION WITHOUT RAISING THE QUESTION OF MARKETING. SO I WILL POSE SOME QUESTIONS AND PROBLEMS ASSOCIATED WITH MARKETING FIREWOOD.

AS DICK HILL MENTIONED IN THE INTRODUCTORY SYNOPSIS HE SENT US, MOST FIREWOOD PRODUCERS ARE SMALL BUSINESSMEN WHO ARE NOT GEARED UP TO THE DEMANDS INHERENT IN A BURGEONING COMPLEX MARKET. IN ADDITION, THERE IS SOME QUESTION AS TO WHETHER MANY OF THEM TRULY want to expand and organize their PRESENT BUSINESS, USUALLY PULPWOOD, TO INCLUDE A FIREWOOD COMPONENT. HOWEVER, OUR TASK IS TO TRY TO ADDRESS THE NEEDS OF THOSE PRODUCERS WHO DO WANT TO ENTER THE FIREWOOD MARKET.

THE FIRST AND MOST OBVIOUS QUESTION CONCERNS THE ACTUAL MARKET FOR FUELWOOD. HOW MANY PEOPLE ARE BURNING WOOD, HOW MUCH WOOD DO THEY WANT TO PURCHASE, AND IN WHAT FORM? WITHOUT AN UNDERSTANDING OF THE DEMAND FOR FUELWOOD, FIREWOOD PRODUCERS ARE AT A LOSS AS TO HOW TO MEET THAT DEMAND.

HOWEVER, THIS QUESTION IS ANSWERABLE. IN FACT, SEVERAL OF THE NEW ENGLAND STATES, INCLUDING MAINE, HAVE INITIATED STUDIES TO DETERMINE THE PAST, PRESENT AND FUTURE DEMAND FOR FUELWOOD. AT MAINE AUDUBON, WE ARE JUST COMPLETING A STATEWIDE SURVEY WHICH ADDRESSES NOT ONLY THE BARE DEMAND FIGURES, BUT ALSO SEEKS INFORMATION ON SUCH SUBJECTS AS PRIMARY AND SECONDARY SOURCES OF HEAT, AMOUNT OF INSULATION, INCOME LEVEL, REASONS FOR BURNING WOOD, AND MANY OTHERS.

THE SURVEY HAS PRODUCED SOME FASCINATING RESULTS, AND WE ARE LOOKING FORWARD TO RUNNING SOME CROSS-TABS AND RELEASING THE DATA PUBLICLY QUITE SOON. THIS SURVEY IS PART OF MAINE AUDUBON'S WOOD FUEL PROGRAM, FUNDED BY THE POWER SYSTEMS DIVISION OF THE D.O.E. AND THE MAINE OER.

A SURVEY LIKE THIS IS OF ENORMOUS BENEFIT TO THE STATE ENERGY AND FORESTRY OFFICES, TO THE PUBLIC AND TO FIREWOOD PRODUCERS. I STRONGLY RECOMMEND THAT IT BE UNDERTAKEN IN THOSE STATES WHICH ARE STILL IN THE DARK ABOUT THEIR FIREWOOD CONSUMPTION.

WITH THE QUESTION OF THE EXTENT OF FIREWOOD DEMAND ANSWERED, OR ANSWERABLE, THE NEXT ISSUE TO RESOLVE IS THAT OF FIREWOOD SUPPLY. ALTHOUGH IT COULD BE THE CASE IN MAINE, I HAVE NOT HEARD THAT--PULP OR FIREWOOD DEALERS ARE HAVING A HARD TIME BUYING STUMPAGE. INDIVIDUALS WHO WISH TO CUT FOR ONLY THEIR YEARLY WOOD HEAT REQUIREMENTS ARE HAVING A HARD TIME BUYING SMALL AMOUNTS OF STUMPAGE IN MAINE. BUT THIS PROBLEM CAN BE SOLVED BY THE STATE ALLOWING CUTTING TO TAKE PLACE ON ITS PUBLIC LANDS, WHICH I EXPECT TO HAPPEN SHORTLY.

THERE ARE THREE KEY ASPECTS TO THE ISSUE OF SUPPLY WHICH MUST BE ADDRESSED. THE FIRST IS THE OVERRIDING QUESTION OF THE REASONABLE ENERGY POTENTIAL OF THE NORTHEAST FOREST RESOURCE. I KNOW THAT THE USFS IS INITIATING A FOREST ENERGY RESOURCE STUDY FOR NEW ENGLAND AND NEW YORK. NO DOUBT THE CANADIAN PROVINCES ARE ALSO GEARING UP FOR THIS SORT OF MASSIVE EFFORT.

SINCE TWO OF THE DISCUSSION GROUPS WILL BE DISCUSSING THE RESOURCE QUESTION IN TERMS OF PRESENT AND POSSIBLE FUTURE FOREST MANAGEMENT STRATEGIES, I WILL NOT GO INTO IT EXCEPT TO SAY THAT RESULTS OF THEIR FINDINGS WILL BE OF SIGNIFICANT IMPORTANCE TO THE OTHER TWO DISCUSSION GROUPS.

ALTHOUGH SCHEMES FOR HARVESTING, TRANSPORTATION, MARKETING AND CONVERSION HAVE A LIMITED USE UNTIL THE FORESTS ENERGY POTENTIAL IS ACTUALLY DOCUMENTED,

THOSE OF US WHO ARE TRYING TO HELP ORGANIZE THE WOOD ENERGY MARKET CANNOT WAIT IDLY FOR THIS DEFINITIVE INFORMATION. ~~WE MUST ACT NOW WITH THE LIMITED INFORMATION~~. WE MUST ACT NOW WITH THE LIMITED INFORMATION AVAILABLE.

THIS BRINGS ME TO THE OTHER TWO ASPECTS OF THE FIREWOOD SUPPLY ISSUE-- THE WOODLOT OWNERS' FIREWOOD MANAGEMENT PRACTICES AND THE NEEDS OF FIREWOOD PRODUCERS THEMSELVES. MAINE AUDUBON IS TRYING TO ADDRESS BOTH OF THESE ISSUES.

IN NEW ENGLAND, AND MOST LIKELY IN CANADA, MUCH OF THE FIREWOOD BEING BURNED IS CUT BY THE HOMEWONER ON HIS OR HER PROPERTY. ALTHOUGH HOMEOWNERS IN THIS CASE ARE CONVENIENTLY FURNISHING THEIR OWN SUPPLY OF WOOD, THE QUESTION ARISES AS TO THE QUALITY OF MANAGEMENT ON THEIR WOODLOT. SINCE THE VAST MAJORITY OF SMALL WOODLOTS ARE PRIVATELY OWNED, INDIVIDUAL LANDOWNERS ARE HAVING A PROFOUND IMPACT ON THE FUTURE SUPPLY OF CORDWOOD AND ALSO HIGHER QUALITY TIMBER.

I BELIEVE IT IS AS IMPORTANT TO DEAL WITH THIS CATEGORY OF WOODLOT OWNER AND MANAGER AS IT IS TO WORK WITH THOSE ALREADY INVOLVED IN SUPPLYING FIREWOOD. AT MAINE AUDUBON WE HAVE HIRED AND TRAINED FIVE CETA-SPONSORED "FIREWOOD SPECIALISTS". THESE FIREWOOD SPECIALISTS ARE AVAILABLE TO SMALL WOODLOT OWNERS IN SOUTHERN MAINE TO COUNSEL THEM ON PROPER MANAGEMENT OF THEIR LAND AND CORRECT FIREWOOD HARVESTING TECHNIQUES. THE PROGRAM HAS MET WITH GREAT SUCCESS.

WE ARE ALSO TRYING TO LEARN SOMETHING ABOUT FIREWOOD PRODUCERS, WHICH IS THE THIRD COMPONENT OF THE WOOD SUPPLY ISSUE I MENTIONED EARLIER. AFTER ALL, FIREWOOD PRODUCERS ARE THE BOTTOM LINE OF ALL THIS TALK ABOUT MARKETING. UNLESS MARKETING STRATEGIES ARE DEVELOPED TO MEET THE NEEDS OF THOSE "MEETING THE MARKET", THE STRATEGIES ARE NOT LIKELY TO BE SUCCESSFUL.

THEREFORE, WE ARE CONDUCTING AN INFORMAL SURVEY OF FIREWOOD PRODUCERS TO DETERMINE HOW THEY ARE HARVESTING AND RETAILING FIREWOOD. THIS INFORMATION WILL IN PUT MAINE AUDUBON'S RESEARCH INTO FIREWOOD MARKETING MECHANISMS.

MARKETING MECHANISMS IS WHAT I ORIGINALLY SET OUT TO DISCUSS UNDER THE HEADING OF TRANSPORTATION, BUT I FELT THE QUESTIONS OF SUPPLY, SUPPLIERS AND LANDOWNERS WERE IMPORTANT TO NOTE BEFORE DELVING INTO ACTUAL MARKETING OPTIONS.

HERE IN NEW ENGLAND WE KNOW THAT THE SUPPLY OF WOOD IS NOT MEETING THE DEMAND FOR HOME-HEATING FUEL. MANY OF US BELIEVE THIS IS ESSENTIALLY A MARKETING PROBLEM. SO, HOW IS FIREWOOD MARKETED PRESENTLY AND WHAT MIGHT MORE APPROPRIATE METHODS BE OF ECONOMICALLY AND EFFICIENTLY MEETING THE DEMAND FOR WOOD FUEL?

LEST I AROUSE YOUR HOPES THAT I CAN ACTUALLY ANSWER THIS COMPLEX QUESTION, LET ME ADMIT THAT ALTHOUGH I KNOW SOMETHING ABOUT PRESENT MARKETING PRACTICES (BASICALLY BECAUSE THERE IS SO LITTLE GOING ON), I DO NOT YET HAVE SPECIFIC FIREWOOD MARKETING SCHEMES TO SUGGEST. NOTICE I USED THE WORD "YET". THE FINAL COMPONENT OF OUR FOUR-PART WOOD FUEL PROGRAM IS AN ANALYSIS OF FIREWOOD MARKETING MECHANISMS SUITABLE TO MAINE. WE ARE JUST BEGINNING WORK IN THIS AREA, USING INFORMATION WE COLLECTED ON THE WOOD SUPPLY AND DEMAND PROFILE FOR MAINE.

OUR PRIMARY TASK IN THE MARKETING ANALYSIS IS TO IDENTIFY THE COSTS ASSOCIATED WITH PRODUCING FIREWOOD. THESE COSTS WOULD INCLUDE EQUIPMENT, LABOR, LAND AND TRANSPORTATION FOR DIFFERENT SIZE OPERATIONS. WITH THESE COSTS, WE CAN START TO RELATE SOME MARKETING STRATEGIES TO DETERMINE UNDER WHICH SCENARIOS THE GREATEST FINANCIAL BENEFIT WOULD ACRUE TO THE FIREWOOD SUPPLIER. MARKETING OPTIONS MIGHT INCLUDE CENTRAL CLEARING YARDS, FIREWOOD COOPS OR COMPLETE WOOD PROCESSING CENTERS. THE POINT TO REMEMBER IS THAT WE MUST DEVELOP INFORMATION WHICH IS USEFUL TO THE FIREWOOD PRODUCERS.

TO SUMMARIZE FOR A MOMENT, I BELIEVE THAT WE ARE NOT YET IN A POSITION TO DESCRIBE WHAT TRANSPORTATION AND DELIVERY METHODS ARE APPROPRIATE TO THE INDUSTRY. FOR THAT MATTER, WE ALSO DON'T KNOW HOW WE CAN OR SHOULD CHANGE

FOREST PRACTICES TO BETTER MEET THE ENERGY NEEDS OF THE REGION. BUT, WE CAN BE CONFIDENT THAT A MEETING LIKE THIS WILL SET US ON THE RIGHT COURSE TOWARD DETERMINING WHAT INFORMATION WE NEED TO MAKE DECISIONS, AND THEN COORDINATING OUR EFFORTS IN GETTING THAT INFORMATION.

NEW ENGLAND REGIONAL COMMISSION
53 STATE STREET
BOSTON, MASSACHUSETTS 02109

May 16, 1978

Wood Workshop

Dear Participant:

First, I would like to thank you for your contributions to a successful conference. We had a very large task to complete in a very short time and although we couldn't go into the problems and solutions to the extent that they deserved, I believe that we achieved a great deal. Now down to business.

As promised, I have enclosed a draft copy of the Final Report. The Co-chairmen and I hope that this is a good blend between the actual discussions and recommendations that came out of the conference and our efforts to present them in a logical, concise and readable form.

We recognize that there are probably omissions and deletions from this report and we request your help in correcting these. Suggestions will be carefully discussed and considered by the workshop cochairment and I.

In order for the final report to be in the Governors and Premiers hands before their meeting in June, it must be sent out during the last few days in May. If we allow time for printing, this brings us back to a deadline of May 24th <u>at the latest</u> for comments.

Please feel free to call (617-223-3750) in your comments if you don't think they will reach me in time. I would most appreciate specific suggestions, such as reworded sentences or paragraphs so that offending sections can be replaced quickly and easily.

I will be looking forward to hearing from you.

Sincerely,

Curtis Mildner

Curtis Mildner
Alternative Energy Resource
Specialist

enclosure

INTRODUCTION

DRAFT

Within the next decade the worldwide scramble for oil will force the use of alternative energy sources along with massive conservation efforts. We believe that wood is one of the most attractive alternatives because it can be used immediately in a wide variety of applications. Of all the solar energies wood is the only one that is also a storage medium, so it has the flexibility of conventional fuels. Importantly, the technology for using wood is well demonstrated and the economics of its use are particularly encouraging.

The region has an enormous forest resource which can be used in an environmentally sound manner to provide a substantial amount of energy. For example, wood could displace more than half the present oil used for space and process heating. The disperse distribution of wood and the dispersed need for space heat make these an attractive match. Space and process heat should obviously be the first priority for wood fuel use. Substantial displacement of oil can also be made in small scale electrical power generation (especially cogeneration) and the eventual production of liquid and gaseous fuels for specialized uses such as transportation. The development of more advanced technologies such as MHD may eventually allow us to use even more of the energy in wood. A conservative estimate is that wood can provide at least 11 percent of the region's total energy needs. This estimate is likely to rise substantially as the sustained limits of the resource become more clearly understood.

Wood is already economically competitive with most conventional sources of energy and it was the consensus of the conferees that wood is even more attractive when its many other benefits are considered.

The use of wood means an increased number of jobs and the circulation of money in a local economy, rather than foreign economies. In addition, using

wood as a fuel is considered by foresters to be an excellent way to upgrade the region's forests which are now in poor shape because of years of underutilization and neglect. Proper harvesting methods can enhance the forests with respect to wildlife benefits and recreational opportunities. The economic advantages of using wood has encouraged the development of a wood fuel industry, and market forces for this development are steadily growing stronger. However, recognizing the urgency of our energy problem, a speeding up of this development through government involvement is desirable. Remarkably, the financial commitment for an effective program may be small as compared with the cost of other energy options. It is obvious that what is needed most is an integrated wood fuel system rather than the fragmented industry which is now emerging. The actions necessary for a successful wood fuel system includes a wide spectrum of activities and interactions.

a) Determine Forest Biomass availability and nutrient balance
b) Determine land ownership patterns and encourage appropriate harvesting
c) Promote good forest multiple use practices
d) Create orderly markets
e) Develop marketing and transportation mechanisms
f) Design safe convenient economical, non-polluting energy schemes
g) Train and assist people to sell, install, and maintain wood burning systems.

Towards the end of creating an integrated wood fuel system, common issues and problems were identified and solutions proposed.

PROBLEMS - RESOLUTIONS

Problem: The region's forests are in poor condition due to underutilization and improper management. Proper harvesting and management could increase yield to many times its current level.

Resolution: Conduct and education program to develop increased pride in managed land and teach proper harvesting and management to landowners.
Develop an extension program to provide professional assistance to plan and manage private wood lots.
Examine financial incentives to encourage proper forest management and sound harvesting technicques.
Create a market for wood chips to provide a use for low quality trees.

Problem: Long term environmental effects of various harvesting schemes must be better understood in order to choose among competing alternatives.

Resolution: Commission an investigation of harvesting effects, especially on nutrient levels and ash disposals.

Problem: The region has an enormous potential energy source in its forests yet the long term value of the resource is difficult to determine because present forest inventories are oriented towards the trunk or bole of the tree rather than total forest biomass.

Resolution: The expansion and revision of forest inventory and yield studies by existing institutions and forest agencies is necessary.

Problem: Lack of information on costs of various harvesting methods under different conditions inhibits development of wood harvesting businesses.

Resolution: Commission economic studies to determine costs and benefits of harvesting under various conditions such as varying terrain, environmental safeguards, silvacultural practices, degrees of mechanization, etc.

Problem: Harvesting equipment for large scale operations is currently in use but this equipment is not suitable for smaller harvesting operations.

Resolution: Commission a Research and Development program to develop smaller, economical and less environmentally damaging equipment for thinning, clearing and chipping. Technology transfer and modification of European equipment may be sufficient.

Problem: Part of the attraction of homeowners to burning wood is the potential saving money by cutting wood themselves. Unfortunately access to wood lots or public land is severely limited.

Resolution: Mandate a program to make public woodlands available to individuals to cut their own wood. Such a program would require funding for roads and careful and competent supervision.

Problem: The current firewood marketing sturcture is loosely organized and unresponsive to either the buyer's or seller's needs. This often creates a disincentive to buying or selling wood.
Wood quantity and quality standards are poorly understood by buyers or sellers leading to instances of consumer fraud.

Resolution: Commission studies to determine appropriate marketing schemes.
Establish quantity and quality standards for wood sales and enforce them.
Conduct information program to inform the public of these standards.

Problem: There is no established wood chip market for buyers or sellers although wood chips are both available and cost effective.
This is because of lack of buyer confidence in the equipment and continuing availability of chips and a lack of seller confidence in a continuing market.

Resolution: Government can help build buyer confidence in wood burning equipment and create a wood chip need by replacing conventional heating systems with wood fueled systems in its buildings, and specifying wood fueled equipment for all new buildings.
This was identified as the key role of government in fostering the use of wood for energy.

Problem: Residential and small scale commercial wood burning equipment in the 100,000 BTU/hr. range which is convenient, safe, and non-polluting, is not readily available.

Resolution: Conduct research development and demonstration efforts should be fostered to develop such equipment.
Establish standards should for the performance, installation and safe operation of such units.

Problem: There are no consistant and uniformly applied safety standards for wood fired residential heating units.

Resolution: Promote standards development, and encourage enforcement.

Problem: Environmental hazards of burning wood in residential application have not been adequately defined.

Resolution: The atmospheric emissions from all types of wood burning appliances should be analyzed to identify the hazards which might arise from widespread use.

Problem: The use of wood as fuel will probably grow faster than the industries needed to service wood burning equipment.

Resolution: Introduce wood burning equipment maintenance instruction in vocational institutes and junior colleges as part of oil burning courses to prepare technicians for coming level of wood use.
Develop teaching equipment and curriculum for wood burning technologies.

Problem: Initial high capital cost of wood burning equipment is sometimes not justified by current oil prices and other factors.

Resolution: Provide tax incentives to businesses and individuals who switch over to wood energy.

FINAL RECOMMENDATIONS

Recommendation: The Governors and Premiers must recognize the growing constraints on the use of oil and to encourage the orderly transition to alternative fuels.

Rationale: A long range commitment to oil could be disasterous due to even higher costs of oil, unstable supply due to possible embargos, a limit to oil available economically, and dollar drain from the two countries.

Recommendation: The Governors and Premiers must recognize that current energy price manipulations and subsidies give conventional energy sources an unfair competitive advantage over alternative energies that is in the long run self destructive.

The Governors and Premiers should support a gradual withdrawal of the subsidies and price controls on conventional fuels. And increased funding for alternative fuels to be phased out when these fuels are no longer at a competitive disadvantage.

Rationale: The pricing policy for oil does not encourage an orderly transition to alternative fuels in that it

1. encourages use rather than conservation due to artificially low prices
2. Treats a dollar spent on foreign oil the same as a dollar spent on domestic energy.

Discussed at the conference were two recourses. Gradually allowing oil prices to rise to world levels to encourage conservation and a special tax on foreign oil to reduce still further the dollar drain, and encourage domestic production. (Tax revenues to go to conservation, alternative energy, and economic hardship programs.)

Recommendation: It should be the policy of the Governors and Premiers to ~~en~~ strongly encourage the use of wood energy.
Such a policy must provide for the needs expressed in the previous section.

Rationale: Every one of the Problem-Resolutions are potential projects that should be investigated and implemented.

Recommendation: It should be the policy of the Governors and Premiers to use existing agencies to implement proposed problem solutions wherever possible.

Rationale: Duplication of effort seems to be the rule rather than the exception. Existing agencies already have an expertise in many of the areas that could help to avoid this duplication.

Recommendation: The Governors and Premiers should each as a group sponsor a task force to determine the progress made towards the problem solutions outlined in this report. The task force should meet frequently to exchange information and to discuss current developments and have the responsibility for keeping the Governors and Premiers informed on progress. This group should have representatives from the State Energy Office, include existing agencies working in the field and other interested parties.

Rationale: The exchange of information was a key part of the conference, and a simple network would be extremely useful towards continuing this information exchange to insure that needs are met and to avoid duplication of effort.

Recommendation: The Governors and Premiers should encourage the use of wood for energy in the following order of priorities:

1.) Space or process heat including residential, commercial and industrial.
2.) Electric power generation.
3.) Liquid-gaseous fuels.

Rationale: Wood supply is dispersed so dispersed uses such as space and process heat are natural matches.

EXHIBIT VII

THAYER SCHOOL OF ENGINEERING
DARTMOUTH COLLEGE · HANOVER · NEW HAMPSHIRE
03755

May 22, 1978

Elizabeth W. Swain
Maine Audubon Society
118 Old Route One
Falmouth, ME 04105

Dear Elizabeth,

The explosion of interest in wood as a substitute for oil in the Northeast has led to the proliferation of conferences, research programs, consulting studies, legislative initiatives, publications, and wood energy engineering efforts. Under the circumstances many efforts duplicate each other while some important research priorities are overlooked.

I am writing to you and several others to learn of your interest in constituting an informal Northest Wood Energy Advisory Council. The organization would have no staff, no budget, and no facilities. Its only resource would be the commitment by each of us to meet at least once every two months for half a day in Boston to discuss mutual interests, acquaint each other with the current work underway in the region, and identify appropriate research priorities. The group would have no legal standing and no power, except that which comes from its members' respect for a good idea clearly expressed. The board would not be allied with any particular organization, and it would be accessible by any group carrying out wood energy efforts in the region who wished to have a sounding board for its ideas. If it is successful, the Council should materially facilitate the exchange of technical information and reduce signficantly the time each of us must spend keeping abreast of developments.

Gordon Deane, Manager of the Alternative Energy/Environment Program within the New England Regional Commisssion, has kindly offered the use of NERCOM's conference room for our bimonthly meetings. I will be pleased to do the minimal administration necessary to organize the agenda for each session and distribute background materials in advance.

One initial item for our agenda would be the thorough technical criticism of Dartmouth's plan for execution of the NERCOM-sponsored project on the market potential for intermediate-sized wood boilers. A briefing sheet has been enclosed for your information. David Garrett, director of the U.S. Forest Service research laboratory in Burlington, is also initiating an extensive program of research on wood energy. He would like to use the Advisory Council to ensure that his program complements other projects. Other members of the proposed Council, also involved in projects on the assessment harvesting, transportation, and/or conversion of wood for energy, have asked to deliver a brief description of their work at the first meeting.

On the enclosed sheet I ask for your response to the above proposal, for some indication of the best time to meet, for the name of your alternate, and a list of the agenda items you would propose for the first few meetings. Please look over the list of people to whom this letter has been sent. You should point out any serious omissions, while keeping in mind the decision to limit Council membership to fifteen. Please give serious consideration of the obligations inherent in Council membership before accepting this invitation. You will have to cover all of your own expenses in connection with the meetings. We may meet monthly at first to deal with the backlog of accumulated business, and absence by you and your alternate at two successive meetings will automatically constitute a resignation from the Council.

Aside from the fact that I would personally enjoy meeting with you from time to time to learn about your current work, I think your insights would contribute significantly to the quality of the Council's discussions. Thus I hope you will be able to participate.

If you have any questions or comments, you should put them at the bottom of the return form or call met at Dartmouth (603) 646-3551. I would hope our first meeting could be early in June.

Cordially,

Dennis Meadows, Director
Research Program on Technology & Public Policy

NORTHEAST WOOD ENERGY ADVISORY COUNCIL

PROPOSED MEMBERS

Dennis L. Meadows
Thayer School of Engineering
Box 8000, Dartmouth College
Hanover, N.H. 03755

Alan Turner
Vermont State Energy Office
Montpelier, Vermont

Gerald G. Dawbin
Office of Energy Resources
55 Capital St.
Augusta, ME 04330

John M. Nystrom
Northeast Solar Energy Center
70 Memorial Drive
Cambridge, MA. 02142

Abbie Page
MITRE Corporation
P.O. Box 208
Bedford, MA 01730

Elizabeth W. Swain
Maine Audubon Society
118 Old Route One
Falmouth, ME 04105

Sam Reddy
Governor's Council on Energy
26 Pleasant St.
Concord, NH 03301

Richard Hill
Boardman Hall
University of Maine
Orono, ME 04473

J. Marvin Kittelson
International Paper Co.
220 East 42nd St.
New York, NY 10017

Sandra J. Bodmer-Turner
Massachusetts Energy Policy Office
73 Tremont St.
Boston, MA 02108

Emily Benoit
Rhode Island Energy Office
80 Dean St.
Providence, RI 02903

Paul Bedrosian
E.P.A. Region #1
J.F.K. Building
Boston, MA 02203

L. David Garret
Northeast Forest Experimental Stations
P.O. Box 968, 705 Spear St.
Burlington, VT 05402

Paul Bofinger
SPNHF
55 State St.
Concord, NH 0330