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Catalog of  
**Representative Operations**

on the

**HARVARD FOREST**

Petersham, Massachusetts

CATALOG OF  
REPRESENTATIVE OPERATIONS  
ON THE  
HARVARD FOREST

PETERSHAM, MASSACHUSETTS

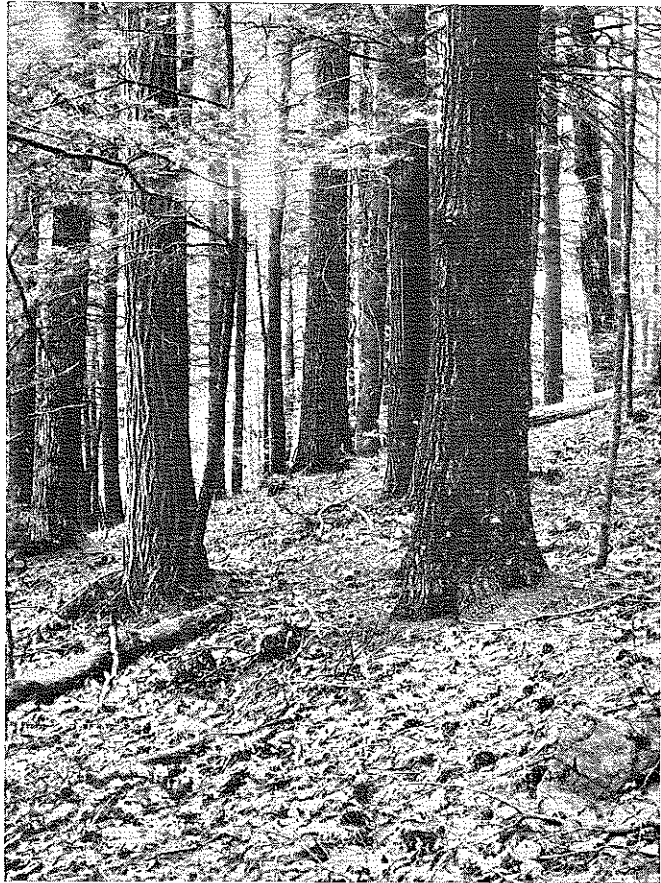
BEING

BRIEF ACCOUNTS OF SELECTED CUTTINGS,  
PLANTATIONS, SAMPLE PLOTS,  
FOREST TYPES, ETC.

ILLUSTRATING

THE DEVELOPMENT OF FOREST MANAGEMENT

ATHOL, MASS.  
THE ATHOL TRANSCRIPT COMPANY  
1924



MIXED PINE, HEMLOCK AND HARDWOOD, VIRGIN FOREST

## GENERAL INFORMATION

The Forest is managed with two aims, first as a business unit for continuous production and the ultimate creation of a normal condition, and second as an experiment station for research. All of the operations in the management of a tract under sustained yield, from the establishment of stands both by natural reproduction and by planting, to the marketing of lumber, poles, cordwood and other forest products, are carried on annually. The total area is 2,044 acres, exclusive of an annex of 276 acres loaned by the New England Box Company. There are three separate areas or blocks, Prospect Hill, Tom Swamp, and Slab City, of 763, 800, and 481 acres respectively. Elevations above sea level range from 750', the level of Tom Swamp, to 1400', at the summit of Prospect Hill. All types of soil common to the region are represented. On the uplands are the heavier, sandy loams, with some tendency to clays. Considerable areas of the lighter soils, mainly gravels and sands, occur on the Tom Swamp Block and its annex. The bulk of the present stand of timber is old field pine, but the original forest was mixed pine, hemlock, and hardwood. There are substantial areas of all the important types of the transition zone between the Central Hardwood and North Woods regions. Eleven types occur: White Pine, Pine and Transition Hardwood, Hardwood Swamp, Grey Birch, Pine and Grey Birch, Hemlock, Pine-Hemlock and Transition Hardwood, Hemlock and Transition Hardwood, Pine and Hemlock and Spruce Bog.

The Forest has been on a sustained yield since its acquisition in 1908. At present all species of saw log size are salable as lumber, and there is besides a fair market for cordwood. The growing stock at the outset, including softwoods alone, was approximately 10,000,000 board feet. At present it amounts to 2,928,635 cu. ft. of sawtimber, including hardwood, and 255,895 cu. ft. of cordwood. The rotation in general is sixty years, with longer periods for mixed stands with promise of sustained growth and quality increment, and for the spruce bog type. In 1908, for pine alone, the estimated mean annual increment was 250,000 board feet; it is now, of sawtimber 92,595 cu. ft., of cordwood 8,970 cu. ft. The allowed annual cut in board feet is approximately 500,000. Divided by area into three periods of twenty years each, the age groups are abnormal chiefly by a deficiency of 127 acres in the first period. This is expected to be made up by conversion of inferior hardwood types into new crops of saw timber species. The general silvicultural policy is to replace pure stands of pine with mixed pine and hardwoods, usually mixed by groups, and to develop mixed hardwoods and mixed conifers where these types are suitable or easy to secure. The net return, figured on potential forest area, has ranged from 75c to \$1.50 per acre per annum.

Some of the outstanding local problems in silviculture are: (1) dealing with the abundant advance growth of hardwood in the pure pine type, (2) choice of the best method of reproducing white pine, (3) conversion of gray birch and other inferior types to timber crops, (4) possibilities of release cuttings, (5) development of types more permanent than pure pine, (6) the handling of mixed stands, (7) the technique of weeding and cleaning, (8) means of improving quality in future crops.

The following notes are intended to aid visitors to the Forest. For areas exemplifying various sorts of silvicultural treatment or condition, essential facts are summarized according to block, compartment, and sub-compartment or stand. Of the index symbols opposite each paragraph, the first indicates the block, the second the compartment, and the last the sub-compartment or stand.

## TOM SWAMP BLOCK

### COMPARTMENT I

- T 1 A Transition Hardwood Type; Age 50; Area 22.6.
- T 1 B1 Shelterwood (Two-cut)  
Pure Pine; Age 60.  
Preparatory Cutting 1910-11; Final Cutting 1916-17; Supplementary Planting, Scotch Pine 500 2-0 and Red Pine 400 2-0 in 1918; White Pine 1125 2-3 and Red Pine 2625 2-3 in 1919; Weeding 1st 1921, 2nd 1923.
- T 1 B2 Shelterwood (Two-cut)  
Pure Pine; Age 60.  
Preparatory Cutting 1908-09; Final Cutting 1914-15; Supplementary Planting White Pine 3000 2-2 in 1917; Weeding 1st 1921, 2nd 1923.  
(Present sapling hardwood largely from advance growth under parent pine stand).
- T 1 B3 Group Cutting.  
Pine and Hardwood; Age 60.  
Cut 1909-10; Weeding 1916.
- T 1 C Clear Cutting (Mixed stand by supplementary planting).  
Pure Pine; Age 63.  
Cut 1922-23.
- T 1 B1 Sample Plot (Density controlled by periodic thinnings).  
Transition Hardwood Type following pure pine cut in 1916-17.

### COMPARTMENT II

- T 2 A1 Clear Cutting in Seed Year.  
Pine and Hardwood; Age 60; Area 3.75.  
Cut 1908-09; Weeding 1st 1912, 2nd 1915-16; 3rd 1919.

- T 2 A2 Strip Cutting.  
Pine and Hardwood; Age 60; Area 1.5.  
Cut 1909-10; Weeding 1st 1913.
- T 2 D Clear Cutting (With Supplementary Planting).  
Pine and Hardwood; Age 70; Area 1.9.  
Cut 1919-20; Supplementary Planting Red Pine 750 2-3 in 1922; Weeding 1st 1923.
- T 2 B Improvement Cutting.  
Pine and Hardwood; Age 40; Area 3.6.  
Release Cutting 1913 3 acres, 1923 .75 acres.
- T 2 A1 Sample Plot (Density controlled by periodic thinnings).  
Transition Hardwood Type following pure pine cut in 1908-09.

### COMPARTMENT III

- T 3 H Strip Cutting with Reserves.  
Pure Pine; Age 60; Area 1.5.  
Cut 1910-11.
- T 3 B Clear Cutting Groups in Seed Year.  
Pure Pine; Age 60.  
Cut 1911-12.
- T 3 D Clear Cutting (With Supplementary Planting).  
Pine and Hardwood; Age 65.  
Cut 1922-23 and 1923-24.

### COMPARTMENT IV

- T 4 A Pine, Hemlock and Hardwood Type; Uneven age; Area 14.6. (Managed as selection forest).
- T 4 H Pine and Hardwood Type; Age 65; Area 3.3.  
(Excellent quality of pine growing with hardwood in even-aged stand).
- T 4 D Clear Cutting.  
Transition Hardwood and Hardwood Swamp; Age 60-70; Cut 1910-11; Weeding 1st 1914.
- T 4 C1 Shelterwood (Two-cut)  
Pure Pine; Age 60;  
Preparatory Cutting 1911-12; Final Cutting 1917-18; Supplementary Planting Red Pine 1950 2-3 in 1919; Weeding 1st 1920 and 21; 2nd 1923 and 1924.
- T 4 C2 Shelterwood (Two-cut)  
Pure Pine; Age 60.  
Preparatory Cutting 1911-12; Final Cutting 1917-18; Weeding 1st 1920; 2nd 1923 and 1924.
- T 4 K Clear Cutting (With Supplementary Planting).  
Pure Pine, Pine and Hardwood, Transition Hardwood; Aged 60-70;  
Cut in 1923-24.
- T 4 U Clear Cutting ((With Supplementary Planting)  
Transition Hardwood (Chestnut and Ash);  
Age 60; Area 1.4.  
Cut 1919-20; Supplementary Planting Red Pine 1150 2-3 in 1921; Weeding 1st 1923.

COMPARTMENT V

- T 5 E Strip Shelterwood (Small Scale Demonstration).  
Pure Pine; Age 60.  
Preparatory Cuttings 1911-12, 1917-18, 1922-23;  
Final Cuttings 1917-18, 1922-23; Weeding  
1st 1920, 2nd 1924.
- T 5 C Improvement Cutting and Final Cutting (In-  
cluded Clear-Cut Groups, Thinning 40-year  
pine, Selection Cutting and Release).  
Pure Pine, Pine-Hardwood, Hardwood Swamp, and  
Transition Hardwood; Age 40-100; Area  
15.00; Cut 1909-10.
- T 5 B Cordwood Cutting (Conversion to Mixed Conifers  
by planting).  
Transition Hardwood; Age 35; Area 5.0.  
Cut 1923-24;  
(Transition hardwood stand, the density of  
which was greatly reduced due to death of  
chestnut, the predominating species).
- T 5 O Plantation.  
Red Pine 2-3; 6'x6'; Area 1.0; 1922.

COMPARTMENT VI

- T 6 N Improvement Cutting  
Pine and Gray Birch; Age 35.  
Release Cutting on adjoining areas 1909-10,  
1912-13, 1913-14.

COMPARTMENT VIII

- T 8 A Spruce Bog Type; Age 45-55; Area 40.5.
- T 8 B1 Gray Birch Type; Age 20-30; Area 30.0.  
(Result of a burn on cut-over land about 1900).
- T 8 B2 Plantation  
White Pine 2-0, 6'x6'; Area 1.00; 1923  
(Underplanting very open stand of gray birch on  
light soil).
- T 8 B3 Plantation  
White Spruce 2045 3-0; 5'x5'; Area 1.22; 1924.
- T 8 F1 Plantation  
Red Pine 2-3, 6'x6'; Area 1.5; 1921.
- T 8 F2 Plantation  
Scotch Pine 2-0, 6'x6'; Area .5; 1921.  
(Heavy Ericacious ground cover).
- T 8 F3 Plantation  
White Spruce 3-0, 5'x5'; Area .84; 1924.

The whole of the Tom Swamp Block with two hundred acres  
of adjoining land is a State bird sanctuary and game refuge.

The Tom Swamp Annex, adjoining Compartment VIII on the  
north, is a tract of exceptionally fine softwood timber loaned by the  
New England Box Company for experimental purposes.

Along the borders of the pond, public roadsides, islands, and  
ledgy summits a total of forty-three acres is reserved for scenic  
purposes.

SLAB CITY BLOCK

COMPARTMENT II

- S 2 B Coppice With Standards  
Hardwood Swamp; Age 40-50; Area 1.8.  
Cut 1910-11.
- S 2 A Sample Plot (Periodic Thinning to Stimulate In-  
crement).  
Pure Pine; Age 40; Area Plot .45, Control .48.  
Thinning October 1912, November 1920.

COMPARTMENT III

- S 3 B Shelterwood (Two-cut)  
Pure Pine; Age 60; Area 8.9.  
Preparatory Cutting 1912-13; Final Cutting 1918-  
19; Supplementary Planting Red Pine 1725  
2-2 and White Pine 2200 2-2 in 1921; Weed-  
ing 1st 1923 and 1924.  
(Satisfactory natural reproduction largely de-  
stroyed by Pales weevil).
- S 3 A Pine-Hemlock-Transition Hardwood Type; Un-  
even aged, culled old growth.  
(Reserved as example of this type).

COMPARTMENT IV

- S 4 A Pure Pine Type; Age 60; Area 30.5.
- S 4 C Hemlock-Transition Hardwood Type; Age 60;  
Area 1.9.

COMPARTMENT V

- S 5 F Pine-Hemlock Type; Age 70; Area 2.7.  
(Stand per acre on 1/2 acre strip 70M).
- S 5 K Pure Pine Type; Age 50; Area .9.  
(Over-stocked showing stagnation).
- S 5 C Cleared Strip (With Seed Trees and Supplement-  
ary planting).  
Pure Pine; Age 60; Area 5.7.  
Cut in 1912-13 and 1913-14; Supplementary  
Planting 1915; Weeding 1st 1919, 2nd 1923.
- S 5 G Improvement Cutting  
Pine-Gray Birch; Age 25  
Release Cutting 1912-13.

COMPARTMENT VII

- S 7 A Clear Cutting (With Supplementary Planting)  
Pure Pine; Age 65; Area 3.5.  
Cut 1923-24;  
(Yield 171,000 board feet).

COMPARTMENT VIII

- S 8 D Salvage Cutting  
Transition Hardwood; Aged 45; Area 6.4.  
Dead and diseased chestnut cut 1920-21.
- S 8 C Pine-Hemlock-Transition Hardwood Type; Un-  
even age; Selection forest in ledges.

### COMPARTMENT X

- S 10 N Pine-Hemlock-Northern Hardwood Type; Un-even aged;  
(Reserved as sample of virgin forest).
- S 10 I Clear Cutting (With Supplementary Planting)  
Pure Pine; Age 60; Area 4.4.  
Cut 1913-14; Supplementary Planting White Pine 2-1 in 1915; Weeding 1st 1920, 2nd 1923 and 1924.
- S 10 D Improvement Cutting  
Pine Gray Birch; Age 30.  
Release Cutting 1923-24.

This block is widely known as the "Barre Woods." On account of the public resort to it, a margin from 50 to 100 feet along the state road is reserved from cutting.

### PROSPECT HILL BLOCK

#### COMPARTMENT I

- P 1 K Plantation (On Abandoned Pasture).  
White Pine 2-0, 2-1, 2-2; 6'x6'; Area 1.50; 1911.
- P 1 M Plantation (On Cordwood Cutting of 1915-16)  
White Pine 2-2; 6'x6'; Area .35; 1917. Weeding 1920.
- P 1 D Plantation (On Cordwood Cutting of 1919-20)  
European Larch 3-0; 6'x6'; Area 1.40; 1921.
- P 1 H Plantation (On Cordwood Cutting of 1921-22)  
Red Pine 2-3; 6'x6'; Area 1.00; 1922.
- P 1 A1 Plantation (On Abandoned Pasture)  
Scotch Pine 400 2-0 and White Spruce 990 3-0;  
5'x5'; Area 1.03; 1924.
- P 1 A2 Plantation (To Study Influence of Character of Parent Tree on Planting Stock)  
White Pine 3-0; Each Group of seedlings from a single parent tree; Nos. 3 and 4 open grown, No. 2 on margin of woods, No. 5 dominant tree in good sixty-year-old stand, No. 6 co-dominant tree in good sixty-year-old stand; No. 1 old second growth with crown above hardwood stand. 1924.
- P 1 A3 Plantation (On Abandoned Pasture)  
Japanese Spruce 550 2-2, White Spruce 3826 3-0;  
5'x5'; 1924.
- P 1 Plantation (On Mowing)  
Red Pine 415 2-1 and White Spruce 415 3-0  
(selected) 5'x5' in groups; 1924.

#### COMPARTMENT II

- P 2 I Plantation (On Abandoned Pasture)  
White Pine 2-1; Area .53; Fall Planting 1909, 1911.

- P 2 J1 Plantation (On Cordwood Cutting 1918-19)  
Red Pine 2-3; 6'x6' Area 2.82; 1919; Weeding 1st 1921, 2nd 1923.
- P 2 J2 Plantation (On Cordwood Cutting of 1921-22)  
Scotch Pine 1070 2-0 and White Spruce 1100 3-0;  
Area 1.23; 1924.
- P 2 H Plantation (On Cordwood Cutting of 1922-23 and 1923-24)  
(Groupwise Mixed Coniferous Plantation)  
Hemlock 1600 2-2, White Spruce 1600 3-0, White Pine 1600 2-1; 5'x5' in groups of 16 trees; 1924.
- P 2 B1 Plantation (Orchard-Mowing)  
White Spruce 1800 2-1 and White Pine 900 2-1;  
5'x5'; Two rows of spruce to one pine; 1924.
- P 2 B2 Plantation (On Mowing)  
White Spruce 1700 3-0 and White Pine 1700 2-1;  
5'x5'; in Groups of 16; Area 1.88; 1924.
- P 2 B3 Plantation (On Abandoned Pasture)  
White Spruce 1200 3-0 and White Pine 400 2-1;  
5'x5'; Three rows of spruce to one of pine; 1924.

#### COMPARTMENT III

- P 3 A1 Plantation (On Abandoned Pasture)  
White Pine 2-1; 6'x6'; Area 1.00; 1911 and 1913.
- P 3 A2 Plantation (On Abandoned Pasture)  
Scotch Pine 1-1, 1-1-1, 1-2; 6'x6'; Area .77; 1912, 1913; (Many trees died as result of girdling by mice under heavy snow in 1917).
- P 3 M Plantation (On Abandoned Pasture)  
Western Yellow Pine 1-2; 6'x6'; Area .47; Southern California Seed; 1915.
- P 3 A3 Plantation (On Abandoned Pasture)  
White Pine 2-0; 6'x6'; Area 3.75; 1909.
- P 3 B Plantation (Under Sprout Hardwood)  
Norway Spruce 2-1; 6'x6'; Area .50; 1913.
- P 3 J Plantation (On Mowing)  
(Spacing experiment to study effect of various planting distances).  
White Pine 2-2; Area 1.10; Spacings 6'x6', 5'x5', 4'x4', and 3'x3'; 1916.
- P 3 L Plantation (On old field).  
White Pine 2-2; Area .74; 6'x6'; 1916.
- P 3 F1 Plantation (On Abandoned Mowing-Orchard)  
Red Pine 2-3; Area 1.50; 6'x6'; 1922.
- P 3 F2 Plantation (On Recently Abandoned Garden Site)  
White Pine 2-1; Area .70; on land last cultivated in 1917; White Pine 2-1; Area .20; on land used as a garden in 1921.



#### COMPARTMENT IV

- P 4 D Plantation (On Abandoned Pasture with Much Natural White and Pitch Pine).  
White Pine 2-0 and 2-2; Area 13.90; 1910, 1911, 1912, and 1913.
- P 4 L Plantation (On Abandoned Mowing).  
Western Yellow Pine 1-2; 6'x6'; Area .59; 1915.

#### COMPARTMENT V

- P 5 R Plantation (On Abandoned Pasture).  
(Experimental Mixture of Several Coniferous Species Planted by Mattock Hole, Slit with Sod On, and Slit with Sod Off Methods to Determine Effect of Planting Method on Survival).  
White Pine 2-1, Scotch Pine 1-1, Douglas Fir 2-1, Norway Spruce 2-1, Western Yellow Pine 2-1; 1913. (In 1918 little or no difference due to planting method was discernible).
- P 5 P Plantation (On Abandoned Pasture).  
(Small areas on progressively higher and drier sites to determine effect on growth).  
European Larch 2-1 and 2-1-1; Area 3.00; 1915.  
(Plantations seriously damaged by porcupines in 1921, 1922 and 1923. In 1923 twenty-one porcupines were killed on and adjacent to these areas).
- P 5 H Plantation (On Abandoned Pasture)  
Norway Spruce 2-2 and 3-1; 6'x6'; Area 3.10; 1916.  
Norway Spruce 2-3; 6'x6'; Area 2.2; 1919.
- P 5 W Plantation (On Abandoned Pasture)  
White Pine 2-2; 6'x6'; Area .8; 1929.  
Red Pine 3-2; 6'x6'; Area 1.75; 1920.

#### COMPARTMENT VI

- P 6 C Plantation (On Pasture Grazed for One Season after Planting).  
Red Pine 2-1 and White Pine 2-1 and 1-2; 6'x6'; Area 12.00; 1915.
- P 6 H Plantation (Under Sprout Hardwood)  
Norway Spruce 2-2, 6'x6'; Area .55; 1916.

#### COMPARTMENT VII

- P 7 C Plantation (On Abandoned Mowing)  
Scotch Pine 1-2; 6'x6'; Spring and Fall 1915.
- P 7 V Plantation (On Abandoned Mowing)  
European Larch 2-0, 1-1, 1-2; Area .83; 1914.  
(Some trees killed by porcupine 1922).

#### COMPARTMENT VIII

- P 8 K Plantation (On Abandoned Mowing).  
Norway Spruce 2-1; 6'x6'; Area .25; 1913.  
(For comparison with plantations made in same year under sprout hardwood, see P 3 B).
- P 8 W Plantation (Under Sumach).  
Scotch Pine 2-1 and White Pine 2-2; 6'x6'; Area .41; 1913.  
(Many groups of trees killed by mound building ants).

Prospect Hill, the highest point in Petersham, is by request of the previous owner, to be kept forever open.

