

PROFILES IN LAND AND MANAGEMENT:
Adaptive Grazing on Public Lands

Missouri Department of Conservation

18 sites across Missouri

15 years of combining prescribed burns and planned grazing provides a mosaic of grassland habitat options for wildlife at sites across Missouri.

Cattle graze a recently burned section of an MDC property



Missouri Department of Conservation at a Glance

RAINFALL

43 inches per year

PROPERTY DESCRIPTION

Some native tallgrass prairie; mostly restored native grasslands or recovered cropland

PROPERTY SIZE

18 sites, 300–1500 acres each

ACRES IN GRAZING LANDS

11,500 in patch burn grazing management

PLANNED GRAZING SINCE

2004

SPECIES

Cattle stocked at low density, average 1 AU per 5.5 acres

GRAZING SEASON

May–August, all cattle gone by 9/1, the start of fall hunting seasons

PARTNERS

3-year contracts with 8–15 private graziers

DOES THIS SAVE YOU MONEY?

Yes, by reducing staff time and increasing the effectiveness of invasive plant control efforts

GRAZING PERIOD

90–120 days

LENGTH OF RECOVERY

2 years of no grazing follow a 3-year patch-burn grazing cycle

MANAGING FOR

- Increase the health of the grassland through disturbance
- Improve wildlife habitat
- Reduce maintenance, mowing and haying; be more efficient with resources
- Increase plant diversity



Northern bobwhite eggs in an active pasture

*“No other management technique
can produce patchy cover to benefit
wildlife like well-managed grazing.”*

— MAX ALLEGER

Grasslands in Missouri are thick and lush thanks to 40+ inches of annual rainfall and a long growing season. Historically, the growth of these grasslands was kept in check by wildfires and native grazers including bison and elk; the grasslands adapted to disturbance and native grazers browsed the tender regrowth of plants that appeared after a fire.

Today, the native grazers are mostly gone and fire has generally been removed from the landscape. Without such disturbance, Missouri grasslands become overly dense and “decadent,” new growth is choked out, wildlife moves away, and subsequently the grassland’s health and diversity decline. For the Missouri Department of Conservation (MDC), the best solution to averting this decline lies in the past: a mix of fire and grazing.

Today the MDC uses a technique called “patch-burn grazing” on 18 conservation areas. Each site ranges from 300–1500 acres, totaling 11,500 acres. This acreage includes 4,500 acres of remnant native prairie and 7,000 acres of mixed native plantings or cultivars of warm season grasses.

HISTORY

In the early 2000s, MDC staff experimented with patch-burn grazing to solve the problem of uniform vegetation in their grasslands, which was decreasing grasslands’ value to wildlife. Their use of mowing was creating a homogenous vegetation structure and providing only short-lived benefits since Missouri’s long growing season and plentiful precipitation supports rapid regrowth.

MDC staff tried patch burning and liked the results. After the initial pilot, the agency conducted a three-year study to assess the benefits of this practice for birds, insects,

and habitat. Seeing positive results, MDC kept adding patch-burn units to properties across the state and began a 15-year study of the impacts of this practice on vegetative structure and plant communities. The agency continues to refine their processes as they seek to achieve their goal of re-establishing pre-settlement grazing conditions, when native grazers grazed in high concentrations on recently burned wildfire sites.

WHY GRAZING?

For the MDC, adding grazing to their practice of patch burning has proved key to achieving their goal of creating mosaic-style landscapes with a diversity of wildlife habitats, including a mix of grass heights and densities. Without grazing, Missouri grasslands can easily become too thick for wildlife within a few years without disturbance. Where bison and elk historically kept the grassland growth in check, prescribed burns and seasonal grazing are now used.

MDC patch-burn grazing units experience a mix of grazing intensities: while they are stocked at an overall average density of one animal unit (AU) per 5.5 acres, the recently burned areas receive the majority of the grazing impact.

In a 2016 Missouri Conservationist article, Max Allegor of the Missouri Department

PATCH BURN GRAZING *uses prescribed fire to focus livestock grazing impact on a specific area, with the intention of increasing the diversity of vegetation to benefit wildlife and maintain livestock production.*

Benefits of adaptive grazing



Increased Ecosystem Health

Well-managed grazing provides a diversity of vegetative structure to meet the various needs of the ecosystem.



Improved Bird Nesting & Brooding Habitat

By managing for intensively grazed areas next to ungrazed areas, a wide range of habitat types is provided for different bird species and other wildlife.



Increased Plant Diversity & Native Grasses

Grazing suppresses the dominant grasses and allows a wider variety of plants to thrive.



Greater Efficiency & Cost Savings

Without grazing, the MDC would spend considerable time and money mowing these sites, with sub-optimal results. Grazing also increases the efficiency of efforts aimed at controlling invasive plants.

of Conservation wrote: “data and theory suggest that grazing benefits grasslands and a wide range of wildlife species that depend on them.”* MDC has seen that play out over time and have seen that invertebrates, grassland birds, reptiles and amphibians, and small mammals all are benefitting from the diverse habitats provided by grazing. Ground-nesting grassland birds need dense cover for nesting and then thin cover for rearing chicks, and different species prefer different heights and densities. By having intensively grazed areas next to ungrazed areas, a wide range of habitat types is created to suit the needs of a range of wildlife.

WHO GRAZES?

Through partnerships with private graziers, cattle are brought to these sites under carefully scripted grazing plans. MDC staff set the number of cattle, the grazing period for each site, the location of fences to protect sensitive areas, and the timing and location of burn patches. After one-third of each site is burned annually in the spring, burned patches then regrow for a few weeks prior to grazing. The cattle naturally concentrate on that one section because of the succulent new plants that are growing there, and roughly two-thirds of the grazing impact will be on the recently burnt patch. The remaining two-thirds of the unit is lightly grazed, providing time for recovery from past grazing. After a 90-120 day grazing season, cattle are removed by September 1, the start of dove hunting season. Over a three-year period, an entire site gets burned and grazed. This achieves a slow rotation without the need for moving fences to control the movement of animals.

*“Grazing for Conservation”, Missouri Conservationist, May 2016

Advice to Other Agency Staff Considering Using Grazing from Max Alleger:

“Make the startup as transparent to all partners, stakeholders and neighbors as you can—have informational meetings, share objectives, communicate your plans... work with people to try to gain consensus before you start.”

“Start small and get a feel for it a bit at a time.”

Max Alleger, MDC grassland coordinator, with a greater prairie chicken



While MDC uses a sealed bid, competitive process to select their grazing partners, they are not required to select the highest bidder. They prioritize experience and believe that the relationship with the grazer is essential for the success of the project. Three-year contracts are awarded, and then renewed annually based on performance. MDC generally receives multiple bids for each grazing lease, and partners with 8-15 graziers per year, with some graziers leasing multiple sites. While MDC receives revenue and cost savings from grazing, the decision to graze protected grasslands is driven by the potential benefits to the grassland community, not by revenues.

Significant communication is involved before any animals arrive so that all parties are clear on the goals and detailed requirements set by the MDC, such as the allowable types of dewormers given to cattle. The system works for the permittee graziers with most of them returning for multiple years.

SUCCESSSES

The early success of patch-burn grazing pilot projects led to the expansion of this method to 18 MDC sites statewide, totaling 11,500 acres as of 2018. After a three-year study showed positive results, the MDC embarked on a 15-year study of how plant communities respond to this mix of burning and grazing.

Local communities have been very supportive of this shift to patch-burn grazing and appreciate the value of these grazing permits to private graziers. Disagreement remains among some stakeholders about the long-term impacts of this approach; the ongoing study is designed to eventually address those issues.

CHALLENGES

- **Balancing production with grassland health:** the agency wants to support local graziers and achieve disturbance with grazing, but

without reducing the vigor of the plant community. To achieve this, they use low stocking rates and only graze 90-120 days during the growing season.

- **Burning:** with the variables of wind, humidity, and fuel loads, it is challenging to get all the prescribed burns completed each year.
- **Overcoming past impacts:** land use history can overshadow current management. Some MDC sites were formerly cropland or fescue pastures; the impact of tillage or long-term intensive continuous grazing can be hard to recover from.

CHANGES & MONITORING

The MDC has staff botanists who collect extensive data every summer to monitor the plant communities. MDC's three-year study of patch-burn grazing on five tallgrass prairie remnants found:

- **Vegetation Improvements:** patch-burn grazing increased the diversity of the existing vegetation, expanding the range of plant heights, plant density, and litter depth in each grazing unit.
- **Bird Diversity:** more species were found on patch-burn grazing sites than on control sites. Four true grassland bird species were found uniquely or predominantly on grazed sites; none were found uniquely or predominantly on control sites.
- **Plant Diversity:** across all sites and years, more plant species were documented in grazed plots than ungrazed control plots.

A recent study of northern bobwhites in southwest Missouri indicated the importance of grazing as a management tool to reduce the density of dominant grasses and create patchy cover. The study found that both adult birds and chicks highly prefer areas that have been grazed and burned, and found that grasslands that received neither grazing nor burning for more than 18 months get almost no brood use. (publication forthcoming). ■

*“A good relationship with the grazier
is essential for the success of the project”*

— MAX ALLEGER

All photos: Missouri Department of Conservation

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