The Effects of Fire and Grazing on Butterflies in Iowa's Loess Hills

The intensification of agriculture has contributed to loss of prairie habitat across the Midwest, and in Iowa less than 0.01% of native prairie remains. However, the slopes in the Loess Hills that were formed from loose wind-deposited soil were more suitable for pastures and hay fields than row cropping and grassland habitat has remained intact in that region. Land managers often combine the use of fire and rotational grazing to help maintain high quality grasslands and prevent the encroachment of woody species. Research has shown that this type of management increases and maintains grassland habitat suitability for many wildlife species but little is known about the effects of fire and grazing on invertebrates such as butterflies. The Loess Hills supports almost 100 species of butterflies, including some rare and endangered species, therefore it is important to understand the effects of this type of management on butterfly species.

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Study Area:

Broken Kettle Grasslands Preserve, Five Ridge Prairie, and adjacent private land in Plymouth County, Ia.

Study Dates: 2004-2007

Loess Hills - Photo Courtesy of Jennifer Vogel

Broken Kettle Grasslands Preserve - Photo Courtesy of Jennifer Vogel

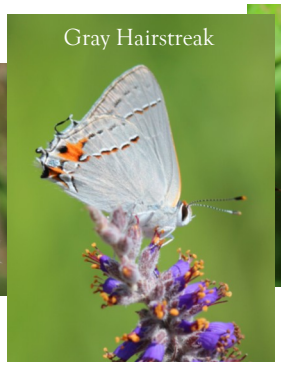
Research Goal:

- Evaluate the effect of grazing and burning on butterfly species richness and abundance

Results:

- Total abundance and abundance of prairie specialist butterflies were highest on prairies that were grazed and burned.
- Burn only sites had lower butterfly abundance but highest butterfly diversity
- Butterflies seemed to prefer habitat with a higher percent of forbs and a low amount of bare ground
- The areas that were managed with just fire, just grazing, and a fire-grazing combination had equal numbers of species but each had a unique suite of butterfly species

Orange Sulfur



Gray Hairstreak

Great Spangled Fritillary

Implications for Graze-Burn Management

The butterfly species inhabiting an area should be identified prior to implementing a management scheme that includes use of fire and grazing in order to determine how those specific species will respond. If maximizing the number of butterfly species present is the goal, managers should use a variety of management techniques and create a diversity of microhabitats across the landscape.

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