

Rangeland Management and Pollinators

A GUIDE FOR PRODUCERS IN THE GREAT PLAINS

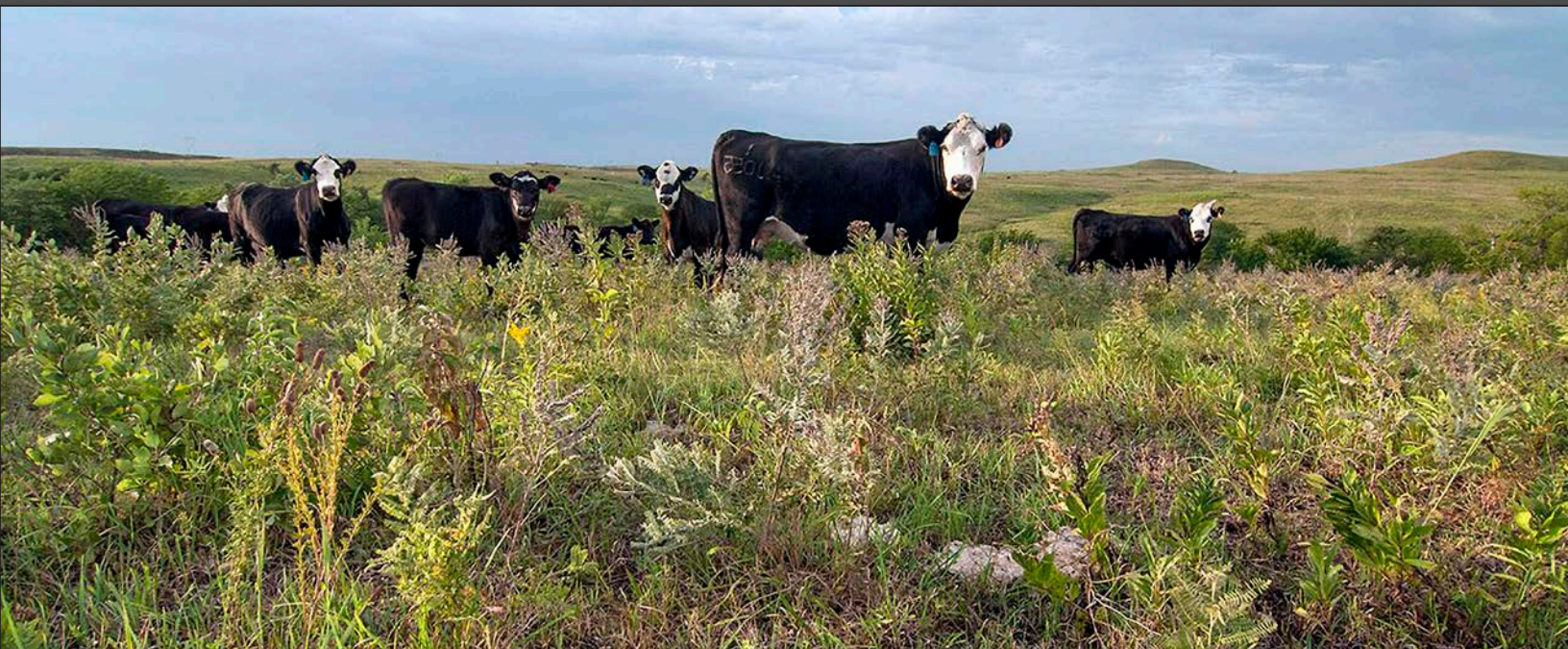


FIGURE 1: Healthy rangeland provides quality forage for cattle and is home to a diversity of plants and animals, including pollinators.

Overview

Ranchers are essential stewards of grasslands and prevent rangeland from being converted to cropland or urban areas. Rangelands are important for pollinators, providing contiguous and often expansive areas of habitat (food and shelter) in the Great Plains. In turn, pollinators are important for rangelands; by sustaining a wide array of wildflowers, they provide valuable forage for cattle, food for wildlife, support soil health, and make grasslands more resilient. These best management practices (BMPs) will help you manage your rangeland using grazing, fire, or haying, to support both livestock production and pollinator health. Well-managed rangelands are home for many species of wildlife, and your management decisions play an important role in conservation.

Incorporating pollinator conservation into your rangeland management may not require large-scale changes, but rather a shift to a broader view of rangelands as permanent habitat for creatures large and small. Some of the practices we recommend can also bring additional benefits. For instance, many of these practices enhance habitat for other wildlife, including game birds, and reduced stocking rates can increase rangeland resilience to drought.

We hope this document provides a framework for the management of healthy rangeland for livestock, pollinators, and other wildlife, and helps you view your rangelands through the eyes of a pollinator.

Introduction

Livestock grazing is one of the primary land uses in the Great Plains, and the majority of grazing lands are privately owned. Livestock performance is a critical aspect of the ranching business, and consideration of the nutritional value of the plants on your rangeland is important when developing your grazing plans and strategies. Many wildflowers have high forage quality, making wildflowers an important component of livestock diet (e.g., Figure 2).

Studies have found that, on a global basis, cool- and warm-season wildflowers have crude protein contents of 4–23%, levels comparable to native cool- and warm-season grasses that have crude protein contents of 2–25%. In the Southern Great Plains, crude protein content and digestibility is actually higher in rangeland wildflowers than rangeland grasses throughout the spring, summer, and fall.

Pollinating insects such as bees, moths, butterflies, wasps, flies, and beetles provide a meaningful contribution to your ranching operation as they are essential for the reproduction of wildflowers, vines, and shrubs found on rangeland. As pollinators visit flowers to consume energy-rich nectar and protein-filled pollen, they transfer pollen grains between flowers. This pollen transfer results in fruits and seeds that feed a variety of wildlife. Pollinators themselves are a food source for animals big and small, including game birds like pheasants and quail.

Rangelands can support a diversity of wildflowers with overlapping bloom periods that nourish pollinators throughout the growing season. They also provide nesting places for native bees, many species of which are solitary and use small patches of bare ground or hollow- or pithy-stemmed wildflowers and grasses for nesting sites. Diverse plant communities on your rangelands also provide breeding and overwintering habitat for butterflies and moths, as well as overwintering habitat for beetles, flies, and wasps that provide other ecosystem services (e.g., pest control). Some pollinators live only on rangelands, because they need particular

The Great Plains region includes tall-, mixed-, and shortgrass prairie found west of the Mississippi and east of the Rocky Mountains. This region spans all or a portion of these states: North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, New Mexico, Colorado, Wyoming, Montana, Minnesota, Iowa, and Missouri.

plants or habitat and cannot live elsewhere. The benefits of healthy rangelands can extend into the broader landscape by supporting insects that contribute to the pollination of nearby crops.

Rangelands in the Great Plains evolved with natural disturbances, such as widespread grazing by large mammals, wildfire, and drought. Maintaining disturbances through management, including prescribed grazing, prescribed fire, and haying, is necessary for the health and profitability of your rangelands—and for pollinators. In the short term, management activities can temporarily reduce pollinator populations or habitat quality, but if done carefully over the long term, managed disturbances can lead to increased habitat quality for pollinators on your rangelands. There is much variation in how rangeland management is best implemented across the Great Plains, and more research is needed on the impacts of rangeland management on different groups of pollinators. Therefore, our recommendations for best management practices are broad. We encourage you to monitor your grasses and wildflowers and, based on your observations, make adjustments to your management strategies to promote healthy rangelands that provide high-quality forage for livestock and habitat for pollinators.

We strongly encourage producers to seek technical assistance from regional Xerces Society partner biologists and local NRCS staff to discuss the specifics of their rangeland when incorporating pollinator conservation into their grazing and management systems.

FIGURE 2: This rotational grazing system in North Dakota provides important nutrition for livestock and pollinators by allowing Great Plains wildflowers with high forage value, such as purple prairie clover (*Dalea purpurea* [A]), leadplant (*Amorpha canescens* [B]), and narrow-leaved coneflower (*Echinacea angustifolia* [C]), to bloom.



Rangeland Management: Practices for Rangeland Health and Pollinators

Grazing Best Management Practices

- Implement a prescribed grazing system that:
 - » Uses stocking rates that balance cattle performance and rangeland health with wildflower abundance and diversity.
 - » Avoids chronic overutilization.
 - » Provides proper rest and recovery of vegetation, allowing grasses to maintain vigor and wildflowers the opportunity to bloom.
 - » Changes season of use from year to year to ensure no unit is grazed during the same time every year.
 - » Monitors effects of grazing practices on grasses and wildflowers (and pollinators, if possible), adjusting practices as necessary to achieve goals and account for contingencies, should potential problems occur (e.g., drought, livestock water availability, flooding, etc.).
- If you choose continuous or season-long grazing every year on the same unit, keep stocking rates low or moderate. ***In some states, continuous season-long grazing is not compatible with NRCS guidelines and programs. For more information, contact your local NRCS Field Office.***
- When possible, allow for wildflower recovery by deferring grazing for a season on some units until late fall, winter, or early spring.
- Consider integrating prescribed fire into grazing management plans (see next section).
- Seek technical assistance from regional Xerces Society partner biologists and local NRCS staff to help you incorporate pollinator conservation into your grazing plan.

Integrating Fire & Grazing BMPs

- As with the grazing recommendations above, use stocking rates that balance livestock performance, rangeland health, and wildflower abundance and diversity.
- Allow for proper plant recovery times from both grazing and prescribed fire management.
- Do not burn your whole ranch every year. Unburned rangeland is a refuge for fire-sensitive pollinators.
- Ideally, burn 1/3 or less of your property each year in order to reduce the likelihood that a pollinator population will be eliminated and to speed up pollinator recolonization of the burned unit.
- If small patches fail to burn within your burn unit, leave them unburned.
- Consider burning different units in different seasons to avoid impacting the same pollinator species consistently.

Prescribed fire is a management tool that can be used without grazing; follow the best management practices above that involve fire.



FIGURE 3: This rangeland in Oklahoma provides forage for cattle and supports wildflowers like yellow wild indigo (*Baptisia sphaerocarpa*), a bumble bee favorite.

FIGURE 4: The regal fritillary butterfly (*Speyeria idalia*) is one of a number of pollinators that depend on rangeland as habitat.

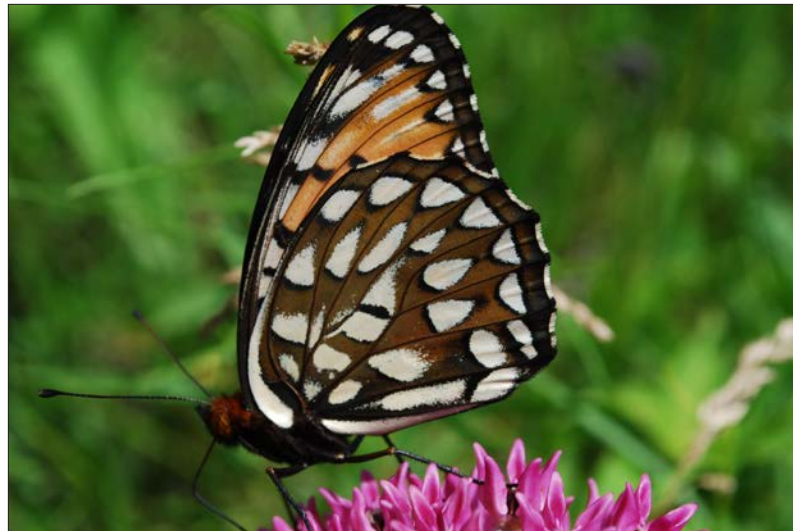
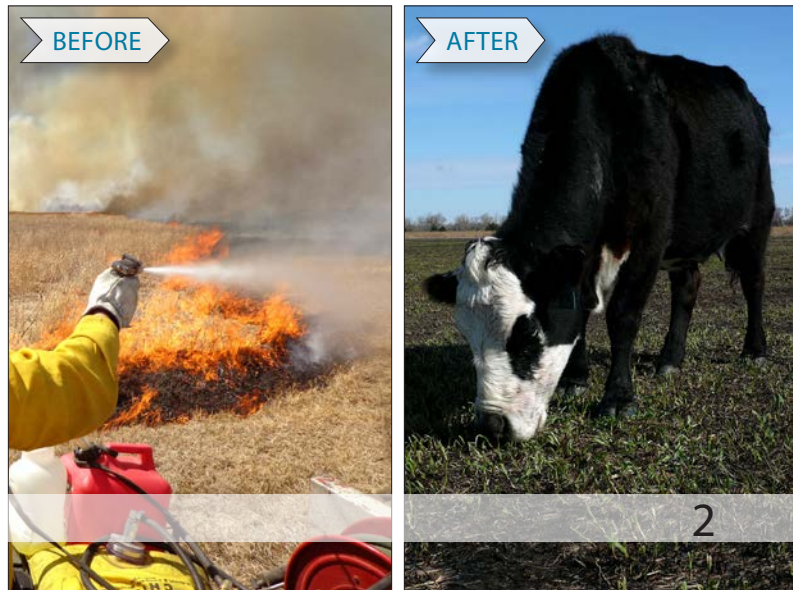


FIGURE 5: Integrating prescribed grazing and fire (e.g., patch-burn grazing) generates highly nutritious regrowth for livestock and encourages native wildflower abundance and diversity.



Haying Native Rangeland BMPs

- One cutting per year is recommended to maintain grassland health and productivity, as well as pollinator abundance.
- Vary the season of haying from year to year to encourage plant and pollinator diversity.
- Hay during daylight hours at reduced speeds (less than 8 mph) so adult pollinators can escape.
- When possible, limit haying to 1/3 or less of a site in a given year.
- If you want to cut the entire site each year, consider the following options:
 - » Maintain cutting heights of 8" or higher.
 - » Offset the timing of cuttings—cut 1/2 early, 1/2 late.



FIGURE 6: This native tallgrass prairie in Kansas is hayed annually and is full of native wildflowers.

Brush & Weed Control BMPs

For all weed-control methods:

- Controlling invasive plants, especially non-native species, is critical for rangeland health and pollinators. Invasive plants degrade rangeland health; as invasives take over, cattle forage pressure increases on remaining native plants. Additionally, non-native species support fewer pollinator species than native species.
- Use plant identification guides* to distinguish noxious and invasive weeds from nontarget species. For example, native thistles are not weeds and should not be treated.
- Many plants may increase in response to certain events (e.g., after intense grazing events) but then decrease in abundance on their own when grasses recover. Consult your NRCS office for species specific guidance.
- Know the biology of your target weed. Weed management should be species-specific.
- When possible, schedule control for when the target weed is most vulnerable.
- Some weeds may require multiple control approaches and multiple years of treatment.
- Target weed control methods to patches of infestation to avoid damage to nontarget plants.

For weed control using herbicides:

- Avoid targeting wildflowers, which are forage for cattle and pollinators.
- Always follow the label recommendations.
- Avoid broadcast applications; direct your applications to target weeds and brush to avoid weakening nontarget species.
- When controlling invasive weeds, use selective herbicides whenever possible to reduce damage to nontarget plants.
- Apply foliar sprays under weather conditions that reduce or eliminate drift.
- Choose and calibrate equipment with drift management in mind.

*See the Resources section (page 4) for additional sources of information on plant identification and brush & weed control.

Interseeding BMPs

- If wildflower diversity has been lost and cannot be regained through multiple years of management because the seed bank has been lost, consider interseeding (adding native wildflower seeds to a site following a disturbance that suppresses dominant vegetation). *Before considering interseeding, consult your State NRCS Rangeland Management Specialist.*
 - » In some states (e.g., North Dakota and Kansas), the NRCS does not support interseeding on rangeland. For more information, contact your local NRCS Field Office.
- Use diverse, high-quality rangeland of similar soils nearby as reference sites (when possible) to select wildflowers to interseed. Use locally sourced, native seed. Focus on wildflowers that are competitive with grasses.
- Weed or grass suppression through grazing, mowing, haying, prescribed burning, chemical control—or a combination of these techniques—is necessary before and after interseeding.

CHECKLIST: What Does Pollinator Habitat Look Like On a Ranch?

If you can stand at various locations around your ranch and see the following, your ranch provides pollinator habitat.

- Blooming flowers throughout the spring, summer, and fall. There should be a succession of flowers in bloom throughout the growing season across the ranch.
- Several different species of flowers blooming nearby.
- Different heights of vegetation, including small patches of bare ground and recovering or lightly grazed areas.

In addition,

- Each unit on your ranch should be managed during different seasons from year to year to allow cool season and warm season grasses to thrive. This also moves the impact of management around the landscape so wildflowers have the opportunity to bloom and reproduce, and pollinators have the resources they need.

Resources

Grazing

Range and Pasture Technical Resources (USDA–NRCS)

www.tinyurl.com/NRCS-Grazing-Lands

Ecological Site Description Portal

<http://tinyurl.com/NRCS-ESD>

NRCS Field Offices

Contact or visit your local field office to find more information on desirable species for grazing. www.nrcs.usda.gov/wps/portal/nrcs/main/national/contact/local/

Integrating Fire and Grazing

Helzer, C. 2011. *Patch-Burn Grazing for Biological Diversity*. 13 pp. Omaha: The Nature Conservancy–Nebraska. <https://prairienebraska.files.wordpress.com/2011/05/patch-burning-for-biodiversity.pdf>

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Haying

Kindscher, K., L. Byczynski. 2009. *Native Prairie Hay Meadows: A Landowner's Management Guide*. 32 pp. Lawrence: Kansas Biological Survey, University of Kansas. <http://kindscher.faculty.ku.edu/wp-content/uploads/2010/12/PrairieHayMeadows-print.pdf>

Brush and Weed Control

National Invasive Species Information Center (U.S. Department of Agriculture). This website has a compilation of fact sheets and identification guides for invasive plants. www.invasivespeciesinfo.gov

Cal-IPC. 2013. *Best Management Practices for Wildlands Stewardship: Protecting Wildlife When Using Herbicides for Invasive Plant Management*. Cal-IPC Publication 2013-1. 52 pp. Berkeley: California Invasive Plant Council. www.cal-ipc.org/resources/library/publications/herbicidesandwildlife/

Stubbendieck, J., M. Coffin, and L. M. Landholt. 2003. *Weeds of the Great Plains; 3rd edition*. 605 pp. Lincoln: Nebraska Department of Agriculture, Bureau of Plant Industry in cooperation with the University of Nebraska-Lincoln.

Parkinson, H., J. Mangold, and F. Menalled. 2013 (updated 2015). *Weed Seedling Identification Guide for Montana and the Northern Great Plains (EB0215)*. 164 pp. Bozeman: Montana State University Extension. <http://store.msuxextension.org/publications/AgandNaturalResources/EB0215.pdf>



FIGURE 7: This rangeland is maintained using fire and grazing. Wildflowers are thriving and providing important resources to prairie specialist pollinators.

Interseeding

Williams, D., J. Eckberg, J. Hopwood, R. Powers, M. Vaughan, K. Jokela, S. Foltz Jordan, and E. Lee-Mader. 2018. *Interseeding Wildflowers to Diversify Grasslands for Pollinators: Guidance for the Great Plains and Midwest Regions*. 36 pp. Portland, OR: The Xerces Society for Invertebrate Conservation. xerces.org/publications/guidelines/interseeding-wildflowers-to-diversify-grasslands-for-pollinators

Seed Saving

Eckberg, J., J. Hopwood, and E. Lee-Mäder. 2016. *Collecting and Using Your Own Wildflower Seed*. 12 pp. Portland, OR: The Xerces Society for Invertebrate Conservation. xerces.org/publications/guidelines/collecting-and-using-your-own-wildflower-seed

Ecology and Conservation of Pollinators

Society for Rangeland Management. June 2011. "Pollinators in Rangelands" special issue. *Rangelands Magazine* Volume 33, Number 3. 52 pp. Lawrence, KS: Society for Rangeland Management. xerces.org/publications/periodicalsarticles/rangelands-magazine-volume-33-number-3-june-2011

Mäder, E., M. Shepherd, M. Vaughan, S. H. Black, and G. LeBuhn. 2011. *Attracting Native Pollinators. Protecting North America's Bees and Butterflies*. 371 pp. North Adams, MA: Storey Publishing.

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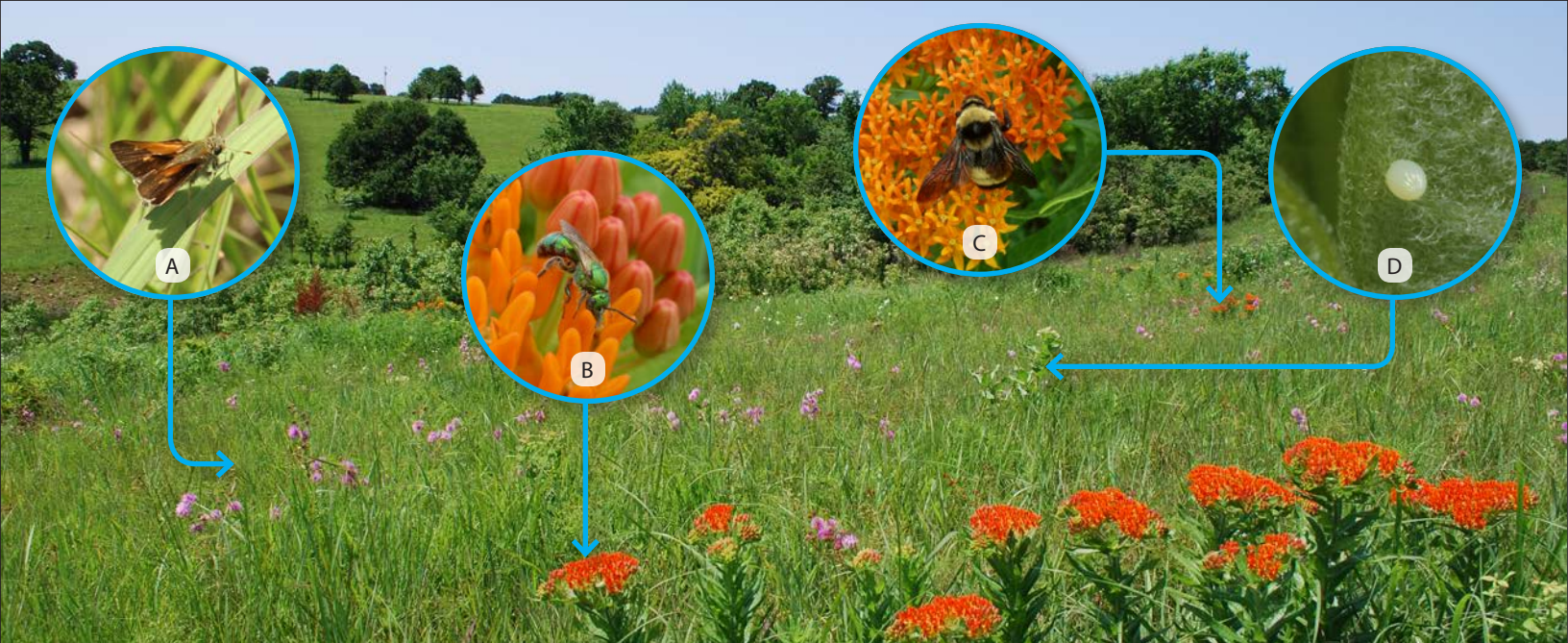


FIGURE 8: This Oklahoma rangeland is grazed and burned and supports numerous pollinators with diverse grasses (host plants for many skippers [A]) and wildflowers, such as butterfly milkweed (*Asclepias tuberosa*, shown with a green sweat bee [*Augochlora* sp., B] and black-and-gold bumble bee [*Bombus auricomus*, C]) and green antelopehorn (*A. viridis*, shown with a monarch butterfly [*Danaus plexippus*] egg, D).

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