

Seasonal succession in floral resources and response of insect pollinator groups in three grassland types important for pollinator conservation in Iowa

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Goals and Objectives:

- Provide information on differences in floral resources and pollinator communities among different types of grasslands important for conservation in the Upper Midwest.
 - Quantify differences and patterns of changes in floral resources over the entire growing season.
 - Understand how pollinator communities change in response to differences and seasonal changes in floral resource availability.
 - Use information acquired on differences of floral resources and pollinator communities among grassland types to develop recommendations to improve floral resources in tallgrass prairie reconstruction efforts and management practices of exotic dominated grasslands.
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Introduction:

Recently a global decline in pollinators has been observed. Nectar and pollen from flowers are important resource for many pollinators for powering flight and increasing reproductive success. Conservation of native grassland pollinator species in Iowa relies upon the preservation of high quality habitats, the reconstruction of new habitats, and the careful management of novel grasslands (fallow fields and moderately managed pastures dominated by exotic plant species). These three types of grasslands differ in their floral resource communities. Here we proposed to measure the floral resources available in three types of grasslands not only from a single or a few snapshots in time but throughout the growing season (spring-fall), and to observe the pollinator community over four sampling rounds. Understanding how these habitat types differ in their floral resources and seasonal availability is an essential step in determining their utility for pollinator conservation and for refining strategies for reconstruction, restoration, and management of habitat for pollinators.

Progress:

We completed 12 sampling round of floral resource measurements at two week intervals from May 3rd to Oct. 5th 2014. Over this time we made a total of 768 observations at transects, counted 296,293 inflorescences and identified 144 flowering species (excluding graminoids). We observed butterflies at all of the transects over three sampling rounds (early June, late June - early July, and late July). Butterfly observations have been entered into a database but have not yet been analyzed. We also sampled bees using pan traps over two sampling rounds mid-June and mid-July. All bees have been pinned and are currently in the process of being identified to the species level. Analyses of floral resource responses are underway. Some preliminary results from the floral resource measurements are as follows: A) richness and diversity of inflorescences are lower in fallow fields compared to the other grasslands types, B) composition of floral resources over all sampling rounds is different in remnants compared to the other grassland types, and C) turnover (Bray-curtis dissimilarity from round to round) in species composition is lower in pastures than in remnants.

Future Plans:

All of the field work for this project has been completed and only a small portion of lab work remains. Analyses are ongoing, and the differences in the diversity of floral resources among grassland types are proving to be interesting, with important implications for restoration and conservation of floral resources in grasslands. We have begun writing the first manuscript for this research, which will focus on differences in floral resources among the four grassland types, and will be a chapter of John Delaney's PhD dissertation. One-two additional manuscripts will be written on the butterfly and bee responses to floral resources beginning in the fall of 2014.

