

BEST MANAGEMENT PRACTICES FOR THE

# Monarch Butterfly



## IN OKLAHOMA RANGELANDS



Authored By the Lands Working Group of the Oklahoma Monarch and Pollinator Collaborative.

Okies for Monarchs is an initiative of the OMPC, a statewide group of 40+ organizations and citizens working together to ensure thriving Monarch migrations for generations to come.

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## INTRODUCTION

This document provides recommended Best Management Practices (BMPs) for monarch habitat on Oklahoma rangelands. These BMPs were created primarily by combining the most pertinent elements of the following three documents:

- a) OK NRCS Biology Technical Note OK-36 Planning, Restoring and Establishing Monarch Habitat (December 2016),
- b) Draft Grassland Best Management Practices for the Monarch Butterfly (Kansas), by the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program in Kansas (2014), and
- c) Best Management Practices: Monarch Habitat (Grazing), by Missourians for Monarchs
- d) Article titled "Rangeland Management for Pollinators" by Scott Black, Mace Vaughn and Matthew Shepherd in 2011 issue of Rangelands Volume 33, Issue 3, pp 9-13.

The authors of this document recognize that all methods discussed below are optional and their application may vary dependent upon the size of the property.

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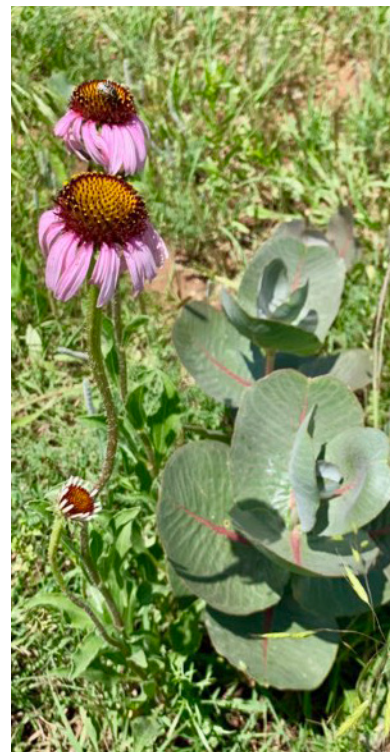
### PRO TIP:

Learn what to plant and where to buy at [OkiesForMonarchs.org](http://OkiesForMonarchs.org)



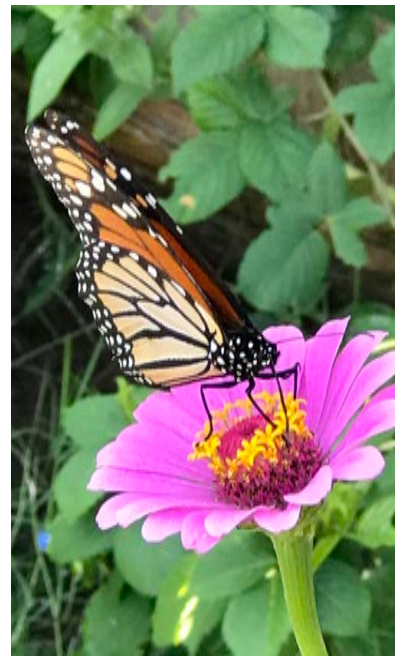
# GRAZING

Grazing can be an excellent land management tool for the generation or restoration of key Monarch nectar plants. Managing the timing, duration, intensity, and stocking rate can impact Oklahoma habitat that Monarchs depend upon.



- ▶ Monitor the abundance of milkweeds in spring and late summer, and the abundance of key nectar sources in spring, late summer, and early fall.
- ▶ Keep stocking rates low. There is evidence that over stocked cattle reduce the availability of key nectar sources.
- ▶ Rest periods are important and should be used as a tool, just as disturbances such as grazing and fire are used as a tool.
- ▶ When and where feasible, restrict grazing to late fall (post-October) and winter (November - February), when monarchs are not present in Oklahoma.
- ▶ Timing, duration, and intensity of stocking rates may give key nectar plants, including green antelopehorn (*Asclepias viridis*) and spider milkweed (*A. asperula*) a competitive advantage, but may decrease the presence of butterfly milkweed (*A. tuberosa*) and other late spring and early summer nectar resources.

- ▶ There is no perfect grazing system for maintaining monarch habitat. Patch-burn grazing considered to be one of the best for monarch habitat, but other grazing systems can be used.
- ▶ Conduct prescribed burning in grazed rangelands to prevent brush encroachment. BMPs for prescribed fire are provided below.
- ▶ If hay is utilized as a supplemental feed, ensure it is free of weeds and invasive plants.
- ▶ The use of rotational grazing systems with light to moderate stocking rates, may create a patchy grazing distribution - 3 - 10 paddocks.
- ▶ Employ a two-pasture switch back or modified patch-burn system. This can be accomplished by light to moderate grazing of one pasture during the first half of the season and rotating the second paddock during the last half of the season. The grazing season per paddock is varied annually so as not to graze the same acres at the same time annually. Alternatively, a pasture can be split into 2 burn units with a 2-3 year burn cycle. Burn units are identified based upon grazing distribution (i.e. higher frequency on underutilized portions, such as north ends of pasture or distance from water).
- ▶ A high-intensity, low frequency grazing system could be utilized if adequate rest in the rotation is allowed.
- ▶ Implement a high-intensity, low frequency grazing plan for late summer - early winter to promote spring migration habitat.
- ▶ Conduct all grazing systems based upon 25% utilization rates.



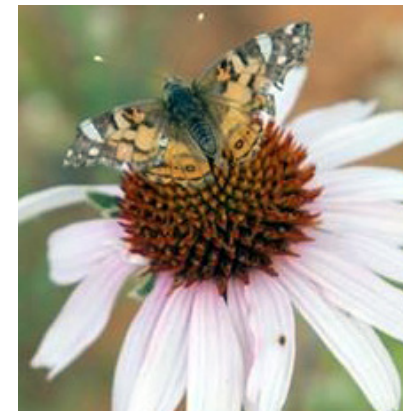
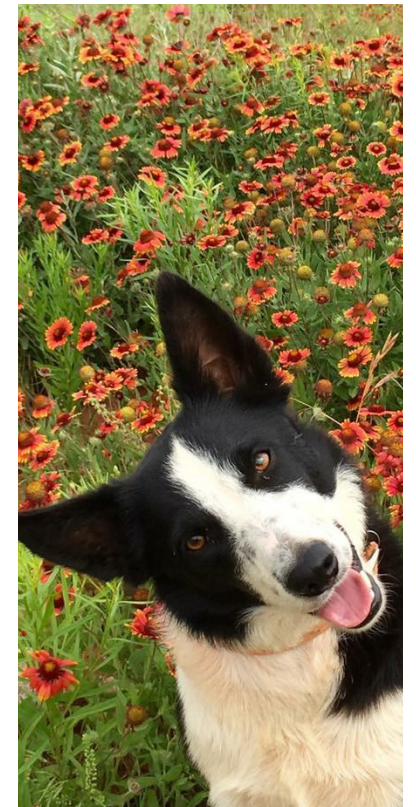


All of Oklahoma's landscape is fire-adapted. Prescribed fires can play a crucial role in the restoration of prairie habitats and nectar sources for Monarchs. If grazing is an essential part of your operation, then integrating prescribed fire as a tool is an excellent system for cattle production and wildlife, and appears to be conducive to monarch conservation.



- ▶ Burn grasslands and woodlands to create/maintain open conditions for monarchs, milkweeds, and nectar plants.
- ▶ If possible, avoid burning your entire acreage at the same time. Split your property into at least two burn units (preferably more), burning one unit each year or more than one unit at differing times in the same year, to create a patch-burn landscape. If grazing cattle, do not burn more than 33% of pastures.
- ▶ Vary the timing of your prescribed fires. Burn your units in different seasons to generate a variety of habitat conditions.
- ▶ Burn in fall (late October - November) to stimulate flower production of spring-blooming nectar sources.

- ▶ Burn in early summer (June 15 - July 15) to stimulate resprouting of green antelopehorn (*A. viridis*) and spider milkweed (*A. asperula*) in August and September, and to maximize flower production of fall-blooming nectar sources.
- ▶ In areas with high milkweed density (>100 stems/ac), refrain from burning between April 1 - June 15 because monarch eggs, larvae and pupae are present on the landscape and are vulnerable to fire.
- ▶ Refrain from burning between August 1 and October 20th because monarch eggs, larvae and pupae are present on the landscape, vulnerable to fire, and because fire at this time will reduce the availability of fall nectar sources.
- ▶ If your property has few milkweeds and has a significant amount of exotic cool-season grass cover, burning in early summer (see above) when native warm season grasses such as big bluestem and indiangrass are 1 to 2 inches tall will reduce cover of the exotic cool-season grasses.
- ▶ If you have skips (unburned areas) within your burn units, leave them unburned. This is particularly important if you burn when monarch eggs, larvae or pupae are present on the landscape, but is also important for pollinators other than monarchs.





## BRUSH MANAGEMENT

The management of woody plants and their encroachment onto prairie and grassland habitats can play a critical role in the continued presence of monarch habitat.

- ▶ Prioritize treatment of areas with low-density infestations, as this is more cost-effective on a per acre basis. Then, treat areas of moderate and high-density infestations.
- ▶ Prescribed fire or mechanical clipping of eastern redcedar is preferred as it creates modest soil disturbance that will promote early successional flowering plants. Bulldozing eastern redcedar will cause excessive soil disturbance in some situations but has been proven to restore monarch habitat.
- ▶ When using chemicals to kill trees, apply to individual trees and do not broadcast spray to avoid the accidental application to unintended plants.
- ▶ Brush removal should be followed up with prescribed fire to help stimulate germination of milkweed and nectar source seeds. BMPs for prescribed fire are provided above.

## Herbaceous Weed Control

Invasive species control is critical to the creation and management of healthy monarch habitat. Invasive species management is a long-term commitment and should be conducted surgically and strategically to reduce impacts to desirable, native species.

- ▶ Controlling invasive plants can improve monarch habitat, but only if the infestation is displacing (or is likely to displace) milkweeds or monarch nectar plants.
  - ▶ Use approved herbicides and follow the label.
  - ▶ Avoid broad spectrum herbicides or herbicide blends that will harm monarch nectar plants.
  - ▶ Avoid broadcast spraying. Instead, practice Individual Plant Treatment (IPT) for herbaceous plants.
  - ▶ When herbaceous plant populations are too large and dense for IPT, broadcast spraying should treat no more than 50% of the project area, in a rotation with selective herbicides.
- If spraying plants that also serve as monarch nectar plants (e.g. exotic thistles), spray when the plants are not in bloom. If one must spray during the bloom period, spray during the evening, in order to avoid spraying herbicide directly on monarchs.



## FORAGE HARVEST MANAGEMENT

The timing of native forage harvest (i.e., haying) can have a direct impact on monarch nectar sources.

- ▶ Cut native hay once per year, between June 15 and July 15, to stimulate milkweed regrowth for fall monarch reproduction. This will eliminate floral resources in treated area for 3 to 5 weeks but is likely to increase flower production of some fall-blooming nectar sources.
- ▶ Avoid cutting native hay immediately before or during migration (spring or fall). To benefit monarchs, do not cut native hay between March 15 and June 1, nor between Aug 1 and October 20th. Second cuttings of native hay will result in reduced production and a plant community not beneficial to monarchs.
- ▶ To help ensure that some floral resources are blooming during each month of the growing season, leave unharvested strips, or vary the timing of harvest among portions of your hay meadow.

## Early Successional Habitat Management and Development

Early successional habitat provides key nectar and forage sources for monarch and their larvae and pupae. The creation and management of early successional habitat can benefit monarchs at all life stages. In the absence of grazing, brush-hogging or a mulching lawn mower and prescribed fire become increasingly important as a management tool.

- ▶ A system of mowing that shreds the grass stocks (i.e. brush-hogging or a mulching lawn mower) is preferable because it distributes the biomass more evenly and the thatch decomposes more readily.
- ▶ Avoid brush-hogging immediately before or during migration (spring or fall). In other words, no brush-hogging between March 15 and June 1, nor between Aug 1 and October 20th.
- ▶ Brush-hog in early summer (between June 15 -July 15) or in fall (late October -November), after milkweeds and nectar sources have died back.
- ▶ Early summer brush-hogging will stimulate milkweed regrowth for fall monarch reproduction. This will eliminate floral resources in treated area for 3 to 5 weeks but is likely to increase flower production of some fall-blooming nectar sources.
- ▶ Fall brush-hogging may increase milkweed and nectar source abundance during the spring migration.
- ▶ Light disking may increase the abundance of antelopehorn milkweed. Disking should be 2 to 4 inches deep, in late October or November, after milkweeds and nectar sources have died back.
- ▶ Consider using burning, light disking, or high stock density cattle grazing as tools in conjunction with fall brush-hogging.



# ESTABLISHING MONARCH HABITAT THROUGH PLANTINGS

Creating new monarch habitat through the planting of desirable species is a rewarding way to directly benefit monarchs.



- ▶ Locate monarch plantings at least 125 feet from areas where insecticides are regularly applied. If this is not possible, implement mitigation practices described in USDA NRCS' Agronomy Technical Note No. 5 Pest Management in the Conservation Planning Process.
- ▶ If converting non-native grasses to monarch plantings, be sure to effectively eliminate the non-native grasses before planting.
- ▶ Monarch plantings should have at least three species that bloom in spring, three species that bloom in summer, and three species that bloom during fall migration (late September to October 20), but more plant diversity is better.
- ▶ When monarch habitat is the primary purpose of the planting, forbs and legumes used by monarchs should make up at least 60% of the mix.
- ▶ When monarch habitat is a secondary purpose of the planting, forbs and legumes used by monarchs should make up at least 30% of the mix.
- ▶ Native warm season grasses may comprise up to 25% of the total seeds in the mix.

- ▶ At minimum, 10% of the seeds within the mix should be bunch grasses in plantings greater than 2 acres.
- ▶ Mid-grasses, such as little bluestem or sideoats grama, are preferred over tallgrasses to prevent the potential shading out of desired forbs and legumes.
- ▶ Avoid cool season grasses in monarch seed mixes because of their competition with desirable forbs.
- ▶ Do not establish monarch plantings in areas of concentrated flow or high erosion potential.
- ▶ If interseeding into existing grassland, use a minimum till drill.



Johnston Seed in Enid now offers three new regional Wildflowers for Monarchs seed mixes: Eastern, Central and Western Oklahoma.

## Maintaining Monarch Plantings in the first 24 months after planting

Providing the proper care to a monarch planting in the first two years will ensure the successful establishment of plants.

- ▶ If undesirable vegetation begins to dominate the desired plant community, consider mowing the first summer after planting.
- ▶ Burn in early summer (June 15 -July 15) to stimulate resprouting of green antelopehorn (*A. viridis*) and spider milkweed (*A. asperula*) in August and September.
- ▶ Flash grazing can be used in large plantings to reduce competition from grasses.
- ▶ Consider using grass-selective herbicides to reduce competition from grasses in small plantings.

## Monitoring Monarch Plantings and Habitat

- ▶ Periodic monitoring of your project will aid in adaptive management to maximize monarch/pollinator habitat. Easy to use methods, such as photo point monitoring or the use of a livestock exclosures (at least 6' x 6'in size), can illustrate change over time and provide valuable information to land managers.
- ▶ This is as simple as setting permanent photo points, taking photos and returning the same time each year to repeat.
- ▶ In addition to photo point monitoring there are some alternative assessment methods that can be used to quantify monarch/pollinator habitat. These assessment methods require more time and plant identification knowledge but can also be a great tool to illustrate change over time.

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**SPECIAL THANK YOU TO KATIE BLUNK AND MICHAEL HORNTVEDT OF LAZY KT RANCH IN FREEDOM, OK.**

Majority of the photos in this publication are of their hard work at their ranch.



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PHOTO CREDITS: All photos in this document are provided by Katie Blunk and Michael Horntvedt, except for the following: Page 8 - TNC; Page 9 - ©Chris Helzer/TNC; Page 10 - top: Chis Helzer/TNC.

