

Analysis of Population Spread

The goal of the Slow the Spread (STS) project is to reduce the rate of spread of the gypsy moth population, which is expanding out from New England to the south and west. The Decision Algorithm (DA) is a program that is used to help suggest treatments to be performed based on gypsy moth trap catch. Additionally the DA is used to analyze the rate of spread of the gypsy moth population in order to verify the overall success of the STS project. The historical spread rate of the gypsy moth population has been 21 km/year while the goal of the STS project is to reduce the spread rate to less than 10 km/year.

To better understand where the population is growing, the states that are in the project have been divided into 14 individual regions to examine the spread rates. To determine the spread rate for a given region and given year the difference between each of the moth lines between the given year and the previous year is averaged. This includes examining the movement of the 1, 3, 10, 30, 100, and 300 moth lines. In addition to the changes in the location of the lines, the average distance between the 1 and 3 moth line is compared in the two years. The same thing is done for the other pairs of moth lines. All the values are averaged together to determine the compression rate of the given area. This process is repeated for all of the regions in the program.

After all the rates are determined, pages summarizing the data is created. This includes creating graphs of both the compression and spread rate and determining the project wide spread rates. Finally an image is created showing the location of the 10-moth line through time. This is just a good way to visually show what the moth population is doing, but the spread rate is not limited to just the 10-moth line.

The graph below shows the results of the STS spread over the course of the project. It was determined that using a 5 year moving window gives a better average of what the gypsy moth population is doing. There is a known variation in the population spread based on the gypsy moth. Using this 5 year window helps to smooth out these known variations and show how the project is doing overall for several consecutive years.

