1-1-1954

RESEARCH In the LAKE STATES

Joseph H. Stoeckeler

Iowa State University

Follow this and additional works at: https://lib.dr.iastate.edu/amesforester

Part of the Forest Sciences Commons

Recommended Citation

Available at: https://lib.dr.iastate.edu/amesforester/vol41/iss1/3

This Article is brought to you for free and open access by the Journals at Iowa State University Digital Repository. It has been accepted for inclusion in Ames Forester by an authorized editor of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
RESEARCH in the LAKE STATES

By JOSEPH H. STOECKELER

Forester-in-Charge

Northern Lakes Forest Research Center

Lakes States Forest Experiment Station

The Northern Lakes Forest Research Center was established July 1, 1946 at Rhinelander, Wisconsin, for the specific purpose of studying forest management problems in northern Wisconsin. It is a part of the Lake States Forest Experiment Station, St. Paul, Minnesota, one of the nine regional forest experiment stations of the United States Forest Service. The work of this research center is correlated with that of three others in Minnesota and Michigan by the regional experiment station in a manner designed to bring about regional solutions of the problems of managing different forest types. The regional approach is necessary since forest type boundaries have no relation to state boundaries, but are largely determined by climate and soils, and modified by fire and cutting.

What Are the Forest Management Problems?

Probably the most important forest management problem in this area is the determination of cutting methods in the various forest types which will promote good growth and assure adequate natural regeneration if at all possible. A prime consideration in species used for veneer and sawlogs is the promotion of quality increment. Of specific interest in northern Wisconsin are the northern hardwood, pine, balsam fir, and mixed coniferous swamp types. An important facet of the work is the evaluation of site potential, particularly as it relates to rotation age.

The reforestation of idle or understocked acres presents problems of species adaptation, site selection, ground preparation, age class performance, plantation care, and evaluation of insect, disease, mammal and other pests.

Forest nurseries have very specific problems of fertility, sowing, density, watering, weed control, and soil crop adaptability.

Farm forestry is a whole field of research in itself because it involves not only purely technical silvicultural considerations, but also a problem of demonstrating such principles and selling them to owners of small forest tracts.

Guiding the general scope of the research undertaken at the center, and evaluating priorities, is an Advisory Council which meets annually. It is composed of about 10 members representing the pulp and paper, sawmill, and veneer industries, the state extension forester, conservation department, agricultural experiment station, state university, and the federal Indian Service and administrative branch of the Forest Service.

Forest Management Studies

At the Northern Lakes Forest Research Center the work is concentrated on management problems in second-growth northern hardwoods, in the balsam fir-spruce type, in aspen, in mixed coniferous swamps, and in jack pine.

In second-growth hardwoods, cutting methods, stocking levels, length of cutting cycles, and timber stand improvement measures, such as cull removal and thinning, are being studied. The cutting methods and stocking level study involves group selection, border strip cuttings 82-feet wide, clear cutting in 10-acre blocks, 8-inch stump diameter cuttings; it includes light, medium, and heavy selection cuts with residual basal areas after logging of 90, 75, and 60 square feet per acre, of trees of 5-inch diameter class and larger.

A separate study involves testing relative silvicultural and economic merits of 5-, 10-, and 15-year cutting cycles in second-growth hardwoods.

Removal of cull trees, especially hardwoods, by felling, axe girdling, power saw girdling, and by chemicals is under trial as are intensities of thinning.

Two-storied forests of aspen over balsam fir with occasional admixture of white or black spruce are rather common in the Lake States and there is a major test of cutting in such a stand where the overstory was about 37 years old at time of logging. The experiment includes (1) complete removal of the overstory, (2) partial removal by marking about half the volume including cankered trees (Hypoxylon), and (3) designation cutting, removing trees that would make three 100-inch sticks and two 100-inch sticks of pulpwood respectively.

In a separate experiment the center, with the help of the Supervisor's staff of the Nicolet National Forest, is testing out partial cutting of rather pure aspen type with emphasis on cutting from below and removing about 50 percent or more of the cordwood volume. This shows promise of excellent growth response—the five-year remeasurement indicating around 0.1 cord
per acre per year increase for every cord left. This particular trial also involved a test of marking trees to leave, rather than those to be cut, with the idea of reducing marking costs and focusing maximum attention on the growing stock to be left and on the attributes of each individual residual for proper spacing, crown vigor, growth potential, and freedom from disease or insects.

Another test involves thinning of young aspen below commercial growth size with the purpose of increasing quantity and quality of growth.

A newly installed study involves the concept of trying to extend the life of an older balsam fir-white spruce stand by partial cutting in an attempt to obtain more complete stocking of pulpwood species and to increase the percentage of the highly desired spruce. This trial includes a light selection cut, a group selection cut, and a heavy selection cut.

In the mixed conifer swamp type there is one project on thinning in a 65-year-old white cedar-balsam fir-black spruce stand. This project is carried out in cooperation with the Wisconsin Conservation Department near Pembine, Wisconsin. The original stocking of about 1500 trees per acre was cut back to around 770, 950, 1120, and 1260 trees per acre respectively on plots replicated four times. The thinning space between trees expressed in percent of total height ranges from 20 to 25 percent of total height of average dominant. This trial showed that thinning guides based on percent of total height of average dominant trees are applicable only in very even-aged, even canopied forests. Number of trees or basal area of residual stand works out better as a field marking guide in many stands.

Thinning of dense young jack pine—especially by mechanical means—is being investigated in cooperation with the Nekoosa-Edwards Paper Company at Port Edwards, Wisconsin. Time studies with recently devised brush cutting power saws have revealed that it may be possible to reduce per acre costs by as much as 50 percent compared with hand methods. Such saws may, therefore, give great impetus to the large scale early treatment of young overdense stands in forest areas which are smooth to gently rolling in topography and where there is not an excessive amount of windfall and large surface boulders.

A trial thinning of dense 23-year-old white spruce plantings is under way on the Menominee Indian Reservation. The stand of 3800 trees per acre was reduced to 750, 1,000, 1,250, 1,500, and 1,750 trees per acre.

Nursery Studies

In past years there have been under way a considerable number of nursery experiments dealing with density of sowing, root and top pruning, fertilization, weed control by chemical means, and adaptations of leguminous soilings crops to sandy acid soils located in cool climates.

Results from our density-of-sowing studies have been directly instrumental in bringing about a reduction in sowing density of conifer seedbeds in the Lake State nurseries. Formerly the densities in conifer beds were often in the range of 100 to 150 trees per square foot. These have now been reduced to 50 to 75, as a

Peeled Aspen on the Argonne Experimental Forest.
Reforestation and Regeneration Problems

The research center has some 500 acres of experimental plantations in the northern Wisconsin vicinity in which various tree species and age classes are under test on a wide variety of soil and cover conditions. The bulk of these tests were established in the late 30's by help of the Civilian Conservation Corps and have already yielded useful information on species and site adaptation, survival and early growth rate, and response to various intensities of removal of overstory aspen, paper birch, and scrub oak.

Tests are under way to determine the influence of seed source on development of spruces, and jack pine, and to discover the value of hybrids of several pine and aspen species developed by the Institute of Forest Genetics at Placerville, California and the Maria Moors Cabot Foundation at Harvard University, Petersham, Mass.

Another aspect of the problem of restocking forest lands is how to obtain natural regeneration. Several tests have been made which involve some aids such as exposing mineral soil by use of heavy disks drawn by a crawler tractor. There are now quite a number of instances in sod-bound and brush-covered understocked stands, on level to slightly undulating terrain, where as many as 50 to 185 thousand first-year seedlings per acre were obtained by disking shortly before seed fall.

Farm Forestry

Small forest tracts owned by farmers and others offer a special problem to the forestry profession—not only to the researcher but even more so to the extension foresters, state and conservation district foresters and any others who may on occasion be called on to give advice and guidance on management of small woodlands. In many instances, the landowner has only a hazy notion of the elements of forest management and marketing, and may live in an area where no private consulting forester is available for help.

In Wisconsin the problem of demonstration, extension, and research in farm forestry is being tackled by joint efforts of the state extension forester, district foresters of the Wisconsin Conservation Department, county agents, and personnel of the research center.

As an attempted solution of the problem, the state extension forester, and the research center have selected some 10 different tracts, generally state owned, and ranging from 20 to 75 acres in size which are dedicated as Timber Harvest Forests. They are sometimes referred to as “Farm Forestry Demonstration Forests.” The tracts average about 40 acres in size, “size that happens to be about the average of farmer-owned woods in this area. The timber types selected generally are mixed hardwoods, oak, red pine, or white pine, because they are amenable to repeated cuts at rather short intervals.

Each tract is subdivided into 5 to 8 compartments. Annually one compartment on each tract is marked to
remove a volume equivalent to slightly less than the average computed growth on the tract as a whole. The marked timber is logged and decked up by a local farmer or logger within the compartment where it was cut. Records are kept of logging costs including man-hours, machine-hours, and horse-hours. Detailed records of growth and mortality are kept on some 10 to 25 1/5-acre growth plots sampling the area.

Simultaneously publicity regarding the date, place, and purpose of a "field day" is activated by means of posters, newspaper releases, radio, and mimeographed announcements, sent out by the several cooperating county agents. These "field days" are staged for the benefit of farmers and other owners of small forest tracts. The proceedings last about two hours, during which foresters and county agents explain, in everyday language of the layman, the purpose of the compartmentation, the improvement basis of the cutting, the need for leaving an adequate amount of good growing stock, and the dollar earnings made per man-hour of labor; on occasion information may be given on how to cut the trees for best log grade, and where to market the material.

The timber tract is likened to a small "lumber and cellulose producing factory" where the farmer, in his off season, can very profitably employ himself as a logger for some 60 to 140 man-hours per annum, without impairing the capital value. In other words, he is harvesting only about 80 or 90 percent of the annual growth in the early cuts and the forest property is actually gaining in value meanwhile.

Demonstration Value of Research Center

The Northern Lakes Research Center operates the 6500-acre Argonne Experimental Forest, on which many of the test cuttings are conducted. Such experimental forests have a unique value as demonstrations of various concepts of silviculture and forest management where professional forest managers for industry, and government, may participate in “show me” tours and weigh the relative merits of various methods and forest treatment for their particular forests. As time goes on the value of the experimental forest should increase. Only after the cuttings and plantings are 20 to 30 years old will they yield information of maximum value to the forest manager.

Some of Wisconsin's potential forest land.

ABOUT THE AUTHOR . . .

Joseph H. Stoeckeler, following graduation from Dubuque (Iowa) High School, entered Iowa State College where he received his B.S. degree in 1930 and his M.S. degree in 1931. In addition to his forestry degrees from Iowa State, Mr. Stoeckeler has done graduate work in soils and plant physiology at the University of Minnesota.

He has been employed at the Lake States Forest Experiment Station since 1931. He is currently Forester-in-Charge of the Northern Lakes Forest Research Center at Rhinelander, Wisconsin.

Research in forest nurseries and planting, shelterbelts, forest influences, forest soils and silviculture has led to publication of over 100 articles on these subjects by Mr. Stoeckeler. In addition, forestry travel and study in Canada, Sweden, Norway, Finland, Austria, France, Switzerland, Germany, Denmark and Italy have served to give the author a broad and varied background in his field.

Professional and honor societies to which Mr. Stoeckeler belongs include: Sigma Xi, Society of American Foresters, Soil Science Society of America, Ecological Society, American Association for Advancement of Science and the American Forestry Association.