

# The Effect of Spotted Lanternflies on Wood Boring Insects in Pennsylvania

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## Background/Motivation

*Lycorma delicatula*, more commonly known as the Spotted Lanternfly, is a planthopper insect that is native to Asia (Pennsylvania Department of Agriculture, 2020). This invasive species was first found in eastern Pennsylvania in 2014, and has since continued to migrate throughout the rest of the mid-atlantic states (Urban, 2019). The infestation of these flies has gotten so severe in some counties that quarantines have put in place that mandate people to inspect their vehicles for signs of the flies before leaving their county (Pennsylvania Department of Agriculture, March 2020). This invasive species feeds on the sap of traditional economically important plants and trees such as grapevines, maple trees, walnut trees, birch trees, and willow trees (Dara, Barringer, & Arthurs, 2015). Spotted Lanternfly feeding can result in trunk wounds, wilting, branch death, sooty mold at the base of the trunk, and ultimately death of the tree (Barringer & Ciafré, 2020). These invasive species have proven to be very detrimental to native plants and damaging to local ecosystems. Therefore, assessing exactly how the invasive lanternflies impact the local insect populations is imperative to understanding the full extent of environmental damage caused by this species.



Figure 1: Images show Spotted Lanternfly in different stages of life as well as habitat. Image from Penn State

## Hypothesis

We hypothesize that there is a clear relationship that exists between the consumption of resources by the Spotted Lanternfly and the population size of local wood boring insects.

## Prediction

We predict that the amount of wood boring insects will be the greatest in areas with the least amount of Spotted Lanternflies, and the least in areas with the most amount of Spotted Lanternflies. Our prediction stems from the idea that in areas with more spotted lanternflies, more trees will be destroyed from their presence and therefore there are less resources available for wood boring insects. Therefore, the spotted lanternflies are forcing the wood boring insects to move to new habitats.

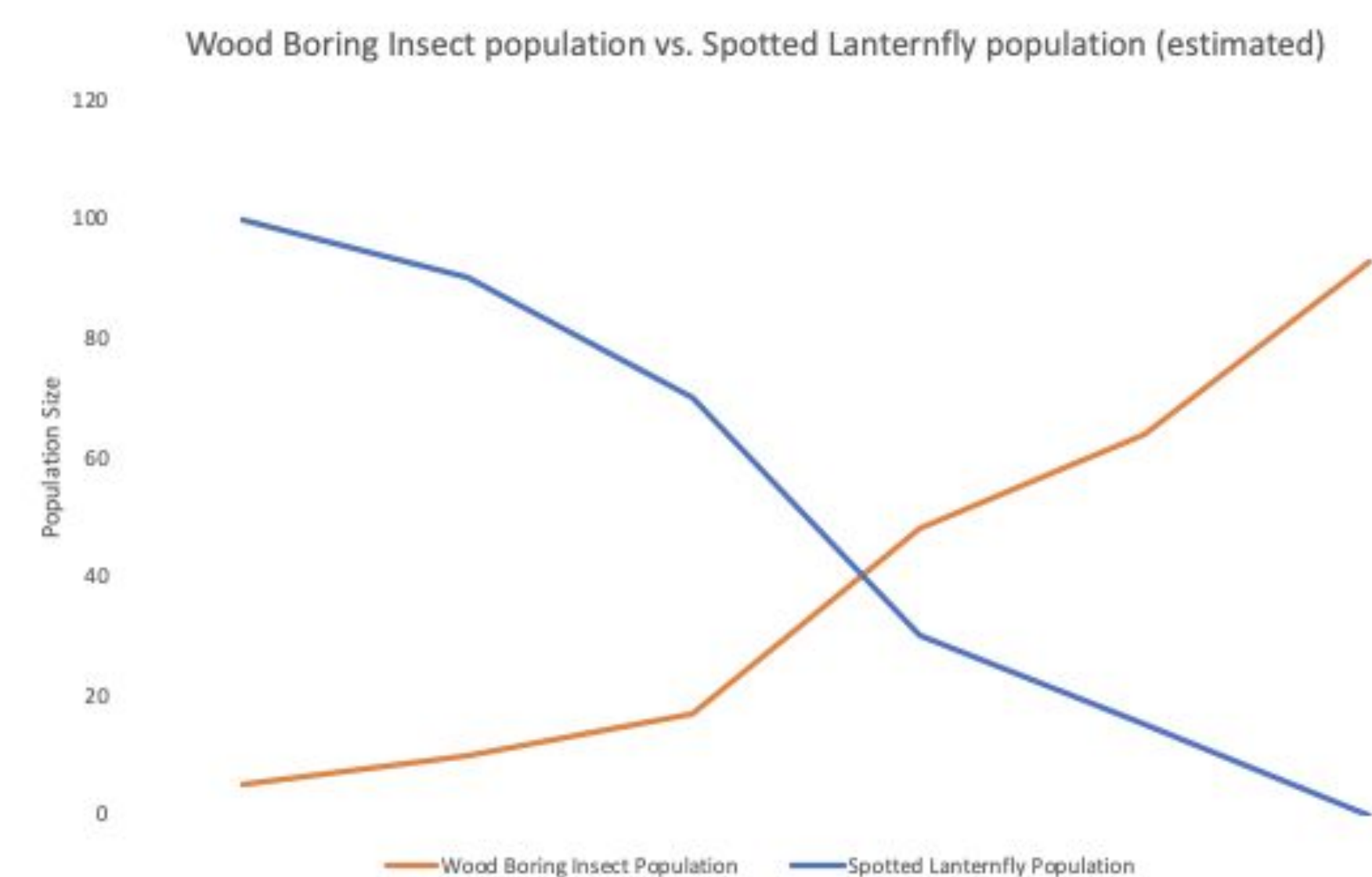


Figure 2: Graph shows the predicted relationship between the population size of the two species.

## Study Design

- A total of six plots will be taken into account in this experiment. Two plots will be infested with the Spotted Lanternfly, two will be free of the Spotted Lanternfly, and two will be randomly selected plots. The randomly selected plots will truly be random, so it is still unknown whether or not they will be infested and to what degree.

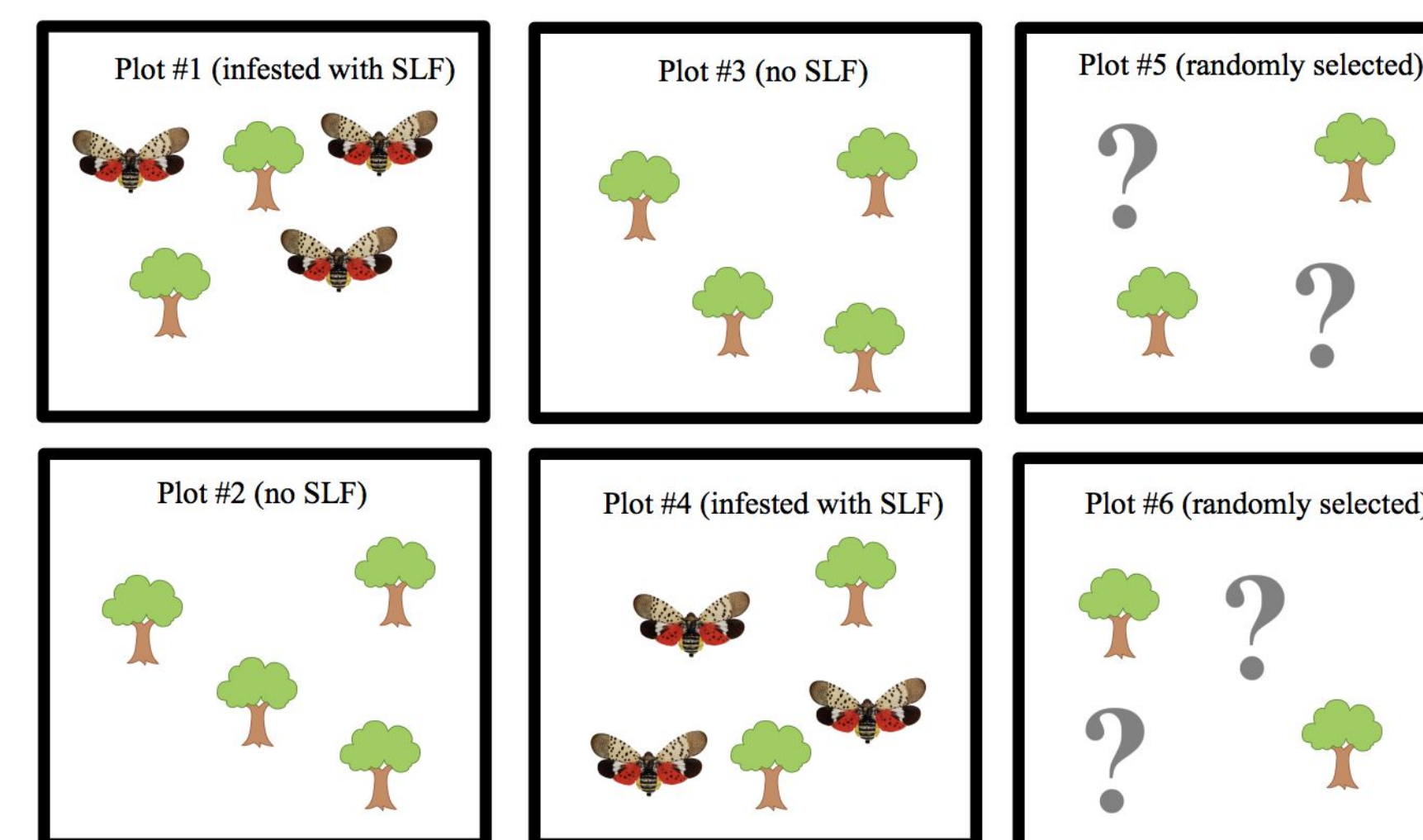


Figure 3: Depiction of the study plots

- At each plot, the overall health of the ecosystem will be looked at and noted, but there will also be some specific things looked at.
- First and foremost, the presence of the Spotted Lanternflies will be determined, and if present, the degree of infestation will be noted.
- Tree and plant health are two other primary things to be looked at by the field researchers. Tree/plant age, signs of infestation of Spotted Lanternfly, wood boring insect presence, and overall health of the plant will be recorded.

## Study Design

- Wood boring insect activity will be observed in order to later compare species health and abundance compared to that of the spotted lanternfly to determine the relationship between the two. The species and health will be recorded for the tree the wood boring insect was located on, which will be recorded.
- Biodiversity will also be recorded. That will include things such as the number of different species and their quantity within each sample plot. This will help to see which species the spotted lanternflies are targeting in each region to best create a solution to the problem.
- For the plots infested by the flies, the main focus will be abundance of the wood boring insects and which species of tree they were most commonly found on. This will be compared to the plots not containing the flies to determine how the spotted lanternflies have affected the population of the wood boring insects and also to see if the flies forced a change in habitat due to their domination of other tree/plant species.

## Intended Analysis

Given that the dependent variable is the amount of wood-borer insects which is continuous, and the independent variable is the degree of infestation of Spotted Lanternflies, the statistical test that we will use to analyze the data is a regression. The data collected from the regression test will show us if there is definable evidence between the amount of spotted lanternfly infestation and the amount of wood borer insects present in the area.

## Works Cited

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