# CHANGES IN ARTHROPOD COMPOSITION ACROSS A FOREST-FIELD ECOTONE

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## Introduction

An **Ecotone** is the ecological boundary between two adjacent but differing habitats, with biophysical characteristics that are determined by the interactions between these different plant and animal species (Kolasa & Zalewski, 1995)

**Arthropods** are the most speciose and successful group of animals on the planet. They form the basis for a number of food chains, as well as performing a number of vital ecosystem services, most notably those of pollination and decomposition (Finnamore, 1996)

## Research Question

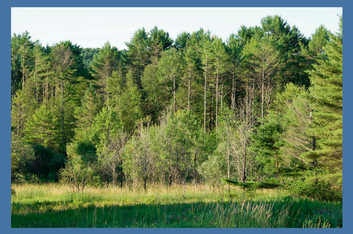
**How does arthropod composition change across a transition between forest and field?**

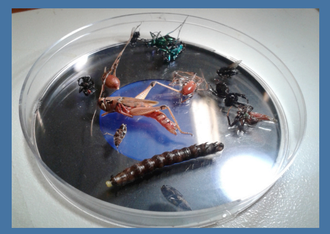
## Predictions

We predicted that arthropod ordinal diversity and abundance would be greatest in the ecotone, followed by the field, and lowest in the forest.

## Abstract

Arthropods were sampled along three field-forest transitions, in order to investigate any changes in mean ordinal diversity or abundance. Our results showed that there was not a significant change in mean ordinal diversity over distance. However, there was a statistically significant negative linear relationship between arthropod abundance and distance.





## Results

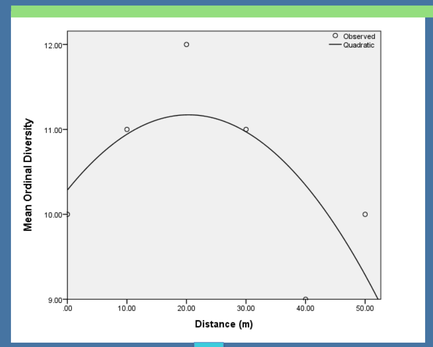



**Figure I**: Mean ordinal diversity vs. distance for three field-forest transitions, showing a non-statistically significant **decrease in ordinal diversity** (ANOVA, t = 1.008, df = 5, P = 0.42).

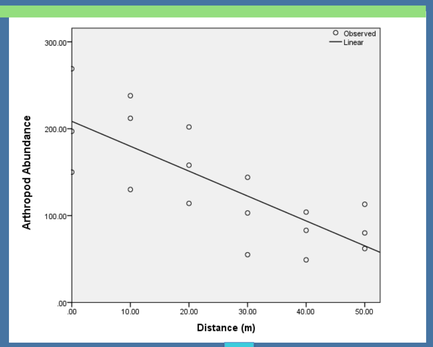
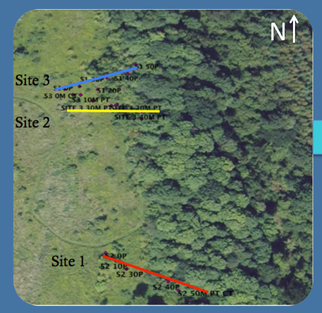



**Figure II**: **:** Arthropod abundance vs. distance for three field-forest transitions, showing a statistically significant **decrease in arthropod abundance** (ANOVA, t = -4.939, df = 17, P < 0.001).

## Methods

- Placed six pan traps at 10m intervals along three 50m transects
- Set 3 composite traps at the 0m, 30m, and 50m points along the transect.
- Traps were placed in the afternoon and sat for 24 hours before collection.
- Performed six, 20m sweep-net transects which were perpendicular to the main transect, placed at 10m intervals, at the same points where the pan traps were located
- Performed a linear regression to analyze changes in diversity vs. distance




We collected from three sites in the field north of the Earth Ranger's Centre in Woodbridge, Ontario from June 23 to June 26, 2014

## Significance

With increasing urbanization and forest fragmentation altering natural ecosystems, the study of ecotones and their interactions has been pushed to the forefront of conservation biology.

## Design Limitations

- Transects placed too close together
- 24 hour active time for traps too short
- No biomass data

## Conclusions

- Contrary to prediction, there was no significant change in mean ordinal diversity along the transition between forest and field, which may be because the arthropods found in these sites consisted largely of habitat generalists. Despite being statistically insignificant, there was a peak at the 20m mark, indicating a potential trend which could be explored in further research.
- However, the negative linear relationship between arthropod abundance and distance into the forest supported our hypothesis. An explanation for this observed trend is that, as canopy cover increased along the transect, light and temperature decreased as they began to be shaded out by taller vegetation, and this was mirrored in a decrease in arthropod abundance.