

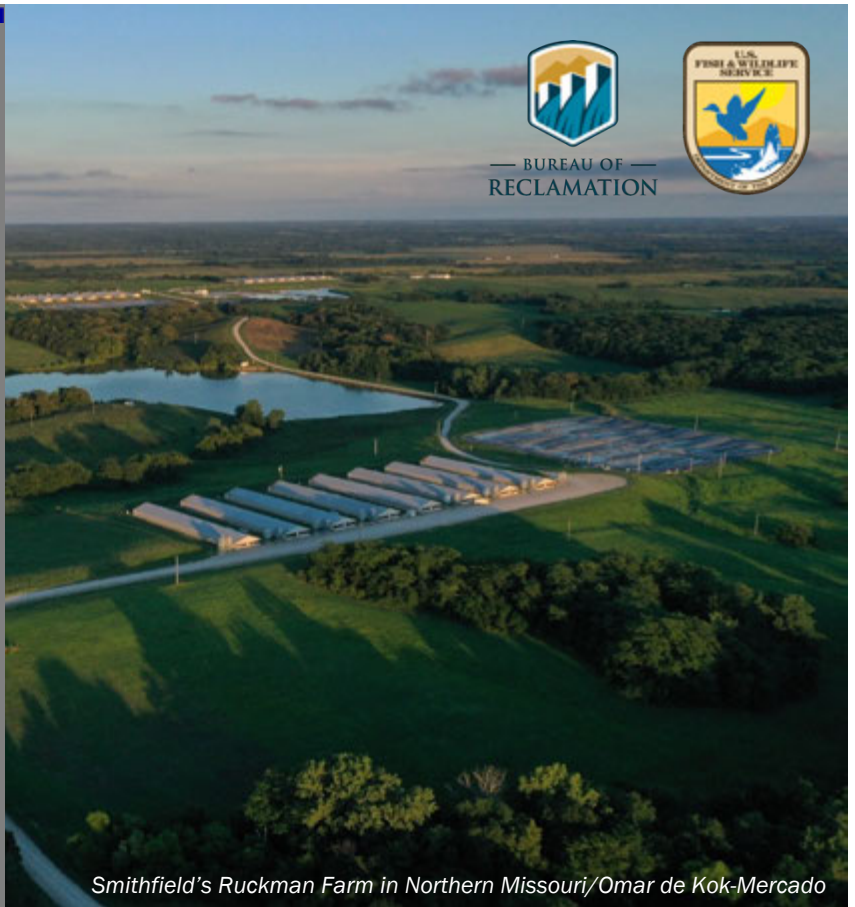
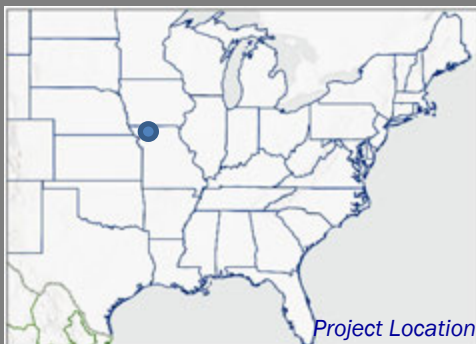
RESTORATION

Grassland Restoration Treatment for Wildlife and Pollinators

IOWA STATE
UNIVERSITY



Grasslands in the Great Plains can reduce soil erosion, improve water quality, and provide habitat for wildlife and pollinators. However, conversion of grasslands for agriculture has led to the loss of 42% of native grasslands in the Great Plains (World Wildlife Fund, 2018). Fortunately, agriculture and grasslands can co-exist. Roeslein Alternative Energy is restoring native grasslands to use biomass from restored grasslands and manure from hog production to produce renewable energy through biodigestion. Roeslein partnered with researchers at Iowa State University to study the effects of restored grasslands at Smithfield's Ruckman Farm in northern Missouri on plants, pollinators, and wildlife. Researchers used varying levels of seed diversity to see which seed mix most improved diversity of the plants, wildlife, and pollinators.



BUREAU OF
RECLAMATION



Smithfield's Ruckman Farm in Northern Missouri/Omar de Kok-Mercado

KEY ISSUES ADDRESSED

Grassland restoration can be costly and is often perceived to harm farm productivity and economic viability. Communicating about the benefits of grassland restoration has often led to tension and mistrust between farmers and restoration practitioners.

Furthermore, there is little research on how seed diversity used for restoration impacts native plant cover and wildlife and pollinator habitat. Researchers at Iowa State University have studied grassland restorations in agricultural settings in the past but have not directly focused on the impact of seed diversity on wildlife.

Additionally, the community-wide impacts of restoration and seed diversity on birds, small mammals, and pollinators are poorly understood. This information would help managers and farmers use restoration treatments that best support wildlife.

PROJECT GOALS

- Study how diversity of seed mixes influences plant biodiversity
- Monitor how bird populations, small mammals, and bees respond to grassland restoration
- Disseminate study results to apply to other conservation projects and research

EARLY SEEDING

Researchers built on previous successes by seeding the study fields in the winter, in late January and early February, for optimum seed germination in the spring.



Prairie Ring-Necked Snake (*Diadophis punctatus amnyi*) at the Study Site

PROJECT HIGHLIGHTS

High Diversity, High Success: The high-diversity mix resulted in native grass cover increasing 9% and forbs increasing 33%. With the low-diversity mix, native grasses increased 15% and forbs increased 20%. Cover of native plants increased by more than 40% over the 3-year study.

Wildflowers Flourish with Restoration: Fast growing forbs coreopsis (*Coreopsis tripteris*), bergamot (*Monarda fistulosax*) and coneflower (*Echinacea purpurea*) were more common than slower growing compass plant (*Silphium laciniatum*) and lead plant (*Amorpha canescens*) in all seed mixes. Growth of wildflowers improved pollinator habitat across the landscape.

Wildlife Benefits: Bird communities sustained healthy population sizes while small mammals and snakes increased in population size.

Pollinator Response Lag: Bee populations were higher in high diversity fields by the study's conclusion. However, bee populations did not increase until year three.

Benefits for Agriculture: Restored grasslands around lakes and rivers filter water and increase water quality for the benefit of surrounding farms, people, and the environment.

Collaborators

- Iowa State University (ISU)
- Roeslein Alternative Energy
- Smithfield Foods
- U.S. Fish and Wildlife Service

Authors: Sam Johnson/Hastings College and Jordan Giese/ISU, April 2022.

Photos courtesy of Jordan Giese/ISU

For more information on CCAST, contact Genevieve Johnson (gjohnson@usbr.gov) or Matt Grabau (matthew_grabau@fws.gov).

Visit CCAST:



LESSONS LEARNED

Patience is key for grassland restoration. Native grasses did not appear until year two and three of the study. Restoration success occurs on a long timeline and project managers must plan accordingly. Grassland restoration is beneficial to wildlife, regardless of the diversity of the seed mix used. The study showed improvements or maintenance of all wildlife populations studied with all seed mixes used. Pollinators take longer to respond to restored habitat than other wildlife populations because of extra time required to establish forbs. Increases were not observed until year three of the study. Communicating intention with landowners is critical for success. It is a challenge to work with landowners in areas where there is a lack of trust in federal agencies. In order to increase the impact of restoration projects, managers and researchers found utilizing workshops with open discussions for local farmers to share knowledge, express concerns, and learn from each other to be an effective tool.

NEXT STEPS

- Extend pollinator monitoring program and include additional taxa
- Use acoustic monitoring technology to better understand grassland bird communities
- Apply study results to different landscapes with similar challenges
- Study how manure applications impact restored grasslands
- Use findings from this research to help achieve Roeslein's goal of restoring 30 million acres of grasslands in the next 30 years

For more information on this project, contact Jordan Giese:

jordangiese2@gmail.com



Researcher Conducting a Plant Species Survey