Floral resource availability and butterfly community characteristics in CP-42 Pollinator Habitat plantings

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Background
Prairies once covered approximately 85% of Iowa, but due to extensive habitat loss less than 0.1% of native prairies remain (Smith 1998). Habitat loss in Iowa has been driven by agricultural expansion and intensification, and has resulted in the decline of many native insect pollinators. To curb habitat loss and restore habitat for pollinators, USDA’s Farm Service Agency (FSA) provides private landowners incentives to enroll agricultural land into the Conservation Reserve Program (CRP) Pollinator Habitat (CP-42) program. The CP-42 conservation practice requires landowners to seed at least 9 species of pollinator friendly wildflowers, legumes, or shrubs on enrolled lands. CP-42 seed mixes must include at least three species during each of three bloom periods (April-June 15, June 15-July, and August-October) (USDA 2011). About 50% of all CP-42 acres are seeded in Iowa (USDA 2018). We have developed methods for evaluating floral resources and habitat quality for butterflies at CP-42 sites in central Iowa. Our study will produce data to assess the quality of habitat produced by the CP-42 program and to provide information about the effectiveness of the CP-42 program to Farm Service Agency.

Methods
Floral Resource Surveys: Floral resources were surveyed at 15 Conservation Reserve Program CP-42 sites in central Iowa. At each site, we established four 100 m transects. We recorded the abundance and diversity of flowers along the first 50 m of each transect per site. Twenty-five 1 m² quadrats were placed randomly on the right or left side of the transect every 2 m. We identified each species in bloom and counted all ramets and flowers in each quadrat. A total of 60 floral resource transects were surveyed between July 9-12, 2018 at the 15 sites. Floral resource surveys will be repeated in August 2018.

Pollinator Surveys: Butterfly communities were surveyed visually along four 50 m strip transects at each site. We walked the second 50 m of each transect at a pace of 10 m/min and recorded the species and behavior (searching, flushed, feeding, or courting) of each butterfly observed. For each sighting, we recorded whether the butterfly was within 3 m of the observer or >3 m away. For sightings, >3 m away, distance from the observer was estimated and recorded. Surveys took place on days with suitable weather conditions between 9 AM and 5 PM when butterflies were most active. We surveyed 15 CP-42 sites from July 9-12, 2018, and butterfly communities at the same sites will be surveyed again in August.

Milkweed surveying: We recorded data on milkweeds at each site between June 11 and July 6, 2018. We established five 100 m transects at random points at each site and recorded milkweed plant and stem density within 1 m² quadrats placed every 7 m along the transects.

Results
1) What is the correlation between the floral resources and butterfly communities at CP-42 sites?
2) What percentage of blooming flowers at CP-42 sites are planted species versus opportunistic weeds?
3) Is there a correlation between milkweed density and the number of monarchs observed at CP-42 sites?

Floral Resources
The CP-42 program has created diverse floral resources across the 15 sites surveyed. We found that the amount of milkweed stems and the number of Monarchs present positively correlated. CP-42 sites with more milkweed stems also had a higher percentage of blooming flowers. In the CP-42 program, planting milkweeds will attract Monarch butterflies and provide an important food source for their larvae. Monarchs are a threatened species, and increasing their abundance is crucial for maintaining healthy butterfly populations.

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References