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*Copied for Governor Ford
Land Exchange see p. 45*

STATE OF MONTANA

Report of the

**FOREST LANDS ADVISORY
COMMISSION**

Appointed by the Governor under authorization
of the Twenty-eighth Session of the State Legislature

JANUARY, 1945

To

THE HONORABLE SAM C. FORD
Governor

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State of Montana
Report of the
Forest Lands Advisory Commission

Pondosa Pine

Appointed by the Governor under authorization of the Twenty-eighth Session of the State Legislature under Chapter 176, Session Laws of 1943.

In compliance with the law, the report is prepared for the consideration and use of the Governor.

JANUARY, 1945

To

**THE HONORABLE
SAM C. FORD
Governor**

ACKNOWLEDGMENT

The seven individual tabulated records in the form of tables embraced in the body of this report were prepared by the Northern Rocky Mountain Forest and Range Experiment Station, of the United States Forest Service, Missoula, Montana. The major portion of this information was made available from the National Forest Survey project in the United States, authorized by the United States Congress. The actual work was performed by the Federal agency previously mentioned.

The Commission wishes to extend its thanks and express its appreciation to Director Melvin Bradner and to his assistant Research Engineer, Paul Kemp, not only for the use of the statistical material, but also for constructive comments in the form of suggestions which proved very helpful in the compilation of this report.

LETTER OF TRANSMITTAL

Forestry Building
State University
Missoula, Montana
January 13, 1945

The Honorable Sam C. Ford
Governor of Montana
Helena, Montana
Dear Governor Ford:

In compliance with Chapter 176 of the Twenty-eighth Legislative Assembly (1943), authorizing you to appoint a commission to make a study and report on the subject of the present forest conditions on State, county and privately-owned lands, we are submitting herewith a report for your consideration and use.

Its contents are compiled from the best available information and cover the subjects designated in the law heretofore referred to.

Very respectfully yours,

FOREST LANDS ADVISORY COMMISSION

Stanley Antrim, Chairman
George R. Cooper
Roscoe Haines
George Neils
Otto Hansen

CONTENTS

	Page
Preface	5
Brief Summary of Recommendations	6
Summary—Privately-owned Forest Lands.....	7
Statement of Forest Conditions on Privately-owned Forest Lands:	
Forest Resources of Montana	10
Annual Drain—Present Stand	12
Lumber Production	13
Sustained Yield	15
Forest Fire Protection	24
Logging Practices	25
Taxation	28
Watershed Protection	30
Grazing	31
Importance of Montana's Forests	32
Summary—State owned Forest Lands.....	33
Statement of Forest Conditions on State-owned Forest Lands:	
Acreage	37
Timber Resources	37
Drain from Cutting	38
Annual Drain—Natural Causes	38
Sustained Yield	39
Basis for Cutting	41
Sustained Yield on Short Rotation	42
Grazing	44
State Lands Within Sustained Yield Units.....	45
Land Exchange	45
Land Acquisition	47
Proposed County Forests	47
Board of Forestry to Cooperate with Land Board.....	48
Need for Adequate Financing	48

PREFACE

Governor Sam C. Ford, in his message to the State Legislature on January 5, 1943, called attention to the importance of the forests of the State and indicated the manner in which they serve the people. He pointed out also that if the many benefits from the forests now enjoyed by our people are to be continued, it would be to the public interest to formulate a sound forest policy; first, with respect to State-owned lands and second, with respect to the State's responsibilities toward privately-owned lands.

As a follow-up to assist in securing the data on which to formulate a constructive forest program, Governor Ford asked the Legislature to initiate legislation which would authorize him to appoint a commission to make a study of the problem. As a result, a law was passed designated as Chapter 176, known as an "Act Providing for the Appointment of a Forest Lands Advisory Commission, consisting of five members, to make recommendations to the Governor for a long range program for the conservation and use of forest resources."

MEMBERS OF GOVERNOR FORD'S FOREST LANDS ADVISORY COMMISSION

Representative Stanley Antrim, Chairman, Stevensville, Montana

Senator George R. Cooper, Superior, Montana

Mr. Roscoe Haines, Land Agent, A. C. M. Co., Bonner, Montana

Mr. George Neils, J. Neils Lumber Co., Libby, Montana

Mr. Otto Hansen, Superior, Montana

Rutledge Parker
Secretary and State Forester

BRIEF SUMMARY OF RECOMMENDATIONS

Privately-owned Forest Lands

1. That there be no new legislation affecting privately-owned forest lands.
2. That information now available, compiled from studies in the past, does not justify any change in existing laws under present emergency conditions.
3. That further studies should be made during the next two years, at the end of which time information may be available to supplement this report.

State-owned Forest Lands

1. That the State Forester's office be authorized to make small timber sales (not to exceed one million feet log scale) to make a tree scale in place of a log scale. This will be more economical where the daily output is not sufficient to warrant keeping a scaler on the job.
2. (a) That counties be authorized to create county forests from tax deed forest lands, (b) that such lands be consolidated through an exchange with other owners, (c) that the State, through the State Forester's office administer the county forests, (d) that all income from county forests in excess of the cost of administration and fire protection be allocated to the counties.
3. That the Montana State Board of Forestry cooperate with the State Board of Land Commissioners in the management of State-owned forest lands.
4. That a referendum measure be acted upon proposing an amendment to the State Constitution to legalize the exchange of State forest lands for forest lands in other ownerships to help in the consolidation of State forests.
5. That a plan be approved for the State acquisition of some of the best logged-off privately-owned lands for consolidating the State forests.
6. (a) That the State Forester's office be better financed, making it possible for it to more adequately perform the duties of the office, (b) that due consideration be given the appropriation budget request for the fiscal years 1946 and 1947.

SUMMARY

PRIVATELY-OWNED FOREST LANDS

Possibilities of Sustained Yield—Industrial forestry in Montana would be possible if there were sufficient and attractive bodies of public and privately-owned commercial timber stands which could be pooled and the operations conducted on a sustained yield plan. (See caption 4, page 15, definition of sustained yield.)

If private enterprise in Montana is expected to enter into a program of forestry, it is essential that the plan include concessions given by the public in some form in order to give assurance that a profit will be made from the operations and at the same time provide all of the social, economic and other benefits for the welfare of the public. It might be cheaper and more efficient to do this than to have the public carry the entire load of the forestry program. If the present normal cut is not greatly exceeded in the future, there is every evidence to indicate that the commercial forests as a whole will continue to produce through growth a volume of wood products equal to the volume now being normally used.

Organized Forest Fire Protection—Federal, State and private cooperation in fire protection has progressed and developed to a point where the forests of Western Montana are receiving adequate protection, or nearly so.

Unorganized Districts—Consideration should be given to the bill sponsored by the Montana's Rural Fire Fighters Service authorizing county commissioners to participate in a program of rural fire protection outside of organized fire protection districts.

Logging Practices on Private Lands—The annual cut on privately-owned lands has been greatly increased under the stimulus of wartime requirements. Despite handicaps due to manpower shortage, inexperienced help and loss of time in securing equipment, repairs and supplies, operators have been producing tremendous amounts of forest products needed for war purposes, and the forest areas on which they have been operating *have not been destroyed*. Generally, they are left stocked with young growth so that, if protected from fire, these areas will continue to produce timber, but will require a period of one hundred or more years to produce sawlog material. Closer supervision and training by the industries of sawyers and operators of skidding machinery are recommended for better conservation of advanced and young growth left as residual stand after logging. Consideration of this class of training

might also be undertaken by the School of Forestry and in co-operation with industry.

The terms "sustained yield," "selective cutting" and "regulation" are variously interpreted. All are agreed that forest lands must be kept productive. However, the period of rotation depends on the use made of the timber—lumber, ties, poles, piling, Christmas trees, etc. For lumber production the cutting cycle may be from 50 to 100 years or more, depending on the amount of timber reserved from cutting and the number of poles under sawmill size. Where 50 per cent is reserved for a second cut, the period of rotation is about 50 years. Where thrifty growing stock to the amount of 10 to 15 per cent of the volume of the original stand is left, by cutting pine to 18 inches and larch and fir to 16 inches diameter breast high, and leaving some larger bull pine, a period of 100 years is required for the production of another cut for lumber. Closer cutting practices lengthen the rotation period. For railroad ties the rotation period is 50 to 60 years; for cedar poles, 25 to 30 years; and for Christmas trees, 3 to 5 years.

Taxation on Immature Forest Lands—There is no evidence to indicate that a decrease in the present ad valorem tax on logged-off lands containing advanced forest growth will in any manner encourage private owners to carry such lands for forestry purposes. No change is recommended in property taxes on lands containing immature forests. The present rate is not thought to be out of line with those of other states.

Watershed Protection—Since the forested mountain regions of the State are the chief source of our water supply, it is only natural that the public should be vitally interested in seeing that these watersheds are not adversely disturbed. Now that practically all of these watersheds in the State are within organized fire protection districts, the public is given assurance that, with the control of forest fires, the greatest threat to a constant supply of water has been removed. If fire protection served no other purpose than to safeguard watersheds, its continuance at public expense would be more than justified.

The cutting and removal of timber from the watersheds in Western Montana have caused some apprehension as to the influence this will have upon our water supply. The general appearance of the extensive cutover acreage, from which billions of feet of timber have been cut and removed, does not support an alarmist attitude that our watersheds have been seriously impaired by removing the merchantable timber. It is true that there are some small drainages where present mechanized logging methods have caused some damage through soil erosion.

With the expansion of irrigation to include all irrigable lands, it may be expected that modern logging methods will eventually come in conflict with other land uses unless preventive soil erosion controls are established. Legislation on this subject is not needed for the present, although the logging of certain stands of timber adjacent to irrigated lands will require careful observation.

Grazing—The pasturage resources of the privately-owned forest lands should be fully utilized not only for the purpose of increasing the State's potential meat and wool production but also as a ready source of income for the forest landowner, thereby assisting him in meeting his fire protection and other carrying costs. Careful and well-planned pasturage may be maintained on much of the forest cover without conflict with forest growth. Wherever pasturage is possible, it should be encouraged, since it makes use of an annual natural resource that would otherwise be wasted.

The State, through the office of the State Forester, should be in a position to assist forest landowners whose property may be adapted to pasturage that they may secure the highest economic returns from their holdings.

RECOMMENDATIONS

1. That there be no new legislation affecting privately-owned forest lands.
2. That information now available, compiled from studies in the past, does not justify any change in existing laws under present emergency conditions.
3. That further studies should be made during the next two years, at the end of which time information may be available to supplement this report.

STATEMENT OF FOREST CONDITIONS ON PRIVATELY-OWNED FOREST LANDS

1. FOREST RESOURCES OF MONTANA

The forested areas of Montana may be divided into three groups:

- a. The extensive commercial forests West of the Continental Divide.
- b. The scattered and sparsely forested areas in the Great Plains region.
- c. The forested areas in the mountains and contiguous foothills East of the Continental Divide.

The forests of the State, in addition to providing raw material in the form of wood for the manufacture of lumber, railroad ties, mining timbers, fuel and hundreds of other useful products essential to maintain our prosperity, likewise provide the following benefits:

- a. *Conservation of water and soil:* The forest-covered mountains are the reservoirs supplying the streams and rivers which furnish the water for irrigation, power and navigation.
- b. *Forage for domestic livestock:* Thousands of head of cattle and sheep range each year in the forested mountains of the State, which therefore directly serve one of the most important industries.
- c. *Recreation:* Hunting, fishing, outdoor winter sports and the many other enjoyments are provided in the "Big Outdoors."
- d. *Food and protection for wildlife:* The forests are an important refuge and furnish an ample food supply for big game and upland birds.

The four purposes of the forests or uses to which they are put, other than the production and use of wood which have been enumerated, render a sufficient service to the people of the State to justify full public participation in cooperative fire protection and likewise in practical cooperative forest cutting practices in order to guarantee their perpetuation for the use and enjoyment of the people of the State.

Table I on page 11 shows the total forest land area in Montana in Federal, State, county and private ownership. The forest is divided into commercial and non-commercial areas, the ownership of which is indicated. The forest acreages within National Forests and Parks reserved from commercial use

are shown separately for the classified commercial and non-commercial areas and are as indicated below:

Classified as forest lands24,238,000 Acres

Classified as Non-commercial

forest land 8,808,000 Acres

Classified as Commercial

forest land15,430,000 Acres

Commercial forest land reserved

from cutting 732,000 Acres

Total unreserved commercial

forest land14,698,000 Acres

Table II on page 12 shows the forest land available for commercial use in Montana. This table shows the forested areas in acres owned by federal, State, county and private owners. The forested areas for both Western and Eastern Montana are in three separate classes; namely, (1) virgin timber stands (saw timber), (2) young growth in various stages of development, (3) areas which are not restocking satisfactorily. Totals are given for these as indicated.

Table 1. Total forest land in Montana by ownership, commercial character and subregion.

Subregion and commercial character	Total	Private			State	County	Indian	Public domain	National park	Other federal	National forest
		Total	Farm	Other							
		Thousand Acres									
WESTERN MONTANA											
Commercial											
Nonreserved	8,909	2,866	800	2,066	446	59	380	177			4,981
Reserved	602	10		10					325	5	262
Total.....	9,511	2,876	800	2,076	446	59	380	177	325	5	5,243
Noncommercial											
Nonreserved	2,512	232	41	191	40	2	95	28			2,115
Reserved	996	63		63					187	1	745
Total.....	3,508	295	41	254	40	2	95	28	187	1	2,860
Total Western Montana.....	13,019	3,171	841	2,330	486	61	475	205	512	6	8,103
EASTERN MONTANA											
Commercial											
Nonreserved	5,789	1,167	820	347	90	87	240	147			4,058
Reserved	130								90		40
Total.....	5,919	1,167	820	347	90	87	240	147	90		4,098
Noncommercial											
Nonreserved	4,400	1,014	680	334	110	63	360	153			2,700
Reserved	900								600		300
Total.....	5,300	1,014	680	334	110	63	360	153	600		3,000
Total Eastern Montana.....	11,219	2,181	1,500	681	200	150	600	300	690		7,098
ALL MONTANA											
Commercial											
Nonreserved	14,698	4,033	1,620	2,413	536	146	620	324			9,039
Reserved	732	10		10					415	5	302
Total.....	15,430	4,043	1,620	2,423	536	146	620	324	415	5	9,341
Noncommercial											
Nonreserved	6,912	1,246	721	525	150	65	455	181			4,815
Reserved	1,896	63		63					787	1	1,045
Total.....	8,808	1,309	721	588	150	65	455	181	787	1	5,860
Total Montana	24,238	5,352	2,341	3,011	686	211	1,075	505	1,202	6	15,201

Data for Western Montana from Forest Survey; private split between farm and other estimated. Data for Eastern Montana adapted from Montana Handbook, 1938 Joint Congressional Committee reports and adjustments indicated by Survey findings in three eastern Montana counties. Courtesy Research Department U. S. Forest Service Region I.

Table II—Nonreserved commercial forest land in Montana by ownership, character of growth, stand class and presence or absence of forest cover

Ownership	Total	Forested				Defor- ested
		Total	Saw timber		Pole, seedling and sapling	
			Old growth1/	Second growth		
WESTERN MONTANA						
Private						
Farm	800	50	42	8	721	29
Other	2,066	1,167	1,145	22	826	73
Total	2,866	1,217	1,187	30	1,547	102
State	446	238	237	1	189	19
County	59	18	18		40	1
Indian	380	205	204	1	166	9
Public domain	177	40	39	1	129	8
National forest	4,981	1,657	1,650	7	3,131	193
Total	8,909	3,375	3,335	40	5,202	332
EASTERN MONTANA						
Private						
Farm	820	114	84	30	700	6
Other	347	116	96	20	225	6
Total	1,167	230	180	50	925	12
State	90	30	29	1	57	3
County	87	16	16		70	1
Indian	240	80	76	4	148	12
Public domain	147	24	24		120	3
National forest	4,058	1,215	1,189	26	2,723	120
Total	5,789	1,595	1,514	81	4,043	151
ALL MONTANA						
Private						
Farm	1,620	164	126	38	1,421	35
Other	2,413	1,283	1,241	42	1,051	79
Total	4,033	1,447	1,367	80	2,472	114
State	536	268	266	2	246	22
County	146	34	34		110	2
Indian	620	285	280	5	314	21
Public domain	324	64	63	1	249	11
National forest	9,039	2,872	2,839	33	5,854	313
Total Montana	14,698	4,970	4,849	121	9,245	483

1/ Over about 120 years; areas estimated. Distinction between saw-timber stands is based on whether the majority of the cubic volume (in trees 5 inches d.b.h. and larger) is respectively in trees 11 inches d.b.h. or larger or in trees 5 inches to 11 inches d.b.h.

Courtesy Research Department U. S. Forest Service Region I.

2. THE ANNUAL "DRAIN" FROM THE PRESENT STAND

The drain is the reduction each year in the volume of merchantable timber through cutting operations and losses due to fire, insects, disease and other natural causes.

- a. *Drain from fires* Although fire protection in Montana is very much more effective at present than during the past, very definite losses from this source must be expected. Records for the period 1931 to 1937, inclusive, give the average annual losses from fire in commercial saw log stands in Western Montana as 43,000,000 feet log scale, and in Eastern Montana 1,000,000 feet log scale. In addition there are extensive fire losses in young forest stands, which result in reducing the future volume of wood through growth of the forests.
- b. *Drain from insects, disease and other natural causes:* There is no accurate information available to indicate the an-

nual loss of timber due to destruction by insects and disease. The destruction from this source, however, is far greater than some of the estimates indicate. During the past 40 years there has been a loss in the Ponderosa pine saw timber stand in Western Montana of about $\frac{1}{2}$ of 1 per cent annually, and this includes mature trees of the finest quality for lumber. During the period in question the most extensive damage occurred in the Bitterroot Valley where about 35 per cent of the Ponderosa pine was destroyed and about 25 per cent, in the Blackfoot Valley. Private owners are salvaging the remaining stands of mature timber in these areas as rapidly as possible in order to avoid additional losses.

- c. *Drain from cutting:* The average annual drain from the cutting of saw log timber for both Western and Eastern Montana is indicated in Table III on page 14.

It is noted that the average annual cut for all species (saw timber products) covering the period from 1925 to 1940, inclusive, is 229,600,000 feet log scale, while the average annual cut of saw log material during the war emergency period 1941 to 1943, inclusive, increased to 348,000,000 feet log scale, which is an annual increase in saw log material of 118,400,000 feet log scale. In addition to the saw-log material indicated above, there is cut annually approximately 60,000,000 feet, manufactured into materials indicated below Table III on page 14. This makes a total annual drain from cutting, amounting to 289,600,000 feet log scale.

3. LUMBER PRODUCTION

Sawmill operations: Possibly the most important saw timber stands to be considered are the commercial forests West of the Continental Divide, because Western Montana is one of the important lumber producing centers. Eastern Montana is of minor importance in this respect, there being only about 3 per cent of the lumber of the State produced there and practically all of it is used locally.

Timber products, their value and importance: The average annual cut of saw logs for lumber, sawed ties and timbers from Western Montana during the 16-year period from 1925 to 1940, inclusive, was 222,400,000 board feet log scale. Montana lumbermen have gone "all out" for production during the war emergency period and the average annual cut of lumber, sawed ties and timbers for the 3-year period 1941-1943, inclusive, has increased from 222,400,000 feet log scale to 336,500,000 feet in Western Montana. In Eastern Montana the average

Table III—Average Annual Sawlog Production—Montana
(By Species Groups and Ownership)

Species	For Western Montana				For Eastern Montana				For Whole State			
	Prewar period		War emergency period		Prewar period		War emergency period		Prewar period		War emergency period	
	16-yr. ave. 1925-40 inclusive	% Total	3-yr. ave. 1941-43 inclusive	% Total	16-yr. ave. 1925-40 inclusive	% Total	3-yr. ave. 1941-43 inclusive	% Total	16-yr. ave. 1925-40 inclusive	% Total	3-yr. ave. 1941-43 inclusive	% Total
Volume in million board feet Scribner Log Scale												
Ponderosa and												
W. white pine	120.4	54	158.0	47	2.5	35	2.9	25	122.9	54	160.9	46
All other species	102.0	46	178.5	53	4.7	65	8.6	75	106.7	46	187.1	54
Total all species	222.4	100	336.5	100	7.2	100	11.5	100	229.6	100	348.0	100
Privately owned	1/	79	204.4	61	1/	78	2.5	22	1/	77	206.9	60
State owned	1/	10	57.3	17	1/	1	0.0	0	1/	10	57.3	16
Federally owned	1/	11	74.8	22	1/	21	9.0	78	1/	13	83.8	24

1/ Information for 16-year period not available. Percentages shown are an estimate based on figures covering only a 3-year period.

In addition to the sawmill products indicated in the above table, there is an estimated annual cut of 60,000,000 feet covering the following products: fuelwood, poles, mine stulls, posts, pulpwood, hewed ties, converter poles, piling and shingles. This makes an estimated total drain from cutting in the State during normal times of (229,600,000+60,000,000) 289,600,000 feet board measure log scale.

Courtesy Research Dept. U. S. Forest Service Region I.

annual lumber cut is about 7,200,000 board feet log scale. Since the beginning of the war this has increased to an annual cut of 11,500,000 feet log scale, most of which is used locally.

Table IV on page 16 shows the volume of commercial saw timber stands by species in Montana as a whole, in federal, State, county and private ownership, available for commercial uses. Table V on page 17 gives this information for Western Montana and Table VI on page 18, for Eastern Montana.

The present war has created a demand for all species; consequently, there has been an unusual increase in the annual cut of fir, larch and other species.

Table III on page 14 shows the average annual log production converted into sawed products for the 16-year period 1925 to 1940, inclusive, as 222,600,000 feet board measure log scale, and timbers other than sawed products estimated at 60,000,000 feet log scale. This makes a total average annual cut for the period of 289,600,000 feet log scale. It was also indicated during this period that the percentage of the cut from privately-owned lands was about 77 per cent and from public lands, 23 per cent. During the war period 1941 to 1943, inclusive, saw log production converted into sawed products increased to 348,000,000 feet log scale. This added to material cut other than sawmill products equals a total of 408,000,000 feet. This increased the cut from publicly-owned lands from 23 to 40 per cent, and reduced the percentage of the total from privately-owned lands from 77 to 60 per cent.

The lumber industry is a very important economic factor in the welfare and prosperity of the people, in a number of localities in the State; such as, in Missoula, Flathead and Lincoln Counties. In Lincoln County, the only important pay roll in the county is from the lumber industry.

4. POSSIBILITIES OF SUSTAINED YIELD

Sustained yield is a term used by foresters which means, literally, that annually or during a fixed period the volume of timber in board feet log scale to be cut from the forest will approximately equal the volume of wood produced through the growth of the forest during the year or period under consideration. The records indicate that the annual normal cut including all material is about 289,600,000 feet log scale and the annual growth is about 351,400,000 feet log scale which is 61.8 million feet in excess of what is being actually cut annually.

There are no absolutely accurate figures available giving the volume of wood in board feet produced through growth in Montana. The figures, however, given in Table VII, page

ALL MONTANA

Table IV—Saw-timber volume 1/ (Scribner Rule) of the nonreserved commercial forests by species, ownership and stand class

Ownership	Area 2/	Volume by species															
		Total all species	Western white pine	Ponderosa pine	Western larch	Douglas-fir	Grand fir	Alpine fir	Western red-cedar	Western hemlock	Engelmann spruce	Lodgepole pine	Timber pine	Aspen	Cottonwood	Cedar poles	
M acres		SAW-TIMBER STANDS															
Private																	
Farm	164	669	1	285	40	110	2	1	2		9	15	1	3	200	6	
Other	1,283	10,368	90	4,076	3,439	2,137	11	23	54	6	389	116	12		15	140	
Total	1,447	11,037	91	4,361	3,479	2,247	13	24	56	6	398	131	13	3	215	146	
State	268	2,256	54	650	710	464	12	21	11	1	246	65	5		17	25	
County	34	164	2	34	52	48		2	1		11	11			3	3	
Indian	285	1,833		1,002	280	266	5	21	2		97	127	10		23	4	
Public Domain	64	281		93	49	105		1			7	14			12		
National forest	2,872	22,099	713	2,790	4,205	5,367	158	293	215	114	4,049	4,107	61	1	26	721	
Total	4,970	37,670	860	8,930	8,775	8,497	188	362	285	121	4,808	4,455	89	4	296	899	

POLE, SEEDLING AND SAPLING STANDS

Private			721	1	330	80	230	2		1		4	47	1	3	22	1
Farm	1,421		1,189	23	270	239	411	24	8	6	4	17	173	4		10	28
Other	1,051		1,910	24	600	319	641	26	8	7	4	21	220	5	3	32	29
Total	2,472		223	2	67	43	72	3	1	1		4	28	1		1	
State	246		59	1	21	11	20	1				1	4				
County	110		246	1	76	41	76	2	2	1		1	39	1	1	2	
Indian	314		159		43	9	72	1				1	32	1			
Public Domain	249		3,922	54	386	725	1,183	65	58	20	11	192	1,194	29		5	84
National forest	5,854		6,519	82	1,193	1,148	2,064	98	69	29	15	223	1,517	37	4	40	114
Total	9,245		44,189	942	10,123	9,923	10,561	286	431	314	136	5,031	5,972	126	8	336	1,013
Grand total	14,215																

1/ Trees approximately 11.1 inches d.b.h. and larger, scaled in 16-foot logs to a merchantable top diameter.

2/ The area of stocked nonreserved commercial forest lands.

Courtesy Research Dept. U. S. Forest Service Region I.

WESTERN MONTANA

Table V—Saw-timber volume 1/ (Scribner Rule) of the nonreserved commercial forests by species, ownership and stand class

Ownership	Area 2/	Volume by species															
		Total all species	Western white pine	Ponderosa pine	Western larch	Douglas-fir	Grand fir	Alpine fir	Western red-cedar	Western hemlock	Engelmann spruce	Lodgepole pine	Limber pine	Aspen	Cottonwood	M pieces	
SAW-TIMBER STANDS																	
Private		275	1	71	40	55	2	20	54	2	6	5	3	1	95	6	
Farm	50	9,911	90	3,730	3,439	2,072	11	20	54	2		383	90	11	5	140	
Other	1,167	10,186	91	3,801	3,479	2,127	13	20	56		6	388	93	11	100	146	
Total	1,217	2,156	54	625	710	434	12	20	11		1	243	34	5	7	25	
State	238	134	2	26	52	36		1	1			11	3		2	3	
County	18	1,472		878	280	172	5	11	2			87	27	7	3	4	
Indian	205	242		85	49	97						3	6		2		
Public domain	40	14,310	713	2,320	4,205	2,917	158	180	215		114	2,879	557	47	1	4	
National forest	1,657	28,500	860	7,735	8,775	5,783	188	232	285		121	3,611	720	70	2	118	
Total	3,375																
POLE, SEEDLING AND SAPLING STANDS																	
Private		460	1	180	80	160	2		1			3	22	1	10	1	
Farm	721	1,106	23	220	239	391	24	7	6		4	15	168	4	5	28	
Other	826	1,566	24	400	319	551	26	7	7		4	18	190	4	15	29	
Total	1,547	1,97	2	52	43	64	3	1	1			3	26	1	1		
State	189	39	1	9	11	13	1					1	3				
County	40	186	1	56	41	56	2	1	1			3	24		1		
Indian	166	129		17	9	70	1					1	30	1			
Public domain	129	3,139	54	348	725	933	65	37	20		11	76	844	23	3	84	
National forest	3,131	5,256	82	882	1,148	1,687	98	46	29		15	102	1,117	29	20	114	
Total	5,202	33,756	942	8,617	9,923	7,470	286	273	314		136	3,713	1,837	99	138	1,013	
Grand Total	8,577																

1/ Trees approximately 11.1 inches d.b.h. and larger, scaled in 16-foot logs to a merchantable top diameter.

1/ Trees approximately 11.1 inches d.b.h. and larger, scaled in 16-foot logs to a merchantable top diameter.

2/ The area of stocked nonreserved commercial forest lands.

Courtesy Research Dept. U. S. Forest Service Region I.

EASTERN MONTANA

Table VI—Saw-timber volume 1/ (Scribner Rule) of the nonreserved commercial forests by species, ownership and stand class

Ownership	Area 2/ M acres	Total all species	Volume by species							M pieces
			Ponderosa pine	Douglas- fir	Scribner Rule					
					Alpine fir	Engel- mann spruce	Lodge- pole pine	Limber pine	Aspen	
SAW-TIMBER STANDS										
Private										
Farm	114	394	214	55	1	4	12	1	2	105
Other	116	457	346	65	3	6	26	1		10
Total	230	851	560	120	4	10	38	2	2	115
State	30	100	25	30	1	3	31			10
County	16	30	8	12	1		8			1
Indian	80	361	124	94	10	10	100	3		20
Public domain	24	39	8	8	1	4	8			10
National forest	1,215	7,789	470	2,450	113	1,170	3,550	14		22
Total	1,595	9,170	1,195	2,714	130	1,197	3,735	19	2	178

POLE, SEEDLING AND SAPLING STANDS

Private										
Farm	700	261	150	70		1	25	1	2	12
Other	225	83	50	20	1	2	5			5
Total	925	344	200	90	1	3	30	1	2	17
State	57	26	15	8		1	2			
County	70	20	12	7			1			
Indian	148	60	20	20	1	1	15	1	1	1
Public domain	120	30	26	2			2			
National forest	2,723	783	38	250	21	116	350	6		2
Total	4,043	1,263	311	377	23	121	400	8	3	20
Grand total	5,638	10,433	1,506	3,091	153	1,318	4,135	27	5	198

1/ Trees approximately 11.1 inches d.b.h. and larger, scaled in 16-foot logs to a merchantable top diameter.

2/ The area of stocked nonreserved commercial forest lands.

Courtesy Research Dept. U. S. Forest Service Region I.

20, are taken from those prepared by Northern Rocky Mountain Forest and Range Experiment Stations of the United States Forest Service and are based on limited studies only. The figures given are conservative and the very best available.

This, however, is not an accurate picture of the situation because Ponderosa pine (yellow pine), the most desirable specie for sawmill operations is being cut very much faster than it is being grown. Growth is estimated at 89,700,000 feet annually and the cut normally has averaged about 122,900,000 feet board measure. The annual cutting drain has been about 33,200,000 feet in excess of the growth. When considering the annual cut of yellow pine from private lands (96,000,000 feet), which is 78 per cent of the total cut, and the annual growth is only 44,800,000 feet, there are being cut 51,200,000 feet in excess of the actual annual growth. These figures indicate that, while the privately-owned yellow pine stands are being cut at a rate of 2.15 times as fast as they are growing, virgin forests must of necessity have the old and decadent timber removed before the forest can be developed into a thrifty growing condition where a maximum volume of wood will be produced through growth. Under the circumstances, it is good forest practice to have the annual cut exceed the growth until the mature virgin forests have been cut over and thus provide more favorable conditions for increased volume through growth of younger and more thrifty trees remaining.

It is almost impossible to rectify this situation because of the better prices and the strong demand for the Ponderosa pine. If the cut, however, of this specie could be reduced to a figure to approximate the cut of less desirable species which could be correspondingly increased, the opportunity for sustained yield in the Ponderosa pine type would be more encouraging.

When considering the drain from cutting, fire and insects in the commercial forests of Montana, the total is approximately 17,700,000 feet board measure less than the growth. If it were possible to provide a more even distribution of the cutting of the forests of the State and to reduce the losses from fire and insects from what they have been in the past, together with some improvement in forest practices, sustained yield would not be beyond the possibility of a reality even in the Ponderosa Pine type.

If the 8,909,000 acres of forest land in Western Montana will produce wood through growth at the rate of 35 board feet per acre, then the total area of 8,909,000 acres would grow a total of 313,000,000 board feet log scale annually and, if the 5,789,000 acres of forests East of the Continental Divide would

Table VII—Estimated current annual increment on nonreserved commercial forests of Montana

	Western Montana			Eastern Montana			Total Montana		
	National Forest	Other lands	Total	National Forest	Other lands	Total	National Forest	Other lands	Total
Million board feet, Scribner Scale									
Western white pine	6.9	1.9	8.8				6.9	1.9	8.8
Ponderosa pine	24.4	41.3	65.7	2.9	12.3	15.2	27.3	53.6	80.9
Larch and Douglas fir	89.8	59.2	149.0	11.6	3.6	15.2	101.4	62.8	164.2
Spruce and balsam fir	17.9	4.8	22.7	7.3	0.3	7.6	25.2	5.1	30.3
Lodgepole pine	26.4	11.0	37.4	19.6	1.9	21.5	46.0	12.9	58.9
All other species	4.0	2.8	6.8	0.1	1.4	1.5	4.1	4.2	8.3
Total.....	169.4	121.0	290.4	41.5	19.5	61.0	210.9	140.5	351.4
Per acre (bd. ft.)									
Current	35	31	33	10	11	11	23	25	24
Potential	91	93	93	28	33	30	63	76	68

These figures include growth on both mature sawtimber stands and on young growth.

Courtesy Research Dept. U. S. Forest Service Region I.

produce through growth 11 board feet or more per acre or a total of 60,000,000 feet board measure log scale, the two areas combined would produce 372,000,000 feet as a whole. This is a very conservative estimate and it checks very closely with the figures of 351,400,000 feet compiled by the Research Department of the United States Forest Service.

If the figures showing the average annual normal cut, plus the drain from all natural causes estimated at 333,700,000 feet log scale for all species, are correct and the remaining stand of timber in public ownership is 31,189,000,000 feet log scale, and private holdings are 13,000,000,000 feet log scale and the cutting plus all other drain from private timber is 235,900,000 feet annually, then the private timber will be exhausted in 55 years. On the other hand, if the public holdings containing 31,189,000,000 feet board measure under normal conditions are being cut plus drain from all other sources at the rate of 97,800,000 feet annually, it would require 317 years to complete the cutting of the timber. What will actually happen is that the demand for the public timber will gradually increase during the period required to cut the private timber. This will have a tendency to increase the time during which the private timber will be cut and after which time practically the only remaining commercial supply will be public timber. From this time on it is logical to assume that the annual cut will be less than at the present time and will be largely influenced by the volume of wood produced through growth on the public forests.

This restriction in the volume of commercial timber to be cut may continue through a period of 50 years or more, or until the young forests now in private ownership reach merchantability, at which time an increase in the annual cut can be expected. The records indicate that the private forests are only producing a volume of 100,000,000 feet log scale annually through growth and the annual drain from cutting and other sources is 235,900,000 feet board measure log scale. The present cut, therefore, from the privately-owned lands is 135,900,000 feet more than the volume of wood being actually produced through growth. On the other hand, the annual normal cut and drain from other sources on publicly-owned lands is only 97,800,000 feet and the annual volume produced through growth is estimated at 251,400,000 board feet. The public forests, therefore, could provide a volume of 153,600,000 feet board measure in addition to that being cut from the public forests at the present time. This results in the other extreme of undercutting. The reason for this is that the present cut is being applied to the more attractive bodies of private timber from the standpoint of volume, quality, accessibility, and de-

sirable species. The cutting of the greater part of the public timber, therefore, will be deferred until the timber on these private areas has been exhausted.

As previously stated, at the present rate of cutting the privately-owned forests can be exhausted in 55 years. It is very doubtful, however, that this will actually happen because in the future, as private timber diminishes, the demand for public timber will increase, which will help in some degree to slow up the overcutting on private lands and gradually increase the volume of the cut on public lands until a maximum of 251,400,000 feet board measure is reached, which is estimated to be the volume actually produced through growth. When this point is reached the public forest will be cut on a basis of sustained yield.

If these are the facts, the time will be reached in the next 40 to 60 years when the most attractive bodies of private timber will be exhausted and the public forests will be largely depended upon to supply the demand for wood products. In such an event, the present annual cut will be materially reduced and will continue during an interim until some portions at least of the present privately-owned forest lands reach maturity and, from which time on, the cut will be gradually increased until it approximates or exceeds the volume of wood being harvested at the present time.

It should be pointed out that of the 14,698,000 acres of commercial forest land in the state, 4,849,000 acres contain old growth timber. This old growth timber continues to increase in volume through growth, but the mortality due to insects, disease, fire and other causes will, on the average, exceed the growth volume. In these extensive areas of decadent old growth virgin timber, it logically follows that the annual cut should exceed the annual growth during the period required to remove the mature and over-mature timber.

The cutover and burned over forested areas containing 9,245,000 acres of advance forest growth in various stages of development, or about 62 per cent of the total commercial forested area are the productive lands estimated at the present time to produce through growth annually 351,400,000 feet board measure. When the cutting of the old decadent virgin timber stands has been completed, this estimated annual growth of the gross commercial forested areas will be increased by 38 per cent. This will add 133,500,000 feet to the estimated 351,400,000 feet which will equal a total volume of 484,900,000 feet.

If industrial forestry in Montana had an attractive financial future where private enterprise entered into the business

of growing trees for commercial purposes, it would not be a difficult matter to pool the public and private forests and work out a plan of timber harvesting which would result in sustained production. A plan of this kind, however, with possibly one exception does not now appear to be in the picture.

- a. If there were sufficient and attractive bodies of public and privately-owned commercial timber lands which could be pooled, the operations of which to be conducted on a sustained yield plan on a short rotation, no doubt this plan could be made operative, provided the volume, quality and accessibility of the publicly-owned timber, together with favorable terms in the agreement, were sufficiently attractive to the operator or operators to enter into the plan.
- b. The only operators that could qualify to enter into a sustained yield plan, as outlined under the provisions of Public Law 273 (Senate Bill 250, 78th Congress), on a reasonably large scale are those who have extensive holdings of commercial timber stands and own at least $\frac{1}{4}$ to $\frac{1}{3}$ of the volume of the timber required in a sustained yield operation. A study should be made to determine the possibilities of the plan.
- c. If private enterprise in Montana is expected to enter into a program of forestry, it is essential that the plan provide sufficient concessions in some from by the public in order to definitely provide assurance that a reasonable profit can be made from the operations—otherwise, private forestry in Montana is entirely out of the picture, for reasons well known to lumbermen, foresters and others.
- d. It is an extremely difficult thing to legislate forest practice on private lands, particularly if such practice is not profitable to the owner. Demonstration and education in forest practices are the two most important approaches to such a program. It would not be a very popular move to attempt to regulate business enterprise through legislation in the matter of undertaking a program that will not prove profitable. The public is interested in making business profitable, and if forestry is not a profitable private enterprise, but is important from the standpoint of public interest, then there should be concessions by the public so that it will be made profitable, and at the same time provide all of the social, economic and other benefits for the welfare of the public. It might be cheaper and prove more effi-

cient to do this than have the public carry the entire load of the forestry program.

In spite of the not too optimistic outlook for industrial forestry in Montana, the outlook for the future in securing a fairly even balance between the cut and the volume of wood produced through growth based on the normal cut is promising except that 50 to 100 years from now there will probably be an interim when the cut may be reduced until the lands now in private forests begin to produce merchantable material.

No consideration has been given in this report to the many thousands of acres of sub-Alpine forests not now considered merchantable. These may be in demand for plastics and the processing of wood for many valuable materials which may prove to be of more practical use than ordinary wood for building and other uses. If this proves to be true, then there will be more extensive forest areas for the growing of wood to supplement the supply from the present areas classified as commercial forests.

The future prospects in Montana for the continued production of wood through growth are as good and in some instances better than those of many of the forested states. This is not because climatical conditions favor rapid forest growth, but because the average volume of the cut for all purposes is small, when considering the large area of 14,696,000 acres of forest land available for producing through growth the volume for which there is a demand. The forests of Montana can be made to produce through growth a volume in excess of the present cut after the old and decadent trees in the present virgin stands have been removed and the forest left in a better growing condition.

5. FOREST FIRE PROTECTION

a. Organized Districts—Federal, State and private cooperation in fire protection has progressed and developed to a point where the forests of Western Montana are receiving adequate protection, or nearly so.

b. Unorganized Districts—For the protection of the unorganized fire protection areas in Montana, an organization known as Montana's Rural Fire Fighters Service came into being and was originally affiliated with the National Forest Fire Fighters Service, a branch of the Office of Civilian Defense. The membership in this organization comprises all of the federal, State and private organized fire protection agencies in the State, including the Extension Service and the State Highway Patrol Service. These agencies are the custodians of 40,000,000 acres of federal, State and privately-owned lands. Mr.

Walter J. Derrick was recommended as State Coordinator by Governor Ford to the Office of Civilian Defense which approved and made the appointment. The salary and expenses of the State Coordinator were prorated on an acreage basis and paid for by the several cooperating agencies (employment covered a 6-months' period), and the work was under the direction of the State Forestry Board. The counties were very cooperative and through the joint efforts of all agencies, 4,200 persons volunteered their services during 1944 for the prevention and suppression of range, crop and forest fires. Many of the counties purchased fire fighting equipment. At a recent meeting of Montana's Rural Fire Fighters Service, a committee was appointed to draft a bill for legislative action giving the County Commissioners authority to expend within certain limitations, funds for the purchase of fire equipment, to appoint a rural fire chief (who shall be a county officer) and to provide for the organization of volunteer rural fire control crews. If the bill passes, all of the unorganized rural areas of Montana will be under some form of organized protection.

6. LOGGING PRACTICES

- a. *Forest growth left after logging:* Ordinarily, in the fir and larch stands, young growth in the form of seedlings, saplings and poles is more numerous than in the yellow pine (Ponderosa pine) stands. The diameter limit of the trees to be left after logging will depend upon the commercial products in demand. For instance, if the major product to be cut is in the form of saw logs to be manufactured into lumber, the maximum diameter limit of trees left standing will be greater (14 inches or more) than where the demand is for stull and other small round timbers, in which case the forest will be cut to a diameter limit of 12 inches and smaller. Foresters all agree that if fir and larch stands are cut to a diameter limit of 14 inches or larger it will better provide the forest with sufficient capital stock and materially reduce the time in which a second cut can be expected. On the other hand, exemptions are justified where timber smaller than 14 inches in diameter is required for essential industrial operations. There are serious objections, however, to the cutting of trees on logged-off lands in the lower diameter brackets (10 to 14 inches) for commercial purposes, particularly in the Ponderosa pine type, as any general practice of this kind will prove detrimental to the future welfare of all forest types within the logged-off areas.

When logged off, fir and larch areas are ordinarily left in a reasonably productive condition and will in time

produce a second crop of timber. The yellow pine (Ponderosa pine) type does not reproduce naturally as readily as the fir and larch stands and, therefore, if trees from 12 to 16 inches are removed for industrial uses, there will ordinarily remain after logging, with few exceptions, not only an understocked stand in the form of seedlings, saplings, poles and other sizes, but in addition there will be no suitable seed trees available to aid in reproduction on areas in which there is no forest growth. Such seed trees if left will, in time, aid in producing naturally a fully-stocked stand. The cutting during logging of the young Ponderosa pine trees within the diameter limits of from 10 to 14 inches for mining, fuel and other commercial purposes should be discouraged, since this type is of primary importance to the lumber industry and, therefore, trees below the diameter limit of value for lumber should be reserved for future growth. If trees within the diameter brackets of 14 inches and smaller are required for commercial use, other less valuable species should be utilized.

b. *The following practices should be observed:*

1. Carefully locate the roads and main skidding trails and restrict their number to the minimum necessary for the most economical operation.
2. Clearing for landing sites will be restricted to the minimum necessary for convenient use.
3. Limit width of main skidding trails and roads to a minimum necessary for the equipment used.
4. Fall trees in line with the direction to be skidded wherever practicable to restrict the swing of logs to minimum.
5. Where practicable, fall trees away from clumps of young growth and not into or across such clumps.
6. Confine drivers insofar as practicable to the use of main skidding trails and back-trip trails in going to and from landing.
7. Do not allow indiscriminate and unnecessary swamping.
8. Machine skidders may be used, if carefully supervised, on all level and uphill drags and on slight to moderate slopes on downhill drags in mature and over-mature timber stands. In any event, damage can be held to a low enough degree to meet minimum requirements only if drags are made in a straight line pull to truck roads or railroads. In general, back-haul lines should not be used.

9. Closer supervision and training by the industries of sawyers and operators of skidding machinery are recommended for better conservation of advanced and young growth left as residual stand after logging. Consideration of this class of training might also be undertaken by the School of Forestry and in cooperation with industry.
- c. *Care in protecting young growth during logging:* If care is not exercised in the use of heavy machinery (caterpillar tractors) for skidding logs from the woods to landings where they are loaded for final shipment, much young growth may be damaged or destroyed. Extra care should be exhibited in the logging of yellow pine areas where advance growth is sparse and scattered. If an undue amount is destroyed during logging, it will require many years to replace it through natural processes. The minimum requirements as outlined under caption b would no doubt prove helpful if put into law.
- d. *Care in felling timber to safeguard young trees to be left for future growth:* Ordinarily, there is a choice in the direction a tree can be felled and therefore some care can be exercised in protecting advance growth, seed trees or others designated to be left for future forestry purposes. In conducting cutting practices in many instances, insufficient consideration is given such matters. This, likewise, is an educational matter. In fact, it is one of the practical things which should be taught in forest schools.
- e. *Slash Disposal on private lands:* Slash disposal after logging has been a moot question ever since the inception of forestry in this country. The only excuse for spending any money on slash disposal is to remove the fire hazard created during logging operations and thus remove the menace to adjoining property, and at the same time to safeguard the advance forest growth, which forms the basis for a future forest, from destruction by fire.

Numerous methods of slash disposal, other than by piling and burning, have been devised with some limited success. Ordinarily, however, success in removing slash cannot be obtained on moderate to steep slopes without piling and burning. Slash created during logging is usually broadcast over the area and if an attempt is made to dispose of it on moderate to steep slopes through methods other than piling, broadcast burns result, control is often difficult and much destruction of young growth results. In most instances, it is not necessary to accomplish a 100 per cent slash disposal; a 50 to 75 per cent job

should ordinarily suffice, and it should be accomplished by piling and burning. The money should be made available from some source to accomplish this. This system is more costly, but it is the most efficient from the standpoint of the objective to be obtained, as follows:

1. It will result in the most complete job possible of hazard reduction.
2. The greatest safeguard to adjacent property.
3. Likewise, the greatest safeguard to the advance growth left after logging.
4. In the long run, it will reduce the cost of fire protection on the logged-off areas and will be a factor in preventing any serious fire catastrophe.

7. TAXATION ON COMMERCIAL FOREST LANDS CONTAINING IMMATURE FOREST GROWTH

A federal law passed in 1924, known as the Clarke-McNary Act, providing for cooperation with the states in fire protection, also provided for a study of taxation on forest lands.

The reports prepared on the subject of taxation were involved in a number of complications, but the meat of the situation was, that local governments were largely dependent upon the annual receipts from the ad valorem tax and, if this were materially lowered and a severance or yield tax substituted, it would reduce the annual payment and complicate the financing of the annual budget for the operation of the local government (counties), unless the funds could be secured from other fields of taxation. The records indicate that 16 states have passed laws to encourage private forest landowners to carry their lands for forestry purposes, but the vast majority of the forest landowners have not exhibited very much interest. In some of the states it is a voluntary proposition where there is a reasonably small ad valorem and severance tax when the timber is cut.

In Oregon, ad valorem tax is 2½ cents per acre East of the Cascades and 5 cents per acre West of the Range, together with a severance tax at the time of harvest of 12½ per cent of the stumpage value at the time of cutting. Idaho has a similar law and requires persons who desire to benefit by the law to enter into agreements with the State for definite periods of years. A few of the large owners have committed themselves under such laws, but only in cases where they are planning on carrying their lands for forestry purposes. On the other hand, the majority of the owners, it appears, do not care to commit themselves under a definite agreement for 50 years or more.

Any reduction in the ad valorem tax on lands containing advanced forest growth in various stages of development will have no effect on influencing private landowners to carry their lands for forestry purposes. With one exception, there are no forest landowners who have indicated their intention of carrying their land for forestry purposes. The exception noted is an operating sawmill company which is qualified to pool its lands with those of the U. S. Forest Service in what is known as a sustained yield unit. Under the plan the operator agrees, if and when the agreement is consummated, to leave uncut a considerable volume of timber per acre as a basis for a second cut, after the rotation period expires. Under the circumstances, such lands could not very well be classed as non-commercial forest lands carrying an ad valorem tax on the land alone because the land has been cut over and it carries an actual timber value. Under the circumstances, the cooperating company must reach some understanding with the County Commissioners in the respective counties where the timber is located, so that a fair value can be placed for taxation purposes on the timber left standing. This tax on the unit of a thousand feet board measure should be considerably less per unit than on the original stand, for the reason that the remaining timber will be inferior in quality to the timber removed from the area. The point to be emphasized is that an ordinary ad valorem tax on the land alone to encourage forestry practice has no direct bearing here. The ad valorem tax on logged-off lands in Montana in comparison with other states is not an excessive charge. It is not thought that any reduction in the present taxation rate will create any change in the minds of private forest landowners in the matter of industrial forestry. The forest lands of Montana, after the merchantable timber is removed, carry a very low value. Some of the reasons for this are as follows:

- a. The forests are mostly located in the Northern Rocky Mountain region of the State where the growth is slow and possibly slower than any extensive commercial forests in the United States.
- b. Thus the long time required for young forests to reach maturity combined with the annual carrying charges are obstacles in the way of a financial investment sufficiently attractive to interest private enterprise.
- c. Forest fires and insects are a serious threat to forest destruction, possibly as great or greater than in any forest region in the United States.
- d. It is fully recognized that it is preferable to have private enterprise undertake its full part in the field of indus-

trial forestry. If it is to the best interest of the public that this be accomplished and the conditions in Montana as previously discussed are such that industrial forestry will not be a profitable venture, then certain definite concessions should be made by the public to make industrial forestry possible. Cooperative measures of this nature may prove to be more economical and efficient than in the case of the public taking over the entire forestry program. This would be no different in principle from the programs now in effect in cooperative forest fire protection on privately-owned lands, the Soil Conservation and the National Farm Programs.

8. WATERSHED PROTECTION

The source of Montana's water supply in the form of springs, streams, rivers and lakes originates in the forest-covered mountains of the State. All streams which contain running water throughout the year depend almost entirely upon the forest-covered watersheds for their supply. In this semi-arid region a continuous supply of water for the irrigation of agricultural land, hydro-electric, domestic and industrial uses, navigation, livestock and the like is of vital importance to the prosperity of the people. Exclusive of the many other uses of the forests, the people of this state will be justified in exerting every effort to protect and conserve the forests and other vegetation embraced within the mountain regions of the state for watershed protection alone.

Many persons interested in agriculture, stock raising and forestry have expressed themselves as having some fear that the extensive logging operations carried on during the past 50 years in the forests of the State will have the detrimental effect in retarding soil erosion, and maintaining the water supply. The valuable forests containing saw timber are confined within the lower elevations of the mountain regions and embrace only from 20 to 25 per cent of the total area. The removal of the mature and over-mature timber by the lumber industry for commercial purposes does not in any manner imply that the forests are being destroyed and the land left in a denuded condition. The advanced forest growth in the form of seedlings, saplings, poles and some larger trees are left intact and the logged-off areas will continue to function provided they are adequately protected from ravages of fire.

Slash burning in some instances has resulted in damage to advance forest growth on logged-off areas. This is largely due to insufficient funds to accomplish a standard job of piling and burning. Damage from this source, however, has been cut to the minimum by State crews.

On some of the steep logged-off slopes where tractors have operated and exposed the mineral soil there is a small degree of erosion during the spring thaw. This, however, is not general, but is mostly local and therefore not serious, and will be checked as soon as vegetation has had time to establish itself. The clear water flowing from the mountainous regions of the State is conclusive evidence that erosion through surface run-off is not a problem of major importance.

There are some bad practices on logged-off lands where the young remaining stand is cut for fuel, poles and the like for commercial purposes. This results in denuding the young forest, which forms the basis for a future crop and may likewise subject the area to possible erosion. Fortunately, such practices are not general.

9. GRAZING ON FOREST LANDS

The grazing of livestock on forest lands is helpful in removing the fire hazards. This results in reducing the cost of fire suppression and the fire losses resulting from the damage to commercial stands.

The stockmen, however, who are dependent upon the use of these lands each year for the grazing of their stock should be interested in their conservative use so that they may be maintained at a reasonably high standard of productivity. The scientific management of a range to secure its highest use under a conservative plan is no different in principle from good forestry practice, the conservation of soil and good farming practices. These are all very important questions because they directly effect the welfare of the people. It appears to be very clear that, in order to get the best use from our lands, public concessions of some kind are necessary to secure the best results.

The pasturage resources of the privately-owned forest lands should be fully utilized not only for the purpose of increasing the State's potential meat and wool production but also as a ready source of income for the forest landowner, thereby assisting him in meeting his fire protection and other carrying costs. Careful and well-planned pasturage may be maintained on much of the forest cover without conflict with forest growth. Wherever pasturage is possible, it should be encouraged, since it makes use of an annual natural resource that would otherwise be wasted.

The State, through the office of the State Forester, should be in a position to assist forest landowners whose property may be adapted to pasturage that they may secure the highest economic returns from their holdings.

10. THE FORESTS ARE OF SUFFICIENT IMPORTANCE TO THE STATE'S ECONOMY TO JUSTIFY FURTHER ATTENTION AND STUDY.

The forested lands within the State are of increasing importance to the State in its future development. They are intimately related to its industry, its irrigation, its wild life and other recreational resources and to the pasturage of livestock. Windbreaks and shelterbelts maintain soil productivity and increase the comfort of the farm home. Because of the State's climatic and topographic conditions, serious study should be made by the State agencies to secure the maximum productivity of the forest soils, the integration of forest soil uses, the reduction of waste, the development of new uses and a better understanding of the farm windbreak and its soil and moisture conservation possibilities. Little work has been done that is immediately applicable to Montana's conditions. Its importance in the State's economy requires immediate attention.

SUMMARY

STATE-OWNED FOREST LANDS

The Commission has made an earnest attempt in the short time allotted it to make a comprehensive study and report on the conditions now existing on State-owned forest lands, which in brief are as follows:

Acreage of State-Owned Forest Lands—

Commercial forest land:

Saw timber	268,000 Acres
Immature forest growth	246,000 Acres
Burned-over lands not restocking satisfactorily..	22,000 Acres

	536,000 Acres
Non-commercial forest land:.....	150,000 Acres
Total	686,000 Acres

Present Available Timber Resources on State-Owned Lands—

	Board feet Log scale
Western yellow pine and white pine	704,000,000
Douglas fir and larch	1,174,000,000
Spruce, lodgepole pine and all others.....	378,000,000
Total.....	2,256,000,00

This volume of State-owned commercial standing timber converted into railroad ties would equal 56,400,000 ties, and would furnish sufficient ties for 22,000 miles of railroad track; or, transformed into terms of 5-room bungalows, this would equal 150,000 houses.

In addition, there are 246,000 acres of forest lands containing advanced forest growth in various stages of development, some of which are now reaching maturity. These are the forest areas which are producing timber volume through growth and in the end will supply needed forest products after the virgin timber stands are cut over.

Rate of Exhaustion of State Timber Including the Annual Drain From Cutting and Losses From Insects, Diseases and Fire—

During the past 40 years, the drain from cutting has averaged about 25,000,000 board feet per year, or a total of 1,000,000,000 (one billion) board feet, for which the State received \$3,000,000.

The losses from insects and diseases, practically all of which are in the virgin timber stands, are estimated at 180,000,000 board feet for the 40-year period. The periodic growth in these mature stands just about balanced these losses. Could these trees have been salvaged, it would have added \$630,000 to the wealth of the State during the period involved.

Fire losses during the 40-year period are estimated at 200,000,000 board feet valued at \$550,000, only a minor portion of which was salvaged.

Possibilities of Sustained Yield of the Timber Resources on State Lands—

It will require about 100 years at the normal rate of the cutting of 25,000,000 board feet per year to complete the cutting of the State-owned commercial virgin timber stands. If during this period, the timber is cut conservatively, leaving thrifty fast-growing trees 18 to 20 inches in diameter, properly spaced, and also leaving, where available, thrifty yellow pine (bull pine) up to 26 inches in diameter to form the basis for a future forest crop, these State forest lands can be cut over again in 75 to 100 years. It is possible that this process of cutting can be repeated indefinitely, if the lands are properly protected from fire and good forest cutting practices are followed.

The primary object is to earn the greatest possible return for the benefit of the State Institutions and, at the same time leave the forests in the very best growing condition. (See body of report for further detail.)

Grazing of Livestock—

Many areas of State-owned forest lands have a ground cover of forage plants capable of full or partial utilization. The State can, by carefully integrating forest production and pasture usage, augment its meat and fibre output without injury to forest growth and can appreciably increase the financial return from the State-owned forested soils. Since the State's Forest Land Policy is maximum utilization under planned management, pasturage of domestic livestock or wild life should be encouraged wherever it can be done without injury to the forest soil and forest crop. The consolidation of the State-owned forest lands will facilitate the administration of the grazing of livestock.

RECOMMENDATIONS

To Legalize a tree scale on small sales of State timber.

The measurement of logs is obtained by scaling the logs with a Scribner Decimal C rule. However, it would be ad-

vantageous on small sales, and very beneficial for small operators, if the office of the State Forester were authorized to make a tree scale where the daily output is not sufficient to warrant keeping a scaler on the job. It is recommended that not to exceed 1,000,000 feet board measure log scale be the maximum stumpage involved in such sales.

Scattered State Forest Land Holdings Located Within Sustained Yield Units Created Under the Provisions of Federal Laws—

These are units involving large bodies of forest lands, federal, State and privately-owned, but mostly government-owned (National forests). The term "Sustained Yield Unit," literally means an area of commercial forest land sufficient in size to yield a volume of wood (timber) through annual or periodic growth to sustain permanently the operation of a lumber or other wood-using manufacturing plant. Under a recent Federal law, the U. S. Forest Service and other Federal agencies having jurisdiction are authorized to grant concessions in the form of timber at an appraised value to operators who can comply with the terms of the sustained yield plan. Such a unit has been created in Montana, in which the State has scattered holdings. The State should cooperate just as far as it is to its advantage toward the successful operation of such a plan.

The Attorney General has been asked to render an opinion on the extent to which the State may cooperate toward the successful culmination of such a plan.

State Land Exchange—

In order to facilitate the consolidation of State-owned lands, it is recommended that a referendum measure be acted upon, proposing an amendment to the State Constitution, favorable action on which would legalize the exchange of isolated State-owned lands for lands in other ownerships.

State Acquisition of Privately-Owned Cut-over Forest Lands—

It is recommended that some plan be inaugurated to permit the State to acquire some of the highest quality logged-off privately-owned forest lands within or adjacent to the State forests. Such a program will assist in consolidating the lands within the State forests and provide a means of putting such lands into stable ownership and administration.

Proposal to Allocate County Tax-Deed Logged-Off Forest Lands to the State for Administration—

1. That counties be authorized to create county forests which

will include tax-deed forest lands or other such lands to which the county has received title.

2. That the counties be permitted to consolidate these forests through land exchange with any federal, State or private landowner.
3. That these forests be administered by the State Forester's office, and all income, after fire protection and administration charges have been deducted, be allocated to the counties involved.

Montana State Board of Forestry to Cooperate With Montana State Board of Land Commissioners—

It is recommended that the State Board of Forestry cooperate with the State Board of Land Commissioners in the management of State-owned forest lands, in compliance with Section 7, Chapter 128, Laws of 1939.

Need for Adequate Financing—

The studies and investigations made by the Commission indicate that the State Forester's Office has not been sufficiently financed to efficiently administer the many activities on the State-owned forest lands. Salaries paid to the key men are small when considering the responsibilities involved and when compared with other states having a similar volume of duties to perform.

Earnest consideration therefore should be given to the budget submitted by the Office of the State Forester covering the fiscal years 1946 and 1947.

STATEMENT OF FOREST CONDITIONS ON STATE-OWNED FOREST LANDS

1. TOTAL ACREAGE OF STATE-OWNED FOREST LANDS

The records of the State Forester's office indicate that approximately 516,000 acres of State-owned lands are classified as forest lands. The records, however, as secured by the National survey covering forest lands in Montana, conducted by the Research Department of the United States Forest Service, indicate that the total State-owned forest lands classified and unclassified will aggregate 686,000 acres. The total forest land area is classified as follows:

Commercial forest lands:

Western Montana:

Saw timber	238,000	acres	
Young growth	189,000	acres	
Not restocking satisfactorily	19,000	acres	446,000 acres

Eastern Montana:

Saw timber	30,000	acres	
Young growth	57,000	acres	
Not restocking satisfactorily	3,000	acres	90,000 acres

Non-commercial forest lands:

Western Montana:	40,000	acres
Eastern Montana:	110,000	acres

Total Forest Land.....	686,000	acres
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2. VOLUME OF COMMERCIAL SAW TIMBER STANDS ON STATE-OWNED FOREST LANDS

(In millions of board feet log scale)

	Yellow and White Pine	Larch and Douglas Fir	Spruce, Lodgepole and all Other Species	Total
Western Montana	679	1,144	333	2,156
Eastern Montana	25	30	45	100
TOTALS.....	704	1,174	378	2,256

From the figures it will be noted that there still remain 268,000 acres of State-owned forest lands containing merchantable stands of saw timber size; 246,000 acres of burned or cut-

over lands containing advanced forest growth in various stages of development, and 22,000 acres which are not restocking satisfactorily.

The estimates show that on these 268,000 acres of non-reserved commercial forests, there are 2,256 million feet log scale of saw log timber. According to these figures the State-owned commercial timber lands will average 8,400 feet per acre or 5,376,000 feet log scale per section (640 acres).

3. DRAIN FROM CUTTING OF STATE TIMBER DURING THE PAST 40 YEARS

During the past 40 years there have been sold by the State approximately 1,000,000,000 board feet of timber, log scale. This includes some land and timber sold in fee simple prior to 1909, during which year the State Forester's office was created. Since 1909 there has been no sale of land containing merchantable timber. Timber has been sold only after being appraised, advertised and awarded to the highest bidder and paid for on the basis of board feet log scale.

During the first 20-year period, the sales averaged something less than 25,000,000 board feet log scale per year and, while the State was paid in cash for all of this timber sold, much of it was not immediately cut but was held on the stump for subsequent operations; in fact, a considerable amount of timber formerly owned by the State is still uncut. So, while approximately 1,000,000,000 feet of timber have been sold and paid for, land and timber to the extent of 300,000,000 to 350,000,000 feet board measure, 35,000 to 40,000 acres, were sold in fee simple and the timber, or a considerable portion of it, remains uncut to date. During the past 20 years, the annual cut has averaged about 27,000,000 feet board measure log scale. This average is somewhat higher than for the first 20 years. Figures are not complete to give a true story, but the estimate of 1,000,000,000 board feet sold during the 40 or more years will give an average of 25,000,000 board feet per year, the total income from which is \$3,000,000 or more.

4. ANNUAL DRAIN FROM CAUSES OTHER THAN CUTTING, SUCH AS INSECTS, FIRE AND DECAY ON STATE-OWNED LANDS

It is a very difficult matter to secure an accurate estimate of the losses in the virgin timber stands from insects and decay. A reasonably accurate figure can be secured, however, of the losses due to fire, because an actual record can be made of these losses. During 1926 alone, there was an estimated loss from fire in the North Fork of the Stillwater River in the Flathead country of 100,000,000 feet board measure log scale of

State timber, practically all spruce. This is an average of 2,500,000 feet of timber per year lost during the past 40 years. If all of the fires are included during this period, the losses would average about 5,000,000 board feet per year, or a total of 200,000,000 feet board measure for the 40-year period. Losses from this source are estimated in dollars and cents, from \$500,000 to \$600,000.

The losses from insects during the past 40 years have been stupendous. If the State had 1,100,000,000 feet of yellow pine 40 years ago and has cut 400,000,000 feet of it to date, it has on hand at the present time about 700 million feet board measure. It then had standing in the woods during the 40-year period an average of the two figures, or 900,000,000 feet of yellow pine. Conservative estimates indicate that $\frac{1}{2}$ of 1 per cent of the total stand is destroyed annually by insects. This would give an annual loss of 4,500,000 feet board measure or a total of 180,000,000 feet board measure during the past 40 years. Insects have also destroyed considerable quantities of Douglas fir. Exclusive of this, the losses from insects and fire during the past 40 years are as follows:

Fire: 200,000,000 feet board measure, all species,	
value	\$ 550,000
Insects: 180,000,000 feet board measure, yellow pine,	
value	630,000
	<u>\$1,180,000</u>

If the State has sold 1,000,000,000 feet and has lost 200,000,000 feet from fire and 180,000,000 feet from insects, and has now on the stump 2,256,000,000 feet, then it had 40 years ago:

$$2,256,000,000 + 1,000,000,000 + \frac{200,000,000}{40} + \frac{180,000,000}{40} - (2,256,000,000 \times .005) + (1,380,000,000 \times .005) = 3,047,000,000 \text{ feet.}$$

The actual increase in wood (board measure) in the virgin stands through growth ranges anywhere from minus to zero to negligible, when considering the losses from all sources. In other words, the losses in the mature and over mature timber in the virgin stands from fire, insects and other causes, may equal or exceed the volume in growth.

5. POSSIBILITIES OF SUSTAINED YIELD ON STATE LAND BASED ON THE NORMAL CUT

It is generally agreed that the possibility of fires destroying as much State timber during the next 40 or even 80 or more years, as has been the case in the past, is very remote, for the reason that back country areas have been made acces-

sible by roads and airplanes, and facilities generally for the detection and suppression of fires have vastly improved. Federal, State and private cooperation in fire protection has developed to a point never dreamed of 40 years ago, and more funds from all sources have been made available for the protection of the forests.

It is generally agreed, too, that the chances of very serious insect infestation other than the normal losses during the next 40 to 80 years is unlikely. During the past 40 years, however, literally billions of feet of timber in the Ponderosa pine stands have been destroyed by insects.

If the losses from fire and insects can be cut 50 to 75 per cent from what they have been in the past, then the State, if sufficiently financed to administer its timber sale operations with the present available supply of 2,256,000,000 feet board measure as a basis for future cutting operations, can cut at the rate of 25,000,000 feet board measure annually for a period of 90 to 100 years. After the expiration of this period, it can plan for a second cut and repeat the cutting operations:

This will become a reality if the Ponderosa pine is cut to a diameter limit of from 18 to 20 inches d. b. h. as a guide and all of the thrifty bull pine left up to 26 inches d. b. h., leaving an estimated volume of approximately 10 to 15 per cent of the stand for a future forest crop. The area will then be left in the very best possible condition from the standpoint of thrifty fast growing trees, with prospects of a minimum loss from insects and diseases.

A section of the State timber averaging 8,000 feet board measure per acre has a total of 5,120,000 feet board measure of timber, at \$3 per thousand, total value \$15,360. If 50 per cent of this timber is left during a 50-year rotation period for a second cut, then timber values to the extent of \$7,680 will be invested for a period of 50 years, with no definite knowledge of what this capital will earn during this 50-year period, considering the many hazards to which the forest is subjected. As a substitute for this proposition, suppose the \$7,680 were invested in bonds at $2\frac{1}{2}$ per cent, maturing in 50 years, the capital, if left untouched, would have increased to \$26,112, just as in the case of the timber, or would have actually earned \$18,432. This is \$3,000 more than the full value of all of the timber on the section in the first instance. In order to get equal returns for the timber, it would have to grow at the rate of 192 board feet per year while, as a matter of fact, considering all types of trees which grow very slowly in this Northern Region, 50 feet board measure would be a high average. The earning capacity of the forest in the form of wood through

growth would be less than one-half of the earning capacity of the funds invested in securities, if left untouched, as in the case of the timber in the forest, during the 50-year period.

If the forest contains a stand of 8,000 feet per acre where the merchantable timber will average from 250 to 350 years old, and 4,000 feet per acre are removed from the forest and the remaining 4,000 feet are left in the form of capital stock to grow for 50 years, it cannot be expected that during a period of 50 years the forest would have produced through growth a volume of 4,000 feet per acre and when added to the 4,000 feet originally left would equal the volume of the original stand before it was cut. Assuming that this is possible, and such a program can be repeated each 50 years, then the State would be receiving at the end of each 50 years \$7,680 or an annual income of \$143.60, which would be at the rate of 1.86 per cent simple interest. From a dollars and cents proposition, this is a poor showing in comparison with the investment of the funds in securities to be left untouched, as in the case of the merchantable timber during the period of 50 years. The income from the securities is 2 and 4/10 times greater.

6. WHAT SHOULD BE THE BASIS FOR CUTTING STATE TIMBER—LEAVING 10-15 PER CENT OR LEAVING FROM 30-50 PER CENT OF THE VOLUME OF THE STAND?

This is a moot question, but the system to be decided upon will depend upon conditions. Ordinarily, on the scattered sections of timber owned by the State it would be better practice to leave from 10 to 15 per cent of the volume of the stand. On areas which have been consolidated into 100,000 acres or more a system of leaving 30 to 50 per cent of the volume of the stand might be the economic thing to do, providing the cost of logging is not increased, so as to have a tendency of reducing the stumpage price received by the State for its timber. If the forest is cut on the reasonably conservative basis of leaving 10 to 15 per cent of the volume of the stand, the benefits will be as follows:

- a. The stand will produce more rapidly during the period of the rotation.
- b. All of which growth is more resistant to attack by insects and diseases.
- c. Such cutover areas serve equally well from the standpoint of watershed protection compared with other methods of cutting practices.
- d. This practice of cutting for a temporary period will create more favorable conditions for the grazing of livestock, provided such use is advisable.

- e. The Enabling Act granted these lands to the State in a form of an endowment to the several educational and other State institutions. Endowments are interpreted as investments of funds, in what are considered to be safe securities, which will produce the greatest possible income, or investments in real property or the like which are considered safe and income producing. The Enabling Act and the State Constitution clearly indicate that this is the primary purpose of the Federal Government's Land Grant Endowment to the several State institutions.
- f. If the statement in the previous caption (e) is true to all intents and purposes, then the forest cutting practices, under consideration of leaving 10 to 15 per cent of the volume of the stand which results in liquidating the timber that is ripe and ready for the market and investing the funds therefrom in securities or real property, will more nearly meet the requirements of the State Constitution than any other method of forest cutting practice under the conditions of scattered State ownership.
- g. Forest practice permitting the cutting of the major portion of the mature and overmature timber will greatly reduce the logging costs and maintain stumpage prices at a more even level.

7. POSSIBILITIES OF SUSTAINED YIELD ON A SHORT ROTATION BASED ON CUTTING 30 TO 50 PER CENT OF THE VOLUME OF THE STAND

If it were economically possible, it would be better forestry to cut the virgin forests more rapidly; that is, not increase the volume of the cut, but instead of cutting 5,000,000 feet on one section, spread the cut of 5,000,000 over two sections. This would give an opportunity to remove the very old over-mature trees, and possibly reduce the average age of the merchantable stand from 300 years to 200 years or less. This method would provide a means to salvage trees of the best quality, many of which are apt to die during the next 25-50 years or less. If, for instance, there were a block of timber available containing 768,000 acres, averaging 5,000,000 feet to the section, 60,000,000 feet could be cut annually during a 50-year period and 50 per cent of the timber be left as growing stock.

There is no question but that the forest would be in a very much better growing condition at the end of the 50 years. There would be plenty of growing stock left in the forest, some of which would be too old to grow very much more, but the rotation would be greatly reduced and at the end of 50 years

there would be sufficient timber for a second cut. Such a system would add stability to industry and labor.

If the State had its forest lands consolidated into blocks of 100,000 acres or more, where the administration could be more concentrated, the State would be in a better position to say when and where the timber should be cut, it would be possible to spread the cut over all of the areas leaving from 30 to 50 per cent of the volume of the stand (depending upon conditions), using a short rotation of 50 years for a return cut instead of 100 years. Under this plan, the normal annual cut of 25,000,000 feet board measure log scale annually could be spread over the 268,000 acres of the State-owned commercial timber stands, and the cutting completed in 50 instead of 100 years, as now planned. If 30 to 50 per cent of the volume of timber is left as capital stock for a future cut, it would mean that twice the area would have to be covered annually to get the normal average cut of 25,000,000 feet. If it were possible to carry out a program of this kind, it would give an opportunity to remove the old over-mature timber, all of which should have been harvested many years ago, and leave the most thrifty intermediate trees which give some assurance of continuing their growth and some evidence of living through the 50-year period for a second cut. This would leave the forest growth after a 50-year period in a very much better growing condition than formerly. A system of this kind is more applicable to yellow pine (*Ponderosa* pine), but a similar system could likewise be applied to the fir and larch stands.

It would not be to any advantage for the State, however, to plan the cutting of its timber on its scattered holdings on the basis of leaving 30 to 50 per cent of the volume of the timber stand, for the reason that practically all of the adjacent commercial timber stands would not be cut under such a system, so that under the circumstances the State could not possibly gain anything under such ultra-conservative forest practices. It would be a better investment for the State to liquidate 80 to 90 per cent of its merchantable timber and invest the funds in securities. The timber would be cut so as to require a longer period of time for the remaining immature forest to reach maturity, which would approximate the time when the adjacent forests would have reached the stage of producing merchantable timber and thus make available a sufficient volume of timber to attract prospective purchasers.

This may be termed a reasonably conservative method of forest cutting practice. It accomplishes the same purpose except that it requires a longer rotation or period during which the forest reaches maturity. One disadvantage is that, if a

normal annual cut is applied, it is going to take just double the time to complete the cutting program. This will lead to the necessity of carrying for a longer period of time the mature and over-mature timber contained in the virgin stands, with consequent losses from insects, diseases or other causes in the old decadent virgin timber stands before an opportunity is given for any major salvaging operation. After the rotation period, however, the forest will be left in an excellent growing condition. Better stumpage prices will have been received, because in the long run it is going to cost less per thousand to log 7,000 feet per acre than it is to log 4,000 feet. In fact, in some logging areas it may be entirely impractical for an operator to contract the logging of a timber stand that averaged 8,000 feet per acre where he is permitted to remove only 4,000 feet or just one-half of the volume of the stand.

8. GRAZING ON STATE-OWNED FOREST LANDS

The consolidation of the State's forest lands is just as important from the standpoint of the grazing of livestock as in the matter of administering the sale of timber, fire protection and the like. Until this can be done, the State will have little or no control over the grazing of these lands. There is some overgrazing on the State forest lands, but this is impossible to control on the scattered sections 16 and 36 school lands. The State, for instance, can and does control the grazing on the Stillwater State Forest which comprises a consolidated area of 90,000 acres. Definite grazing units are allotted for sheep covering a stated period and the State fee is based on a per head charge. In some instances where the State's forest lands are intermingled with some of the large private forest land-owners, a system of cooperative use of land for grazing has been worked out. Permits are issued to stockmen in the unit as a whole and the charge is made on a per head basis. The fees are collected by the State and prorated on the basis of the acreage owned and afterwards allocated to the owners. Before this cooperative arrangement was made, no fees for grazing were collected from much of the State-owned forest lands.

9. SCATTERED STATE HOLDINGS WHICH MAY BE INCLUDED IN SUSTAINED YIELD UNITS CREATED UNDER THE PROVISIONS OF PUBLIC LAW 272 (S250) 78th CONGRESS

The term sustained yield unit, used under this caption, literally means an area of commercial forest land sufficient in size to yield a volume of timber through annual or periodic growth to sustain permanently the operation of a lumber or other wood-using manufacturing plant. Recent federal legislation authorizes the United States Forest Service or other federal agencies having jurisdiction, to create sustained yield forest units in which concessions in the form of government timber may be granted to private timber operators at an appraised value providing the private timber holdings within the sustained yield unit or other conditions permit the private operator to comply with the terms of the sustained yield plan.

Suppose, for instance, the State owned 20 sections of scattered timber lands (12,800 acres) involving a volume of 100,000,000 feet board measure log scale, within a sustained yield unit comprising an area of 1,000,000 acres, and entered into an agreement with the owners of timber within the unit and guaranteed the sale of its timber at an appraised price, rather than through competitive bidding, to the operator who is able to comply with the terms of the sustained yield plan. The State's timber may be tied up indefinitely, in which case it would have little or nothing to say as to when and where its timber would be harvested. It is possible the timber may be carried for 50 years before it is cut. On the other hand, much of it may be in demand from other sources, where it could be sold and awarded to the highest bidder at a more attractive price, and at the same time the mature crop harvested within a reasonable course of time and the funds invested in securities.

The State should cooperate just so far as it is to its advantage toward the successful operation of such a plan. The Attorney General of the State has been asked to render an opinion of the extent to which the State may cooperate toward a successful culmination of such a plan.

10. LAND EXCHANGE

The State of Montana, in acquiring timber land under the Federal grants, consolidated its selections in certain localities to the extent of the amount which was available and suitable. Also, through the exchange of unsurveyed school sections lying within National Forests for National Forest lands, two areas more or less consolidated were created.

The 1925 Legislative Assembly created seven State forests in those localities where the State lands were in more or less compact bodies, as follows:

- a. Coal Creek, located on the North Fork of the Flathead River, containing 20,000 acres.
- b. Stillwater, located on the Whitefish and Stillwater Rivers, containing 90,000 acres.
- c. Swan, on Swan River, containing 42,000 acres.
- d. Thompson River, containing 30,000 acres.
- e. Clearwater, in the Blackfoot drainage, with 18,000 acres.
- f. Lincoln, near the headwaters of the Blackfoot River, containing 8,000 acres and
- g. Sula, on the East Fork of the Bitterroot River, with 14,000 acres.

These seven State forests contain an area of State-owned lands of 222,000 acres. This leaves a balance of 314,000 acres contained in small tracts ranging from 640 acres and less scattered throughout the State, the major portion of which is located West of the Continental Divide. Most of the seven State forests contain some of the best timber and forest land to be found in the State. Since, however, most of the timber and land within the boundaries of the majority of these State forests are privately owned, the State forest idea is just a little more than a name.

Land exchanges between the State and the owners of the lands within and adjacent to these State forests should be consummated at the earliest possible date. The only obstacle at the present time preventing the initiation of the land exchange program is that the State Constitution makes no provision for exchanging the State grant lands for other land of equal value.

Authority has been granted by the Congress of the United States wherein the State Enabling Act has been amended to permit state land exchanges with private, county and federal landowners.

The State Legislature in 1931 likewise passed a law authorizing State land exchanges for the purpose of blacking up State lands.

A referendum measure should be acted upon at the earliest possible date, so that the way will be made clear for making a start on the State land exchange program for consolidation purposes.

The administration of these 314,000 acres of scattered land is an extremely difficult problem. If and when the lands are consolidated into blocks of sufficient size, then they

can be set up as more efficient and economical administrative units.

11. STATE ACQUISITION OF LOGGED OFF PRIVATELY-OWNED LANDS

Many of the States have entered into a program of the acquisition of cutover privately-owned lands to be made a part of the State forests. Sooner or later the State must make its decision as to what policy to pursue regarding private cutover lands. Most of the best and most accessible timber lands are located outside of the boundaries of federal reservations, and these are the lands with few exceptions, which the State should be most concerned.

If, however, the private owner plans on retaining the land for producing timber, then he should be given every encouragement by the State to do so. On the other hand, if he has no intention of retaining the cutover land for forest production, in which case much of it will go through the processes of tax delinquency, it becomes the State's duty to find ways and means of acquiring the lands.

Examples of State laxity in similar cases in many of the Eastern states are too numerous to need more conclusive evidence as to what Montana's attitude should be regarding idle and waste timber lands. These Eastern states are now paying for their lack of forethought by introducing costly corrective measures. Montana should profit by the mistakes of other states and act now, while the time is opportune.

The investment in these lands would be very small. A good opportunity would be afforded for the collecting of State forest receipts resulting from fees for the grazing of livestock, special use permits of various kinds, sale of dead and down timber after logging operations, thinnings, Christmas trees and the like. The sale of Christmas trees alone has in some instances produced sufficient income to pay for the land in full from which they were taken.

12. PROPOSAL TO ALLOCATE COUNTY TAX-DEED, LOGGED-OFF FOREST LANDS TO THE STATE FOR ADMINISTRATION

The records contained in Table IV, page 16 of the privately-owned lands report, indicate that the counties of the State have a tax-deed title to 164,000 acres of logged-off and other forest lands. The Commission was of a unanimous opinion that, since the counties of the State have no organization for administering forest lands logged-off or otherwise, it would be to the best interest of the people of the counties if such lands were allocated to the State to be administered by the

State Forester's office, such lands to be designated as county forests. The counties to be given authority to consolidate these holdings through land exchange with other owners, when such legal authority is given.

These lands would be given the same management as other State-owned lands. It is proposed by the Commission that, if the State is given this responsibility, any income from these lands in excess of the cost of fire protection and administration be allocated by the State to the several counties involved. A law of this kind for Montana could be drafted similar to the law now existing in the State of Washington, which, according to reliable information, is giving satisfactory results.

13. MONTANA STATE BOARD OF FORESTRY TO COOPERATE WITH THE STATE BOARD OF LAND COMMISSIONERS

The members of the State Board of Land Commissioners concurred in following the suggestion contained in Section 7, Chapter 128, Laws of 1939, creating the Montana State Board of Forestry which reads as follows:

Section 7. The Board is hereby directed to assist the State Board of Land Commissioners in the protection, economic development and use of the State forests and forest land held by the State for the purposes and benefit of the common schools and State institutions.

At the regular meeting on November 15, 1944, the members of the State Board of Land Commissioners expressed themselves as being very willing to cooperate with the Montana State Board of Forestry and would be glad to consider any recommendations presented by the Forestry Board in connection with the management of State-owned forest lands.

14. NEED FOR ADEQUATE FINANCING

The studies and investigations made by the Commission indicate that the State Forester's office has not been sufficiently financed to efficiently administer the many activities on the State-owned forest lands. Salaries paid to the key men are small when considering the responsibilities involved and when compared with other states having a similar volume of duties to perform.

It is recommended that earnest consideration be given to the budget submitted by the office of the State Forester, covering the fiscal year 1946 and 1947.