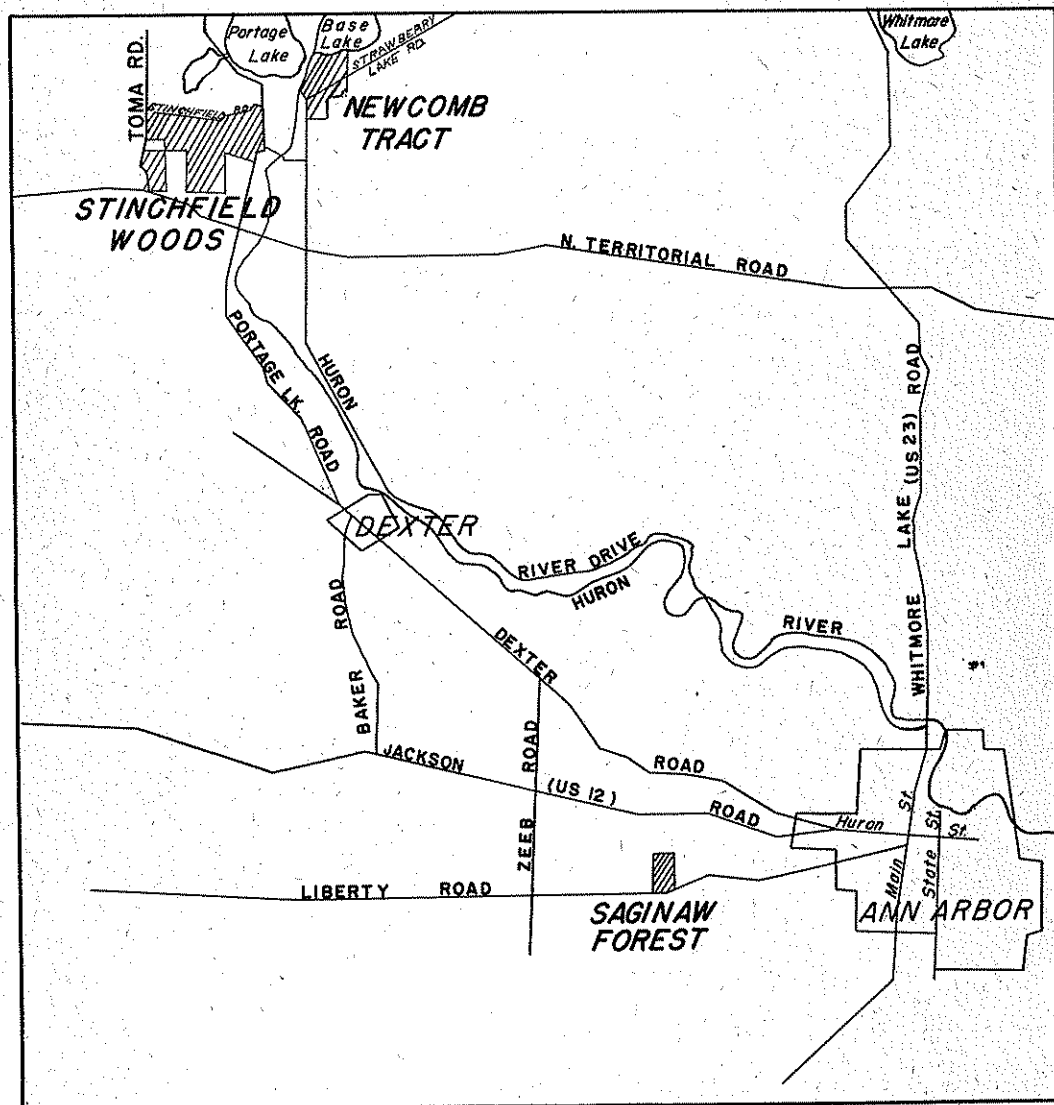


FORESTRY

SD  
365  
.M63  
M62

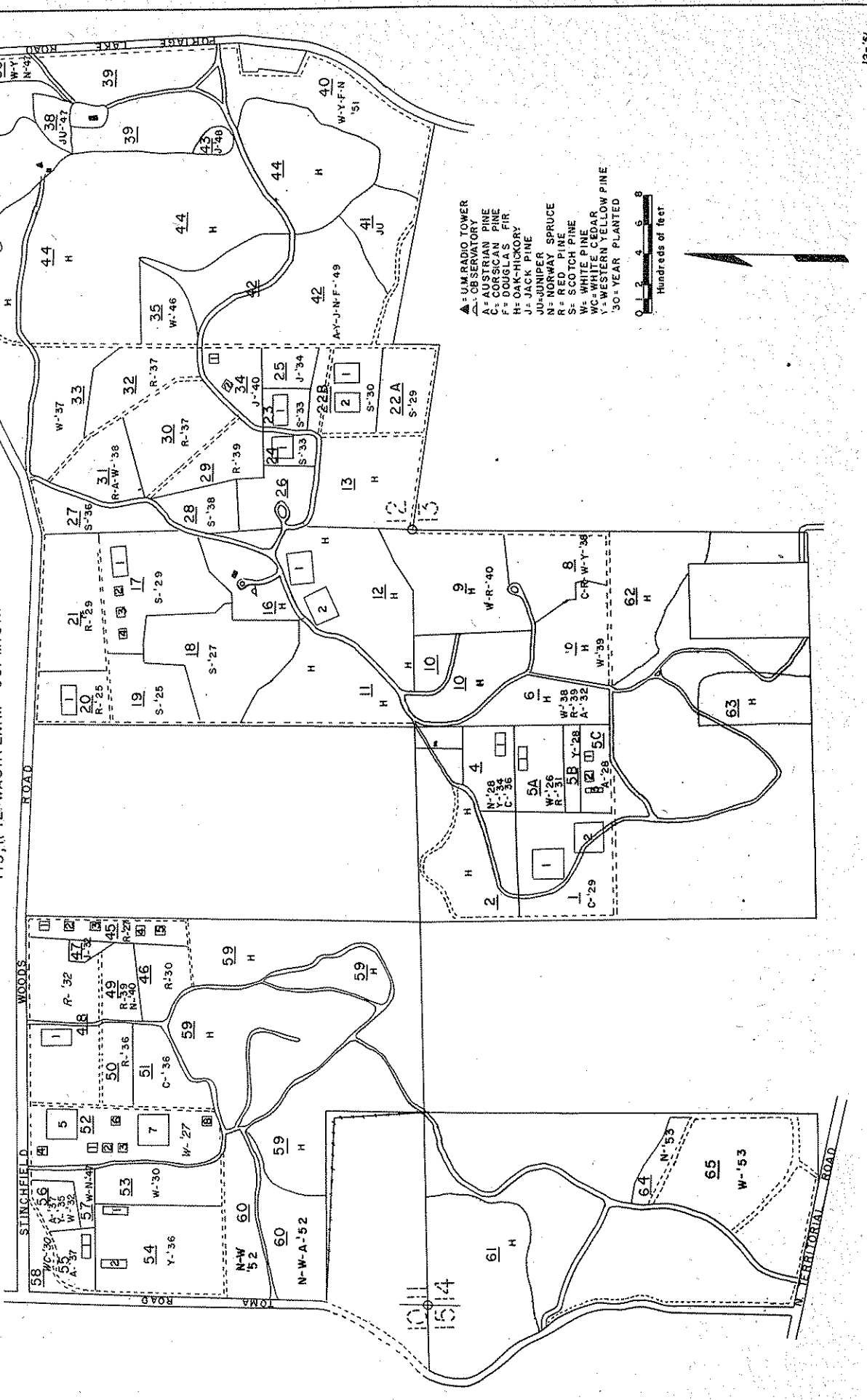
try

# A GUIDE TO STINGFIELD WOODS

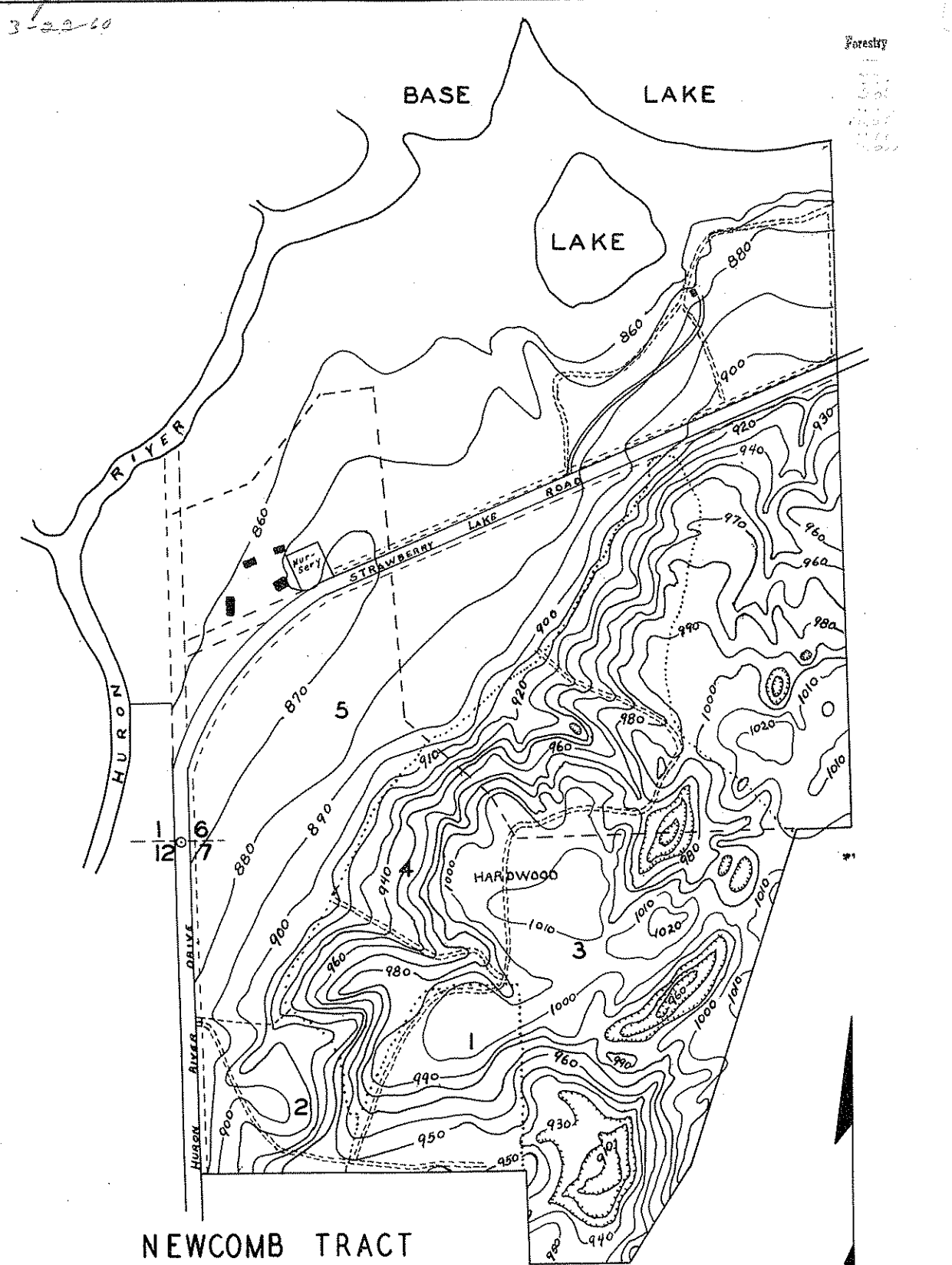


SCHOOL OF NATURAL RESOURCES  
UNIVERSITY OF MICHIGAN  
ANN ARBOR, MICHIGAN  
UNIVERSITY OF MICHIGAN LIBRARIES

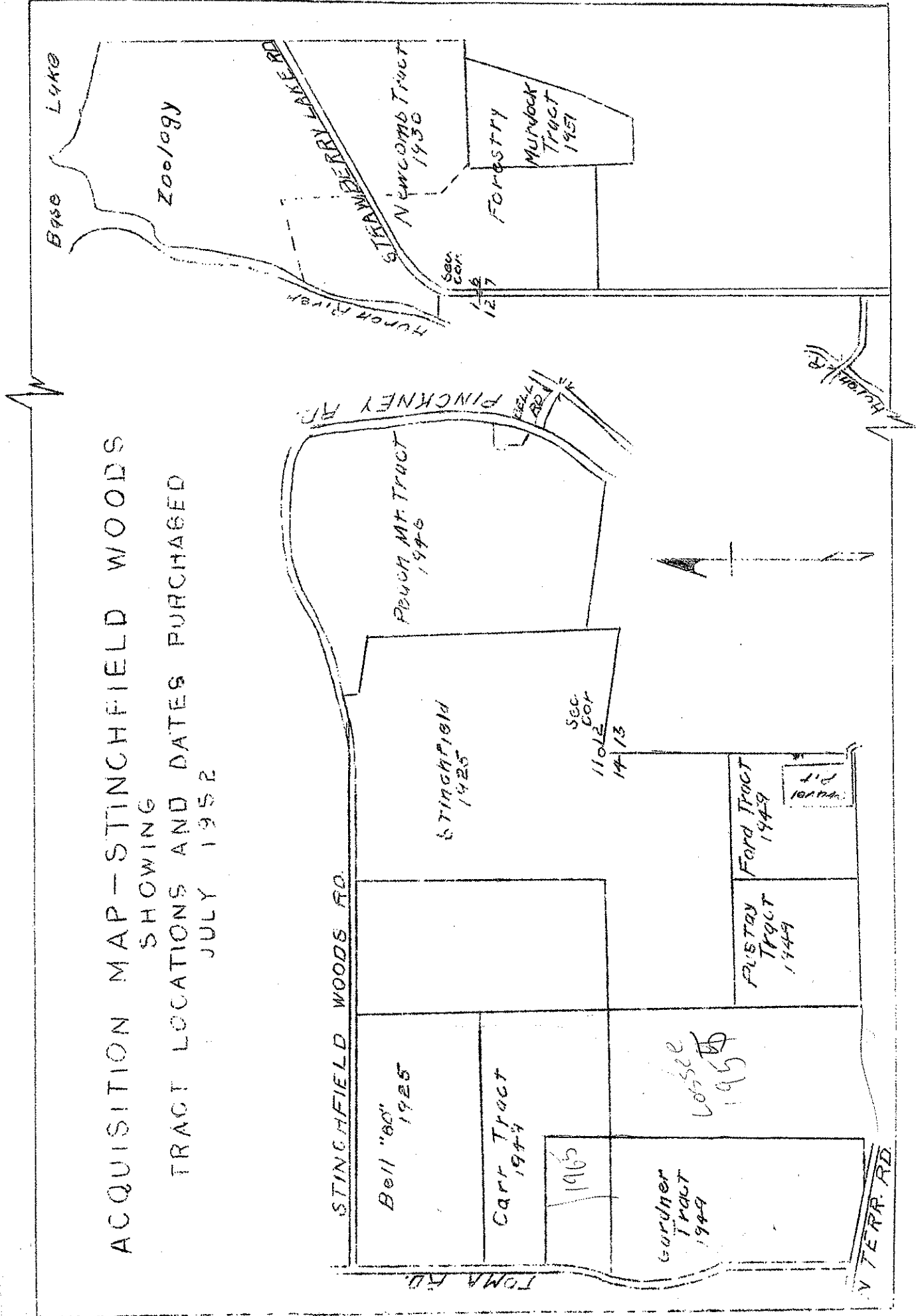
**STINCHFIELD WOODS**  
**SCHOOL OF NATURAL RESOURCES**  
**UNIVERSITY OF MICHIGAN**  
 PARTS OF SECTIONS 11, 12, 13, 14 & 15  
 T1S, R4E, WASHTENAW CO. MICH.



*Forestry*  
 3-22-60



ACQUISITION MAP - STINGFIELD WOODS  
 SHOWING  
 TRACT LOCATIONS AND DATES PURCHASED  
 JULY 1952



## 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 and most of the lumber is used for school purposes. Thinnings furnish a considerable number of posts for use on school properties. All other wood is cut into firewood and sold. Income from the area is allocated to the current operating fund of the school and applied against the cost of area maintenance.

A small nursery was started in the spring of 1949 immediately east of the caretaker's house on the Newcomb tract. Each spring the establishment of seed beds and transplanting of older stock are done, as required work, by the class in artificial forestation. Water for irrigation through the overhead sprinkler system is pumped from the Huron River nearby.

The Portage Lake Observatory and Radio Station WUOM, both units of the University, are located on the area. Detailed descriptions of these units appear later in the Guide.

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 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. This brought the area of the tract up to nearly 700 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 the Astronomical 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 810 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. One improvement cut has 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 is 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 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. A road, extending south from the gravel pit to North Territorial Road, will then revert to the University and will provide access to the property from the south.

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 is used for a nursery. A 15-acre field growing up to sumac, hawthorn, and poor Scotch pine naturally seeded-in from trees planted to the west in 1915, was planted with conifers in 1950. No cutting has been done in the hardwoods.

The Murdock tract is completely wooded with a hardwood stand of potentially good quality, but because it was heavily grazed until 1950, reproduction is lacking.

### 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 been introduced with beneficial results. Multiflora roses have been planted along the exterior fence lines as a source of food and cover for wildlife and also to prove a permanent stock proof fence that will not require maintenance. 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 as the hardwood forest has grown more brushy there has been an increase in the grey squirrel and a decline in the fox squirrel population.

### 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 56'  
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, to be replaced with swing cut-off saw in the near future.  
Rolls: Dead rolls. Enough on hand eventually to transport lumber and slabs to proposed 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.  
Planer: Purchased from the Plant Department. Surfaces one side only.  
Power: Electric throughout. Any piece of equipment can be run separately.

The mill is used primarily for teaching the logging and milling courses given by the School and is run entirely by student labor under the supervision of a member of the staff. All logs cut on the forest properties are sawed in the mill. The lumber is used to furnish material for use by classes in the Wood Technology Department or for general construction purposes. Some material is sold to the Plant Department of the University and to private individuals.

### The Portage Lake Observatory

The Portage Lake Observatory, which is a unit of the Department of Astronomy of the University of Michigan, is located in Lot 16 of Stinchfield Woods about 3/4 miles west of the Portage Lake Road. This very interesting and modern establishment, 15 miles from the campus, in the middle of the forest, deserves a brief explanation.

If a powerful telescope is to yield the best possible results, it must be located where the air is free of dust and smoke, and where the sky is not illuminated by the glare of city lights. When it was decided, in 1947, to construct a telescope of the most recent design, it was obvious that, for these reasons, it should not be placed within the city limits of Ann Arbor. A site in Stinchfield Woods, on the other hand, offered the advantages of convenient access from the campus, a dark, clear sky, and attractive woodland surroundings, controlled and maintained by the School of Natural Resources.

The Portage Lake Observatory at present includes the domed observatory itself and a small residential building, used by faculty and students who operate the telescope. In the basement of the residence there is also a small machine shop in which repairs and alterations to electrical and mechanical equipment can be made.

The telescope is of the latest type, which is known after its inventor as a "Schmidt." Optically, it consists of a concave glass disc three feet in diameter, aluminized on the front surface to form a spherical mirror, and mounted at the bottom of the fourteen-foot tube. At the upper end is a thin lens or "Schmidt correcting plate" two feet in diameter.

Like all modern astronomical telescopes, the Schmidt is a giant camera. A round photographic plate 8 inches in diameter, is loaded in a plateholder halfway down the tube. Starlight, passing through the correcting plate, continues to the mirror, which focuses it by reflection on the light-sensitive emulsion of the photographic plate.

The telescope tube is carried on two axes, by means of which it can be swung to any part of the sky and clamped in position. Thereafter an electric motor drives it at the proper rate to follow the desired star-field as it rises from the eastern horizon and sinks toward the west. The large shutters visible on the outside of the dome roll apart, leaving an opening from horizon to zenith. An electric motor rotates the dome to afford a view of any part of the heavens through this slit.

A small conventional telescope is mounted on the side of the tube to permit the observer to check the pointing and performance of the five-ton instrument during the exposure, which may last a few minutes, or as much as six hours.

Auxiliary electrical equipment is located on the ground floor of the observatory, which also includes garage space. A small basement darkroom is provided for developing the astronomical photographs.

Upon completion, in June 1950, the telescope was dedicated as the H eber Doust Curtis telescope in memory of the distinguished astronomer who was director of the Observatories of the University of Michigan from 1930 to 1942.

The Schmidt telescope design is especially suited to astronomical research problems which require high quality photographs of large regions of the sky. The circular photographs taken with the Curtis telescope each cover an area one hundred times that of the full moon. Tens of thousands of stars, hundreds of the giant stellar systems called galaxies, or widespread clouds of interstellar dust and gas may appear on one such plate. By placing a glass prism two feet in diameter at the upper end of the telescope tube, the light of each star is split into a band of colors - the spectrum. It appears on the photograph as a long narrow rectangle at the position which the star would normally occupy. Patterns of bright and dark bands across the spectrum are important clues to the characteristics of the stars, and assist in measuring their distances from the earth.



Because the telescope is designed as a camera, it is impossible to "look" through it. For this reason, and because during photographic operations the dome must be kept in total darkness, it is not practical to have visitors at the telescope during the night hours.

### Radio Station WUOM

Shortly after World War II, plans were made for a University radio station which would broadcast non-commercial programs in the newly-developed Frequency Modulation (FM) band. As reliability, clarity, and fidelity of reception characterize FM broadcasting, it was felt that this medium would best serve the public interest in program schedule of the University.

Construction of the transmitter building and tower was begun in 1947 at Peach Mountain in Stinchfield Woods and the station made its debut in July, 1948, with a radiated power of 13,500 watts which was increased to 44,000 watts a little over a year later. In the meantime new studios of advanced design had reached completion on the campus in Ann Arbor, making possible a diversified and smoothly-operating system of broadcasting.

At the Peach Mountain site, programs from the Campus are picked up by means of a high frequency radio link, and re-broadcast on WUOM's assigned frequency, 91.7 megacycles. In addition, programs originating from other stations may be picked and re-broadcast. To carry on in an emergency a small studio has also been provided at the transmitter building.

The tower is 440 feet in height and is of the guyed variety with the size at the top the same as at the base, 2-feet on a side. The weight, exclusive of the 27 guy wires exerting a downward pull, is 8 tons. Lights on the tower and radiator, visible at great distances at night, provide a spectacular landmark. A 1000-watt beacon located at its uppermost point, is the highest spot in the Lower Peninsula, being 1,483 feet above mean sea level.

July, 1952

EUROPEAN BLACK PINE (CORSIKAN STRAIN)

Lot No. 1  
9.9 acres

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

This plantation is being managed in two blocks. The south half of the lot is to remain without thinning or pruning. The north half was thinned and crop trees pruned to a height of 12 feet during the winter of 1948-49. The next cut is planned for the winter of 1953-4.

Two, one-acre sample plots were established in 1933. Plot No. 1-1 was thinned and pruned in 1948. Plot No. 1-2 was left without treatment.

SAMPLE PLOT DATA

Plot No.	Year Measured	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	
1-2	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 operation and the next thinning will remove the remainder. (However in the unthinned part they are a rather serious problem as the double stemmed trees are in a dominant position in the stand.) A number of the trees were tipped in the spring of 1949 by a combination of high wind and a heavy wet snow. Pines of other species in the near vicinity, excepting Austrian pine, were not damaged. These two species may be less windfirm and therefore less desirable for planting on exposed sites.

June 1953

Lots Nos. 2, 9, 10, 11, 12.

66.5 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 will serve as a demonstration of sustained yield management of a farm woodlot.

The tract chosen for this project is a stand of native hardwoods composed mainly of oak and hickory. This stand is the greater part of the wooded section 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 permanent lots, each to be worked over once every five years. The lots were subdivided along natural boundaries in so far as possible.

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, mark the lot for cutting, and return after the cutting is completed to study their work.

The following table shows the cutting schedule for the next 10-year period.

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

1953  
Lots 2-9-10-11-12, cont.

STAND SUMMARY  
LOT 12, STINCHFIELD WOODS

Area and location: South of observatory. 15.0 acres.  
Consists of former lot 14 (5.7 acres); all of Lot 12 (716 acres) except for a 0.9 ac. area in the ravine in the southeast corner of that lot; and most of Lot 11 east of the road (Lot 11A, 2.6 acres.)

History: At time of purchase in 1925, a typical overgrazed farm woodlot, with no reproduction and a grass ground cover. Sugar maple underplanted 1933-37 along the east half. Improvement cuts in winters of 1932-33, 1935-36, and 1940-41 in which poorest quality trees were cut, especially large white oak culls.

THE STAND ON A PER-ACRE BASIS BEFORE CUTTING, FALL, 1952

Species	No. trees	B.A.	Mean diam.	Diam. range
Bl. Oak	92.8	58.3	10.7	6-23
R. Oak	1.9	1.6	12.6	6-21
Both	(94.7)	(59.9)	(10.8)	
Wh. Oak	15.6	6.4	8.7	6-16
Hickory	23.7	9.2	8.4	6-19
Bl. Cherry	2.0	1.2	10.4	6-14
Other	0.2	0.1	7.7	6-9

Permanent sample plots: Plots 12-1 and 12-2, established in 1934, give some information on growth:

- 1) On plot 12-1, where the present basal area is 85.4 sq. ft. per acre, the gross growth since 1934 has been 1.70 sq. ft. per acre per year. The largest 50 percent of the trees contributed 64.4 percent of the basal area in 1934 and have contributed 70.9 percent of the growth from 1934 to 1952.
- 2) On plot 12-2, where the present basal area is 48.8 sq. ft. per acre, the gross growth since 1934 has been 1.05 sq. ft. per acre per year. The largest 50 percent of the trees made up 70.3 percent of the basal area in 1934, and have contributed 74.8 percent of the growth from 1934 to 1952.

1953  
Lots 2-9-10-11-12, cont.

Basal area cut in 1952, per acre basis:

---

Bl. Oak B.A.	Wh. Oak B.A.	R. Oak B.A.	Hick. B.A.	Other B.A.	Total B.A.
9.3	0.1	0.2	2.1	0.2	11.9

---

The above cutting yielded (15 acres) :

11,150 board feet (Int.  $\frac{1}{4}$ " )lumber  
75 face cords of 16" fuelwood.  
12 face cords of 24" fuelwood.

Conversion to board feet: One square foot of basal area is equal to 61 bd. ft., Int.  $\frac{1}{4}$ "

Note: During the period from 1935 through 1951 improvement cuttings in the native hardwood stand on the original Stinchfield purchase unit yielded 23,300 bd. ft. of sawlogs and 1,388 cords of 16" fuelwood.

July, 1952

Lot. No. 4

4.9 acres

NORWAY SPRUCE-WESTERN YELLOW PINE - CORSICAN PINE

Scientific names: Picea excelsa-Pinus ponderosa- Pinus nigra  
Date of planting: Spring, 1928-34 and 1936  
Seed source or 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. The results of the measurements are tabulated below.

Species	Date planted	D.b.h.		Basal area per A	No. trees per A	Ave. ht. dom. trees
		Max.	Ave.			
Norway spruce	1928	10.0"	8.5"	8.0	20	38'
Corsican pine	1936	5.3"	3.3"	28.7	476	25'
Western yellow pine	1934	9.1"	6.1"	65.1	320	29'
Totals				101.8	816	

A small percentage of the Western yellow pine have become infected with "Woodgate" rust, probably from Lot No. 5B a short distance away.

July, 1953

Lot No. 5A

4.5 acres

WHITE PINE-RED PINE

Scientific names: Pinus strobus - Pinus resinosa  
Date of planting: Spring, 1926m 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 1952 and 53 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.		Ave. 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	688					135.82

Remeasured in Fall of 1952  
Residual Stand

Red pine	148	8.0"	4.8"	40'		19.1
White pine	368	9.6"	7.0"	42'		98.2
Total	516					117.3

July, 1952

Lot No. 5B

1.5 acres

JEFFREY PINE

Scientific name: Pinus jeffreyi  
Date of planting: Spring, 1928  
Seed source or strain: Unknown, but obviously from a strain that is very different from any planted on the School's properties  
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 not become established in practically every tree in the eastern portion. Many trees have been killed and the rust is spreading slowly to other plantations of this species.

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

Year	Years	Trees per A	Max.	D.b.h.		Av. ht. dom. trees	Basal area per acre
	After Planting			Min.	Ave.		
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.



July, 1953

Lot. No. 50  
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'g	Trees per acre	D.B.H.			Height		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, 50-3 was left unthinned as a check and Plots 50-1 and 50-2 were thinned to different degrees of stocking. Data from the first measurements on these plots are given below.

Plot No.	Area*	Trees per A		Ave. d.b.h.		Basal area		Year Measured
		Before	After	Before	After	Before	After	
50-1	1/10	970	760	4.3"	4.6"	99.9	85.7	1947
50-2	"	970	670	4.2	4.6	95.6	76.9	1947
50-3	"	1000		4.4		109.6		1947
50-1	"	760		5.2	5.4	114.0	105.2	1952
50-2	"	670		5.4	5.5	105.9	98.7	1952
50-3	"	1000		5.1	---	139.3	---	1952

\* tenth acre plots.

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 will cease. 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 planted with 2-2 wh. pine spring of 1953.

August, 1953

Lot 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 1930- 32- 36 and 42.

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 at the time the open area was planted, 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'.

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 small diameter classes only as the number of stems per acre was satisfactory.

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

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

Summary of plots - per acre basis.

DBH	No. trees		No. trees		No. trees		No. trees		No. trees	
	Bl.oak	B.A.	W.Oak	B.A.	Hickory	B.A.	Bl.Cherry	B.A.	Aspen	B.A.
3-5"	58	5.0	42	3.7	77	6.7	6	0.5	17	1.5
6	33	6.5	13	2.6	6	1.2				
7	21	5.6	3	0.8	2	0.5	1	0.3		
8	20	7.0	12	4.2						
9	8	4.0	3	1.3						
10	4	2.2								
11	1	0.7	1	0.7						
12			1	0.8						
Totals	145	31.0	75	14.0	85	8.4	7	0.8	17	1.5

Total basal area per acre = 55.7

Bd. ft. volume per acre Int.  $\frac{1}{4}$ " - 8" min. top = 300

No. of trees per acre all species = 329

July, 1952.

Lots Nos. 17, 18, 19.

28.4 A

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 with the results tabulated below.

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	
17-1	1943	1078		3.8		88.0	
17-1	1951	656	593	4.9	5.0	87.7	73.1
17-2	1946	1090	700	4.1	4.4	100.1	74.2
17-2	1951	700	700	4.7	4.7	85.2	85.2
17-3	1946	970	500	4.4	5.0	102.2	68.4
17-3	1951	500	500	5.6	5.6	87.0	87.0
17-4	1946	1060	300	4.2	4.7	103.0	33.9
17-4	1951	300	300	5.7	5.7	54.2	54.2

The three tenth-acre plots show some interesting differences in growth during the past five years. Growth in diameter of the average tree and in basal area per acre were greatest on Plot 17-4, having only 300 trees left per acre. However, these differences in growth are not due entirely to the variation in density of the stands left after thinning. When the plots were thinned the trees that seemed to be most vigorous and with the best chance to survive were selected for leaving. On the plots with 500 and 700 trees per acre left, there were a greater number of trees of less vigor as compared to the vigor of the trees on the 300 tree plot. The growth that has occurred on these plots in the past five years does not indicate that 300 trees per acre represent the best stocking for healthy, normal Scotch pine of this age.

Thinnings were made in Lots 18 and 19 in 1941, 1946 and 1951; in Lot 17 in 1946 and 1951. Because of the heavy damage 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 Western yellow, Austrian, and White pines, Douglas fir, and Norway spruce, as none of these species is susceptible to attack by the spittle bug. Results of this planting should help in the choice of species to be used in restocking these lots if and when future attacks of the spittle bug destroy any more of the Scotch pine.

Very minor damage has been caused by the European pine shoot moth and European pine sawfly.

July, 1952

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. It is planned to extend the pruning of these trees to 17 feet and make a second thinning during the winter of 1953-54.

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 1947-8.

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

Date planting	Years after	No. Trees /A		Ave. d.b.h.		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"		154.8	137.1

July, 1952

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. No pruning has been done because of the poor form of the trees severely damaged by the European pine shoot moth. This stand is in a worse condition than the Red pine stand in Lot 20.

No measurements of growth have been made.



July, 1953

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 measured	Years after plant'g	Trees per A		Ave. d.b.h.		Ave. ht.	Basal area/A	
		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.

Lots Nos. 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 differences 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	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 1952-3.

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 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 after Planting	Trees per A		Ave. d.b.h.		Height		Basal Area per A	
				Before	After	Before	After	Av.	Dom	Before	After
22B	1	1940	11	1060		2.1"		12'		25.9	
22B		1945	16	1054		3.6"		20'		73.2	
22B		1952	23	914		4.3			29'	93.4	
22B	2	1940	11	998		2.1"		12'		25.0	
		1945	16	1006		3.6"		21'		70.3	
		1952	23	* 668		4.4	4.5		29	* 70.1	63.4
23	1	1942	10	966		3.1		18		51.3	
		1947	15	976	726	4.1	4.1	25		89.2	68.6
		1952	20	682	538	4.6"	4.7"		34'	78.3	66.2
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	752	4.1	4.1			75.6	64.8

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

July, 1952

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.

No thinnings or growth measurements have been made.

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. Some of this reproduction was 800 feet from Lot 25 and some individuals were 4 feet high.

July, 1952

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.

July, 1952

Lot 27

5 acres

SCOTCH PINE

Scientific name:	<u>Pinus sylvestris</u>
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 parallela - 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.

No growth or plantation records are being kept on this plantation.

July, 1952

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 - Sphaeropsis sellisii - have not caused any appreciable damage perhaps due to the young age of the stand.

July, 1952

Lots Nos. 29-30-32

17.8 acres

RED PINE

Scientific name:	Pinus resinosa
Date of planting:	Spring, 1927-30 and 31; Spring, '29-30
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.



July, 1952

Lot No. 31

5 acres

MIXED PINES

Scientific names:	White pine - <i>Pinus strobus</i> , Red pine - <i>Pinus resinosa</i> , Austrian pine - <i>Pinus nigra</i>
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. & 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.

July, 1952

Lot No. 33

6.9 acres

WHITE PINE

Scientific name:	Pinus strobus
Date of planting:	Spring, 1939
Seed source or strain:	Unknown
Class of stock:	2-0
Spacing:	6 x 6 (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.

July, 1952

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. No silvicultural treatment has been undertaken. In the fall of 1951, 12 years after planting, two, one-tenth acre permanent sample plots were established.

DATA FROM PLOTS

Plot	Trees per acre	Ave. d.b.h.	Av. ht. dom. trees	Basal area per acre
34-1	1420	2.5"	19'	52.5
34-2	1540	2.7"	19'	65.7

July, 1952

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, Western yellow pine and an occasional Scotch pine (in error) were planted in the fail spots.

July, 1952

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
Western yellow pine	Pinus ponderosa	2-0	Saginaw Forest
Norway spruce	Picea excelsa	2-1	Saginaw Forest

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 fall 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.

July, 1952

Lot No. 37

11.6 acres

MIXED CONIFERS

Date of planting: Spring, 1948  
Planting stock used:

Species		Size	Seed source
White pine	Pinus strobus	2-1	Wisconsin
Western yellow 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'.

July, 1952

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.

July, 1952

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 Western yellow 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	6 x 6
1949	Norway and H.Maple	Wildlings	SF	grubhoe	6 x 6
1949	Norway spruce	2-1	SF	P bar	6 x 6
1950	W. yellow pine	2-0	IronCo.	P bar	6 x 7
1951	White pine	2-2	SF	grubhoe	6 x 6
1951	Norway spruce	2-2	Colo.	grubhoe	6 x 6
1951	Douglas fir	2-2	Stinch-	P bar in	6 x 7
1951	Red oak-White oak Bass-White ash	1-0	field	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.



July, 1952

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.

Year	Species	Size	Seed source	Planting method	Spacing
1951	White pine	2-2	Iron Co. Mich.	P bar in furrow	6 x 7
1951	Austrian pine	2-0	Denmark	" " "	6 x 7
1951	W. yellow pine	2-0	Sag. For.	" " "	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.

July, 1952

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 now known as there was considerable center rot.

Note: This area can be observed from the Pinckney road at the beginning of the School property.

July, 1952

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
Western yellow 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 Western yellow 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 Western yellow pine. The Spruce and Douglas fir were planted along the bottoms of the ravines wherever the soil appeared of higher quality.

July, 1952

Lot No. 43

0.8 acres

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:	Planting bar
Replanting:	Small amount in the spring of 1949 with 2-0 Jack pine of same seed source.

July, 1952

Lot No. 44

66 acres

NATIVE HARDWOODS

Lot No. 44 consists of 66 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. The next cut is planned for 1960.

Basal Area and Bd. Ft. Volumes Per Acre (Int.  $\frac{1}{4}$ " to 8" min. top)

Before and After Cutting

Basal Area		Bd. Ft.	
Before	After	Before	After
68.0	48.0	1030	934

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

July, 1952

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.

Two thinnings have been made on the area in the winters of 1946-7 and 1951-52. 500 board feet of small sawlogs were obtained in the 1951-52 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 1941.

DATA FROM SAMPLE PLOTS

Plot No.	Year Measured	Trees per A		Ave. d.b.h.		Ht. Ave.	B.A. per A	
		Before	After	Before	After		Before	After
Orig. plot	1931					2.6'		
	1937	1638		2.3"		11.2'	34.5	
	1941	1525		3.3"		18.9'	90.9	
1.58 A	1946	1498	1320	4.1"	4.3"		140.2	
45-1	1951	1230	960	4.9"	5.0"		158.8	133.6
45-2	1951	1370	890	4.8"	5.0"		173.7	120.5
45-3	1951	1410	1040	4.8"	4.8"		175.7	130.7
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
45-5	1946	1370	770	4.4"	5.0"		144.1	101.1
45.5	1951	770	630	6.0"	6.2"		151.6	132.0

July, 1952

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 x6
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. Another thinning is planned for the winter of 1954-55. At that time the crop trees will be pruned to a height of 17 feet.

July, 1952

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.

The plantation has received very little silvicultural treatment. A few crop trees were pruned during the winter of 1949-50. The plantation was measured in 1949.

DATA FROM MEASUREMENT

Year Measured	Years after planting	Height dom. trees	Ave. dbh	No. trees per A	Basal area per A
1949	18	30'	4.2"	541	52.1



July, 1952

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 negligible. Due to the height of the stand, further damage is not expected even if the moth population increases. 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 has been retained for study purposes.

The area is being managed as two units. That part of the plantation east of the road was thinned in 1949-50. That part of the plantation east of the road was thinned in 1949-50. That part of the plantation west of the road is to remain unthinned.

Crop trees on the entire area were pruned to a height of 12 feet during the winter of 1949-50.

DATA FROM PLOT

Years Measured	Years after planting	Trees per acre	Ave. d.b.h.	Ave. ht.	Basal area per A
1937	5	1162		3.0'	77.8
1941	10	1174	2.1"	12.7'	27.8
1946	15	1178	3.8"		95.0
1950	19	1190	4.6"		137.9

July, 1952

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 arrangement:	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 but now the majority of the trees are high enough to be out of danger. 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 30'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.

July, 1952

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 pine 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 this year.

July, 1952

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. Trees up to 6' in height have died from this cause.

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.

The leaf-cast seems to be decreasing in intensity and it is hoped that in a few more years it will be absent from the stand.

July, 1952

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 Nur.  
 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 twice; once in the winter of 1946-47 and again in the winter of 1951-52. Crop trees were pruned to 12' ht. in the winter of 1946-7. 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. In 1946, two one-tenth acre plots were set: 52-6 and 52-8. In 1951, four more plots: 52-1, 52-2, 52-3 and 52-4 were established. Plots 52-5, 52-6 and 52-8 are maintained as thinning plots and Plot 52-7 as a control, to be left unthinned. Plots 52-1, 52-2, 52-3, and 52-4 are thinning plots established with different densities of crop trees.

52-1 - 150 crop trees per acre  
 52-2 - 120 " " " "  
 52-3 - 100 " " " "  
 52-4 - 200 " " " "

DATA FROM PLOT 52-5

Year measured	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

July, 1952

Lot No. 52 (cont'd)

Plot 52-7

Year Measured	Trees per A		Ave. d.b.h.		Ave. ht.	B.A. per A	
	Before	After	Before	After		Before	After
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	

Plot 52-6

1946	1180	840	4.1	4.6	106.5	97.2
1951	840	610	5.6	5.8	144.5	113.3

Plot 52-8

1946	1180	670	4.3	5.0	121.9	89.9
1951	670	540	6.2	6.4	141.1	122.1

Plot 52-1

1951	1790	600	6.0	6.3	153.6	131.2
------	------	-----	-----	-----	-------	-------

Plot 52-2

1951	750	560	6.0	6.5	150.3	125.2
------	-----	-----	-----	-----	-------	-------

Plot 52-3

1951	640	480	6.4	6.6	140.8	115.3
------	-----	-----	-----	-----	-------	-------

Plot 52-4

1951	890	590	5.3	5.6	135.8	101.5
------	-----	-----	-----	-----	-------	-------

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.

During the 1951-52 thinning 2500 bd. ft. of small sawlogs were cut.

July, 1953.

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 '53.

July, 1952

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. Thinning operations are planned for the winter of 1955-56.

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.

SAMPLE PLOT DATA

Plot No.	No. trees per acre	D.B.H.		Ave. ht. of dom. trees	Basal area per acre
		Max.	Ave.		
54-1	896	5.9"	4.1"	23.0'	81.8
54-2	1200	5.7"	3.5"	21.0'	82.9



July, 1952

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.

DATA FROM PLOT

Plot No.	No. trees	D.b.h.		Ave. ht.	Basal area per acre
	Per acre	Max.	Ave.	dom. trees	
55.1	1132	6.9"	3.9"	22.0'	93.6

The area has been free of insects and disease. In the spring of 1949 this, as well as other Austrian and Corsican pine plantations, was damaged by a combination of heavy snow and wind.

July, 1952

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 12 feet.

July, 1952

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.

July, 1952

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  $\frac{1}{4}$  adjoining Lots Nos. 45-46 and 51. This 7 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 - 11,564 bd. ft.

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

July, 1952,  
 Lot No. 59 (cont'd)

Per Acre Stand and Stocking Table After Cutting  
 Plots Measured March, 1952. Based on 20  
 Permanent  $\frac{1}{4}$  acre sample plots.

D.b.h.	Red & Bl Oak		White Oak		Hickory		Black Cherry	
	No. of trees	Bd.ft.	No. of trees	Bd.ft.	No. of trees	Bd.ft.	No. of trees	bd. ft.
1-4"	43.4		34.6		50.0		2.6	
5	10.6		4.8		1.8		0.4	
6	11.4		3.4		1.0			
7	8.2		5.4		1.2		0.2	
8	8.8		4.0		1.0			
9	6.6		3.0		0.8			
10	6.4	218	3.4	104	0.6	16	0.2	
11	4.4	228	1.8	90	0.2	14		
12	3.4	225	1.6	91	0.2	15	0.2	15
13	3.4	256	0.8	59	0.2	17		
14	1.6	153	0.6	48				
15	1.4	179						
16	0.6	85						
17	0.2	45						
18	0.2	41						
19	0.2	65						
	<u>110.8</u>	<u>1495</u>	<u>63.4</u>	<u>392</u>	<u>12.2</u>	<u>95</u>	<u>3.6</u>	<u>15</u>

D.B .H.	White Ash		Aspen	
	No. of trees	bd.ft.	No. of trees	bd.ft.
1-4"	10.0		2.0	
5	0.4		0.6	
6	0.2		1.0	
7	0.4		0.4	
8	0.2		0.2	
9			0.2	
10	0.4	16		
11	0.2	10		
12				
13	0.2	14		
	<u>3.0</u>	<u>40</u>	<u>4.4</u>	

Bd. ft. in Int.  $\frac{1}{4}$ " rule, 8" min. top.

2037 bd. ft. per acre

Total B.A. per acre = 47.2 sq. ft.

B.A. per acre in trees 10" d.b.h. and larger = 24.7

Note: In the table trees with  $\frac{1}{2}$  log merchantable length were counted in total volume. The previous table gave volume only in trees that had at least one full 16' log.

July, 1952

Lot No. 59 (cont'd)

In the summer of 1949, 21 one-quarter acre circular sample plots were established on the area. Center point of each plot was marked with an iron pipe.

SUMMARY OF PLOT DATA AS OF 1949

D.b.h.	Bl. & Red Oak		Wh. Oak		Hickory		Misc.	
	no. of trees	bd. ft.	No. of trees	bd. ft.	No. of trees	Bd. ft.	No. of trees	Bd.ft.
3-5	65.0		30.0		44.0		3.0	
6	9.1		3.2		3.4			
7	10.3		5.5		3.1			
8	9.5		3.0		4.0			
9	7.3		4.9		3.1		5.2	
10	4.9	196	1.8	72	1.4	54	0.4	16
11	4.2	210	2.0	100	0.4	20	0.2	10
12	5.3	344	1.0	65	0.2	13		
13	2.6	208	0.7	56	0.2	16	0.2	16
14	1.1	115	0.3	31	0.2	21		
15	1.1	143	0.2	40	0.4	52		
16	0.4	66	0.2	55	0.2	33		
17								
18	0.2	48						
19	0.2	55						
20								
Totals	121.2	1385	52.8	419	60.6	211	9.0	42

Per acre basis. Bd. ft. in  $\frac{1}{4}$ " Int. 8" min. top.

2057 Bd. ft. per acre

Basal area per acre = 60.8 sq. ft.

Basal area per acre trees 10" d.b.h. and larger = 23.4 sq. ft.

August, 1953.

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 wh. 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.

August, 1953.

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. In 1949 six one-quarter acre circular sample plots were established on the area. The University acquired the land in 1949. No cutting on the area has been done since that time.

Per Acre Summary of Sample Plots

Based on 5 acres, Applied to 18 acres

DBH	No. trees		No. trees		No. trees	
	Black Oak	B.A.	Wh. Oak	B.A.	Red Oak	B.A.
6	5.3	1.0	14.6	2.9	1.3	0.3
7	4.0	1.1	7.3	1.9	2.7	0.7
8	8.0	2.8	6.0	2.1	3.3	1.1
9	4.0	1.8			3.3	1.5
10	3.3	1.8			0.7	0.4
11	0.7	0.5	2.7	1.8	2.0	1.3
12	0.7	0.6	3.3	2.6	0.7	0.5
13			1.3	1.2		
14						
15	1.3	1.6	0.7	0.9	1.3	1.6
16			2.7	3.8		
17	0.7	1.1				
Totals	28.0	12.3	38.6	17.2	15.3	7.4

	No. trees		No. trees		No. trees		No. trees	
	Hickory	B.A.	Bass	B.A.	Elm	B.A.	Aspen	B.A.
6	3.3	0.7						
7	2.7	0.7						
8	2.0	0.7			1.3	0.4	1.3	0.4
9	1.3	0.6			1.3	0.5	1.3	0.5
10	1.3	0.7					0.7	0.3
11					0.7	0.5		
12								
13								
14			0.7	0.7				
15			0.7	0.8				
16								
17								
	10.6	3.4	1.4	1.5	3.3	1.4	3.3	1.2

Total basal area per acre = 44.4 sq. ft.  
 Total board ft. per acre Int.  $\frac{3}{4}$ " rule 8" min. top = 1370



July, 1952

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 1941, 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  
(1949 measurements)

D.b.h.	Red Oak No. of Bd. trees ft.	Bl. Oak No. of Bd. trees ft.	Wh. Oak No. of Bd. trees ft.	Hickory No. of Bd. trees ft.	Bl. Cherry No. of trees	Sassafras No. of trees
3-5	37.6	25.4	21.6	40.8	9.6	76.8
6	4.0	0.8	8.8	5.6	1.6	1.6
7	.8	6.4	5.6	1.6	0.8	3.2
8	2.4	6.4	2.4	2.4	0.8	1.6
9		6.4	3.2	4.0		
10	2.4 96	5.6 128	1.6 64	1.6 80		
11		5.6 240	4.8 160	.8 48		
12	1.6 96	3.2 204	.8 48			
13	1.6 124	3.2 310				
14						
15			.8 76			
16				.8 92		
17						
18			.8 164			
19						
20	0.8 200					
	516	882	512	220		

Bd. ft. Int.  $\frac{1}{4}$ " rule to 8' min top

Total vol per A = 213 bd. ft.

Total basal area per A = 65.2 sq. ft.

B.A. in trees 10" d.b.h. and over = 25.3

August, 1953

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 '40, 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 are 12-15 feet high.

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 as Measured in 1949  
Per Acre Basis. Based 0.75 A  
(three permanent sample plots) measured  
applies to 5.7 acres

---

D.b.h.	No. trees Bl. Oak	Basal Area	No. trees Wh. Oak	Basal Area	No. trees Hickory	Basal area
6			1.3	0.3	6.6	1.3
7			2.8	0.7	14.6	3.9
8			5.3	1.9	10.7	3.7
9	4.0	1.8	1.3	0.6	10.7	4.6
10	8.0	4.5	1.3	0.7	10.7	5.8
11	2.7	1.8	2.7	1.8	4.0	2.6
12	1.3	1.0				
13	2.7	2.5			1.3	1.2
14	6.7	7.1			2.7	2.8
15	1.3	1.6	1.3	1.6		
Totals	26.7	20.3	16.0	7.6	61.3	25.9

---

Total basal area per acre = 53.8 sq. ft.

Bd. ft. per acre Int.  $\frac{1}{4}$ " rule 8' min. top = 2,600

Lot #63, cont'd.

Per Acre Summary of Improvement Cut  
 Made the winter of 1952-53  
 based on 0.75 acres (three permanent sample plots  
 applied to 5.7 A.

Residual Stand

D.B.H.	Bl. Oak.	Basal area	W. Oak	Basal area	Hickory	Basal area
5					6.7	0.9
6			1.3	0.3	5.3	1.0
7					13.3	3.6
8			4.0	1.4	6.7	2.3
9	4.0	1.8	2.7	1.2	9.3	4.1
10	4.0	2.2	1.3	0.7	6.7	3.6
11	6.7	4.4	5.3	3.5	4.0	2.6
12					1.3	1.0
13	1.3	1.2				
14	4.0	4.3			1.3	1.4
15	1.3	1.6	1.3	1.6		
Totals	21.3	15.5	15.9	8.7	54.6	20.5

Cut Trees

D.B.H.	Bl. Oak	Basal area	W. Oak	Basal area	Hickory	Basal area
5					4.0	0.5
6					1.3	0.3
7			1.3	0.5	2.7	0.7
8					1.3	0.5
9					2.7	1.2
10					1.3	0.7
11					4.0	2.6
12						
13	1.3	1.2				
14	2.7	2.8			1.3	1.4
15	2.7	3.3			1.3	1.6
Totals	6.7	7.3	1.3	0.5	19.6	9.5

Total basal area per acre before cutting = 62 sq. ft.  
 " " " " " after " = 44.7 " "

Bd. ft. per acre before cutting Int.  $\frac{1}{4}$ " rule 8" min. top = 2780  
 " " " " " after " " " " " = 1970

Actual products salvaged from cutting

Fuel wood - 16" 29 face cords  
 24" 30 " "  
 36" 5 " "

Bd. ft. lumber - 6565

August 1953

Lot #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

This plantation was established to try for a seed source from trees resistant to the Spruce Gall Aphid. Trees that become infested will be removed from the stand and only the trees from the Gall Aphid will be left.

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 - 209, seed source, Austria  
White Pine - 3-0 stock, seed source Stinchfield Woods, Lot 52  
Hard maple - ? native stock 4-6" high

One small area along the road was planted to a pure stand of Japanese Larch, 2-0 stock and supposed to come from Japan.