Post-Fire Bryophyte Dynamics in a Temperate Mixed Forest

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The purpose of this study is to evaluate the changes in biodiversity and species composition of bryophytes (mosses and related species) within Hot Springs National Park in relation to the controlled burn in February 2022, which was used to preserve the old-growth area of the park. The predicted bryophyte dynamic was that the burned areas would be less diverse than the unburned sites and that the biodiversity of burned sites would increase over time. The pioneer species was expected to be of class Polytrichopsida. Using QGIS, nine sites were selected using stratified random sampling. Six of these sites were within the burned area and three were outside the burned area as a control. Bryophytes were sampled from each site once per month for nine months (May-January 2023) and separated by species. Using the Shannon-Wiener Diversity Index, each site was evaluated for biodiversity. A multiple linear regression was run to determine the relationship between the distance from the edge of the burn, the time since the burn occurred, and biodiversity. The regression showed that both factors were statistically significant ($p=1.93e-10$ and $p=0.0046$ respectively). The pioneer species were determined to be Leucobryum glaucum, Leucobryum albidum, and Atrichum angustatum, a member of Polytrichopsida. This supports the hypothesis that unburned sites are more diverse than burned sites and that the pioneer species would be of class Polytrichopsida. The burned sites are likely less diverse because the only species that were growing within a year of the fire were pioneer species.