

THE IMPACT OF USE ON VEGETATION, WATER RELATIONS,
AND PHYSICAL SITE CHARACTERISTICS OF
FORESTED RECREATION SITES

BY

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ABSTRACT

The impact of recreational activities on site and vegetation was evaluated in eight forest recreation areas in Washington County, Rhode Island. Forest vegetation on the study areas consisted of mixed-oak or white pine stands. Soils were either of granitic glacial till or outwash origin.

Soil penetration resistance, bulk density, field capacity, and water infiltration rate were measured to determine changes resulting from heavy recreational use. Bulk density and penetration resistance were found to be higher on recreation areas than on undisturbed areas. The higher values are indicative of significant soil compaction on the recreation sites. Average field capacity and rate of water infiltration were less on recreation areas reflecting loss of organic matter from the soil surface on the recreation sites.

Soil moisture regimes for the surface 4.5 feet of soil on study sites were monitored with a neutron probe and were found to be similar during the growing season. Examination of soil moisture content changes at various depths, however, showed that undisturbed areas recharge and use soil moisture at a faster rate than recreation areas.

Ground cover vegetation on study sites was inventoried by use of photos. Photos revealed that much of the ground surface on recreation areas was devoid of vegetation. The surface commonly consisted of bare mineral soil, rock or litter. The most common plants present were grasses and sedges. In comparison, the ground in undisturbed areas was in all cases completely covered with litter; the most frequently occurring

ground cover plants were ericaceous shrubs. Seasonal changes in ground cover were negligible. Tree seedlings were abundant on undisturbed areas, but scarce on recreation areas.

A total of 1962 stems representing 23 species of overstory vegetation were examined on study sites. Damage to tree trunks was common on recreation areas. Stem heart-rot was found to be not correlated with heavy recreational use of sites; but was attributed to the fact that most hardwood stems on all study sites were of coppice origin.

Analysis of variance of diameter growth revealed that white pine diameter growth on recreation areas was significantly slower than growth on undisturbed areas. In the case of oaks (white, black and scarlet), very little difference was observed between recreation and undisturbed areas. Analysis of annual height growth showed that scarlet oak height growth was significantly less on recreation areas in comparison to stems on undisturbed areas while for other species differences were not significant.