

Use of Cattle-Grazing and Fire as Management Tools to Maintain Grassland Biodiversity in Southern Iowa

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Photo Credit - Stephanie Shepherd



Dates:

2006-2012

Location:

Grand River Grasslands
Ringgold County, Iowa
Harrison County, Missouri

Historically, grazing and fire disturbances increased diversity in the landscape across the Midwest, allowing the environment to support a greater variety of wildlife species. Fire suppression, row cropping, and intensive grazing practices have reduced habitat variation, limiting species diversity and shifting species composition. Patch-burn-grazing can be used to mimic historic disturbance patterns, increasing habitat diversity by varying the timing and position of disturbance across the landscape as different patches of land are burned and cattle shift to the freshest spots of grass after the fire.

Project Goals:

- Test effects of patch-burn graze, burn-only, and graze-and-burn treatments on native and invasive plants, grassland birds, and butterflies
- Determine the lasting effect of prior land use on management success
- Evaluate the efficacy of patch-burn-grazing to benefit Species of Greatest Conservation Need (SGCN)



Photo Credit - Bruce Ehresman

Results:

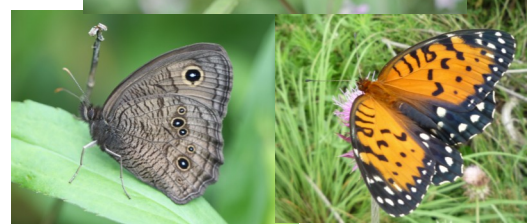
- Burning and grazing did not have a significant effect on vegetation structure or plant species composition in the initial 3-year project period.
- Tall fescue hinders prescribed burns, undermining restoration effects fire; thus, plots significantly degraded by invasive plants like tall fescue did not recover during the initial 3-year study
- The ratio of native to exotic plant cover was a significant factor affecting butterfly abundance.

Iowa DNR State Wildlife Grants Research Findings

Results:

- SGCN butterfly populations within the study pastures have shown improvement
- Prairie-specialist butterflies tend to use native nectar sources despite low population densities of these plants
- Grassland bird community structure on pastures managed with patch-burn-grazing differed significantly from communities within burn-only and graze-and-burn treatments.
- Grasshopper sparrows and eastern meadowlarks responded positively to patch-burn grazing
- Sedge wrens, common yellowthroats, dickcissels and bobolinks responded positively to burn-only treatment

Great Spangled Fritillary - MSIM Photo



Common Wood-Nymph
MSIM Photo

Regal Fritillary
MSIM Photo



Sedge Wren

Photo Credit - Aaron Brees

Conclusions:

- High cattle stocking rates reduce effects of patch-burn grazing by decreasing variability between patches
- It can take several years for restoration management to overcome the effects of prior land use such as cultivation and intensive grazing
- Grassland bird community structure is affected by local structural habitat requirements and by the varying degrees of landscape fragmentation in the surrounding area

Management Implications:

- It is best not to burn entire pastures, unless they are small and are adjacent to acceptable habitat not burned that year
- The future success of using patch-burn-graze to benefit grassland birds in fragmented grasslands hinges on whether adequate habitat can be maintained for a diverse bird community, or whether fragmentation will perpetually limit the efficacy of this method in fragmented grassland landscapes like the Grand River Grasslands.
- Prairie restoration should include seeds of crucial butterfly host plants (e.g. *Viola* spp. for regal fritillary) and preferred nectar plants (*Echinacea pallida*, *Liatris pycnostachya*). Consider planting greenhouse-reared plants of Butterfly Milkweed, given its importance to SGCN butterflies.

Common Yellowthroat - MSIM Photo

