BULLETIN 223 JULY, 1912

THE UNIVERSITY OF WISCONSIN AGRICULTURAL EXPERIMENT STATION

RELIEF MAP OF WISCONSIN

THE CLIMATE OF WISCONSIN AND ITS RELATION TO AGRICULTURE

BY

A. R. WHITSON AND O. E. BAKER

MADISON, WISCONSIN

Walter Mulford

BULLETIN OF THE UNIVERSITY OF WISCONSIN
Serial No. 590, General Series No. 412

THE UNIVERSITY OF WISCONSIN
COLLEGE OF AGRICULTURE

HEADQUARTERS CAMP, STATE BOARD OF FORESTRY.
Headquarters of Field Instruction.

THE FOREST RANGERS' COURSE

1914

MADISON
Published by the University
November, 1913

[1] The writer is greatly indebted to Prof. L. R. Jones of the Department of Plant Pathology of this Station for many helpful suggestions received during the progress of this study.

CALENDAR, 1914

Registration begins, Monday, January 5
Recitations begin, Tuesday, January 6
Washington's birthday, legal holiday, February 23, (February 22, Sunday)
Term at University ends, April 14
Term in field begins, April 16
Term in field ends, July 31

Work in Forest Reserve under State Board of Forestry, August 1 to October 31 or later.

FACULTY OF FOREST RANGERS' COURSE

Charles R. Van Hise, president of the University.
H. L. Russell, Dean of the College of Agriculture.
E. M. Griffith, State Forester.
*A. M. Cook, In charge of Forestry.

A. C. Burrill, Fish and Game.
L. R. Jones, In charge of Plant Pathology.
Abby L. Marlatt, In charge of Home Economics.
F. M. White, In charge of Agricultural Engineering.
J. G. Sanders, In charge of Economic Entomology and Nursery Inspection.
A. R. Whitson, In charge of Soils.
F. G. Wilson, In charge of Field Surveying.

*Formerly connected with United States Forestry Service as Supervisor Arapahoe National Forest, Colorado.

Entered as second-class matter, June 10, 1908, at the Post Office, at Madison, Wisconsin, under the Act of July 10, 1894.

STUDENTS MEASURING TREES.
Practical instruction is given in the field.

THE FOREST RANGERS' COURSE

The Regents of the University established a Forest Rangers' Course in the College of Agriculture for the purpose of offering elementary courses in forestry and also to give instruction to both Long, Middle and Short Course students in Agriculture, in care of woodlands and especially in the management of farm wood lots.

The practice of forestry by the owners of timber land; the organization and rapid development of definite forest policies by the states, and the organization of forest fire protective associations, are bringing about a demand for young men who have had practical training in forestry. The purpose of the Ranger School is to meet this demand by preparing men for such secondary positions as rangers, guards, tree planting experts, nursery foremen, and for responsible employment by lumber companies, commercial nurserymen, and the owners of timbered estates. Young men who have already gained some experience in general woods work and in practical lumbering operations will find this course of especial value, as they will receive training which will fit them for the more expert service which is demanded by modern methods of handling timber holdings.

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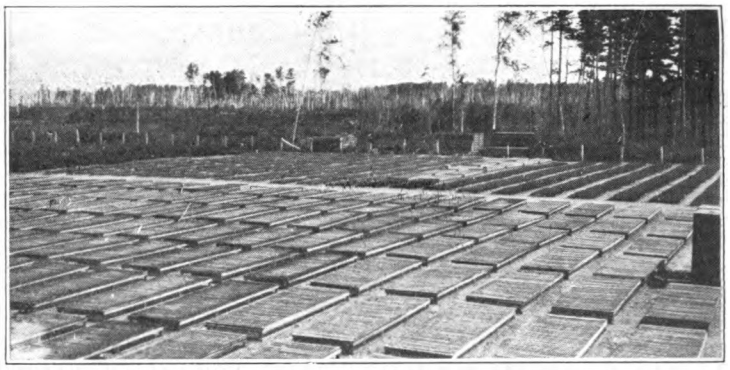
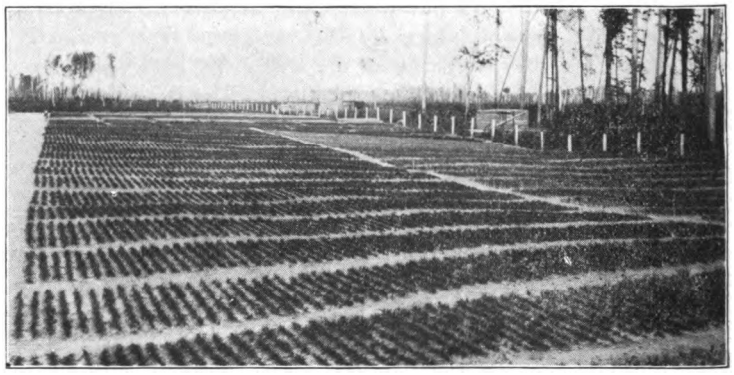
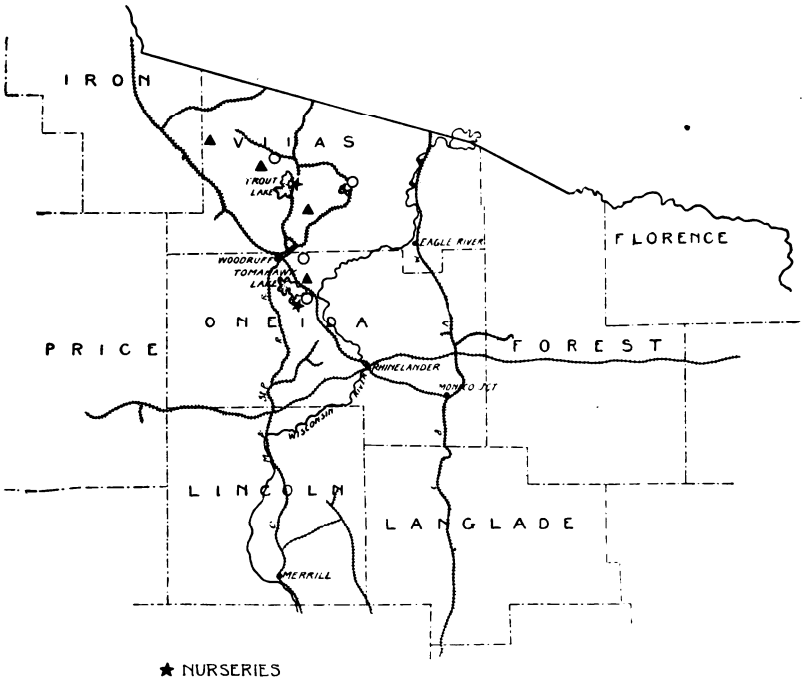




VIEWS OF STATE NURSERY AT TROUT LAKE.

Young pine must be grown in the nursery for two years before being planted. This nursery has an annual capacity of 1,000,000 seedlings and transplants.

The two years' course is not offered as a complete education in forestry. On satisfactorily completing the course, the student will not be a professional forest engineer but he should be a trained ranger or guard, or an expert in tree planting and forest nursery practice.



FOREST RANGER STATIONS

Map of Forest Reserve Region showing ranger stations, "lookout" towers and nurseries.

The life of a ranger is spent in the woods, and no one should enter the school with any misunderstanding in this respect. Students who are not physically able to do hard woods work and who do not care for the rough outdoor life, are advised not to enter the course.

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FACILITIES FOR THE COURSE.

The Ranger Course will be offered in co-operation with the State Board of Forestry, and much of the field instruction will be given on the state forest reserve. It is not expected, however, that the men trained in this work will be used exclusively in the State Forest Service.

By this cooperation with the State Board of Forestry, special facilities are offered for the student to gain practical training in forestry. A term of instruction will also be given each year at the College of Agriculture, thus providing facilities for instruction not only in forestry but also in other closely allied subjects.

Much experimental work of a very practical nature is being carried on at the United States Forest Products Laboratory located in Madison. Students of forestry will be especially interested in this experimentation and arrangements will be made to give them the opportunity to acquaint themselves first hand with the results of much of this work. Arrangements will be made for several special lectures upon vital forestry topics by the director of the Laboratory, or some of his assistants.

The state forest reserve now comprises about 400,000 acres, principally located at the headwaters of the Menominee, Wisconsin, and Chippewa rivers, in the counties of Forest, Oneida, Vilas, Iron, and Price. The reserve is divided into districts with a forest ranger or patrolman in direct charge of the field work in each district.

Forestry headquarters are maintained at Trout Lake, in Vilas County. Here is located the main forest nursery which has an annual capacity of 1,000,000 seedlings and transplants that will be planted on surrounding unoccupied cut-over pinery lands that have been badly burned over and upon which natural reproduction will not follow. Another forest nursery was started at the Tomahawk lake ranger station during the season of 1913, which will have an annual capacity of 500,000 seedlings and transplants, much of which stock will be offered for sale to residents of the state.

Comfortable houses for the rangers, with barns, wood and ice houses, etc., have already been built at the following ranger stations: Little Carr Lake, Plum Lake, Star Lake, Rest Lake Carroll Lake, and Oxley. All ranger stations are connected by telephone with the nearest town and with the forestry headquarters on Trout Lake.

LOGGING ROAD CONVERTED INTO A FIRE LINE.

An old logging road may, at a relatively low cost, be converted into a fire line for forest protection and at the same time serve as a passable highway for the ranger, settler, hunter or fisherman. More than 150 miles of such roads and 125 miles of fire line have been made in the forest reserve region.

GENERAL PLAN OF COURSE.

The Forest Rangers' Course includes work during two years, arranged according to the following plan:

(1) Work at the University from January 6, 1914, to April 14.

(2) For a period of one month beginning April 16 the students will be employed at the rate of $40 per month and maintenance by the State Board of Forestry transplanting trees on the forest reserve and doing such other work as may be necessary. It is anticipated that from 25 to 30 students will be given an opportunity for employment at this time.

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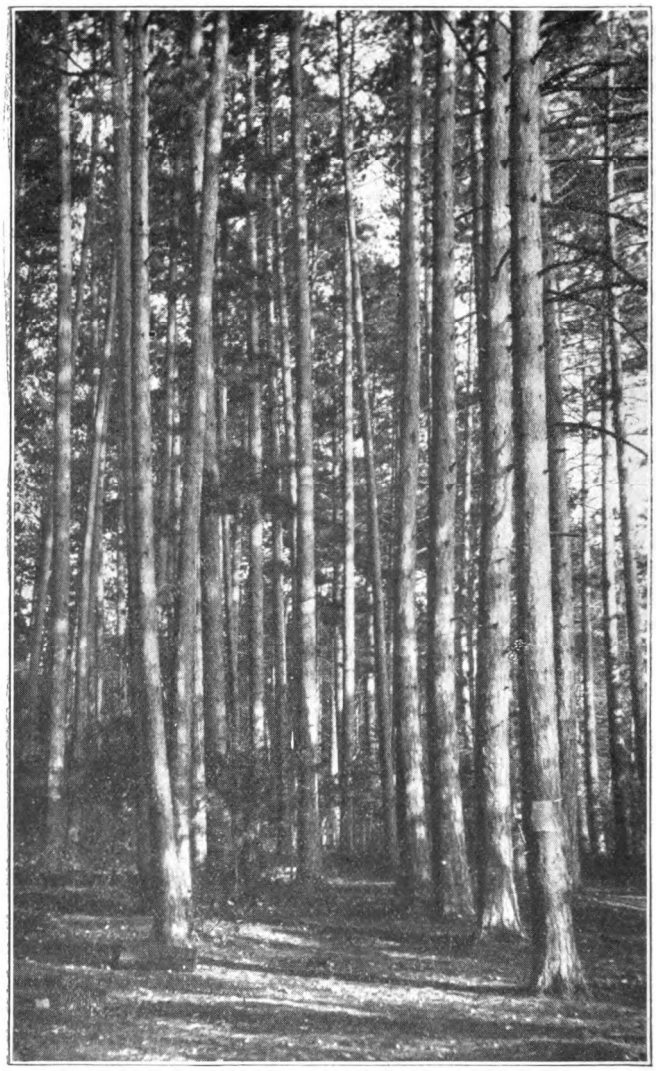

NORWAY PINE ON THE NORTH SHORE OF TROUT LAKE.
This timber is now worth over $450 per acre.

(3) From May 16 to July 31 instruction in the field will be given under the direction of the Professor of Forestry and in cooperation with the State Board of Forestry, the state forest reserve serving as a laboratory for this field work.

During the field instruction period, the student will receive board and lodging, but will be expected to devote practically one-half of his time to practical work carried on in connection with the instruction.

(4) From August 1 to October 30 or later a limited number of students will be employed in practical forestry work by, or under the direction of the State Board of Forestry. For this period they will receive, in addition to maintenance, $40 per month.

During the fall of 1914, the State Board of Forestry will be able to employ not to exceed ten or twelve students; and this number will be selected at the end of the field instruction period, the selection depending upon progress made by the students and their standing during the course.

Exceptional opportunities will be given the student to gain practical field experience in the various lines of forestry management, such as making roads, trails and fire lines, building bridges, telephone lines, and lookout towers, establishing section lines and corners, fighting fires and patrolling, burning slash, and studying tree growth and logging methods.

The nursery work will be carried on throughout the season at the Trout and Tomahawk Lake stations, and practical experience in cone collecting, seeding, care and protection of seedlings, planting, transplanting, and field planting will be an important feature of the work of the student.

LOCATION OF FIELD WORK

For the most part the field instruction will be conducted at the Headquarters Camp of the State Board of Forestry, which will be placed at the disposal of the school. This camp is in the center of the state forest reserve region, and is located at Trout Lake, which is about twelve miles north or Woodruff, Wisconsin, a station on the Lake Shore and Ashland Division of the Chicago and North-Western Railroad. The region of-

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fers an exceptional opportunity for the student to study all phases of forestry, especially from the standpoint of fire protection, which is the greatest problem confronting the lumbermen and foresters of the present day. Side trips will be taken to all points of the reserve and much of the time will be spent in tents during the summer months.

RANGER CABIN WITH LOOKOUT TOWER.

By triangulation methods, the location of a fire may be quickly and accurately determined for any point within the forest reserve.

TUITION AND FEES

Tuition for residents of Wisconsin	Free
Tuition for non-residents	
First term (at University)	$7.50
Second term (in field)	7.50
Incidental fee (for all students)	
First term (at University) (including medical and gymnasium fees)	4.00
Second term (in field)	2.50

Laboratory fees (for all students)

First term (at University)	5.00
Second term (in field)	7.50
Key and breakage deposit (balance refundable)	2.00
Other expenses	
Books, approximately	15.00
Board and room (at Madison) approximately, per month	25.00
Board and room (in field) furnished free by State Board of Forestry as compensation for practical work done.	

A list of rooms and boarding places, to aid students in securing desirable accommodations at the University, will be furnished upon application. As the University has no dormitories all students live in private homes.

Mail should be addressed to the College of Agriculture, Madison, Wisconsin, and marked "Ranger Course."

COURSES OF STUDY

First Year

Dendrology and Silviculture	Meterology
Soils	Fish and Game
Land Surveying and Mapping	Camp Management
History of Forestry	Mechanical Drawing
Forest Measurements	

Second Year

Utilization	Forest protection
Tree diseases	Forest law
Forest Entomology	Forest Administration and Policy
Forest Economics	

Every student will be given a thorough physical examination by the medical examiner, and will be required during the University term to take two half-hour periods per week of development exercises and athletic drill. These activities are carried on in the stock pavilion which has been equipped with facilities for this purpose, including gymnastic and athletic apparatus, lockers and shower baths.

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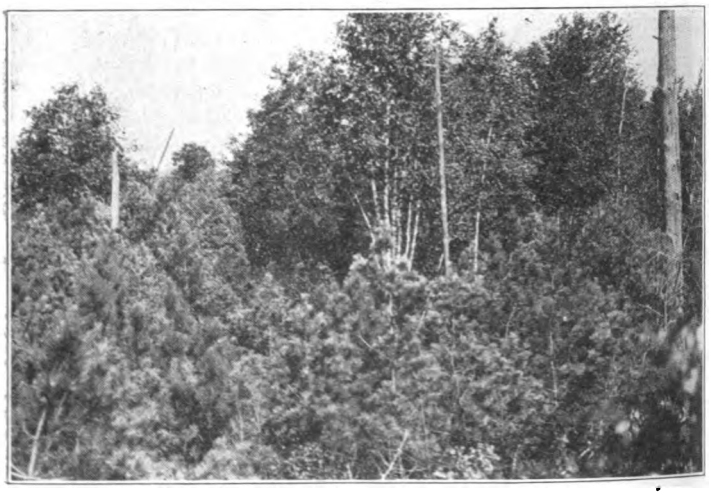
The courses in Soils, Land Surveying and Mapping, Mechanical Drawing, Entomology, Tree Diseases, and Camp Management will be given in various departments of the College of Agriculture, and all other courses in the department of Forestry.



NATURAL REPRODUCTION OF YOUNG PINE.
Where fires are kept out reproduction quickly occurs.

DESCRIPTION OF COURSES

First Year.

Dendrology (In department of Forestry). Characteristics of the important timber trees of the lake states. Forest regions of the United States, their commercial importance and distribution in Wisconsin. Detailed study of the species of trees native to Wisconsin. Field practice.

Silviculture (In department of Forestry). Relation of forests to factors of soil and climate. Factors influencing growth and distribution of trees. Seed production, time of seeding,

cost of gathering seed, raising of seedlings, transplanting, field planting. Methods of handling species especially adapted for Wisconsin conditions. Field practice.

Soils (In department of Soils). Origin, classification, physical and chemical composition. Relation between forest growth and soil condition. Effects of tillage and fertilizers. Differentiation of agricultural and forest lands. Field practice.

Land Surveying and Mapping (In department of Agricultural Engineering). Land survey; Scheme of United States public land and other surveys in the United States. Problems involved in relocation of old land surveys. Methods of relocating adapted to forest work. Demarcation of forest boundaries. Use of surveying instruments, such as hand level, compass, transit, aneroid barometer; theory and practice of compass, and chain surveying. Field work will include running lines, pacing, locating and establishing section corners, field mapping.

History of Forestry (In department of Forestry). Brief history of forestry and its development in Wisconsin.

Forest Measurements (In department of Forestry). Use of various log rules. Methods of measuring logs, lumber, bark, piling, etc. Determination of rate of growth in height and diameter of trees and volume of single trees and stands. Field practice.

Meteorology (Special lectures). Weather forecasting and observation. Storm, winds, humidity.

Fish and Game (In department of Economic Entomology). Care and propagation. Habits, usefulness and protection.

Camp Management (Special courses of lectures). Camp practice and cookery, first aid to the injured, packing, care of horses. Supplies for field trips and costs of supplies and camp outfits. Lectures on hygiene and the laws of efficient living will be given by the University physician and members of the department of Physical Education.

Mechanical Drawing (In department of Agricultural Engineering). To aid the student in land surveying, mapping, and forest measurements, a practical course in mechanical drawing has been planned.

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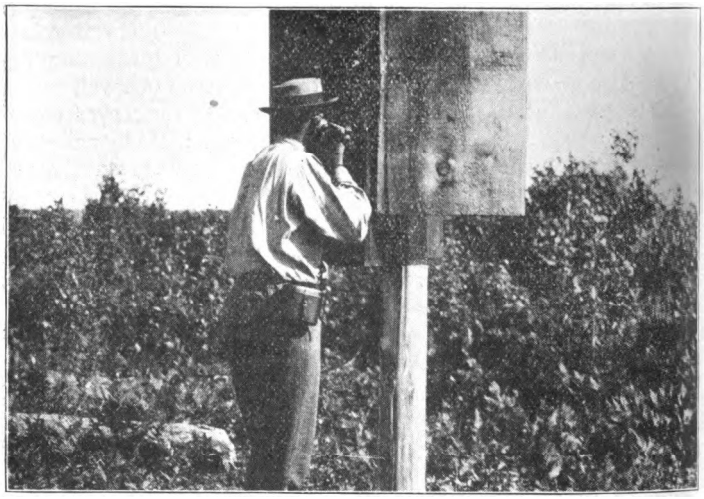
Second Year.

Timber Utilization (In department of Forestry). Logging and Milling. Methods of Manufacture of pulp, lumber, veneer, charcoal, woodenware, etc. Uses of the various wood produced within the state and points of production. Wood preservation. Logging tools and implements (costs).

Tree Diseases (In department of Plant Pathology). Diseases of the more important local timber trees and of forest nursery stock. Life history and methods of control.



THE LONG DISTANCE CALL ON THE RANGE.
Thousands of acres of timber are safeguarded by the telephone system.

Forest Entomology (In department of Economic Entomology). Description and life history of insects injurious to forest trees of the lake states region. Methods of control.

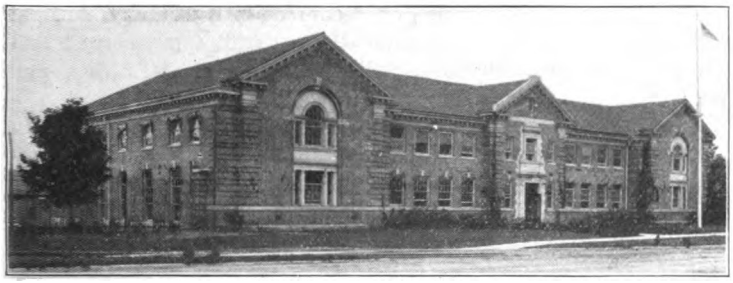
Forest Economics (In department of Forestry). The commercial importance of forests and forestry. Forest Management by the individual, by the state and by the nation. Course of a general nature and open to any student in the University.

Forest Protection (In department of Forestry). From fires, wind, insects, etc. General policy for state forest reserve.

Fire lines, purpose of, how constructed, where located, costs. Source of danger from fire, campers, fishermen, hunters, settlers, locomotives and lightning.

Telephone lines. Construction. System used—ground line, pole line, tree line. Equipment used per mile and per station, costs. Maintenance. Fire tools, cost.

Roads. Laying out, grading, building, purpose of, cost per mile. General plan of roads for reserve.



THE FOREST PRODUCTS LABORATORY.

Located near the college of agriculture and equipped and operated by the federal government.

Lookout towers. Location. Construction, steel and wood; specifications and cost. Methods of locating fires, use of maps, etc. Reports.

Ranger cabins and barns. Requirements for ranger. Methods of construction and costs.

Forest Law (Special lectures). Leases, titles, conveyances, abstracts. Federal laws and laws of states regarding fires, trespass and taxation.

Forest Administration (In department of Forestry). Organization of state service. Qualifications. General plan of development of the Forestry work in Wisconsin.

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