

MAPPING THE CURRENT AND POTENTIAL DISTRIBUTION OF RED SPRUCE IN VIRGINIA: IMPLICATIONS FOR THE RESTORATION OF DEGRADED HIGH-ELEVATION HABITAT

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The objective of our project is to create a habitat suitability model to predict potential and future red spruce forest distributions. This model will be used to better understand the influence of climate change on red spruce distribution and to help guide forest restoration efforts. We also anticipate creating a procedure that uses freely available remotely sensed data to locate new red spruce stands and improve the accuracy with which known stands are mapped. In order to accomplish our two objectives, we will integrate remote sensing analysis, GIS analysis, field surveys, and experimental field research. Few studies have used GIS and remote sensing technology to create habitat suitability models and even fewer models have been created to identify restoration sites for forest ecosystems at a large scale. Red spruce was selected as our model species because it is one of the most threatened forest ecosystems in the United States. Many previously forested areas that were historically dominated by red spruce appear to be in a state of arrested succession in the form of stunted, species-poor forest stands or shrub-dominated glades. We anticipate identifying all current red spruce stands in Virginia and potential restoration sites with our proposed methodology. Degraded areas for red spruce restoration will be prioritized based on land-use data. The information will then be disseminated to forest restoration organizations to increase the effectiveness in restoring this critical habitat, either to offset carbon emissions or to conserve biological diversity.

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