



THE HARVARD FOREST, 1961-62

Harvard University

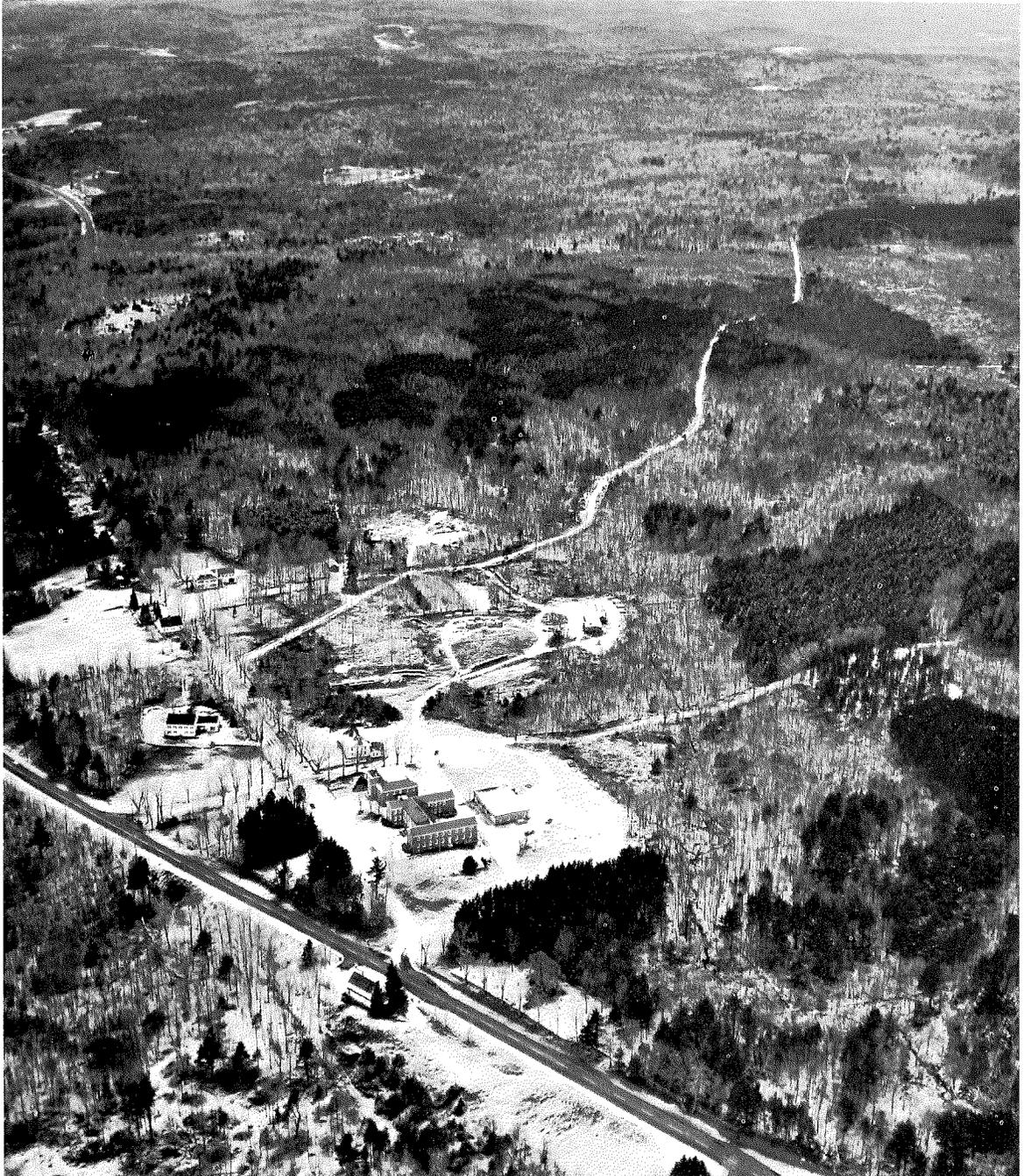


Photo by Martin H. Zimmermann, 1962

HARVARD FOREST

STAFF

The technical staff of the Forest consists of Dr. Ernest M. Gould, Jr., Forest Economist, Mr. Walter H. Lyford, Soil Scientist, Dr. William F. Murison, Forest Biologist, Mr. Jack J. Karnig, Forest Manager for both the Harvard and Black Rock Forests, and myself. Miss Barbara M. Kelley has continued as business secretary and librarian, Mrs. Marion S. Hambleton as secretary, and Mrs. Dorothy B. Waid as half-time assistant in the library. Mr. Charles F. Upham is superintendent of woods operations.

A GIFT OF LAND

Approximately 150 acres of land came to the Forest during the winter, as a generous gift from Mr. John L. Waldo, Jr., of Dartmouth, Massachusetts. This land lies along the Tom Swamp Road east of the Nelson Road, thus adjoining Compartment IV of our Tom Swamp Tract. It will be useful to us for several reasons. Its location makes it readily accessible and easily administered as part of an already existing unit. The Tom Swamp Tract as a whole has proved to have an excellent array of forest types and sites for research, and this new area is a welcome extension of these northward along the slopes that dip westward into the nearby valley. The upper part of the newly acquired land contains several acres of open pasture. This is a particularly desirable feature because the Forest has not had for many years any open land for experimental plantings.

WOODS OPERATIONS AND BUILDING IMPROVEMENTS

Although there was much snow during February and March, woods operations were not impeded so much by the winter as they were in the preceding year. The cold was not so intense, and it was possible to keep necessary woods roads open. Some of our winter difficulties were obviated by the fact that most of the season's operations were quite near the Headquarters Buildings.

Woods operations were performed on 71 acres in the course of the year. About 60 acres of these were in natural stands and the remainder were in coniferous plantations. In the natural stands the operations were combined thinning, improvement and salvage cuttings, yielding about 225 cords of fuelwood and about 50,500 board feet of sawlogs. From thinnings and weedings in the plantations came another 57 cords of wood and about 17,500 linear feet of poles and posts. A small underplanting of spruce was made in a stand of white ash in Compartment II of the Prospect Hill Tract. Although operations in the Forest have been widely scattered in all the three main tracts, a notable feature has been the work in Compartment IX of the Prospect Hill Tract, where nothing had been done for many

years. A road was opened to make the area accessible, and a general plan was made to serve probable future needs for the use of the compartment.

The principal building improvements and alterations made during the year were in Shaler Hall. Increased research activities in the last few years, notably by the personnel of the Cabot Foundation, have occupied nearly all of the laboratory facilities that were available in the building. With the advent of Mr. Lyford's research in soils and Dr. Murison's work in problems of tree nutrition it became necessary to provide an additional laboratory. This was done by adapting a basement room for the purpose. Most of the essential equipment was already at hand, so that a satisfactory laboratory could be made at modest expense. At the same time our photographic darkroom, also in the basement, was improved to meet the needs of greatly increased use. Other improvements in the building included refinishing several dormitory rooms.

STUDENTS AND VISITORS

Approximately 350 persons visited the Forest during the year for research or for demonstrations of various phases of the research in progress here. One of the Forest's more valuable assets is its facility for lodging and feeding such people. This makes possible evening discussions with staff and students, all of whom live in the immediate vicinity. Nearly half of the visitors mentioned above took advantage of these opportunities.

One graduate student was in residence during the year, and two new ones came in June of 1962 to remain for the academic year 1962-63. One of these is a graduate of the forestry school of the University of Oklahoma, and the other is from the State Forest Service of India.

CONFERENCE ON FOREST PRODUCTION

The eighth Harvard Conference on Forest Production was held at the Forest October 15-27, 1961. Fifteen professional foresters were in attendance, and six invited guests took part in the discussions. The first four Conferences (1953-56) were devoted to the theme: "Forestry in Transition," wherein the assumption was made that America was approaching the need to produce more of its wood by cultural means. It soon became obvious that uncertainties due to imperfect knowledge, and the economic problems raised by the intensified management that would be needed in this cultural production, were of overwhelming significance. Consequently the next three Conferences (1957-59) were reoriented to the question of investment analysis as applied to the forest resource. These discussions brought out the fact that only recently have forest land owners, either public or private, begun to question seriously how much labor, capital and management can be used effectively with land in long-run forest production. They demonstrated that the technical knowledge needed to choose the most efficient combination of these factors is usually

deficient or lacking, and that there was serious doubt whether our present economy could support the production of wood by cultural means, especially in light of increasing demand for other uses of forests and forest land.

Thus it was realized that the problem of investment in forest production in America is rapidly emerging as only a part of a larger and more complex problem of investment in forest land management for a multiplicity of purposes. These include, in addition to the production of conventional and new wood products, the manipulation of cover to affect water supply, forage for wild and domestic animals, and the development of land for aesthetic values, recreational facilities, or living space. Some of these purposes are easily compatible while others are in conflict, and the ability of forest land managers to achieve them concurrently needs careful appraisal. No Conference was held in 1960, but when the eighth was convened in 1961 its theme was the broadened view of the investment problem just mentioned.

Members of the Conference were representatives of both federal and state public services: the Soil Conservation Service, the U. S. Forest Service, and the state conservation departments of Rhode Island and New Jersey. There were also four men from the pulp and paper industries, and one from the Canadian Forest Service. Geographically they represented the eastern states from Maine to Mississippi and Georgia, and came from as far west as Utah. There is now a roster of 116 "alumni" from the eight Conferences held thus far.

THE CHARLES BULLARD FELLOWS

The first awards of Charles Bullard Fellowships at Harvard were made in the spring of 1962. The purpose of this fellowship program is to support advanced research and study by men who show promise of making an important contribution, either as scholars or administrators, to forestry and forest management. These subjects are here defined in their broadest aspects -- scientific, economic, political, administrative, and legal. The required qualifications for candidates, and the research and study programs for fellowship recipients, are written broadly. Seven Fellows were awarded grants for the fiscal year 1962-63, and the first of them arrived early in September. One of them will use the Harvard Forest as his study center, and others will spend varying periods of the year here.

RESEARCH

Dr. Gould prepared two research papers during the year, both based on his past and current research. The first, entitled "Forest policy and economics," was presented at a meeting of the New England Section of the Society of American Foresters in March and has been published in the Proceedings of that meeting. The second, on "Recreation and forestry," was presented at a meeting of the Western Farm Economics Association at Reno, Nevada, in August. It has been published as Harvard Forest Paper no. 6. His work with the Forest Service

during his year's leave in California was concerned with the growing use of National Forest lands for recreation purposes, and after his return here in September he completed the manuscripts of three papers resulting from this research. He also attended two conferences on recreation research, one in Washington and the other in Berkeley. In the local scene he has collaborated with Mr. Lyford of the Forest staff and Dr. Wilson of the Cabot Foundation in designing a basic study of the growth and development of individual trees. This is a continuing program. He has made some notable improvements in the time and materials record system of the Harvard Forest, and has had a large share in an extensive reappraisal being made by the Forest staff of research opportunities at the Harvard Black Rock Forest. More will be said about this reappraisal in another part of the present report.

Mr. Lyford has completed the final draft of a manuscript on the soils, landforms and forest vegetation of Compartment I of the Tom Swamp Tract. This paper deals with certain of the Harvard Forest soils that contain a "fragipan" horizon which impedes drainage. He has begun a similar study in Compartment VIII of the Prospect Hill Tract, where the soils do not have this horizon. In the course of these general programs he has done some useful research on methods for determining the amount and distribution of stones and boulders in the soil. Data derived from such studies are significant in the assessment of moisture and nutrient availability. He has also made some detailed studies of faunal activity in the forest soils, notably that of ants. Ants move fine materials from deeper horizons to the surface, and their activity in doing so is great enough to affect appreciably the rate and kind of soil genesis. Apparently this process has not been studied previously. Mr. Lyford has continued his measurements of depths to water tables in several parts of the Forest.

Dr. Murison has made critical studies during the year of two areas of land that are detached from the main parts of the Harvard Forest. One of these is the Schwarz Tract in the westerly part of the town of Petersham, given to the University in 1928 for the purpose of developing the aesthetic aspects of forest management. The other is in the town of Hamilton, Massachusetts, where we have about 60 acres of plantations, most of them in exotic conifers. Dr. Murison has resurveyed these tracts, assessed their present conditions, revised plans for their management in terms of their intended purposes, and has supervised the work of students brought in for the summer to put the plans into practice. At the Black Rock Forest he has begun an experiment with pitch pine to determine the effect of seed source upon the growth behavior of this species in that area. At the same time he has taken a share of the general survey of research facilities and resources of the Black Rock Forest. At the Harvard Forest he has had a large part of the responsibility for maintenance of the long-term research program in management, planning the thinnings and improvement cuttings that constantly go forward in our plantations and natural stands of trees. Out of his studies of the Schwarz Tract, as well as from his personal interests, has come a short essay on some basic elements of aesthetics that are involved in the management of wild land for recreation purposes.

The Cabot Foundation continued to use the facilities of the Forest for its research program. Dr. Martin H. Zimmermann pursued his work on the translocation of sugars in the phloem tissues of trees. An additional appointment to the Foundation staff was made during the year in the person of Dr. Brayton F. Wilson, who came to the Forest in September 1961. His research is concerned with observation and experiment on the production of wood by the cambial tissues in trees. During the year an article by Dr. Wilson on "A survey of the incidence of ring shake in eastern hemlock" was published as Harvard Forest Paper no. 5.

H A R V A R D B L A C K R O C K F O R E S T

The Harvard Black Rock Forest is owned and administered by a separate educational corporation in New York State. It is supported by funds held in trust for the purpose by the President and Fellows of Harvard College.

Locally the Forest is supervised by Mr. Jack J. Karnig, Forest Manager. Woods operations and research are planned in consultation with Harvard Forest personnel who have visited Black Rock frequently during the year. Cutting and other work in the woods was done by local contractors except for that carried out by one half-time employee.

W O O D S O P E R A T I O N S

During the first half of the year woods operations remained at a normal level, and the fuelwood cut was about 170 cords. The contractor then suffered an accident that effectively stopped operations for several months. The work consisted of marked thinnings and improvement cuttings. In July, August and September of 1961, and again in the summer of 1962 the contractors were employed chiefly in the repair and maintenance of the Forest's roads.

R E S E A R C H

In the spring of 1961 some experimental plantings of Norway spruce trees were made under a heavily thinned hardwood stand. In the spring of 1962, 3000 additional seedlings, this time of white spruce, were obtained without cost from the New York State Department of Conservation and planted in a hardwood thinning area in Compartment IV. The planting was preceded by poisoning of stump sprouts to reduce hardwood competition with the young spruce.

A small tree nursery was started during the year to further a seed source provenance experiment with pitch pine. This pine occurs naturally in the Black Rock Forest, but only in poor form on the rocky tops of the higher hills. Seeds from better-formed trees were acquired from two sources in New Jersey and one from Cape Cod, and these were planted in the nursery along with those from the

local source. Ultimately seedlings from all the origins will be outplanted in each of them, and the results compared as the trees grow.

Detailed studies of growth in thinned hardwood stands begun in the early spring of 1961 were continued and expanded. Measurements are being made by means of simple calibrated metal bands fixed to the trunks of the trees. A long transect was drawn, beginning at Cornwall-on-Hudson which is at the foot of the north slope of the Hudson Highlands. It then passes over the hills of the Black Rock Forest, into a deep valley south of the Forest, and into the West Point Military Reservation which adjoins the Forest on the south. To date fourteen plots have been sampled along this line, using red oaks as the trees to be measured for comparison of the possible effects of altitude and other factors. Measurements of growth are made every two weeks.

Several experiments were carried out during the summer of 1961 in the use of foliage sprays for the control of hardwood sprout growth. There is now not much question of the biological effectiveness of some of these hormone-like solutions for selectively controlling the form and species content of forest stands. However, the economy of their use is still conjectural. Whether they can be used at a reasonable cost will depend upon their levels of effectiveness under varying methods of application, on different kinds of trees growing on a variety of sites, and on the season of the year in which they are used. These experiments were made with student help which was employed in the summers, and careful records were made for future observation and comparison.

A combined effort on the part of the staffs of both Forests was begun during the year to gather data for a general analysis of the Harvard Black Rock Forest. This rather comprehensive study is designed to provide a systematic evaluation of all of the Black Rock Forest's resources, with a view to evolving a set of management objectives for the foreseeable future. The outline of procedure calls first for a study of the significance of the location of the Forest with respect to the dense concentration of population in coastal Connecticut, New York and New Jersey, and also with respect to the rapidly developing suburbanization of the region with its attendant transportation facilities. Second, it will deal with the space, soil, water and forest resources of the Forest itself, their history and present condition in relation to present and probable future use. Third, it will attempt to assess the value of existing improvements such as roads, buildings and operating equipment. Fourth, it will try to measure existing financial resources against existing and immediate needs. Finally it will review the research and educational functions of the Black Rock Forest, try to identify and evaluate past trends, and attempt to define alternative plans for the use of available resources during the next decade. Choice can then be made of the plan most likely to promote the research and educational aims of the Forest most effectively.

Hugh M. Raup
Director