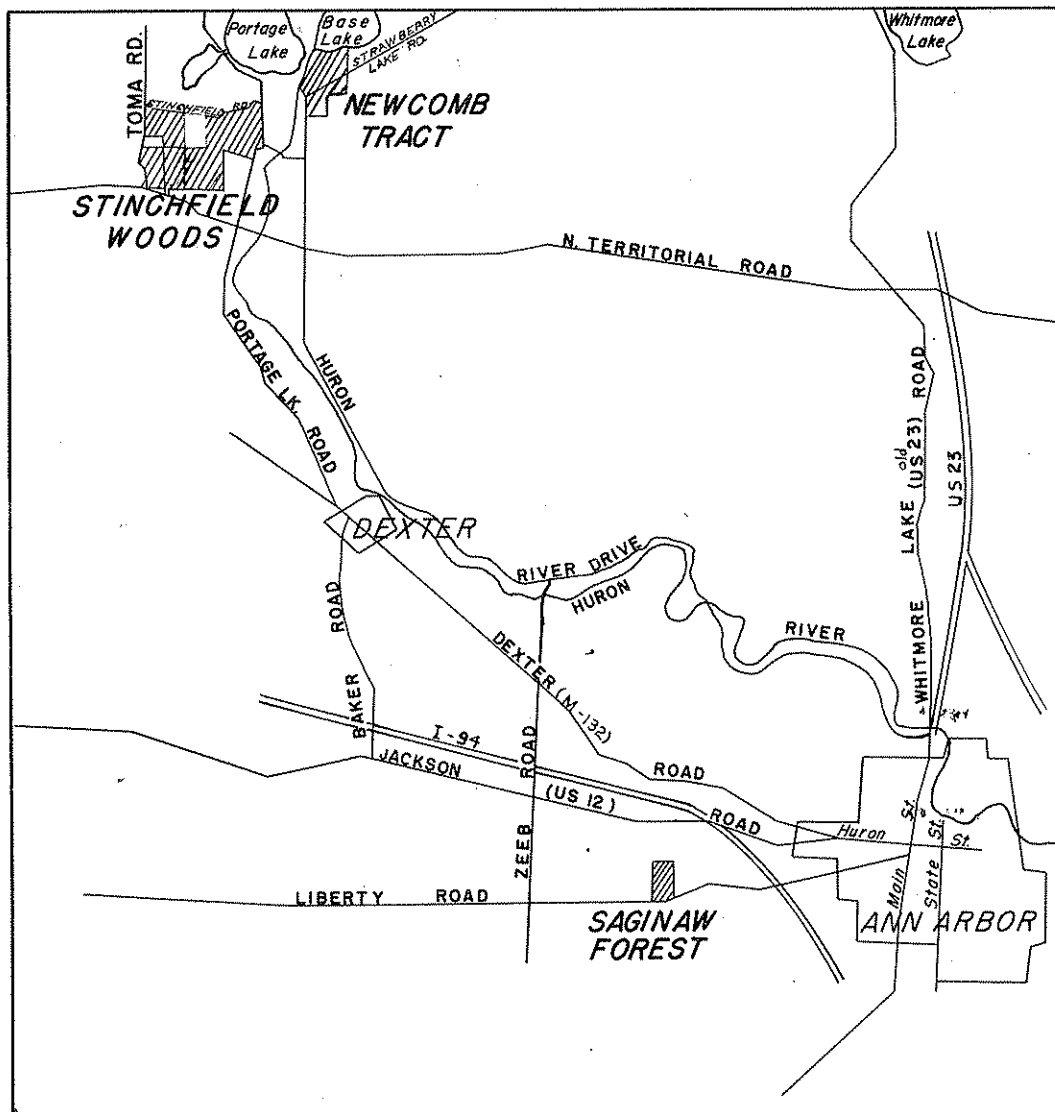
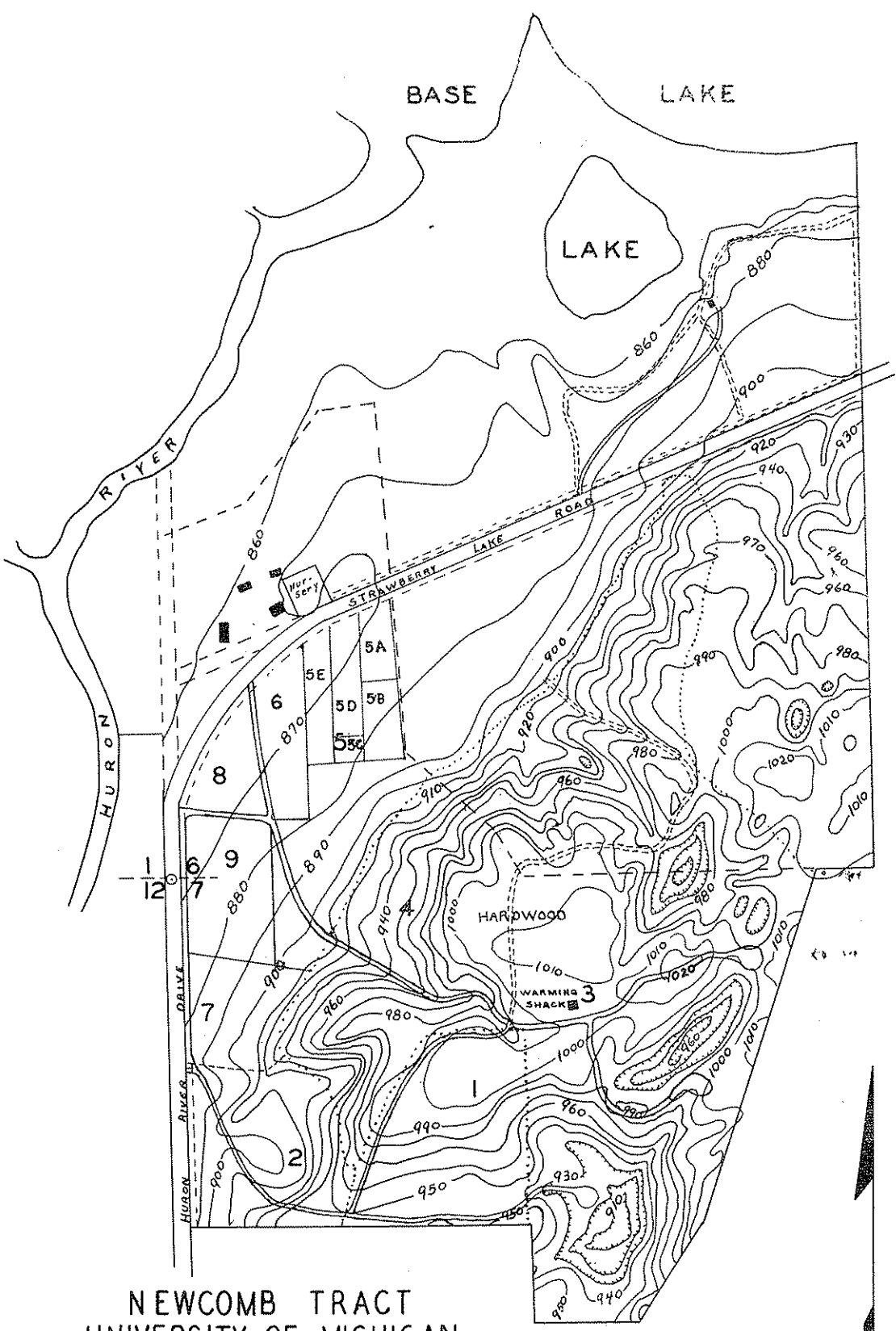
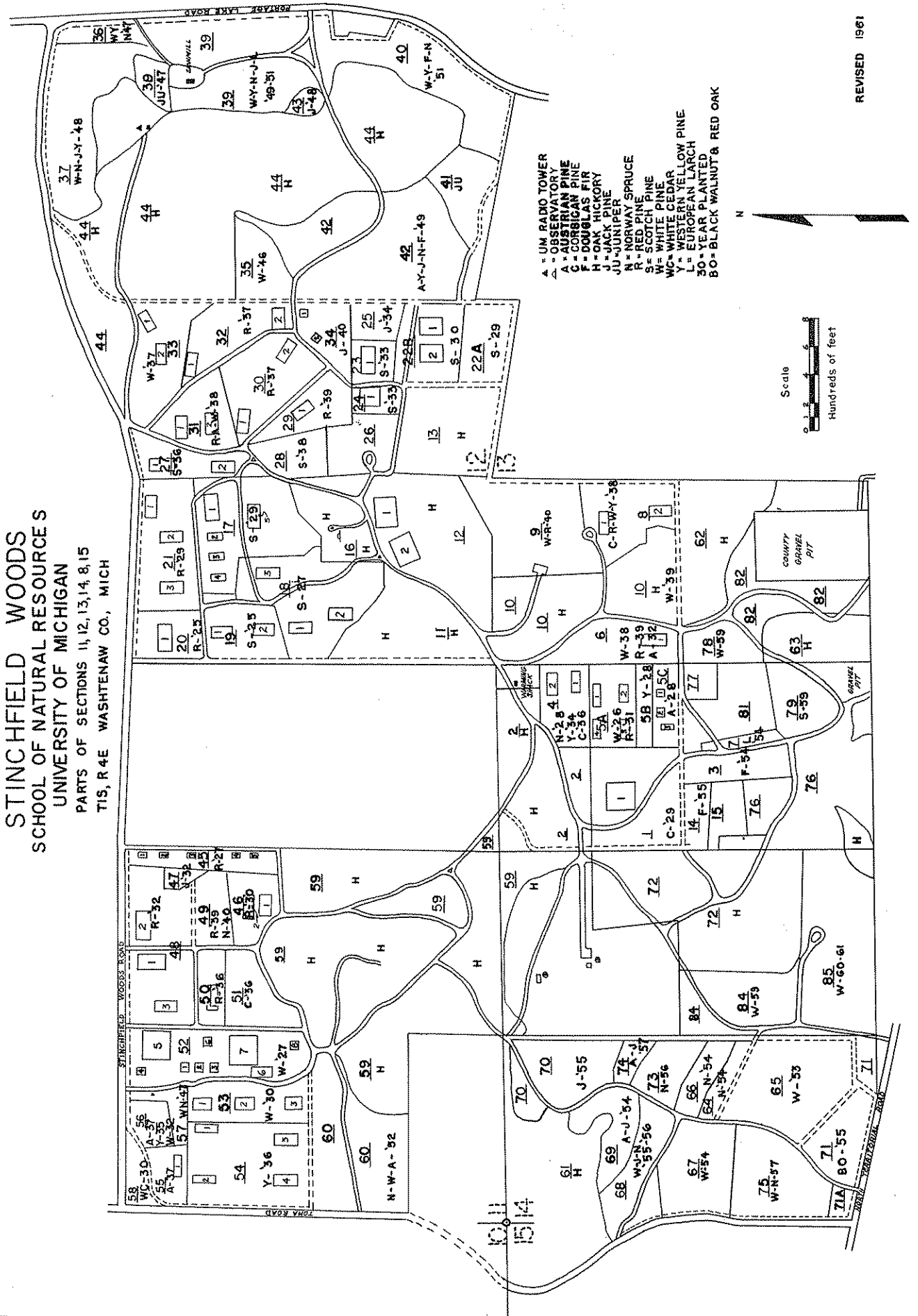


A GUIDE TO
STINGFIELD WOODS



SCHOOL OF NATURAL RESOURCES
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

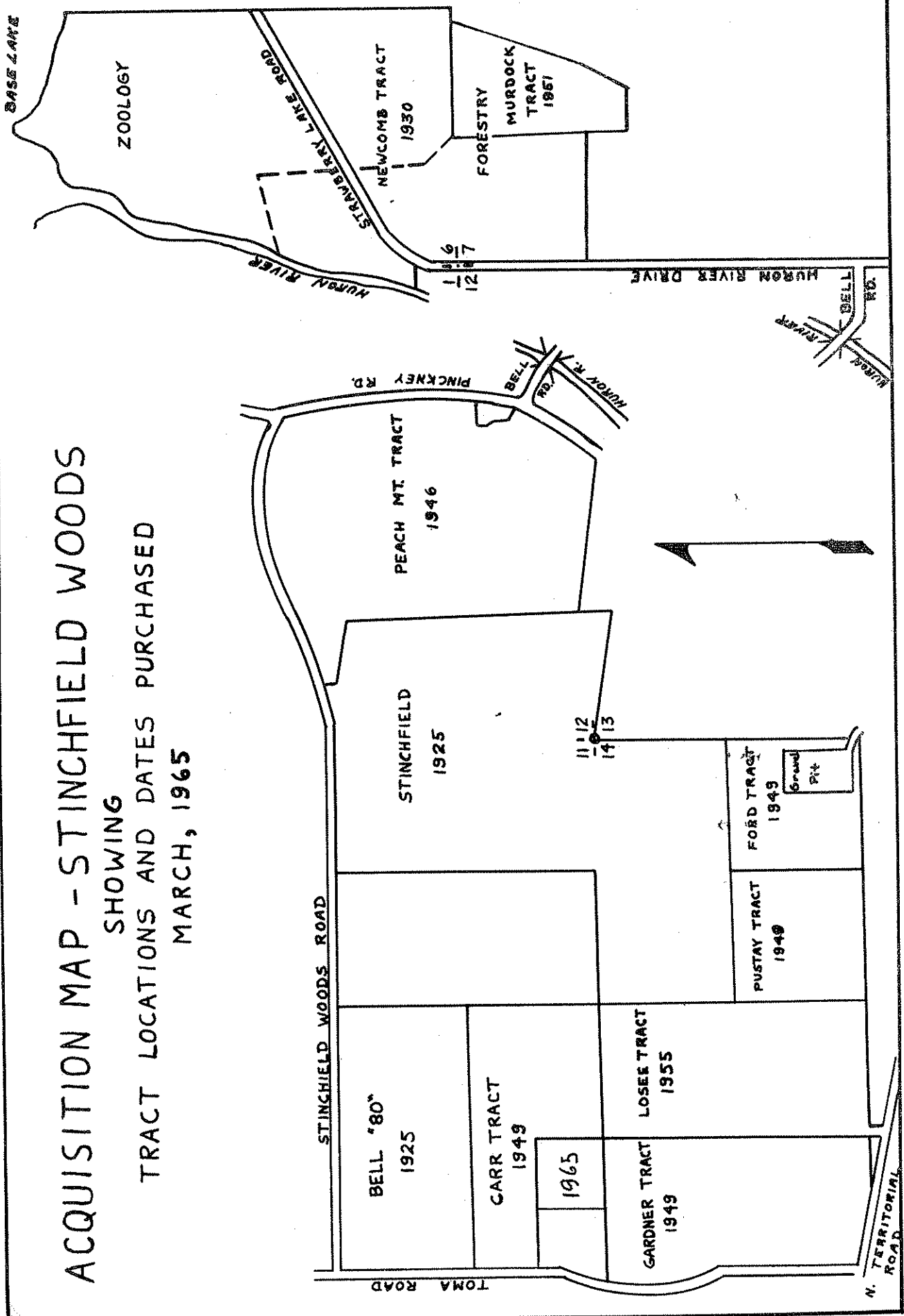
STINCHFIELD WOODS
SCHOOL OF NATURAL RESOURCES
UNIVERSITY OF MICHIGAN
PARTS OF SECTIONS 11, 12, 13, 14, & 15
T1S, R4E WASHTENAW CO., MICH



NEWCOMB TRACT
UNIVERSITY OF MICHIGAN
A PART OF
SEC. 6 & 7 T1S R5E - SEC. 1 T1S R4E
WASHTENAW CO. MICH

ACQUISITION MAP - STINCHFIELD WOODS

SHOWING
TRACT LOCATIONS AND DATES PURCHASED
MARCH, 1965



GUIDE TO STINCHFIELD WOODS

Introduction

Stinchfield Woods serves as a demonstration area and research laboratory for the faculty and students of the School of Natural Resources and other units of the University. All woods work including planting, thinning, and other stand improvements is done by students of the School. Part of the work is required in connection with classes, but much of it is paid for on an hourly basis, thereby providing a source of income to those students who desire to earn money for school expenses.

Logs suitable for sawing are processed in the sawmill. All other wood is cut into firewood and sold. Income from the area is allocated to the current operating fund of the School.

A small nursery was started in the spring of 1949 immediately east of the caretaker's house on the Newcomb tract. Water for irrigation through the overhead sprinkler system is pumped from the Huron River nearby. As all open areas are now planted, the nursery has been discontinued.

The Portage Lake Observatory, Radio Telescope, and Radio Station WUOM, all units of the University, are located on the area.

Attention is called to the maps appearing on the front cover, and to the acquisition map, which should be used in connection with the detailed information which follows:

Acquisition

A gift from Mrs. Annie Tillson Stinchfield of Detroit in memory of Jacob W. Stinchfield and Charles Stinchfield, made it possible in 1925 to make the first purchase of land for what is known as Stinchfield Woods. With the funds furnished by Mrs. Stinchfield, plus a small appropriation by the University, nearly 320 acres in two separate tracts were acquired at that time. The westerly part, described on the acquisition map as the Bell tract, had an area of 80 acres, whereas the eastern tract contained approximately 240 acres. This was the Stinchfield Woods as the older alumni know it.

In 1946 the Peach Mountain tract of 147 acres was purchased from the State Department of Conservation and in 1949 the Carr tract of 60 acres, the Gardner of 90, the Ford of 40 and the Pustay of 40 acres were added. A purchase of .67 acres in 1953 was made from the Clarke Bros. This

made it possible to build a road connecting the Carr tract with old Stinchfield tract.

In 1955 the Losee tract, 80 acres, was purchased. This brought the total area up to 777 acres.

Across the Huron River to the east and bordering on the Strawberry Lake Road lies another University-owned area of 206 acres known as the Newcomb tract. This was purchased in 1930 as the site for an Observatory. Pending its use for this purpose, the administration of the land was handled by the Department of Zoology. For almost 19 years the Newcomb Tract was used chiefly for ornithological and limnological observations. In 1949 the School was assigned the management of approximately 80 acres of the tract including the farm buildings which are now used as headquarters for Stinchfield Woods, and are occupied by the assistant to the Forest Properties Manager. Adjoining the Newcomb tract on the east is the Murdock tract of 33 acres purchased in 1951. The Newcomb and Murdock tracts are now considered part of Stinchfield Woods so that the total area now embraces 890 acres.

Land Description and Development

The eastern portion of the original purchase in 1925 consisted of 165 acres of cleared land and 75 acres of severely grazed hardwoods. The soil varies from sand and gravel to clay, but the prevailing type is Bellefontaine sandy loam, which is of low value for crop production. When the land was acquired most of the cleared land was no longer cropped but did furnish some poor pasturage. Planting of the open land began in 1925 and was completed in 1940. The detached 80 acres to the west, the Bell 80, included about 73 acres of abandoned fields, a small swamp in the northwest corner, and 7 acres of overgrazed hardwoods. The first planting on the Bell 80 was made in 1927, and the last in 1937, except for a small lot that was used for a short time for seed beds. Several cuts for the removal of trees of poor quality or of low-value species have been made in the hardwood stands on these two tracts, and some small, poorly-stocked areas have been clear cut and replanted with pines. Black and white oaks and several species of hickory predominate heavily. Seedling reproduction of white ash, black cherry, oaks and sassafras has occurred, and some sprouting has resulted from the cuttings. Small areas have been underplanted with hard and Norway maples.

On the Peach Mountain tract there were 60 acres of heavily grazed hardwoods and 87 acres of cleared land when

the land was acquired. Improvement cuts have been made in the hardwood area and planting of the open land was begun in 1946 and completed in 1952. With the exception of some scattered red cedar, there was practically no natural seedling reproduction. The tower of the University's broadcasting station is located on the top of Peach Mountain and the School's sawmill is located a short distance below the tower. Public access to the top of Peach Mountain by walking only is provided for in an agreement with the State Conservation Department.

The Carr tract is made up of forty-seven acres of hardwood and 13 acres of old field. Improvement cuts in the hardwood area were made in the winters of 1950-51 and 1951-52. Site quality on parts of this area is very low for hardwoods. White ash reproduction is good in some places, and seedlings of white, red and black oaks are appearing. The cleared land was planted with conifers in 1952.

The Gardner, Pustay, and Ford tracts consist mostly of old fields with some small areas of poor, over-grazed hardwoods. The Pustay tract was subject to a lease under which gravel could be removed until August, 1952. Another gravel lease of 10 acres on the Ford tract expires when the gravel is exhausted.

The part of the Newcomb tract controlled by the School of Natural Resources consists of 19 acres of hardwoods, 51 acres of old fields, and 10 acres around the buildings. A part of this 10 acres was used for a nursery.

The Murdock tract, 33 acres, is completely wooded with a hardwood stand of potentially good quality.

Wildlife

There is a large variety of wildlife on the area. The greatest attraction is deer which between 1945 and 1949 increased to such proportions in the county that an open season was declared. Other game animals and fur-bearers are rabbits, grey and fox squirrels, foxes, woodchucks, badgers, raccoons, opossums, weasels and an occasional coyote. Of the game birds, ruffed grouse are present in considerable numbers and pheasants are found in those parts of the area adjacent to private farm lands. Occasionally quail are seen. Songbirds in great variety, and hawks and owls, comprise the rest of the bird population on the area.

Some wildlife management practices have introduced

beneficial results. Multiflora roses have been planted along the exterior fence lines as a source of food and cover for wildlife and also to provide a permanent stock proof fence that will not require maintenance. Not very successful. Since 1947 squirrel and raccoon den trees have been preserved. It is interesting to note that the ratio of fox and grey squirrels has changed within the last few years. The hardwood forest now has a dense understory which seems to have caused an increase in the grey squirrel and a decline in the fox squirrel population. Wild Turkey were observed on the area in the spring of 1965.

Portable Sawmill

The senior class of 1942 established a fund for the purchase of a portable sawmill. With this start, and with contributions from the Forestry Club, succeeding senior classes, and the alumni, a fund was finally built to about \$2,000. With this amount on hand the University contributed enough to make possible the purchase and installation of the mill.

The building was constructed entirely with student labor, and the material came largely from the forest properties of the School. One notable exception is the corner posts and posts around the doors which are of wood from Chile brought here by a graduate student from that country. The equipment was installed with student labor and the building and installation was completed in the spring of 1947. During the summer the electrical hook-up was made by electricians from the University Plant Service. The first lumber was cut in the fall of 1947.

Following are some statistics on the building and equipment:

Building:	28' x 46'
Mill:	Farquhar #9 variable belt feed circular sawmill, will swing up to a 54" saw.
Carriage:	20'; 4 headblocks with side opening dogs and taper setouts.
Edger:	27" two-saw Tower edger.
Cutoff saws:	Dewalt saw purchased from war surplus. There is now a tilt cut off saw for trimming and a swing cut off saw for slabs with conveyor to remove slabs from mill.
Rolls:	Dead rolls. Enough on hand to transport lumber and slabs to lumber shed without handling.
Blower:	The blower was salvaged from the Plant Department and is out of balance with the mill but does the job efficiently.

Spring, 1965
 Lot No. 1
 9.9 acres

EUROPEAN BLACK PINE (CORSICIAN STRAIN)

Scientific name: Pinus nigra
 Date of planting: Spring, 1929
 Seed source or strain: Purchased from a dealer in Austria
 Class of stock: 2-0
 Spacing: 6 x 6
 Site preparation: Furrowed
 Method of planting: Planting bar

The north half was thinned and crop trees pruned to a height of 12 feet during the winter of 1948-49. Crop trees on all the area except a small unthinned area were pruned to 17' during the winter of 1954-55.

Two, one-acre sample plots were established in 1933. Plot No. 1-1 was thinned and pruned in 1948-1953-1959-1964. Plot No. 1-2 was left without treatment. This plot was discontinued in 1953-54 as a road was constructed thru the plot. A small part of the plot on the west side of the road was left unthinned, but is not to be a measuring plot.

SAMPLE PLOT DATA

Plot No.	Year	Yrs. after planting	Trees per acre		Ave. d.b.h.		Basal area per A.		Ave. ht. ft.
			Before	After	Before	After	Before	After	
1-1	1933	5	1256						2.2
1-1	1938	10	1267		1.7"		21.7		8.8
1-1	1943	15	1212		3.5"		83.4		18.0
1-1	1948	20	1197	843	4.4"	4.7"	125.6	103.0	
1-1	1953	25	843	576		5.8"	145.0	108.6	40.0
1-1	1959	31	576	439		7.0"	142.3	117.4	48.0
1-1	1964	36	438	332	7.7"	8.0"	142.2	116.5	56.0
1-2	1933	5	1327						2.2
1-2	1938	10	1363		1.5"		20.0		8.5
1-2	1943	15	1309		3.3"		76.4		17.0
1-2	1948	20	1265		3.9"		105.9		

The plantation has been free of insects and disease except for a needle blight. A fairly large percentage of the trees developed forked stems at heights of 4-10 feet. The bulk of these were removed in the thinning operations.

Spring, 1965
Lot Nos. 2, 9,
10, 11, 12.
66 acres

HARDWOOD MANAGEMENT UNIT

In the fall of 1952, a hardwood management unit was established at Stinchfield Woods. The purpose of this unit is to provide students an opportunity to integrate timber cruising, growth studies, regulation of cut, and actual silvicultural marking on the same area. In addition, the unit serves as a demonstration of sustained yield management of a small farm woodlot.

The tract chosen for this project is a stand of native hardwoods composed mainly of oak and hickory. This stand was part of the wooded area of the original Stinchfield Woods acquired in 1925. At the time of purchase, the woods were typical of over-grazed farm woodlots, with no reproduction and a ground cover of grass. Several improvement cuttings have been made, starting soon after purchase.

The management unit has been subdivided into five lots, each to be worked over once every five years. The lots were established along natural boundaries in so far as possible and are roughly equal in size and productive capacity.

Each year the lot coming up for cutting is cruised by the students. Its past five-year growth is computed by the 100-percent "control method" inventory following the rules laid down in Switzerland (Forest Inventory, pp. 219-225). From the volume and growth values obtained, the students compute the periodic cut, participate in marking the lot for cutting, and return after the cutting is completed to study their work.

The following table shows the cutting schedule for the 15 years following 1952.

Lot No.	Acres	Year Cut
2	14	53-54, 58-59, 63-64
9	11.5	54-55, 59-60, 64-65
10	16	55-56, 60-61, 65-66
11	9.5	56-57, 61-62, 66-67
12	15	52-53, 57-58, 62-63

Lot Nos. 2,9, 10,11,12 (Cont)

Stinchfield Hardwood Management Unit

Annual Cut

Year	Lot	Area	Basal	Area	(Sq.Ft.)	Yield	
			Total	Cut	Percent	Board Feet Int. 1/4"	Cords
1952-53	12	15	1151	183	15.9	11,150	31
1953-54	2	14	1056	248	23.5	19,810 ^{1/}	54
1954-55	9	11.5	737	221	30.0	13,735 ^{1/}	68
1955-56	10	16	1202	250	20.8	8,410	64
1956-57	11	9.5	739	152	20.6	5,265	37
1st cycle (5 comps)		66	4885	1054	21.6	58,370 ^{1/}	254
1957-58	12	15	1058	46	4.3	2,575	11
1958-59	2	14	865	90	10.4	6,485	21
1959-60	9	11.5	612	63	10.3	6,000	16
1960-61	10	16	1108	164	14.8	13,420	30
1961-62	11	9.5				6,565	14
2nd cycle (5 comps)		66	3643	363	10.0	35,045	92
1962-63	12	15				17,360	40
1963-64	2	14				9,590	24
3 cycle 2 comp.						26,950	64

^{1/} Excludes hickory, except in lots 2 and 9, 1st cycle where it is assumed on basis of comp. 2 that 15% of the board-foot yield was hickory. This would make total cut of species other than hickory for first cycle 53,420 board feet.

Lot Nos. 2, 9, 10, 11, 12 (Con't)

Stinchfield Hardwood Management Unit

Basal Area Summary

	BO_RO	WO	Hickory	Other	Total
Stand, 1930	37.4	14.2	7.6	3.1	62.3
Cut, 1930-1951	8.7	8.6	2.4	1.8	21.5
Stand before cut, 1952-57	50.4	10.9	10.8	1.9	74.0
Cut, 1952-57	9.5	0.3	5.8	0.3	15.9
Stand after cut, 1952-57	40.9	10.6	5.0	1.6	58.1
Periodic Annual Increment (Gross)					
1930 to 52-57 cut	0.89	0.22	0.23	0.03	1.36
52-57 cut to 58-60 cut (4 compartments only)	0.73	0.37	0.06	0.24	1.40
1949-1959 (27 1/4-acre plots = 10.2% cruise)	1.43	0.37	0.29	0.07	2.16
1949-1964 "					

Lot Nos. 2, 9, 10, 11, 12 (Cont)

Yields

The annual cuts for the first 12 years of the sustained yield unit are summarized in table form. Over 120 thousand board feet of hardwood lumber and 410 cords of 4-foot fuelwood have been harvested during this period. The cut has come primarily from the poorer-quality black oak and from hickory, as the better black oak has been favored along with red oak, white oak, white ash, and black cherry.

Growth

Since the management is based upon basal area control, growth is best summarized on the same basis. From 1930 to the beginning of the management unit (varying from 1952 to 1957 for the different compartments), the gross mean annual increment was 1.36 square feet per acre. Between the first and second cuts the increment for four of the compartments was 1.40 square feet. A comparison was made using 27 1/4-acre plots in the area measured in 1949 and 1964. This 10.2 percent cruise showed a gross annual increment for the 15-year period of 1.88 square feet per acre and a board-foot growth of 235 gross per acre per year.

Assuming that a gross basal area increment of 1.40 square feet per acre per year can be maintained and that this increment will yield 93 board feet of sawlogs per square foot of basal area (excluding 0.10 square feet of hickory growth) and 0.20 cords of fuelwood, a mean annual increment of harvest of approximately 121 board feet and 0.28 cords per acre should be realized. For 66 acres the annual cut should be in the neighborhood of 8,000 board feet and 18 1/2 cords of 4-foot wood. If the permanent sample plot estimates prove to be correct, even greater yields are possible under sustained yield management.

Marking Practice

The early cuts have been largely of the improvement type. With the exclusion of grazing, however, a hardwood understory has become established under much of the stand, and merchantable species are successfully established in many places. Now that the larger inferior trees have been removed, future cuttings will take on more and more the character of group cuttings in clumps of mature trees standing over understories composed of merchantable species, and light thinnings elsewhere in the compartments. The percentage of hickory has been greatly reduced while a thrifty growing stock of white oak, black cherry and other more valuable species has been substantially increased. Black oak, however, will continue to be the principal tree species on this poor oak site.

Spring, 1965
Lot No. 3
3.4 acres

DOUGLAS FIR

Scientific name: Pseudo Suga - taxi folia
Date of planting: Spring, 1954
Seed source: Pike National Forest Col.
Elev. 9000'
Class of stock: 3-0
Spacing: 25% 4 x 6' 75% 6 x 6'
Site preparation: Furrowed
Planting method: Planting bar

Part of the area, near the road, was planted at a 4 x 6 spacing with intention of using some of the trees for Christmas trees.

Spring 1965
 Lot No. 4
 4.9 acres

NORWAY SPRUCE-WESTERN YELLOW PINE (CORSIKAN PINE)

Scientific names: *Picea excelsa*-*Pinus ponderosa*-
Pinus nigra
 Date of Planting: Spring, 1928-34 and 1936
 Seed source of strain: Unknown

This lot was planted to Norway spruce in the spring of 1928, using 2-2 stock and a spacing of 6 x 6 feet. Planting was done in plowed furrows. A heavy mortality occurred, probably due to drought conditions and competition of a heavy cover of grass, so the area was replanted with Western yellow pine in the spring of 1934. This latter planting was damaged severely by mice and the fall spots were filled with Corsican pine in 1936.

For several years, the University was supplied with Norway spruce Christmas trees from this lot.

Crop trees on the area were pruned to a height of 12 feet during the winter of 1950-51.

In the fall of 1951, a quarter-acre sample plot was established and the trees measured. This plot was measured again in Feb. of 1958 and data tabulated below.

Species	Date Planted					Basal area per A		No. of trees per A		Av. ht. dom. trees	
		1951		1958		1951	1958	1951	1958	1951	1958
		Max	Ave	Max	Ave						
Norway Spruce	1928	10.0	8.4	13.4	10.2	10.2	15.8	28	28	38'	57'
Corsican pine	1936	5.3	3.3	6.4	4.4	28.7	30.0	476	272	25'	40'
Pond. pine	1934	9.1	6.1	11.9	7.1	65.1	87.3	320	320	29'	50'
Totals						104.0	133.1	824	620		

Many of the Ponderosa pine trees turned out to be Jeffrey pine. These were being killed with "Woodgate" rust so a heavy salvage cut was made in the fall of 1963.

Original measuring plot # 4-1 was discontinued. In the fall of 1964 Plot # 4-1 was re-established and another plot # 4-2 was established, both 1/4 acre plots.

Per acre data of the two plots combined is as follows.

August 1964

Species	Date Planted	# trees per acre	Av. D.B.H.	B.A.
Norway Spruce	1928	40	12.1"	31.6
Ponderosa & Jeffrey Pine	1934	58	7.0"	15.5
Corsical Pine	1936	268	5.8"	48.1
Totals		306 366		95.2

Spring 1965
 Lot No. 5A
 4.5 acres

WHITE PINE-RED PINE

Scientific Names: Pinus strobus - Pinus resinosa
 Date of planting: Spring, 1926, 1931, and 1933
 Seed source or strain: Unknown
 Class of stock: White pine, 2-2
 Spacing: 6 x 6
 Site preparation: Scalped
 Method of planting: Grubhoe
 Replanting: 1931 and 1933 with Red pine

A very light thinning was made in the winter of 1943-44. At that time crop trees were pruned to a height of 6 feet. This pruning was extended to a height of 12 feet during the winter of 1948-49.

The area was thinned in the winter of 1953 and pruning on the crop trees was extended to 17'.

A permanent sample plot of a quarter-acre was established and measured in the fall of 1951 with the results tabulated below.

Species	Trees per A.	d.b.h.		Ht.	Dom	Basal area per acre
		Max	Ave			
Red pine	236	8.0"	4.3"	39'		25.02
Wh. pine	452	10.0"	6.7"	41'		110.8
Totals	<u>688</u>					<u>135.82</u>

Remeasured in Fall of 1952
 Residual Stand

Red pine	148	8.0"	4.8"	40'		19.1
Wh. pine	368	9.6"	7.0"	42'		98.2
Totals	<u>516</u>					<u>117.3</u>

A thinning was made in 1958. A small area was thinned by the Silviculture class in the spring but bulk of area thinned in fall of 1958

Spring 1965
 Lot No. 5 A (cont.)
 4.5 acres

Another thinning was made in the fall of 1963. Plot No. 5A-1 was remeasured. The following Table is per acre data for 1958 and 1963.

Species	Date	No. trees per acre		Av. DBH		Av. Ht. dom.	B.A. per Acre	
		Before	After	Before	After		Before	After
Red pine	1958	140	96	5.6"	5.8"	50'	24.0	19.0
Wh. pine	1958	368	284	8.1"	8.5"	56'	132.0	112.0
Totals		508	380				156.0	131.0
Red pine	1963	96	80	6.8"	6.9"	55'	24.0	21.0
Wh. pine	1963	280	264	9.5"	9.6"	60'	137.0	134.0
Totals		376	344				161.0	155.0

In the fall of 1964, 3 additional 1/5 acre plots were established, data from these plots were combined with plot No. 5A-1 for a better sample of the stand. The following table gives this data on a per acre basis.

	No. trees per acre	Av. DBH	Av. Ht. dom.	B. A.
Red Pine	170	6.5"	49'	39.5
Wh. pine	223	8.6"	53'	100.0
Totals	393			139.5

Spring, 1965
Lot No. 5B
1.5 acres

JEFFREY PINE

Scientific name: Pinus jeffreyi
Date of planting: Spring, 1928
Seed source or strain: Unknown
Class of stock: 2-2
Spacing: 6 x 6
Site preparation: Scalped
Method of planting: Grubhoe

In 1937, infection with "Woodgate" rust started in this stand and has now infected practically every tree in the stand. Many trees have been killed and the rust is spreading slowly to plantations of ponderosa pine.

A permanent sample plot of one-half acre was established on the area in 1937. Data from this plot are given below.

D.B.H.

Year plant.	Years after	Trees per A.	Max	Min	Ave.	Av. ht. dom. trees	Basal area per Acre
1937	10	1320	2.1"	0.0"	1.3"	8'	11.7
1942	15	1320	5.3"	0.3"	3.5"	17'	78.7
1947	20	1320	6.8"	0.5"	4.1"		113.7

This area was turned over to Professor Dow V. Baxter of the School in 1947 for research on the rust. A thinning was made at that time. All the trees have been numbered with aluminum tags.

The most striking characteristic of these trees is the large ratio of diameter to height. Growth has varied widely and has been generally slow.

Practically all the trees are dead on the East 1/2 of the lot. This area is seeding in with white pine.

Spring, 1965
 Lot No. 5C
 2.9 acres

EUROPEAN BLACK PINE (AUSTRIAN STRAIN)

Scientific name: Pinus austriaca
 Date of planting: Spring, 1928
 Seed source or strain: Unknown
 Class of stock: 2-2
 Spacing: 6 x 6
 Site preparation: Part furrowed; part scalped
 Method of planting: Planting bar in furrows; grubhoe
 in scalps

In 1932, a half acre sample plot was established and the table below gives the results of measurements at 5-year intervals.

DATA FROM PLOTS									
Year	Yrs. after plant.	Trees per acre	D.B.H.			Height		Ave dom	B. A. per acre
			Max	Min	Ave	Max	Ave		
1932	5						2.6'		
1937	10	1052	3.9"		1.6"	17.0'	8.4'		14.3
1942	15	1080	5.7	0.7"	3.5	24.0	16.9		72.4
1947	20	1036	6.8	1.1	4.3			27'	103.8

In 1947, a thinning was made and the crop trees were pruned to a height of 12 feet. The half-acre plot was discontinued and 3 tenth-acre plots were established. One plot, 5C-3 was left unthinned as a check and Plots 5C-1 and 5C-2 were thinned to different degrees of stocking. Data from the measurements on these plots are given below.

Per Acre Summary of the 3-1/10 Acre Plots								
Plot No.	Year	No. of trees		Ave D.B.H.		Basal Area		Av. Ht. Dom.
		Before	After	Before	After	Before	After	
5C-1	1947	970	760	4.3"	4.6"	99.9	85.7	
	1952	760	660	5.2"	5.4"	114.0	105.2	
	1958	660	500	6.3"	6.5"	143.8	116.9	42'
	1964	480		7.0"		139.2		
5C-2	1947	970	670	4.2"	4.6"	95.6	76.9	
	1952	670	600	5.4"	5.5"	105.9	98.7	
	1958	600	500	6.4"	6.5"	135.3	114.3	42'
	1964	500		7.0"		135.8		
5C-3	1947	1000		4.4"		109.6		
	1952	1000		5.1"		139.3		
	1958	970		5.8"		178.1		42'
	1964	920		6.0"		191.4		

Lot No. 5C (Con't)

There has been no serious damage from insects or diseases except for a leaf-cast which attacked the older leaves each year until recently, leaving only needles of the current season. As the trees became larger the attacks lessened and gradually ceased. During the spring of 1949 a number of trees were tipped by a combination of heavy snow and high wind.

Note: Part of this lot, along the east end was originally planted to Jeffrey Pine. This was almost 100% killed by the "Woodgate" rust. The area was clear cut and plated with 2-2 wh. pine in spring of 1953.

Spring, 1965

Lot No. 6

6.3 acres

NATIVE HARDWOOD AND MIXED PINE

This lot at the time of purchase in 1925 was largely covered with oak and hickory. Part of the area was very open with a covering of scattered clumps of coppice oak of very poor form. This part of the lot, 3.9 acres, was clear cut and planted to pine at different intervals, as follows:

European Black Pine - Austrian strain - planted in spring,	1932
White pine	" " " 1938
Red pine	" " " 1939

Seed source and size of stock unknown. Planting was in scalped spots with planting bar. Spacing 6' x 6'.

Two and four tenths acres (2.4) remain in hardwood. Improvement cuts were made in the hardwood in 1930 - 32 - 36 - 42 and 56.

Selected white and red pine trees were pruned to 8' ht. during the winter of 1954-55.

Undesirable Hardwoods were removed from the planted area during the winter of 1959-60. A light thinning was made in the pine at the same time and crop trees were pruned to 17'. One 1/5 acre sample plot was established in August, 1964.

Per Acre Data From Plots

	#Trees	B.A.	Av. DBH	Av. Ht.
White pine	320	85.3	7.2"	50'
Red Pine	105	17.2	5.5"	47'
Black cherry	45	6.5	5.2"	--
Aspen	25	5.9	6.5"	--
Total	495	114.9		

Spring, 1965
Lot No. 7
1/2 acres

EUROPEAN AND JAPANESE LARCH

Date of planting: Spring, 1954
Seed source: Unknown
Class of Stock: 2-0
Spacing: 6 x 6
Site preparation: Part furrowed, part scalped
Method of planting: Planting bar

Initial survival was very poor. Replanted with 3-0 white pine spring 1959. Seed source - Lots No. 52 & 53, Stinchfield Woods.

Spring, 1965
Lot No. 8
6.2 acres

NATIVE HARDWOODS AND MIXED PINE PLANTATION

The lot at the time of purchase (1925) was partly covered with native hardwoods and part old field or pasture. A large percentage of the hard stand was very open and was clear cut and planted with pine. Only 0.8 acres remain in hardwoods.

Plantation data:

European Black Pine - Corsican strain	planted	spring	1938
Ponderosa Pine	"	"	1938
White Pine	"	"	1938
Red Pine	"	"	1942

Age of stock and seed source unknown. Planting was in scalped spots with planting bar. Spacing aimed at 6' x 6'.

Crop trees pruned to ht. of 8' during the winter of 1954-55.

Undersirable Hardwoods in the plantation were cut during the winter of 1959-60. A light thinning was made in the pine at this time.

An improvement cut was made in the native Hardwood area during the winter of 1959-60. Poor formed and undesirable species were removed.

Lot #8 (Cont)

In the fall of 1964 two 1/4 acre sample plots were established.

Species	No. trees per acre	Av. DBH	Av. Ht. Dom.	Basal area
Red pine	486	6.0"	43'	92.2
White pine	94	9.3"	45'	44.7
White cedar	22	5.2"	--	3.4
Total	602			132.3

None of the clumps and scattered trees of Ponderosa pine or Corsican pine fell in the plots.

Spring 1965
Lot No. 13
9 acres

NATIVE HARDWOODS

This lot evidently was clear cut at one time before purchase by the University in 1925, with a resulting sprout stand of black oak, wh. oak, and hickory with a considerable number of stems throughout apparently starting from seed. This stand was of much smaller size class than any of the other hardwood stands in the original Stinchfield Woods purchase of 1925. In 1930 the basal area per acre was only 45 sq. ft. as compared to an average of 80+ sq. ft. on the rest of the purchase. This was due to the small diameter classes as the number of stems per acre was satisfactory.

Two improvement cuts were made on the area, 1934 and 1939.

In 1949, four permanent sample plots, one quarter in area, were established.

An improvement cut was made during the winter of 1954-55. Ninety-four cords of 16" wood and 3.5 cords of 24" wood were taken from the area.

The four sample plots were re-measured in the fall of 1954, 1959, and 1964. The following is a summary of the measurements per acre basis.

Year	Basal area	Bd. ft.	
	6" DBH & up		
	Before cut	Before	
1949	55.7	400	
1964	64.7	2470	

Increment in both B.A. and Bd. Ft. does not include volume cut in 1954.

Spring, 1965
Lot No. 14
1.3 acres

DOUGLAS FIR

Scientific Name: Pseudo-tsuga taxifolia
Date of Planting: Spring, 1955
Seed source: Pike Nat. Forest, Colorado
Elev. 9000'
Class of stock: 3-0
Spacing: 6 X 6
Site preparation: Furrowed
Method of Planting: Planting bar

Replanted spring of 1960 with European and Japanese larch 2-1 stock and some White pine 3-0 stock, seed source, Lots # 52 and 53. Stinchfield Woods.

DOUGLAS FIR

Scientific Name: Pseudo-tsuga taxifolia
Date of planting: Spring, 1956
Seed source: Colorado Elev. 9000'
Class of stock: 3-0
Spacing: 7 X 7
Site preparation: Furrowed
Planting method: Planting bar

Replanted in spring 1958 - 3-0 Douglas fir, Colorado seed source from elevation of 4000'.

Replanted in spring of 1960 with European and Japanese larch 2-1 stock and some white pine 3-0 stock, seed source Lots 52 and 53. Stinchfield Woods.

Spring 1965
Lot No. 16
7.7 acres

NATIVE HARDWOODS

The observatory is on this lot also a small plantation of white pine planted in the early '40's. This planting was largely wiped out by a late November fire and replanted about 1948.

Improvement cuts were made in the Hardwoods in the winter of 1940-41 and again in the winter of 1953-54. Fifty-six cords of 16" fuel wood was produced in the last cutting.

A small amount of White pine blister rust was discovered on the pine in the spring of 1960. All infected trees were removed and burned.

Salvage cut made in the winter of 1962-63 removing wind and ice damaged trees. 30 bd. ft. and 7 cords of 16" wood.

Spring 1965
Lots Nos. 17, 18, 19
28.4 acres

SCOTCH PINE

Scientific name: *Pinus sylvestris*

These lots were all planted with a 6 x 6 spacing using 2-2 stock but at different dates. All were planted in the spring: Lot 17 in 1929 and 1930, Lot 18 in 1927 and Lot 19 in 1925 and 1926. The stock on the north portion of Lot 19 evidently was grown from seed of a different source than that in the other part as the trees have poor form and give a general impression of scrubbiness.

During the late '30's, these stands had become noticeably infested with a spittle bug - Aphrophora parallela. This infestation steadily increased in severity and reached its peak about 1944. Entering through the wounds made by the spittle bugs, a "Dieback" fungus - Sphaeropsis ellisii - killed many of the trees and caused a heavy reduction in the size of crowns on the remainder. The percentage of dead trees varied widely in different portions of the stand and was heaviest in the southern part of Lot 17.

Eight sample plots that had been established for thinning experiments when the stands were five years old, had their value destroyed for this purpose and were discontinued, except for one-half acre plot - Plot 17-1 in Lot 17. Three plots, of one-tenth of an acre each were thinned to different densities in 1946 to test the possibility that a reduction in root competition would increase the vigor of the trees left and their resistance to further damage. About 1950, the spittle bug attack decreased in severity and the trees that were still alive have now begun to recover normal crowns. However there is no evidence that reducing the density affected the recovery as trees in unthinned portions of the same stands show the same behavior. These plots and Plot 17-1 were measured in 1951, 1956, and 1963.

Data from these plots on a per acre basis is shown on the next page.

Lots #17-18-19 (cont)

Plot No.	Year	No. trees per acre		Ave. d.b.h. inches		Basal area per A. sq. ft.	
		Before	After	Before	After	Before	After
17-1	1938	1118	--	2.9	--	51.0	--
	1943	1078	--	3.8	--	88.0	--
	1951	656	593	4.9	5.0	87.7	73.1
	1956	514	458	5.9	6.0	98.8	90.5
	1963	456	370	6.9	7.0	118.5	97.6
17-2	1946	1090	700	4.1	4.4	100.1	74.2
	1951	700	--	4.7	--	85.2	--
	1956*	700	600	--	5.5	115.2	99.9
	1963*	600	495	6.3	6.4	128.6	101.5
17-3	1946	970	500	4.4	5.0	102.2	68.4
	1951	510	--	5.6	--	87.0	--
	1956*	510	485	6.5	6.3	116.9	104.2
	1963*	485	400	7.1	7.3	136.3	116.0
17.4	1946	1060	300	4.2	4.7	103.0	33.9
	1951	300	--	5.7	--	54.2	--
	1956*	300	--	8.3	--	80.5	--
	1963*	300	275	8.0	8.2	103.4	99.5

* Based on 1/5 acre plot, previous data based on 1/10 acre plot

Thinnings were made in lots #18 and 19 in 1941-1946-1951-1957 and parts of each lot in 1964. In Lot #17 in 1946-1951-1957 and 1963-1964. Because of the heavy mortality caused by the spittle bug, the Southern part of lot #17 was heavily cut (clear cut in spots) in 1948. In the spring of 1949, this area was replanted with a mixture of Ponderosa, Austrian and white pine, Douglas fir and Norway spruce. The Scotch pine recovered very rapidly after this planting and most of the newly planted trees were shaded out or grew very slowly except in the larger clear cut areas.

In the fall of 1964, six new 1/4 acre plots were established. Measurements on these plots were combined to give a better sample of the area as a whole.

Per Acre Data From Plots

# Trees	Av. D.B.H.	Basal Area
410	7.0"	109.5

Spring 1965
 Lot No. 20
 3.5 acres

RED PINE

Scientific name: Pinus resinosa
 Date of planting: Spring, 1925
 Seed source or strain: Unknown
 Class of stock: 2-2
 Spacing: 6 x 6
 Site preparation: Scalping
 Method of planting: Deep hole with grubhoe

This was the first plantation on the Stinchfield woods area. In the winter of 1948-49, the stand was thinned and crop trees were pruned to a height of 12 feet. The lot was thinned again in 1953-54 and crop trees pruned to 17'. Another thinning was made in the fall of 1958.

The soil on most of this lot is sandy, but in the northwest corner there is a knoll of clay on which the pine is shorter and of considerably slower growth than that in the rest of the stand.

Tympanis pinastri - has infected the majority of the trees and caused numerous cankers. No trees have been killed but it is difficult to estimate how much damage may have been caused to the wood of the infected trees. It is hoped that the thinning and pruning will reduce the incidence of the disease in the future.

Severe damage was caused by the European pine shoot moth for a number of years until 1947. Since then damage has been light as a result of some unusually low temperatures during the winter of 1947-48.

There is one half acre permanent plot in this stand. The results of measurements on the plot are given in the following table.

Date plant.	Years after	No. trees/A		Ave. d.b.h.		Ave. ht.	Basal area per acre	
		Before thin.	After thin.	Before thin.	After thin.		Before thin.	After thin.
1929	5	1304				2.2'		
1934	10	1228				8.7'		
1939	15	1214		3.3"		18.1'	80.5	
1945	21	1134		4.7"		25.7'	132.5	
1948	24	1134	858	5.0"	5.4"		154.8	137.1
1953	29	854	726	5.7"	5.9"	33.0'	152.6	135.6
1958	34	722	554	6.5"	6.8"	39.0'	162.5	131.4
1963	39	550	422	7.1"	7.3"	42.0'	149.2	118.4

The 1958 thinning produced 5000 bd. ft. of small saw logs or 1,400+ bd. ft. per acre.

The 1963 thinning produced 5600 bd. ft. of small saw logs or 1600 bd. ft. per acre.

Spring, 1965
Lot No. 21
9.2 acres

RED PINE

Scientific Name: Pinus resinosa
Date of planting: Spring, 1929
Seed source or strain: Unknown
Class of stock: 2-2
Spacing: 6 X 6
Site preparation: Plowed furrows
Method of planting: Planting bars

Because of poor survival replanting was done in 1930, in new furrows plowed between the original ones. Additional replanting of Red pine was done in 1929 and 1932. In 1937, some remaining openings were planted with 2-0 Scotch pine.

During the winter of 1948-49, north and south skid trails were cut through the stand at intervals of about 66 feet and a very light thinning was made in the strip between the skid trails. Thinnings made again in 1953-54 and 1961-62.

The stand has been severely damaged by the European shoot moth.

The lot was thinned in 1953-54 and crop trees on entire area were pruned to 8', approximately 30% of area pruned to 12' and one small area pruned to 16'.

In the fall of 1964, 3 1/4 acre sample plots were established.

Per Acre Data From The 3 Plots			
Species	No. Trees per acre	Av. DBH	Basal Area
Red pine	578	6.6"	138.0
Scotch pine	65	6.5"	15.0
Total	643	-	153.0

Spring 1965
 Lot. No. 22A
 4 acres

SCOTCH PINE

Scientific name: Pinus sylvestris
 Date of planting: Spring, 1929
 Seed source or strain: Unknown
 Class of stock: 2-2
 Spacing: 6 x 6
 Site preparation: Furrow
 Method of planting: Planting bar

A permanent sample plot - one half-acre - was established in 1936. The stand was thinned in the winter of 1945-46 and again in the winter of 1947-48 in an endeavor to control the spittle bug and follow-up fungi. The damage from the spittle bug - Aphrophora parallela - and the fungi - Sphaeropsis ellisii - started in the early '40's and was very serious until recovery started in 1949-50. In 1951 the stand was apparently well recovered from the damage. The number of trees killed can be seen by comparing the 918 trees per acre left in 1945 on the sample plot to the 568 trees per acre in 1947. The heaviest mortality occurred on the plot area. During the winter of 1952-53 another light thinning was made, removing poorly formed trees from the denser parts of the stand.

DATA FROM PLOT

Years	Years		Trees per Acre		Ave. d.b.h.		Ave. ht.		Basal area/A	
	Meas.	plant.	before	after	before	after	before	after	Before	After
1936	7	1160						7.8'		
1940	12	1160			3.3"			19.4'	68.5	
1945	17	1092	918		4.1"	4.3"		32.5'	101.1	92.4
1947	19	568	250		4.7"				69.5	43.3

1952 - sample plot thrown out as it does not represent the stand.

A light thinning was made in the spring of 1960.

Spring, 1965
Lots No. 22B, 23, and 24
10.1 acres

SCOTCH PINE

Scientific name: *Pinus sylvestris*

These three plantations are discussed together because they afford an opportunity to compare the difference in growth and development of trees from different seed sources planted on similar sites. Planting data and area are given below:

Lot No.	Area Acres	Variety	Planting date	Planting Stock	Planting method
22B	5.9	Riga	1930	2-2	Bar in furrows
23	2.2	Bavarian	1933	2-1	Bar in furrows
24	2.0	Norwegian	1933	2-1	Bar in furrows

These stands have suffered minor damage from the European pine shoot moth and have had about the same history of damage from the spittle bug as the other Scotch pine stands, except that mortality has been less than in some of the others.

In the winter of 1947-48, all three stands were thinned, except Plot 1 in Lot 22B and several rows along the east side of Lot 23. The thinning removed mostly trees of poor form and those that were badly damaged. In Lot 22B, 278 trees and 15.6 square feet of basal area per acre were cut; in Lot 23, 250 trees and 20.6 square feet of basal area; in Lot 24, 202 trees and 6.9 square feet of basal area. This same thinning procedure was followed during the winter of 1952-53 and 1962-63.

Trees of the Bavarian variety have made the most rapid growth but have the poorest form. Those of the Riga and Norwegian varieties are about equal with each other in rate of growth and percentage of well-formed stems, as can be seen from plot data. The Norwegian variety is of somewhat slower growth. Crop trees on Lots 22B and 24 were pruned to ht. of 12 feet in the fall of 1952.

Two half-acre plots have been established in Lot 22B and one in each of Lots 23 and 24. Results of measurements on these plots are given in the table below:

Lots 22B, 23, and 24, cont'd

Lot	Plot #	Year Measured	Years		Trees per A		Ave. d.b.h.		Height Av.	Dom	Basal Area per A	
			After	Planting	Before	After	Before	After			Before	After
22B	1	1940	11		1060		2.1"		12'		25.9	
		1945	16		1054		3.6"		20'		73.2	
		1952	23		914		4.3"			29'	93.4	
22B		1957	28		882		4.9"			37'	116.7	
		1962	33		796		5.5"			46'	131.2	
		1940	11		998		2.1"		12'		25.0	
22B	2	1945	16		1006		3.6"		21'		70.3	
		1952	23		*668	576	4.4"	4.5"		29'	*70.1	63.4
		1957	28		568		5.6"			37'	97.9	
23	1	1962	33		564	434	6.0"	6.1"		47'	115.9	99.7
		1942	10		996		3.1"		18'		51.3	
		1947	15		976	726	4.1"	4.1"	25'		89.2	68.6
23		1952	20		682	538	4.6"	4.7"		34'	78.3	66.2
		1957	25		538		5.8"			41'	95.8	
		1962	30		538	398	6.0"	6.9"		47'	121.6	100.3
24	1	1942	10		1064		1.6"		10'		16.2	
		1947	15		1082	860	3.3"	3.5"		21'	64.5	57.5
		1952	20		838	666	4.1"	4.1"			75.6	64.8
24		1957	25		664		5.1"			33'	95.4	
		1962	30		662	554	5.6"	5.9"		40'	115.4	104.2

* Low figure due to trees being cut out in 1947 and not deducted from the 1945 figures.

Spring, 1965
Lot. No. 25
2.3 acres

JACK PINE

Scientific name	Pinus banksiana
Date of planting:	Spring, 1934
Seed source or strain:	Unknown
Class of stock:	2-0
Spacing:	6 x 6
Site preparation:	Scalped
Method of planting:	Grubhoe
Replanting:	Area replanted in 1940 and in 1942 with 2-0 stock planted in furrows with planting bar.

The area has been free of insects and diseases. The original mortality was caused by rodent damage.

When Lot No. 42 to the east was planted in 1949, it was noted that some young Jack pine had started from seed produced on lot 25. Individuals were 4 feet high.

A light thinning was made in 1958 and crop trees pruned to height of 9'.

Spring, 1965
Lot. No. 26
4.8 acres

WESTERN YELLOW PINE-DOUGLAS FIR-SCOTCH PINE

Scientific names: Pinus ponderosa, Tseudotsuga
taxifolia,
Pinus sylvestris
Date of planting: Spring, 1932
Seed source or strain: Unknown, excepting that the
Douglas fir is the mountain
type

This lot was not established as a plantation. It was originally picked as a site for a proposed cabin and the planting was done in groups for ornamental purposes. The Scotch pine along the southeast side of the lot was planted at a later date - 1937.

The Western yellow pine was planted with a 10 x 12 foot spacing. This will be a good comparison with other Western yellow pine plantations which were established with a 6 x 6 foot spacing. Part of the Western yellow pine has been pruned to 12 feet. This area should develop into a good visual comparison of the over-all growth rate, tree form, size of branches, etc., between the wide and close spacing of the same species.

The Douglas fir is an illustration of what can be expected of the mountain type fir in this region planted on poor soil in a dry location. The trees would have made excellent Christmas trees ten years after planting.

The Scotch pine in the northeast corner of the lot is of unknown strain. This small planting of Scotch pine has been very free of the spittle bug and the "Dieback" fungus - Sphaeropsis ellisii.

A thinning was made in 1962 in the Scotch pine just east of the Ponderosa pine planting. Some pruning done - 8'-17' in this same area.

Spring, 1965
Lot No. 27
5 acres

SCOTCH PINE

Scientific name: Pinus sylvestris
Date of planting: Spring, 1936
Seed source or strain: Unknown
Class of stock: 2-2 and 2-0
Spacing: 6 X 6
Site preparation: Scalped
Method of planting: Grubhoe

This plantation was established with both 2-2 and 2-0 stock. No records were kept of the location on which each size was planted and a few years after planting there was no difference in the size of the trees.

The European pine shoot moth - Rhyacionia buoliana - was very prevalent in this stand in the early 1940's and continued abundant until 1948. Since then there has been very little damage from this moth. The spittle bug - Aphrophora parallels - and the Sphaeropsis ellisii fungi has caused little damage to this stand.

There has been considerable defoliation by the European sawfly - Neodiprion sertifer.

A thinning was made in the winter of 1948-49. Only the more crooked and deformed trees were removed at that time.

Silviculture class pruned some trees along the West side of the area the winter of 1955-56. More of the area pruned to 17 feet the spring of 1965.

A thinning was made in the winter of 1956-57 again removing some of the more crooked and deformed trees.

In the fall of 1964, 2 - 1/4 acre sample plots were established.

Per Acre data from Plots

No. trees per acre	av. dbh	Basal area
566	6.0"	111.5

Spring 1965
Lot. No. 28
3.2 acres

SCOTCH PINE

Scientific name: Pinus sylvestris
Date of planting: Spring, 1938
Seed source or strain: Bavarian strain
Class of stock: 2-0
Spacing: 6 x 6
Site preparation: Furrowed
Method of planting: Planting bar

This plantation suffered some damage from the European pine shoot moth - Rhyacionia buoliana - from 1942 to 1948. Since then there has been very little damage from this cause. Some defoliating has been done by the European sawfly - Neodiprion sertifer - but not to any extent. The spittle bug - Aphrophora parallela - and the "Dieback" fungus - Sphaeropsisellisii - have not caused any appreciable damage perhaps due to the young age of the stand.

The European shoot moth was rather serious during the years of 1955-58 but declined during the summer of 1959.

A moderately heavy thinning was made in the fall of 1960.

Spring 1965
Lots Nos. 29-30-32
17.8 acres

RED PINE

Scientific name: Pinus resinosa
Date of planting: Spring, 1937-30 and 32; Spring, '39-30
Seed source or strain: Unknown
Spacing: 6 X 6
Site preparation: Furrowed
Method of planting: Planting bar

The plantations did very well until the early 40's when they were infested with the European pine shoot moth - Rhyacionia buoliana. Very heavy damage was done in the year 1945 and also in '46 and '47. Experimental spraying with a fog machine, using DDT was tried in the spring of 1947. Effective kill within 3 chains of the machine resulted. However, a fall checkup showed unsatisfactory results from this spraying. During the winter of 1947-48, there was a spell of very cold weather (12-15 degrees below zero). This cold spell, unusual for this vicinity, materially reduced the population of moths and subsequent cold spells in following winters has resulted in bringing the insect under control. There was hardly a moth to be found in the summer of 1951. The trees are short for their age and many are badly deformed. However, it is believed that with judicious thinning and pruning there will be a satisfactory number of crop trees if the pine shoot moth population remains at its present level until the stand reaches a height of 20' or more. From then on it is thought that the damage to the trees will not be serious.

Some cutting was done in Lot 30 during the spring of 1959. This was part of a masters problem worked under Prof. Zahner's supervision. Small amount of cutting was done along the east side in 1957-58 and 59 for trees for the Paul Bunyan Dance. Small outbreak of Ips pine followed the above cutting.

A non-commercial thinning was made in the winter of 1961-62.

In the fall of 1964, five 1/4 acre sample plots were established.

Per Acre Data from Plots

No. trees per acre	Av. DBH	Basal Area
784	5.1	112.0+

Spring 1965
Lot No. 31
5 acres

MIXED PINES

Scientific names: White pine - *Pinus strobus*
Red pine - *Pinus resinosa*,
Austrian pine - *Pinus nigra*
Date of planting: Spring, 1938
Seed source or strain: Unknown
Class of stock: White pine and Austrian 2-0,
Red pine - 2-1
Spacing: 6 X 6 Wh. and Red pine in mixture,
Aust. pine as a group along east
side of area
Site preparation: Furrowed
Method of planting: Planting bar

The pine plantation is a good illustration of the damage done by the European pine shoot moth - *Rhyacionia buoliana* - to different species. The Red pine was damaged from about 1942 to 1947. The White and Austrian pine came through with very little damage. The Scotch pine plantation adjacent to the west was severely damaged during this same period.

The silviculture class started pruning in this lot the winter of 1962-63 and have the area mostly covered in the winter of 63-64, completed the winter of 1964-65. Crop trees pruned to 17'.

Light cutting of Red pine for Paul Bunyan Dance decorations started in the winter of 1962-63.

In the fall of 1964, two 1/4 acre sample plots were established.

Per Acre Data from Plots

Species	No. Trees	Av. DBH	B.A.
White pine	428	6.4"	96.4
Red pine	364	4.0"	32.4
Aust. pine	28	5.3"	4.8
Total	820		133.6

Spring 1965
Lot No. 33
6.9 acres

WHITE PINE

Scientific name: Pinus strobus
Date of planting: Spring, 1937
Seed source or strain: Unknown
Class of stock: 2-0
Spacing: Approx. 4 X 9 (1200 trees per acre)
Site preparation: Furrows
Method of planting: Planting bar

The Norway spruce along the west end of the plantation were put in about 1939 in a fail spot of the original planting area. This has a very heavy sod cover. The small White pine trees originally planted were crowded out and large 2-2 and 2-3 Spruce were used as replacements. Even some of these were unable to cope with the extremely heavy sod and high grass competition. About 1940, some Red pine was planted in scattered fail spots throughout the plantation. The Red pine suffered very heavily from the European pine shoot moth and will probably drop out of the stand completely. The White pine was practically free from any attack.

Pruning on the area was started in the winter of 1956-57 by the Silviculture Class and continued in the years 57-58 and 58-59 and 1959-60.

A thinning was made in the fall of 1964. At this time two 1/4 acre sample plots were established.

Per Acre Data From Plots

No. trees per acre		Av. DBH		Basal Area		Av. Ht Dom. Trees
Before cutting	after	Before	after	Before	After	
626	446	6.7"	7.2"	154.4	126.1	49'

Several trees were infected with a canker and were removed in the thinning.

Spring 1965
 Lot No. 34
 3.4 acres

JACK PINE

Scientific name: Pinus banksiana
 Date of planting: Spring, 1940
 Seed source or strain: Wisconsin
 Class of stock: 2-0
 Spacing: 5 x 5
 Site preparation: Furrow
 Method of planting: Planting bar

This area has been free of insects and diseases. In the fall of 1951, 12 years after planting, two, one-tenth acre permanent sample plots were established. The plots were re-measured in the fall of 1957. Diameter growth was very slow and a heavy thinning was completed during the winter of 1957-58.

DATA FROM PLOTS

Plot	Year Meas.	Trees per A.		Ave. d.b.h.	Av. ht. dom. trees	Basal area per acre	
		Before	After			Before	After
34-1	1951	1420		2.5"	19'	52.5	
34-1	1957	1420	920	3.0"	28'	70.1	59.7
34-1	1964	920	630	4.6"		98.2	73.3
34-2	1951	1540		2.7"	19'	65.7	
34-2	1957	1520	990	3.3"	28'	92.8	71.3
34-2	1964	970	630	5.0"		110.4	83.9

The west 1/2 of the lot, adjoint to the road was pruned to 9' in the fall of 1959.

Area to be thinned during the summer of 1965.

Spring 1965
Lot. No. 35
3.4 acres

WHITE PINE

Scientific name:	Pinus strobus
Date of planting:	Spring, 1946
Seed source or strain:	Saginaw Forest plantations, north of lake.
Class of stock:	4-0
Spacing:	6 x 6
Site preparation:	Furrow
Method of planting:	Planting bar
Replanting:	1947. Norway spruce, Ponderosa pine and an occasional Scotch pine (in error) were planted in the fail spots.

Spring 1965
Lot No. 36
1.8 acres

MIXED CONIFERS

Date of planting: Spring, 1947
Spacing: 6 x 6', species mixed without formal plan
Site preparation: Area furrowed
Method of planting: Planting bar
Planting stock used:

<u>Species</u>		<u>Size</u>	<u>Seed Source</u>
White pine	Pinus strobus	2-1	Wisconsin
Ponderosa pine	Pinus ponderosa	2-0	Saginaw Forest
Norway spruce	Picea excelsa	2-1	Saginaw Forest
Scotch pine	Pinus sylvestus	2-0	Bavarian source

This area had a heavy quack grass sod which gave the young trees severe competition until about 1951 when they reached sufficient height to compete and start to shade out the grass. The fail spots in the plantation are a direct result of the shading in summer and the breaking down of the small trees in winter when the tall grass was weighed down with snow.

The ponderosa pine has been severely attacked by European shoot moth. Most of the Scotch pine was cut for Christmas trees.

Some of the white pine trees have had the tops broken out by vandals.

Spring 1965
Lot. No. 37
11.6 acres

MIXED CONIFERS

Date of planting: Spring, 1948
Planting stock used:

<u>Species</u>		<u>Size</u>	<u>Seed Source</u>
White pine	Pinus strobus	2-1	Wisconsin
Ponderosa pine	Pinus ponderosa	2-0	Saginaw Forest
Norway spruce	Picea excelsa	2-1	Saginaw Forest
Jack pine	Pinus banksiana	2-0	Wisconsin

That part of the plantation west of the path leading up to the Broadcasting Tower was planted at a spacing of 6 x 8' in furrows with planting bars. Species were mixed without any formal plan. The area to the east of the path was planted in groups, in scalps, with planting bars. Spacing was 6 x 6'.

Part of the plantation along Stinchfield woods road was released from undesirable hardwood overstory during the spring of 1959.

Quite a few spruce have been stolen for Christmas trees.

Spring 1965
Lot No. 38
1.9 acres

RED CEDAR

Scientific name: *Juniperus virginiana*

This small area was planted to Red cedar in the spring of 1947. Native stock was used. This stock was collected on Lot No. 37 adjacent to the hardwood type on the northwest corner of the Lot. Stock averaged from 12 to 18" in height. Planting was done with grubhoes. An area about 2' square was scalped free of sod and then trees were planted in holes dug with grubhoes. Soil conditions range from sandy loam to very coarse gravel on the steep slope. Many trees on the slope were planted and covered with not more than small stones as soil is almost non-existent. The survival is very good in the more level areas where the sandy soil is located. Survival is fair, and much more than was expected, on the steep slopes where very poor planting conditions exist. Trees on this slope have also been in stiff competition with sumach.

Many of the trees on the better site condition had attained a height of more than 7 feet by the fall of 1951. Many trees are 25' high in spring of 1965.

Spring 1965
Lot No. 39
13 acres

MIXED PLANTATION

This area was planted in different years starting in the spring of 1949 and completed in the spring of 1951. The mixed Maple-European larch-Norway spruce plantation immediately adjacent to the sawmill was established in the spring of 1949. The Ponderosa pine on the hill south of the mill was planted in the spring of 1950. The remainder of the area was planted in the spring of 1951.

PLANTING DATA

Year Planted	Species	Size	Seed Source	Method of planting	Spacing
1949	European Larch	2-0	Unknown	p bar	
1949	Norway & H. Maple	Wildlings	Saginaw Forest	grubhoe	6 x 6
1949	Norway spruce	2-1	Saginaw Forest	p bar	
1950	Ponderosa pine	2-0	Saginaw Forest	p bar	6 x 7
1951	White pine	2-2	Iron Co. Mich.	grubhoe	6 x 6
1951	Norway spruce	2-2	Saginaw Forest	grubhoe	6 x 6
1951	Douglas fir	2-2	Colorado	p bar in	6 x 7
1951	Red oak-White oak Bass-White ash	1-0	Local	furrows	

The Norway spruce and Douglas fir were planted in groups. The hardwoods were planted along the road to the mill. The hardwoods were used in mixture with coniferous trees around the sawmill in an attempt to establish a forest that would not be as great a fire hazard as a pure coniferous stand.

The white pine seed was collected from one tree in Sec. 30 T46H R36W Iron Co. Mich.

Most of the maple was cut out of the Larch stand near the mill in the summer of 1963. Mostly Norway maple, very crooked and crowding out the Larch. Several Larch trees have been killed by cankers.

Spring 1965
Lot. No. 40
11 acres

MIXED PINE PLANTATION

This plantation was established in the spring of 1951. The different species were planted in groups and not intermingled. About one acre on the extreme south side was planted in the spring of 1952.

<u>Year</u>	<u>Species</u>	<u>Size</u>	<u>Seed Source</u>	<u>Planting method</u>	<u>Spacing</u>
1951	White pine	2-2	Iron Co. Mich.	P bar in furrow	6 x 7
1951	Austrian pine	2-0	Denmark	P bar in furrow	6 x 7
1951	Ponderosa	2-0	Sag. Forest	P bar in furrow	6 x 7
1951	Jack pine	2-0	Wisconsin	P bar scalp	3 x 3'
1952	White pine	2-1	Iron Co. Mich.	P bar, scalp	6 x 7

The Jack pine was planted in an old gravel pit. The close spacing was used, as a high mortality is expected.

The White pine seed was collected from one tree in Sec. 30 T46N R36W Iron Co., Mich.

Spring 1965
Lot No. 41
5.5 acres

RED CEDAR

Scientific name: *Juniperus virginiana*

This area was fairly well stocked with native Juniper when taken over by the School of Natural Resources in the spring of 1946. It was decided to maintain the area in Juniper as an example of what the species would do under local existing conditions. The large openings between the naturally seeded areas were planted with wildlings, 12-18" high from places that were overstocked.

The exposure is to the southeast. The soil is gravel or sand, mostly gravel, containing very little organic matter. The site was heavily eroded while being farmed or heavily grazed with sheep. Grazing stopped about 1940.

The one group of larger Juniper that shows up in about the center of the 5.5 acres covers enough area to give an idea of the potentialities of the species under plantation conditions. The trees in the center of the group average 7" d.b.h.; 20 ft. high at the age of 40 years. The heavy grazing for years evidently had some detrimental effect on the growth. The size to which the species will develop in this locality under plantation management is not known.

In 1949, a Juniper from the Stinchfield area produced 105 bd. ft. of 4/4 lumber at our mill. This tree was growing in a fairly large group somewhat similar to plantation conditions. The age of the tree is not known as there was considerable center rot.

Spring 1965
Lot No. 42
19 acres

MIXED CONIFEROUS PLANTATION

This area was planted in the spring of 1949. The following species were planted:

Austrian pine	2-0 seedlings - seed source unknown
Ponderosa pine	2-0 seedlings - seed source unknown
Douglas fir	2-1 transplants - seed source unknown
Jack pine	2-0 seedlings - seed source, Wisconsin
Norway spruce	2-1 transplants - seed source, Saginaw For.

The Austrian, Ponderosa pine and Douglas fir seed were purchased from a dealer in Montana so the exact source is not known. The Austrian pine is believed to have originated in Austria.

Planting method was as follows: That part of the plantation south of the valley running east and west across the area was planted directly in the sod with planting bars. A spacing of 7 x 7 was aimed at. Red cedar trees already on the area were considered desirable and allowance was made in spacing whenever they were encountered. No scalping was done, which makes the spacing rather irregular as it was difficult to keep the planters in alignment without the scalped spot as a guide. North of the gulley the trees were planted in scalped spots with planting bars. Spacing was 6 x 6. The Pines are largely in mixture with groups here and there of pure Austrian or Ponderosa pine. The Spruce and Douglas fir were planted along the bottoms of the ravines, wherever the soil appeared of higher quality.

Ponderosa Pine has been severely attacked by European shoot moths.

Some 3-0 White pine were planted on part of the area in the spring of 1958. Seed source Lots #52-53 Stinchfield.

Spring 1965
Lot No. 43
0.8 acre

JACK PINE

Scientific name:	Pinus banksiana
Date of planting:	Spring, 1948
Seed source or strain:	Northern Wisconsin
Class of stock:	2-0
Spacing:	6 x 8
Site preparation:	Scalps
Method of planting:	Small amount in the spring of 1949 with 2-0 Jack pine of same seed source.

Spring 1965
Lot No. 44
60 acres

NATIVE HARDWOODS

Lot No. 44 consists of 60 acres of Oak-Hickory type. The topography is very rough. The soil varies from light sandy loam in the valleys to gravel on the top of the hills and ridges. The site varies greatly, grading from good to medium in the bottom of the valleys to very poor on the top of the hills and ridges. It is very doubtful if the tops of some of these hills and ridges will ever produce sawlog timber. Parts of the area were apparently cut clean at one time and either farmed or heavily grazed so that some erosion took place on the steeper slopes. Much of the area is a sprout stand with a fair proportion of trees that evidently started from seed. Heavy grazing by sheep stopped about 1940.

The School of Natural Resources completed its first cut on the area in the spring of 1950. This cut was strictly a stand improvement cutting with deformed and defective trees removed. In a few places the stand was dense enough to justify thinning, in such cases oak was favored over Hickory.

Products Salvaged:

<u>Fuel wood:</u>	16"	159 cords
	24"	42 cords
	30"	3 cords
	36"	2 cords

Logs: 2,625 bd. ft. low grade logs

Basal area in trees 6" DBH and up and Bd. Ft. Volumes
Per Acres (Int. 1/4" to 8" min. top)

Before and After Cutting

	Basal Area		Bd. Ft.	
	Before	After	Before	After
1950	41.2	35.0	1144	948
1954	46.2	--	1578	--
1959	53.7	--	2170	--
1964	59.1	--	3092	--

Thinning was started again in 1960 along the road from the saw mill and north of the road to Broadcasting tower.

Products cut: 63 cords 16" wood, 33 cords 24" wood,
14,240 Bd. ft. logs.

Spring 1965
Lot No. 45
3.1 acres

RED PINE

Scientific name:	Pinus resinosa
Date of planting:	Spring, 1927
Seed source or strain:	Unknown
Class of stock:	2-0
Spacing:	5 x 5
Site preparation:	None
Method of planting:	Grubhoe

Light damage was done to the stand in 1945-46-47 by the European pine shoot moth - Rhyacionia buoliana. The trees are sufficient height at this time so that further damage is not expected. There was a light infestation of a canker - Tympanis pinastri in the stand, however, thinnings and pruning are expected to condition the stand so that serious damage will not take place.

A sample plot, the north one-half of the area, was measured at five year intervals from 1937 to 1946. In 1946 two more plots No. 45-4 and 45-5 of one-tenth acre each were established. In 1951 the original large plot was discarded and three new one-tenth acre plots 45-1, 45-2, and 45-3 were established within the original plot boundaries. Each of the above plots of one-tenth acre area have been thinned to a different degree of stocking.

Thinnings were made on the area in the winters of 1946-7, 1951-2, 1957-8, and 1962-63. 500 board feet of small sawlogs were obtained in the 1951-52 cutting, 1000 board feet in the 1957-58 cutting, and 3580 board feet in the 1962-63 cutting.

A heavy pruning was done in 1945-46 when the trees were pruned to a height of 12 feet. This pruning was an attempt to stop the canker as well as to improve the quality of timber. Crop trees were pruned to a height of 17 feet in the fall of 1951.

Lot No. 45 (Con't.)

DATA FROM SAMPLE PLOTS

Plot No.	Year Meas.	Trees per A		Ave. d.b.h.		Ht.	B.A. per A	
		Before	After	Before	After		Ave.	Before
Orig. plot of 1.58 A	1931					2.6'		
	1937	1638		2.3"		11.2'	34.5	
	1941	1525		3.3"		18.9'	90.9	
	1946	1498	1320	4.1"	4.3"	Ht. Dom.	140.2	
45-1	1951	1230	960	4.9"	5.0"	----	158.8	133.6
45-1	1957	960	660	5.6"	5.9"	45'	166.0	126.5
45-1	1962	660	530	6.4"	6.5"	50'	144.6	122.4
45-2	1951	1370	890	4.8"	5.0"	----	173.7	120.5
45-2	1957	870	550	5.6"	6.1"	40'	152.5	112.5
45-2	1962	550	380	6.6"	6.9"	48'	131.0	98.9
45-3	1951	1410	1040	4.8"	4.8"	----	175.7	130.7
45-3	1957	1010	770	5.4"	5.9"	44'	158.0	136.0
45-3	1962	770	570	6.2"	6.4"	52'	158.1	126.7
45-4	1946	1480	960	4.1"	4.4"	----	134.5	100.1
45-4	1951	960	890	5.0"	5.0"	----	134.1	124.5
45-4	1957	880	670	5.8"	6.1"	42'	160.0	126.0
45-4	1962	670	540	6.3"	6.5"	50'	143.8	121.7
45-5	1946	1370	770	4.4"	5.0"	----	144.1	101.1
45-5	1951	770	630	6.0"	6.2"	----	151.6	132.0
45-5	1957	630	390	7.1"	7.4"	50'	172.0	116.0
45-5	1962	390	290	8.1"	8.5"	57'	141.2	114.0

Spring 1965
Lot No. 46
4 acres

RED PINE

Scientific name: Pinus resinosa
Date of planting: Spring, 1930
Seed source or strain: Unknown
Class of stock: 2-2
Spacing: 6 X 6
Site preparation: Scalped
Method of planting: Grubhoe
Replanting: 1931 - small amount

There were a few trees damaged by the European pine shoot moth - *Rhyacionia buoliana* - prior to 1947. Since then no damage has been noticed. The plantation as a whole is now of sufficient height so that the moth is not expected to do any further damage.

The stand was thinned lightly in 1949-50, and crop trees pruned to a height of 12 feet. A thinning was made the winter of 1954-55 and the crop trees pruned to ht. of 917'. A third thinning was made in the winter of 1959-60. A small outbreak of *Ips pini* in the fall of 1961. 3080 bd. ft. of small logs plus 420 pieces of rafter stock, 3" thick and 16' long, was produced in this last cutting. Thinned again 1959-60 when 2,375 bd. ft. of small sawlogs plus 252 rafter poles were produced.

Lot #46

In the fall of 1964, two 1/4 acre sample plots were established.

Per Acre Data From Plots

Species	No. trees	Av. DBH	av. ht. dom. trees	Basal area
Red pine	558	7.0"	51'	147.4
White pine	6	5.3"		0.9
Scotch pine	4	6.4"		0.9
Total	568			149.2

Spring 1965
Lot No. 47
.8 acres

JACK PINE

Scientific name:	Pinus banksiana
Date of planting:	Spring, 1932
Seed source or strain:	Unknown
Class of stock:	2-0
Spacing:	6 X 6
Site preparation:	Scalped
Method of planting:	Planting bar
Replanting:	Corsican pine - date unknown but shortly after 1932-stock size unknown

A few crop trees were pruned during the winter of 1949-50 to ht. of 917'. The area was thinned during the winter of 1954-55 and all the residual trees pruned to 9'.

Spring 1965
 Lot No. 48
 11 acres

RED PINE

Scientific name: Pinus resinosa
 Date of planting: Spring, 1932
 Seed source or strain: Unknown
 Class of stock: 2-2
 Spacing: 6 X 6
 Site preparation: Furrow
 Method of planting: Planting bar

This stand was injured considerably by the European pine shoot moth - Rhyacionia buoliana - from about 1943 through 1947. The cold winter of 1947-48 reduced the insect population and damage since then has been light. For an unknown reason the moth infestation was the most severe in the part of the plantation east of the road.

Two sample plots were established on the area but only the plot west of the road had been retained for study purposes and this discontinued after 1954-55 measurements. Re-measured in the summer of 1965.

Crop trees on the entire area were pruned to a height of 12 feet during the winter of 1949-50. And that part east of the road pruned to 17' during the winter of 1954-55.

DATA FROM PLOT #48-1					
Years Measured	Years after plant.	Trees per acre	Ave. d. b. h.	Ave. ht.	Basal Area Per A
1937	5	1162		3.0'	
1941	10	1174	2.1"	12.7'	27.8
1946	15	1178	3.8"		95.0
1950	19	1190	4.6"		137.9
March 1955	24	1186	5.1"		162.5
Aug. 1965	34				

Lot No. 48 (Con't.)

The plot east of the road, which had been discontinued, was measured in 1954 and remeasured in 1959. This plot will be retained for inventory purposes.

Data from plot, per acre basis: #48-2

Year Measured	Years after plant.	# Trees/A		Av. D. B. H.		Basal Area	
		Before	After	Before	After	Before	After
1954	24	746	702	5.6"	6.1"	147+	141+
1959	29	702	546	6.5"	6.6"	162+	132+
1964	34	544	440	7.2"	7.3"	156	131+

Thinning on this east part of the lot was completed in the winter of 1959-60. That part of the lot west of the road adjacent to the White pine, 3 acres was thinned for the silviculture class in the spring of 1960. Remainder of stand to be cut in the 1960-61 season. A small area, 0.4 acres, that had never been thinned, was thinned in the winter of 1963-64. Material from thinnings was used by a graduate student in a study for use of Red pine thinnings for use in pallets. Material was sawn on the Bolter Mill. Results can be found in master thesis submitted by Carl Nolinberg.

Plot #48-3

Spring 1965
Lot No. 49
3 acres

RED PINE - NORWAY SPRUCE

Scientific names:	Pinus resinosa - Picea excelsa
Date of planting:	Spring, 1939
Seed source or strain:	Unknown
Class of stock:	Norway spruce, 2-0; Red pine, 2-2
Spacing and species Arrangements:	Red pine on east end and southeast corner, Spruce in the west end.
Site preparation:	Furrows
Method of planting:	Planting bar
Replanting:	In 1942, Red pine was planted in furrows between the rows of Spruce.

The Spruce suffered from frost damage for several years. The Red pine was severely attacked with the European pine shoot moth about 1943 through 1947; since the spring of 1948, the trees have been fairly free from moths. The Black locust on the area was planted in the early 1930's. Several attempts have been made to eradicate the species as the locust borer is so serious that the trees do not develop well. In the spring of 1951, the Locust was girdled and sprayed with Esteron.

Until 1956-57 many of the spruce were cut and sold to the University for Christmas trees.

Crop trees were pruned to a height of 8' during the winter of 1954-55.

A thinning was made in the spring of 1964. In many places, where survival was good, spacing was only about 2" x 2'. Spruce was favored over Red pine. Slight outbreak of Ips Pini in fall of 1964 on the Red pine.

Spring 1965
Lot No. 50
2.6 acres

RED PINE

Scientific name: Pinus resinosa
Date of planting: Spring, 1936
Seed source or strain: Unknown
Class of stock: 2-2
Spacing: 6 x 6
Site preparation: Furrowed
Method of planting: Planting bar

This plantation suffered some damage by the European shoot moth - *Rhyacionia buoliana* - but not heavily enough to be serious. The pine shoot moth population was reduced by the cold weather of the winter of 1947-48 and has practically disappeared since that time.

The plantation was thinned and pruned to 8' during the winter of 1954-55. A 2nd thinning was made in the fall of 1960.

In the fall of 1964, one 1/4 acre sample plot was established.

Per Acre Data From Plot			
No. trees	Av. DBH	Av. Ht. Dom.	Basal area
628	6.5"	45'	143.1

Spring 1965
Lot No. 51
4.7 acres

EUROPEAN BLACK PINE (Corsican Variety)

Scientific name: Pinus nigra
Date of planting: Spring, 1936
Seed source or strain: Unknown
Class of stock: 2-0
Spacing: 6 x 6
Site preparation: Furrowed
Method of planting: Planting bar

The plantation has suffered from a heavy leaf-cast infestation since shortly after planting. The leaf-cast attacks all needles over one year old so that they become brown and fall off during the winter and spring. Mortality very high.

Lot No. 51 (Cont'd)

The growth rate is very irregular over the area and is believed to be a result of the leaf-cast. It is interesting to note, the first 2 rows of this plantation on the north and east side along the road, adjacent to the Red pine, are Austrian pine, 2-2 stock, planted the same time as the Corsican pine. This Austrian pine has been free of the leaf-cast and has considerably greater height than the Corsican pine.

This area is seeding in very well with White pine from Lot #52 and will probably become a white pine stand.

Spring, 1965
Lot No. 52
11.1 acres

WHITE PINE

Scientific name: Pinus strobus
Date of planting: Spring, 1926 and 1928
Seed source or strain: Unknown - trees purchased from State Nursery
Class of stock: 2-0 and 2-2
Spacing: 6 x 6
Site preparation: Furrowed
Method of planting: Planting bar

Approximately one-half of this plantation was planted with 2-0 stock in the spring of 1926, and the remainder with 2-2 in the spring of 1928. The stock was all purchased from the State Nursery at Higgins Lake as 2-0, but part of the stock was planted in transplant beds for two years before transplanting in the field.

All of the area excepting a one-acre sample plot has been thinned; in the winter of 1946-47, 1957-58, and 1962-63. Crop trees were pruned to 12' ht. in the winter of 1946-47. This pruning was continued to 17' in the winter of 1949-50.

The following sample plots have been established on the area. In 1937 two one-acre plots were established: 52-5 and 52-7. Plot 52-5 is maintained as thinning plot and Plot 52-7 as a check to be left unthinned.

Year Meas.	Trees per A		Ave d.b.h.		Ave. Ht.	B.A. per A	
	Before	After	Before	After		Before	After
1937	1301		1.7		11.5	22.4	
1941	1243		3.2		21.1	69.4	
1946	1240	1016	4.2	4.5	--	116.7	109.2
1951	1016	704	5.2	5.7	--	152.1	124.3
1957	687	475	6.7	7.3	52'	170.8	137.7
1962	470	370	7.7	8.1	61'	152.7	132.8

Lot No. 52 (Con't.)

PLOT 52-7

Year Meas.	No. Trees	Av. D.B.H.	Av.ht. Dom. Trees	Basal Area
1937	1210		12.2	24.4
1941	1172	3.4"	22.2	72.9
1946	1105	4.3	--	112.7
1951	1004	5.3	--	154.1
1957	842	6.3	53'	181.8
1962	737	6.8	62'	184.4

The plantation had been free of insects and diseases until the winter of 1950 when a tree was found infested with a canker - Valsa superficialis. Identification was made by Prof. Dow V. Baxter. The extent of damage that will be done cannot be estimated at this time. *Fomes annosus* found in the stand in 1963.

During the 1951-52 thinning 2500 bd. ft. of small sawlogs were cut. The thinning of 1957-58 produced 8215 bd. ft. small sawlogs. Thinning of 62-63 produced 6500 bd. ft.

Spring, 1956
Lot No. 53
5.2 acres

WHITE PINE

Scientific name: Pinus strobus
Date of planting: Spring, 1930
Seed source or strain: Unknown
Class of stock: 2-2
Spacing: 6 x 6
Site preparation: Furrows
Method of planting: Planting bar

A light thinning was made in 1948-49. Crop trees were pruned to a height of 12 feet in the winter of 1949-50 and to a height of 17' in 1952 and fall of 1953.

A second thinning was made during the winter of 1956-57. 1185 bd. ft. small sawlogs cut. Third thinning winter of 1961-62. 4200 bd. ft. cut.

In the fall of 1964, three 1/5 acre plots were established.

Per Acre Data From Plots

<u>No. trees per acre</u>	<u>Av. DBH</u>	<u>Av. Ht. of Dom.</u>	<u>Basal Area</u>
417	8.1"	59'	150.0

Spring, 1965
 Lot No. 54
 11.9 acres

PONDEROSA PINE

Scientific name: Pinus ponderosa
 Date of planting: Spring, 1936
 Seed source or strain: Unknown
 Class of stock: 2-2 and 2-0
 Spacing: 6 x 6
 Site preparation: Furrowed or scalped
 Method of planting: Planting bar in furrows; grubhoes
 in scalps

A strip about 75 feet wide along the east side of the plantation was planted with 2-2 stock with grubhoes in scalps. The rest of the area was furrowed and planted with 2-0 stock with planting bars.

Crop trees were pruned to the height of 6 feet in the fall of 1950.

Two one-quarter acre sample plots were established in the fall of 1951. Plot No. 54-1 is in the area planted with 2-2 stock. Plot No. 54-2 is in the area planted with 2-0 stock. The plots were remeasured in the winter of 1955-56. A heavy thinning was made and crop trees pruned to a height of 13'. A second thinning was made in the fall of 1960.

SAMPLE PLOT DATA

Plot	Year Meas.	Trees per A		D.B.H.		Av. ht. dom. trees	Basal area per acre	
		Before	After	Before	After		Before	After
54-1	1951	896		4.1"		23.0'	81.8	
54-1	1955	812	552	4.7"	5.1"	31.0	97.2	77.9
54-1	1960	552	512	5.8"	6.0"	43.0'	108.7	99.8
54-1	1964	512	-	6.4"	-	--	112.8	
54-2	1951	1200		3.5"		21.0'	82.9	
54-2	1955	1180	680	4.0"	4.5"	28.0'	104.8	74.3
54-2	1960	680	520	5.2"	5.5"	37.0	101.8	86.0
54-2	1964	520		5.9"			108.2	

Spring, 1965
 Lot No. 55
 2.5 acres

EUROPEAN BLACK PINE - AUSTRIAN VARIETY

Scientific name: Pinus nigra
 Date of planting: Spring, 1937
 Seed source or strain: Unknown
 Class of stock: 2-2 with a small amount of 2-0
 Spacing: 6 x 6
 Site preparation: Furrowed
 Method of planting: Planting bar

Crop trees were pruned to a height of 6 feet during the fall of 1950. A one-quarter acre sample plot was established in the fall of 1951. A heavy thinning was made and crop trees were pruned to 13' ht. in 1955. A second thinning was made in the fall of 1960.

DATA FROM PLOT

Plot	Year Meas.	Trees per A		Av. d.b.h.		Ave. ht. dom. trees	Basal area per acre	
		Before	After	Before	After		Before	After
55-1	1951	1132		3.9"		22.0'	93.6	
55-1	1955	1128	620	4.4"	5.0"	34.0'	120.1	86.2
55-1	1960	620	484	5.7"	6.1"	41'	111.3	97.9
55-1	1964	444	-	6.9"	-	-	113.9	

Spring, 1965
Lot No. 56
2.2 acres

MIXED PINE PLANTATION

This area is made up of several plantings. The Ponderosa pine was planted in 1935, White pine in 1932 and Austrian pine filled in the Ponderosa pine in 1937. The few Red pine were accidentally planted with the White pine in 1932. 2-2 planting stock was used throughout.

A light thinning was made in the White pine in the winter of 1948-49. Low pruning (6 feet) of crop trees was started in 1949-50 and completed in 1950-51. The White pine was pruned to a height of 13 feet. Remaining crop trees were pruned to a height of 13' in the winter of 1955-56.

The east 1/2 of the lot is White, Red, and Ponderosa. Pine crop trees on this area were pruned to 17' in the winter of 1953-54. A second thinning was made in the fall of 1960.

Spring, 1965
Lot No. 57
2.0 acres

WHITE PINE NORWAY SPRUCE

Scientific name:	Pinus strobus - Picea excelsa
Date of planting:	Spring, 1947
Seed source:	White pine - Wisconsin Norway spruce - Saginaw Forest
Class of stock:	White pine 2-1 Norway spruce 2-1
Spacing:	White pine 6x6 Norway spruce Interplanted for Xmas tree stock
Site preparation:	None planted on what had been a nursery for several years.
Method of planting:	Planting bar

Only about 1 acre of this lot is in the plantation. For several years there had been a school nursery on this area. When the nursery was discontinued the pine was planted for the crop trees and Norway spruce intermingled for Xmas trees. A large percent of the spruce was sold to the University for that purpose. The remainder of the spruce is being crowded out by the pine. The remainder of the lot is used for a log landing and tool shed.

The plantation was pruned to 8' in fall of 1960.

Spring, 1965
Lot No. 58
2.2 acres

WHITE CEDAR

Scientific name:	Thuja occidentalis
Date of planting:	Spring, 1930 and 1934
Seed source or strain:	Unknown
Class of stock:	1930 used 2-2-2; 1934 used 2-2
Spacing:	6 x 6
Method of planting:	Grubhoes

The heavy grass cover was burned off before the planting in 1934. This planting was successful so in 1934 the rest of the area (the 1934 planting was around the north and west sides) was planted to 2-2 stock. This stock proved too small to compete with the heavy marsh grass and shrubs and a low release was made in 1937. A few competing Aspen and Elm that were overtopping the Cedar were cut during the winter of 1950-51.

Spring 1965
Lot No. 59
54 Acres

NATIVE HARDWOODS

This block of hardwoods was acquired by the University of Michigan in 1949 with the exception of 7 acres along the north side of the lot in the NE SW 1/4 adjoining lots Nos. 45-46 and 51. This seven acres was part of the original Stinchfield Woods purchase of 1925.

The lot is very rough and the site varies from good, in the potholes and bottom of the ravine, to very poor on top of the ridges and hills. Grazing was stopped about 1935 so there is a fair amount of reproduction on the area. White ash is seeding in very well.

A rather heavy improvement cut was started the winter of 1950-51 and completed the winter of 1951-52. The more crooked and defective trees were removed and a large amount of the hickories cut, regardless of form, in an endeavor to increase the white oak, white ash, and red oak composition of the forest.

The following products were obtained from the improvement cutting operations:

Logs - 11,546 bd. ft.

Fuelwood - 280 cords of 16"
120 " " 24"
17 " " 36"

Per acre Basal area trees 6" DBH and up + bd. ft. Int. 1/4"
8" min top.

	Basal Area		Bd. Ft.	
	Before	Cut	Before	Cut
1949	45.3		2524	
1952		8.6		394
1954	52.8		3661	
1959	60.4		4244	
1964	68.2		5180	

An improvement and harvest cut was made in part of the area near Lots 46 and 51 in the spring of 1962. Products cut: 19,385 bd. ft. Int. 1/4" rule plus 59 cords 16" and 24 cords of 24" fuelwood. In the fall of 1963, 4,000 bd. ft. of aspen was cut adjacent to Lot #51.

Spring 1965
Lot No. 60
13.7 acres

WHITE PINE - NORWAY SPRUCE - EUROPEAN BLACK PINE (AUSTRIAN)

Scientific names: Pinus strobus - Picea excelsa -
Pinus nigra
Date of planting: Spring 1952
Seed source or strain: White pine - Stinchfield Lot #52
Norway spruce - Saginaw Forest
Austrian strain of black pine - Austria
Class of stock: White pine 2-0
Norway spruce 2-2
Austrian 2-0
Spacing: 6 x 8'
Site preparation: White pine - Norway spruce - furrows;
Austrian pine - scalped with grubhoe.
Method of planting: Planting bar

The white pine and Norway spruce were planted in mixture, two Norway spruce then one white pine along the rows. The austrian pine was planted in a pure stand on the slope along the south side of the lot.

The lot is listed as being 13.7 acres, of this only about 10 acres is in plantation. The remainder is in roads - natural elm reproduction and on area around the old farmhouse that is on the lot.

The summer of 1952 was exceptionally dry, especially right after planting. Initial survival percent was about 80. Replanting with stock of same seed source and same species distribution was done in spring of 1953. Additional replanting of white pine and norway spruce of the same seed source was done in the spring of 1956. 3-0 stock was used.

Spring 1965
Lot #61
18 acres

NATIVE HARDWOODS

The topography on this area is so rough that it was never cleared for farming. The more level parts have been clear cut at one time. The very steep areas were hi-graded only. There is evidence of heavy grazing in the past but probably none since about 1940-45. The University acquired the land in 1949. No cutting on the area has been done since that time. In 1949 six one-quarter-acre circular sample plots were established on the area.

Per acre summary of Sample Plots

Based on 1.5 acres, applied to 18 acres

Year	B.A.	Bd. ft. Int. 1/4" pole
1949	44.4	1370
1954	53.4	3280
1959	63.9	4272
1964	78.7	6555

Spring 1965
Lot No. 62
10 acres

NATIVE HARDWOODS

This area of native hardwoods was acquired by the University in 1949. Its composition and character can be compared to the hardwood type owned by the University in the surrounding area and will not be managed, but left as a check plot for the hardwood type on other University holdings. The last cutting on this area was probably in the late 30's.

In 1949, five one-quarter-acre circular sample plots were established and they are to be remeasured at 5-year intervals for growth and mortality data. The center of each plot is marked with an iron pipe.

PER ACRE SUMMARY OF PLOT DATA

Year	B. A.	Bd. ft. Int. 1/4" Rule 8" top
1949	45.0	2770
1954	54.6	3270
1959	68.7	4670
1964	79.1	5984

Spring 1965
Lot #63
5.7 acres

NATIVE HARDWOODS

This block of hardwoods was acquired in 1949. The area had evidently been hi-graded many times in the past and heavily grazed up until about 1935 to 1940, with a resulting stand of low density-poor quality oak and hickory with practically no reproduction. One exception to this is in the northeast corner of the lot where one sugar maple tree approximately 18" d.b.h. has seeded in about one acre. Some of the small sugar maple were 12-15 feet high at the time of purchase.

Three one-quarter permanent sample plots were established on the area during the summer of 1949.

A heavy improvement cut was made during the winter of 1952-53.

Summary of Sample Plots
Per Acre Basis. Based 0.75 A
(three permanent sample plots)
measured applies to 5.7 acres

Year	B.A.	B.A. cut	Bd.ft.	Bd.ft. cut
1949	51.7		3628	
		16.9		1610
1954	46.7		3450	
1959	52.9		4293	
1964	58.9		5032	

Spring 1965
Lot No. 64
2.2 acres

NORWAY SPRUCE

Scientific name:	Picea excelsa
Date of planting:	Spring 1953
Seed source:	Saginaw Forest
Class of stock:	2-1
Spacing:	5 x 5
Site preparation:	Furrows
Method of planting:	Planting bar

The east end of this plantation is a very light sandy soil and has been replanted several times without much success. Scotch-pine, (3.0, size-seed source Spain) was planted in this area in the spring of 1960. Very poor survival of the pine.

Spring 1965
Lot #65
12+ acres

WHITE PINE

Scientific name:	Pinus strobus
Date of planting:	Spring 1953
Seed source:	Stinchfield Woods, Lot #52
Class of stock:	3-0
Spacing:	4' x 4', 6' x 6', 6' x 8', 8' x 8'
Site preparation:	Furrows
Method of planting:	Planting bar

This plantation was set up to study the effects of varying spacing on white pine planted on equal site conditions. Strips, running north and south, were planted at 4' x 4', 6' x 6', 6' x 8' and 8' x 8' spacing.

A small part of the area along the west side of the lot was of heavy clay soil on a knoll. This area was furrowed and planted to various species in mixture to see which, if any, would develop under those soil conditions. The following were planted in mixture:

Norway spruce - 2-3 stock, seed source Saginaw Forest
European Black Pine, Austrian strain - 2-0 stock seed source,
Austria
White Pine - 3-0 stock, seed source Stinchfield Woods, Lot 52
Hard maple - ? native stock 4-6" high.

Some damage by vandals in the fall of 1964. Tops broken off of quite a few trees.

Spring 1965
Lot No. 66
2.7 acres

NORWAY SPRUCE

Scientific name:	Picea excelsa
Date of planting:	Spring 1954
Seed source:	Saginaw Forest
Class of stock:	3-0
Spacing:	6 x 6
Site preparation:	Furrows
Method of planting:	Planting bar

Replanted fail spots in the spring of 1957 with white pine, 3-0 stock, seed source Lots #52 and 53, Stinchfield Woods.

Spring 1965
Lot #67
7.7 acres

WHITE PINE

Scientific name:	Pinus strobus
Date of planting:	Spring 1954
Seed source:	Lots 52 & 53 Stinchfield
Class of stock:	3-0
Spacing:	7 x 7
Site preparation:	Furrows
Method of planting:	Planting bar

Replanted in fall spots in spring of 1956 with 3-0 white pine (same seed source as above) and accidentally a few Douglas fir 3-0 stock seed source Colorado elevation 9000'.

Spring 1965
Lot #68
3.7 acres

MIXED CONIFER

Scientific name: Picea excelsa
Pinus banksiana
Pinus strobus

Date of planting: Jack pine, Spring 1955
Norway spruce, Spring 1955
White pine, spring 1955 and 56

Seed source: Jack pine - Wisconsin
Norway spruce - Saginaw Forest
White Pine - Lots 53 and 53 Stinchfield

Class of stock: Jack pine - 2-0
Norway spruce - 2-1
White pine - 3-0

Spacing: 7 x 7'

Site preparation: Furrows plus some scalping in rough areas.

Planting method: Planting bar

Spring 1965
Lot #69
4.2 acres

JACK PINE AND EUROPEAN BLACK PINE

Scientific names:	Pinus banksiana Pinus nigra
Date of planting:	Spring 1954
Seed source:	Jack pine - Wisconsin Black pine - Austria (dealer)
Class of stock:	2-0
Spacing:	6 x 6'
Site preparation:	None
Method of planting:	Planting bar in light sod

Species were not mixed.

Spring 1965
Lot No. 70
8.5 acres

JACK PINE

Scientific name:	Pinus banksiana
Date of planting:	Spring 1955
Seed source:	Wisconsin
Class of stock:	2-0
Spacing:	6 x 6'
Site preparation:	None
Planting method:	Planting bar in sod

Approximately 1 acre on south side of lot was replanted in spring of 1957. The sod was heavy on this area causing the mortality. Area was scalped and planted to 2-0 jack pine same seed source as above. In the spring of 1947 a small part of the lot enclosed by the 970' depression contour was furrowed and planted with 30 bl. walnut and about 200 each of sugar maple and bass wood wildlings, all of local source. Planted in furrows with planting bar. The hardwood has suffered from frost damage and is questionable if it will succeed here.

Spring 1965
Lot No. 71
4.5 acres

This lot has varying site conditions. Wet areas were planted with white cedar along the edges. Norway spruce was planted on a small area on the central north side. The rest of the area was planted with black walnut and red oak, seed in furrows. Planting in spring of 1955.

<u>Species</u>	<u>Planting stock</u>	<u>Source</u>	<u>Approx. area</u>
wh. cedar	3-0	Wisconsin	0.25 acres
Nor. spruce	2-1	Saginaw Forest	0.50 "
Open marsh			
Bl. walnut	seed	Saginaw Forest	3.50
Red oak	seed	" "	3.50

Bl. walnut and red oak seed did not germinate well and was replanted in fall of 1955 with seed collected locally.

Planting is not very successful and further planting must be done.

Spring 1965
Lot No. 72
2.5 acres

HARD WOODS

This lot is the wooded area of the Losee Tract purchased in 1955. The stand was in very bad condition due to hi-grading over the years. An improvement cut was made during the winter of 1957-58 and 1958-59. This was a heavy cut due to very poor form and defective condition of the large trees. 21,180 bd. ft. Int. 1/4" rule, of low grade logs were cut and 208 cords of 16" and 79 cords of 24" fuel wood.

Spring 1965
Lot No. 73
3.5 acres

NORWAY SPRUCE - WHITE BIRCH

Scientific name:	Picea excelsa
	Betula alba verrucosa
Date of planting:	Spring 1956
Seed source:	Norway spruce - Saginaw Forest
	White birch - Finland
Class of stock:	Norway spruce - 3-0
	White birch - 2-0
Spacing:	6 x 6
Site preparation:	Furrow
Planting method:	Planting bar

The white birch was planted in parts of 4 rows.
The seed was sent to the University from Finland and
is supposed to grow curly birch only.

Spring 1965
Lot No. 74
1.5 acres

EUROPEAN BLACK PINE AND JACK PINE (AUSTRIAN)

Scientific names:	Pinus nigra Pinus banksiana
Date planted:	Spring 1957
Seed source:	Jack pine - Wisconsin Austrian pine - Murray's yard, Ann Arbor
Class of stock:	2-0
Spacing:	6 x 6
Site preparation:	Furrow and scalped
Planting method:	Planting bar

The species were not mixed. All Austrian pine was planted in furrows. Some of jack pine in scalps.

Spring 1965
Lot No. 75
8 acres

WHITE PINE - NORWAY SPRUCE

Scientific names:	Pinus strobus Picea excelsa
Date of planting:	Spring 1957
Seed source:	Wh. pine - lots 52 and 53 Stinchfield Nor. spruce - Saginaw Forest
Class of stock:	3-0
Spacing:	7 x 7
Ground preparation:	Furrow
Planting method:	Planting bar

80% or better white pine. Some spruce intermingled with pine.

Spring 1965
Lot No. 76
14 acres

WHITE PINE - NORWAY SPRUCE

Scientific names:	Pinus strobus Picea excelsa
Date of planting:	Spring 1958
Seed source:	White pine - Lots 52 & 53 Stinchfield Norway spruce - Saginaw Forest
Class of stock:	3-0
Spacing:	6 x 7'
Ground preparation:	Furrow
Planting method:	Planting bar

Only a small amount of spruce planted. Area adjacent to E & W road, in old fence row, replanted in spring of 1960 with 4-0 white pine, same seed source.

Spring 1965
Lot No. 77
1.4 acres

WHITE PINE

Scientific name:	Pinus strobus
Date of planting:	Spring 1958
Seed source:	Lots 52 and 53 Stinchfield Woods
Class of stock:	3-0
Spacing:	7 x 7'
Ground preparation:	Furrows
Planting method:	Planting bar

Replanting done in spring of 1959 with same class of stock, same seed source.

Area sprayed with 2-4-5 T during the summer of 1958 to kill sumac overstory.

Spring 1965
Lot No. 78
3.2 acres

WHITE PINE

Scientific name:	Pinus strobus
Date of planting:	Spring 1959
Seed source:	Lots 52 & 53, Stinchfield
Class of stock:	3-0
Spacing:	6 x 6
Ground preparation:	Furrows and scalps on rough areas
Planting method:	Planting bar

Area replanted spring of 1960 with 4-0 stock, same species and seed source. Ninety percent of failures were in the scalped areas.

Area was sprayed with 2-4-5 T the year before planting to kill heavy stand of sumac and brush.

Spring 1965
Lot No. 79
2.8 acres

SCOTCH PINE

Scientific name:	Pinus sylvestris
Date of planting:	Spring 1959
Seed source:	Spain - Sierra Guadarrama Mts. elev. 3000-4000'
Class of stock:	2-0
Ground preparation:	Furrow
Planting method:	Planting bar

Some of the area - especially along the ravine by the road, was too rough to furrow. Trees there were planted directly without any ground preparation.

Spring 1965
Lot No. 84
5.5 acres

WHITE PINE

Scientific name:	Pinus strobus
Date of planting:	Spring 1959
Seed source:	Lots 52 and 53 Stinchfield
Class of stock:	3-0
Spacing:	6 x 6'
Ground preparation:	Furrows - Scalps in rough spots
Planting method:	Planting bar

A small amount of 2-0 Scotch pine - Spain seed source and 3-0 Douglas fir from Colorado became mixed in the planting by error.

Replanted in spring of 1960 with 4-0 white pine, same seed source. Most of failed trees were in scalped areas.

Spring 1965
Lot No. 85
12.5 acres

WHITE PINE

Scientific name:	Pinus strobus
Date of planting:	Spring of 1960 and 1961
Seed source:	Lots #52 and 53 Stinchfield
Class of stock:	3-0 and 4-0
Spacing:	7 x 7' in furrows; 8 x 8 in scalps
Ground preparation:	Furrow and scalps
Planting method:	Planting bar

Rough area to the east scalped in the more open spots in the sumac. Approximately 8 x 8 spacing.

About one-half of the area planted in spring of 1960, completed planting the lot in the spring of 1961 with same species and seed source, 4-0 stock.

Newcomb Tract
Spring 1965
Lot No. 1
9.0 acres

MIXED CONIFERS

Date of planting: Spring 1960

Species	Class of Stock	
White pine	2-1	Sec 30 T46NR36W Collected from one tree
Ponderosa pine	2-0	Saginaw Forest
Norway Spruce	2-1	Saginaw Forest
Douglas fir	2-1	Unknown Seed purchased from dealer

Spacing: 6 x 8 (Experimented spacing plots varying)

Site preparation: Furrow - Scalping on spacing plots

Planting method: Planting bag

Attached map shows location and variation in spacing of the experimental plots.

Lot No. 1 (cont)

Spacing Experiment

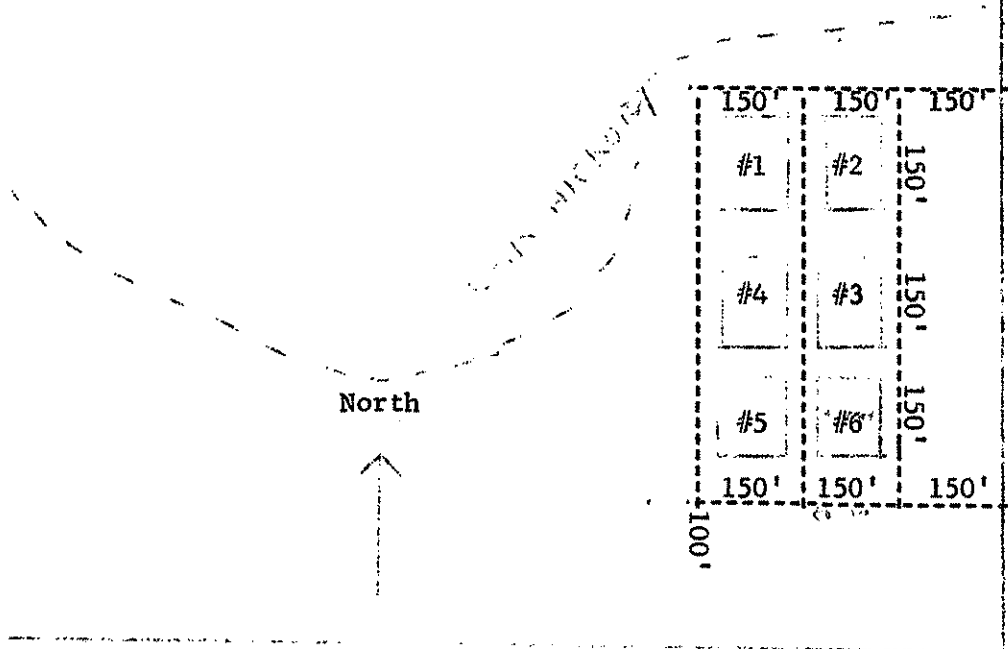
Location - NWNW Sec. 7 T 1 S R 5 E Lot #1
Newcomb Tract

Species - Western Yellow Pine 3-0
Seed from Saginaw Forest

Date - Spring 1950

Planting Method - Scalp & planting bar

HURON RIVER DRIVE



<u>Plot #</u>	<u>Spacing</u>
1	10' x 10'
2	12' x 12'
3	15' x 7 / 3 staggered
4	15' x 15'
5	17' x 17'
6	19' x 19'

0 = Iron pipes at 1/4 acre plot corners

Spring 1965
Newcomb Tract
Lot #2
7.5 acres

MIXED CONIFER

Date of planting: Spring, 1950

Species	Class of stock	Seed Source
Ponderosa Pine	2-0	Saginaw Forest
Norway spruce	2-1	Saginaw Forest
Douglas fir	2-1	Unknown seed purchased from dealer

Spacing:	6 x 6'
Site preparation:	Scalp
Planting method:	Planting bar

A large part of this lot had a dense cover of Scotch pine of very poor form. The trees were up to 6'-8' high and had seeded in from trees planted as a wind break along the road and from an old plantation across the road. The area was clear cut and burned before planting. Scotch pine and occasional Ponderosa pine came up very thick again and crowded out some of the planted stock. Thinnings have been made several times for Scotch pine Christmas trees and boughs taking the poorer trees and leaving the better ones to make up a part of the plantation.

The trees from the 2nd seeding have a much better form than the original ones cut and burned. This is believed to be largely due to the marked reduction in European shoot moth damage.

A thinning was made in the winter of 1960-61.

Spring 1965
Newcomb Tract
Lot No. 3
33 acres

NATIVE HARDWOODS

This area was purchased in 1950 and added to the Newcomb Tract. The stand is generally superior in quality, volume and a better site than most of the hardwood stands on Stinchfield Woods property. Light grazing was practiced until time of purchase.

Roads were built thru the area during the summer of 1958.

The following table is a summary of 12 1/4 acre permanent sample plots established during the fall of 1954.

Per Acre B.A. & Bd. ft.

B.A. in trees 6" & up Bd. ft. Int. 1/4" rule
8" min. top

	B.A.	Bd. ft.	Cut
1954	70.3	6579	
1959	79.2	7724	1123
1959-64			
1964	76.6	7715	

A harvest and improvement cut was started in the winter of 1960-61 continued each winter through 1964-65. Old overmature trees and culis made a rather heavy cut necessary.

Products cut through the winter of 1964-65.

Spring 1965
Newcomb Tract
Lot No. 4
19 acres

NATIVE HARDWOODS

This area had been higraded many times and heavily grazed up until about 1946. A heavy improvement cut was made in the winter of 1955-56. This cut was west of the road running thru the area.

Per acre data from 7-1/4 acre plots in the area.
B.A. in trees 6" DBH & up. Bd. ft. in Int 1/4" rule
8" min top.

	BA	BA cut	Bd. ft.	Bd. ft. cut.
1949	47.3		4086	
1954	59.8		5197	
1955		11.5		1197
1959	56.3		4809	
Cut 1959-64		8.4		1097
1964	56.0		4851	

Heavy improvement and harvest cut made in the vicinity of the Quonset Huts in the winter of 1960-61, in which 6,440 bd. ft. of logs and 34 cords of 16" wood and 17 cords of 24" wood were produced.

Spring 1965
 Lot No. 5
 4.7 acres

LARCH PROVENANCE TRIAL

Scientific names: European Larch - *Larix decidua*
 (miller)
 Japanese Larch - *Larix leptolepis*
 (Siebold and Zuccarini)

Date of planting: May 1957

Seed Source of Strain: European Larch - Hrabusica, Tatra
 Czechoslovakia
 Midmar, Scotland
 Ballindalloch,
 Scotland
 Blervie, Scotland

Japanese Larch - Hokkaido, Japan

Class of stock: 2-0

Spacing: 8 x 8

Site preparation: Plowed furrows

Method of planting: Planting bar

In May 1954 larch seed of five different sources were received from the Great Britian Forestry Commission. The seed from Scotland is of continental Europe origin. The seeds were sown in the Newcomb Tract nursery in the spring of 1955. With a poor percentage of germination, only enough seedlings were available to plant six acres. The seedlings were hand planted in plowed furrows May 1957 as 2-0 stock.

Data from Lot 5

Seed Source	Survival % Fall 1959	Ave. Hgt. Inches	Tallest Tree In.	% Tips Damaged
Midmar, Scotland	84	30	68	0
Ballindalloch, Scotland	69	27	54	0
Blervie, Scotland	93	30	62	0
Hokkaido, Japan	60	39	90	25
Hrabusice, Tatra, Czec.	83	29	56	0

The high mortality in the Hokkaido and Ballindalloch origins is probably due to the combined effects of compact soil, poor planting and dryness. A majority of the mortality occurred in low-lying wet area characterized by a heavy compacted soil horizon. In this moist site, the roots of the larch did not penetrate the compacted zone and were apparently desiccated in the summer drought of 1959. Both the European and Japanese larch survived better on a light soil but the Japanese larch appeared

Lot No. 5 (Con't)

more susceptible to drought damage. Deer and rabbits did not feed upon the larch nor were injurious insects and diseases found. The Japanese larch had a higher average height growth and a higher maximum height growth than any of the European Larch sources.

Considerable mortality by mice girdling trees in the winter of 1961-62.

<p>Hrabusice, Tatra, Czechoslovakia</p>	<p>Av. Ht. Taller trees fall 1964 22'</p> <p>Hokkaido, Japan</p>	<p>Av. Ht. Taller trees tall 1964 17'</p> <p>Ballindalloch, Scotland</p>
<p>Av. Ht. Taller trees fall 1964 19'</p>		<p>Av. Ht. Taller trees fall, 1964 17'</p> <p>Midmar, Scotland</p>
	<p>Blervie, Scotland Av. Ht. Taller trees fall 1964 20'</p>	

Spring 1965
Newcomb Tract
Lot No. 6
2.4 acres

WHITE PINE & NORWAY SPRUCE

Date of planting:	Spring 1957
Seed source:	Wh. pine - Lots #52 & 53 Stinchfield Norway spruce - Saginaw Forest
Class of stock:	3-0
Spacing:	6' x 8'
Ground preparation:	Furrows
Planting method:	Planting bar

This plantation was established in center of European and Japanese larch study area for a comparison with the larch species.

A few rows adjoined to the north and south road, were planted in the spring of 1958, same class of stock and seed source.

Very small percentage of spruce. Av. Ht. of taller wh. pine trees fall of 1964 - 11'.

Spring 1965
Lot No. 7
Newcomb Tract

JAPANESE LARCH & SCOTCH PINE

Scientific name:	Larix leptolapis
Date of planting:	Spring 1958
Seed source:	not sure, purchased from dealer
Class of stock:	2-0
Site preparation:	Furrow
Planting method:	Planting bar
Spacing:	8 x 8 in furrowed area

A considerable part of this lot is in Scotch and Ponderosa pine natural seeding from trees along the road to the west. A small amount of European larch of 2-1 size and 3-0 Norway spruce from Saginaw Forest was used in the N.E. corner to complete planting the lot.

Self-seeded scotch pine was cut out of the larch stand in the summer of 1963. Av. Ht. of taller trees fall of 1964- 17'.

Spring 1965
Newcomb Tract
Lot No. 8
1.4 acres

HYBRID LARCH (DUNKELD)

Scientific name:	Larix europolis
Date of planting:	Spring 1960
Seed source:	Purchased from dealer
Spacing:	8 x 8
Site preparation:	Furrow
Planting method:	Planting bar

Some 3-0 white pine seed source lots #52 and 53 Stinchfield was mixed with the larch.

Av. hgt. of taller larch 10' fall of 1964.

Spring 1965
 Lot No. 9
 3.5 acres

INTERNATIONAL LARCH PROVENANCE TEST

Scientific Names: European Larch - *Larix decidua*
 (Miller)
 Japanese Larch - *Larix leptolepis*
 (Siebold and Zuccarini)

Date of planting: Spring 1960

Seed source or strain:

Prov. No.	Provenance Name	Seed Origin Country	Alt. Above Sea Level	Longitude	Latitude
2	Schonwies	Austria	3608	10°40'	47°12'
3	Muhldorf	"	2952	13°21'	46°52'
5	Langau 59g	"	3280-3608	15°12'	47°51'
7	Langau 38w/4lw	"	3608	15°10'	47°49'
12	Sterzig/Flains	Italy	3208	11°26'	46°54'
15	Ahrntal/Val Aurina	"	3936	12°00'	47°00'
28	Schlitz Abt. 65	Germany	1099	9°31'	59°43'
34	Neumunster	"	164	10°10'	54 15'
39	Zabreh-Dubicko	Czech.	1312	16°58'	49°50'
40	Ruda nad Morarou	"	1574	16°54'	49°59'
36	Ina	Japan	3936	138°4'34"	35°52'9.6"
Hybrid Dunkeld		District of Boller, Jutland, Denmark			

Class of Stock: 2-0
 Spacing: 8 x 8
 Site Preparation: Plowed Furrows
 Method of planting: Planting bar - Larger stock - deep hole method with mattock.

In March 1958 larch seed from 23 different sources were received from Dr. R. Schober, Professor of Forest Production and Management, University of Gottingen, Hann. Munden, Germany. As a result, the United States was included with Germany, France, Sweden, Finland, Norway, Holland, Belgium, Turkey, Switzerland, Czechoslovakia, Italy and Chile as an active member of the "International Larch Provenance Test". In the spring of 1958 the 23 sources of seed were sown in the Newcomb Tract nursery. At this time the Dunkeld larch from the District of Boller, Jutland, Denmark was also planted in the nursery. From the original 23 sources and the Dunkeld source, eleven sources and the Dunkeld source were selected for the test.

The twelve sources were planted in individual plots as 2-0 stock July 1960. Each plot contained 78, 8 x 8 foot spaced trees and was replicated twice.

Lot No. 9 (Con't)

PLOT Design with Measurement Data, NOV 1964

ROAD											
Dunkeld											
36 Rows											
A			3	3	12	12	D	D			
			Ave. Ht. 7.3'	Ave. Ht. 7.6'	Ave. Ht. 8.9'						
			% Surv. 90.3	% Surv. 93.1	% Surv. 98.6						
			3	3	12	12	D	D			
			5	5	15	15	36	36			
			Ave. Ht. 7.5'	Ave. Ht. 6.7'	Ave. Ht. 7.2'						
			% Surv. 91.7	% Surv. 97.2	% Surv. 88.9						
			5	5	15	15	36	36			
A			28	28	2	2	39	39			
			Ave. Ht. 9.5'	Ave. Ht. 6.2'	Ave. Ht. 7.5'						
			% Surv. 100.0	% Surv. 90.3	% Surv. 98.6						
			28	28	2	2	39	39			
			34	34	7	7	40	40			
			Ave. Ht. 8.3'	Ave. Ht. 7.6'	Ave. Ht. 8.4'						
			% Surv. 90.3	% Surv. 95.8	% Surv. 97.2						
			34	34	7	7	40	40			
Dunkeld 2 Rows			36	36	12	12	5	5			
			Ave. Ht. 7.2'	Ave. Ht. 7.6'	Ave. Ht. 8.2'						
			% Surv. 54.2	% Surv. 88.9	% Surv. 98.6						
			36	36	12	12	5	5			
			D	D	15	15	3	3			
			Ave. Ht. 7.4'	Ave. Ht. 7.7'	Ave. Ht. 8.2'						
			% Surv. 77.8	% Surv. 91.7	% Surv. 91.7						
B			D	D	15	15	3	3			
			2	2	39	39	34	34	34	34	
			Ave. Ht. 6.8'	Ave. Ht. 8.7'	Ave. Ht. 7.6'						
			% Surv. 58.3	% Surv. 91.7	% Surv. 95.8						
			2	2	39	39	34	34			
			7	7	40	40	28	28			
			Ave. Ht. 5.3'	Ave. Ht. 8.3'	Ave. Ht. 11.6'						
			% Surv. 62.5	% Surv. 86.1	% Surv. 97.2						
			7	7	40	40	28	28			
Dunkeld 2 Rows											

JAP. LARCH

Spring 1965
 Newcomb Tract
 Lot No. 10
 1.4 acres

LARCH PROVENANCE TRIAL

Scientific names: European Larch - *Larix decidua*
 Japanese Larch - *Larix leptolepis*
 Date of planting: April 1961
 Class of stock: 2-1
 Site preparation: Furrows
 Spacing: 6 x 6
 Seed Source or Strain:

Prov. No.	Provenance Name	Seed Origin	Alt. above Sea Level-Meters	Longitude	Latitude	Ave. Ht. Nov. 1964
3	Muhldorf	Austria	900	13°21'	46°52'	4.0'
5	Langau 59	"	1000-1100	15°12'	47°51'	5.5'
7	" 38/41	"	1100	15°10'	47°51'	5.2'
8	Semmering	"	1200	15°46'	47°38'	6.1'
16	Cavalese	Italy	1200	11°27'	46°19'	6.2'
18	Tenna	"	600	11°19'	46°04'	5.7'
19	Pergine/Selvat	"	1300-1400	11°23'	46°06'	6.0'
20	Cavedine	"	600-700	11°04'	45°59'	6.3'
21	Pragelato	"	1900	6°56'	45°01'	4.9'
22	Embrun/Ristola	France	1600	6°57'	44°47'	4.6'
23	Embrun/Aiguilles	"	1450	6°54'	44°47'	4.8'
24	Brianeon/Montagenevre	"	1200	6°43'	44°56'	5.5'
26	Brianeon/de Villard	"	1400	6°39'	44°52'	4.9'
28	Schlitz/65	Germany	300	9°31'	50°43'	7.4'
30	Dobris	Czeck	500	14°11'	49°47'	7.5'
34	Neumunster	Germany	50	10°10'	54°15'	6.8'
36	Ina	Japan	1200	138°04'	35°52'	7.1'
38	Valdeblore	France	1600-1700	7°11'	44°14'	3.4'
39	Zabreh-Dubicko	Czeck	450-550	16°58'	49°50'	7.3'
40	Ruda nad Moravor	"	500	16°54'	49°59'	3.8'

For information as to planting pattern, see silviculture office of School of Natural Resources, University of Michigan.