

Duke Forest Assignment
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Disturbance has had a number of impacts on Duke Forest, both good and bad. The appearance of natural forest gaps offers opportunities for new successional cycles to occur, and often boosts the diversity of plant species found in the gap. On our first stop during the trip, we visited a stream area that not only had hardwood trees of late successional age, but many herbaceous plants of early successional age. Also, where hurricanes blew down trees and created many small gaps in Plot 37, there were numerous small trees compared to Plot 36, which experienced no significant disturbance during the same time.

However, the effects on biodiversity seem to become more negative as the size and number of gaps grows. Historically, multiple patches of forest and grassland in Duke Forest have been cleared for farms, and later, human infrastructure such as roads and power lines. This clearing has heavily fragmented the landscape. Areas of habitat for various plant and animal species are broken up by areas of non-habitat, and although edge species thrive in the numerous habitat edges, species requiring deep forest shelter or tall grass do less well. The fragmentation alters animal movement patterns, while plants that depend on animals for seed dispersal may also experience altered distributions. Clearing has also set succession back to earlier stages. Areas where farms once existed had a mixture of tall pine and short oak, indicating farm abandonment long ago. Other former farms and power line right-of-ways had primarily herbaceous species because of more recent disturbance.

Agriculture has also been responsible for inputting high nitrogen and phosphorus levels into the soil. Because different plants thrive in different soil types, historical land use patterns have directly affected vegetation patterns throughout Duke Forest. Nutrient cycles have also been altered. We saw that disturbed areas were more likely to have maples and tulip poplars than oaks. Since these leaves decay more quickly than those of oaks, the presence of these trees in disturbed areas quickens the rate of nutrient turnover. Invasive species also have entirely different nutrient requirements and decay rates than the native species they are outcompeting, and are a further mode of disturbance affecting the vegetation patterns of Duke Forest.