

Introduction

Background

The Palouse prairie hosts diverse vegetation and invertebrate species. However, the loss of 99.9% of the original Palouse prairie has likely led to a loss of insect richness and abundance. Eastern Washington University began a restoration project 2 years ago to return 120 acres of wheat field to endangered Palouse Prairie vegetation. The ability for insect to dispersal into the site has likely reduced as intact prairie habitat has become fragmented. The loss of insect dispersal likely limits the effects of pollination from bees, which effects the rates of vegetative reproduction, reducing seeding rates.

Objectives

Compare richness and abundance of insect and bees at three different treatment sites: unrestored wheat field, EWU restoration site, and natural area.

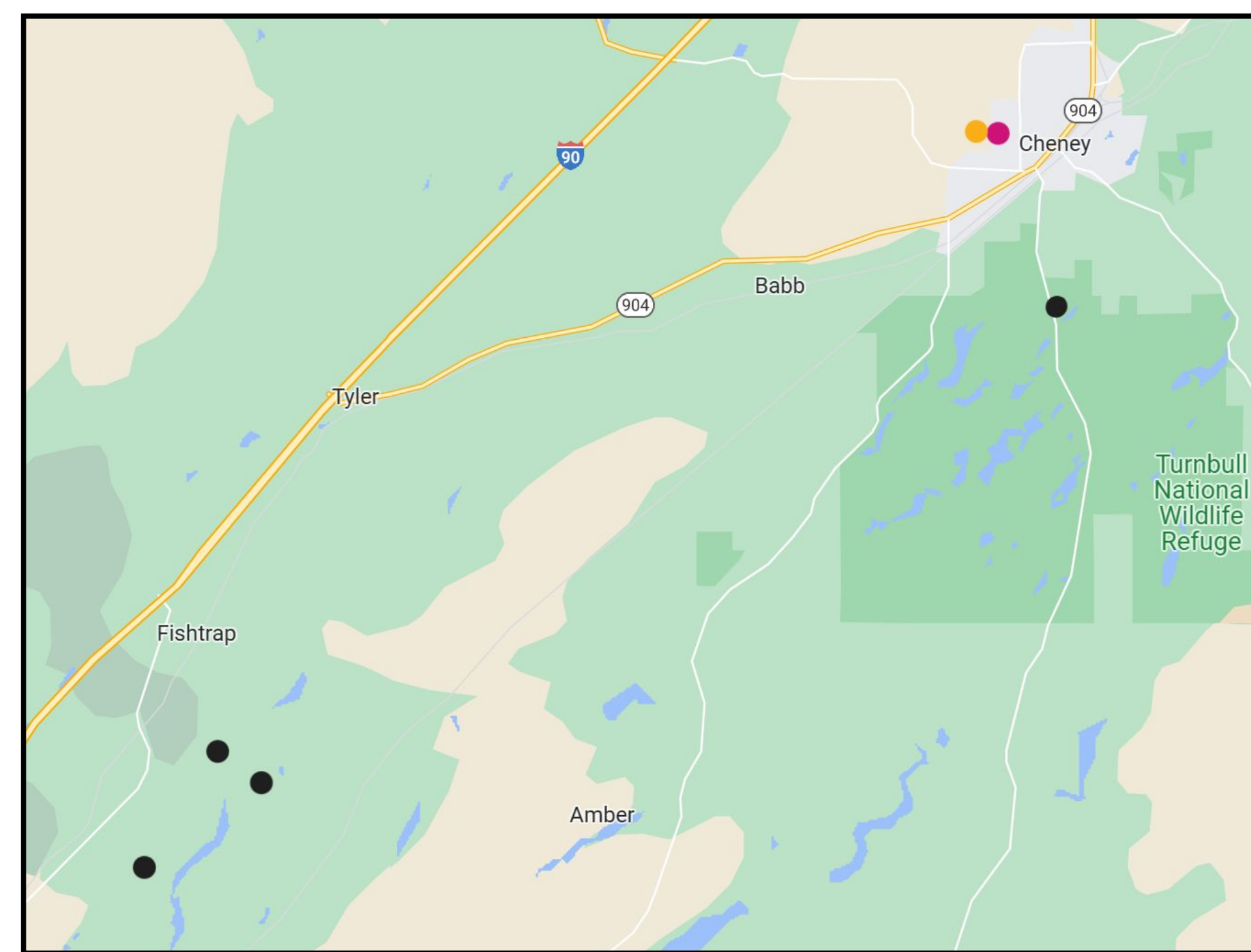
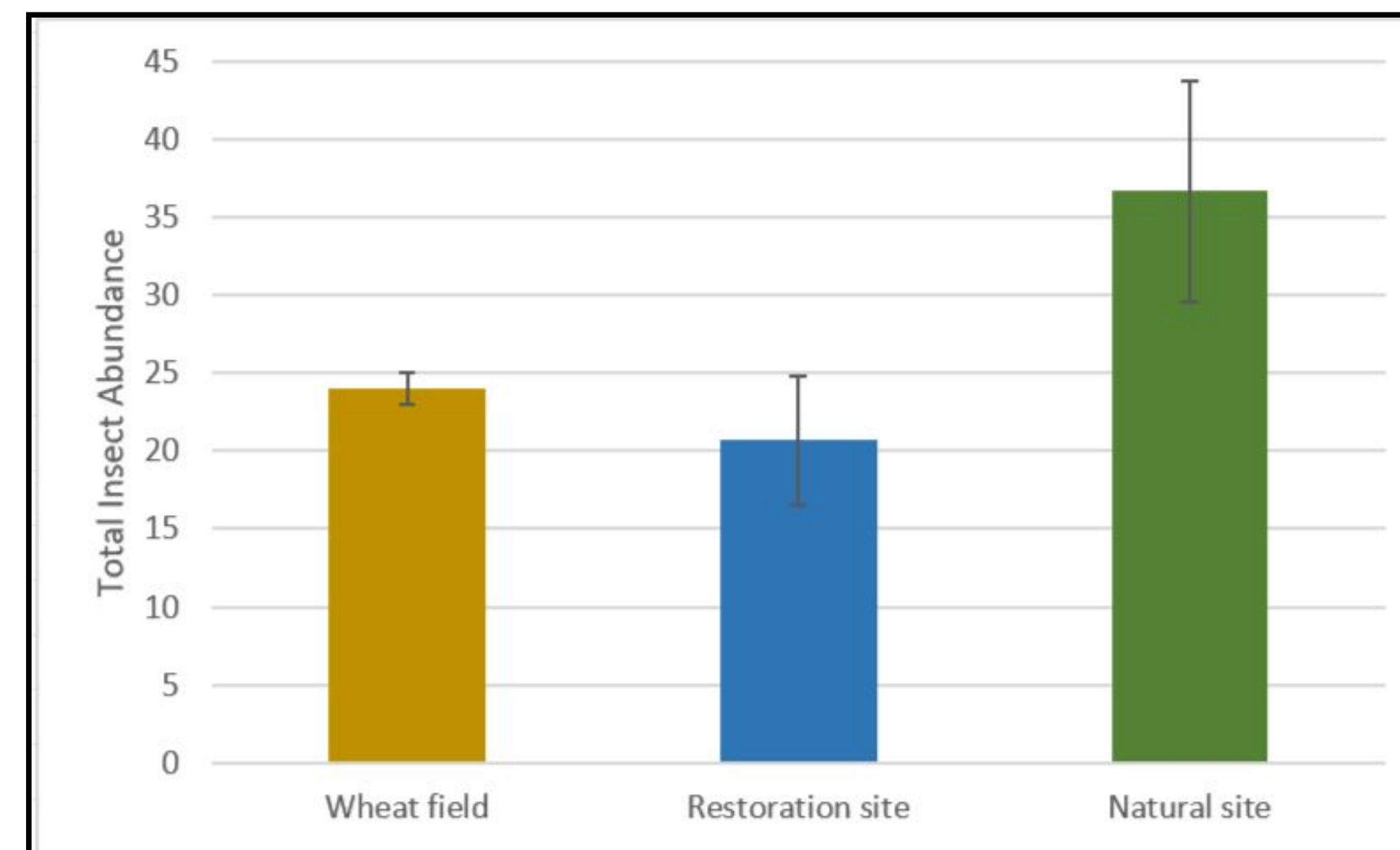


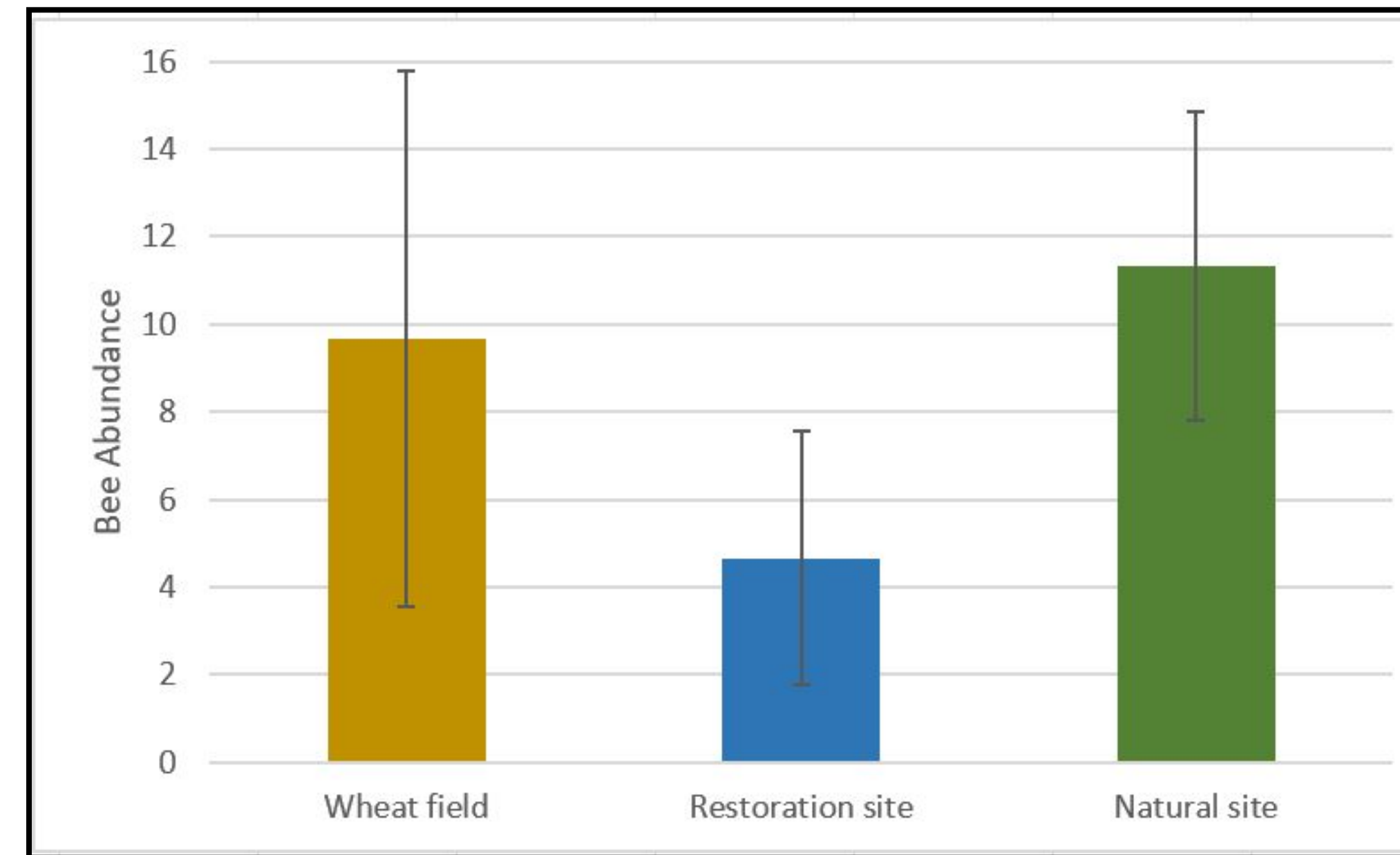
Figure 1. Map of sites. Pink = restoration site, yellow = wheat field, and black = natural sites.

Hypotheses

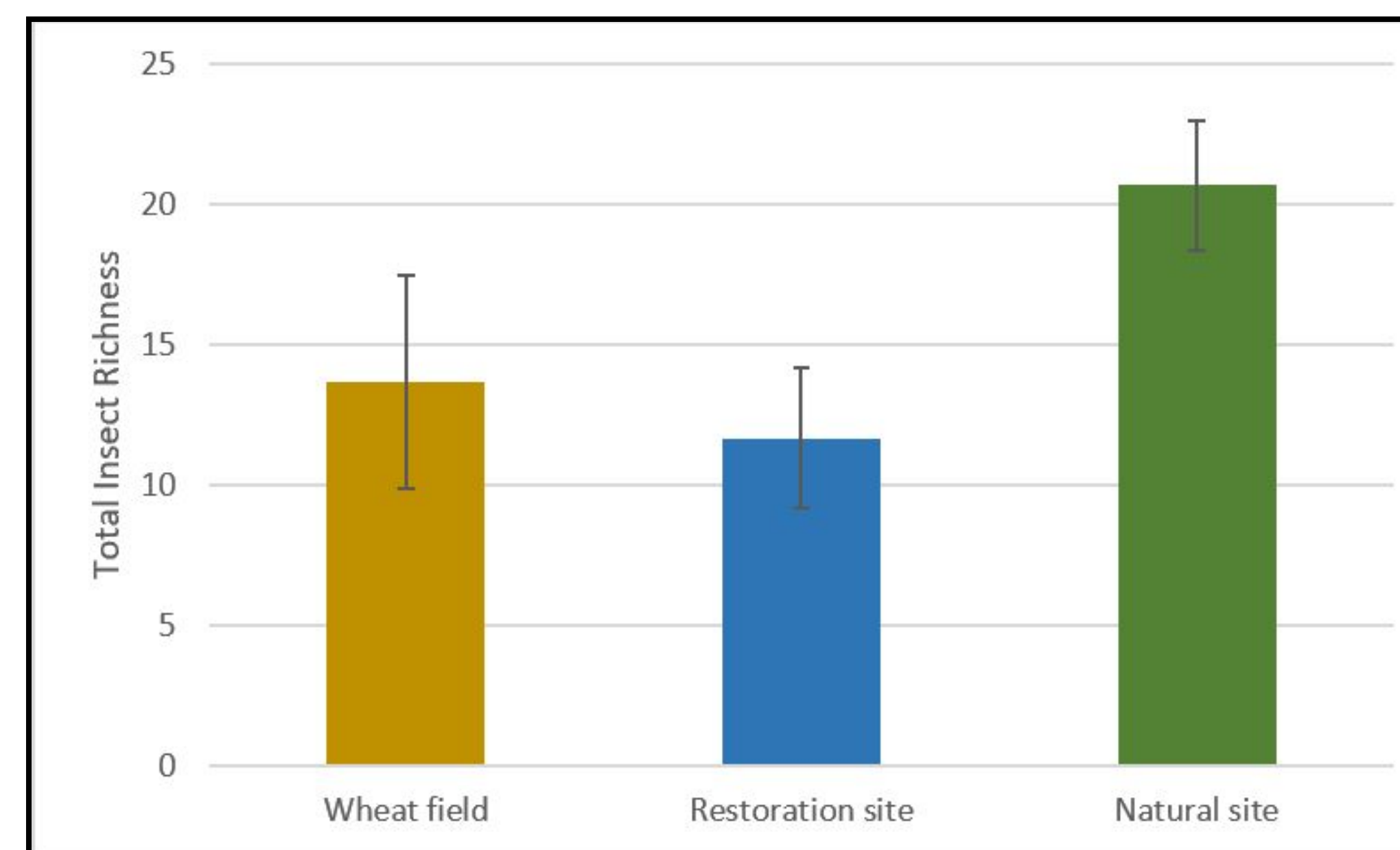
- Natural areas will have higher abundance and richness of insect populations than both the wheat field and the restoration site.
- The Restoration site will have greater abundance and richness than the wheat field



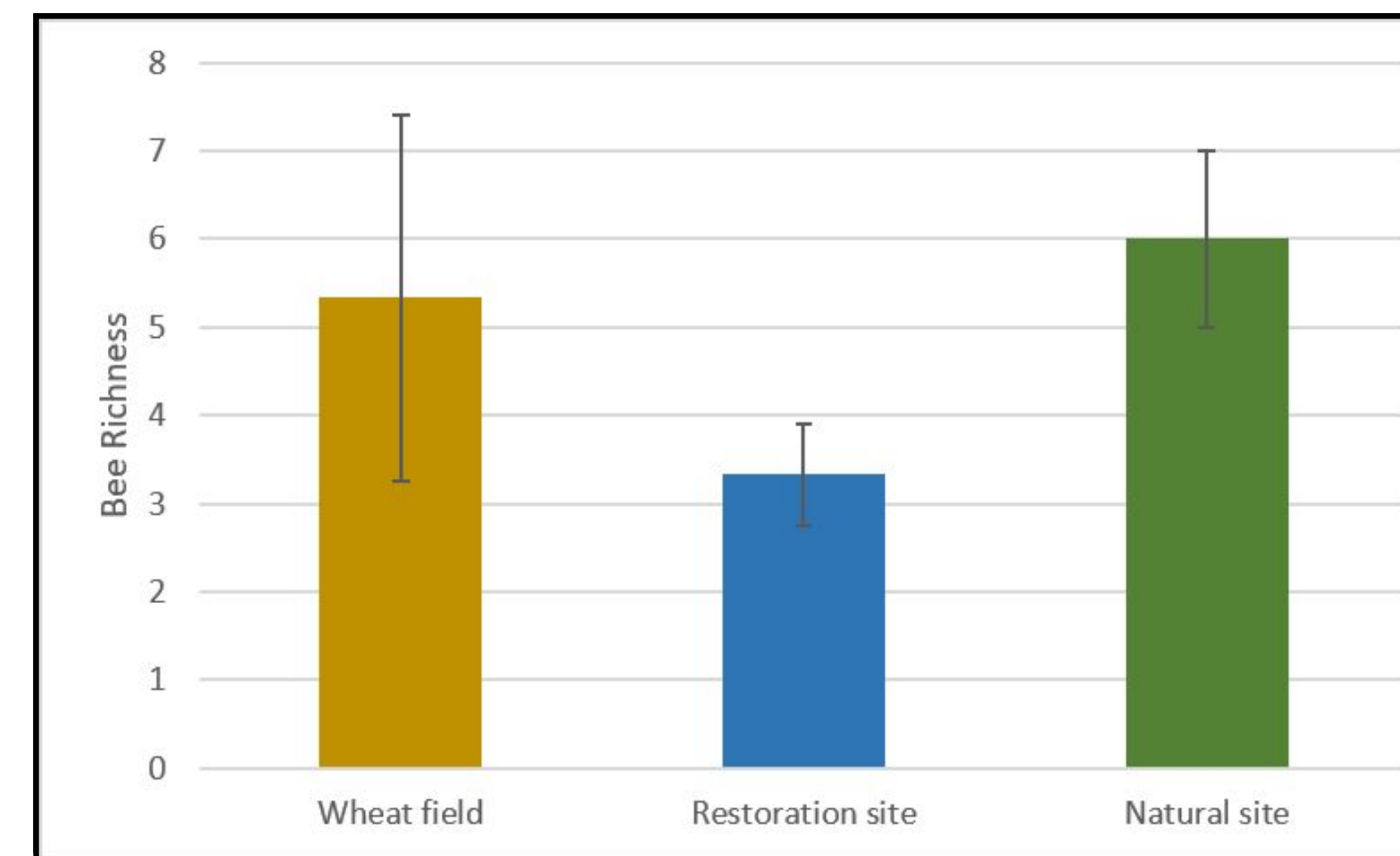
Total insect abundance was significantly different between the natural site and both the restoration site (p-value 0.00763357) and the wheat field (p-value 0.0076357).



The bee abundance between the restoration and the wheat field revealed significant difference (p-value 0.3961524). The difference between the natural site and the restoration site also showed significance (p-value 0.1315530)



Total insect richness was significantly different between the natural site and both the restoration site (p-value 0.0050189) and the wheat field (p-value 0.0159912).



A significant different was observed in bee richness between the Natural site and both the restoration site (p-value 0.0666545) and the wheat field (p-value 0.3789357).



Figure 2. Wheat Field



Figure 3. Restoration site



Figure 4. Natural site at Fishtrap

Methods

Site

- Three treatment sites: wheat field, restoration site, natural site.
- The EWU restoration site and wheat field each had three replicates and natural sites had 5 replicates, two at Turnbull and 3 at Fishtrap

Insect Collection

- 3.25 oz cups were used as bee bowl traps and spray painted three colors, blue, yellow and white
- A trap of each color was placed at each site and filled with soapy water.
- Traps were left for 24 hrs. before collecting
- Most insects were pinned. Smaller specimens were stored in ethanol



Figure 5. Bee bowls at wheat field.

Data analysis

- Anova test with a Tukey to compare treatment sites.

Discussion

Significant difference was observed in abundance and richness of insects between the natural sites compared to both the wheat field and restoration site. Further research is being conducted to observe the effects of insect and floral phenology differences at each site. Research in consecutive years will help observing changes in insect richness and abundance as the restoration site increases in native biomass.



Awcknowledgments

Dr. Justin Bastow Turnbull National Wildlife Refuge
Eric Budsberg Fishtrap Recreation Area