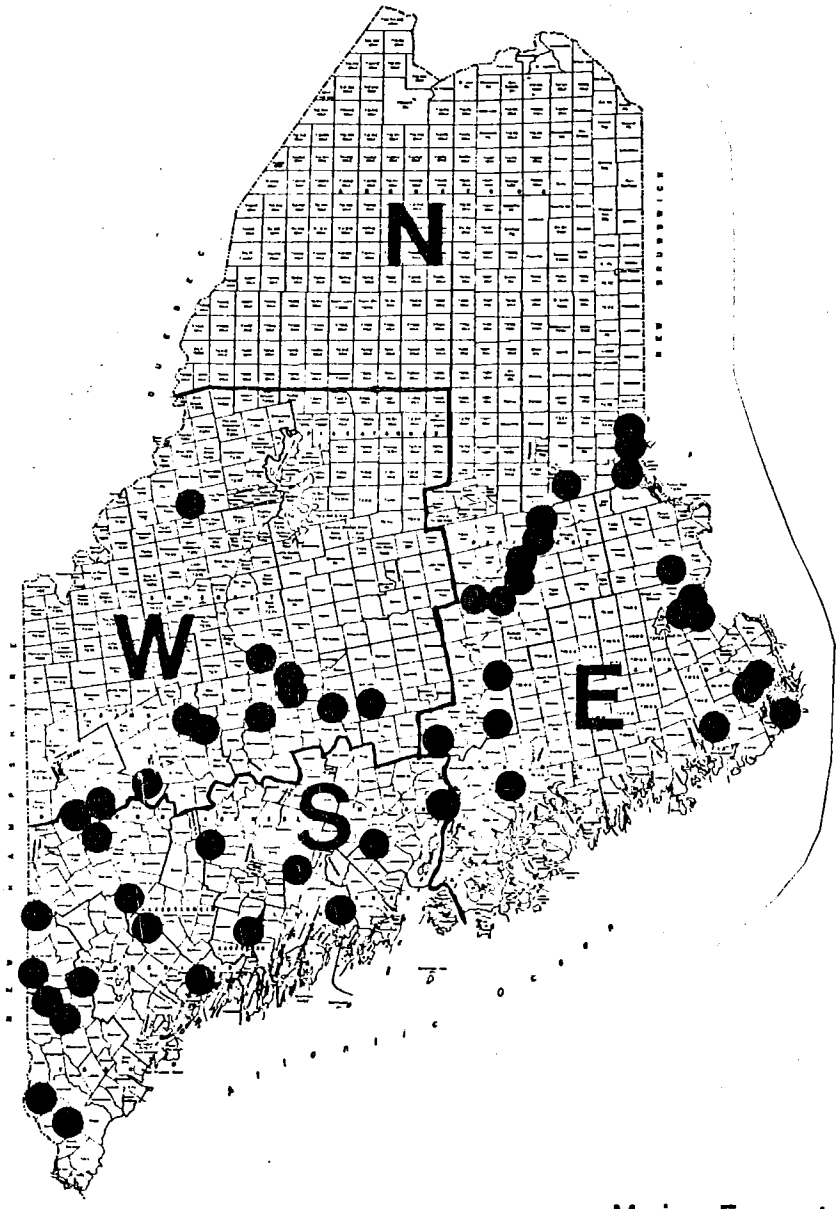
WHOLE TREE CHIPPING OPERATIONS

SURVEY & REPORT

MAINE

1986



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Maine Forest Service

DEPARTMENT OF CONSERVATION

Management & Utilization Division

MAINE FOREST SERVICE

DEPARTMENT OF CONSERVATION

MANAGEMENT & UTILIZATION DIVISION

WHOLE TREE CHIPPING OPERATIONS

SURVEY & REPORT

MAINE 1986

GARY L. MORSE

UTILIZATION FORESTER

MANAGEMENT & UTILIZATION DIVISION

ACKNOWLEDGEMENTS

This report is prepared based on information supplied by the firms performing whole tree chipping in Maine. The information was gathered by the author and Foresters Merle Ring, Peter Lammert and John Dirkman of the Management and Utilization Division, Maine Forest Service. Review of the report was by Vladek Kolman, Division Director, Management & Utilization Division and Marshall Wiebe, Director of Public Information, Department of Conservation.

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INTRODUCTION

This report updates the Whole Tree Chipping Operations Survey and Report, Maine 1985. Readers are encouraged to obtain a copy of the 1985 report from the Maine Forest Service, State House Station #22, Augusta, ME 04333, telephone 289-4980. The 1985 report includes complimentary information not contained in this update.

Only those firms that use portable chippers of 12" knife length or greater for chipping the entire above ground portion of the tree or parts of trees (tops and limbs) are included in this survey.*

This refinement of definition eliminated one operator from the list of those surveyed in 1985. Another six firms that operated in 1985 sold out or ceased chipping operations in 1986.

Thirteen new chipping firms started business in 1986, some coming in at the very end of the year with little or no 1986 production. As of the end of 1986, there was a net gain of six firms, from 40 in January of 1986 to 46 by the end of December, 1986.

These 46 firms were using 60 chippers in their operations (39 Morbarks, 14 Trelans, 4 Blue Oxes, 2 Precisions and 1 Nicholson especially modified to process roadside slash). There are increasingly more small chippers (less than 12" knife length) being bought and used, mostly for land and road clearing. These units will, as their numbers grow, become a more significant component in some supply strategies.

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*Small machines such as roadside brush chippers are not included nor are larger chippers, either portable or stationary used primarily in a stationary mode, usually as part of a sawmill operation or as a stand-alone chip plant for pulpwood.

ECONOMIC IMPORTANCE TO MAINE

Capital Investment

The total estimated replacement value of equipment associated with whole tree chipping has risen to $44,000,000. Subcontractors including truckers and loggers are estimated to have $3,000,000 invested for a total of $47,000,000 or an average of over $1,000,000 per firm.

Employment and Payroll

Approximately 654 people were employed directly by the 46 contractors. They also hired the services of 164 subcontractors, mostly in trucking and felling and yarding for a total of 818 jobs directly associated with whole tree chipping in 1986. This is an increase of 198 jobs over 1985.

Total payroll, based on last year's per person average, is estimated at $17,000,000, an increase of $4,000,000 over 1985.

DESCRIPTION OF CHIPPING OPERATIONS

Length of Time in Chipping Business

The 46 operators have spent an average of 3.5 years in chipping. This is the same as last year because of the entry of new firms and exits of older firms. Even the new chipping firms have had considerable past experience in logging operations. Some of them have run chipping operations for other firms. Seventeen percent of the firms have been chipping for less than one year; 63% for 1 to 5 years; 17% for 6 to 10 years; and 2% for over 10 years.

Modes and Methods of Operation

There continue to be a wide range in methods and organization of the process of harvesting, processing and transportation. Readers are referred to

the 1985 report for a detailed discussion of some of those methods.

Custom Chipping

Twenty-eight firms said that they were available to do chipping for other logging firms. Twelve of these are already doing outside chipping for 48 other logging firms. Twenty-four of the twenty-eight wanted to be listed as custom chippers. They are designated by an * on Appendix 3. In total then there are about 94 firms producing wood for the various chip markets of pulpwood, fuel and other. Limiting factors for custom chipping are moving time, availability of market quotas, volume available to chip and distance to the markets.

Purchase of more material on a dry ton basis would facilitate more custom chipping since the producer would not be penalized for loss of moisture if he had to wait for the custom chipper and could thus harvest and stockpile wood ahead of the chipper. It is this writer's belief that this practice would improve wood utilization since there would be more time to pick logs and boltwood out of the material.

The minimum tonnage for which an operator would move to chip varied from 80 tons (approx. 32 cords) to 1500 tons (approx. 600 cords) the average was 585 tons (234 cords).

The use of custom chipping services offers an opportunity for other logging firms to take advantage of this market without the extra investment in the machinery.

Mechanization

The trend toward mechanization continues with 29 firms now fully mechanized. Thirteen (13) firms use a combination of mechanical tree felling

devices and chain saw operators; only 4 chipping contractors now rely entirely on chain saws. There is an increasing trend toward mechanization across the entire logging industry in Maine and chipping jobs are no exception.

In 1985, 79% of the whole tree chipping jobs had at least one mechanical feller-buncher or feller-forwarder on site. In 1986, 90% of the jobs had at least one.

The reasons for mechanization of the felling process are many and vary from operator to operator. They usually include: (1) a shortage of skilled people to perform the chain saw felling; (2) high Workers Compensation insurance rates and other employee taxes; (3) a need for rapid production with a small mobile crew; (4) cutting more small diameter stems; (5) ease of supervising a few equipment operators vs. the larger crew of chain saw operators, and (5) in some situations the machine will do less residual stand damage than will the manual felling and subsequent skidding, e.g. in overstory removal from established regeneration by a boom mounted feller-buncher. The type of feller-buncher used tends to reflect situations most encountered in a particular working circle.

In Southern Maine, for example, the smaller, mobile, rubber tired machines that drive to each tree are predominant, with 15 Morbells, 7 Franklin 105's, 12 Hydro-Axes, 1 John Deer and 1 Bob Cat 1213. Three tracked, boom mounted machines are used - 1 Proclain, 1 John Deer 493 and 1 Timbco 2820.

In western Maine, there are six drives to the tree feller-bunchers (1 Morbell, 2 Hydro-Axes and 3 Franklin) and two boom mounted machines (1 Cat 221 and 1 John Deere 693).

In eastern Maine, the preference is for larger track and wheel carrier, boom mounted machines. There are 23 units of various makes and models including 4 Timbcos, 7 Hydro-Axes 6200, 1 Case, 3 Leihbers, 4 Kockums, 6 John

Deere 743, 2 Koehrings, and 1 Caterpillar. Ten "drive to the tree" machines are used including 6 Hydro-Axes, 1 Franklin and 3 Bob Cat 1213.

It is expected that a greater proportion of chain saw operators are used by those firms that do not do their own chipping but the trend toward machine felling is evident throughout the entire logging industry.

PRODUCTION & MARKETING

Average Number of Markets

There was an increase in number of markets for chips but demand was uneven due to new plant start-up problems and other factors. The 1986 average number of markets that chipping firms sold to was 2.6 (1.8 in 1985). This uneven demand is further illustrated when one compares the increase in average number of markets per firm (44%) with the actual increase in total chip production of only 7%, produced by 17% more firms. Forty-one percent of the firms still had only one market for their chip production.

Chip Volumes

Total chip production was 1,764,465 green tons. Pulpwood chips accounted for 686,440 tons of this with fuel and other uses* being 1,078,025 tons. This was an average 66% of the firms' desired production level.

Regionally, southern Maine had 102,000 tons of pulpwood chips and 406,000 tons of fuel and other, western Maine 4,000 tons pulpwood and 209,000 tons of fuel with northern & eastern Maine at 580,000 tons pulpwood and 463,000 tons fuel.

* Other uses includes sewage sludge composting, landscaping, cattle bedding, road dust control and anything else that does not come under the categories of pulpwood or fuelwood. In 1986 the volume was less than 2,000 tons.

UTILIZATION AND MANAGEMENT

Product Mix

An area of concern often expressed by those outside the industry and even by some chipper operators is that material that should be utilized for logs and pulpwood is being chipped for fuel or other low grade uses. While a limited amount of this may be taking place, most of the firms reported that extraction of the higher grade products was a company policy and a significant part of their profit picture. Most of the firms reported that their product utilization remained the same as 1985. Four firms reported that they had improved their log yield.

The average chipping operation produces the following proportions of products:

Roundwood products - Logs, boltwood, veneer, round pulpwood	42%
Pulpwood chips - Whole tree and partial tree hardwood & white pine	23%
Fuelwood chips - "biomass" and chips for other uses	35%
	100%

Forester Involvement

A forester was involved on 94% of all acres harvested for whole tree chips on those areas harvested where the land remained in production of forest crops. Regionally, foresters were involved on 79% of southern operations, 94% of western operations and 96% of eastern and northern operations.

Forester Affiliation

When contractors or landowners obtained professional forestry assistance, most often the foresters were from industrial or larger land management firms (27) followed by foresters employed by the logging firms (16). Many of the owners of the logging firms are themselves foresters. There was a modest

increase in the number of private consulting foresters mentioned, up from four last year to nine this year. Again as in last year, State foresters were only mentioned twice. The figures total to more than the number of chipping firms because some contractors worked with more than one forester.

Acreage Harvested and Management Practices

A total of 50,002 acres were harvested where at least one of the products was whole tree chips.

The predominant management practices were those that removed only a portion of the standing trees on the area. These "partial" cuts involved a combination of single tree and group selection, thinnings and weedings both in plantations and natural stand and a method of tree selection where only those trees over a certain diameter are harvested. The total of all these practices was 28,780 acres or 58%.

Clear-cutting with a reliance on natural reproduction was performed on 11,355 acres or 23%. Clear-cutting as a site preparation tool prior to replanting was performed on 5,581 acres or 11%.

The remaining 4,286 acres (9%) was cleared or otherwise harvested as a conversion from forest land to some other land use. Agricultural uses accounted for 696 acres and other uses such as golf courses, house lots and other urban and suburban developments accounted for the other 3,590 acres.

The differences in the pattern of various practices is again evident from region to region.

In southern Maine, land clearing and other changes from forest to other uses accounted for forty-two percent (42%) of the chipping work with 641 acres for agriculture and 3,472 acres in other uses. Site preparation for planting was 307 acres (3%) and clear-cutting with reliance on natural regeneration was

421 acres (4%). The most plantation thinning of any region was in southern Maine, 287 acres (3%). Thinning in natural stands, selection harvest, shelterwoods and other partial stand removals accounted for the remaining 4,670 acres (48%).

The predominant practice in western Maine was site preparation for the planting of trees, usually of a different species than existed in the original stand, 3,105 acres (78%). Clear-cutting with reliance on natural regeneration was only 125 acres (3%). Thinnings, weedings, selection and shelterwood cuts represented 690 acres (18%). Changes to other land uses was only 70 acres or a little over 1% of the western Maine acreage harvested for chips.

This will be the last year that northern and eastern Maine will be combined in the survey. Increasing markets and associated activity in northern Maine will warrant a separation of these two sizeable areas of the state. The combined areas accounted for 59% of the volume and 72% of the acreage harvested for chips. It had the highest percentage of forester involvement (96%) and lowest percentage of land use change (nil). The predominant forestry practices were those that removed only a portion of the stand; thinnings, weeding, selection, shelterwood and diameter limit, 23,133 acres (64%). Clear-cutting with a reliance on natural regeneration was 10,809 acres (30%) and site preparation for planting was 6% with 2,169 acres.

LAND USE CHANGE/DEVELOPMENT - FORESTRY'S WILDCARD

On a statewide basis, land use change accounts for 9% of all timber acreage harvested for chips in 1986; 4,286 acres. This is a 27% increase over the acreage to this purpose in 1985.

Ninety-six percent (96%) of all of this took place in southern Maine 4,113 acres. This is over 4,000 acres that will in all probability never be available for forest crops again.

Seven of the 18 chipping firms (39%) in southern Maine had over 90% of their acreage harvested in land use change. Half of all firms in southern Maine did 50% or more of their work in land use change. Only 2 of the 18 reported that they did no land clearing in 1986.

One firm reported that they were concerned that the use of whole tree chippers made land clearing too easy.

Another observation made by some is that the poorer wood utilization will probably take place on the land clearing jobs since the primary goal will be to clear the land with the wood products being secondary. There is greater pressure to get in, get the job done and get out so the subsequent work of bulldozing and building can get on.

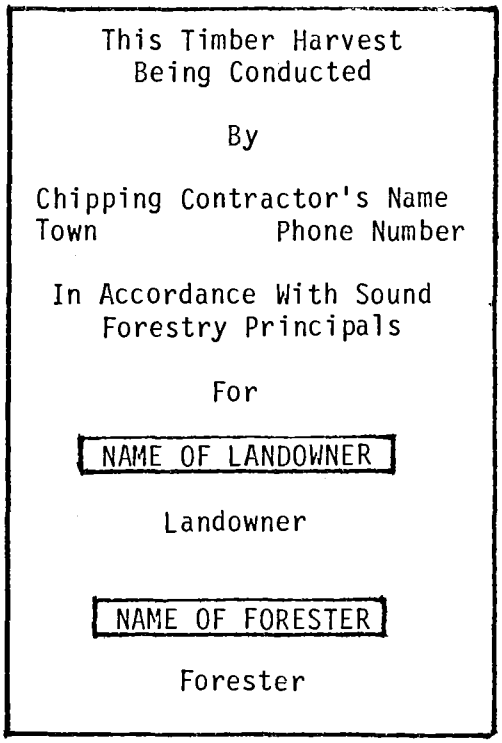
A danger for professional forest management and loggers' freedom of activity is that the public often sees the beginning stages of land use conversion and development as stripping of the forest. Then if development plans fall through or take a long time to begin construction, their suspicions are confirmed. This in turn increases the cry for regulation of the entire forest resource when the actual cause of what they are seeing is the mushrooming development taking place in portions of the state.

In addition, since the public often doesn't recognize a harvest where only a portion of the stand is removed, they only "see" the clear cuts and land use conversions. This reinforces their misperception that all "biomass" is from clear cuts.

A way for operators and landowners to consistently inform the public of what is actually happening would be to erect roadside signs on their jobs briefly explaining what they are doing and who people can contact for more information and/or comment. This would be applicable both to land use conversions and to forestry operations.

A couple of possiible variations could be as follows. Please note on these examples that information in the small rectangles would be on "shingles" and could be changed as the situation dictated.

* EXAMPLES:
FARM FIELD
HOUSE LOT
SHOPPING COMPLEX
BUILDING LOT



WHOLE TREE CHIPPING OPERATIONS SURVEY & REPORT
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1986

SUMMARY TABLE

VOLUMES, ACRES AND MANAGEMENT PRACTICES

REGION	VOLUME: GREEN TONS (%)	ACREAGE HARVESTED ACRES (%)	FORESTER INVOLV. ACRES (%)	CC NAT REGEN ACRES (%)	SITE PREP FOR PLANTING ACRES (%)	THINNING PLANTATIONS ACRES (%)	THINNING NAT'L STANDS ACRES (%)	SEL/ SHELTERWOOD ACRES (%)	LAND USE CHANGE AGRICULTURE ACRES (%)	OTHER ACRES (%)
S.ME										
Pulp	102M#									
Fuel & Other	406M									
Total	508M	9798	4918	421	307	287	2379	2291	641	3472
	(29)	(20)	* (79)	(4)	(3)	(3)	(24)	(24)	(7)	(35)
W.ME										
Pulp	4M									
Fuel	209M									
Total	213M	3990	3690	125	3105	25	285	380	55	
	(12)	(8)	* (94)	(3)	(78)	(1)	(7)	(10)	(1)	15
N&E ME										
Pulp	580M									
Fuel	463M									
Total	1043M	36,214	34,821	10,809	2,169	-0-	2,228	20,905	-0-	103
	(59)	(72)	* (96)	(30)	(6)	(0)	(6)	(58)	(0)	(Nil)
	1,764M	50,002	43,429	11,355	5,581	312	4,892	23,576	696	3,590
			* (94)	(23)	(11)	(<1)	(10)	(47)	(1)	(7)
						(10)			(9)	

* Discounting areas harvested for a change from forest to other uses (agriculture, house lots, other developments) where a forester wouldnot significantly affect future wood production from these areas.

SUMMARY

1,764,465 green tons of chips (686,000 tons of pulpwood plus 1,078,000 tons for fuel and other uses) were produced from 50,002 acres by 46 chipper operators using 60 whole tree chippers.

These 46 operators operated with approximately $1,000,000 of capital investment each, employing either directly or as subcontractors 818 people with a payroll of $17,000,000.

The 46 firms have been chipping an average of 3 1/2 years with all of them either in the logging or sawmill business before that.

There has been a substantial increase in mechanization of the felling phase of wood harvesting with all but four of the firms having at least one felling and bunching machine in use - a total of 80 machines.

Markets increased from an average of 1.8 per chip firm in 1985 to 2.6 per firm in 1986. Forty-one percent of the firms still have only one market for their desired level of production.

Of the total wood production from the 46 firms, 42% was roundwood logs, boltwood, veneer and pulpwood; 23% was pulpwood chips (686,000 tons) and 35% was fuel and other chips (1,078,000).

Twenty-seven of the firms are available to do chipping for other logging firms.

The services of a forester were used on 43,429 acres. This is 94% of all acres where the land is to remain in forest uses.

On the 50,002 acres, management practices were: "Partial" cutting including selection, thin, weed and diameter limit - 58%, clear cutting for natural regeneration - 23%, site preparation for planting - 11%, land clearing for conversion to other non-forest land uses - 9% (adds to 101% due to rounding).

The predominant practice in southern Maine was land clearing for such things as fields, house lots, businesses, etc.; 4,113 acres (42%). This reflects an increase in development in that area. In western Maine it was site preparation for planting; 3,105 acres (78%). Eastern and northern Maine's predominant practices were those that removed only a portion of the stand; 23,133 acres (64%).

MAINE FOREST SERVICE
WHOLE TREE CHIPPING OPERATIONS SURVEY UPDATE
1986

APPENDIX 1

FIRM NAME Summary 46 Firms PHONE

ADDRESS TOWN STATE ZIP

OPERATOR/MANAGER NAME

EQUIPMENT & MANPOWER: Make & Model of Chipper(s) 39 Morbark, 14 Trelan, 4 Blue Ox 2 Precision, 1 Nicholson

Any Major Change in Equipment Mix From Last Year, Such As From Hand Crews to Feller-Bunchers? 79% of Firms had 1 or more F-B's in 1985 90% in 1986

Make & Model of Feller-Bunchers, if Any? 3&4 wheel drive-to-the-tree 52 | Total 80
4 wheel & tracked, boom mounted 28

Total Value of Equipment (Last Year:) $47,000,000

Number of Employees Involved in Chipping Operation Inc. Harvest, Office & Garage: 654

Number of People Involved With Your Chipping Operation as Contractors or SubContractors: 164

MARKETING: No. of Different Chip Markets to Which You Sell? 2.6 (Range 1-9)

Percentage of Chip Volume Sold to Market#1 #2 #3

****

Tonnage of Chips Produced in Last 12 Mos: For Fuel 1,076M Pulpwood 686M Other 2M

****

At What Level of Your Present Chipping Capacity is Your Current Chip Production (percent)? 66 For example, if you could have produced 50,000 tons at full production but only could sell 25,000 tons, then you would be chipping at 50% of your capacity.

What Factors Were Responsible For This Level of Production?

****

Of your Overall Operation, What Percentage of Your Total Annual Wood Production is Whole Tree Chips? 58 Example: If your total production is equivelant to 20,000 cords (logs, boltwood, pulpwood, fuel, chips, pulp chips, etc.) and of that 10,000 cord equivelants are in chips, then your chip percentage is $(\frac{10,000}{20,000} \times 100) = 50\%$.

****

Has The Last Year Been a Good/Bad/So-So Year for Your Operation?

Why? 43% good, 45% fair, 12% bad

FOREST MANAGEMENT & UTILIZATION: Total Acres Harvested Where All or Any Part of The Production Was Whole Tree Chips 50,002

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Cutting Practices Used (Acres or % of Acres Covered)

Clear Cut For -Stand Conversion - Planting 5,581

Clear Cut -Natural Regeneration 11,355

Land Use Change To Agriculture 696 Land Use Change to Other Uses 3590

Thinning & Weeding of Plantations 312 Thin & Weed Of Natural Stands 489

Selection & Shelterwood (Partial cuts including diameter limit) 23,576

******

Forester Used on Operations (Percent of Acres) 94% excluding land use change

Forester Relationship - Company Employee 16 Private Consultant 9

Industrial 27 Government 2 Other -

****

Has Your Log/Boltwood and Other High Grade Separation Changed Much From Last Year? Yes No If Yes, How? 4 improved, 33 same, 9 did not comment or did not have time enough to make a judgement

****

Are You Available to Chip For Others (Custom Chipping)? Min. Vol. That You Would Move For Yes 28, No 18 Min vol from 80 tons to 1500 tons

If You Are Available For Custom Chipping, May I publish That In Loggers' News And Other Ways?

About How Many Logging Firms Do You Custom Chip For Now? 48

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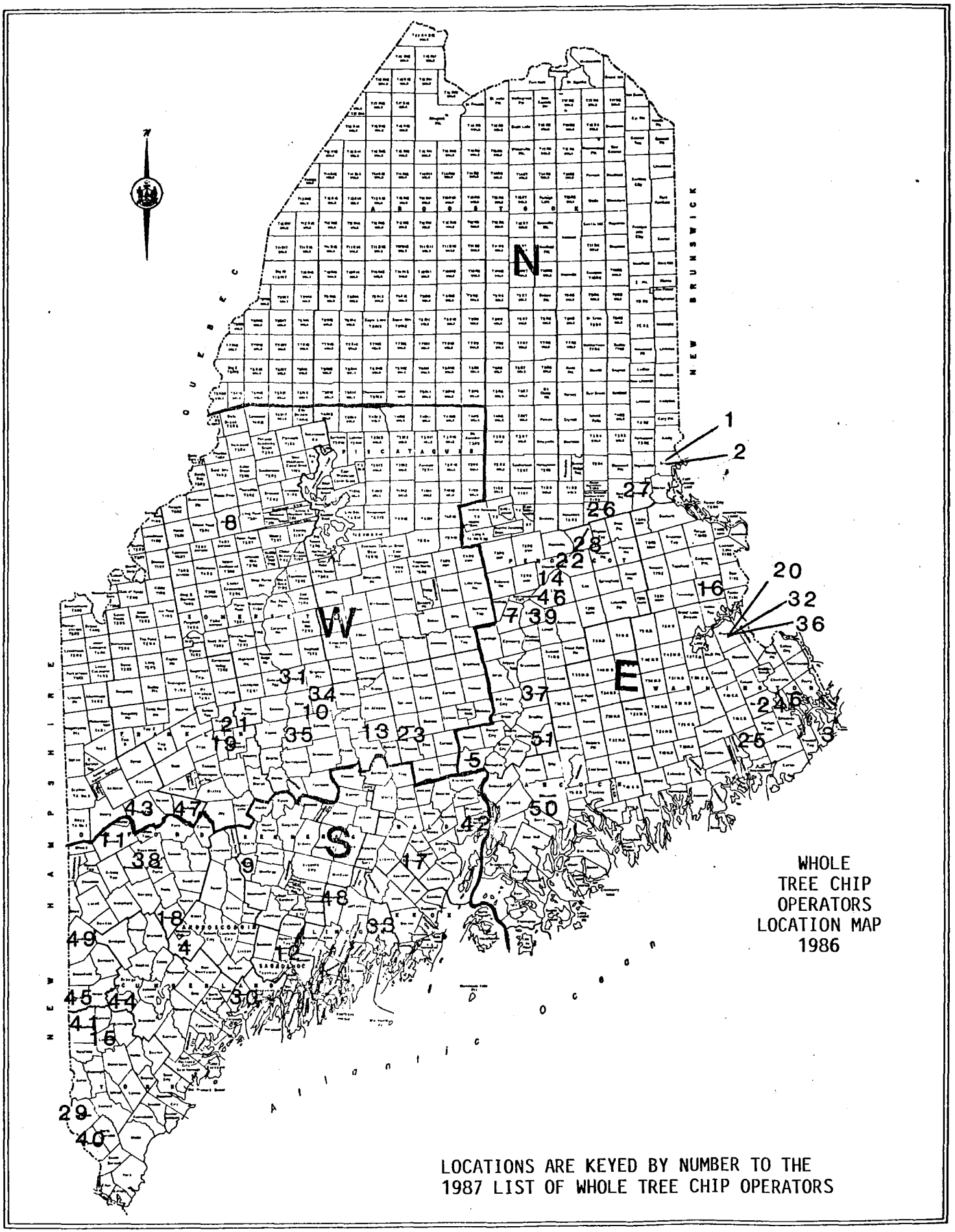
Problems, Observation, Comments That You Would Like to Make? Is There Anything That You Think The Maine Forest Service Should Be Aware of or Working On Regarding Whole Tree Chipping in The Comming Year?


N
W
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QUEBEC
NEW BRUNSWICK
NEW HAMPSHIRE
Atlantic Ocean
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WHOLE
TREE CHIP
OPERATORS
LOCATION MAP
1986
LOCATIONS ARE KEYED BY NUMBER TO THE
1987 LIST OF WHOLE TREE CHIP OPERATORS

WHOLE TREE CHIP OPERATORS AS OF DECEMBER, 1987

	1.	B&R Bartlett Enterprises, Inc. Brent Bartlett RFD#1 Orient, ME 04471	448-2662
	2.	Colin Bartlett RFD#1 Orient, ME 04471	448-2831
*	3.	Bell Farms HCR 74 Lubec, ME 04652	733-4756
*	4.	Benson & Webster Bradley Benson Box 203 Poland, ME 04274	998-2135
*	5.	H.O. Bouchard Box 249 349 Cold Brook Road Hampden, ME 04444	862-4070
	6.	Brown Bros., Inc. Wallace & Jack Brown P.O. Box 115 Pembroke, ME 04666	726-4454
*	7.	Tim & Don Buck HCR 66 Box 145 Howland, ME 04448	723-4751
*	8.	E.J. Carrier, Inc. P.O.Box 489 Jackman, ME 04945	668-4457
*	9.	Gerald Castonguay RFD#1 Box 2890 Wayne, ME 04284	946-5790
	10.	Cayford Bros. RFD#1 Box 5143 Athens, ME 04912	654-3781 654-3787
	11.	P.H. Chadbourne, Inc. Tim Sawyer RFD#1 Box 30E Bethel, ME 04217	824-2166
	12.	Robert G. Cote Box 62 White Road Bowdoinham, ME 04008	666-8830

	13.	Kendal Davis P.O. Box 56 Palmyra, ME 04965	938-4162
*	14.	Richard Delaite RR1 Box 110 Lincoln Ctr., ME 04458	794-8832
*	15.	Daniel Dunnells RFD#2 Box 304 Limerick, ME 04048	793-2901
*	16.	Orland Dwelly & Son Waite, ME 04492	796-2646
	17.	Dyer Brook Logging P.O. Box 9 Searsmont, ME 04973	342-5221
*	18.	Forest Residue Fuel Corp. Willard & John Sawyer RFD#2 Box 5772 Oxford, ME 04270	998-4431
*	19.	Forster Manufacturing Co. P.O. Box 188 Strong, ME 04983	684-3021
	20.	Georgia Pacific Corp. William Kendall West Street Princeton, ME 04668	796-2203
	21.	Harry Gordon Strong, ME 04983	684-4462 (Home) 684-5791 (Garage)
*	22.	Grant Forest Products Box 97 Winn, ME 04495	736-2055 736-2065
*	23.	Gray & Temple Maurice Temple RFD#2 Box 2220 Newport, ME 04930	257-2333
	24.	Griffin Bros. Dale Griffin Box 56 Dennysville, ME 04628	726-5107
*	25.	Guptill Logging Supplies Lyle Guptill P.O. Box 226 E. Machias, ME 04630	255-4130

	26.	Hanington Bros., Inc. Hollis Hanington, Jr. P.O.Box 40 Wytopitlock, ME 04497	765-2681
	27.	Hanington & Davis Raymond Hanington Box 36 Weston, ME 04424	448-2625
	28.	H.C. Haynes, Inc. Winn, ME 04495	736-3412 or 3422
*	29.	Carl Herson P.O. Box 6242 E. Rochester, NH 03867 (Res. Lebanon, ME)	457-1127
	30.	Howard's Pulp and Logging, Inc. Box 112, Curtis Rd. Freeport, ME 04032	865-3290
	31.	Jenness' Chipping, Inc. Box 248 Bingham, ME 04920	672-4192
*	32.	Murry LaPlant Rt. 1 Box26 Princeton, ME 04668	796-2733
	33.	Gordon A. Libby P.O. Box 849 Waldoboro, ME 04572	832-6313
*	34.	Gordon Linkletter & Son RR#1 Box 135 Athens, ME 04912	654-2301
	35.	N.F. Luce Forest Products, Inc. Norman Luce P.O. Box 27 Madison, ME 04950	474-9333 (O) 696-3006 (H)
*	36.	Phil McDowel P.O. Box 92 Princeton, ME 04668	796-2389
	37.	F.A.Madden, Inc. 345 Main Rd. Milford, ME 04461	827-4142
*	38.	Lloyd Poland Chipping Bryant Pond,ME 04219	674-2785

*	39.	Prentiss and Carlisle Box 36 Enfield, ME 04289	674-2771
*	40.	Putnam Lumber Co. Joseph C. Putnam P.O. Box 109 No. Berwick, ME 03905	676-9292
*	41.	Forest Sanborn Rt. 160 Box 41 E. Parsonfield, ME 04028	793-8424
	42.	Emery Shute, Sr. & Emery Shute, Jr. Double E. Chipping Stockton Springs, ME 04981	567-3284 or 3601
	43.	David Smith Box 86 Rumford Pt., ME 04279	392-2531
	44.	Snip & Chip, Inc. Richard Wagner 459 Chase Rd. W. Baldwin, ME 04091	625-4056
*	45.	L.E.Taylor& Sons Laurence Taylor, Jr. Box 24 Porter, ME 04068	625-4056
	46.	Thompson Forestry Products, Inc. Calvin Thompson Box 206 Lincoln, ME 04457	794-6101
	47.	Timberlands Inc. Box 650 Dixfield, ME 04224	562-7277
	48.	Total Tree Chipping, C. Patrick Chase RFD#1 Box 38 No. Whitfield, ME 04353	549-7611
	49.	Rodney H. Wales & Son Inc. RR#1 Box 121 Fryeburg, ME 04037	925-2634
*	50.	David Warren RFD#3 Ellsworth, ME 04605	667-5377
	51.	R. Leon Williams, Inc. Melvin Williams RFD#1 E. Eddington, ME 04428	843-7331

* Indicates that these firms are available under certain circumstances to perform custom chipping services.