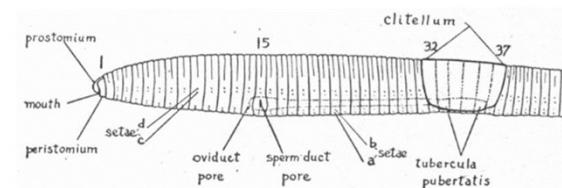


# The impact of non-native earthworms on regenerating forest communities in western Pennsylvania

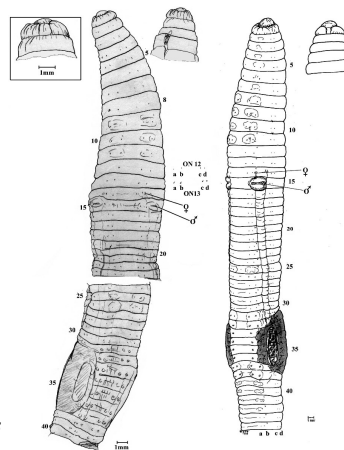


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## Abstract:

During the last glacial period, earthworms native to the Eastern United States were extirpated, causing forest communities in Eastern North America to develop without the presence of earthworms for at least the last 20,000 years. Now, non-native earthworms from Asia and Europe, deliberately introduced through human actions, have invaded these forests. This invasion potentially may affect these ecosystems' composition and function, although to date no research has assessed the impact of non-native earthworms on forest communities of Western Pennsylvania. The environmental impact of non-native earthworms varies by species, but generally they change soil composition, alter carbon: nitrogen ratios, and decrease phosphorus abundance. By altering the soil composition and chemistry, these non-native earthworms have a cascading effect on forest plant communities. This study specifically seeks to enumerate the impact of non-native earthworms on new-growth forest communities across the Wisconsin glacial boundary in Pennsylvania.



Eaton, T.H., 1942 Journal of the Washington Academy of Science Header worm, Natural History Museum, London



Figure 2: Map of forest sampling locations in northwestern Pennsylvania

## Methods & Maps:

Sites will be selected by stratified sampling across three forest ages (Fig. 1)

1. Forests aged 20-30 years (3 sites)
  2. Forests aged 40-50 years (3 sites)
  3. Forests aged 60+ years (3 sites)
- 9 sites total

Three of the nine sites are located in a region covered during the most recent glaciation (Wisconsin Glaciation)

At each site, three plots will be surveyed for

1. Earthworm diversity and abundance
2. Understory plant community composition
3. Overstory plant community composition
4. Abiotic conditions (disturbance, landscape features, etc.)



Figure 1: Proposed timeline of fieldwork

## Purpose:

To analyze plant communities of different aged Western Pennsylvania forests and how non-native earthworm species affect these communities.

## We hypothesize that:

1. the presence of non-native earthworm species will change the composition of these plant communities leading to the domination of non-native plants
2. Earthworm densities and plant communities will be correlated to the ages of forests sampled and glacial history
3. Leaf litter layer will be affected by presence/composition of earthworm community
4. Earthworm communities will affect plant community composition to include understory, overstory, and non-vascular plant community components

## Deliverables:

1. Characterize the earthworm community in regenerating woodlands of western Pennsylvania
2. Link plant communities to earthworm communities
3. Describe impact of earthworm invasion on forest communities across glacial boundary

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