Station Paper 45 November 1951

A Preliminary Appraisal

of

New Hampshire's Forest-Yield Tax

by

Solon Barraclough and Ernest M. Gould, Jr.

Northeastern Forest Experiment Station

Ralph W. Marquis, Director
Upper Darby, Pa.

Forest Service, U.S. Dept. of Agriculture

FOREWORD

For many years various State governments have tried to find an adequate and fair substitute for the general property tax on forest land. Heavy annual taxes were thought to discourage the practice of good forestry. Such taxes tempt the timberland owner to liquidate his forest capital; they discourage him from investing money in a long-range program to provide for future timber crops.

The first attempts to encourage forestry through tax legislation took the form of exemptions, rebates, and bounties for plantations. In recent years the principle of the yield tax has been incorporated in most of the new legislation. Under this method, annual tax payments are made on the bare-land valuation, timber is exempt from annual taxes, and a yield tax is paid on products harvested. The heaviest part of the total tax payment is thus postponed to the time when income is received.

Most of the State yield-tax laws have provided for the voluntary classification of forest land by the owner. But only a very small percentage of the eligible land has been classified under these voluntary systems; and the success of these laws in stimulating better forest practices has been spotty.

New Hampshire in 1949 enacted a yield-tax law that departed in many respects from the traditional pattern set for such legislation and introduced a number of new provisions that are hoped to correct the imperfections of earlier laws.

This report attempts to show how this new forest-yield tax is working out in New Hampshire and how it will affect the forest resource, the landowner, and the taxing jurisdictions.

Ralph W. Marquis
Director

CONTENTS

A PRELIMINARY APPRAISAL OF NEW HAMPSHIRE'S FOREST-YIELD TAX

by

Solon Barraclough, *forest economist*
Northeastern Forest Experiment Station
Forest Service, U.S. Dept. Agriculture

and

Ernest M. Gould, Jr., *research associate*
Harvard Forest, Petersham, Mass.

INTRODUCTION

A NEW FOREST-TAX ACT, based on the yield from forest land, was passed in 1949 by the State Legislature of New Hampshire in an attempt to correct some of the inequities of forest taxation. Foresters are closely watching this new tax law, and naturally the people of New Hampshire would like to know how the law will affect them.

The Society for the Protection of New Hampshire Forests, which has long been interested in forest-tax reform as well as in promoting forest management, granted funds to Harvard University's Committee on Research in the Social Sciences for a special study of the new forest tax and its impact on a selected sample of farm forest properties.

In making this study, the authors analyzed the tax and its effect on six farm-forest holdings scattered throughout the State, in seven towns. (One property lies in two towns.) They asked two main questions: "How will the new tax differ from the old tax in its long-term effect on the owner's income from stumpage?" and "What incentive does the new tax offer for the improvement of forest management?"

Another question that came up during the course of the study was "What impact will the new tax have on tax revenue in a town where timber is an important element in the tax base?" The study was not designed to answer this question. However, using the six farms as a basis, some partial answers were found.

THE OLD TAX SYSTEM

TRADITIONALLY IN NEW HAMPSHIRE, all forest land and the timber on it was taxed under the general-property-tax laws, based on assessed valuation. This tax is levied and collected by the 234 New Hampshire towns and 11 chartered cities; the 14 unincorporated places are under State administration.

Elected town officials (the selectmen) usually assess property for taxation. The town appropriations are fixed each year by majority vote of the citizens at "town meeting." The tax rate is determined by dividing the total amount of money needed by the total town assessment.

The State Constitution says the assessment shall be at "full and true value." The State Tax Commission has interpreted this to mean "fair sale value." But the Constitution also says that assessments are to be "proportional and reasonable"; and the assessors used this as authority to exercise their own discretion. As a result, there was no uniform policy for assessing forest property. Great variation existed, not only from town to town, but also from property to property within the same town.

A forest property was usually assessed in one lump-sum value. Timber value was not separated from land value.

The procedure for evaluating timber varied greatly. Assessors took into account only timber that was merchant-

able locally. Some put a value only on softwood saw timber; others included both softwood and hardwood saw timber--and pulpwood. Properties located in back areas that selectmen seldom visited were often assessed solely on the owner's statement of how much timber was there. Some assessors adjusted their timber valuations each year, some every 5 to 10 years, some even less often.

An owner could usually get a reduction in his timber assessment if his entire property were stripped of merchantable timber. But the assessors often looked on moderate cutting as the removal of accumulated growth; so then they generally did not reduce the assessment. Therefore, good forest practices that built up the growing stock were most likely to result in higher tax assessments. Naturally this tended to discourage good forest management.

Under these conditions the general property tax on forest land and timber was often inequitable. Taxes fluctuated capriciously according to the town's financial needs and changes in administration. Some assessments were influenced unfavorably by the fact that the owner was not a local resident. Or favorably if the owner wielded strong political influence. The amount of tax levied was related to neither the productivity of the forest land nor the time of harvest from it.

Agitation for tax reform resulted. One early result of this agitation was the passage in 1923 of an optional forest classification law. As in other states where such measures have been tried, few owners made use of the provisions of this law.

Several constitutional conventions (beginning with one in 1912) had proposed or discussed amendments to permit special assessment and taxing of growing timber. Such an amendment was finally adopted by the voters of the State in 1942.

The next step came in 1943, in legislation requiring that growing wood and timber be listed and assessed separately from the land on which it stood. This separation of timber and land values was done rather imperfectly in many towns. Some tracts were overlooked and a few assessors made no separate listing at all.

This act did not correct the inequities in timber taxation. But it did pave the way for the new forest yield tax.

THE NEW TAX SYSTEM

IN 1949 THE STATE Legislature passed "An Act Relating to Forest Conservation and Taxation." This act was designed not only to correct the inequities in the taxation of timber, but also to encourage good forestry practices.

The new law releases growing timber from taxation under the general property tax (but the land on which it stands is to be assessed as before). Instead, a yield tax is levied on timber at the time of cutting. This tax is 10 percent of the stumpage value. However, an abatement of 30 percent of the tax is granted if the cutting practices meet at least the minimum standards set up by the law.

The law exempts timber cut for the owner's personal use within the State as fuel or for construction and repair of buildings on his own property. Stumpage that was under contract when the new law was passed is also exempt. But stumpage bought by private operators from tax-exempt lands such as national forests is subject to the yield tax. And mature forests deemed to be withheld from the market for some purpose other than timber production may be assessed and taxed as before.

When an owner decides to cut on his own land, or when an operator decides to cut purchased stumpage, he must notify the selectmen of the town in which the timber is located. He must also send a copy of the notice to the State Tax Commission (according to a 1951 amendment). The notice shows the taxpayer's estimate of the amount and value of the stumpage he intends to cut and tells whether he intends to qualify for abatement.

Selectmen may oblige the owner or operator to deposit a bond with the town tax collector equal to the estimated amount of the yield tax before he starts to cut. He must make a report to the town selectmen within 15 days of the end of the operation. This statement includes information on the kind and amount of products actually cut, and other

data to enable the selectmen to determine the stumpage value of the timber removed and the exact location of the cutting area. The tax must be paid by December 1.

Forest-practice standards, used as the basis for yield-tax abatement, are recommended to the State Forester by District Forest Advisory Boards. These boards, established some years ago, consist of interested local citizens appointed by the State Forestry and Recreation Commission. The boards are set up on a county basis with the County Forester acting as secretary. At present, one set of forest-practice standards applies throughout the State. These, when faithfully applied, are considered to meet the requirements for tax abatement:[1]

1. PARTIAL CUTTING. Merchantable and defective trees may be removed by groups, strips, or individuals if at least one-third of the original merchantable volume of healthy trees of desirable species is left well distributed over the area operated to provide another timber crop.

2. HARVEST CUTTING. All merchantable trees may be removed, provided a sufficient number of young trees of desirable species at least 3 feet in height are present prior to cutting. At the completion of the operation there must remain an adequate number of such young trees well distributed over the area.

3. SPECIAL CASES. If an owner desires to follow any other forest practice on a specific area he may describe it in writing and request approval by the State Forester. Such practice, if approved in writing by the State Forester or his authorized agent, shall be considered as the forest-practice standard for such specific area.

The selectmen must decide whether the taxpayer is entitled to abatement. The Extension Service and the Tax Commission have conducted training conferences for selectmen to explain the operation of the law. The County Foresters are available to advise the selectmen on forestry matters at any time. The selectmen may ask the State Forester for certifi-

[1] ANONYMOUS. FOREST PRACTICE STANDARDS FOR NEW HAMPSHIRE WOODLANDS. 1950. N.H. UNIV. AGR. EXT. BUL. 98. 16 PP., ILLUS. 1950.

cation of specific doubtful operations. Any taxpayer who is not satisfied with the selectmen's decision on abatement may appeal to the District Forest Advisory Board.

Many New Hampshire towns depend heavily upon timber taxes. For example, the town of Pittsburg derives more than half its tax revenue from this source. The legislature recognized that until better forest practices are more widely adopted, yield-tax revenues will tend to be irregular; furthermore, while the growing stock is being built up, current harvests may be small. Therefore, the 1949 law provides for a State Reimbursement Fund to compensate towns for any loss of timber-tax revenue due to the new law. To calculate this reimbursement, the average 1944-48 assessed value of "growing wood and timber", in each town is multiplied by the current town tax rate and the amount of yield tax is subtracted after making certain adjustments for State funds paid to the town.

If the yield tax in any given year brings in a larger revenue to the town than the old tax would have, the surplus will first be applied to paying back past advances from the Fund. After the account with the Fund is in balance, surpluses may be retained by the town as clear gain, but would have to be deducted from any call upon the Fund in future years. Since surpluses are not turned back to the State, except to cover past deficits, the Reimbursement Fund does not have a chance to build up.

METHOD OF ANALYSIS

VALID COMPARISON of the effects of the old and new taxes on forest income must cover a long period of years. A short-term analysis is subject to great chance variations, depending upon the present condition of the growing stock. This analysis covers a 90-year period, a period long enough to show the full income possibilities of young stands and to indicate the value of the succeeding stand.

Such long-term considerations are not unique for forestry; nor do they imply that favorable returns cannot be had from good forest practices in a much shorter time. In an objective analysis, however, the probable long-term effects should be considered. This is particularly true in matters of public policy, which should not be limited in

outlook by the life expectancy of individuals. Similar concern must be shown for future values when investments are made in education, power development, some public health measures, major road systems, and the like.

For purposes of this analysis it was necessary to estimate the probable amounts and dates of future forest yields, the stumpage prices received, and the taxes paid. These estimates are only rough approximations. But in any economic analysis concerning future values, assumptions must be made--at least implicitly--about expected production and prices. Such questions can be discussed more intelligently if these assumptions are made clear in the beginning.

The kind of management practiced is one of the major variables affecting an owner's forest income. On the holdings studied, three levels seemed adequate to test the probable range of alternatives. (A fourth and lower level of management is frequently found where all stands are cut as soon as they produce salable box-boards, fuel, or pulpwood. Experience indicates that the returns from such practices are much less than those of substandard management. The owners of the forest properties studied did not consider this system desirable; so it was not included in the analysis.)

Standard management is the type that will just qualify for abatement of yield tax under the New Hampshire Forest Practice Standards. Such management aims to keep the land continuously productive. Cutting is done with a view to regeneration of desirable species and the preservation of rapidly growing small trees that can be harvested more profitably at a later date. Such management involves little if any added cash expense to the owner.

Substandard management is of a lower intensity and represents a conservative program of clear-cutting and high-grading as currently practiced on many New Hampshire farms. This assumes the cutting of saw timber at 70 to 80 years of age and pulpwood at from 40 to 60 years. Such cutting would not meet the minimum specifications for tax abatement under the new law.

Above-standard management has been included in the analysis to illustrate what might be achieved under favorable conditions. Such a program includes weedings, improvement cuttings, and thinnings designed to better the quality of the stands and promote growth.

Whether or not above-standard management is desirable depends on many factors such as type and size of ownership, length of tenure, site, location of the land, quality of the growing stock, available markets for forest products, and expected prices. The immediate returns from stand-improvement work of this kind may be so low that commercial operators will not accept the job on a stumpage basis. As a result, the work will frequently involve some extra cash investment. The monetary returns indicated in the study cannot be expected from above-standard management on all forest properties. But they are considered reasonable for the particular forest properties studied.

Data to base accurate estimates of forest yields on are not available. Sufficiently long experience with permanent sample plots is lacking. Nor is there a satisfactory body of tables and rules based on observations of present stands. Even methodology is uncertain and unstandardized and we can only estimate in the roughest way what volumes of timber to expect from wild and managed stands at rotation age, how fast the timber will grow, the amount of mortality, and many other factors vital to valid estimate. The predictions used here are necessarily makeshifts, but they do roughly indicate the probabilities. More than this cannot be claimed.

All the sample forests were cruised and divided into stands, and stand tables were made for them. Appropriate normal yield tables were used to project yields under substandard and standard management. The tabular yields were reduced by Gehrhardt's formula [2] to take account of understocking. Special tables were constructed to show the yields of stands managed with above-standard practices. These tables projected the growth of the individual trees found in each stand. Careful adjustments were made in all predictions to allow for differences in the site, species, age, and quality of the trees found growing in each stand. The authors believe the results are internally consistent.

Stumpage prices were taken from the 1950 Forest Market Report.[3] It is true, of course, that prices will not

---

[2] GEVORKIANTZ, S.R. THE APPROACH OF NORTHERN HARDWOOD STANDS TO NORMALITY. JOUR. FORESTRY 35: 487-489. 1937.

[3] ANONYMOUS. FOREST MARKET REPORT, 1950. N.H. UNIV. AGR. EXT. BUL. 93. 32 PP. 1950.

remain static over the next nine decades. Nevertheless, basic price relationships change slowly, and estimates based on 1950 prices seem reasonable.

Forest taxes are made up of two elements, the tax on land and the tax on timber. The land tax under either system is determined by the assessed value of the land and the town tax rate. These were held constant in the analysis at the 1950 level; this simplified comparison of the old and new systems of taxing timber.

Under the old system the assessed value of growing timber fluctuated and was difficult to predict. In our analysis it was assumed that assessments of growing timber would equal roughly one-half the stumpage value of the merchantable timber actually standing on the farm. Reassessment was assumed at the end of each 10 years. Past assessments have not been this high, but a continued shrinkage of the tax base due to clear-cutting, combined with the towns' growing need for revenue, tends to raise assessment of the remaining timber. Moreover, increasing familiarity with forest values on the part of town selectmen and improving markets for forest products have accelerated this trend. These factors, taken together, indicate that the assumed assessments are reasonable.

Under the new system the question of assessing growing timber does not arise because the tax is a percentage of the stumpage value at time of cutting. A 10-percent tax is levied on substandard cutting, a 7-percent tax on standard or above-standard cutting.

FOREST TAXES & THE TIMBER OWNER

SIX SAMPLE PROPERTIES were studied to show the effects of the two tax systems. No attempt was made to select properties that represented all kinds of forest ownerships found in New Hampshire. But the farm forests selected did represent fairly typical forest types, growing stocks, and forest taxes paid. It will be convenient to consider the first property (designated "Farm A") separately, and then to take up the remaining five properties together.

Sample Farm A

Farm A is a dairy-livestock farm containing almost 800 acres of forest land in addition to substantial areas of crop land and pasture. As shown in table 1, there is a

Table 1.--Farm A: Present distribution of forest-land acreage by forest type and age class

Forest type	Age class (years)			All ages	
	0-20	21-40	41+		
	Acres	Acres	Acres	Acres	Percent
Northern hardwood	53	--	40	93	12
Mixed hardwood and spruce-fir	69	225	220	514	64
Spruce-fir	128	61	--	189	24
Total	250	286	260	796	100
Percent	31	36	33	100	--

fairly even distribution of the forest growing stock, primarily mixed hardwood and spruce-fir, among the three age classes. Little woods work has been done in recent years, but the owner plans to start harvesting merchantable trees soon. As presently operated, the agricultural enterprise provides enough work to keep the farm labor force busy. However, some changes and efficiencies can be effected that will permit about 4 man-months of woods work per year. Any further expansion of the forestry enterprise would require more hired labor or increased stumpage sales.

The average assessment of bare forest land in Town A (where Farm A is located) is $3.00 per acre. The 1950 tax rate was $3.90 per hundred dollars of assessed valuation.

Table 2 shows the estimated stumpage proceeds per acre of forest land from the three management levels after subtracting forest taxes, calculated under both the old and the new tax systems. Proceeds were estimated from the expected yields and prices received as explained under "Method of Analysis." These figures are cumulated by decades over the 90-year planning period. In other words, the figure shown opposite each decade represents the returns of that

Table 2.--Farm A: Estimated stumpage proceeds after taxes, under three levels of forest management, with taxes estimated under both old and new systems[1]

(In dollars per acre, cumulated by decades for 90 years.)

Decade	Substandard management		Standard management		Above-standard management	
	Old tax system	New tax system	Old tax system	New tax system	Old tax system	New tax system
1st	$ -1	$ 0	$ -1	$ 0	$ 11	$ 11
2nd	10	19	-1	10	34	42
3rd	20	36	8	30	46	65
4th	12	39	16	49	69	98
5th	70	95	41	85	90	130
6th	76	101	83	130	130	173
7th	79	102	90	139	145	189
8th	80	106	94	144	186	230
9th	79	105	105	157	224	268

[1] The stumpage value of the growing stock left at the end of nine decades is shown in table 3.

decade plus returns of the previous decades. The stumpage value of the residual growing stock at the end of 90 years is shown in table 3.

Table 3.--Estimated average stumpage value per acre of residual growing stock on the sample farms after 90 years of forest management at three different levels[1]

Farm	Substandard management	Standard management	Above-standard management
A	$ 33	$ 69	$ 105
B	24	82	120
C	15	49	73
D	31	69	81
E	9	51	77
F	8	62	80

[1] Only the volume in stands 25 years of age or older was considered. Before evaluating the growing stock it was segregated into saw-timber and pulpwood volumes. The per-acre volumes of desirable species will be greater under standard or better management. Above-standard management also implies construction of a permanent road system. The following average stumpage prices were used to reflect the quality and accessibility of the growing stock under the different levels of management:

Stumpage value	Substandard	Standard	Above-standard
Saw timber	$6.00/M.b.f.	$9.00/M.b.f.	$12.00/M.b.f.
Pulpwood	$1.60/cord	$2.00/cord	$ 2.40/cord

Under either tax system the more conservative cutting practices of standard management require some postponement of income; thus early returns are less than those from substandard management. Once the growing stock has been built up, however, proceeds from standard practices become greater.

The close utilization of tree growth and the rapid improvement in the growing stock under above-standard management yield returns considerably larger than those from either standard or substandard cutting practices. The residual stand value is also greater.

Table 2 shows that Owner A keeps more of his stumpage returns under the new tax law regardless of the kind of forest management he uses. At the end of the ninth decade with above-standard management he has accumulated $44 more per acre ($268 - $224) under the new tax than under the old tax system. The comparable figure for standard management is $52 per acre ($157 - $105) and for substandard management $26 per acre ($105 - $79).

In the foregoing we have assumed that the timber owner maintains the same level of management throughout the planning period. Let us suppose, however, that he raises his level of management from substandard to standard. In this case, under the old tax, in 90 years he would gain $26 per acre ($105 - $79). Under the new tax his gain would be $52 per acre ($157 - $105). If, however, he compares his 90 years' returns from substandard management under the old tax with those of standard management under the new tax, he will find his gain is $78 per acre ($157 - $79).

It is apparent from this that the owner can keep more of the gains due to improved management under the new tax than he could under the old. This is due in part to the 30-percent abatement for better forest practices; in part to eliminating high assessment of the timber left after partial cuttings.

The new tax will do four things for the owner of Farm A. It will remove the uncertainity connected with changing assessments on the growing timber. It will relate the amount of tax to forest productivity and to the time of forest income. It will provide a tax saving for a given level of forest management. And it will encourage the practice of more intensive management.

Table 4.—Present distribution of forest land on Farms B, C, D, E, and F (in acres), by forest type and predominant age class

Forest type	Farm B				Farm C				Farm D				Farm E				Farm F			
	Age class (in years)				Age class (in years)				Age class (in years)				Age class (in years)				Age class (in years)			
	0-20	21-40	41+	All	0-20	21-40	41+	All	0-20	21-40	41+	All	0-20	21-40	41+	All	0-20	21-40	41+	All
Northern hardwood	--	—	--	--	497	89	50	636	108	55	68	231	31	50	82	163	516	110	61	687
Mixed hardwood and spruce-fir	—	--	--	--	--	--	--	--	62	241	57	360	8	--	27	35	10	12	20	42
Spruce-fir	48	26	10	84	—	--	--	--	89	26	--	115	79	83	--	162	128	--	12	140
White pine	--	--	--	--	85	204	53	342	--	--	--	--	16	11	1	28	--	--	--	--
Total	48	26	10	84	582	293	103	978	259	322	125	706	134	144	110	388	654	122	93	869
Percent	57	31	12	100	60	30	10	100	36	46	18	100	35	27	28	100	75	14	11	100

Five Other Sample Farms

The other five sample farms are designated B, C, D, E, and F. Like Farm A, they are dairy farms and have varying proportions of pasture and forest land. Forest acreages are shown in table 4, classified by forest type and age.

A fairly even division of forest acreage among the different age classes is found on Farms D and E. No very long waiting period is necessary before commercially mature products can be cut. Farms D and E are similar in this respect to Farm A.

More than half of the growing stock on Farms B, C, and F, on the other hand, is very young; more waiting is involved before any large amount of harvesting can be done. Some earlier cutting can be carried out on Farm B, since its growing stock is all spruce and fir and will yield a good deal of pulpwood at 40 to 60 years of age. Most of the growing stock on Farm C, however, will be held to 80 years of age for sawlog production.

Farm F is an extreme example of unbalanced distribution among age classes. Most of this land was bought cheaply after it had been clear-cut for pulpwood or high-graded for veneer logs. The growing stock must be built up for a long period before any extensive harvesting will be possible.

The local tax rates vary from a low of $3.10 in Town E to a high of $5.66 in Town B (table 5). These rates

Table 5.--The 1950 tax rate and average assessed value of bare forest land in the sample towns

Item	Towns[1]					
	B	C_1	C_2	D	E	F
Tax rate per $100 of valuation	$5.66	$4.55	$4.60	$5.20	$3.10	$4.40
Average assessment per acre of forest land	$3.00	$4.50	$3.00	$2.00	$4.50	$2.00

[1] Towns are lettered the same as the sample farm in the town. Farm C is located in two towns shown as C_1 and C_2.

compare with an average for the State as a whole of $4.33 in 1950. In the sample towns, average bare-land assessments ranged from $2.00 to $4.50 per acre. A value of about $3.00 per acre appears to be a typical figure.

Table 6 shows the estimated cumulative stumpage proceeds per forest acre for substandard, standard, and above-standard forest management on each of the sample farms after paying either the old or the new forest tax. It is apparent that in the long run the owners will keep more of their timber proceeds under the new tax system than they did under the old one.

The amount that the owner stands to gain under the new tax law is greater, of course, where the old tax on timber was the highest, as with Farm B. Conversely, the least gain from changing the tax system occurs on Farm E, where the tax rate is only $3.10 per $100 of assessed value and only merchantable softwoods were assessed. On this farm positive returns accrue throughout the planning period under all management levels because of the well-balanced distribution of the growing-stock age classes.

Forest returns are zero or negative during an initial period on all of the farms except E unless above-standard management is practiced. This period of loss is longer where the growing stock contains less older material. These initial losses are smaller and the period of waiting for positive returns is shorter under the new tax system than they were under the old system.

This is especially noticeable on Farm F, where taxes are greater than stumpage proceeds under the old tax for the first 65 or 85 years while the growing stock is being built up. Positive returns under the new tax system are received almost from the beginning, since even the small amount of cutting brings in sufficient revenue to pay the low bare-land tax and the yield tax. The owning and reconditioning of such run-down forest land is a much more feasible and attractive enterprise for the private owner under the new tax system.

The cumulated stumpage proceeds of substandard management are greater than those of standard management, under the old tax system, on all farms except E with its low town tax rate and conservative assessment policy for growing timber. Even when the increased stumpage value of the residual

Table 6.--Farms B, C, D, E, and F: Estimated stumpage proceeds after taxes, under three levels of forest management, with taxes estimated under both old and new systems[1]

(In dollars per acre, cumulated by decades for 90 years.)

Decade	Substandard management		Standard management		Above-standard management	
	Old tax system	New tax system	Old tax system	New tax system	Old tax system	New tax system
			FARM B			
1st	$ - 5	$ - 2	$ - 5	$ - 2	$ 3	$ 6
2nd	-18	- 3	-13	1	3	16
3rd	31	50	5	31	34	57
4th	23	49	25	65	77	113
5th	10	47	13	63	74	120
6th	- 8	45	- 8	62	71	135
7th	12	58	-20	71	79	163
8th	-13	75	-17	100	117	225
9th	13	106	-17	139	151	294
			FARM C			
1st	$ - 4	$ - 2	$ - 3	$ - 2	$ 4	$ 5
2nd	- 1	2	- 2	1	13	15
3rd	- 7	0	- 4	4	23	29
4th	- 3	10	- 5	10	33	45
5th	17	37	10	35	71	92
6th	6	35	9	48	97	130
7th	34	70	19	68	129	170
8th	29	71	33	94	166	218
9th	47	93	42	109	193	249
			FARM D			
1st	$ 0	$ 0	$ - 1	$ - 1	$ 7	$ 7
2nd	- 3	1	- 4	0	19	22
3rd	12	18	4	13	38	45
4th	4	17	12	26	38	51
5th	24	40	18	40	66	86
6th	18	39	24	56	82	111
7th	44	66	34	72	102	135
8th	41	65	41	88	122	164
9th	44	73	41	95	132	179
			FARM E			
1st	$ 9	$ 9	$ 2	$ 3	$ 12	$ 12
2nd	5	8	7	10	27	28
3rd	8	14	14	20	51	55
4th	12	21	28	38	96	102
5th	15	30	47	63	120	131
6th	36	54	64	85	162	176
7th	40	63	62	90	198	216
8th	84	106	89	122	240	262
9th	103	124	154	186	330	349
			FARM F			
1st	$ - 1	$ 0	$ - 1	$ 0	$ 4	$ 5
2nd	1	5	0	4	14	16
3rd	- 2	4	- 1	7	17	23
4th	- 2	7	- 3	8	28	37
5th	0	17	- 6	14	39	57
6th	- 1	17	-11	21	45	73
7th	11	50	- 7	41	61	104
8th	4	54	- 2	64	84	144
9th	53	111	16	95	113	186

[1] The stumpage value of the growing stock left at the end of nine decades is shown in table 3.

growing stock is added to stumpage proceeds only very small gains can be obtained by an owner who makes moderate improvement in his management practices.

The long-run gains to be made by improving forest management under the new tax system, on the other hand, are quite clear from table 6; especially when the stumpage value of the residual stand is added to forest returns.

The advantage of tax payments that coincide with receipts of forest income is more striking if compound interest is charged on losses and credited on profits. The 90-year loss of $17 per acre on Farm B under standard management and the old tax would change to a loss of $144 per acre if a 5 percent interest rate were used. But with the new tax and 5 percent interest, standard management shows a gain of $1,300 per acre for the same period.

Similar calculations for Farm F, using 5 percent interest, also show large losses under the old tax system. No such deficit appears under the new tax. Returns are large enough and come early enough so that interest credited on the early operating gains more than offsets the interest charged on operating losses.

The conclusions reached from the study of Farm A are reaffirmed by the analysis of the other five sample farms. Larger and more certain forest returns are made possible by the new tax. A monetary stimulus for owners to adopt forest practices qualifying for the 30-percent abatement is also provided. These factors combine to make the private ownership and management of forest land a more generally attractive financial venture under the new tax system than under the old.

THE NEW TAX & THE TOWN

A COMPREHENSIVE ANALYSIS of any one town did not fall within the scope of this study. Certain limited generalizations on the direct effect of the new tax on a town's revenue have been made, however, using the six sample properties as a basis. It was assumed that their forest acreage represented a 10-percent sample of a hypothetical town having a tax situation similar to that of the seven sample towns.

The percentage distribution of the growing stock on the sample holdings by age classes and forest types is shown in table 7. Similar information is given in table 8 for the

Table 7.--Percentage distribution by forest types and age classes of the 3,821 acres of forest land in the six sample holdings

Forest type	Age class (in years)			All ages
	0-20	21-40	41+	
	Percent	Percent	Percent	Percent
Northern hardwood	33	15	11	59
Spruce-fir	14	12	4	30
White pine	3	6	2	11
All types	50	33	17	100

Table 8.--Percentage distribution by forest types and stand-size classes of the 4,682,200 acres of commercial forest land in the entire State[1]

Forest type	Stand-size class			All size classes
	Seedling, sapling, and poorly stocked	Pole timber	Saw timber	
	Percent	Percent	Percent	Percent
Northern hardwood	17	22	19	58
Spruce-fir	2	6	5	13
White pine	6	8	15	29
All types	25	36	39	100

[1] Northeastern Forest Experiment Station. Forest statistics for New Hampshire. Northeast. Forest Expt. Sta., Forest Survey Release 9. 56 pp. 1950.

State as a whole, including Federal and other public ownerships. Comparison of the two tables shows that the sample holdings are not typical of the State with respect to age distribution. The six farm forests contain much less older

timber; however, they are representative of many large forested areas where cutting, wind, and fire damage have been heavy in recent years.

With a high percentage of young timber below merchantable age, the town will raise less tax revenue from timber during the first years of the new law than it had received during recent years under the old law. To bridge this gap in the towns' tax income, the State Reimbursement Fund was set up. Through this Fund, and the yield tax collected, the towns will receive as much income from timber as they would have received under the old ad valorem tax with timber assessments equal to the 1944-48 average.

(If stumpage prices continue above the 1950 level assumed here, our estimates of tax yield will prove to be very conservative; the towns will benefit by a larger tax yield, and the drain on the Fund will be smaller.)

Reimbursement payments to the town vary with the amount of yield tax the town collects under the new law. One of the chief factors affecting this, according to our analysis, is the level of forest management practiced. Therefore let's examine the effect of three management levels on the hypothetical town's revenue from timber under the new tax law for the next 90 years.

If substandard management is practiced, yield-tax receipts will fall short of the old property tax on timber (based on the 1944-48 assessment). The town will receive sizable payments from the State Reimbursement Fund during the first four decades. After that, frequent payments will be made by the Fund in years when little timber is cut. For the entire 90-year planning period, it is expected, the town's account with the Reimbursement Fund will be in balance. But future calls on the Fund will occur, because a cyclical pattern of cutting will develop under this kind of management. Moreover, a gradual decline in the value of the timber produced, and an increase in the time between harvests, can be expected to reduce tax revenues further.

If standard management is practiced, the same situation as under substandard management will prevail for about the first four decades. After that time, however, the town will not need to draw on the Fund. Yield-tax receipts will balance the town's account with the Fund by the end of the 90-year planning period. After that the yield tax will

continue to bring in more than the old timber tax on the 1944-48 base. The town will receive larger tax revenues and no further payments from the Fund will be needed.

If above-standard management is practiced, yield-tax receipts will be greatly increased. Money will be needed from the Fund only during the first 10 years. The account should be in balance by the end of the second decade, with substantial gains for the town after that. Of course all timber owners will not adopt this high level of management; but if even a few do, town tax revenues will be increased appreciably and the drain on the Reimbursement Fund will be reduced accordingly.

If the fourth and lowest level of management is practiced, a paradoxical situation will occur. The first two decades, when heavy cutting will take place, will see a lighter drain on the Fund than under either standard or substandard management. After the initial stand has been liquidated, however, the yield-tax revenue of the town will fall off drastically. Timber will be harvested as soon as it becomes merchantable for low-value products. Succeeding stands will be of lower quality and volume; so the forest areas will become less productive. This will reduce stumpage receipts and cause a continuous drain on the Reimbursement Fund.

The effect of the new tax on town revenues can be much greater than is indicated by yield-tax receipts alone. As forest resources are built up, secondary benefits will accrue from the harvesting and processing of other kinds of forest products, from enhanced recreational values, and so on.

THE FIRST SIX MONTHS OF OPERATION

PRELIMINARY DATA are now available on the operation of the new tax law between the time it became effective (April 1, 1950) and the end of the tax year (October 1, 1950). This information was obtained from the New Hampshire Tax Commission, selectmen, landowners, and other sources.

It is important to recall that the adoption of the yield tax was widely opposed in the 1949 legislature--the Act was saved by only a one-vote margin. Much of this op-

position was from the representatives of small towns. Since the law is administered locally, this opposition posed a serious problem unless selectmen and landowners could be induced to give the law effective support. Therefore the Tax Commission, the Extension Service, The Society for Protection of New Hampshire Forests, and others have been conducting an intensive educational program to explain the law's purpose and operation.

The new law would have been much less successfully applied without this educational effort. It might well have become a "dead letter," as so often happens with little-understood legislation.

Administrative experience with the new law has been more favorable than was generally expected. The transition has involved extra work for the State Tax Commission so that last year it hired two part-time employees to assist selectmen and investigate trouble spots. We understood that the Commission is satisfied with the results so far.

Town enforcement of the provisions of the new law has been the chief administrative difficulty. There must be assurance that the towns are collecting all the required yield tax. A $500 penalty is incurred by an owner making a false report on the value or amount of stumpage cut. Either the Commission or the assessing officials can bring action on behalf of the town against delinquent owners. The State can also withhold reimbursement from a town where enforcement is obviously lax or irregular. Nonetheless, the full cooperation of the selectmen is needed to prevent evasion.

Last winter the Tax Commission made a rough survey to see how effectively the tax was being collected. In only about one-fifth of the towns did they find evidence of seriously lax enforcement or lack of understanding of the law by town officials. Trouble spots are being ironed out. All things considered, this seems to be a satisfactory record.

Determining qualification for tax abatement is an administrative problem parallel to enforcement. Selectmen have in general recognized this as their responsibility. During the first 6 months, abatement was requested on 35 percent (504) of all tax-paying operations. But selectmen granted only 309 of these requests. The County Foresters were frequently asked to help selectmen to recognize minimum forest practices, but the selectmen made the final abatement

decision on each case. With more experience it is expected that most selectmen will recognize minimum forest practices without assistance.

One administrative problem that loomed large to many observers has not yet become important. This was the evaluation of bare forest land. If bare-land assessments are too high, forest owners will fail to obtain any needed tax relief and the yield tax will become an additional burden to further discourage forest ownership. If bare-land is assessed too low, owners might escape their fair share of local taxes.

When the new law went into effect, however, most bare-land was already listed separately on the tax books. Thus the problem of evaluation did not come up as a necessary part of implementing the new tax law. With State Reimbursement Fund support, there was no pressure on the towns to increase bare-land assessment as compensation for dropping growing timber from the tax base. Whenever necessary, the rule of thumb followed by most selectmen is to assess bare forest land at approximately the market price of similar recently cut-over land in the town. The Tax Commission is alert to investigate cases of inequitable assessment.

The yield tax brought in $99,566 from 1,541 operations during its first 6 months. This was about $356,000 less than would have been collected under the old tax as estimated with the reimbursement formula. This amount was paid to the towns from the Fund. Since the bond issue authorized for the Reimbursement Fund was only $300,000, an additional $60,000 was appropriated this year.

How much future legislatures will have to appropriate for town reimbursement is an important question. Yield taxes collected in 1950 between April 1 and October 1 were used to offset the loss of a full year's property taxes on growing timber. Furthermore, only about 40 percent of the timber harvested in a normal year is cut during this period. Thus one can infer that if the new law had been in operation during the entire year total yield-tax receipts would have been about $250,000 (100/40ths of $99,566).

High stumpage prices and expanding markets for low-grade material will tend to increase the amount of yield tax in future years. Also, greater experience with the new sys-

tem will result in more uniform enforcement. But despite this, an annual net reimbursement of about $200,000 may be expected to continue for some time.

Widespread adoption of better forest practices would not relieve this situation until better growing stock has had time to build up--perhaps in 20 or 30 years. Universal adoption of intensive management could eliminate the drain on the Fund within the next 10 years; but this is decidely unlikely under present conditions.

Nineteen of the towns and six of the unincorporated places were not entitled to any reimbursement last year. In these areas enough cutting was done in 6 months last year to give a yield tax larger than the revenue lost by exempting growing timber from assessment. (The unincorporated places are wild lands administered by the State and held for the most part in large ownerships. In the past taxes here have tended to be light.)

The prospective drain on the State for reimbursement presents a political hazard. New Hampshire is not a rich state and the law's supporters fear that large annual appropriations may endanger the law. The fundamental question is: Will the people support a continuing sizable investment in this form as part of a program to build up the productivity of the State's forest resources?

Two ways have been suggested for reducing reimbursement requirements. One is to change the method of calculating the reimbursement so that towns most able to do so will bear some of the tax loss. Another proposal is to increase the yield-tax rate on cutting that does not meet minimum forest-practice standards.

Still another group of the law's supporters maintain that it should not be altered in any important respect for 10 or 20 years. They hold that the State should avoid any action that might be interpreted as abrogating promises made to the towns and landowners.

Political acceptance of the law is apparently increasing on the town level. This may be due in part to the vigorous educational program and in part to the selectmen's finding that administration is not so difficult and onerous as some had expected. One selectman who had opposed the law summed up a not too uncommon attitude when he said, "Now we've got this law, let's make it work if we can.

Many timber buyers and operators oppose the new law. Previously landowners paid all forest taxes; now the operator must not only pay the yield tax but must also report the value of stumpage cut to the local tax authorities. While this may be good landowner education in timber appraisal, it may also become more difficult for buyers to obtain some of the bargains that have been obtained in the past from owners who were poorly-informed about timber values. This type of operator would like to see the law killed.

A few owners, who are now cutting mature timber that has been fully assessed before, feel that they are the victims of double taxation--which they are--but most owners were never fully assessed. Other owners, confident that their timber would never be more than nominally assessed, feel trapped. In spite of this, forest-owner support of the new law has grown since its adoption.

One man with holdings scattered in several towns summed up a typical attitude of owners interested in forestry. "Our land doesn't support much merchantable timber now, but we hope to have it producing within 40 or 50 years. In 1949 our average tax was about 20 cents per acre while under the new law last year it was 12 cents per acre. But the really important thing is that now we can go ahead with a forestry program without the threat of constantly increasing property taxes as a result."

FINAL OBSERVATIONS

THE BASIC ATTRIBUTES of a good forest tax seem to be these:[4]

> The tax should be simple to calculate and economical to administer, and should yield an adequate revenue.
>
> Its adoption should not unduly disrupt local government finances.

[4] THE CRITERIA ARE BASED ON PRINCIPLES OF TAXATION PRESENTED BY HAROLD M. GROVES. FINANCING GOVERNMENT. ED. 3, 645 PP. NEW YORK. 1950.

It should impose a fair and equal burden on all owners. This burden should be commensurate with the income-producing capacity of the property.

It should be timed, as far as possible, to fall due when the forest yields an income.

It should minimize the uncertainty of future tax burdens.

It should not discourage the most economic, long-range management of forest land.

The foregoing discussion brings out how the old and new forest tax systems in New Hampshire measure up to these criteria. The new law falls short in certain particulars, but it comes much nearer to meeting them than did the old system. How successful it will be depends largely on its administration and on public acceptance.

Perhaps the greatest long-run value of the new law is in its educational effect. Widespread public discussion has been aroused by the passage and application of the new law. Some knowledge of desirable forest practices has been acquired by selectmen, landowners, and operators throughout the State. Forestry has a more realistic meaning to these people now than it had 2 years ago. Then many were still thinking exclusively in terms of fighting fires or planting a new tree for each one cut.

Experience to date indicates that most owners will not improve their forest practices because of the 30-percent abatement alone. However, increasing familiarity with these practices and their costs and returns will help promote better forest management.

It is significant that the minimum forest-practice standards are rapidly taking on meaning quite aside from their original purposes. They are frequently referred to in contracts, and are often specified as operating standards by owners selling stumpage. Most of these owners would not think it worth while to get a forester's advice or to write their own cutting standards. A few buyers have announced a policy of meeting minimum forest-practice standards on their operations.

Not all of these indirect benefits from the new law lend themselves to tangible evaluation; nonetheless they are continuing and real.

Forest taxation is interwoven with the knotty questions of the general property tax, of financing local government, and such related issues as rural zoning and public services. The new tax will certainly not solve New Hampshire's forest problem; its solution must come gradually through many different approaches.

The new tax does, however, enhance the opportunities for forest management as a profitable enterprise. It is a forward step toward creating an institutional framework more favorable to forestry. If cooperation to accomplish the objectives of the new law can be achieved among the State, local authorities, forest operators, and landowners, it will be a milestone in progressive forest legislation.

AGRICULTURE - FOREST SERVICE - UPPER DARBY