

In New Hampshire, How does Forest Cover in and Ecosystem Correlate to Moose Population?

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Background

- During the 1990s until about 2012, there has been a relatively stable amount of forest cover, after 2012 we have seen about a 1.2% percent decrease.
- Out of the state's 5.8 million acres, 4.9 million of them are forested.
- Moose require a vast array and quantity of resources that allow it to perform proper functions, the more abundant in an area the smaller its range will be (NH PBS)
- During the 1800s and early 1900s while there was major deforestation efforts, the moose population had shrunk to alarming numbers, only in recent years have we seen a general rebound



Figure 4. The brush and thick forest seen in this image represents the ideal habitat conditions for moose in New Hampshire. (image from NH PBS, Karen Battle Sanborn)

Hypothesis

- We hypothesize, that areas with higher percentages of forest cover will result in a larger moose population

Predictions

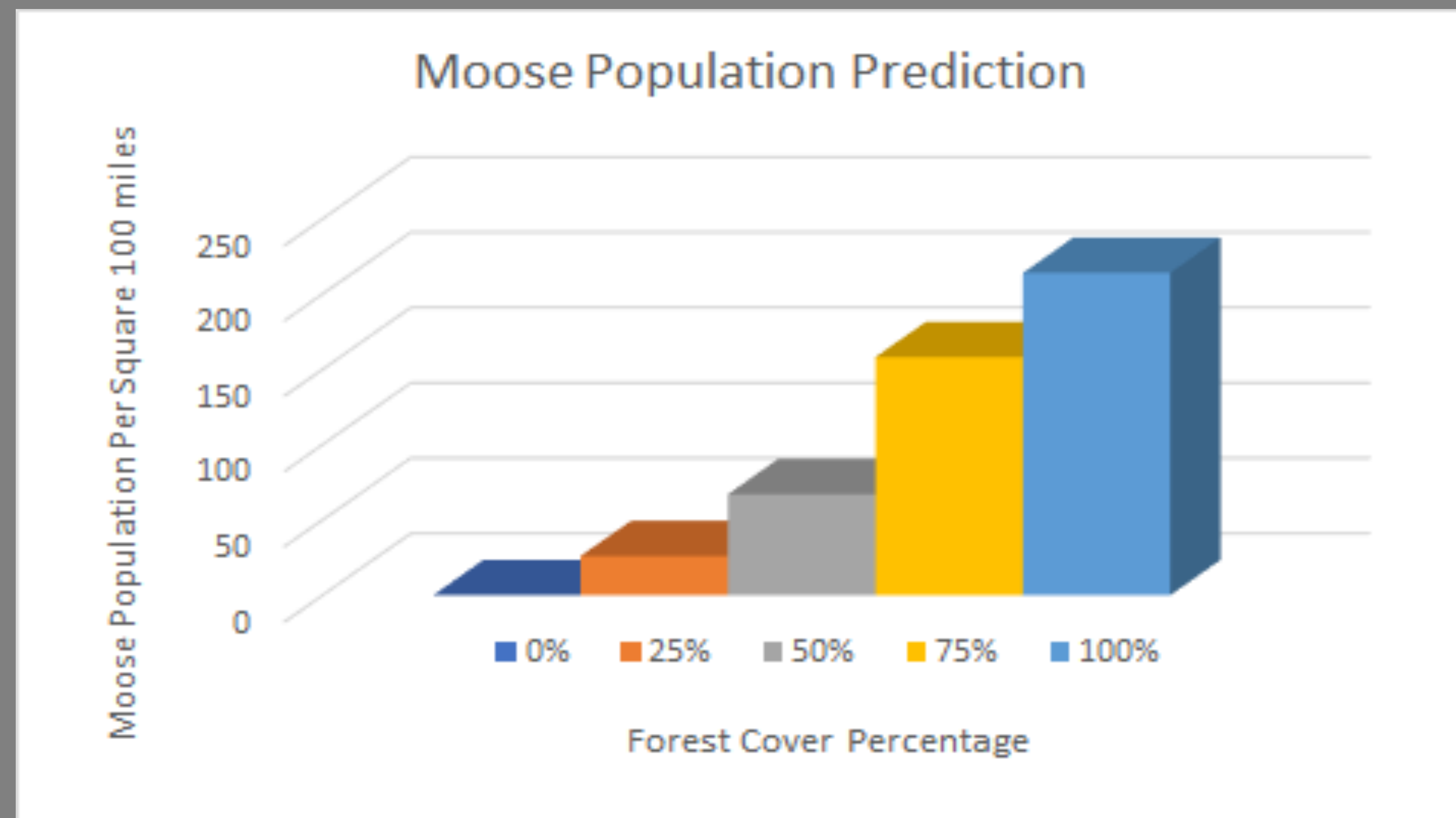


Figure 3. The above figure represents our predictions, based on the data provided in Figure 2 for moose per km^2 for each region.

- We expect to see a higher number of moose living in regions with greater forest cover and density
- We predict in the future years, even less moose will be seen in low forest areas as humans move into the area.
- Moose are most active at dusk and dawn so spotting will be difficult and tedious.

Intended Analysis

- Since our dependent variable (moose population) is continuous, and our independent variable (% of forest cover) is categorical with only two categories we will be using a T-test to analyze the data which we collect.
- The use of the T-test is helpful to determine whether the data which we collect is statistically significant or not. A resulting p-value less than 0.05 would confirm that the data collected is statistically significant. Statistically significant data would represent our hypothesis, that greater forest cover would result in higher moose populations

Literature Cited:

Battle Sanborn, K. (n.d.). Moose - *Alces americanus* - NatureWorks. Retrieved November 18, 2020, from <https://nhpbs.org/natureworks/moose.htm>. Bergeron, Daniel & Pekins, Peter & Jones, Henry & Leak, William. (2011). MOOSE BROWSING AND FOREST REGENERATION: A CASE STUDY IN NORTHERN NEW HAMPSHIRE. 47. "Moose." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., www.britannica.com/animal/moose-mammal. NH Fish and Game Department. "Moose (Alces Alces)." *Wildlife*, www.wildlife.state.nh.us/wildlife/profiles/moose.html. Rönnegård, Lars, et al. "Evaluation of Four Methods Used to Estimate Population Density of Moose *Alces Alces*." *Wildlife Biology*, Nordic Board for Wildlife Research, [bioone.org/journals/wildlife-biology/volume-14/issue-3/0909-6396\(2008\)14\[358:EOFMUT\]2.0.CO;2/Evaluation-of-four-methods-used-to-estimate-population-density-of/10.2981/0909-6396\(2008\)14\[358:EOFMUT\]2.0.CO;2.full](http://bioone.org/journals/wildlife-biology/volume-14/issue-3/0909-6396(2008)14[358:EOFMUT]2.0.CO;2/Evaluation-of-four-methods-used-to-estimate-population-density-of/10.2981/0909-6396(2008)14[358:EOFMUT]2.0.CO;2.full). The Land We Live In: Population, Housing . - Ecosystems + Society. Retrieved November 19, 2020, from <http://ecosystemsandsociety.blogspot.com/2013/09/the-land-we-live-in-population-housing.html>. United States Department of Agriculture. *Forests of New Hampshire*, 2016. US Federal Government, 2016, www.fs.fed.us/nrs/pubs/ru/ru_fs124.pdf.

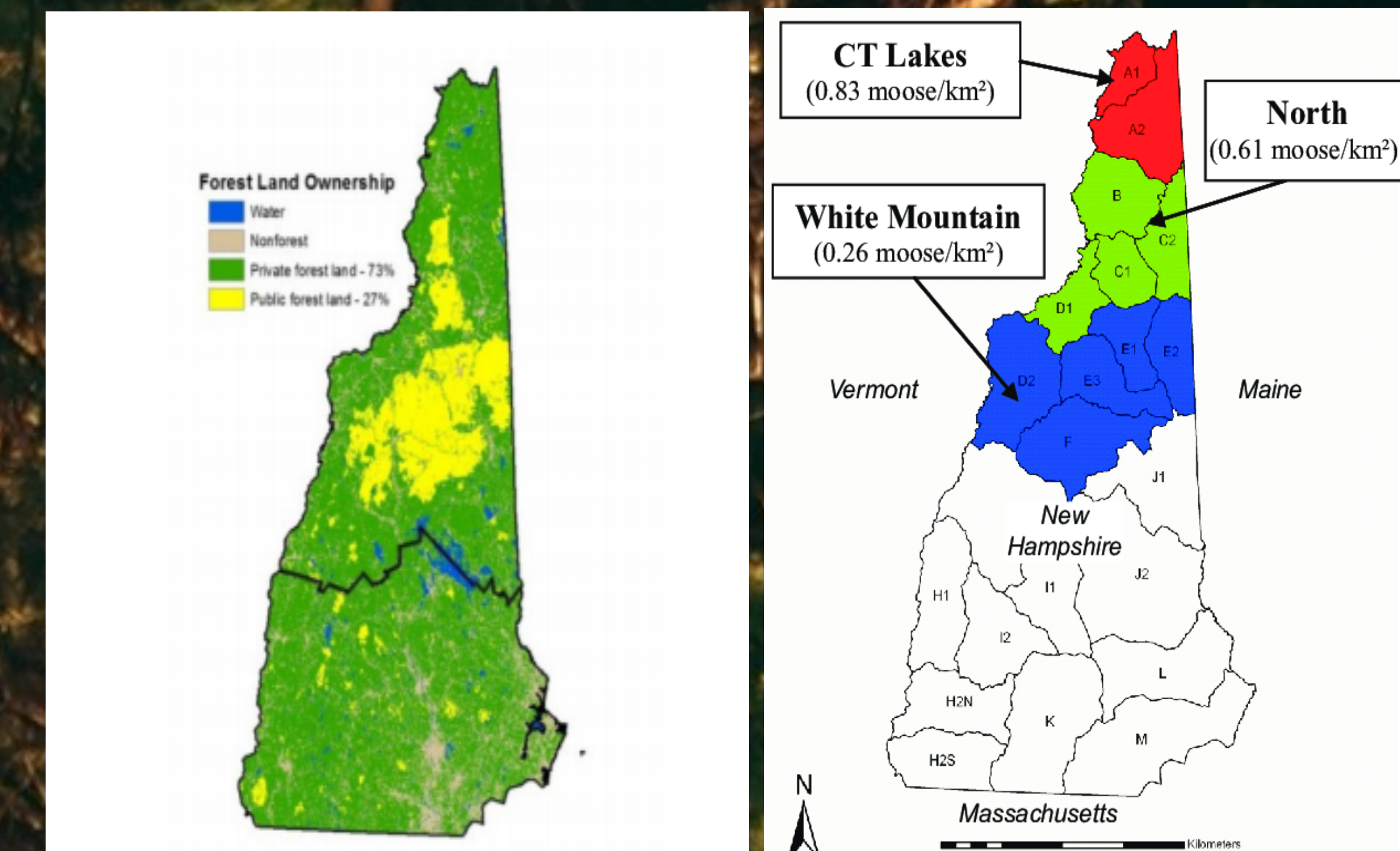


Figure 1. The figure on the left shows the land use in New Hampshire. (Bergeron)
Figure 2. The figure on the right shows moose population by region in New Hampshire (NHFGD)

Study Design

- This will be an observational study in different habitats across the state based on forest cover. Forest cover will be taken via satellite images in various strategic locations, showing different cover. We will observe a total of 25 plots. There will be 5 different plots for each variation of forest cover (0%, 25%, 50%, 75%, 100%).
- The aerial surveys taken will be 100 square mile areas. The moose population data will be collected via aerial survey, as this is the best method to track moose (Rönnegård).

Motivation

- Moose population in New Hampshire is low, around 3800 individuals, and has been decreasing since the 90s. In the 90s there were about 7000-7500 moose present After harsh deforestation in the late 1800s and early 1900s as it returned so did the moose populations. People are wondering why the moose population went away and did not come back, some blame ticks, others blame warmer weather, but we think it has to do with forest cover.
- We propose to try and find a correlation between forest cover and moose population to see if this is the cause for a decline in recent years.