

12-23

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LOGISTICS

Three graduate students, Randy Raymond, James deWaalMalefyt, and Sandra deWaalMalefyt, and one undergraduate field assistant, Robert Aho, all from the BioScience Department of Michigan Technological University, were hired to carry on the bulk of the summer field work. This crew was transported to Isle Royale in mid-June via the motor vessel Ranger III. A base camp was set up in the research campground near Rock Harbor Lodge. Transportation to various points within the park was by means of the 18 foot starcraft runabout used in previous years. My summer job with the National Park Service placed me close enough to the base camp that I could supervise the project during evening hours and weekends. Dr. Steven Shetron, and Dr. Martin Jurgensen, soil scientists from Michigan Tech, spent one week during July in the park taking soil profiles and collecting soil samples. Dr. Ronald Kapp of Alma College, Michigan, joined the research party for two weeks in July to supervise the boring of sediments in lakes and bogs. Most of the research crew returned to the mainland on about August 25.

FOREST HISTORY STUDY

In order to compare present vegetation with that at the time of the original land survey in 1847, Randall Raymond sampled tree species along some of the same lines used in the land survey. Along the sampling line the quarters method was used for sampling trees and, in addition to this, tree saplings and seedlings were counted in quadrats at each sampling point. Also at each point the topographic

position, slope, aspect, soil depth, and distance from Lake Superior were noted. About 1/3 of the potentially spruce-fir-birch climax areas of the park were sampled this summer.

Under the supervision of Ronald Kapp, Raymond and Kapp made borings into the bottom sediments of Harvey, Anglemorm, Otter, Feldtman, Chickenbone, Wallace, Eva, Ahmik, Siskiwit Lakes and into the bog mats of Lily Lake, Raspberry Island bog, and Scoville Point bog. From the cores thus obtained, pollen profiles will be constructed and dates and frequency of fires determined from the presence of charcoal layers. Samples from key strata in the cores will be radio-carbon dated.

ECOLOGY OF THIMBLEBERRY

Sandra deWaalMalefyt was responsible for conducting this phase of the project. Traversing some of the same sampling lines used in Raymond's study, she selected points along the line which had more or less homogenous topography and tree cover within a radius of 20 meters. At each of these points she measured thimbleberry (Rubus parviflorus) abundance plus those environmental factors which would be expected to affect the abundance of thimbleberry. Thimbleberry abundance was measured by determining the stem density and stem heights in 3 one square meter quadrats near each point. Canopy cover for each tree species was measured by use of a special tube with periscope sighting. Soil depth, slope, aspect, elevation, topographic position, and distance from Lake Superior were also determined at each point.

Another part of the thimbleberry ecology study was aimed primarily at determining what effects thimbleberry has on the ecosystem in which it occurs. For this purpose, four forest stands were selected which have relatively homogeneous topography and tree cover but within which thimbleberry cover varies from one point to another.

Much data had already been collected in these stands in previous years. In each stand sampling was done in 45 one square meter quadrats representing a wide range of thimbleberry cover. In each quadrat, thimbleberry cover, percent cover of other vascular ground cover plants, and density of tree seedlings were measured. In a smaller number of quadrats, in which thimbleberry was either abundant or completely absent, soil samples were taken in each of the upper soil horizons (above the B layer) and the thickness of these horizons was determined. In these same quadrats, the number and kinds of earthworms and other macro-soil organisms was determined in the top 5 centimeters of soil in a 1/4 square meter square.

FOREST SUCCESSION - MAMMAL RELATIONSHIPS.

This study, conducted by James deWaalMalefyt, is mostly concerned with the relationship between forest succession and three important forest mammals: the red squirrel, the snowshoe hare, and the moose. Eight forest stands of approximately 4-6 hectares each and representing a variety of forest cover types were selected for study. The age of the stands, the age structure of the trees, and many other characteristics had been determined in previous studies.

Relative red squirrel abundance was determined by walking lines in each stand and recording all squirrels seen or heard. In squirrels seen, the distance to the squirrel was determined with a range finder and the direction to the squirrel was determined with a Brunton compass. From these data relative abundance of squirrels in the various stands can be easily calculated and also absolute squirrel population sizes can be estimated by the Kingstrip method. Squirrel middens were examined in various size quadrats in the eight stands. In particular, the number of cone cores of each conifer species was counted.

An estimate of relative snowshoe hare and moose abundance was made by counting hare and moose pellets in 2x4 meter and 4x10 meter quadrats respectively. Another estimate of relative population sizes in the various stands was made by measuring the quantity of hare and moose browsed twigs in 2x5 meter plots. Browse was measured in two separate strata, 6"-2' and 2'-6'. These data also will yield information about what hare and moose are eating in the various stands.

Steven Shetron and Martin Jurgensen, in their week's visit to Isle Royale, completed their study of soil profiles of all forest stands studied to date.