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FALL PROGRESS REPORT
OF THE
RESEARCH PROJECT
ENTITLED
THE FLORA AND VEGETATION ECOLOGY
OF ISLE ROYALE NATIONAL PARK

SUBMITTED FALL, 1980

BY

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CHIEF INVESTIGATOR

General Objectives

Most of our efforts during this field season centered about two major objectives. One of these was to conduct the fourth annual sampling of vegetation invading two recent burns. One of these occurred at Card Point in 1976; the other, at McGinty's Cove in 1975. Both were natural fires which were permitted to run their course.

The other major objective was to study the ecology of rock-shore communities on the outer exposed shores of Lake Superior. The composition of these communities, their relationship to micro-environmental factors, and successional relationships were investigated.

Logistics

After enlisting summer field assistants and purchasing the necessary supplies and equipment, I traveled to Isle Royale via the motor vessel Ranger III on May 19. From that time until mid-June I checked the general condition of the plots in the recent burns, made a reconnaissance of rock shore areas for study, collected and identified unknown plants in these areas, and made more specific plans for the summer field season.

My crew of assistants arrived on June 17 via Ranger III. Among these were graduate student Joyce Longwith and undergraduate student Kyle Vaught who were hired out of project funds to act as crew leaders for sampling the rock shore communities and the recent burns, respectively. In addition to these, our staff included two other undergraduate students, one funded by the Federal Work-Study program and the other a volunteer, both of whom assisted the crew leaders. We set up our base camp at the Rock Harbor Research Campground. After that approximately 1½ weeks were spent in teaching the field assistants

to recognize Isle Royale plants, acquainting them with the sampling methods to be used, and other logistical orientation. We then began the field sampling.

One crew traveled to Washington Harbor via the motor vessel Voyager II for sampling the recent burns. We then backpacked into McGinty's Cove, and set up a temporary camp. From there sampling was performed at the McGinty's Cove burn. About two weeks later another temporary camp was set up at Grace Harbor. From there we were able to commute daily to Card Point via canoe for sampling in the Card Point burn.

Meanwhile, the other crew remained at the Rock Harbor Base camp from which they could make short trips each day to various shoreline points in the northeast end of the park for sampling the rock shore communities. They were later joined by the other crew about the first of August when the sampling was completed in the recent burns. We broke camp on August 29 and returned back to the mainland on the following day via Ranger III.

The data collected during the summer field season will be processed during the coming winter at Michigan Technological University. A final report of the years activities and results will be submitted to the National Park Service in May, 1981.

Methods

Recent burns. Sampling was done in the same plots that were used in the 1979 sampling at Card Point and McGinty's Cove. Plot centers had been marked with wooden stakes pounded into the ground. Sampling methods were identical to those used in previous years. These are described in our annual report submitted June, 1978.

Rock shore communities. Most of the sampling was done on the outer shores of Blake Point, Scoville Point, Passage Island, and Raspberry Island. A series

of plots were sampled at each of several discrete elevations above the shore-line (i.e., 2, $3\frac{1}{2}$, 5, $6\frac{1}{2}$, etc. meters). Plots were established by means of a 20 x 50 cm (0.1 m^2) rectangular metal frame with decimeter marking along the edges to facilitate percent cover estimates. In use the frame was layed on the rock with the long edges parallel to the shore at one of the elevations specified above. After sampling within it, the frame was then flipped over about one edge to a new position along the same elevation contour line. If the slope in the new position was moderate ($10-35^\circ$) and the new plot was unprotected by microtopography from onshore winds, it was sampled. If not, the frame was flipped over one or more times until the above criteria were satisfied. This procedure was repeated at each elevation until the forest periphery was reached. At the $3\frac{1}{2}$ meter level more extensive sampling was done in that all slopes and all degrees of protection were sampled.

Within each plot the following parameters were determined: (a) stem counts and percent cover of each vascular plant species, (b) average height of each species, (c) areal extent and depth of soil patch (crevice or depression) in which each species was rooted, (d) percent of plot covered by soil, (e) slope, and (f) aspect.

The zone below one meter elevation is frequently and often continually splashed by waves; hence it constituted a separate micro-environment of its own, which we called the splash zone. Plant life here was extremely sparce so that neither systematic nor random sampling could be used. Instead we simply walked the entire shoreline looking for plants and, when found, took detailed notes on them and their micro-environment.

Many rare rock-shore plants were too sparce to appear in the plots sampled. In order to determine their habitat preferences, we thoroughly scanned the study

areas in search of them. Whenever found, we made detailed notes on their micro-environment and the plants with which they were associated.

Miscellaneous activities. We continued to collect all unfamiliar vascular plants for identification in search of plants not previously listed for Isle Royale. We also continued to make notes of the relative abundance of plants in various habitats throughout the park in order to facilitate the preparation of our final annotated list of all vascular plants of the park. As we traveled about, we took notes on any effects of beaver or moose on the park's vegetation. Finally, a series of colored slides were taken for the park's files illustrating various facets of our research project.