



# Missouri Monarch and Pollinator Conservation Plan

Version 2

2021 – 2026<sup>1</sup>



Prepared by the Missouri Monarch and Pollinator Conservation Plan Collaborative Steering Committee<sup>2</sup>

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<sup>1</sup> This is Version 2 of the Missouri Monarch and Pollinator Conservation Plan. Version 1 was in effect 2016 - 2020.

<sup>2</sup> Subset of the Missouri Monarch and Pollinator Conservation Plan Collaborative responsible for governance and setting strategic direction; also referred to as the Steering Committee.

# TABLE OF CONTENTS

Acknowledgements .....	iii
Acronyms .....	iv
Planning Terms.....	v
Executive Summary .....	vi
Section 1: Introduction .....	1
1.1 Plan Development and Collaboration Formation .....	1
1.2 Statement of Problem.....	3
1.3 Purpose.....	5
Mission Statement.....	6
Vision Statement.....	6
Section 2: Species Description .....	7
2.1 Description.....	7
2.2 Biology.....	7
2.3 Migration.....	8
2.4 Habitat.....	11
2.5 Species Distribution and Population.....	12
Section 3.1 Habitat Conservation, Enhancement and Restoration.....	13
Section 3.2 Collaboration and Partnerships .....	13
Section 3.3 Outreach and Education .....	13
Section 3.4 Science and Research .....	13
Section 3.5 Governance, Capacity and Funding .....	13
Section 4 Accomplishments .....	13
Habitat Conservation, Restoration and Enhancement .....	13
Collaboration and Partnerships .....	13
Outreach and Education.....	13
Science and Research.....	13
Governance, Capacity and Funding.....	13
Literature Cited.....	13
Appendix A: Collaborative Member Organizations .....	13
Appendix B: USFWS Listing Decision for Monarch Butterfly .....	13

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# ACRONYMS

<b>BMP</b>	Best Management Practices - Conservation or land management methods or techniques considered the most effective and/or practical
<b>CAFNR</b>	College of Agriculture, Food and Natural Resources - University of Missouri
<b>CFM</b>	Conservation Federation of Missouri
<b>DNR</b>	Missouri Department of Natural Resources
<b>ESA</b>	Endangered Species Act
<b>FSA</b>	Farm Service Agency
<b>IMMP</b>	Integrated Monarch Monitoring Program
<b>MAFWA</b>	Midwestern Association of Fish and Wildlife Agencies
<b>MDA</b>	Missouri Department of Agriculture
<b>MDC</b>	Missouri Department of Conservation
<b>MoDOT</b>	Missouri Department of Transportation
<b>MPF</b>	Missouri Prairie Foundation
<b>NGOs</b>	Non-governmental organizations
<b>NRCS</b>	Natural Resources Conservation Service
<b>NWF</b>	National Wildlife Federation
<b>QF/PF</b>	Quail Forever/Pheasants Forever, Inc.
<b>ROW</b>	Right of Way – Unique land use managed for monarch and pollinator habitat
<b>SSA</b>	Species Status Assessment
<b>STEM</b>	Reference for the academic disciplines of science, technology, engineering, and math
<b>USDA</b>	U.S. Department of Agriculture
<b>USFWS</b>	U.S. Fish and Wildlife Service

# PLANNING TERMS

This Plan identifies goals and objectives that will guide the Missourians for Monarchs over the next five years. Objectives are supported by an initial set of strategies and actions/tasks that will be evaluated and modified over time as needed. Terms and their definitions as used in this plan are as follows:

GOAL	THE DIRECTION WE WILL PURSUE
Generalized directional statements for an intended purpose (e.g., to improve, increase, maintain, decrease, provide, etc.); qualitative and usually not quantified	
OBJECTIVE	WHAT WE WILL ACCOMPLISH
Concise statements of what will be accomplished	
STRATEGY	HOW WE WILL ACCOMPLISH IT
Statement(s) of an approach to achieve an objective(s).	
ACTIONS	HOW TO IMPLEMENT THE STRATEGY
Specific efforts that must be completed.	

# EXECUTIVE SUMMARY

Following a state summit of agencies, non-governmental organizations, businesses, landowners and others in 2015, a concerted effort was made to bring greater focus to the plight of the monarch butterfly and pollinators in Missouri. The original grassroots organization, Missourians for Monarchs<sup>3</sup> transformed into a formal statewide collaborative. From the many ideas generated during the summit emerged a vision of monarch and pollinator habitat conservation that would combine the efforts of multiple entities and individuals through awareness, education, volunteerism, and non-regulatory, voluntary action. In addition to the expectation that these efforts will assist in monarch and pollinator conservation is the hope that the combined actions of the Missourians for Monarchs will render the need for listing the monarch butterfly as threatened unnecessary.

An important first step in building off the energy and momentum created in 2015 is the development of this conservation plan. This Plan focuses on the North American eastern migratory population of monarchs, located east of the Rocky Mountains. All mentions of monarch migration and population within this document refer to the eastern migratory population, unless otherwise stated.

Arranged by key areas of focus, this plan is viewed as a dynamic document, subject to change as conditions and new information warrant. The essential core of this plan is a 20-year objective for the conservation, enhancement, and restoration of monarch butterfly and pollinator habitat on public and private lands in Missouri; all other elements of the plan are intended to support this end with an initial three-year period from May 1, 2016 to April 30, 2019, followed by review(s) and revision(s), as needed. This version of the Missouri Monarch and Pollinator Conservation Plan spans a five-year period from January 2021 through January 2026.

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<sup>3</sup> Moniker given to the grassroots initiative to address monarch and pollinator conservation in Missouri. Today, that original grassroots initiative is known as *Monarchs & Pollinators Network*.



# SECTION 1:

## INTRODUCTION



### 1.1 PLAN DEVELOPMENT AND COLLABORATION FORMATION

Recognizing the importance of this issue and the need to be part of the solution, the National Wildlife Federation (NWF) and Missouri Prairie Foundation (MPF) met to discuss how Missouri could create a statewide habitat enhancement approach to deal with the devastating decline in monarchs and pollinator species. A team was assembled including representatives from NWF, MPF, Conservation Federation of Missouri (CFM), and Missouri Department of Conservation (MDC) to plan a summit for discussing the potential and options for future collaboration.

On July 13-14th, 2015, invited representatives from state and federal agencies, non-governmental organizations, businesses, landowners, and others were convened in Columbia, Missouri, to begin the process of developing a statewide coordinated strategy for habitat enhancement to assist in the conservation of

monarch butterflies and pollinators<sup>4</sup> in Missouri. During the meeting, 47 participants representing 32 different groups worked to identify and prioritize areas of interest and need, the results of which were captured in a final report.

Generally, summit participants agreed that Missouri's strategy for monarch butterfly conservation should focus on expanding and creating native milkweed<sup>5</sup> and nectar plant<sup>6</sup> habitat necessary to support robust breeding and successful migration throughout the state. Moreover, participants agreed that while the monarch butterfly is our primary concern, the plight of all pollinator species needed to be included as part of the strategy and overall message. Among the many ideas generated during the summit was the need to develop a steering committee as a means of continuing the momentum and finding ways to further develop and energize the collection of interests in attendance.

<sup>4</sup> Generally, pollinator or pollinator species means any insect, bird, or mammal capable of transferring pollen from flowers thereby inducing fertilization and the formation of fruit; as used in this document (bees, butterflies, moths, and other insects).

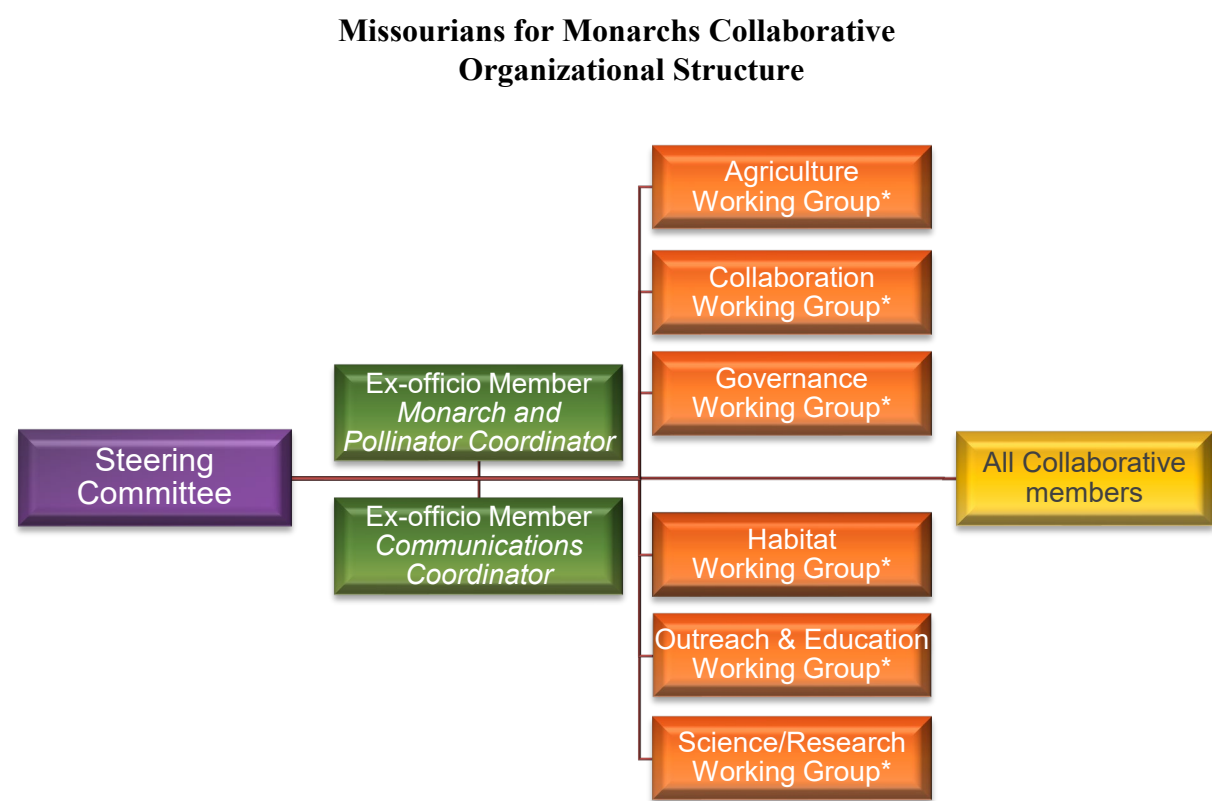
<sup>5</sup> Native Missouri species include but are not limited to: Swamp (Marsh) Milkweed (*Asclepias incarnata*), Prairie (Sullivant's) Milkweed (*A. sullivantii*), Aquatic Milkweed (*A. perennis*), Common Milkweed (*A. syriaca*), Tall Green Milkweed (*A. viridis*), Butterfly Milkweed (*A. tuberosa*)

<sup>6</sup> Native plants that produce blooms and nectar necessary as a food/nutrient source to resident and migrating monarchs and other native pollinators.

Members of the steering committee include representatives from agriculture, business, education, non-profit organizations, private landowners, and agencies with land management and conservation responsibilities. The Missourians for Monarchs Collaborative<sup>7</sup> is the direct result of summit deliberations and is Missouri’s response to the challenges ahead for monarch and pollinator conservation.

An important first step for the steering committee was to oversee the development of a conservation plan with the hope of further facilitating collaborative efforts across Missouri and detailing steps that will result in monarch and pollinator habitat enhancements. What follows are the initial steps to be taken

by the Missourians for Monarchs Collaborative in its quest to assist in the conservation of monarch butterflies and pollinators. The goals and objectives herein are ambitious but were created and are supported by a significant coalition of public and private entities willing to contribute substantial effort and resources to their achievement. This collaborative approach to plan development and implementation is a strength that will aid in the success of Missouri’s program. In addition, regional collaboration is encouraged to ensure cohesive implementation of the national and international efforts underway to help reverse the decline of the monarch butterfly and pollinators.



**Figure 1.** \* Working Groups may change as needed

<sup>7</sup> The, now, formal collaborative of organizations representing agriculture, business, education, non-profit organizations, private landowners and agencies with land management and conservation responsibilities; also referred to as the Collaborative.



1.2 STATEMENT OF PROBLEM

In recent decades, the eastern migratory population of monarch butterflies (*Danaus plexippus*) has declined by more than 80% (Semmens et al., 2016). Extensive loss of habitat throughout their breeding grounds and migratory path due to land-use changes<sup>8</sup> and untimely mowing or pesticide applications, combined with illegal logging, forest degradation, and harsh winter storms at their overwintering lands; has cumulatively contributed to this significant population decline.

Habitat loss throughout their breeding grounds and migration route includes the loss of native milkweed plants and native nectar resources, both of which are essential for monarch survival. The decline in various species of native milkweed is troublesome as they are the monarch’s host plant<sup>9</sup>. However, loss of nectar resources further complicates the monarchs’ struggle since the last migratory generation, born each year, requires these resources to fuel the final leg of their sensational migration flight to Mexico. Survival of this last generation is crucial because they produce the following year’s first generation.

The downward trend in the monarch population, as well other pollinator species’ populations, prompted cooperative action from the Presidents of the United States and Mexico and the Prime Minister of Canada. In June 2014, a Presidential Memorandum was issued from The White House directing Federal actions to address the issue of pollinator conservation resulting in the creation of a Pollinator Health Task Force and the *National Strategy to Promote the Health of*

*Honey Bees and Other Pollinators*. This strategy set a goal for the eastern migratory monarchs’ population to increase to 225 million butterflies, occupying 6 hectares (15 acres) in the overwintering grounds in Mexico (The White House, Office of the Press Secretary, 2014).

In August 2014, the U.S. Fish and Wildlife Service (USFWS) was petitioned to list the monarch butterfly as a threatened species under the Endangered Species Act of 1973 (ESA). In December 2014 USFWS published a 90-day substantial finding in the Federal Register stating protection of the monarch may be warranted. By December 2020, the USFWS had completed the Species Status Assessment (SSA) for the global populations

**U.S. FISH AND WILDLIFE SERVICE  
ENDANGERED SPECIES ACT LISTING  
FOR  
MONARCH BUTTERFLY  
“WARRANTED BUT PRECLUDED”**

“On December 15, 2020, the Service announced that after a thorough assessment of the monarch butterfly’s status, it has found that adding the monarch butterfly to the list of threatened and endangered species is warranted but precluded by work on higher-priority listing actions. With this decision, the monarch becomes a candidate for listing under the Endangered Species Act (ESA), and its status will be reviewed each year until it is no longer a candidate.”

See [Appendix B](#) for more details.

<sup>8</sup> Land-use changes consist of commercial, residential, and agricultural development or conversion.  
<sup>9</sup> The plants monarch butterflies lay their eggs and the only plants monarch caterpillars eat.

of the monarch butterfly (79 FR 250, 2014) and announced their listing decision of “warranted but precluded.” ([Appendix B](#)). Warranted-but-precluded findings require yearly subsequent reviews by the USFWS until the agency undertakes a proposal or makes a not-warranted finding. Therefore, monarch butterfly conservation efforts are still necessary and crucial.

A related but uniquely important problem is the plight of all pollinators, especially honeybees and Missouri’s more than 450 native bee species. Many native bees appear to be declining across their range with five of the ten species of bumblebees found in Missouri listed as threatened on the IUCN Red List of Threatened Species. The rusty-patched bumblebee (*Bombus affinis*), now considered extirpated in Missouri, was recently listed as endangered under the ESA. In addition, over the last decade beekeepers have lost on average one-third of their managed honey bee colonies annually.

Bees are a critical pollinator vital to our food production systems, and insect pollination in general contributes an estimated \$29.4 billion<sup>10</sup> of added value to the agricultural economy in the United States. In Missouri, over 560,000 acres are planted in crops dependent upon or improved by the pollination services of honey bees and native bees. Honey production alone in Missouri is valued at approximately \$1.5 million from the 10,000 colonies registered with USDA. In addition, bees and other pollinators sustain native plant communities, which further contribute to maintaining diverse and healthy ecosystems and all that they provide (e.g.,

wildlife, recreation, carbon cycling). As is the case with monarchs, multiple factors threaten bees and other pollinators including loss of habitat and forage plants, climate change, pesticide exposure, pathogens, and various pests.

Because no one agency is responsible for monarch, pollinator or habitat conservation, the urgency for action cannot be overstated. Currently, states have considerable leeway in determining action for improving habitat, limited mostly by available resources (i.e., money, seeds/plants, time) and the willingness of landowners and managers. As of December 15, 2020, the monarch butterfly is recognized as a candidate species for listing (85 FR 81813, 2020). As a candidate there are no protections for monarch butterflies under the ESA. If the butterfly should be elevated from candidate status and be listed under the ESA, there will be additional protections for the species. The continued approach for collaborative efforts in Missouri within all sectors is a critical step in working towards increasing the population by improving habitat conditions for this species and other pollinators over the next 5 years.

Missouri’s primary strategy for monarch conservation will focus on expanding and creating milkweed and nectar plant habitat corridors to support robust breeding and successful migration throughout the state. Therefore, finding ways to diversify habitat in agricultural and urban landscapes as well as improving habitat on existing lands in conservation ownership will be crucial.

<sup>10</sup> Derived from Calderone, N.W. 2012. Insect Pollinated Crops, Insect Pollinators and US Agriculture: Trend Analysis of Aggregate Data for the Period 1992–2009. The value of pollination services for Directly Dependent and Indirectly Dependent insect pollinated crops is \$26.92 billion (\$15.12 and \$11.80 billion respectively), plus the value of tomatoes (\$2.5 billion).

### 1.3 PURPOSE

This Plan provides a framework for coordinated and shared efforts for monarch butterfly and pollinator conservation, in Missouri, during a 20-year time period (2015-2035). The following conservation goals, objectives, and actions will be implemented by Missourians for Monarchs Collaborative members. This plan will be monitored and refreshed as needed to keep it relevant and up to date with the best available science and information.

As detailed in this plan, we have: 1) set goals for monarch and pollinator habitat efforts in

the state, including strengthening existing work, identifying gaps, and prioritizing actions, 2) created a holistic, coordinated statewide strategy for supporting monarchs and pollinators, 3) developed a collaborative effort to attract resources needed to the state's monarch population, while boosting populations of all pollinator species, and 4) identified opportunities to integrate our efforts with other regional and national initiatives.

## MISSION STATEMENT

Engage Missourians to increase and sustain habitat for monarch butterflies and pollinators through community involvement, and to seek ways for partners, communities, and agencies to coordinate similar efforts.



## VISION STATEMENT

Missourians will continue to appreciate the importance of monarch butterflies and pollinators generating a call to action resulting in increased conservation efforts to create and promote healthy habitats that support robust populations of these species and improve our local communities.



## SECTION 2:

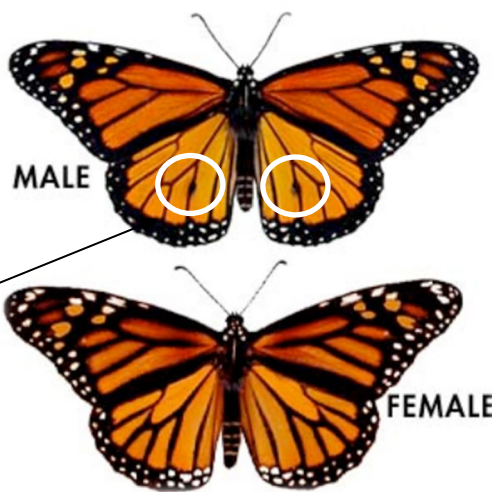
### SPECIES DESCRIPTION



#### 2.1 DESCRIPTION

The iconic monarch butterfly is recognized by many due to its vivid coloring. A bright orange background is contrasted by the black outer edge and vein pigmentation throughout its four wings.

Slight differences between males and females are easily distinguishable. Females' vein pigmentation is thicker than the males and the males have two swollen pouches on their hindwings (lower wings), which look like black spots (Figure 2).



**Figure 2.** Comparison image of male and female butterflies. [www.monarchwatch.org](http://www.monarchwatch.org)

#### 2.2 BIOLOGY

The complete metamorphosis of the monarch consists of 4 life stages. The first stage is the egg. A female monarch can have up to 500 eggs to lay and each egg is laid individually, on the underside of a milkweed leaf (Figure 3) by secreting a glue-like substance to help adhere the egg.



**Figure 3.** Monarch butterfly egg on the underside of milkweed leaf. John Cleckler.

When a female monarch has laid all her eggs, her life cycle is complete. Within three to five days of the egg being laid, the larva (caterpillar) will emerge (Figure 4). Its first meal will be the egg from which it emerged. Thereafter, the larva will feed exclusively on milkweed.



**Figure 4.** Monarch caterpillar emerging from egg. Noppadol Paothong.

This second stage of the monarch's life cycle lasts approximately two weeks. During this time, the caterpillar will develop through five instars (intervals between molts), which allows for its exponential growth rate of up to 3,000 times its original size (Figure 5).

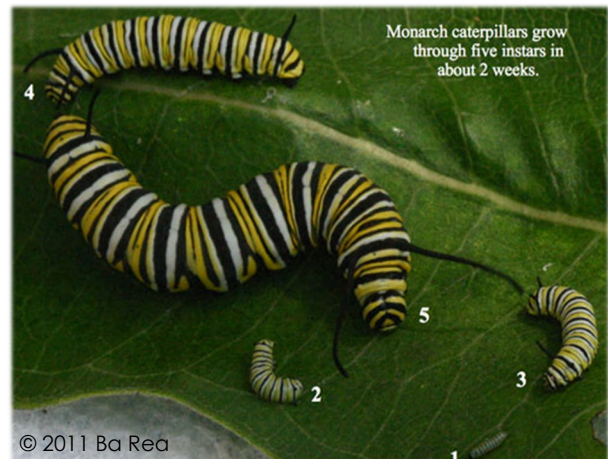
When fully grown, fifth instar larvae will enter the third stage of development called pupa stage. During this stage of metamorphosis, the caterpillar will form a chrysalis (Figure 6) and remain inside for approximately eight to fifteen days.

When the butterfly is ready to emerge from its chrysalis, the iconic orange and black wings are visible through the chrysalis (Figure 7). Once the adult monarch emerges, it will remain attached to the chrysalis for another 3-4 hours while it "inflates" its wings with fluid contained in its swollen abdomen, as well as to allow time for the wings to both dry and harden.

In this last life stage of the monarch, its primary purpose is to breed and lay eggs. The spring and early-summer generations will reproduce and live only two to five weeks. The last generation adults can live up to nine months, during which time, they must migrate, as well as reproduce.

### 2.3 MIGRATION

Adding to the monarch's allure is its international migration, which is arguably the most dramatic example of insect migration known (Johnson 1969). Every year, three to five generations of monarch butterflies are needed to successfully navigate their transnational migration (Figure 8).



**Figure 5.** Size comparison of instars 1 through 5



**Figure 6.** Time lapse image of monarch caterpillar forming chrysalis. [www.monarch-butterfly.com](http://www.monarch-butterfly.com)



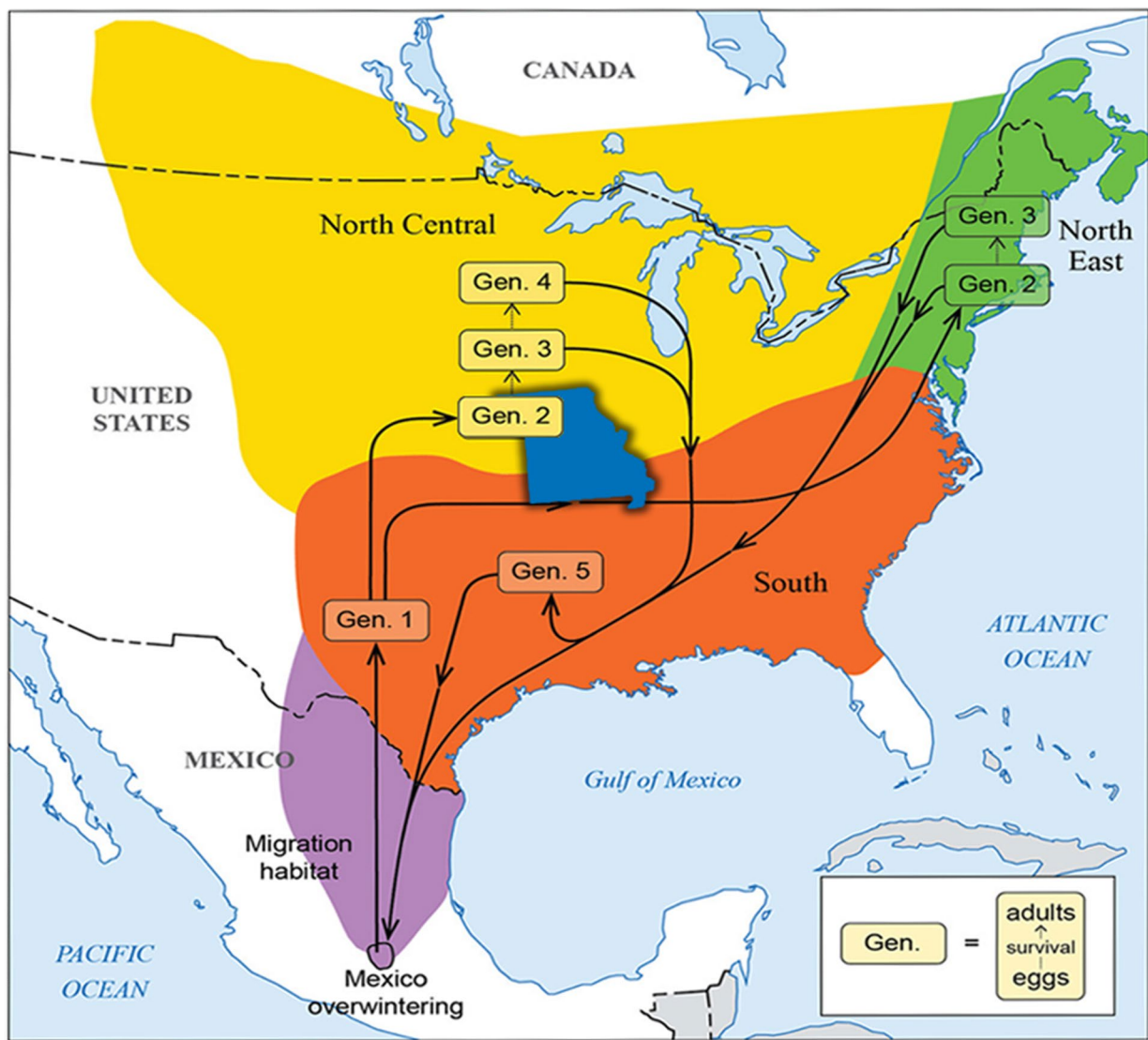
**Figure 7.** Time lapse photo of adult monarch emerging from chrysalis. [www.monarch-butterfly.com](http://www.monarch-butterfly.com)



Only the last generation born will make the migratory trip to overwinter in the oyamel fir (*Abies religiosa*) forests in central Mexico. Utilizing environmental cues, this generation will enter reproductive diapause<sup>11</sup>, which helps increase the energy reserves needed for the long-distance journey to Mexico where they'll overwinter throughout the winter months. The

following spring, this generation will fly northward toward Texas and reproduce. This last generation's offspring is considered generation one, for this season, and will continue moving farther north where they lay eggs to begin populating that year's monarch generations.

**Figure 8.** Map of annual migration for the eastern population of monarchs inclusive of regions where the various generations are produced. Map courtesy of Oberhauser, K. et al. 2017.

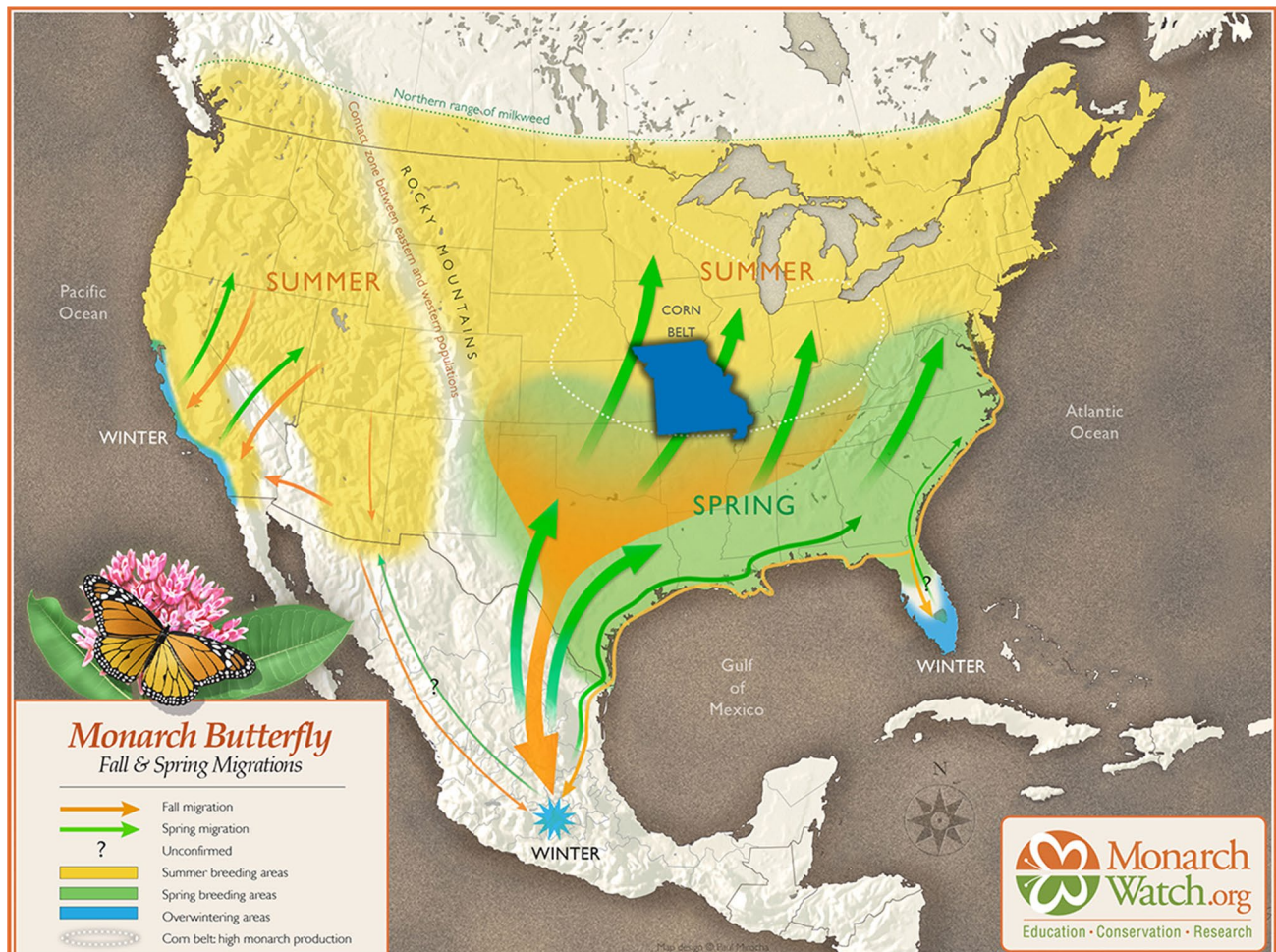


<sup>11</sup> Diapause is a period of suspended or arrested development. For monarchs, in particular, they undergo a suspension of reproductive functions.

This annual migration of the eastern migratory population spans Canada, the United States, and Mexico and traverses thousands of miles. Missouri is centrally situated within this migratory flyway, which also serves as the monarchs breeding grounds (Figure 9), making Missouri and the Midwest vital to the monarch population. Scientific research using isotope data has shown 40-50% of over-wintering monarchs in Mexico were produced in the Midwest “corn belt”

(Wassenaar and Hobson; 1998; Flockhart et al. 2017).

Each fall, millions of monarch butterflies travel through Missouri, feeding on available nectar from native plants, fueling their migration to their overwintering grounds in central Mexico. As spring arrives and temperatures warm, monarchs begin their return journey north to their breeding range, once again traversing Missouri, this time, in search of milkweed.



**Figure 9.** Map depicting annual fall and spring monarch butterfly migration with state of Missouri highlighted. Base map courtesy of [www. Monarchwatch.org](http://www.Monarchwatch.org).

## 2.4 HABITAT

Due to the monarch's migratory life strategy, suitable monarch habitat is needed in both their overwintering grounds in Mexico, as well as their breeding range and migratory path. Ideal breeding range habitat, throughout their migratory path, consists of both milkweed species and a diverse array of native blooming nectar plants.<sup>12</sup> Such habitat can be found in various land-cover types including, but not limited to, prairies, meadows, wetlands, farms, urban and suburban gardens, roadsides, and even open forest and woodlands. Because adult monarchs are generalists, feeding on a variety of native blooming nectar plants; and their larvae are specialists, feeding only on their host plant, milkweed; having the right plants at the right time for each stage of its lifecycle is crucial. Therefore, the monarch's long-distance, multi-generational migration requires not only for the requisite plant species to exist, but for those plants to be both spatially and temporally available during their migration.

Overwintering habitat for monarchs consists almost solely of oyamel fir trees (Anderson and Brower, 1996; Oberhauser and Peterson, 2003), native to the mountains of central and southern Mexico. The canopy of these evergreen conifers which act like an umbrella (Anderson and Brower, 1996) and the microclimatic effects of the large tree trunks (Brower et al., 2009) helps protect colonies of monarchs from freezing as they overwinter.

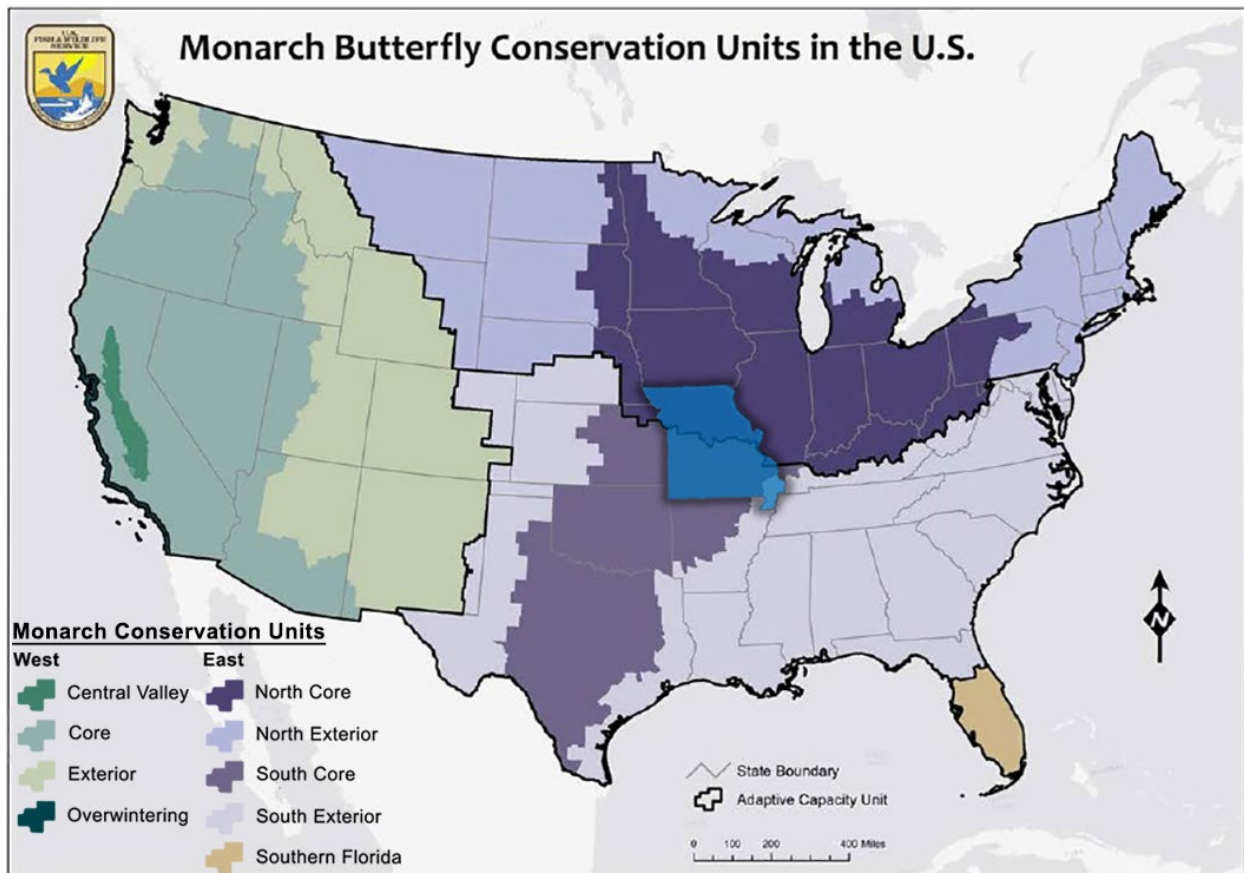
Experts agree, habitat conservation and restoration within the monarch's breeding

range and migratory path is needed to increase their population size. Research has shown increased habitat in key areas, within the aforementioned range, could lead to favorable impacts on population size, such as the "corn belt" region as noted earlier in this plan and originally reported by Flockhart et al. (2013). Additionally, a large portion of first-generation monarchs, responsible for colonizing all subsequent generations each year, are born in Texas and bordering states. Therefore, combined efforts in central, south-central and midwestern states in the U. S. are key areas for enhancing the monarch population (Flockhart et al. 2013).

The USFWS has proposed areas known as "monarch butterfly conservation units" (Figure 10), which were derived using county level land use data for conservation planning purposes and incorporating scientific research and analysis and known primary production and migration areas of the eastern population of monarchs. These units help planners determine the highest priority regions to provide suitable habitat. The map below identifies the designated monarch butterfly conservation units as defined by USFWS. Missouri is centrally located between two key units: the "North Core" (dark purple) which constitutes the primary breeding range of monarchs in the eastern United States and the "South Core," which represents the core of the monarch migratory corridor, contributing to Missouri's crucial role in monarch recovery.

<sup>12</sup> For the purposes of this plan, land capable of meeting one or more life-stages and needs of the monarch species is considered suitable monarch habitat





**Figure 10.** USFWS Monarch butterfly conservation units.

Image credit: U.S. Fish and Wildlife

## 2.5 SPECIES DISTRIBUTION AND POPULATION

Monarch butterflies have a wide distribution, which ranges across various regions, countries, and continents (Figure 11) with distinct and differing populations existing among the different locations. Monarchs are indigenous to North America and have



**Figure 11.** Image credit: [www.worldwildlife.org](http://www.worldwildlife.org)

existed for more than 20,000 years; however, three distinct dispersal events to other continents, which began 2,000-3,000 years ago, gave rise to their presence on 6 continents (Vane-Wright 1993; Zahn et al. 2014) (Figure 11). Each of these geographical populations is genetically distinct and, in fact, small, non-migratory populations, within North America, located in south Florida and along the gulf coast are also genetically distinct from the other two North American populations. In recent decades, many factors have challenged monarch butterfly populations including habitat loss, droughts, and climate change. Habitat loss incurred by monarchs includes a significant decline in

milkweed and native nectar resources throughout its migratory corridor, as well as loss of oyamel fir trees at its overwintering grounds.

Monarch population size is assessed by

measuring the total area occupied by monarch colonies at their overwintering site in Mexico. The trend since 1994-95 has been downward with modest population rebounds in 2015-16 and 2018-19 (Figure 12).

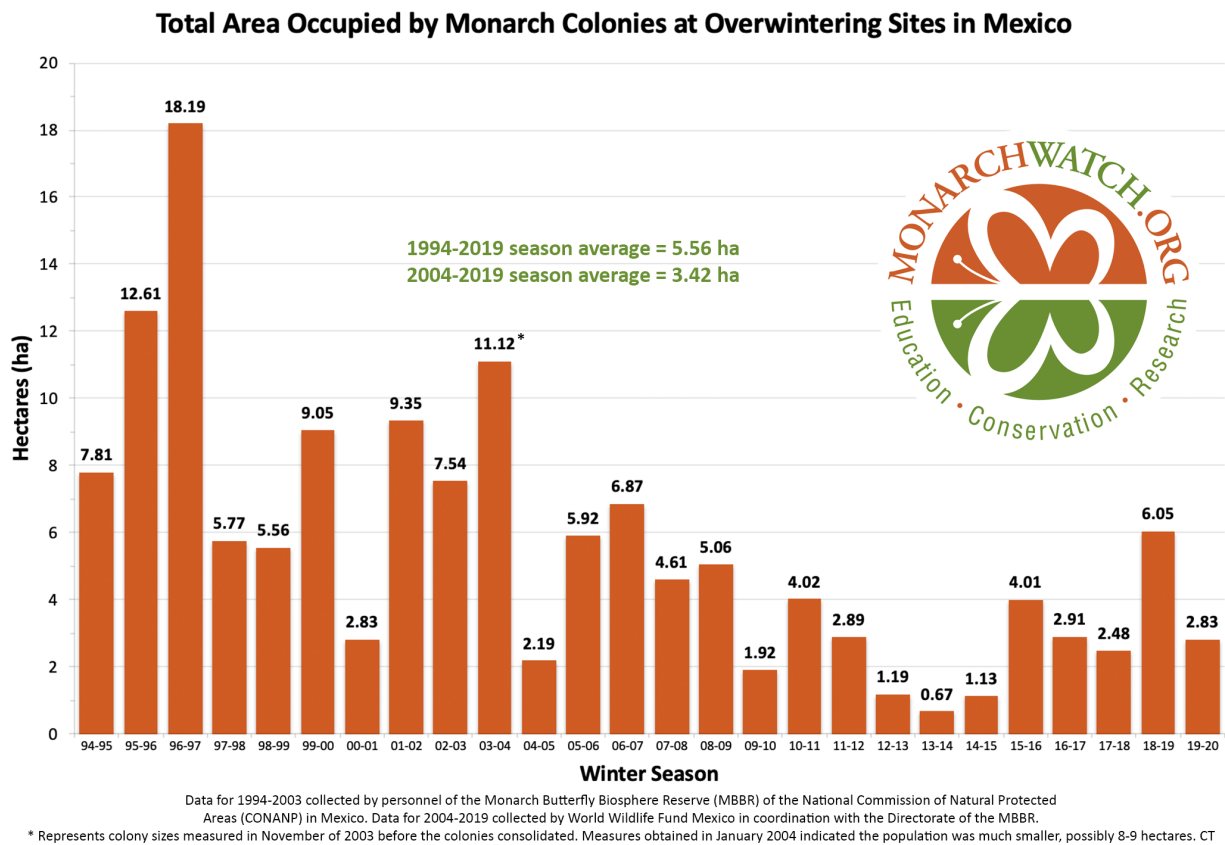


Figure 12.

## SECTION 3.1

# HABITAT CONSERVATION, ENHANCEMENT AND RESTORATION

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Monarchs have lost significant amounts of habitat mostly due to land use changes, development, and agricultural land management. Our biggest challenge is mitigating habitat loss or restoring habitat on lands that are nearly all privately owned. Our intention is to work toward a Missouri 20-year habitat<sup>13</sup> objective of 385,000 acres of additional pollinator habitat which consists of 200 milkweed stems/acre<sup>14</sup>. This objective is a step-down from the USFWS 20-year national plan to develop 7 million acres of habitat with 1.25-1.5 billion additional milkweed stems. Much progress has already been made as the Missouri Collaborative has improved or created 445,000 acres of pollinator habitat between 2014 and 2019, yet losses to Conservation Reserve Program acres have offset some of the gains made in the state. It is our hope that achieving this habitat objective (385,000) will help to address the threat of habitat loss for monarchs and render the need for possible future listing of this and additional pollinator species under the ESA as unnecessary.

The limited capacity to produce milkweed seed, plants and plugs, in needed quantities, is a significant restrictive factor that must be addressed.

Through the Collaborative, we continue to work to coordinate and mobilize public and private stakeholders to increase and sustain monarch and pollinator habitat through planting, restoration and management. A major emphasis will be to identify limitations and obstacles to achieving the objective and collectively find practical solutions for creating monarch and pollinator habitat.

In the fall of 2019, the Collaborative had a stakeholder workshop involving Collaborative members, representatives from agriculture, education, seed production, municipalities and cities, and Missouri citizens to discuss certain aspects related to reaching more Missourians and engaging people in more ways. The meeting resulted in several breakout groups discussing actions needing further development. Conversations resulted in new strategies for: municipalities; rural private lands managed for activities other than haying, grazing and row crop agriculture; native seed production; outreach and education to reach broad diverse groups; and capacity for sustainable resources to support staffing and support needs for the collaborative. These additional actions have been incorporated into the strategies of the revised plan as outlined below.

<sup>13</sup> As used in this document, habitat or suitable habitat refers to land capable of meeting one or several life-stages and needs of a species.

<sup>14</sup> One stem of one milkweed plant; extrapolated number of stems per acre using a standard field method for counting.



GOAL 1	To conserve, enhance, and restore habitat on public and private lands to support populations of monarch butterflies and pollinator species.
OBJECTIVE A	Conserve and manage existing monarch and pollinator habitat and create 385,000 acres (19,000 acres per year) of additional habitat with 200 milkweed stems/acre by 2036.
STRATEGY 1 (HG1-OA-S1)	Inventory Habitat Conditions/Identify Target Geographies – Identify existing habitat for conservation and high priority geographies for enhancement and restoration. Use gross determinations from existing information for initial, short-term work but refine information and scale over time to improve decision-making and priority-setting.
ACTIONS	
HG1-OA-S1-A	Assemble Missouri monarch and pollinator habitat and land use data; use USGS ARCGIS tool, “Monarch Conservation Planning Tools,” to help determine Missouri-specific target geographies.
HG1-OA-S1-B	Identify existing habitat and priority geographies and corridors.
HG1-OA-S1-C	Identify areas at risk for conversion of habitat to other land uses (CRP).
HG1-OA-S1-D	Encourage HabiTally use by general public. Calculation for successful benchmark = proportion of people buying native plants at plant sales or working with conservation programs
STRATEGY 2 (HG1-OA-S2)	Public Land Management – Convene and engage partners with public land stewardship responsibilities in determinations about commitment, priorities, targets, capabilities, and effort commensurate with their authority and limitations. Seek opportunities for coordination and collaboration, information sharing, and pooling of resources.
ACTIONS	
HG1-OA-S2-B*	Create demonstration sites featuring BMP use. Calculation for successful benchmark = 1 per county (county seats and widely used public areas) within 100-mile flyway corridor)

**ACTIONS (CONTINUED)**

HG1-OA-S2-C	Identify existing habitat for conservation.
HG1-OA-S2-D	Identify areas to create or enhance habitat.
HG1-OA-S2-E	Increase partner participation in monitoring efforts by utilizing various school groups (college fraternities, National FFA Organization, 4H, etc.) on public habitat sites.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

**STRATEGY 3  
(HG1-OA-S3)**

Public Land Management – Municipalities including villages, rural towns, metropolitan areas, and major cities - Engage partners in population centers to address areas where monarch and pollinator habitat can be utilized to increase interest in community beautification/ecological services through planting native forbs and milkweeds. Seek opportunities to assist, collaborate and share information with local government leaders whereby utilities, parks and recreation, Homeowner Associations and others can budget and support action.

**ACTIONS**

HG1-OA-S3-A	Increase partner participation in creating habitat and monitoring through inclusiveness utilizing school groups (college fraternities and sororities, National FFA Organization, Biology/environmental clubs, 4H, National FFA Organization) on municipal habitat sites. Encourage youth internships at high school and college levels create flexible policies.
HG1-OA-S3-B	Champion the Mayor's Monarch pledge, expand publicity using St. Louis, Columbia, Kansas City as examples for others, create a sense of ownership to continue to implement into the future.
HG1-OA-S3-C	Provide a cost/benefit money saving analysis to reduce mowing. Develop mock ordinances and contracts/templates (i.e., formulate a template for start-up and maintenance, staff costs).
HG1-OA-S3-D	Work with leadership in larger communities to streamline internal contracting processes and administrative processes to make it practical for partners (like 3-M, DOT's, etc.) to contract land management efforts.
HG1-OA-S3-E	Make a repository for information on M4M website that cities and towns can have readily available. Include how to identify existing habitat for conservation and how to identify areas to restore/enhance.
HG1-OA-S3-F	Staff a position to support and advocate increasing community collaboration—build bridges between departments and administrators.
HG1-OA-S3-G	Champion Homeowner Associations adoption of monarch/pollinator friendly practices, working with municipalities on development codes and regulations that promote BMPs and native habitats.

**STRATEGY 4  
(HG1-OA-S4)**

Private Land Management (Non-traditional agricultural/rural) – Continue to engage rural residents in discussions about the role they can play in monarch and pollinator conservation for recreational lands, vineyards, wood products, orchards, etc. Help identify opportunities for voluntary habitat conservation and enhancement.

**ACTIONS**

HG1-OA-S4-B\*

Develop marketing strategy targeting potential, nontraditional USDA customers such as non-operating landowners, use BMP information for social media campaign and work with local landowners to demonstrate to others pollinator benefits on their lands.

HG1-OA-S4-C

Advise owners of recreational lands or Rights of Way on how to identify areas to create or enhance habitat, encourage native forbs and milkweeds as well as pollinator friendly native trees/shrubs where applicable.

HG1-OA-S4-D

Link to agricultural media outlets- Agricultural media and web resources, google caches, social media sites etc.; highlight social/human dimension strategies focused on the problem (i.e., “we would not have this \_\_\_\_\_ if we don’t have pollinators”).

HG1-OA-S4-E

Utilize Extension offices, Farm Bureau, Farmers markets, Missouri Governors Conference on Agriculture, and similar venues of large gatherings to deliver pollinator messaging.

HG1-OA-S4-F

Work with Midwestern Association of Fish and Wildlife Agencies (MAFWA) at the national and state levels to benefit pollinators: 1) crop insurance program adjustments to incentivize pollinator habitat and good conservation practices (Farm Service Agency (FSA)/Risk Management Agency (RMA)); 2) promote raising CRP cap and county rental rates for pollinator friendly buffers; adjust so small acreage contracts get larger annual payment than whole field; 3) Continue to innovate in paying higher rates for smaller acreage contracts.

HG1-OA-S4-G

Create statewide cost-share program for landowners to establish pollinator plots and keep pollinator habitat intact after incentives and contracts expire that can provide an additional revenue stream by working with the Missouri Native Seed Association to harvest seed after monarch migration.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

**STRATEGY 5  
(HG1-OA-S5)**

Private Land Management (Agricultural) – Collaborate with agricultural partners and interests to identify and promote proactive actions by farmers and ranchers that work to support monarchs and pollinators in production agricultural landscapes.

**ACTIONS**

HG1-OA-S5-B*	Identify existing agricultural systems that are compatible with monarch conservation; work to promote monarch habitat within these systems. (no till, mow timing, etc.).
HG1-OA-S5-C	Advise agricultural landowners and hobby farms on ways to integrate monarch and pollinator conservation with land management practices. (Precision agriculture can identify areas)
HG1-OA-S5-D	Identify existing habitat for conservation.
HG1-OA-S5-E	Identify high potential areas for creating or enhancing habitat. (precision ag on marginal soils, profitability, need more CRP)
HG1-OA-S5-F	Request partner participation in monitoring efforts.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

**STRATEGY 6  
(HG1-OA-S6)**

Technical Assistance - Develop methods by which private landowners can access necessary information, equipment, and contractual services for developing and managing monarch and pollinator habitat.

**ACTIONS**

HG1-OA-S6-B*	Develop and maintain a list of contractors approved/certified to properly install monarch and pollinator habitat (e.g., Grow Native Resource Guide, county contractor list).
HG1-OA-S6-E*	Explore opportunities for Collaborative members to provide equipment for landowner use (e.g., drills, spreaders, sprayers, etc.), or provide funding to help landowners secure equipment for use.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

**STRATEGY 7  
(HG1-OA-S7)**

Financial Incentives and Assistance - Seek to develop, provide, and promote financial incentives (e.g., cost-share opportunities) that will enhance the affordability of establishing monarch and pollinator habitat on private lands.

**ACTIONS**

HG1-OA-S7-A	Form a state, federal and NGO work team to examine existing cost-share/incentives and provide suggestions for additions, improvements, or new programs.
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**ACTIONS (CONTINUED)**

HG1-OA-S7-B Seek grant opportunities to fund additional incentives for monarch and pollinator plantings on private lands.

HG1-OA-S7-C Strive to develop a program that will incentivize pollinator plots but be flexible enough to work with Missouri Native Seed Association members to allow harvest of seed to ensure long range availability of seed stock and reduce price of currently expensive seed mixes.

**STRATEGY 8  
(HG1-OA-S8)**

**Seed and Plant Resources** - Work to increase availability of native seed and plant resources necessary to meet demand, with special emphasis on availability of regionally appropriate milkweed species. Promote the commercial native seed and plant industry in ways that further create and meet demand expectations.

**ACTIONS**

HG1-OA-S8-B\* Collaborate with native seed and plant dealers to collect seed, grow, and sell locally sourced and/or regionally appropriate milkweed and native nectar species.

HG1-OA-S8-C Create and maintain a milkweed geo-location database; use information as a guide to identify and designate Missouri milkweed genetic source sites and inform habitat enhancement work.

HG1-OA-S8-D Encourage seed collection (with permission) on public and private land to increase Missouri genetic source seed supply.

HG1-OA-S8-E Work with native seed/plant dealers to ensure and promote the use of diverse seed mixtures including appropriate milkweed and native nectar-producing plants.

HG1-OA-S8-F Coordinate with native seed and plant dealers to develop adequate supplies of resources to meet existing and projected demand for milkweed and nectar producing plants.

HG1-OA-S8-G Develop a volunteer force to assist with seed collection, propagation, and distribution (e.g., 4-H, National FFA Organization), libraries).

HG1-OA-S8-H Contract/Lease private land for seed production on Electric Cooperative Easements; landowners receive a portion of any harvested seed along ROW. Develop a database to track source and agreement template to allow harvest.

HG1-OA-S8-I Allow seed harvest on MDC/USDA/USFWS easements with permission of landowner using contractors for harvest. (what are the bottlenecks?)

HG1-OA-S8-J Create cost-share program for private landowners to harvest seed as a “crop” and track quality plantings to allow for seed collections and sustainability through market development strategy.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

OBJECTIVE B

Implement a shared, multi-jurisdictional monitoring strategy for measuring and capturing Missouri-specific accomplishment data and information.

STRATEGY 1  
(HG1-OB-S1)

Engage partners and resident experts in discussions about methods for capturing accomplishment data; examine opportunities to participate in existing initiatives (e.g., USGS Monarch Conservation Science Partnership); consider required level of rigor and limitations of community-science.

ACTIONS

- HG1-OB-S1-B\*

Determine methods for gathering community-collected data.
- HG1-OB-S1-F\*

Determine if outreach efforts need to be considered as accomplishments to document outreach successes and to identify potential gaps in promotion of monarch efforts.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

OBJECTIVE C

Collect and report statewide habitat accomplishment information from partners as measured against the annual and the 20-year objective.

STRATEGY 1  
(HG1-OC-S1)

Create an easy and efficient method for partners to collect and self-report accomplishments in a timely manner.

ACTIONS

- HG1-OC-S1-A

Research, utilize and refine existing accomplishment reporting methods developed by others (e.g. HabiTally, etc.).



## SECTION 3.2

# COLLABORATION AND PARTNERSHIPS

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Monarch and pollinator conservation is a bigger, more complex task than any one agency or organization can accomplish alone; therefore, it is essential to develop and maintain effective relationships and promote collaboration with all the groups that share the common interest of enhancing monarch and pollinator habitat/populations in Missouri. Existing and potential partners include but are not limited to federal and state agencies, city governments, non-governmental organizations, community-based groups, corporations, businesses, private landowners, educational institutions, and private citizens. A fundamental part of our effort will be a reliance on voluntary actions and volunteerism. Matching projects and actions to the varying levels of ability, willingness and desire will be a necessary component to our success.

Fulfilling our mission will also require a concerted effort to identify and implement effective methods and approaches that are science-based, effective, and practical. It is our intention to act in partnership with all interested parties on the conservation of monarchs and pollinators as a true coalition, providing information to the public about all aspects of monarchs and pollinators in Missouri, and creating opportunities for public engagement in decisions about the management of Missouri's pollinator resources. Moreover, substantial opportunities exist for everyone to contribute at some level; no effort is too small. However, important keys to monarch conservation are those communities, groups, and individuals that control Missouri's diverse rural landscape. Only by working together with these stakeholders will we find practical options and solutions critical to our overall success.

### GOAL 1

To promote and cultivate collaboration and partnership across agencies, organizations, and stakeholder groups in support of our mission to increase and sustain habitat for monarch butterflies and pollinators.

### OBJECTIVE A

Communicate monarch management needs and strategies to all stakeholders and take the lead in maintaining dialogue ensuring all sectors are included and engaged.

STRATEGY 1  
(CG1-OA-S1)

Arrange periodic meetings, demonstrations, workshops, and industry or partner events for information sharing, encouraging participation, planning, problem solving, and recognizing accomplishments. Use partner events and venues for promoting collaboration, needs, and accomplishments.

ACTIONS

- CG1-OA-S1-A Identify and target major partner events for presence and/or delivery of the Missourians for Monarchs message.
- CG1-OA-S1-B Identify existing efforts, resources, and potential partners in order to connect interests with opportunities.

OBJECTIVE B

Secure commitments from leaders of Collaborative partner organizations to direct resources (e.g., time, money, services) to monarch habitat efforts and adoption of monarch conservation recommendations as appropriate to their organization.

STRATEGY 1  
(CG1-OB-S1)

Engage Collaborative partners in regular and timely discussions about individual and collective priorities and additional opportunities for collaboration. Formalize commitments as necessary.

ACTIONS

- CG1-OB-S1-C\* Conduct conservation planning with major landholders in the state.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

OBJECTIVE C

Engage Missouri’s agricultural community in discussions about ways Missouri farmers and ranchers can help participate in meeting monarch habitat objectives using methods that are compatible with agricultural production systems.

STRATEGY 1  
(CG1-OC-S1)

Find or create opportunities for discussions with agricultural leaders to explore, develop and promote practical conservation solutions designed for farmers and ranchers.

### ACTIONS

CG1-OC-S1-A	Identify critical agricultural stakeholder groups.
CG1-OC-S1-C*	Take the lead in convening an agriculture specific monarch and pollinators summit for the purpose of information sharing and strategy development.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

### GOAL 2

To develop, support and inspire a network of community-volunteers willing to donate time and expertise to the purpose of Missourians for Monarchs.

### OBJECTIVE A

Create process/structure and tools necessary to facilitate group and individual volunteer recruitment and action.

### STRATEGY 1 (CG2-OA-S1)

Identify opportunities for volunteer recruitment and engagement. Establish a communications link between Missourians for Monarchs and existing and potential volunteers. Promote volunteerism within existing organizations.

### ACTIONS

CG2-OA-S1-A	Identify local/regional organizations that might form independent volunteer teams/crews (e.g., business clubs, church groups, school districts and universities/colleges).
CG2-OA-S1-B	Identify groups and organizations whose members may be receptive to individual volunteer action.
CG2-OA-S1-D*	Create and/or provide information and tools necessary for self-guided action.
CG2-OA-S1-E	Coordinate with target groups to develop an understanding of their resources and needs in order to assist them with delivering monarch and pollinator conservation.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

## SECTION 3.3

# OUTREACH AND EDUCATION



Successful action begins with a clear understanding of the problem we are trying to solve and how not solving the problem stands to affect us all. This means providing factual information about the plight of monarchs and pollinators in a timely manner, reaching stakeholders and individuals alike. Fundamentally, we desire to create a level of awareness and urgency that motivates people, groups, and organizations to take the steps necessary to offset impacts to these species by arming them with the knowledge and resources they need. Through outreach, education, and marketing we will work with the public and partners to achieve our mission, with a special

emphasis on reaching individuals, youth and community-based groups and organizations, minorities, and people with limited resources. Our role will be as a coordinator and facilitator bringing together informational and educational materials, resources of existing programs, and supporting the substantial grassroots efforts that already exist. Moreover, we will work to ensure connectivity so everyone may realize the part they play and their relative contribution to the overall statewide effort.

### GOAL 1

To establish the Missourians for Monarchs as a leader and source for information about monarch butterflies and pollinator conservation in Missouri.

### OBJECTIVE B\*

Develop and initiate a broad Missourians for Monarchs marketing campaign to create statewide awareness of the plight of the monarch and pollinators targeting the general public.

\* Objectives appearing out of order are due to some Objectives being accomplished. [Click Here](#) to view accomplished Objectives for this Goal.

<b>STRATEGY 1</b> <b>(OG1-OB-S1)</b>	Develop and implement a marketing campaign targeting the general public. Establish a marketing work group for this purpose, as needed.	
	<b>ACTIONS</b>	
	OG1-OB-S1-A	Develop primary messages for the campaign.
	OG1-OB-S1-B	Determine and develop appropriate campaign materials.
	OG1-OB-S1-C	Determine methods of delivery and documenting effort.
	OG1-OB-S1-D	Determine budget and methods of funding.
	OG1-OB-S1-E	Designate Missourians for Monarchs spokespersons.
	OG1-OB-S1-F	Determine timing and methods of campaign rollout.
	OG1-OB-S1-G	Develop a standard agreement for partners to access and use campaign materials.

<b>STRATEGY 2</b> <b>(OG1-OB-S2)</b>	Assess public awareness and understanding of monarch and pollinator issues through general polling and/or representative surveys. Initiate a baseline survey with planned follow-up surveys.	
	<b>ACTIONS</b>	
	OG1-OB-S2-A	Explore opportunities with partners and institutions of higher education (e.g., graduate study) for developing and supporting a general survey for determining public awareness.

<b>OBJECTIVE C</b>	Promote the mission and work of the Missourians for Monarchs through strategic integration of traditional and non-traditional methods of media and marketing.
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<b>STRATEGY 1</b> <b>(OG1-OC-S1)</b>	Identify and prioritize communication and information delivery objectives; determine the need for Missourians for Monarchs-specific information, materials, or displays. Determine available traditional and non-traditional media outlets and high-profile events to deploy information according to delivery objectives and target audiences.
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**ACTIONS**

OG1-OC-S1-B*	Identify gaps in monarch/pollinator educational materials and solicit support in the creation of appropriate tools to satisfy the need.
OG1-OC-S1-C	Seek preparation of publication-ready news articles for popular traditional and non-traditional media and partner outlets.
OG1-OC-S1-D	Regularly publish an online, subscriber-based Missourians for Monarchs newsletter.
OG1-OC-S1-E	Ensure critical materials are translated (i.e., Spanish-speaking target audience).
OG1-OC-S1-F	Identify high profile events (e.g., state or county fairs) for message delivery.
OG1-OC-S1-I*	Review and update existing fact sheet and frequently asked questions (FAQs) and generate answers sheet on monarch status in Missouri and flyway for distribution to decision-makers, policy makers, and communities.
OG1-OC-S1-J	Update the basic media package to include original content, success stories and small videos. Coordinate the release of those media between collaborative members.
OG1-OC-S1-K	Have a biennial landowner Appreciation Dinner (model something similar to Private Lands Partners Day), alternating years with Annual Leadership meeting.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

**OBJECTIVE D**

Work with partners to identify or develop methods to train contractors, farmers, partners and individuals on proper establishment and maintenance of quality monarch and pollinator habitat.

**STRATEGY 1  
(OG1-OD-S1)**

Ensure partners offer or host regular workshops to certify/train contractors/landowners on the latest habitat techniques for successfully implementing monarch habitat improvements (e.g., burn workshops, early successional management workshops, etc.).

**ACTIONS**

OG1-OD-S1-D\* Track partner outreach efforts in an effort to identify gaps in program delivery.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.



**GOAL 2**

To engage and involve youth-focused groups/organizations, under-served, and/or under-represented in all aspects of monarch butterfly and pollinator education and conservation. Establish the Missourians for Monarchs as a leader and source for information about monarch butterflies and pollinator conservation in Missouri.

**OBJECTIVE A**

Develop outreach and educational components that may be used or easily adopted by existing groups, with an emphasis on youth, under-served, and/or under-represented persons.

**STRATEGY 1  
(OG2-OA-S1)**

Outline desirable concepts to be included as part of efforts to reach youth, under-served, and/or under-represented persons, and begin assembling components or tracts from existing sources, or develop new elements as needed. Emphasis will be on learning and activities that enhance understanding and direct participation in monarch conservation.

**ACTIONS**

OG2-OA-S1-A	Engage target groups (e.g., 4-H, National FFA Organization, Boys & Girls Clubs, scouts, church groups, schools, teacher organizations, Department of Elementary and Secondary Education, STEM education supporters).
OG2-OA-S1-B	Develop a basic how-to guide for teaching and engaging youth; provide information on existing educational programs and materials.
OG2-OA-S1-C	Develop and propose a curriculum to include more about monarchs with messaging different between rural and urban communities to make it more relatable.
OG2-OA-S1-D	Engage groups with existing related programs for partnering opportunities, or high potential for engagement.
OG2-OA-S1-E	Use schools already interfacing monarch conservation with the STEM approach as a model for other schools to broaden interests. Have students present what they have learned in various forums. Encourage more inter-school communication. (Possible organization targets include: DESE, 4-H, FFA, Boy/Girl Scouts)
OG2-OA-S1-F	Promote human dimension connection to monarchs through music, food, art, health, etc. Have a field day every year to have kids learn about pollinator habitats with public schools in priority monarch areas "Missouri Day with Monarchs Habitat" get kids involved with the work for pollinator habitat.
OG2-OA-S1-G	Develop whole family programs for better engagement and inclusion especially in urban centers and for underserved communities, use technology like HabiTally and iNaturalist.
OG2-OA-S1-H	Determine best method(s) for how to deliver/disseminate information to target audiences.

GOAL 3	To engage and involve Missouri cities and communities in all aspects of monarch butterfly and pollinator education and conservation.
OBJECTIVE A	Increase the awareness of Missouri city and community leaders about monarch and pollinator issues and seek their support and action to aid in the conservation of these species.
STRATEGY 1 (OG3-OA-S1)	Provide cities and communities with basic information about monarch and pollinator habitat needs and the opportunities for conserving and enhancing habitat. Engage local citizens to lead discussions about the potential for community efforts.
ACTIONS	
OG3-OA-S1-A	Determine availability of existing information addressing city/community monarch habitat needs and enhancement, and whether material may be used by Missourians for Monarchs.
OG3-OA-S1-B	Determine methods to develop additional informational materials if lacking.
OG3-OA-S1-C	Ensure that community ordinances or policies are monarch and pollinator-friendly; engage community-volunteers in this process.
OG3-OA-S1-D	Actively promote NWFs, <i>Mayors' Monarch Pledge</i> program among Missouri communities.
OBJECTIVE B	Actively promote, support, and engage the Monarch and Pollinators Network – Naturalists and Gardeners and Regional Coordinators; Master Naturalists, Master Gardeners, and Federated Garden Clubs in their work toward enhancing monarch habitat.
STRATEGY 1 (OG3-OB-S1)	Enable the Monarch and Pollinators Network – Naturalists and Gardeners to promote the creation, maintenance, and expansion of monarch/pollinator habitat in the most effective manner relevant to the overall state habitat goals.

ACTIONS

OG3-OB-S1-A

Develop and implement methods of communication to enable coordination of habitat work with the work of partners to achieve connectivity to monarch habitat corridors throughout the State.

# SECTION 3.4

## SCIENCE AND RESEARCH



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Efforts to aid in monarch and pollinator conservation will require detailing progress in a manner that can be managed by all participants and dove-tails with regional and national initiatives. A significant challenge will be in determining realistic methods for quantifying effort and accomplishments that have enough scientific rigor to be credible. Designing protocol, methods of data collection,

and database management will likely need the work and investment of multiple professional entities following a structured decision-making framework. Moreover, a major opportunity exists for the Collaborative to help bring together state and regional researchers to discuss Missouri’s role in addressing applied scientific needs, and potentially engaging several public and private research facilities to those ends.

GOAL 1	To ensure the work of the Missourians for Monarchs Collaborative is scientifically and biologically sound relative to monarch and pollinator conservation.
OBJECTIVE B*	Identify Missouri-specific research needs and, when feasible, collaborate on regional or national research projects.
STRATEGY 1 (SG1-OA-S1)	Engage leading science experts to discuss the current status of monarch science and research and consider jointly identifying priority research needs and collaboration as needed.

\* Objectives appearing out of order are due to some Objectives being accomplished, as well as being relocated to 3.1 Habitat, Conservation, Enhancement and Restoration. [Click Here](#) to view accomplished Objectives for this Goal.

ACTIONS	
SG1-OB-S1-A	Convene a monarch and pollinator science workshop/roundtable discussion.
SG1-OB-S1-B	Collaborate regionally when discussing priority research needs, BMPs for mowing, roadside mortality, neonic research continued, etc.

## SECTION 3.5

# GOVERNANCE, CAPACITY AND FUNDING



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Successfully assembling a broad coalition of interests under a single purpose is a formidable task that cannot be achieved without some level of structure and collective oversight. While allowing partners to be flexible in their individual efforts and engagement with the Collaborative, formal

participation and commitments will be necessary and will strengthen the Collaborative. Moreover, a basic level of staffing support and funding is essential to carry out our mission as agencies, partners and volunteerism all have inherent limitations.

### GOAL 1

To create leadership, momentum, structure, and funding adequate to sustain the work of the Missourians for Monarchs Collaborative into the future.

### OBJECTIVE C\*

Maintain the governing Steering Committee to oversee the work of the Collaborative, Communications Coordinator, and associated efforts.

\* Objectives appearing out of order are due to some Objectives being accomplished. [Click Here](#) to view accomplished Objectives for this Goal.

### STRATEGY 2\* (GG1-OC-S1)

Refine and implement supporting procedures governing formal Collaborative member/partner organization participation and the role and function of the Steering Committee.

### ACTIONS

- |             |   |
|-------------|---|
| GG1-OC-S2-A | Consider methods for adding and removing members of the steering committee as needed. |
| GG1-OC-S2-B | Determine which external organizations/initiatives the Collaborative should join.     |



ACTIONS (CONTINUED)

- GG1-OC-S2-C

Place emphasis on attracting new partners to the collaborative and consider those partners for seats on the steering committee as opportunities arise.
- GG1-OC-S2-D

Create or dissolve advisory working groups as needed.

\* Strategies appearing out of order are due to some Strategies being accomplished. [Click Here](#) to view accomplished Strategies for this Objective.

OBJECTIVE D

Secure necessary funds for operational and programmatic needs.

STRATEGY 1  
(GG1-OD-S1)

Develop a basic funding plan for staffing and related support needs.

ACTIONS

- GG1-OD-S1-A

Identify and prioritize potential funding sources.
- GG1-OD-S1-C\*

Work with Steering Committee and Collaborative partners to provide consistent funding (i.e., private, state, and federal) for habitat initiatives in the focus area that covers Missouri.
- GG1-OD-S1-D

Explore the establishment of a Foundation and a 501(c)(3).
- GG1-OD-S1-E

Explore if proceeds from a monarch license plate could be used as a revenue stream.
- GG1-OD-S1-F

Apprise M4M of Private Donors with an interest in pollinators and monarchs keep an eye on high level contributions to conservation Work towards Endowments.

\* Actions appearing out of order are due to some Actions being accomplished. [Click Here](#) to view accomplished Actions for this Strategy.

OBJECTIVE E

Ensure funding and structure exists for the Monarch and Pollinator Coordinator position.

STRATEGY 1 (GG1-OE-S1)	Identify and acquire funding sources, as needed, for the Monarch and Pollinator Coordinator position.	
	ACTIONS	
	GG1-OE-S1-A	Continue to seek partners for Monarch and Pollinator Coordinator salary and funding sources (short-term and long-term) that will help the collaborative achieve its goals and vision.
GG1-OE-S1-B	Refine, update and implement any necessary Memorandums of Understanding (MOUs) between partners to facilitate funding, hiring, supervision and support.	
STRATEGY 2 (GG1-OE-S2)	Annually identify and outline position structure for the Monarch and Pollinator Coordinator position.	
	ACTIONS	
	GG1-OE-S2-A	Determine related support possibilities for Monarch and Pollinator Coordinator.
GG1-OE-S2-B	Develop a, prioritized 6 to 12-month work plan that considers goals and objectives of the next five year for the Monarch and Pollinator Coordinator position.	
OBJECTIVE F	Ensure funding and structure exists for the Communications Coordinator position.	
STRATEGY 1 (GG1-OF-S1)	Identify and acquire funding sources, as needed, for the Communications Coordinator position.	
	ACTIONS	
	GG1-OF-S1-A	Continue to seek partners for Communications Coordinator salary and funding sources (short-term and long-term) that will help the collaborative achieve its goals and vision.

ACTIONS (CONTINUED)

GG1-OF-S1-B	Refine, update and implement any necessary Memorandums of Understanding (MOUs) between partners to facilitate funding, hiring, supervision and support.
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STRATEGY 2 (GG1-OF-S2)	Annually, identify and outline position structure for the Communications Coordinator position.
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ACTIONS (CONTINUED)

GG1-OF-S2-A	Determine related support possibilities for Communications Coordinator.
GG1-OF-S2-B	Develop a prioritized 6 to 12-month work plan that considers goals and objectives of the next five years.

## SECTION 4

# ACCOMPLISHMENTS



### 4.1

## HABITAT CONSERVATION, RESTORATION AND ENHANCEMENT

### ACCOMPLISHMENTS

<b>HG1-OA-S2-A</b>	Collaborate on the development of best management practices (BMPs).
<b>HG1-OA-S4-A</b>	Develop, adopt, and promote awareness and use of best management practices.
<b>HG1-OA-S5-A</b>	Collaborate on the development of best management practices (BMPs) that are suitable for a wide variety of agricultural lands.
<b>HG1-OA-S6-A</b>	Develop a system so partners can easily direct citizens interested in creating habitat to the proper experts, whether a backyard landscape or field planting.
<b>HG1-OA-S6-C</b>	Develop an interactive “Who is My Contact” page for the Missourians for Monarchs website and ask partners to provide that link through their media efforts.
<b>HG1-OA-S6-D</b>	Develop and periodically update best management practices/prescribed practices for habitat conservation; provide easy on-line access.
<b>HG1-OA-S8-A</b>	Maintain and regularly update the list of suppliers handling native, regionally appropriate milkweed plants and seeds.
<b>HG1-OB-S1-A</b>	Define general data needs and requirements (e.g., what do we need to measure and how do we gather data?).
<b>HG1-OB-S1-C</b>	Determine methods for counting residential and other small-scale plantings toward state habitat objective.
<b>HG1-OB-S1-D</b>	Coordinate data collection.
<b>HG1-OB-S1-E</b>	Collaborate regionally when developing/implementing data collection protocols.

4.2

COLLABORATION AND PARTNERSHIPS

ACCOMPLISHMENTS

CG1-OB-S1-A	Develop a Memorandum of Understanding for the Collaborative partner organizations with periodic addendums to address operational commitments.
CG1-OB-S1-B	Convene an annual meeting of leaders of Collaborative organizations for the purpose of setting priorities, accomplishment reporting, and commitment of resources.
CG1-OC-S1-B	Create an agriculture-focused work group.
CG1-OC-S1-D	Initiate collaboration in the development of best management practices for monarchs in agricultural settings.
CG2-OA-S1-C	Provide a volunteer portal as part of the Missourians for Monarchs website.



## 4.3

## OUTREACH AND EDUCATION

## ACCOMPLISHMENTS

<b>GOAL 1 OBJECTIVE A</b>	Officially, launch the Missourians for Monarchs Collaborative.
<b>STRATEGY 1</b>	Take formal steps to elevate the profile of Missourians for Monarchs statewide using media and partner communications outlets.
<b>OG1-OA-S1-A</b>	Ensure commitment by partners and agreement to use their name and logos as collaborators as part of Missourians for Monarchs communications.
<b>OG1-OA-S1-B</b>	Determine a suitable date/event for formal announcement of the Collaborative; engage appropriate leaders.
<b>OG1-OA-S1-C</b>	Develop basic media package with news release for traditional outlets.
<b>OG1-OA-S1-D</b>	Post news on website and appropriate social media.
<b>STRATEGY 2</b>	Design, develop and rollout an official Missourians for Monarchs website in concert with or ahead of the Collaborative launch.
<b>OG1-OA-S2-A</b>	Form a small workgroup to 1) quickly determine logistics for creating and hosting, 2) basic design, 3) initial/critical content to be included as part of the website, and 4) oversee initial launch.
<b>OG1-OA-S2-B</b>	Determine website lead with decision-making authority.
<b>OG1-OA-S2-C</b>	Ask steering committee and collaborators about content preferences.
<b>OG1-OA-S2-D</b>	Review existing websites for ideas regarding design and content.
<b>OG1-OA-S2-E</b>	Develop a conceptual design of website layout.
<b>OG1-OA-S2-F</b>	Determine content development needs and methods of addressing; get permission for using outside links.
<b>OG1-OA-S2-G</b>	Determine protocol for website maintenance and tending.
<b>OG1-OC-S1-A</b>	Create a general factsheet and frequently asked questions (FAQs) on monarch status in Missouri and flyway for distribution to decision-makers, policy makers, and communities.
<b>OG1-OC-S1-G</b>	Secure standard event displays that can be stored regionally and checked out by partners.
<b>OG1-OC-S1-H</b>	Establish an integrated social media presence for maximizing messages, branding, and reaching target audiences.

ACCOMPLISHMENTS (CONTINUED)	
OG1-OD-S1-A	Determine target audiences for training and associated needs.
OG1-OD-S1-B	Assess availability of existing, partner delivered training.
OG1-OD-S1-C	Identify gaps in training information and work to develop necessary components.
OG3-OB-S1-B	Create a toolkit to distribute to garden clubs, etc.

4.4

SCIENCE AND RESEARCH

ACCOMPLISHMENTS

GOAL 1 OBJECTIVE C	Annually collect and report statewide habitat accomplishment information from partners as measured against the annual and the 20-year objective.
STRATEGY 1	Create an easy and efficient method for partners to collect and self-report accomplishments in a timely manner.
SG1-OC-S1-A	Assemble relevant habitat accomplishments from partners and stakeholders.
SG1-OC-S1-B	Report and publicize habitat accomplishments to the general public and regional and national level monarch groups.

## 4.5

**GOVERNANCE, CAPACITY AND FUNDING****ACCOMPLISHMENTS**

<b>GOAL 1 OBJECTIVE A</b>	Hire a full-time Missourians for Monarchs Collaborative Coordinator.
<b>STRATEGY 1</b>	Identify the means and methods for hiring a program coordinator who can work across organizations and jurisdictions to lead, implement, and otherwise facilitate achievement of the goals and objectives described in this plan.
<b>GG1-OA-S1-A</b>	Determine and develop necessary qualifications and job description acceptable to the steering committee.
<b>GG1-OA-S1-B</b>	Determine salary and initial funding sources (short-term and long-term).
<b>GG1-OA-S1-C</b>	Determine domicile and related support possibilities.
<b>GG1-OA-S1-D</b>	Develop and implement any necessary Memorandums of Understanding (MOUs) between partners to facilitate funding, hiring, supervision and support.
<b>GG1-OA-S1-E</b>	Develop an initial, prioritized 6 to 12-month work plan.
<b>GOAL 1 OBJECTIVE B</b>	Hire a full-time, term Communications Specialist (Communications Coordinator).
<b>STRATEGY 1</b>	Identify the means and methods for hiring a Communications Specialist that can work to lead, implement, and otherwise achieve the communications/outreach objectives described in this plan.
<b>GG1-OB-S1-A</b>	Determine and develop necessary qualifications and job description acceptable to the steering committee.
<b>GG1-OB-S1-B</b>	Determine salary and initial funding sources (short-term and long-term).
<b>GG1-OB-S1-C</b>	Determine domicile and related support possibilities.
<b>GG1-OB-S1-D</b>	Develop and implement any necessary Memorandums of Understanding (MOUs) between partners to facilitate funding, hiring, supervision and support.
<b>GG1-OB-S1-E</b>	Develop an initial, prioritized 6 to 12-month work plan.

ACCOMPLISHMENTS	
GOAL 1 OBJECTIVE C	Establish and formalize the governing Steering Committee to oversee the work of the Collaborative, Communications Specialist, and associated efforts.
STRATEGY 1	Develop and implement supporting procedures governing formal Collaborative partner organization participation and the role and function of the Steering Committee
GG1-OC-S1-A	The Steering Committee will develop and adopt rules and procedures for determining membership and decision-making.
GG1-OC-S1-B	Determine evaluation metrics.
GG1-OC-S1-C	Develop methods for including or removing collaborator organizations.
GOAL 1 OBJECTIVE D	Secure necessary funds to support operational and programmatic needs.
GG1-OD-S1-B	Establish methods to solicit or receive supporting donations.



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## APPENDIX A: COLLABORATIVE MEMBER ORGANIZATIONS

1	Ameren Missouri
2	Associated Electric Cooperative Inc.
3	Bayer, Inc.
4	Burroughs Audubon of Greater Kansas City
5	City of Branson
6	City of Columbia
7	Conservation Federation of Missouri
8	Deep Roots
9	Environmental Defense Fund
10	Evergy
11	Heartland Conservation Alliance
12	Kansas City Zoo
13	MFA Incorporated
14	Missouri Botanical Garden
15	Missouri Cattlemen's Association
16	Missouri Conservation Heritage Foundation
17	Missouri Corn Merchandising Council
18	Missouri Department of Agriculture
19	Missouri Department of Conservation
20	Missouri Department of Natural Resources
21	Missouri Department of Transportation
22	Missouri Farm Bureau
23	Missouri Native Seed Association
24	Missouri Prairie Foundation
25	Missouri River Bird Observatory
26	Missouri Soybean Merchandising Council
27	Missouri State Beekeepers Association
28	Monarchs & Pollinators Network - Master Naturalists & Gardeners
29	National Wildlife Federation
30	Native Plants and More
31	Natural Resources Conservation Service
32	Quail Forever and Pheasants Forever, Inc.
33	Saint Louis Audubon Society
34	Saint Louis County Parks
35	Saint Louis County Parks - Children's Garden Club
36	Saint Louis Zoo
37	U.S. Fish and Wildlife Service - Missouri Private Lands Office
38	University of Missouri - College of Agriculture, Food and Natural Resources
39	University of Missouri - Cole County Extension
40	University of Missouri - Jackson County Extension
41	University of Missouri - Mizzou Botanic Garden
42	Vintage Homesteader

Press Release

## U.S. Fish and Wildlife Service Finds Endangered Species Act Listing for Monarch Butterfly Warranted but Precluded

December 15, 2020

### Contact(s):

Georgia Parham, [Georgia\\_Parham@fws.gov](mailto:Georgia_Parham@fws.gov), 812-593-8501

After a thorough assessment of the monarch butterfly's status, the U.S. Fish and Wildlife Service (Service) has found that adding the monarch butterfly to the list of threatened and endangered species is warranted but precluded by work on higher-priority listing actions. With this decision, the monarch becomes a candidate for listing under the Endangered Species Act (ESA), and its status will be reviewed each year until it is no longer a candidate.

"We conducted an intensive, thorough review using a rigorous, transparent science-based process and found that the monarch meets listing criteria under the Endangered Species Act. However, before we can propose listing, we must focus resources on our higher-priority listing actions," said U.S. Fish and Wildlife Service Director Aurelia Skipwith. "While this work goes on, we are committed to our ongoing efforts with partners to conserve the monarch and its habitat at the local, regional and national levels. Our conservation goal is to improve monarch populations, and we encourage everyone to join the effort."

"The Monarch Joint Venture is committed to continuing its conservation efforts for monarchs. Each of our partners, and many other stakeholders, come to the monarch conservation table with different approaches, audiences, strengths and opportunities to make a difference. There is a role for everyone in monarch conservation," stated Wendy Caldwell, Executive Director, Monarch Joint Venture.

Over the past 20 years, scientists have noted declines in North American monarchs overwintering in Mexico and California, where these butterflies cluster. Numbers in the larger eastern population are measured by the size of the area they occupy. At a density of roughly 8.5 million monarchs per acre, it is estimated that the eastern population fell from about 384 million in 1996 to a low of 14 million in 2013. The population in 2019 was about 60 million. The western population, located in California, saw a more precipitous decline, from about 1.2 million in 1997 to fewer than 30,000 in 2019.

In 2014, the Service received a petition to list the species and published a substantial 90-day finding in December 2014. In 2016, the agency began an in-depth status assessment, looking at the global population as well as focusing on monarchs in North America, where 90% of the world's population occurs.

"The Association of Fish and Wildlife Agencies has been working side-by-side with the U.S. Fish and Wildlife Service on voluntary monarch butterfly conservation since 2014. We've made great strides, including raising awareness and restoring key habitat, but we still have a long way to go for a sustainable, long-term impact. Moving forward, we'll continue to be a close partner in our collaborative efforts to restore this iconic species," stated Sara Parker Pauley, Director of the Missouri Department of Conservation and President of the Association of Fish and Wildlife Agencies.

The Service used the best scientific information to evaluate threats to the monarch, including habitat loss, climate change and exposure to pesticides, and used a model to create millions of simulations



## APPENDIX B: USFWS LISTING DECISION FOR MONARCH BUTTERFLY

of future conditions to estimate the risk of extinction. The agency launched a monarch conservation database and gathered vast quantities of data on existing and future conservation efforts that benefit the monarch across the continent. The resulting assessment was then peer reviewed.

After a thorough review of the best available scientific and commercial information, the Service found that listing the monarch butterfly as an endangered or threatened species is warranted but precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants. Therefore, the Service is adding the monarch butterfly to the candidate list and assigning it a listing priority number of eight. This priority number indicates the magnitude of threats is moderate and those threats are imminent.

The ESA provides for a warranted-but-precluded finding when the Service does not have enough resources to complete the listing process because the agency must first focus on higher-priority listing rules. Warranted-but-precluded findings require subsequent review each year until the agency undertakes a proposal or makes a not-warranted finding.

[The Service prioritizes work on imperiled species through its National Listing Workplan.](#) Currently, listing actions for 161 species on the workplan (64%) are a higher priority than the monarch. These species include plants, insects, freshwater mussels, fish, birds and mammals. Obligations to meet court orders and settlements due to litigation can affect when the agency works on some species.

Robust conservation efforts are ongoing across the continent, including partnerships with states, tribes, Canada and Mexico, local communities and conservation organizations, to address threats to the monarch and to bolster milkweed abundance and other habitat needs.

“The Rights-of-Way as Habitat Working Group is focused on conserving monarchs and other pollinators through habitat conservation on energy and transportation lands throughout the United States,” said Iris Caldwell, program manager of the University of Illinois-Chicago’s Energy Resources Center. The center administers a historic 2020 agreement between the U.S. Fish and Wildlife Service and the University of Illinois-Chicago that encourages transportation and energy partners to participate in monarch conservation by conserving habitat on potentially millions of acres of rights-of-way and associated lands. “The Service’s decision underscores the important work we have ahead of us, particularly over the next couple of years. We will continue to encourage energy and transportation partners to join the agreement as we all come together to save the monarch,” continued Caldwell.

American Farm Bureau Federation President Zippy Duvall said, “America’s farmers welcome the U.S. Fish and Wildlife Service’s decision to continue monitoring the health of the monarch butterfly population. Preserving natural surroundings for America’s wildlife has long been a priority for America’s farmers and ranchers. More than 140 million privately-owned farm and ranch acres are enrolled in voluntary conservation programs, providing habitats for countless animals and insects, including the monarch. Farm Bureaus across the country have been involved with state and regional planning efforts for the monarch – joining forces with the energy and utility sectors, those who manage natural areas, and our urban hubs across the country - to meet ambitious goals for the species. The warranted but precluded decision will give all stakeholders time to continue conservation and research efforts.”

Adult monarch butterflies, easily recognized by their orange and black markings, feed on nectar from flowers. Monarchs lay their eggs exclusively on milkweed, the sole source of food for monarch caterpillars. Two long-distance migratory monarch populations occur in North America; the largest is east of the continental divide and overwinters in the mountains of central Mexico. Monarchs west of the continental divide overwinter primarily along coastal California. Monarchs also inhabit about 90 other countries, islands or island groups around the world, but these monarchs are believed to have originated from the North American population.

Monarchs are known for their phenomenal spring and fall migrations, traveling across the continent to and from wintering sites. In eastern North America, monarchs travel north in the spring, from Mexico

## APPENDIX B: USFWS LISTING DECISION FOR MONARCH BUTTERFLY

to Canada, over two to three successive generations, breeding along the way. Western monarchs continue to occupy and breed in warmer climates throughout the summer. The final generation in the fall makes the return trip to wintering sites in Mexico and coastal California. Unlike previous generations, which complete their life cycle in four weeks, these “super generation” monarchs live for six to eight months and may travel thousands of miles to return to wintering grounds. These monarchs then begin the multi-generational migration the following spring. Because monarchs travel long distances, it is critical to maintain reliable sources of nectar plants for them to feed on and ample milkweed on which to lay their eggs.

Because monarchs are solely dependent on milkweed during the caterpillar stage, efforts to boost the number of milkweed stems across the country are the basis for many monarch conservation plans.

More information about the Service’s finding on the monarch and tips on how to help conserve monarch butterflies are available here: <https://www.fws.gov/save-themonarch>.