Development of criteria to identify old-growth forests in the Eastern Broadleaf Forest Province

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Introduction

Old-growth forests have an inherent value as well as serve as a baseline to understand the effects of climate change, logging, habitat loss, and invasive species within secondary forests. An old-growth forest is often described as an area with trees greater than 150 years old with little understory disturbance for the last 80-100 years, presents a multilayer canopy, and contains canopy gaps, dead snags, and large down dead wood. While these forests are more easily identifiable in the West, there are no standard protocols to identify old-growth forests in the mixed mesophytic forested region in the East. A standard set of protocols that can be used to detect old-growth forests would allow for efficient identification and possibly conservation of these valuable forests.

Predictions:
- Canopy cover is a valuable criterion in identifying older forests, which should have greater total cover than a younger forest.
- Old forests have more dead-and-down wood (coarse woody debris, CWD) than younger forests.
- Old forests have a diverse size structure in addition to large trees in the forest stand, which should easily identifiable in the West.
- An old-growth forest would have greater total cover than what the densitometer yielded.

Methods

We located a designated old-growth stand (positive control), a younger forest stand (negative control), and potential old-growth sites in Washington County, PA (Fig. 1).

Results

Predictions were easily identifiable in the West. A standard set of protocols that can be used to detect old-growth forests would allow for efficient identification and possibly conservation of these valuable forests.

Discussion

- Canopy cover measured by densiometer was consistently greater than when measured by densitometer, although we cannot conclude that one method is more accurate than the other.
- The CWD index was useful in comparing the amount of dead-and-down wood at each site. A difference in the CWD at a managed site where fallen wood was removed could be detected. A higher CWD index was recorded at the negative control site than expected.
- LAI was only recorded at 4 of 5 sites due to inclement weather but indicated a significant difference in numbers of layers of canopy between the sites. The LAI index could be a useful criterion for identifying forests with multi-storied canopies, as expected with older forests.
- There were not as many large diameter trees recorded at the positive control than at the other sites. This result was unexpected due to the visible abundance of larger trees in the forest stand and forest structure.
- A continuation of this project, possibly through a GRFP grant, would allow for consideration of additional variables, especially related to identification of gap size and structure in older forests.
- The project would benefit the Old-Growth Forest Network by identifying an old-growth forest for designation. The protocols could be further developed for other forest types to accurately identify possible old-growth, which could be conserved.

References


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