

Salamander Study At The Cathance River Preserve, Topsham, Maine

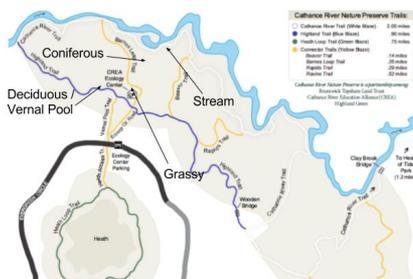
Tyler Bernier, Emily Smith, and Zoe Stevenson



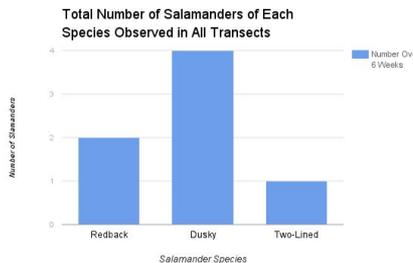
From left to right; Emily S., Tyler B., Zoe S., Matt Dubel.



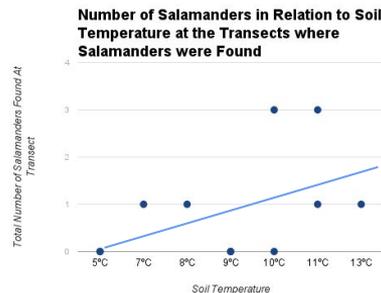
From top left to bottom right; two-lined, dusky, and redback salamanders.



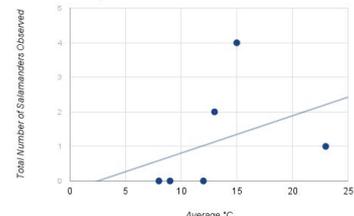
Map showing location of transects



Total Number of Salamanders of Each Species Observed in All Transects



Number of Salamanders in Relation to Air Temperature



Number of Salamanders in Relation to Air Temperature

Conclusion

•The first hypothesis was correct. The most common salamanders that were found at the Cathance River Preserve are redback salamanders, two-lined salamanders and dusky salamanders.

•The second hypothesis claimed that there were other undocumented species of salamanders at the Cathance River Preserve. This was not proven with this study because it failed to find any undocumented salamanders under the coverboards, in the chosen areas.

•The last hypothesis claimed that below 7°C air and soil temperature, the salamanders would disappear underground for hibernation for the winter. The study showed that salamanders weren't found under coverboards below 7°C soil temperature and 13°C air temperature. The hypothesis was correct about soil temperature, but not about air temperature.

An Additional Study

In addition to the six week fall study, a second study in the spring would not only yield more data, but increase the chances of finding both yellow and blue-spotted salamanders. This study would take place in the months of March through early June. It would focus chiefly on the vernal pools and heath bogs of the Preserve. The spring study would follow the same procedure as the fall study.

Thank You

We would thank a few people for helping us through the process of our research and experiment. Thank you Matt Dubel for being our mentor and guiding through CREA and helping us through our experiment and with the salamanders we found. Thank you Mr. Evans for allowing our class to work with CREA to do these experiments. Thank you Katie Callahan for taking a few group picture of us.

Purpose

To identify habitats that are preferable for different varieties of salamanders. To observe previously known species and attempt to discover an undocumented species of salamander. To determine temperature's effect on salamander observations.

Hypothesis
Salamander species that are common and will be found in the Cathance River Preserve are redback salamanders, two-lined salamanders and dusky salamanders.

Some undocumented salamanders will be found at the Preserve.

Salamanders will continue to be observed until air and soil temperatures are below 7°C.

Weekly Procedure

1. Travel to the Cathance River Preserve, Topsham, Maine
2. Meet with mentor CREA Executive Director Matt Dubel.
3. Visit a transect. Each transect is composed of three boards (1 square foot in size) arranged in a relatively straight line about three meters apart.
4. Prepare camera before looking under boards in case of an escape artist.
5. Check underneath boards for organisms.
6. Document the type and number of organisms founds
7. Take abiotic measurements (air temp, soil temp, and soil pH.)
8. Repeat steps 10-13 for each of the transects. (See map for locations)

Background

In Maine, there are six types of salamanders: yellow and blue spotted salamanders, two lined salamanders, redback salamanders, spring salamanders, and dusky salamanders. Most salamanders prefer to live under rocks and rotting wood, in damp environments. Some, such as the spotted salamanders, also burrow underground.

Salamanders prefer temperatures between 10-21°C. The spotted salamanders prefer a soil pHs of 7-9. Duskies and two-lined both prefer pHs between 4 and 6, and redbacks prefer pHs between 3.75 and 4.35. All four salamander species are most commonly found in the Northeastern part of the U.S. and Southeastern Canada.

Boiled-Down Procedure:

1. Acquire materials
2. Setup 4 transects consisting of 3 boards arranged in a line in the following areas
 - Coniferous
 - Grassy
 - Stream
 - Vernal Pool
3. Place flags at each end of the transect to mark area
4. Create a data table with the following abiotic factors
 - Sunlight (L)
 - Air Temperature (°C)
 - Soil Temperature (°C)
 - Soil pH
 - Soil Moisture

Weekly Procedure

5. Travel to the Cathance River Preserve
6. Meet with mentor and CREA executive director Matt Dubel.
7. Visit a transect.
8. Prepare camera.
9. Check underneath boards for organisms.
10. Document the type and number of organisms founds

Boiled-Down Conclusion:

The first hypothesis was correct. The most common salamanders that were found at the Cathance River Preserve are redback salamanders, two-lined salamanders and dusky salamanders. The second hypothesis claimed that below 7°C air and soil temperature, the salamanders would disappear underground for hibernation for the winter. Below 7°C for soil temperature and below 13°C for air temperature salamanders weren't found underneath the coverboards. The last hypothesis claimed that there were other undocumented species of salamanders at the Cathance River Preserve. This was disproven because the study failed to find any undocumented salamanders under the coverboards, in the chosen areas.

Improvements

Three plots of identical size (most likely five feet by five feet) would be set up in a straight line. These plots would allow for multiple logs to be overturned, therefore a more accurate estimation of population size could be calculated.

Errors

The boards that were used were not identical. They were different widths, lengths and heights. Also, the space between the boards was different for each interval in each transect. Not all of the boards were set up in a perfectly straight line. If this study were to be done again, each transect and board should be made identical to make the experiment and conclusions more accurate.