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# Ambystoma species and the *A. jeffersonianum*-hybrid complex : a comparison of abundance in established and restored wetland habitats

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## Introduction

- In the Midwestern United States, many wetland complexes have been converted to farmland or housing developments. This loss and/or degradation of habitat affects the persistence of *Ambystoma* populations.
- Ambystoma* use ephemeral forested wetlands to breed and upland forests for foraging and hibernation. Both of these habitat types are an integral part of *Ambystoma* ecology. Barriers can also influence *Ambystoma* populations by preventing movement between habitats.
- The extensive loss of natural habitat has led to restoration efforts for wetlands and the benefits of such efforts to salamanders are not well known.
- Allen County, IN historically is part of the range of four *Ambystoma* species: *A. maculatum*, *A. opacum*, *A. texanum*, and *A. tigrinum* as well as hybrids of the *Ambystoma jeffersonianum* complex.

## Objectives

- Information about the ecology of *Ambystoma* occurring in disturbed landscapes provides the foundation for effective management of available habitat.
- Comparison of the response of *Ambystoma* salamanders to restored emergent wetlands as breeding habitats could provide insight to which species/hybrids will benefit most.
- The effectiveness of a barrier, a railroad track, was also determined for this sites' *Ambystoma* assemblage.

## Methods

- All salamanders were trapped using pitfall traps.
- Traps (N=20) were used to study two forested habitats and one emergent habitat as well as the potential routes of movement between them.
- Salamanders were individually tagged using VIAAlpha tags
- Tissue samples were taken by removing tail tips and used to identify the hybrids with microsatellite analysis.

## Hybrid Identification

- All hybrid animals that were captured were genotyped using microsatellite analysis to identify the hybrid genome.
- The study population consisted of 87 triploid *Ambystoma* LTJ (*laterale-texanum-jeffersonianum*) (Figure 1) and 6 tetraploid LTTJ. Two specimens could not be fully typed (LTJ?). The LTJ hybrid is well documented in northwestern Ohio but is uncommon in Indiana.



Figure 1. Hybrid genome consisted of three species. From left to right: *A. laterale*, *A. texanum*, *A. jeffersonianum*.

## Results

All species/hybrids showed decreased numbers in emergent and border habitats. *Ambystoma tigrinum* was the most prevalent species found in the emergent wetland of Eagle Marsh. *A. tigrinum* and *A. LTJ* were captured more frequently close to the railroad than *A. texanum* (Figure 2). Trap locations and groupings are shown in the map to the right (Figure 3).

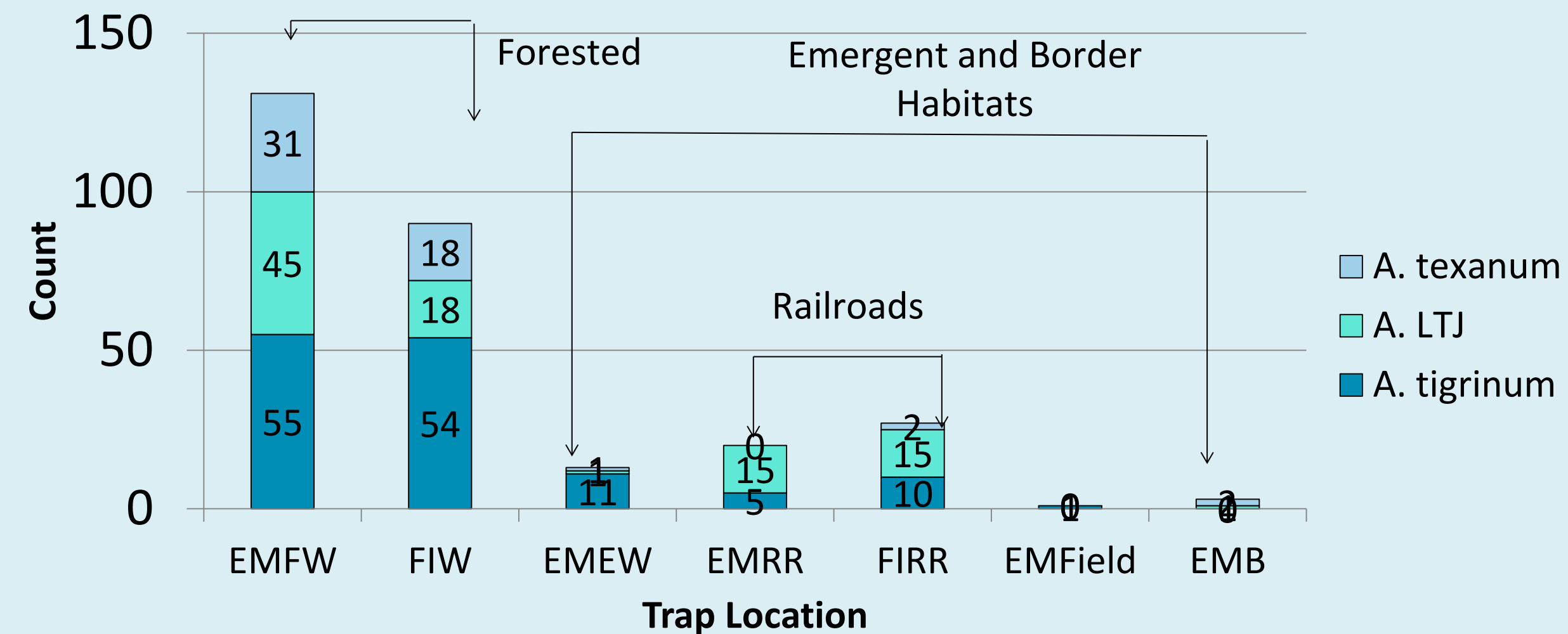


Figure 2. Counts for all three salamanders in each habitat type.

The numbers of all species were fewer in EMEW than EMFW with *A. texanum* and *A. LTJ* showing the greatest decrease (Figure 4). The forested wetlands of Eagle Marsh and Fox Island showed a difference in number but it was not as significant as that found between EMEW and EMFW (Figure 5).

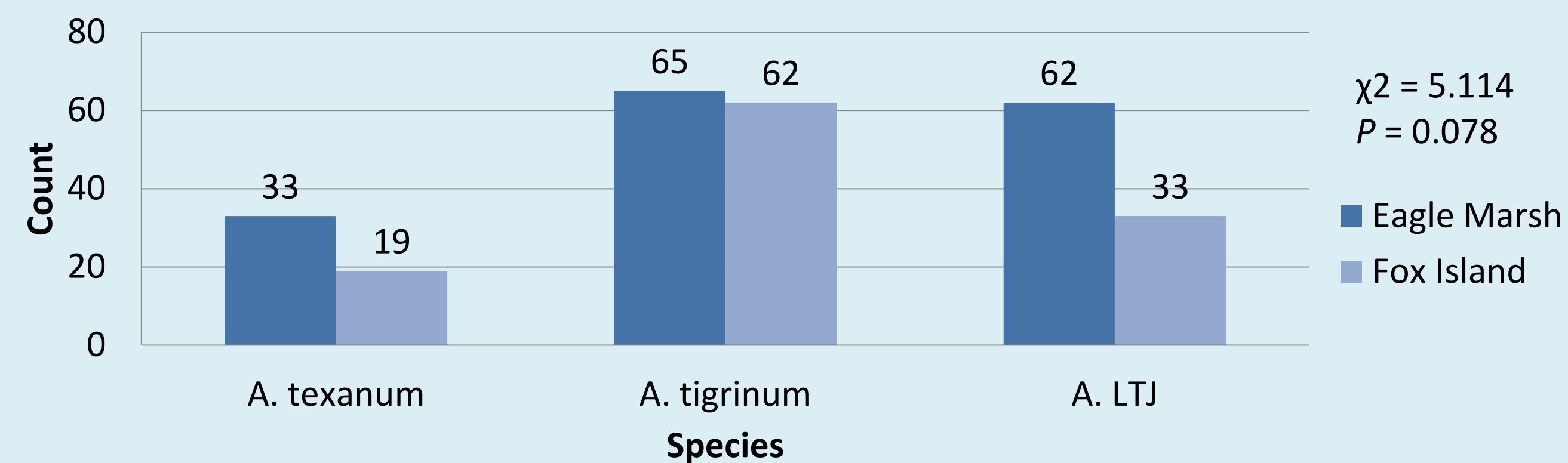


Figure 4. Comparison of the emergent wetland traps and forested wetland traps in Eagle Marsh.

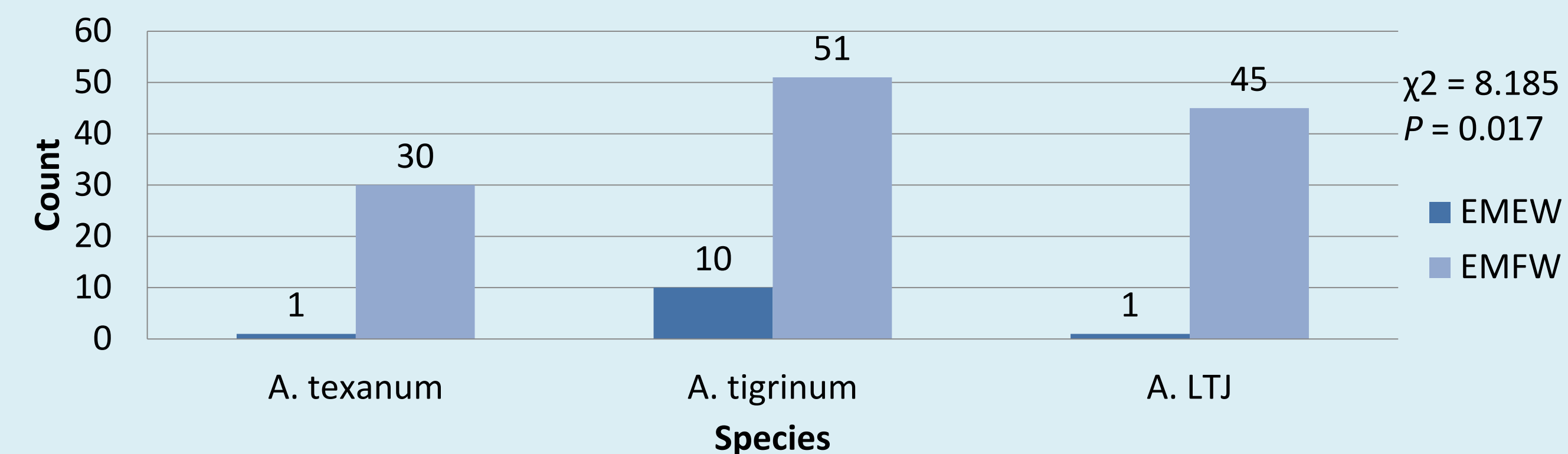


Figure 5. Comparison of the forested traps of Eagle Marsh and Fox Island.

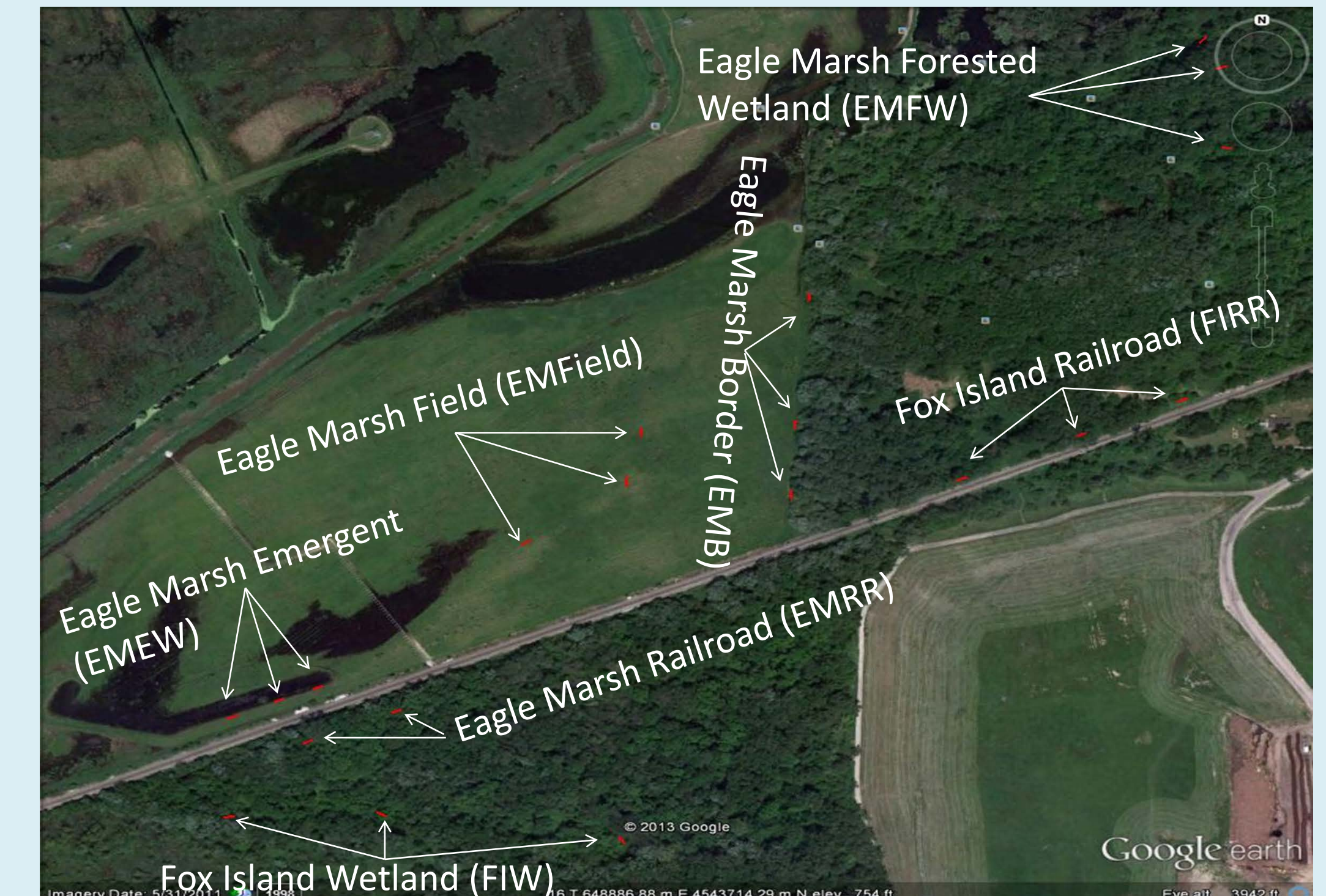


Figure 3. Map of the field site showing trap placement and the grouping of traps into habitats and migration corridors.

## Conclusions

- A. tigrinum* will use open and/or disturbed breeding pools.
- A. texanum* tend to avoid barriers, edges and open habitats.
- The hybrids (LTJ) crossed barriers, and use open breeding pools.
- The railroad seems to be an incomplete barrier. Both *A. tigrinum* and hybrids were trapped near the railroad track on either side.

## Acknowledgements

- Minton Jr., S. A. 2001. Amphibians and Reptiles of Indiana. Second edition. Indiana Academy of Science, Indianapolis.
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