

Missouri Monarch and Pollinator Conservation Plan

May 1, 2016 – April 30, 2019



Prepared by the Missourians for Monarchs Collaborative Steering Committee¹

Table of Contents

EXECUTIVE SUMMARY	2
INTRODUCTION	2
MISSION STATEMENT	4
VISION STATEMENT	4
BACKGROUND	5
I. HABITAT CONSERVATION, ENHANCEMENT, and RESTORATION	8
II. COLLABORATION AND PARTNERSHIPS	12
III. OUTREACH AND EDUCATION	14
IV. MONITORING and RESEARCH	18
V. CAPACITY, GOVERNANCE, and FUNDING	19
Acronyms and Planning Terms:	21
References and Sources	22
Acknowledgements.....	23
Endnotes	23

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. Missourians for Monarchsⁱⁱ transformed from a grassroots organization to the moniker assigned to an overall statewide initiative supported by a formal 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. 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 twenty-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 covering an initial three-year period from May 1, 2016 to April 30, 2019.

INTRODUCTION

Over the past two decades, monarch butterfly (*Danaus plexippus*) populations have declined significantly due to a variety of factors including habitat loss and lack of milkweed plants, the sole host plant used by the monarch during its egg and larval stages. Subsequently, the Presidents of the United States and Mexico, and the Prime Minister of Canada have called for cooperative action. This decline has also prompted several national groups to petition the U.S. Fish and Wildlife Service (USFWS) to protect monarch butterflies under the Endangered Species Act (ESA). 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*.

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 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 pollinatorsⁱⁱⁱ 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 milkweed^{iv} and nectar plant^v 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. Members of the steering committee include representatives from agriculture, business, education, not-for profit organizations, private landowners, and agencies with land management and conservation responsibilities. The Missourians for Monarchs Collaborative^{vi} is the direct result of summit deliberations and the subsequently formed steering committee.

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 the decline of the monarch butterfly and pollinators.



MISSION STATEMENT

Our mission is to engage Missourians to increase and sustain habitat for monarch butterflies and pollinators through citizen involvement, and to seek ways for partners, communities, and agencies to coordinate similar efforts.

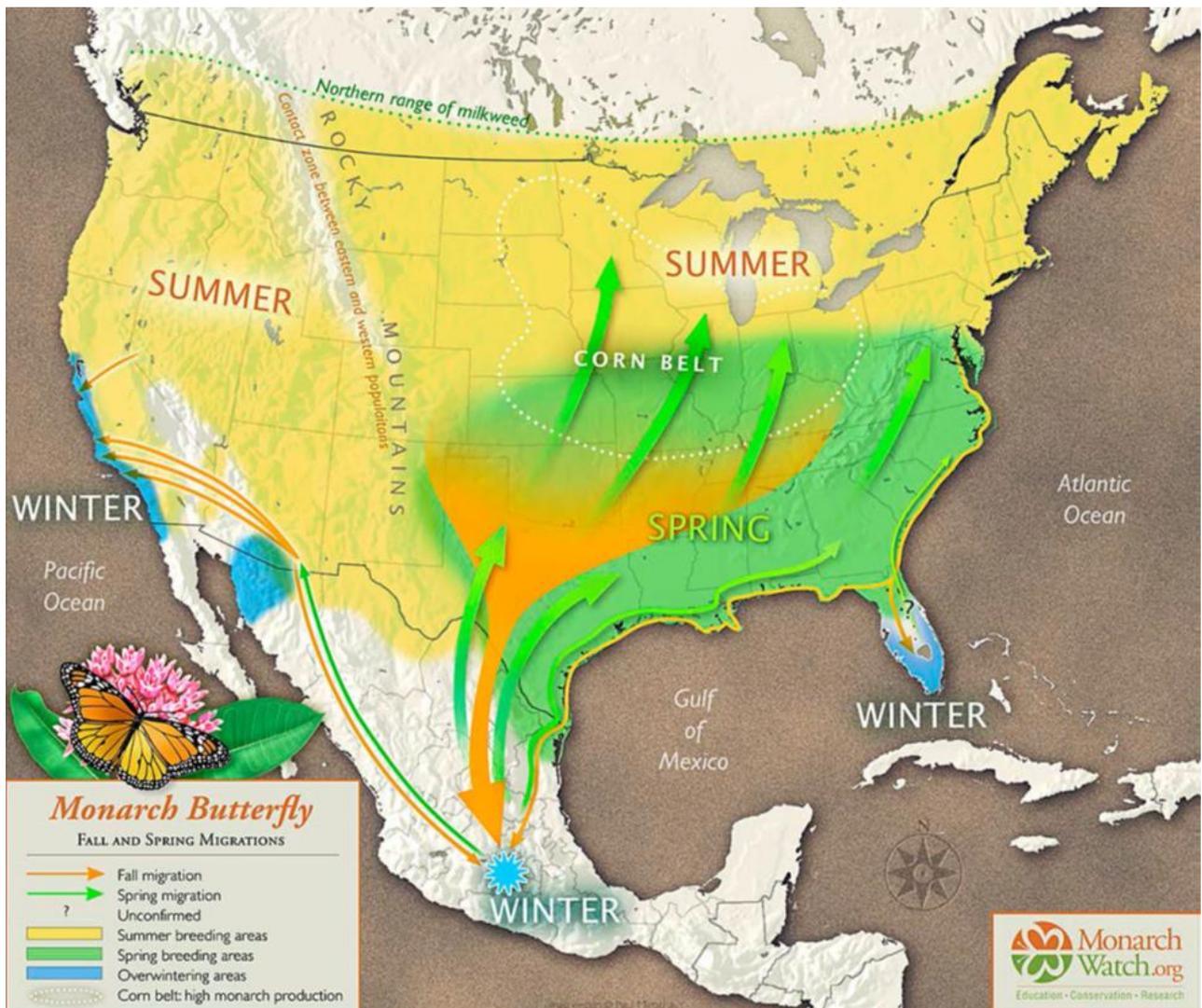
VISION STATEMENT

Our vision is that Missourians will learn to appreciate the importance and value of monarch butterflies and pollinators, and will work to conserve healthy habitats that support robust populations of these species statewide.



BACKGROUND

Missouri lies within the migratory flyway and spring breeding area of the monarch butterfly (*Danaus plexippus*), a species that has declined significantly over the last 20 years. Each fall, millions of monarch butterflies pass through Missouri as part of their spectacular journey to the high-elevation oyamel fir (*Abies religiosa*) forests in central Mexico where they overwinter. In the spring, usually early March, monarchs start returning north to their breeding areas, a range that includes Missouri, where female monarchs will lay their eggs on emerging milkweed plants. The subsequent offspring or first brood will then colonize the remainder of the breeding range in eastern North America. Depending on the length of the season, as dictated by weather, monarchs might produce two to four broods in Missouri. In the fall, the adults produced from the last hatch will then return to the oyamel fir forests, and in the spring, the cycle will start again.

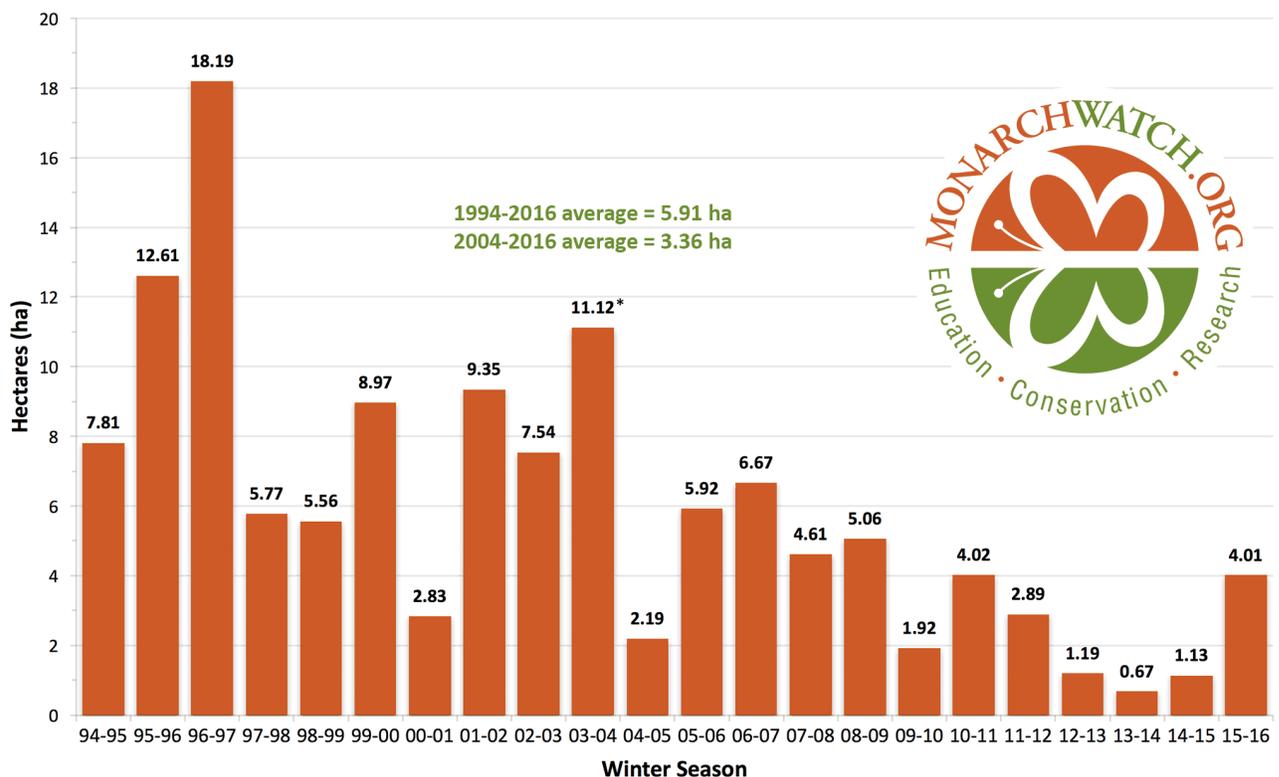


Source with permission for use: Monarch Watch.org (www.MonarchWatch.org)

In recent decades, many factors have challenged monarch populations including habitat loss in the United States, Canada and Mexico, recent droughts, climate change, and a significant decline in milkweed and nectar resources in breeding areas and migration paths that include Missouri. The decline in various species of native milkweed is particularly troublesome as they are essential for monarch survival (i.e., the only plants on which monarch butterflies lay eggs, and the only plants monarch caterpillars eat).

In North America, migratory monarchs have suffered because of habitat loss due to land use changes (commercial, residential, or agricultural development or conversion), and untimely mowing or pesticide applications that are not timed to monarch needs. Threats in Mexico include habitat degradation by logging, climate change, and harsh winter storms. This combination of threats has led to a downward trend in the monarch population, which is assessed by measuring the total area occupied by monarch colonies at their overwintering sites in Mexico. The trend since 1994-95 has been downward; data for 2015-16 show a modest increase.

Total Area Occupied by Monarch Colonies at Overwintering Sites in Mexico



Data for 1994-2003 collected by personnel of the Monarch Butterfly Biosphere Reserve (MBBR) of the National Commission of Natural Protected Areas (CONANP) in Mexico. Data for 2003-2014 collected by World Wildlife Fund Mexico in coordination with the Directorate of the MBBR.

* Represents colony sizes measured in November of 2003 before the colonies consolidated. Measures obtained in January 2004 indicated the population was much smaller, possibly 8-9 hectares. CT

Source with permission for use: Monarch Watch.org (www.MonarchWatch.org)

While the effects of climate change and related weather patterns may represent the greatest uncertainty to the future survival of monarchs, 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.

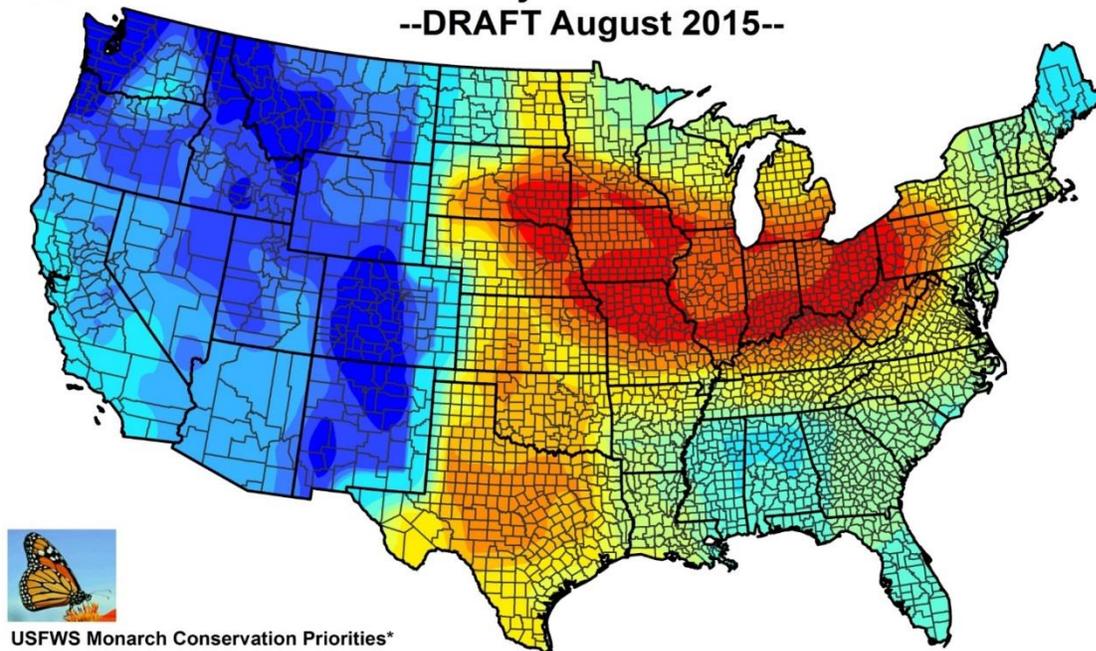
The urgency for taking action cannot be overstated. Currently, states have considerable leeway in determining action for improving habitat, limited mostly by available resources (i.e., money, seeds/plants) and the willingness of landowners and managers. If the monarch butterfly should be listed as a threatened species under the ESA, the environment for collaboration becomes more difficult, potentially polarizing, and inherently political. Therefore, it is in everyone’s best interest to work together in an effort to curtail any potential federal action. Currently, the USFWS is conducting a status review to determine whether the monarch should be listed.



U.S. Fish & Wildlife Service

USFWS Monarch Butterfly National Conservation Priorities

--DRAFT August 2015--



USFWS Monarch Conservation Priorities*



*This map is intended to inform U.S. Fish and Wildlife Service national-scale monarch butterfly conservation work. It was created using tools developed by the USGS-led Monarch Conservation Science Partnership, in this case highlighting priorities for maximizing overwintering population-level outcomes through a combination of focusing on geographic priorities, opportunity areas, and threats to be avoided. This is a DRAFT version and may be adapted or customized for different decisions and/or scales; updates will be ongoing, using the best available science.

A group of researchers under the Monarch Conservation Science Partnership developed a priority map to help indicate where monarch conservation efforts should be targeted to maximize success. A large portion of Missouri falls within the highest priority on this map. Source with permission for use: USFWS

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 USFWS has been petitioned to list one species, the rusty-patched bumblebee (*Bombus affinis*) 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^{vii} 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 honeybees and native bees. Honey production alone is valued at around \$2 million from the 14,000 plus registered colonies. 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, pesticide exposure, pathogens, and various pests.

The Missouri Monarchs Collaborative is Missouri's response to the challenges ahead. 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.

This plan will be monitored and annually reviewed and refreshed as needed to keep it relevant and up-to-date with the best available science and information.

I. HABITAT CONSERVATION, ENHANCEMENT, and RESTORATION

Monarchs have lost significant amounts of habitat mostly due to land use changes, development, and agricultural land management. Our biggest challenge is how to mitigate losses or completely restore habitat on lands that are almost completely in private hands and control. Further complicating the problem is the limited capacity to produce the seed, plants/plugs in needed quantities, a major restrictive factor that must be quickly addressed if public interest and momentum are to be successfully harnessed. Our intention is to work toward a Missouri 20-year habitat^{viii} objective of 385,000 acres (19,000 acres per year) of additional pollinator habitat with 200 milkweed stems/acre^{ix}. 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. It is our hope that achieving this habitat objective 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.

Through the Collaborative, we will 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.

GOAL I: 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. 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/Tasks:

- a. Assemble Missouri monarch and pollinator habitat and land use data; use USGS ARCGIS tool to help determine Missouri-specific target geographies.
- b. Identify existing habitat and priority geographies and corridors.
- c. Identify areas at risk for conversion of habitat to other land uses.

Strategy 2. 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/Tasks:

- a. Collaborate on the development and adoption of best management practices^x, and create demonstration sites featuring their use.
- b. Identify existing habitat for conservation.
- c. Identify areas to create or enhance habitat.
- d. Set acreage targets for habitat.
- e. Request partner participation in monitoring efforts.

Strategy 3. Private Land Management (Non-agricultural) – Engage communities and their residents in discussions about the role they can play in monarch and pollinator conservation. Help identify opportunities for voluntary habitat conservation and enhancement.

Actions/Tasks:

- a. *Develop, adopt, and promote awareness and use of best management practices.*
- b. *Work to identify and amend city/county ordinances and policies to ensure they are monarch and pollinator friendly.*
- c. *Advise communities/residents on how to identify existing habitat for conservation.*
- d. *Advise communities/residents on how to identify areas to create or enhance habitat.*
- e. *Advise owners of recreational lands on how to identify areas to create or enhance habitat.*
- f. *Request community participation in monitoring efforts.*

Strategy 4. 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/Tasks:

- a. *Collaborate on the development and adoption of best management practices that are suitable for a wide variety of agricultural lands.*
- b. *Identify existing agricultural systems that are compatible with monarch conservation; work to promote monarch habitat within these systems.*
- c. *Advise agricultural landowners and owners of recreational lands and hobby farms on ways to integrate monarch and pollinator conservation with land management practices.*
- d. *Identify existing habitat for conservation.*
- e. *Identify high potential areas for creating or enhancing habitat.*
- f. *Set acreage goals for voluntary habitat development.*
- g. *Request partner participation in monitoring efforts.*

Strategy 5. 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/Tasks:

- a. *Develop a referral system so partners can easily direct citizens interested in creating habitat to the proper experts, whether a backyard landscape or field planting.*
- b. *Develop and maintain a list of contractors approved/certified to properly install monarch and pollinator habitat (e.g., Grow Native, county contractor list).*

- c. *Develop an interactive “Who is My Contact” page for the Missourians for Monarchs webpage and ask partners to provide that link through their media efforts.*
- d. *Develop and periodically update best management practices/prescribed practices for habitat conservation; provide easy on-line access.*
- 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.*

Strategy 6. 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/Tasks:

- a. *Form a state, federal and NGO work team to examine existing cost-share/incentives and provide suggestions for additions, improvements, or new programs.*
- b. *Seek grant opportunities to fund additional incentives for monarch and pollinator plantings on private lands.*

Strategy 7. 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/Tasks:

- a. *Maintain and regularly update the list of suppliers handling native, regionally appropriate milkweed plants and seeds.*
- b. *Collaborate with native seed and plant dealers to collect seed, grow, and sell locally sourced and/or regionally appropriate milkweed species.*
- 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.*
- d. *Encourage seed collection (with permission) on public and private land to increase Missouri genetic source seed supply.*
- 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.*
- 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.*

- g. Develop a volunteer force to assist with seed collection, propagation, and distribution (e.g., 4-H, Future Farmers of America (FFA), libraries).*

II. COLLABORATION AND PARTNERSHIPS

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, a key 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 I – 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. 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/Tasks:

- a. Identify and target major partner events for presence and/or delivery of the Missourians for Monarchs message.*

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

Actions/Tasks:

- a. Develop a Memorandum of Understanding for the Collaborative partner organizations with periodic addendums to address operational commitments.*
- b. Convene an annual meeting of leaders of Collaborative organizations for the purpose of setting priorities, accomplishment reporting, and commitment of resources.*
- c. Coordinate development of a step-down acreage goal for major landholders in the state.*

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

Actions/Tasks:

- a. Identify critical agricultural stakeholder groups.*
- b. Create an agriculture-focused work group.*
- c. Take the lead in convening an agriculture specific monarch and pollinators summit for the purpose of information sharing and strategy development.*
- d. Initiate collaboration in the development of best management practices for monarchs in agricultural settings.*

GOAL II – To develop, support and inspire a network of citizen-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. 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/Tasks:

- a. *Identify local/regional organizations that might form independent volunteer teams/crews (e.g., business clubs, church groups, school districts and universities/colleges).*
- b. *Identify groups and organizations whose members may be receptive to individual volunteer action.*
- c. *Provide a volunteer portal as part of the Missourians for Monarchs website.*
- d. *Create and/or provide information and tools necessary for self-guided action.*
- 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.*

III. 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 I – To establish the Missourians for Monarchs as a leader and clearinghouse for information about monarch butterflies and pollinator conservation in Missouri.

Objective A: Officially, launch the Missourians for Monarchs Collaborative.

Strategy 1. Take formal steps to elevate the profile of Missourians for Monarchs statewide using media and partner communications outlets.

Actions/Tasks:

- a. *Ensure commitment by partners and agreement to use their name and logos as collaborators as part of Missouriians for Monarchs communications.*
- b. *Determine a suitable date/event for formal announcement of the Collaborative; engage appropriate leaders.*
- c. *Develop basic media package with news release for traditional outlets.*
- d. *Post news on website and appropriate social media.*

Strategy 2. Design, develop and rollout an official Missouriians for Monarchs website in concert with or ahead of the Collaborative launch.

Actions/Tasks:

- a. *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. *Determine website lead with decision-making authority.*
- c. *Ask steering committee and collaborators about content preferences.*
- d. *Review existing websites for ideas regarding design and content.*
- e. *Develop a conceptual design of website layout.*
- f. *Determine content development needs and methods of addressing; get permission for using outside links.*
- g. *Determine protocol for website maintenance and tending.*

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

Strategy 1. Establish a marketing work group for the purpose of developing and implementing a marketing campaign targeting the general public.

Actions/Tasks:

- a. *Develop primary messages for the campaign.*
- b. *Determine and develop appropriate campaign materials.*
- c. *Determine methods of delivery and documenting effort.*
- d. *Determine budget and methods of funding.*
- e. *Designate Missouriians for Monarchs spokespersons.*
- f. *Determine timing and methods of campaign rollout.*
- g. *Develop a standard agreement for partners to access and use campaign materials.*

Strategy 2. Assess public and partner awareness and understanding of monarch and pollinator issues through general polling and/or representative surveys. Initiate a baseline survey with planned follow-up surveys.

Actions/Tasks:

- 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.*

Objective C: Promote the mission and work of the Missourians for Monarchs through strategic integration of traditional and non-traditional methods of media and marketing.

Strategy 1. 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.

Actions/Tasks:

- a. *Create a general fact-sheet and frequently asked questions (FAQs) on monarch status in Missouri and flyway for distribution to decision-makers, policy-makers, and communities.*
- b. *Identify gaps in monarch/pollinator educational materials and solicit support in the creation of appropriate tools to satisfy the need.*
- c. *Seek preparation of publication-ready news articles for popular traditional and non-traditional media and partner outlets.*
- d. *Regularly publish an online, subscriber-based Missourians for Monarchs newsletter.*
- e. *Ensure critical materials are translated (i.e., Spanish-speaking target audience).*
- f. *Identify high profile events (e.g., state or county fairs) for message delivery.*
- g. *Secure standard event displays that can be stored regionally and checked out by partners.*
- h. *Establish an integrated social media presence for maximizing messages, branding, and reaching target audiences.*

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.

Actions/Tasks:

- a. *Determine target audiences for training and associated needs.*
- b. *Assess availability of existing, partner delivered training.*
- c. *Identify gaps in training information and work to develop necessary components.*

- d. *Ensure that 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).*

GOAL II - To engage and involve youth-focused groups/organizations, minorities, and people with limited resources in all aspects of monarch butterfly and pollinator education and conservation.

Objective A: Develop outreach and educational components with an emphasis on youth, minorities, and people with limited resources that may be used or easily adopted by existing groups.

Strategy 1. Outline desirable concepts to be included as part of efforts to reach youth, minorities, and people with limited resources, 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/Tasks:

- a. *Identify target groups (e.g., 4-H, FFA, Boys & Girls Clubs, scouts, church groups, and schools, teacher organizations, Department of Elementary and Secondary Education, STEM education supporters).*
- b. *Develop a basic how-to guide for teaching and engaging youth; provide information on existing educational programs and materials.*
- c. *Identify groups with existing related programs for partnering opportunities, or high potential for engagement.*
- d. *Determine methods of delivery.*

GOAL III – To engage and involve Missouri cities and communities in all aspects of monarch butterfly and pollinator education and conservation.

Objectives A: Increase the awareness of Missouri city and community leaders about the monarch and pollinator issues, and seek their support and action to aid in the conservation of these species.

Strategy 1. 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/Tasks:

- a. *Determine availability of existing information addressing city/community monarch habitat needs and enhancement, and whether material may be used by Missourians for Monarchs.*
- b. *Determine methods to develop additional informational materials if lacking.*
- c. *Ensure that community ordinances or policies are monarch and pollinator-friendly; engage citizen-volunteers in this process.*
- d. *Actively promote the NWF, Mayor’s Monarch Pledge program among Missouri communities.*

Objective B: Actively promote, support, and engage the Missourians for Monarchs – Naturalists and Gardeners (Network) and Regional Coordinators; Master Naturalists, Master Gardeners, and Federated Garden Clubs in their work toward enhancing monarch habitat.

Strategy 1. Enable the Missourians for Monarchs – 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/Tasks:

- 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.*
- b. *Create a media toolkit to distribute to garden clubs, etc.*

IV. MONITORING and RESEARCH

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 I – To ensure the work of the Missourians for Monarchs Collaborative is scientifically and biologically sound relative to monarch and pollinator conservation.

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

Strategy 1. 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 citizen science.

Actions/Tasks:

- a. *Define general data needs and requirements (e.g., what do we need to measure and how do we gather data?).*
- b. *Determine methods for gathering citizen-collected data.*
- c. *Determine methods for counting residential and other small-scale plantings toward state habitat objective.*
- d. *Coordinate data collection.*
- e. *Collaborate regionally when developing/implementing data collection protocols.*

Objective B: Identify Missouri-specific research needs and, when feasible, collaborate on regional or national research projects.

Strategy 1. 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.

Actions/Tasks:

- a. *Convene a monarch and pollinator science workshop/roundtable discussion.*
- b. *Collaborate regionally when discussing priority research needs.*

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.

Actions/Tasks:

- a. *Assemble relevant habitat accomplishments from partners and stakeholders.*
- b. *Report and publicize habitat accomplishments to the general public and regional and national level monarch groups.*

V. CAPACITY, GOVERNANCE, and FUNDING

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

Objective A: Hire a full-time Missourians for Monarchs Collaborative coordinator.

Strategy 1. Identify the means and methods for hiring a program coordinator that can work across organizations and jurisdictions to lead, implement, and otherwise facilitate achievement of the goals and objectives described in this plan.

Actions/Tasks:

- a. *Determine and develop necessary qualifications and job description acceptable to the steering committee.*
- b. *Determine salary and initial funding sources (short-term and long-term).*
- c. *Determine domicile and related support possibilities.*
- d. *Develop and implement any necessary Memorandums of Understanding (MOUs) between partners to facilitate funding, hiring, supervision and support.*
- e. *Develop an initial, prioritized 6 to 12-month work plan.*

Objective B: Hire a full-time, term Communications Specialist.

Strategy 1. 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.

Actions/Tasks:

- a. *Determine and develop necessary qualifications and job description acceptable to the steering committee.*
- b. *Determine salary and initial funding sources (short-term and long-term).*
- c. *Determine domicile and related support possibilities.*
- d. *Develop and implement any necessary Memorandums of Understanding (MOUs) between partners to facilitate funding, hiring, supervision and support.*
- e. *Develop an initial, prioritized 6 to 12-month work plan.*

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 an MOU and supporting procedures governing formal Collaborative partner organization participation and the role and function of the Steering Committee.

Actions/Tasks:

- a. *The Steering Committee will develop and adopt rules and procedures for determining membership and decision-making.*
- b. *Determine evaluation metrics.*
- c. *Develop methods for including or removing collaborator organizations.*
- d. *Create or dissolve advisory working groups as needed.*
- e. *Determine which external organizations/initiatives the Collaborative should join.*

Objective D: Secure necessary funds to support operational and programmatic needs.

Strategy 1. Develop a basic funding plan for staffing and related support needs.

Actions/Tasks:

- a. *Identify and prioritize potential funding sources.*
- b. *Establish methods to solicit or receive supporting donations (e.g., create formal partnership with an existing 501(c)(3) non-profit).*
- 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.*

Acronyms and Planning Terms:

CAFNR – College of Agriculture, Forestry, and Natural Resources, University of Missouri.

CFM – Conservation Federation of Missouri

DNR – Missouri Department of Natural Resources

ESA – Endangered Species Act

FFA – Future Farmers of America

MDA – Missouri Department of Agriculture

MDC – Missouri Department of Conservation

MoDOT – Missouri Department of Transportation

MPF – Missouri Prairie Foundation

NGOs – Non-governmental organizations

NRCS – Natural Resource Conservation Service

NWF – National Wildlife Federation

QF/PF – Quail Forever/Pheasants Forever

STEM – Educational grouping encompassing science, technology, engineering, and math.

USFWS – U.S. Fish and Wildlife Service

This Plan identifies goals and objectives that will guide the Missourians for Monarchs over the next three 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:

Goals – *IN WHAT DIRECTION DO WE WANT TO HEAD - Generalized directional statements for an intended purpose (e.g., to improve, increase, maintain, decrease, provide, etc.); qualitative and usually not quantified.*

Objectives – *WHAT WILL WE ACCOMPLISH - Concise statements of what will be accomplished.*

Strategies – *HOW WILL WE ACCOMPLISH IT - Statement(s) of an approach to achieve an objective(s).*

Actions/Tasks – *HOW TO IMPLEMENT THE STRATEGY – Specific things that must be done.*

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Endnotes

ⁱ Subset of the Missourians for Monarchs Collaborative responsible for governance and setting strategic direction; also referred to as the steering committee.

ⁱⁱ Moniker given to the overall statewide initiative to address monarch and pollinator conservation in Missouri.

ⁱⁱⁱ 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).

^{iv} Native Missouri species include but is not limited to: Swamp (Marsh) Milkweed (*Asclepia incarnate*), Prairie (Sullivant's) Milkweed (*A. sullivantii*), Aquatic Milkweed (*A. perennis*), Common Milkweed (*A. syriaca*), Tall Green Milkweed (*A. viridis*), Butterfly Milkweed (*A. tuberosa*)

^v Nectar plant or nectar producing plants means native plants that produce blooms and nectar necessary as a food /nutrient source to resident and migrating monarchs, and native pollinators.

^{vi} A formal group representing agriculture, business, education, not-for profit organizations, private landowners and agencies with land management and conservation responsibilities; also referred to as the Collaborative.

^{vii} 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).

^{viii} 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.

^{ix} One stem of one milkweed plant; extrapolated number of stems per acre using a standard field method for counting.

^x Conservation or land management methods or techniques considered the most effective and/or practical; also sometimes referred to as BMPs.

Approved by Steering Committee 7/26/2016