

Effects of Tree migration in the Adirondacks

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Tree migration and climate change

With climate change, tree migrations have been observed on mountains across the country, such as in the Rocky Mountain's Niwot Ridge and Colorado Front Range (Benedict, 1984), as well as in the White Mountains of New Hampshire (Lee, et al. 2005).

High elevation tree species are susceptible to changes in migratory patterns due to climate change. With increased climate change comes reduced habitat size and increased competition for habitat area with trees more suited for warmer climates (Bell, et al. 2013).

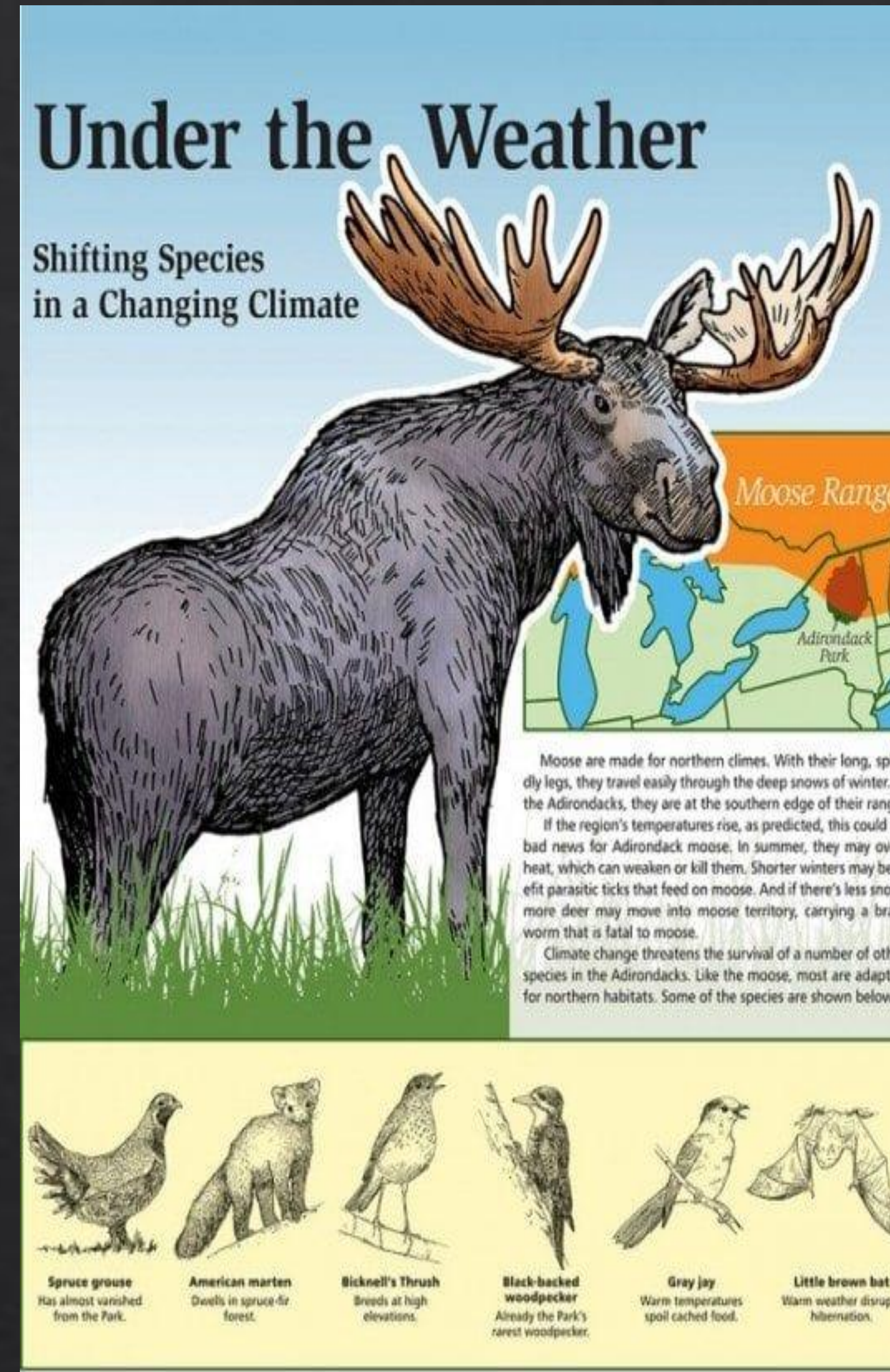
Hypothesis and Prediction

My hypothesis is that there is a correlation between climate change and tree migration in the Adirondack park.

We predict that as a result of warming climate, the size of the Mountain-Conifer habitat will likely decrease while the size of the Hardwood-Conifer and the Northern Hardwood communities will likely expand their territory due to being more suited for warmer climates.

Motivation

Many species in the Adirondacks rely on a certain types of habitat in order to thrive. With increase climate change, some forest communities would increase in size and compete with other forest communities, leading to habitat loss of certain species like Bicknell's Thrush and the American Marten.



(above) Figure 2. Impacted species of climate change and habitat loss in the Adirondacks

(left) Figure 3. My prediction on abundance of types of trees as elevation increases

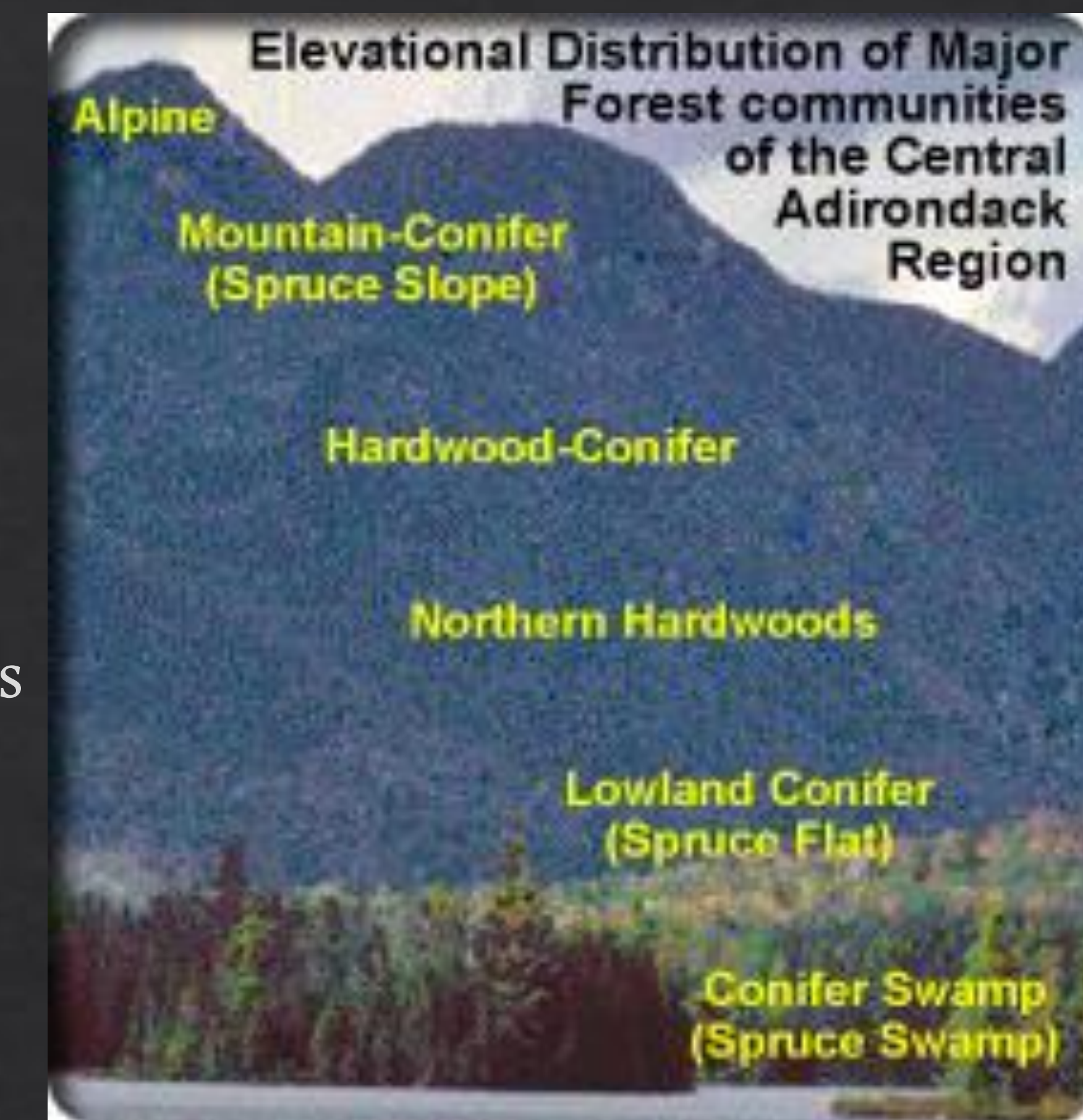
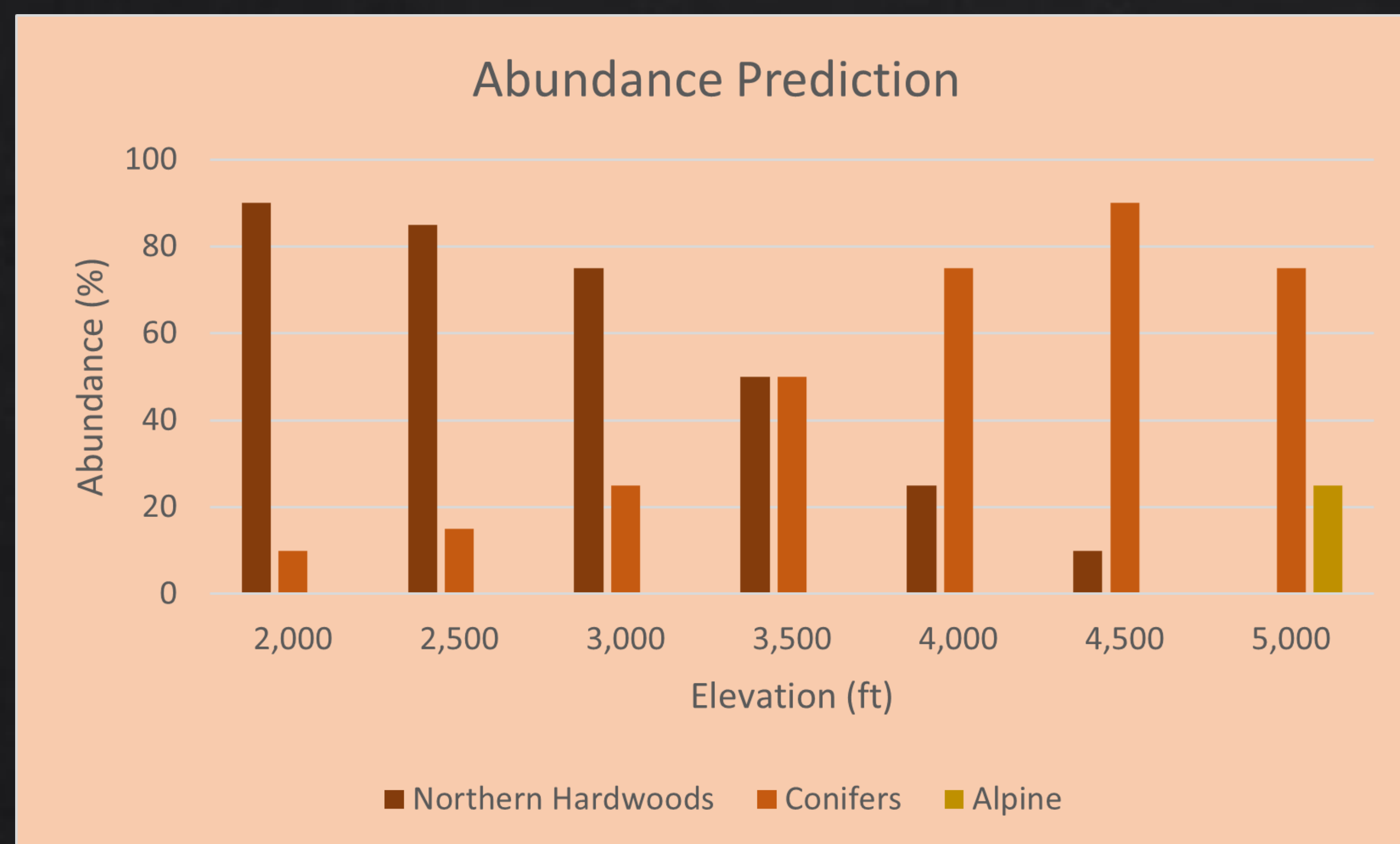


Figure 1. Forest communities on mountain slopes in the Adirondacks

Methods/Approach Study Site:

- Random sampling will be used to pick a total of 10 different 100-meter plots on Mount Marcy, the largest mountain in the park. These locations will be selected from elevations between 2,000 to 5,000 feet in order to include areas where tree migration might be occurring. The tree species within those sample locations will then be recorded.

Expected Benefits

- With the implications of climate change becoming more apparent, it is important to look at the effect that it will have on alpine tree species such as black spruce as well as animal species who rely on these habitats. Many avian species, like the blackpoll warbler, rely on these Krummholz zones for nesting. By determining the size of these zones along the mountain slopes in the Adirondacks, efforts can be made to preserve and help mitigate the impacts of climate change on these areas.

Intended Analysis

- The dependent variable is the abundance of tree species that appear within the sample plots, which is categorical, and the independent variable is elevation, which is continuous. The data that is collected will be analyzed using a contingency analysis. The results from the contingency analysis will help us determine where the forest communities are located and if they have changed in recent years.

Literature cited:

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