



MONARCH JOINT VENTURE

2016 ANNUAL REPORT

Prepared by Wendy Caldwell, Program Coordinator

Partnering to conserve the monarch butterfly migration

TABLE OF CONTENTS

Contents

Introduction _____	1
Financial Summary _____	4
Summary of MJV Funded Projects _____	7
MJV Communications _____	12
Appendix 1: MJV Steering Committee and Partners _____	15
Appendix 2: MJV Partner Descriptions _____	16
Appendix 3: MJV Mission and Vision _____	33
References _____	35
Contact Information _____	35



Introduction

Recognizing the need for conservation action to protect the North American monarch and its tri-national migration, a number of organizations came together in 2008 to form the Monarch Joint Venture (MJV), a partnership-based organization focused on furthering monarch conservation across the continental United States, through a coordinated, collaborative effort.

Monarch Joint Venture priorities are threefold:

1. Monarch habitat conservation on public and private lands, including enhancement and improved management of milkweed and nectar resources and improved management of overwintering groves located along the California coastline.
2. Education and outreach to increase interest, awareness and engagement in monarch conservation efforts.
3. Research and monitoring to track monarch populations and habitats and to inform our conservation work.

PARTNERSHIP STRUCTURE

Partners

MJV partners include federal, state and local government agencies, private conservation groups, academic groups, business, and others; current partners are listed in Appendix 1. Each partner contributes knowledge of and experience with monarch conservation, research, monitoring, or outreach. Together, these partners are working to ensure that the monarch migratory phenomenon that is such a part of North American culture, scientific discovery, science education, and conservation attention is not lost for future generations. The partnership holds an annual meeting for all partners and potential stakeholders, typically in the fall. Smaller working committees meet throughout the year as needed, primarily by teleconference.

Staff

A full-time Program Coordinator manages MJV operations, including staff supervision, management of incoming and outgoing funds, grant writing and fundraising, organization and facilitation of partnership meetings, outreach and communication to partners and other stakeholders, and general maintenance and development of MJV resources and publications. In 2016, the MJV established a full-time Science Coordinator position to build and maintain a more robust science framework within the MJV. The Science Coordinator works closely with various science and research efforts currently underway, helps establish and prioritize research needs, and helps pair existing research or scientific knowledge with ongoing partner projects in an effort to maximize conservation efficiency and minimize duplication of efforts. The MJV established a third full-time position in 2016, a Communications Specialist. The Specialist works with the Program Coordinator to maintain a communications plan for the MJV and its partners, assists with implementing actions identified in the communications plan (updates, website content, new partner communication, etc.) and manages social media posting and follower interaction. Since 2015, MJV has partnered with the U.S. Fish and Wildlife Service and the 21st Century Conservation Corps of Minnesota and Iowa to hire a full-time AmeriCorps member. The current corps member supports MJV programming, education and outreach.

Steering Committee

Some partner organizations make up a smaller MJV steering committee, also listed in Appendix 1. This committee provides general oversight and guidance for the MJV, in accordance with the North

MONARCH JOINT VENTURE 2009-2016

American Monarch Conservation Plan (Commission for Environmental Cooperation 2008) and other national or continental monarch conservation initiatives. This committee meets quarterly, primarily by teleconference although other business items are conducted via email as needed.

FINANCIAL AND STRATEGIC HIGHLIGHTS

From 2009 to 2016 the MJV has engaged 54 partners and raised over 2.5 million dollars for program administration and science-based conservation projects. In addition, over \$550,000 were reported as in-kind support by partner organizations to carry out these projects. Our conservation actions are fully aligned with the goals, objectives, and target actions outlined in the North American Monarch Conservation Plan and 2017 Monarch Conservation Implementation Plan.

SCIENCE-BASED CONSERVATION APPROACH

MJV's science-based approach to monarch conservation builds on three focus areas: monarch habitat conservation, maintenance, and enhancement; education to enhance awareness of monarch conservation issues and opportunities; and research and monitoring to inform monarch conservation efforts.

Monarch Habitat Conservation, Maintenance and Enhancement

There is good evidence that the primary threat to monarchs in the U.S. is widespread loss of breeding habitat (Pleasants and Oberhauser 2013, Pleasants 2015, Pleasants 2016), which must include milkweed (*Asclepias* spp.), the only viable food source for monarch larvae. The MJV promotes monarch conservation activities throughout the U.S. but have prioritized the Upper Midwestern U.S. for breeding habitat restoration efforts. This region has historically produced a high percentage of the population that migrates to the overwintering grounds in Mexico each fall (Wassenar and Hobson 1998, Oberhauser et al. 2001). Additionally, the South Central region (Texas and Oklahoma) is a high priority region for MJV conservation efforts because it plays a significant role in supporting migration.

Our approach to mitigating breeding and migratory habitat loss in the U.S. is to connect and collaborate with partners and other parties willing to take action in creating or restoring habitat that includes both milkweeds and nectar resources. We are working with partners to better understand the native seed market, increase the availability of and demand for native seeds, and equip partners with management tools and guidelines for successful habitat restoration and enhancement. We have supported on-the-ground conservation efforts by working with our partners to install small and large-scale habitats with native prairie plants, produce and distribute locally-sourced milkweed plugs and seeds, install and maintain native seed production plots, develop an integrated pest management system for native milkweed seed production, and engage an extensive network of landowners and managers in habitat restoration in different landscapes.

In addition, we have prioritized habitat conservation in the western U.S., where much is unknown regarding the location of monarch breeding areas and migratory pathways. Current conservation strategies focus on identifying this habitat, and protecting overwintering sites in California.

Education to Enhance Awareness of Monarch Conservation Issues and Opportunities

The monarch migration is one of the most magnificent and intriguing of all natural phenomena. For this reason, we promote monarchs as a flagship species for pollinator conservation. Monarchs inspire people to participate in conservation by creating and restoring habitat to provide greater ecosystem services and benefit a wide variety of organisms.

Education is essential to successful conservation. MJV's science-based approach to monarch

MONARCH JOINT VENTURE 2009-2016

conservation allows us to target our education and outreach efforts to maximize impact. Our citizen science and conservation trainings in priority areas, including the central flyway and western sites, support a strong network of volunteers and other entities working to create and restore habitat for monarchs, help spread the pollinator conservation message, and collect data that inform ongoing conservation efforts.

Additionally, the MJV has produced a dynamic website and numerous outreach materials, like brochures and handouts, webinars, and presentations. Our website is a clearinghouse for monarch conservation information, pulling together the expertise and resources that our partners have to offer and ensuring that the resources and information are accessible to a variety of audiences. We and our partners also work to communicate this information to a wide variety of audiences through media interviews, articles, webinars, campaigns, and social media postings.

Research and Monitoring to Inform Monarch Conservation Efforts

Research and monitoring help us to understand monarch populations and habitat availability, which then inform how the MJV prioritizes areas of greatest conservation need. Monarch and butterfly citizen science volunteers, young and old, not only contribute to our understanding of monarch populations and habitat distribution, they inspire others to do the same. MJV partners have conducted numerous monarch conservation and citizen science training workshops in CA, TX, IA, MO, MN, NV, VT, TN, WI, NE, UT, NM, AZ, OK, KS and ID, with more planned for the upcoming breeding, migrating, and overwintering seasons.

In addition to citizen science monitoring, MJV partners engage in research and analyses to better understand disease in monarchs, impacts of non-native species, qualities of prime monarch habitat, milkweed propagation methods, and best land management practices for monarchs. The MJV and its partners are highly engaged in the Monarch Conservation Science Partnership, a consortium of scientists and conservation professionals from government, academia and NGOs. This group is working to understand threats to monarch populations at the landscape level, model population trends, and develop conservation tools. The MJV has been a leader in MCSP's development of an integrated monitoring framework for monarchs and their habitats throughout the U.S., with discussions about integrating this into a tri-national approach.

A GROWING PARTNERSHIP

When the MJV was initiated in December 2008, there were 10 partners. At the culmination of 2016, we have 54 partners, and numerous others have expressed interest in partnering with the MJV to promote monarch conservation in the U.S. Key monarch, pollinator, and prairie conservation organizations are involved in the MJV, providing a strong base for expansion of conservation efforts across the U.S. A summary of monarch conservation, education, and research activities that each of our partners have undertaken is included in Appendix 2.

In addition to fostering relationships and guiding efforts, we work to both provide and seek funding to implement priority conservation projects. MJV allocates funds each year to support partner conservation projects, and works with partners to seek resources from other entities where additional funds are needed to carry out a priority project.

By streamlining communications between our partners, establishing conservation actions and priorities, and making connections to reduce duplication and bring additional insight to partner work, the MJV is a leader in coordinating monarch conservation efforts in the U.S.

MONARCH JOINT VENTURE 2009-2016

Financial Summary

From 2009-2014 the U.S. Forest Service, International Programs was the primary federal agency sponsor of the MJV. These funds (totaling \$1.2 million from '09-'14) were used to support a program coordinator and assistant, general program operations, and partner monarch conservation or education projects. As of 2016, MJV's total income equals \$2,561,045. As prioritized and approved by the MJV steering committee, most funds were allocated for partner monarch conservation, education, or research projects.

Additional sponsors have contributed to the MJV beginning in fiscal year 2015. All MJV direct financial income (not including in-kind support) is reported in table 1.

MJV funded projects are summarized in Table 2. In total \$1,057,560 of MJV's program funds have been spent on monarch conservation projects from 2009-present, and additional funds have been allocated for projects currently underway.

TABLE 1. MJV INCOME SUMMARY

	FY 10	FY11	FY 12	FY13-14	FY15	FY16	FY17	Total
U.S. Forest Service	\$ 500,535	\$300,240	\$400,285		\$279,990		\$202,020	\$1,683,080
U.S. Fish and Wildlife Service	\$ 2,000	\$ 750				\$126,774	\$78,675	\$ 208,199
U.S. Geological Survey						\$50,006	\$20,000	\$ 70,006
Bureau of Land Management						\$50,000	\$75,000	\$ 125,000
Audubon/Toyota Together Green				\$ 10,000				\$ 10,000
Commission for Environmental Cooperation	\$ 20,300	\$ 6,400						\$ 26,700
Monarch Butterfly Fund		\$ 10,000		\$30,000	\$ 15,000		\$7500	\$ 62,500
New York Community Trust					\$110,000		\$105,000	\$ 215,000
Environmental Defense Fund						\$10,000		\$ 10,000
Donations				\$ 13,647	\$16,180	\$24,977	\$63,505	\$ 150,560

*FY2017 is currently underway, so final income subject to change with remainder of fiscal year.

MONARCH JOINT VENTURE 2009-2016

TABLE 2. MJV FUNDED PROJECTS		FY 09-FY10	FY11	FY12	FY13	FY14	FY15	FY16
	Income	\$522,835	\$317,390	\$400,285	\$10,460	\$43,187	\$421,180	\$261,757
	Carry-forward		\$778,360	\$1,046,791	\$767,362	\$561,889	\$474,828	\$650,765
Funds Expended	MJV Staff and Program							
	Staff Salary and Fringe	\$41,138	\$53,209	\$76,892	\$75,957	\$25,876	\$51,753	\$86,871
	Registration/Sponsorship	\$285	\$1,540	\$1,490	\$375	\$1,595	\$1,435	\$3153
	Printing & Shipping	\$410	\$2,593	\$5,393	\$8,166	\$12,542	\$4,572	\$11,074
	Website & Branding	\$90	\$2,093	\$247	\$10,340	\$6,417	\$445	\$1427
	Equipment & Supplies	\$1,302	\$537	\$320	\$619	\$976	\$2,341	\$368
	Travel (coordinator & other)	\$8,544	\$2,038	\$3,041	\$11,386	\$1,790	\$3,653	\$7604
	Staff and Program Subtotal	\$51,769	\$62,010	\$87,383	\$106,844	\$49,197	\$64,199	\$110,497
	Partner Projects							
	Cibolo Nature Center	\$1,796		\$1,366	\$2,800	\$28,738		\$5627
	Cincinnati Nature Center							\$3,000
	Iowa DNR			\$13,500	\$15,058	\$34,646	\$3,800	\$9,751
	Monarch Alert					\$1,759	\$1,482	
	UMN Monarch Lab	\$590	\$2,026	\$37,674	-\$599	\$114,199		\$55,634
	Monarch Watch		\$6,739	\$11,628	\$26,177	\$99,525		\$4352
	NABA				\$4,550	\$6,252		
	Pollinator Partnership			\$5,284	\$14,590	\$32,426		\$3,500
	Superior Watershed Partnership						\$6,354	\$3047
	Tallgrass Prairie Center					\$5,493		\$52,056
	Univ. of Georgia	\$3,200	\$12,465	\$4,679		\$4,004	\$4,050	\$5195
	Monarch Net (UMD)		\$15,014	\$26,978				
	USGS Milkweed Surveying						\$3,118	\$22,123
	Wild Ones			\$2,500		\$21,000		\$10,000
	Xerces Society		\$24,041	\$80,151	\$60,759	\$73,354		\$70,108
	Partner Projects Subtotal	\$5,586	\$60,286	\$183,760	\$123,335	\$421,396	\$18,804	\$244,393
	Indirect costs (8-17.5%)	\$4,509	\$9,558	\$18,746	\$18,482	\$37,648	\$2,818	\$41,472
	Total funds expended	\$61,865	\$131,854	\$289,889	\$248,660	\$508,241	\$85,820	\$396,362
	Balance	\$460,970	\$646,506	\$756,902	\$518,702	\$53,648	\$389,008	\$254,403

Summary of MJV Funded Projects

FUNDING PROCEDURE FOR PARTNER CONSERVATION PROJECTS

From 2009-2016 the MJV issued contract awards for 18 organizations to conduct monarch conservation, education, and research projects. We use the annually updated Monarch Conservation Implementation Plan to select priority actions for which we provide financial support to partners to conduct in the U.S.

MJV partners have engaged in many monarch conservation projects in addition to the projects listed here; those listed here are only those for which the MJV has directly provided funding. The amount in parentheses next to each partner name is the total MJV funding contracted to that partner for the particular project in a given year. Thus, the amounts listed do not represent the full amount spend on each project; the projects are not necessarily funded in full by the MJV, as partners use additional funds to support their work, or they may have received MJV funding for the work in previous years.

CURRENT YEAR ALLOCATIONS

Education and Outreach

Promoting Citizen Science Monitoring of Monarchs and Milkweed in Texas – Cibolo Nature Center (\$16,000): The Cibolo Nature Center (CNC) in the Texas Hill Country recruits and train new volunteers to participate in monarch citizen science programs, through two-day workshops. At each workshop, approximately 30 citizen scientists learn how to find and monitor monarchs as citizen scientists in the Monarch Larva Monitoring Project, the Monarch Watch tagging program, Journey North, Project Monarch Health, and the North American Butterfly Association. CNC volunteers also conduct workshops for Texas Master Naturalists and other entities across the state to encourage and inform their participation in monarch conservation. These workshops emphasize monarch biology, life cycle, habitat, behavior, milkweed cultivation, as well as both national and international threats to monarch survival. CNC has partnered with MJV to put on monarch monitoring workshops since 2011, and started their workshops in the early 2000s. CNC is also working to create milkweed habitat for monarchs, and has designated monarch larval monitoring areas that shelter milkweed throughout 100 acres of Boerne City Park, and acquired 62 acres of farmland sheltering over 300 milkweeds in a designated “Monarch Conservation Area.”

Western Monarch Conservation Workshops - Xerces Society (\$8,000): Training land managers, federal agency staff and citizen science monitors in key regions is essential to long term habitat restoration and conservation. Land manager workshops conducted by the Xerces Society educate landowners that manage monarch overwintering sites in California. The Xerces Society has also teamed up with other western monarch experts to organize and host workshops to train citizen scientists to monitor monarch overwintering sites. The workshops invigorate current citizen scientists, and engage new ones in monarch monitoring. Current Xerces efforts have been planned to educate federal agency staff working in natural areas in key breeding areas of the Western U.S. While there is a need to establish new monarch habitats, it is important to also ensure that existing monarch habitat is protected. In the breeding range of the smaller western monarch population, there is a significant amount of milkweed on federally managed lands. Targeting education efforts towards federal staff to effectively protect, restore, and monitor these habitats is a priority of the Xerces and MJV. Through partnerships with federal agencies and ongoing education efforts, we can work together to ensure that the management strategies employed on publicly owned lands are compatible with the survival and recovery of monarch populations.

Wild for Monarchs Campaign: Citizen Science and Backyard Pollinator Garden Kits – Wild Ones (\$5,000): Wild Ones has partnered with the MJV and Monarch Watch’s Bring Back the Monarchs program to endorse the use of locally-sourced, native milkweed and nectar plants in monarch habitat restoration efforts and to boost education and outreach efforts for monarchs. In addition, the Wild for Monarchs campaign is

MONARCH JOINT VENTURE 2009-2016

distributing educational resources and materials to their chapters throughout the nation. The **Wild for Monarchs campaign website** provides links to milkweed and monarch resources, as well as downloadable materials, such as a bookmark and brochure. A new addition in 2015 to the Wild for Monarchs Campaign is development of a program to promote monarch citizen science opportunities more broadly through the Wild Ones membership. The Wild for Monarchs campaign is also working to develop backyard pollinator garden kits suited for their chapters and members across the country. These locally adapted kits will help to engage local communities in monarch and pollinator conservation and will tie into existing efforts, including the Million Pollinator Garden Challenge and Mayors' Monarch Pledge.

Engaging Youth in Agricultural Communities as Leaders in Monarch Recovery - Sand County Foundation (\$10,000): The Sand County Foundation is engaging agricultural and utility industries to improve vegetation management for the benefit of monarchs as associated pollinator species. Their long-term goal is to stimulate voluntary, cost-effective habitat restoration by private land managers as an alternative to regulatory requirements. One strategy for reaching this goal is to build the capacity of students in high school agricultural education programs, such as FFA, to develop wildlife habitat on farms and utility facilities in Illinois, Minnesota, Nebraska, and Wisconsin. This effort will apply established milkweed propagation and citizen science methodologies to install and monitor habitat on cooperating private farms or energy facilities.

Southwest Monarch Monitoring Education Tour - Southwest Monarch Study (\$4,000): There are large data gaps in the knowledge of monarch absence/presence in portions of the western United States especially Utah, Nevada, New Mexico and the deserts of California. The Southwest Monarch Study (SWMS) has developed a successful model for tagging and monitoring monarch butterfly activity in the state. A recent recovery of a monarch tagged in Camp Verde near Flagstaff, Arizona in El Rosario, Michoacan, Mexico is reflective of the urgent need to better understand the western migration. This project will offer monarch education opportunities through week-long tours through Utah, New Mexico and the southeast deserts of California to expand monarch conservation and research. Cities that are a part of this tour will be offered a two to three hour workshop on monarch conservation and monitoring. Training events to educate citizen scientists and government employees in monitoring protocols along the Colorado River in Arizona will be conducted to better understand monarch biology and ecology in this unique area.

Habitat Restoration and Enhancement

Milkweed to Monarchs Demonstration Garden - Cincinnati Nature Center (\$3,000): In 2014, the Center for Conservation and Stewardship at Cincinnati Nature Center launched its signature conservation initiative, "Milkweed to Monarchs." Since its inception, numerous educational programs on monarchs have been developed and delivered, millions of native milkweed seeds have been distributed locally, and the Nature Center has enhanced 60 acres of monarch/pollinator habitat on its land, with another 50 acres scheduled over the next two years. In 2015, the Nature Center actively restored a 10 acre abandoned agricultural field on their property to native grassland. Once mature, this habitat will be used for native seed collection, and an outdoor learning space for monarch conservation and monitoring workshops. These opportunities will teach visitors about seed collection, the importance of using native plants, citizen science monitoring, and more. In 2016, the Nature Center created a 10,000 square foot butterfly garden for the purpose of demonstrating monarch conservation and citizen science opportunities. The garden will be utilized as a demonstration site to teach techniques for habitat conservation, and citizen science monitoring.

Great Milkweed Grow Out Seed Amplification and Research - Desert Botanical Garden (\$7,500): To address the critical shortage of plant material, the Desert Botanical Garden (the Garden) initiated a mass effort to promote native southwest milkweeds through the Great Milkweed Grow Out, a multi-pronged effort to grow and distribute appropriate host and nectar plants for monarch conservation, build seed supplies, and engage and support the broader community in monarch conservation. The Garden and a local greenhouse partner will propagate 5,000 new milkweed plants in 2016 and will collect seeds from the wild around the state with support from the Bureau of Land Management Seeds of Success program. Some of the

MONARCH JOINT VENTURE 2009-2016

milkweeds propagated this year will be used for seed amplification, and a field experiment will be performed to study regional hostplant suitability and phenology.

Research and Monitoring

Milkweed, Nectar Plants and Monarchs in Prairie Restoration - University of Minnesota Monarch Lab, Xerces Society, Tallgrass Prairie Center (\$30,000): As conservation organizations work throughout the monarch breeding range to restore monarch breeding habitat, it is important to create cost effective seed mixes that provide the host plant and nectar resources needed by monarchs. To meet targets for addressing the loss of milkweed on the landscape, it is important to know how seeds per acre translate into milkweeds per acre, how various combinations of forbs and grasses translate into the presence of nectar plants across the time that monarchs are present in any given location, and how monarchs use these restorations. This project involves a retrospective analysis of past prairie restoration projects that will eventually allow us to tease out features of restorations that promote excellent monarch habitat. Both analyses take advantage of a partnership with Prairie Restorations, Inc. (PRI), a Minnesota business founded in 1977, and one of the oldest companies in the U.S. that is devoted to designing, planting, and managing restored prairies.

Monarch Wings Across Ohio: Urban Plot Research – Pollinator Partnership (\$2,500): Degraded urban areas, such as empty lots and underdeveloped public spaces provide a great opportunity for habitat restoration and community engagement. In partnership with the MJV, the Pollinator Partnership has begun work to convert underused urban areas into monarch research stations. With their program *Transforming Urban Areas*, degraded areas in Ohio will be transformed into monarch research plots, resulting in monarch habitat restoration as well as ongoing training and research opportunities. The program will hire and train local student interns in planting and monitoring monarch habitats, thereby increasing capacity for monarch habitat planting in the area. *Monarch Wings Across Ohio: Transforming Urban Areas* is one component of a program addressing multiple land use types: urban areas, gardens, corporate lands, and agriculture.

Engaging Commercial Nurseries to Meet Consumer Demand for Monarchs - Monarch Health and Xerces Society (\$5,000): Nurseries and commercial plant producers are crucial to providing milkweed and nectar sources required for monarchs to rebound. However, limited communication between conservationists and commercial nurseries represents a major obstacle to harnessing consumer power in providing monarch habitat. Many nurseries in the southern U.S. either do not provide milkweeds or offer only a single exotic species (tropical milkweed, *Asclepias curassavica*), despite the diversity of milkweeds that are native to North America. However, even nurseries selling native milkweeds often provide plants that have been treated with systemic insecticides. Motivating and equipping nurseries with information to meet consumer demand for native, insecticide-free milkweed and nectar sources could increase monarch production in garden habitats of North America. The primary aim of this project is to enhance native milkweed and nectar plant availability by communicating with and providing information to nurseries in Georgia and Texas.

PREVIOUS ALLOCATIONS

This list can be found on the [MJV Funded Projects](#) webpage, with descriptions of each listed project.

2015-2016

Education and Outreach

Promoting Citizen Science Monitoring in Texas – Cibolo Nature Center (\$12,000)

Monarch Citizen Science Training and Outreach – University of Minnesota Monarch Lab (\$21,031)

Wild for Monarchs Campaign: Citizen Science – Wild Ones (\$10,000)

Workshops for Federal Agency Staff in the Western U.S. - Xerces Society (\$12,244)

Habitat Restoration and Enhancement

Milkweed to Monarchs Abandoned Agricultural Area Restoration – Cincinnati Nature Center (\$3,000)

Iowa: Bringing Back the Prairie, Building Habitat for Monarchs – Iowa DNR (\$10,000)

MONARCH JOINT VENTURE 2009-2016

Monarch and Milkweed Habitat Restoration in Eastern Oklahoma – Monarch Watch (\$15,000)
Monarch Wings Across Ohio: Transforming Urban Areas – Pollinator Partnership (\$3,500)
Pollinator Habitat Demonstration Sites in Ag Areas (project supported by New York Community Trust) – Xerces Society, Tallgrass Prairie Center, University of Minnesota Monarch Lab (\$85,898)

Research and Monitoring

Monarch Breeding Habitat Assessment Tool – University of Minnesota Monarch Lab (\$4,895)
Assessment of Exotic Milkweeds and the Spread of Disease– Monarch Health, Monarch Alert (\$10,695)
Regional Monarch Nectar Plant Lists – Xerces Society (\$12,000)
Developing IPM System for Milkweed Seed Producers – Xerces Society (\$50,000)

2014-2015

Education and Outreach

Promoting Citizen Science Monitoring in Texas – Cibolo Nature Center (\$11,982)
Creating Monarch Habitat in Corporate Landscapes – Pollinator Partnership (\$1,980)
Wild for Monarchs Campaign – Wild Ones (\$9,000)
Monarch Citizen Science Training and Outreach – University of Minnesota Monarch Lab (\$20,653)
Development of Western Monarch Online Resource Center – Xerces Society (\$5926)

Habitat Restoration and Enhancement

Increasing Native Milkweed Seed Availability – Xerces Society (\$8,741)
Iowa: Bringing Back the Prairie, Building Habitat for Monarchs – Iowa DNR (\$18,800)

Research and Monitoring

Assessment of Exotic Milkweeds and Spread of Disease – Monarch Health, Monarch Alert (\$8,000)
Mapping the Milkweed Marketplace – Tallgrass Prairie Center (\$5,493)
Invasive Swallow-wort Control at Peninsula Point – Superior Watershed Partnership (\$10,000)
Western Breeding Habitat Loss Analysis – Xerces Society (\$7,000)

2013-2014

Education and Outreach

Monarch Success Stories Habitat Recognition Program – UMN Monarch Lab (\$8,000)
Workshops for Overwintering Site Land Managers and Citizen Scientists – Xerces Society (\$2,000)
Increase Monarch Outreach to Corporate Partners – Pollinator Partnership (\$4,900)
Wild for Monarchs Campaign – Wild Ones (\$12,000)
NABA Gardening Website and Material Update – North American Butterfly Association (\$6,252)
Promoting Citizen Science Monitoring in Texas – Cibolo Nature Center (\$11,996)

Habitat Restoration and Enhancement

Native Milkweed Seed Purchase for Use in Restoration Projects – Xerces Society (\$11,770)
Bring Back the Monarchs Milkweed Campaign; Milkweed Market – Monarch Watch (\$42,210)
Iowa: Bringing Back the Prairie, Building Habitat for Monarchs – Iowa DNR (\$20,000)

Research and Monitoring

Sharing What We Know: Tri-national Data Exchange and Population and Monitoring Program Analyses – University of Minnesota Monarch Lab, Monarch Alert, Xerces Society (\$34,911)
Documenting Monarch Breeding Areas in the Western US – Xerces Society (\$12,721)
Assessment of Exotic Milkweeds and Disease – Monarch Health and Monarch Alert (\$6,600)

MONARCH JOINT VENTURE 2009-2016

2012-2013

Education and Outreach

Workshops for Overwintering Site Land Managers and Citizen Scientists – Xerces Society (\$13,530)

Promoting Citizen Science Monitoring in Texas – Cibolo Nature Center (\$7,889)

Habitat Restoration and Enhancement

Iowa: Bringing Back the Prairie, Building Habitat for Monarchs – Iowa DNR (\$15,000)

Bring Back the Monarchs Milkweed Campaign; Milkweed Market – Monarch Watch (\$48,910)

Promoting the Planting of Native Milkweeds in the Central United States – Xerces Society (\$3,993)

Research and Monitoring

Assess Western Monarch Overwintering Sites and Fill Data Gaps – Xerces Society (\$31,219)

Analysis of Native vs. Non-native Trees in CA Overwintering Sites – Xerces, Monarch Alert (\$6,455)

Eastern Nectar Plant Recommendations for Monarchs – Pollinator Partnership (\$15,000)

Monarch Breeding Habitat Assessment Tool – UMN Monarch Lab and Xerces Society (\$15,771)

Understanding the Value of Waystations and MLMP Monitoring Sites – UMN Monarch Lab (\$4,358)

2011-2012

Education and Outreach

Monarch Citizen Science Training and Outreach – University of Minnesota Monarch Lab (\$7,504)

Bring Back the Monarchs Campaign; Expanding Waystation Program– Monarch Watch (\$13,350)

Corporate and Utility ROW Areas: Manual Development – Pollinator Partnership (\$30,340)

Monarch Biology and Conservation Meeting – University of Minnesota Monarch Lab (\$25,308)

Habitat Restoration and Enhancement

Increasing Native Milkweed Seed Availability – Xerces Society (\$23,275)

Western Monarch Habitat Conservation, Outreach, and Monitoring – Xerces Society (\$54,726)

Research and Monitoring

Tracking the Migration: Tagging Data Entry, Verification and Analyses – Monarch Watch (\$12,900)

Milkweed Habitat Quantification – Monarch Watch (\$2000)

2010-2011

Education and Outreach

NABA Gardening Website and Material Update – North American Butterfly Association (\$5,000)

Bring Back the Monarchs Campaign; Expanding Waystation Program– Monarch Watch (\$24,400)

Monarch Citizen Science Training and Outreach – NABA, Cibolo Nature Center (\$12,050)

Habitat Restoration and Enhancement

Increasing Native Milkweed Seed Availability – Xerces Society (\$18,943)

Western Monarch Habitat Conservation, Outreach, and Monitoring – Xerces Society (\$21,636)

Research and Monitoring

Sharing What We Know: Tri-national Data Exchange and Monitoring Program Analyses – University of Georgia, Andy Davis, University of Minnesota Monarch Lab, University of Maryland (\$42,100)

MJV Communications

Introduction

MJV partnership growth and increasing stakeholder interest in monarchs led to the development of a more comprehensive MJV communications strategy and plan. The MJV communications plan is a living document updated periodically, and is available upon request. We conducted a survey in 2015 to gauge partner priorities for the plan, and will regularly assess the relevance of the communications plan to the partnership.

Summary of 2015 Survey Results

The survey responses provided helpful insight and reinforced the importance of ongoing MJV communications projects. We found that partner responses aligned well with existing communications goals and staff ideas for the website and inter-partner communications.

There is general consensus that MJV has effective communication to the public and to our partners, but that there is room for improvement.

The MJV resources most frequently used by surveyed partners are:

- The downloadable resources on the MJV website
- The monarch conservation webinar series

The most important communications goals & services to pursue, according to survey, are:

- Regularly send project updates out to all MJV partners
- More publicly shareable tools such as presentations, photos, signs etc.

In the past year, we have worked to improve MJV communications based on survey results by:

- Maintaining a list of all current and previously funded MJV projects on our website
- Improving communications about partner activities through regular posts to the MJV Partner Listserv and through news update posts on our website.
- Improving accessibility of website to specific audiences such as farmers, ranchers, educators, gardeners, and the general public. New draft pages for various audiences have been developed and partner input will be sought before public release.
- Developing a partner 'welcome packet' for all new MJV partners to introduce them to what the partnership has to offer and how they can best contribute.

In addition, we ask that partners integrate the following actions to improve communications within the partnership:

- Submit a brief yearly summary of monarch conservation activities for distribution, and informal updates throughout the course of the year.
- Submit quarterly progress reports for all MJV funded work.
- Identify staff members of their organization to actively participate in MJV working groups as needed. Additionally, partners are encouraged to develop an internal communications structure to disseminate monarch and MJV updates to their staff and public network.
- Follow/like MJV and partner social media outlets, and share relevant posts and activities with their social media networks.
- Publicly recognize partnership with the MJV on partner websites and in relevant presentations or resources.

MONARCH JOINT VENTURE 2009-2016

- Share current projects, products, links, or resources relevant for the MJV to promote on website and through other communications mechanisms.
- Keep MJV up-to-date with information about ongoing and planned projects to minimize duplication and improve coordination of conservation activities nationwide.

STRATEGIC MEETINGS AND PRESENTATIONS

From 2009-2016, MJV program staff participated in strategic meetings and events to increase engagement in monarch conservation, and to grow the MJV partnership. Meetings or committees which MJV was represented at or on in 2016 thus far include:

2016: High Level Working Group, Mexico 3rd international Symposium on Monarch Research and Conservation, International Congress of Entomology Meeting, Prairie Reconstruction Initiative, MJV/NCTC Monarch Conservation Webinar Series, Ohio Pollinator Habitat Initiative Monarch Symposium, National Recreation and Parks Association Annual Conference, North American Pollinator Protection Campaign Annual Conference, Monarch Conservation Science Partnership meetings, Chicago Field Museum and USFWS Urban Monarch Conservation Meeting, Minneapolis Monarch Festival, Keystone Monarch Collaborative meetings, Commission for Environmental Conservation trinational monarch meetings, Society for Conservation Biology meeting, Center for Pollinator Research Conference, Trilateral Committee for Wildlife and Ecosystem Conservation and Management, Quad Cities Pollinator Conference, MN Department of Ag Pollinator Summit, Rights-of-Way as Habitat Working Group meeting, Congressional Panel Speaker, Wolf River Conservancy Lecture Series at the Memphis Botanic Garden, Kentucky Monarch Summit, Michigan Monarch Summit, Minnesota Pheasants Forever State Convention, Minnesota Wild Ones Landscape Design Conference, National Pollinator Garden Network meeting, NAPPC steering committee, NAPPC Monarch Taskforce, Monarch Citizen Science Training – MN, IA, and MO, North American Forest Commission Urban Community Engagement, Terrestrial Invertebrate Taxon Advisory Group,.

DEVELOPMENT AND DISSEMINATION OF PRINT AND WEB OUTREACH MATERIALS

In 2013 we redesigned and expanded the MJV website (www.monarchjointventure.org) to allow for more dynamic and graphically-rich content. MJV and partner materials can be downloaded from the website as PDF documents. This [resources page](#) provides a comprehensive yet succinct set of documents for private landowners, citizen scientists, land managers, and others. From 2013-16, the MJV staff created a series of two page information sheets detailing different aspects of monarch biology and conservation, with two new ones in 2016. Partner organizations or others interested in promoting monarch conservation request these for distribution, and many more download them directly from our website. MJV two page information sheets include:

- Monarch Joint Venture fact sheet: a quick introduction to the monarch migration, monarch conservation issues, and the Monarch Joint Venture.
- Milkweed information sheet: photos with habitat information for milkweed species common to each U.S. region allow readers to find species known to be well-used by monarchs, and easy to establish in gardens and fields throughout the U.S.
- Gardening for monarchs: tips for creating a garden that will attract monarchs and other butterflies and pollinators
- Schoolyard butterfly gardens: similar to gardening, but includes information specifically applicable to schoolyards
- Invasive species alert – Swallow-wort: background on native and non-native swallow-wort species that may impact monarchs and information about management to help control them
- Rearing monarchs responsibly: directions for successfully raising wild collected eggs or caterpillars to adult monarch butterflies

MONARCH JOINT VENTURE 2009-2016

- Monarch conservation talking points: major monarch conservation talking points that describe the value of the monarch migration, the benefits of conserving monarchs, and the steps needed to conserve the monarch migration
- Potential risks of growing exotic milkweeds for monarchs: risks of growing exotic milkweed for monarchs, including the spread of the monarch parasite OE in locations where exotic milkweed can grow year-round.
- Monarch citizen science: provides an overview of the main monarch citizen science programs and provides information about how to learn more
- NEW: Mowing - Best Practices for Monarchs: provides recommendations for windows and practices for land management to minimize negative impact on monarchs
- NEW: Milkweed and Monarch Misconceptions: aims to demystify misconceptions surrounding monarchs and their habitat
- NEW: Monarch Conservation - How to Get Involved: provides a general overview of monarch conservation and how to get involved

Additionally the North American Monarch Conservation Plan, “Plant Milkweed for Monarchs” bookmark, “Celebrating Monarchs” poster, MJV supported publications, and other relevant management resources are available to download from this page.

Appendix 1: MJV Steering Committee and Partners

STEERING COMMITTEE:

Association of Fish & Wildlife Agencies (AFWA):
Kelley Myers
Bureau of Land Management: *Carol Spurrier*
Midwest AFWA: *William Moritz*
Monarch Butterfly Fund/UMN Monarch Lab: *Karen Oberhauser (co-chair)*
Monarch Watch: *Chip Taylor*
National Wildlife Federation: *Mary Phillips*
Natural Resources Conservation Service: *Melissa Martin*
North American Butterfly Association: *Marcus Gray*

Northeast AFWA: *Emily Preston*
Pollinator Partnership: *Laurie Davies Adams*
Southeastern AFWA: *David Eichler*
Tallgrass Prairie Center: *Laura Jackson*
U.S. Fish and Wildlife Service: *Tom Melius*
U.S. Forest Service: *Greg Butcher*
Western AFWA: *Tom Kirschenmann*
Wild Ones: Native Plants, Natural Landscapes: *Pam Wilcox*
Xerces Society for Invertebrate Conservation: *Scott Black (co-chair)*

MJV PARTNERS

U.S. Forest Service
U.S. Fish and Wildlife Service
U.S. Geological Survey
Bureau of Land Management
National Park Service
Natural Resources Conservation Service
Association of Fish and Wildlife Agencies
Iowa Department of Natural Resources
Midwest Association of Fish and Wildlife Agencies
Minnesota Department of Natural Resources
Northeast Association of Fish and Wildlife Agencies
Southeastern Association of Fish & Wildlife Agencies
Texas Parks and Wildlife Department
Western Association of Fish and Wildlife Agencies
Armand Bayou Nature Center
Back to Natives Restoration
Cibolo Nature Center
Cincinnati Nature Center
Desert Botanical Garden
Environmental Defense Fund
The Field Museum
Florida Museum of Natural History
Great Parks of Hamilton County
Green Schools Alliance
Journey North
Lady Bird Johnson Wildflower Center
Loudoun Wildlife Conservancy

Make Way for Monarchs
MetroBlooms
Missouri Prairie Foundation
Monarch Alert
Monarch Butterfly Fund
Monarch Health
Monarch Lab
Monarch Watch
Monarchs Across Georgia
National Recreation and Parks Association
National Wildlife Federation
Native Plant Society of Texas
Naturedigger
North American Butterfly Association
Ohio Pollinator Habitat Initiative
Pacific Grove Museum of Natural History
Pheasants Forever and Quail Forever
Pollinator Partnership
Prairie Restorations, Inc.
San Antonio Zoo
Sand County Foundation
Southwest Monarch Study
Tallgrass Prairie Center
Three Rivers Park District
Wild Ones: Native Plants, Natural Landscapes
World Wildlife Fund U.S.
Xerces Society for Invertebrate Conservation

Appendix 2: MJV Partner Descriptions

MONARCH CONSERVATION SUMMARIES BY PARTNER

U.S. Forest Service: The US Forest Service (USFS) focuses on habitat enhancement and public engagement to build awareness of the conservation of monarchs and pollinators. Working closely with MJV partners, USFS is exploring solutions that would increase survivability and create habitats. Milkweed and nectar plants are added to USFS restoration areas to convert marginal land into pollinator habitat, and demonstration gardens have been cultivated at USFS facilities. In FY16, USFS restored, enhanced or maintained 366,027 acres of pollinator habitat. Of those acres, 251,215 acres were in habitats that support monarchs. USFS initiated an assessment of native plant material needs and capacity, including pollinator-friendly forbs, as part of the federal effort to build the Native Seed Reserve. In partnership with the Natural Areas Association, USFS produced an edition in the Natural Areas Journal “Managing for Pollinators on Natural Areas” and hosted a pollinator symposium at the 43rd Natural Areas Conference. Several USFS Offices, plus the Southern Regional Office, celebrated monarch butterflies this year during National Pollinator Week: Daniel Boone, Rogue River-Siskiyou, Mark Twain, Klamath, and San Bernardino. Other efforts include outreach and education in urban areas, including Atlanta, Chicago, Detroit, Milwaukee, and Washington, DC. The monarch is an excellent starting point to engage people right where they live and promote their participation in conservation activities. The North American Monarch Institute, an important partnership between the US Forest Service International Programs and the University of Minnesota Monarch Lab, has played a key role in training teachers to integrate monarchs into classroom lesson plans and outdoor education programs. Expert instructors train the teachers in inquiry-based lessons and experiential approaches to learning, with a large focus placed on creating schoolyard habitats. To date, more than 500 teachers have participated. Relationships built in this course serve to connect conservation projects, educational programs, and citizen-science monitoring along the flyway.

U.S. Fish & Wildlife Service: The U.S. Fish and Wildlife Service has declared monarch butterfly an agency priority dedicating \$4 million towards conservation efforts each year for five years. Over the last few years, actions by the USFWS included significant investments for monarchs. Using habitat conservation as a framework for implementing monarch conservation work, USFWS has invested monarch efforts in conservation planning and design, conservation delivery, research and monitoring, and education and outreach to audiences. USFWS has completed over 500,000 acres of habitat restoration and enhancement for the monarch through existing and planned projects on public and private lands, including support for 750 schoolyard habitats and pollinator gardens. Conservation delivery of these acres was completed on Service-owned lands, through partnerships on state-owned lands, and on private lands through the Partners for Fish and Wildlife program. The Service will continue to acquire thousands of acres in the Midwest and Mountain Prairie Regions, which although primarily aimed at protecting priority bird habitats, will have secondary benefits for monarchs and other pollinators. The USFWS seeded the Monarch Butterfly Conservation Fund with a \$1.2 million investment in 2015 to the National Fish and Wildlife Foundation to be leveraged through public and private donors. Since inception, NFWF has awarded grants which were leveraged and matched by more than \$10 million and restoration of up to 53,000 acres of habitat. The Species Status Assessment (SSA) Framework has been initiated this year. The SSA is an analytical approach to deliver foundational science for informing the Endangered Species Act (ESA) listing decision for monarchs. The Fish and Wildlife Service is the U.S. lead for the Tri-national Working Group and tasked with leading an Interagency High Level Working Group (HLWG) to coordinate monarch conservation activities trinationally. We are also collaborating with Canada and Mexico to enhance our efforts internationally to save this species.

Bureau of Land Management: The Bureau of Land Management has been focused on inter-agency coordination through the White House Pollinator Task Force and The High Level Working Group for Monarchs to implement the DOI Pollinator Protection Plan. We work with the Federal Committee of the Plant Conservation Alliance to

MONARCH JOINT VENTURE 2009-2016

implement the Pollinator Friendly Seed Reserve from the Federal Strategy to Promote the Health of Honeybees and Other Pollinators by increasing the number of native milkweed species and the number of milkweed collections in Seeds of Success. We are including pollinator friendly plants in all sage-grouse habitat restoration and including milkweed in restoration projects in monarch migration routes. BLM Field Offices are working more closely with Xerces Society for milkweed survey on public lands in Nevada and Utah and putting data into the Xerces Milkweed and Monarch Occurrence Tool. The BLM continues to support the National Fish and Wildlife Foundation Monarch Butterfly Conservation Fund, and The Colorado Plateau Native Plant Program was awarded one of their grants in 2016 to increase milkweed and nectar species for AZ, CO, NM and UT. And the BLM continues to support the MJV coordinator position and MJV project grants that benefit the western monarch population.

U.S. Geological Survey: The USGS, operating through the John Wesley Powell Center for Analysis and Synthesis has hosted of monarch researchers, restoration ecologists, policy implementers, and organizers of citizen science to identify means of characterizing the state of the eastern migrating population of monarch butterflies and steps necessary for recovering them to former levels of abundance. This group has become the Monarch Conservation Science Partnership (MCSP). To this end, individuals within the group developed spatially explicit demographic models for identifying vital stages in the annual life cycle of monarchs; extinction risk analyses to help understand the status of the species and inform population targets; geospatial data and tools for conducting expert-based scenarios of milkweed restoration; and a (inter-)national monitoring strategy for coherently organizing citizen science effort, more rigorously assessing species status and, ideally, determining conservation effectiveness. The MCSP was adopted by the Trilateral Committee for Wildlife and Ecosystem Conservation and Management and now includes a partnership with members from Canada and Mexico. The MCSP piloted a national monitoring framework in 2016.

National Park Service: In fulfilling the 2014 Presidential Memorandum and the National Strategy to Promote the Health of Honey Bees and Other Pollinators, the National Park Service (NPS) is currently reviewing land management practices to incorporate pollinator friendly landscaping, developing education materials and wayside exhibits, and participating in international initiatives to protect and restore pollinator habitat. NPS is currently funding over 50 monarch/milkweed projects Service-wide and has provided funding and support for citizen science and at risk species conservation efforts for several years. Current priority areas for NPS monarch conservation include: habitat restoration, inventory and monitoring, and education/outreach. The Milkweeds of the National Park Service project on iNaturalist.org was designed to enlist resource managers, citizen scientists, and professional scientists to help map native milkweed species in park units throughout the United States. The data collected will help support milkweed seed collection for future monarch butterfly recovery efforts. Additionally, the NPS along with its partners in the National Pollinator Garden Network are calling on teachers to participate in the Million Pollinator Garden Challenge and install pollinator education and awareness as part of their classroom activities this school year. The NPS is also encouraging the public to plant pollinator gardens and register them on the SHARE website to help meet the Million Pollinator Garden challenge. In May of 2016, the NPS conducted pollinator education and conservation through our NPS Centennial BioBlitz, which provided hands-on opportunities for citizens to participant in pollinator education and inventory events across the nation.

National Resources Conservation Service: The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) recently launched a targeted effort in two regions, a total of 10 states that invested \$4 million in fiscal year 2016 to help combat the monarch butterfly's decline. NRCS provided technical and financial assistance to help producers and conservation partners plant milkweed and nectar-rich plants along field borders, in buffers along waterways or around wetlands, in pastures and other suitable locations. NRCS also helped producers manage their pastures in ways that increase critical populations of milkweed and nectar plants, all while improving the health of their rangelands. The Environmental Quality Incentives Program and remaining funds from the former Wetlands Reserve Program provided funding for this work. Additionally, NRCS will be offering enhancements through the Conservation Stewardship Program to establish monarch habitat. These

MONARCH JOINT VENTURE 2009-2016

enhancements will be available nationwide. Several projects are underway to evaluate the effectiveness of these NRCS efforts, including collaborations with MJV partners in the Midwest region. Working with agency and other biologists, the NRCS Central National Technology Support Center biologists developed Wildlife Habitat Evaluation Guides, Decision Support Tools, and on-the-ground training courses to support the implementation of monarch conservation activities in the Midwest and Southern Great Plains. The NRCS Plant Materials Centers in Florida, New Mexico, and Nevada completed native milkweed seed increase projects in cooperation with MJV partners. Plant Materials Centers, working with other NRCS staff and partners, have produced regional milkweed guides for the Southwest, the Great Basin, and the Central States. In addition, NRCS staff working with partners have developed regional plant lists, including milkweed and important nectar producing species, for the Midwest and Great Lakes region and the Southern Plains to support NRCS monarch habitat efforts. These documents may be found at:

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/plantsanimals/pollinate/?cid=nrcseprd402207>

Association of Fish & Wildlife Agencies: AFWA is coordinating state monarch conservation efforts. See updates from MAFWA, NEAFWA, WAFWA, and SEAFWA for more information on state-level coordination.

Iowa Department of Natural Resources: The DNR's public land management staff and Prairie Resource Center produced seed and restored over 1,575 acres to diverse prairie habitat on state-owned lands in 2016. DNR's Private Lands Program and partners have ensured that Iowa has the largest number of acres enrolled in the pollinator CRP in the U.S. Land managers within the Conservation and Recreation Division have been directed by the Division Administrator to create pollinator and monarch habitat in all areas where possible. The DNR is a leader in the Iowa Monarch Conservation Consortium which unites all major stakeholders within the state to coordinate Monarch conservation efforts. The first version of a State Conservation Strategy for Monarchs should be completed and released by the end of 2016. IDNR staff are serving on numerous national committees including: the steering committee of MJV as the Association of Fish and Wildlife Agencies' representative; the Midwest Association of Fish and Wildlife Agencies' (MAFWA) Monarch Committee (co-chair); the USFWS' Monarch Advisory Committee as MAFWA's representative, the USFWS' Species Status Assessment Committee and the Monarch Conservation Science Partnership (MSCP) workgroup developing national monitoring protocols. As a partner in the Blank Park Zoo's Plant.Grow.Fly. program, the DNR participated in the 2016 Monarch Festival held in September. As part of the Iowa Consortium, we produced a Five Best Practices postcard as a handout at events like the Iowa State Fair. Iowa DNR, in partnership with Iowa State University, continues to finalize its Iowa occupancy habitat models for Monarchs based on data collected between 2006-2015 on more than 376 sites as part of the Multiple Species Inventory and Monitoring project. We also performed a pilot project testing out possible citizen-science based Monarch monitoring protocols designed by MSCP.

Midwest Association of Fish & Wildlife Agencies: The Midwest Association of Fish and Wildlife Agencies (MAFWA) has made conservation of the Monarch Butterfly a priority by engaging state fish and wildlife agencies in Monarch conservation planning, implementation and monitoring. Because of the importance of the central flyway to monarch productivity and migration MAFWA has decided to coordinate the development of a state-implemented Central Flyway Monarch Conservation Strategy to account for the placement and priority of these conservation efforts. All regional Associations of Fish and Wildlife Agencies have been invited to engage with MAFWA in this effort. MAFWA is working with the U.S. Fish and Wildlife Service and other organizations to ensure the Strategy is consistent, coordinated, and meets policy and scientific standards needed to inform the Monarch status assessment and listing decision. Lastly, MAFWA will be filling a technical position under a National Fish and Wildlife Foundation grant to help coordinate the development of the Strategy. Looking forward, state fish and wildlife agencies will be able to utilize the Central Flyway Monarch Conservation Strategy to implement and monitor conservation actions on public lands and, through partners and stakeholders, additional private lands.

Minnesota Department of Natural Resources: Minnesota DNR views monarch and pollinator conservation as important to the agency's goal to conserve and enhance MN's natural resources. We manages millions of acres of

MONARCH JOINT VENTURE 2009-2016

land and achieve benefits to monarchs through habitat protection, management, and restoration efforts, especially extensive native prairie activities. Staff have conducted/contracted a variety of surveys to improve our understanding of the distribution, abundance, and conservation status of MN native pollinators. The Division of Ecological and Water Resources recently revised Minnesota's Wildlife Action Plan, a tool focusing efforts to conserve the state's at-risk wildlife. It identifies 345 Species in Greatest Conservation Need, including the monarch. Staff participated in planning and convening the October 2015 Monarch Conservation Workshop in Iowa, participated in the February 2016 Minnesota Department of Agriculture's Pollinators Summit, and is participating in planning and convening a Regional Monarch Butterfly Conservation Planning Workshop to be held in Texas in January 2017. MNDNR is also currently developing a state pollinator conservation plan. The Nongame Wildlife Program includes the state's Project WILD Program, which is field testing activities related to monarch conservation that are being considered for future editions of Project WILD K-12 Curriculum. The Minnesota Biological Survey (MBS) conducts surveys for native bees and rare skippers. MBS also plans and hosts annual bee identification workshops with the University of Minnesota, as well as creating and maintaining the DNR's pollinator website (www.dnr.state.mn.us/pollinators). The Division of Parks and Trails is participating in the national "Parks for Monarchs" campaign, and has established a pilot interpretive program at Lac qui Parle State Park. The Division of Fish and Wildlife led the 2014 effort to create a MNDNR Operational Order on Pollinator Habitat and to develop Pollinator Best Management Practices and Habitat Restoration Guidelines to inform these activities.

Northeast Association of Fish & Wildlife Agencies: The Northeastern Association of Fish and Wildlife Agencies (NEAFWA) represents 13 northeastern states and Washington DC. Monarch activities are listed in state Wildlife Action Plans, which were all revised in 2015. Eleven Wildlife Action Plans list monarch butterflies as Species of Greatest Conservation Need, including Connecticut, Delaware, Washington DC, Maine, Maryland, New Hampshire, New Jersey, Pennsylvania, Rhode Island, Vermont and Virginia. In the plans, analyses of the population status, threats to populations, and actions to address those threats are listed. In some cases, specific actions were developed for monarchs. In others, monarchs are included with actions for other pollinators. Threats include the use of non-specific pesticides and herbicides in landscaping and agriculture, and decline of suitable habitat with particular references to milkweed. For actions, there is a strong emphasis on educating the public and specific groups such as farmers, landscapers, garden centers, nursery stock growers, garden clubs and gardeners on organic practices, milkweed, native species planting, plants suitable for pollinators, and monarch and other pollinator life history needs. Engaging partners, such as university cooperative extension staff, master gardeners, NRCS, conservation groups, and state agriculture departments, are key to providing this information. Restoration and management of grasslands including old fields and pastures to promote wildflowers including milkweed and managing invasive species are also important actions, and will involve state, federal, private and conservation NGO landowners. Several plans point to national efforts to assist in this work.

Southeastern Association of Fish & Wildlife Agencies: The Southeastern Association of Fish and Wildlife Agencies (SEAFWA) is a recent partner addition to the MJV. As an organization representing 15 state fish and wildlife agencies from Florida to Texas, SEAFWA will bring knowledge and insight into the implementation of the North American Monarch Conservation Plan. The agencies have wildlife management expertise, connections in key regions for monarch conservation and will increase the presence of state agencies in the MJV. There are 15 state agencies represented as members of SEAFWA who are the primary agency responsible for management of fish and wildlife resources. The states in the region include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. This region provides essential migrating habitat during the migrations, and is critical for its role in providing breeding habitat for monarchs each spring. SEAFWA works with their partners to achieve goals benefiting fish and wildlife resources, including pollinators. They maintain committees consisting of professionals who explore and analyze a wide range of issues and factors affecting fish and wildlife resources and make recommendations to help mitigate those issues. Additionally, they sponsor cooperative fish and wildlife programs among member states and other entities to address issues of mutual interest. Most monarch conservation activity

MONARCH JOINT VENTURE 2009-2016

is aimed at community outreach to grow public support for monarch and pollinator conservation. Several states are also pursuing seed projects to make native seed packets more readily to the public. Several states are also engaged in monarch tagging projects. South Carolina has been tagging monarchs since 1996. A current theory is that monarchs that migrate southward thru the east coast may overwinter in Florida and not central Mexico. Efforts are underway to investigate the creation of creating pollinator habitat on Florida's barrier islands for these monarchs. Last year, the Plains Chautauqua hosted an event with President & Mrs. Carter in the Plains, GA promoting monarch conservation.

Texas Parks & Wildlife Department: TPWD's Monarch and Native Pollinator Conservation Plan is currently available online. TPWD and the Oaks and Prairie Joint Venture were awarded \$244K by the National Fish and Wildlife Foundation for monarch conservation. Efforts to restore 14,750 acres of monarch habitat on private lands are underway, in addition to the restoration efforts underway on Wildlife Management Areas. TPWD and Oklahoma Department of Wildlife Conservation are working together on administering a Multi-State Competitive State Wildlife Grant that was awarded to the University of Texas – Austin and Oklahoma State University in the amount of \$500,000, to fund the Southern Plains Pollinator Conservation Implementation Program. This project will investigate the efficacy of different habitat restoration approaches for pollinators, the impact of climate change on pollinators, and the potential influence of local and regional land-use factors on the results of conservation activities implemented. TPWD launched a citizen-science based effort last year called Texas Milkweeds and Monarchs, which garnered nearly 3000 observations of 35 different species of milkweed in Texas. Afterwards, TPWD published a guide to the identification and distribution of Texas milkweed species. We completed the Management Recommendations for Native Insect Pollinators in Texas as a management guide for private landowners. TPWD continues to partner with former first lady Laura Bush, USFWS, National Wildlife Federation, and Lady Bird Johnson Wildflower Center to promote pollinator conservation. An event was held on September 13th which highlighted BAE Systems efforts to restore pollinator habitat. TPWD also has staff members that are serving on the Texas Comptroller's Technical Advisory Panel, reviewing the 4 different monarch research projects. After months of planning, the Communications and Outreach division conducted the first Texas Pollinator BioBlitz in October 2016. The goal was to encourage Texans to become more familiar with our native pollinators and to learn about native plant and animal species.

Western Association of Fish & Wildlife Agencies: As an association, WAFWA is a new member of the Monarch Joint Venture partnership. The geographic range covered by WAFWA is a significant portion of the monarch butterfly range and includes unique habitats and populations on both the eastern and western side of the Rocky Mountains. WAFWA, a regional association of the national Association of Fish and Wildlife Agencies, is committed to working with other regional associations and partnering agencies and entities to further advance monarch butterfly conservation, outreach, and science. On-going conservation efforts by individual states east of the Rocky Mountains will overlap efforts within the Midwest Association of Fish and Wildlife Agencies as some states belong to both associations. Several states currently have a monarch butterfly or pollinator management plan in place while others are in the early process of establishing one.

Armand Bayou Nature Center: Armand Bayou Nature Center (ABNC) themed its 2016 Earth Day gala around Monarchs Matter, inviting over 400 attendees, sponsors, and supporters to "join the migration" during the popular annual event. Monarch butterfly migration and pollinator habitat themes were added to the content of all community outreach events, and the entrance lobby exhibit was converted to host and food plants to demonstrate the Monarch lifecycle to almost 30,000 visitors. The Monarch life cycle was added to lesson plans for EcoTot (1.5-3 y.o.), EcoKid (3-5 y.o.) and EcoSchooler (5-12 y.o.) classes. ABNC hosted multiple Texas Master Naturalist and Native Plant Society of Texas training sessions, which have added curriculum on pollinator conservation. The ABNC Monarch program coordinator is working with surrounding suburban communities to enable them to earn Mayors for Monarchs designations. ABNC partnered with Texas A&M Extension to upgrade two existing WaterSmart demonstration gardens to Monarch Wayside qualified demonstration areas with locally available monarch host and food plants, and updated interpretive signage to include both topics. Six other demonstration

MONARCH JOINT VENTURE 2009-2016

gardens, including the McGovern Children's Discovery Area, are being adapted to qualify for Monarch Wayside status. ABNC also partnered with Houston Wilderness on the successful Gulf-Houston Monarch Flyway Strategy project and will be sharing National Fish and Wildlife Foundation and US Fish and Wildlife Service grant funding to expand its native plant nursery operations to include production of local native host and food plants, for monarchs, for its tallgrass prairie restoration projects. During 2016, almost 25 more acres of invasive woody monoculture has been removed and replanted with over ten thousand 1-gallon potted grass and forb propagules by hundreds of community volunteers and students in service learning projects.

Back to Natives Restoration: Back to Natives (BTN) continues to grow and educate our community about using locally native milkweed. We recently gave presentations addressing the milkweed issue at two landscape industry expos, one in Sacramento and the other in Long Beach, in the hopes that professional landscape professionals will use locally native milkweed in their designs and plantings. We have *Asclepias eriocarpa* and *fascicularis* growing at our volunteer run nursery in Santa Ana. Grants from Boeing, Pimco, Southern California Edison and another anonymous Foundation are helping with habitat restoration at Santiago Park Nature Reserve, and at our new Native Plant Reserve in Dana Point, Cuesta Kato. Since our last update we've officially accepted the donation of Cuesta Kato, on which we will create a small wildlife reserve, including a "monarch waystation". As the rains have not really started here in Southern California, we've been focusing on invasive removal, but seeding with *Asclepias* will occur once the wetter weather arrives. A new "Propagation of Native Plants" class will soon be scheduled at the Nursery, in which we will teach our students to grow a number of locally native plants, including milkweed. We continue to include milkweed in our client's landscape designs (we design native plant landscapes to raise funds for our habitat restoration and environmental education programs), and we continue to spread the word about using locally native milkweed when we present educational and service learning programs.

Cibolo Nature Center: The Cibolo Nature Center & Farm continues to support monarch education efforts throughout the state of Texas. This includes intensive "Train the Trainer" programs to encourage others to spread the word, short presentations to garden and naturalist groups, booths with live specimens at festivals and conferences, as well as outreach to school children. Additionally, the Texas Wildlife Association (TWA) has been a terrific partner, enabling our educators to reach thousands of school children through their distance-learning program. In 2016 we are on track to educate over 15,000 individuals. The nature center has raised funds for our "Monarch Meadow" restoration project, which will create 20 acres of monarch habitat for ecological restoration education and seed gleanings. This restoration will begin in 2017 and we will monitor our success with the help of citizen scientists, including Monarch Larva Monitoring Program (MLMP) volunteers. We will also be installing swales and planting cover crops for our "Restoration Agriculture" food system, which will demonstrate pollinator friendly and financially viable regenerative agriculture practices in our "Honey Bee Meadow."

Cincinnati Nature Center: Cincinnati Nature Center's Milkweed to Monarchs Regional Conservation Initiative continues to be a success, and we have recently expanded our focus to include other pollinators. To date, we have engaged tens of thousands of people and organizations throughout the greater Cincinnati region in planting native milkweed. Since October, 2014, we distributed over 270,000 packets of native milkweed. These packets helped to spread awareness about the plight of Monarchs and the importance of planting native milkweed. Our staff has made educational presentations; provided consultations on effective planting techniques; and cultivated partnerships with more than 120 local businesses as "Merchants for Monarchs", each providing support including promotion, educational programs and/or milkweed seeds to their customers. Over 100 acres of CNC old field habitat has been cleared of non-native invasive species and planted with native plants supporting monarchs and pollinators. Milkweed to Monarchs has touched the hearts of thousands of people in our region. Scout troops, churches, garden clubs, homeowners and farmers request seeds. Company presidents and golf course managers ask for our help in planting milkweed on their property, and teachers from every grade incorporated our Teacher Monarch Packet into their lesson plans, planted gardens and sent seeds home with their students by the thousands. We host Pollinator Forums that engage more than 100 professionals and landowners to learn about

MONARCH JOINT VENTURE 2009-2016

the importance of pollinators, the plight of the Monarch, and what can be done to support all pollinators, including the monarch.

Desert Botanical Garden: The Desert Botanical Garden's monarch conservation mission has three main components. First, we raise public awareness and encourage planting of milkweed through our butterfly and caterpillar exhibits, butterfly walks and gardening classes. Second, we are growing more than 7,000 new native milkweeds and collecting thousands of seeds through our new initiative, the Great Milkweed Grow Out. This also has a public awareness element, planting butterfly gardens at local schools, selling milkweeds at Garden events, and sharing the milkweeds with other non-profits in the area. Lastly, we are trying to better understand through research the interactions between native milkweeds of the Southwest and our local monarchs and beneficial insects. We have two research projects. The first is examining monarch female egg-laying preference and larval survival on native milkweed species. The second, funded by Monarch Joint Venture, is surveying the insects attracted to our native milkweeds (while also growing plants for seed amplification).

Environmental Defense Fund: Environmental Defense Fund (EDF) is working with agricultural, conservation and agency stakeholders to develop Monarch Butterfly Habitat Exchanges in key states, including Texas, California and Iowa. Habitat exchanges are innovative conservation programs especially well-suited to enroll large numbers of farmers and ranchers in conservation, and to connect them with sources of funding and technical assistance for habitat restoration and conservation actions. Key characteristics of habitat exchanges include rigorous accounting of conservation outcomes, transparency of operations and results, and maximum return on investment. Habitat exchanges utilize an advanced Habitat Quantification Tool (HQT) to measure habitat quantity and quality to more accurately account for benefits to species. EDF has been working collaboratively with the Monarch Lab and Environmental Incentives over the past 10 months to develop and test a Monarch HQT that measures key habitat attributes for monarchs, including the density and diversity of milkweed and nectar plants. The Monarch HQT will undergo external scientific review beginning in November 2016. The tool will then be ready for implementation in spring 2017. In Texas, EDF is currently evaluating inquiries from a number of landowners with an interest in serving as Monarch Habitat Exchange pilot test sites. We expect to initiate these pilot tests in spring 2017. In Iowa, EDF is collaborating with Iowa State University and Iowa Department of Natural Resources to raise funds to implement pilot transactions through a Monarch Habitat Exchange in 2017. In California, EDF is working to add the monarch to the list of species addressed through the Central Valley Habitat Exchange. These Habitat Exchanges will serve as testing grounds that will help identify the most efficient and effective strategies for monarch conservation, and ultimately serve as models for other states across the monarch's range.

The Field Museum: More than 80% of people in the United States now live in urban areas. This increase in urbanization provides unprecedented opportunities in cities to connect people with nature through monarch and pollinator conservation. Due to increasing availability of high-resolution geospatial data, it is now possible to study areas of dense population at the scales needed to identify urban landscapes that are, or could be, plantable space for monarch habitat. U.S. Fish and Wildlife Service has partnered with Field Museum of Chicago to develop a conservation strategy for monarchs in urban landscapes. The project, "A Monarch's View of the City", is being piloted in four large metropolitan cities in 2016. The resulting conservation plan is science-based, spatially explicit, has measurable objectives (i.e., potential monarch habitat by land use type), and includes community engagement strategies. These tools will support strategic and effective monarch conservation in large urban areas and, in doing so, will help to stabilize the monarch population.

Florida Museum of Natural History: The Florida Museum of Natural History at the University of Florida is currently involved with several monarch conservation initiatives focused on public outreach, native milkweed availability, and scientific research. In support of public outreach, we have partnered with the U.S. Forest Service, the Xerces Society for Invertebrate Conservation, and the Butterfly Conservation Initiative to produce and disseminate a series of information brochures for each Forest Service region. These brochures highlight the monarch and six milkweed species native to that specific region. They also identify the larvae of numerous

MONARCH JOINT VENTURE 2009-2016

common butterflies and their native host plants in an effort to emphasize the importance of plant-insect relationships. We have additionally teamed up with the Florida Fish and Wildlife Conservation Commission and the Disney Conservation Fund to launch a wildlife viewing certificate program called Wings Over Florida – Butterflies (<http://floridabirdingtrail.com/wings-over-florida-butterflies/>) and develop a series of augmented reality education cards highlighting common and at-risk butterflies in Florida, including the monarch. In support of native milkweed availability, we are working with the Florida Department of Transportation to map native milkweed populations along Florida roadways, and with the Florida Association of Native Nurseries and the Florida Wildflower Foundation to collect and distribute native ecotype seed to growers (<http://www.floridanativenurseries.org/info/News/fann-launches-new-program-to-expand-availability-of-native-asclepias/>). In support of scientific research, we have partnered with the University of Florida's Institute of Food and Agricultural Sciences and the Coleman Federal Correctional Complex to help develop best commercial nursery production and pest control methods for various Florida native milkweed species. Lastly, we are evaluating on the impacts of several systemic insecticides typically used in commercial production of tropical milkweed (*Asclepias curassavica*) on monarch larval mortality.

Great Parks of Hamilton County: Several departments within Great Parks of Hamilton County (GPHC) have teamed up to increase pollinator projects in 2017. Their focus is on Monarchs and bees, bats and other pollinators. The goals are to educate a variety of audiences and age ranges, while improving pollinator habitat throughout the region. GPHC has partnered with Rothenberg Preparatory Academy. Rothenberg, which is located in downtown Cincinnati, has a rooftop garden program, run independently by Bryna Bass and Julie Singer. Learn more here. GPHC has a long-term plan in place with the school, which includes outreach visits, a school field trip to our seed nursery, and incorporating a pollinator garden into the rooftop. In October, this program kicked off when our outreach naturalist visited with a monarch tagging program. We are working on improving a highly visible park property. This project will take place on Route 50 in Delhi Township on part of Embshoff Woods Nature Preserve. GPHC will work to replace weeds with pollinator plants, benches and educational signage, as well as partner with local gardening/conservation clubs for maintenance of the space, in order to demonstrate how residential gardens can help our pollinators. GPHC is also working on converting a mowed area along a bike path in Fernbank Park to a pollinator plot. This project will take place in May 2017. This event will be a community volunteer project, an educational opportunity, and utilize current volunteer bee and butterfly experts. In addition to these projects the Outdoor Education Division has continued its mission to educate the public with pollination programs. One such program, Pollinator Power, not only took a look at Monarchs, but other pollinators within the region. Great Parks also hopes to create informational seed packets to give to event attendees, schools and gardening groups.

Green Schools Alliance: Created by schools for schools in 2007, the Green Schools Alliance (GSA) is a coalition that has grown to nearly ten thousand public and private schools in 53 countries representing over seven million students and a billion square feet of school facilities. GSA launched its Pollinator Project, a campaign of the Student Climate & Conservation Corps, to encourage action on the issue and raise awareness through its global, peer-to-peer community. Outreach efforts include: a dedicated campaign page on our website with links and resources; a featured Pollinator Project block in our monthly newsletter; frequent posts to social media; sharing of best-practices by connecting schools with gardens to those who would like one; highlighting The Bella Garden Project, an exemplar member school garden, at the NAAEE National Conference in San Diego; and partnering with the E.L. Furr HS Green Institute and the US Forest Service to replicate and scale their East End Houston Greenbelt Initiative, a habitat restoration and urban garden project. In addition, participants in the GSA's and USFWS' annual Student Climate & Conservation Congress are encouraged to make pollinator gardens part of their Action Plans for projects that they complete when they return to their schools.

Journey North: Journey North is an international citizen science project that tracks monarch migration each fall and spring as the butterflies travel to and from Mexico. Participants are based at over 60,000 sites across North America, including formal and informal educational settings. People report sightings from the field, track

MONARCH JOINT VENTURE 2009-2016

migration on real-time maps, and help scientists learn more about the critical migratory stage of the monarch's annual cycle. Monarch migration news is published weekly and incorporates sightings and images from the field. Journey North provides an easy entry point to citizen science, with relatively simple protocols, strong online support, and immediate results. Beyond its value to science, the project unites people across North America to celebrate monarchs and their migration.

Lady Bird Johnson Wildflower Center: The Wildflower Center 279-acre campus is a monarch waystation with 650 native plant species and high concentrations of pollinator plants. Our Insectary raises eggs and caterpillars from the garden, which educates the public about monarchs and other pollinators year-round. The Ecosystem Design group performs landscape-scale native ecosystem restoration on and off-site to enhance pollinator habitat. We conduct research with USFWS to increase native milkweed seed ecotype availability. The goal is to enhance production of Texas milkweed by collecting all Texas milkweed species seeds, propagating plants and providing seed to growers. Germplasm from seeds across each's geographical range are collected, conserved, banked and available for future use. Our Nursery Program is growing 6,000 milkweed plants for Austin area schools in partnership with NWF's initiative to increase school monarch butterfly gardens this year, and developing milkweed plant propagation protocols for distribution to growers. Native pollinator plants are propagated year-round to enhance habitat in our botanic garden and for sale. Our education programs engage all levels with pollinator conservation outreach. Our Native Plant Information Network is one of the largest plant education information databases (<https://www.wildflower.org/explore.php>). We provide pollinator/plant education through University of Texas Informal Classes, Landscape for Life, and elementary and pre-school programs. Our family-oriented community outreach education programs feature native pollinator conservation. We train citizen scientists to collect milkweed seed and conserve and grow local milkweed. The training includes presentations, a webinar, obtaining milkweed seed ecotype collection best practices, and pollinator education. We work with Native Plant Society of Texas, Texas Master Naturalists, Master Gardeners, and community based volunteer organizations.

Loudoun Wildlife Conservancy: In this fourth year of our Loudoun county (VA) monarch program, we focused on building on our foundation. We continued to work with the Virginia Dept of Transportation as they implemented changes to roadside management practices and supported planting efforts at commuter lots that engaged local students and local native plant society volunteers. For the past 4 years we have been working with Loudoun County Public Schools to become the first school system in the country with certified Monarch Waystations at every school and curriculum to support their use. Administrators are currently making changes to school programming to incorporate teachings pertaining to Monarch butterflies, habitat and restoration into their curriculum so that it is not something extra for teachers but instead is part of their jobs. To date, 46 out of 86 schools have certified waystations and we are developing an aggressive plan to complete the rest of the school waystations over the next 2 years. In addition, we gave talks at conferences and to local groups and schools, reaching approximately 2000 people. And, we made milkweed available to local residents via Monarch Watch, having plant sales through the spring and early summer and getting 3000 milkweed plants into our community. Loudoun volunteers also represented Monarch Watch at the White House Easter Egg Roll for the second years, introducing thousands of people from diverse backgrounds to the magic of Monarch butterflies.

Make Way for Monarchs: Make Way for Monarchs is a milkweed-butterfly recovery alliance of farmers, nurserymen, non-profits, universities, corporate partners, and faith-based communities and is co-facilitated by Dr. Gary Nabhan and Ina Warren. Among our primary goals include promoting respectful dialogues and engagement with government agency officials, industry and farmer organization leaders including not only scientists and farmers, but ethicists, educators, faith-based leaders and sustainable agriculture leaders; second, to provide training workshops IN northern Mexico and the U.S. for nurserymen, farmers, ranchers, highway landscape designers and seed collectors s on how to minimize harm to milkweeds/monarchs; and lastly, to engage the general public through social media with imaginative messaging and networking. In addition to our active blog postings on our website, our most recent publications are "Food Chain Restoration for Pollinators: Regional

MONARCH JOINT VENTURE 2009-2016

Habitat Recovery Strategies Involving Protected Areas of the Southwest" in the Natural Areas Journal and an NRCS Technical Note entitled: "Monarch Recovery from a Milkweed's Point of View: Milkweed Seed Supply Chains for Monarch Habitat Restoration. Available here: MakeWayforMonarchs.org. Our Board of Advisors is a group of scientists, restorationists, writers, environmental educators and farmers from three countries.

Metro Blooms: Metro Blooms saw a host of successes in 2016 through its work to improve and protect the environmental health of the urban landscape and the waters that it drains into. We continue to grow, bloom, and inspire gardeners throughout the Twin Cities metropolitan area. Through our Garden Awards program, we've honored over 900 publicly visible gardens in Minneapolis that beautify our city and help to create a healthy urban environment. Through our raingarden workshops, we've reached over 500 Twin Cities residents, 1/3 of who have since finished or at least begun installing a raingarden or native planting on their properties, and an additional half of who are planning on doing so. Metro Blooms has also directly engaged residents of 8 Minneapolis neighborhoods, working with them to get 214 native plantings and raingardens full of host plants and food sources for monarchs and other struggling pollinators. Lastly, through the Blue Thumb program, a public/private partnership focused on the promotion of native plantings, raingardens, and shoreline stabilization, Metro Blooms has reached thousands of homeowners at fairs, festivals and conferences, and collected over 400 pledges from property owners in Minnesota, Wisconsin, Iowa, Kansas, Missouri and beyond to turn a collective 19 acres of turf into native plantings. We plan to refine and refresh our Pledge to Plant campaign in 2017, and follow up with those who've already pledged in order to register their plots with the Million Pollinator Garden Challenge.

Missouri Prairie Foundation: A 50-year-old, volunteer-governed organization, Missouri Prairie Foundation (MPF) is the only organization in Missouri whose land conservation efforts are devoted exclusively to native grasslands. MPF's mission is to protect and restore prairie and other native grassland communities through acquisition, management, education, and research. With the adoption of its Grow Native! program in 2012, MPF also promotes the use of native plants for wildlife and pollinator habitat, and many other applications in the built environment. The Grow Native! program's service area is the lower Midwest, a key area for monarch habitat. Within this area, the program helps market the native plant products and services of its professional members such as nursery owners, native seed producers, landscape architects and land care professionals. It also drives demand for native plants by educating consumers of their benefits. In addition to the Grow Native! program, all of MPF's conservation activities benefit monarch butterflies. MPF has acquired and stewards more than 3,000 acres of original and some reconstructed prairie in 20 tracts of land, which provides habitat for at least 11 species of *Asclepias* and dozens of native plants that are nectar sources for monarchs.

Monarch Alert: We collaborate on monitoring O.e. prevalence in diapaused and winter breeding monarchs across Coastal CA and use data from citizen science and native milkweeds to establish whether there is a year round breeding population of monarchs in Southern CA. We collaboratively sample monarchs for O.e. at 4-5 overwintering sites from Central to Southern CA. These samples provide a measure of the parasite load in the migratory (diapause) population. We provide tags to interested garden enthusiasts with milkweed in exchange for data on backyard monarchs, and encourage them to provide O.e. samples from their monarchs to Monarch Health. They are a measure of the parasite load in the non-diapause (breeding) population. We expect these data will allow us to test whether overwintering and winter breeding monarchs differ in O.e. prevalence, and whether winter and summer breeding monarchs differ in O.e. Anecdotal reports suggest a year round breeding phenomenon is occurring in Southern California. We are close to submitting a manuscript showing summer, winter, and year round breeding in several areas of Coastal CA. It doesn't address O.e. prevalence. We've streamlined our tag distribution and developed an on-line data form hoping to collect more data. We have identified multiple sites in three coastal California Counties, with large populations of native *A. fascicularis*, *A. eriocarpa*, or *A. californica*. These sites are being monitored year round for evidence of breeding, with a focus on post-diapause breeding and winter breeding. These sites are being compared to gardens in those same counties with *A. curassavica*. The results from this work should help us become better informed and develop more robust

MONARCH JOINT VENTURE 2009-2016

recommendations regarding planting/managing native and non-native *Asclepias* in the winter range of Western monarchs.

Monarch Butterfly Fund: The Monarch Butterfly Fund (MBF) fosters monarch butterfly conservation in the Monarch Butterfly Biosphere Reserve in Mexico (MBBR). Our vision is to provide habitat restoration, research, monitoring, education and support for sustainable community development in and near the overwintering grounds in Mexico. MBF focuses on forest restoration in the buffer zone of the MBBR. We have encouraged and established partnerships with local and international organizations to support comprehensive, science-based reforestation and projects that engage local communities. Trees for reforestation are carefully selected and monitored. We also participate in experiments such as applying organic fertilizer and planting trees at different altitudes to understand how to best adapt to changing climate. In addition, the Monarch Butterfly Fund coordinates environmental education and conservation workshops and supports sustainable development projects such as the construction of fuel-efficient stoves and cisterns to capture rain water.

Monarch Health: Monarch Health is a citizen science program based at the Univ. of Georgia. We work with over 150 volunteers across North America each year to track patterns in monarch disease caused by the protozoan parasite *Ophryocystis elektroscirrha* (OE). Citizen science data from Monarch Health allow us to observe changes in OE infection over time and space – crucial information to monitor this natural enemy of monarch butterflies. We have examined these data to understand how monarch migration affects OE infection and to explore the drivers of disease in monarch populations. Citizen scientists helped to show how long-distance migration reduces disease in monarchs each fall, as reported in a scientific paper in 2011. More recently, citizen scientists demonstrated that non-migratory monarchs that breed year-round in areas with exotic milkweeds are at high risk of becoming infected, as published in two papers from 2015 and 2016. New analyses are exploring the longer-term trends in OE prevalence across North America and their relationship to monarch densities, climate and landscape features. Our scientists and volunteers work together to understand the role of infectious disease in monarch ecology and to develop recommendations for providing habitat that supports healthy monarchs.

Monarch Lab (University of Minnesota): The Monarch Lab is devoted to education, outreach, and research focused on monarch butterflies. In 2016, the Monarch Lab included six graduate students conducting monarch research, twelve undergraduate students who assist in research and outreach projects or conduct their own independent research, and three staff members who focus their efforts on education and outreach. In summer 2016 the Monarch Lab hosted four workshops for K-12 teachers (reaching over 150 teachers) on monarch biology, ecology, conservation, schoolyard science, and citizen science. Citizen science topics focused on birds, dragonflies, phenology and other pollinators, in addition to monarchs. Each December the Monarch Lab hosts the Ecology Fair, a platform for teachers and their students to bring their own research projects to showcase. The students are interviewed by university scientists, have a chance to learn from their peers, and the opportunity to attend interactive breakout sessions with an ecology theme. The Monarch Lab also runs the Monarch Larva Monitoring Project, a citizen science project which just completed its 20th year, engages hundreds of adults and children in monarch monitoring, and has resulted in 24 peer-reviewed publications.

Monarch Watch: Grants: In 2016, Monarch Watch received funding from NRDC to supply free milkweeds to 370 schools and non-profits. To date we've distributed 18,000 free milkweeds to nearly 560 schools, libraries and other non-profits. We added two persons to the staff this year. Dena Podrebarac facilitates the distribution of milkweeds through our restoration program and Matt Tucker coordinates communications with schools and non-profits that received free milkweed. Matt has developed a Monarch Waystation Network to support and connect schools with Waystations. We distributed over 206,000 milkweed plugs this year through our partner nurseries. Eighty-three percent of these distributions were made possible through donations from industry, NGOs and private individuals. Over 250 organizations and individuals from 12 ecoregions received and planted milkweed plugs through this program. The restoration sites include private land, businesses, schools, nature centers, zoos, nature trails, rest areas, roadsides, golf courses, and churches, as well as city, county, state, and national parks. A

MONARCH JOINT VENTURE 2009-2016

small grant funded by MJV helped establish restoration projects with Tribal Nations in Oklahoma. Through a subsequent grant funded by NFWF, we are working with 7 tribal nations to restore 350 acres of milkweed/pollinator habitat on tribal lands in eastern Oklahoma. Programs: Monarch Waystations. 2500 Monarch Waystations were added to the registry this year. Monarch Tagging: This fall we issued over 240,000 tags (over 2200 tagging kits) to taggers east of the Rockies. Monarch Conservations Specialists: This extraordinary group of volunteers communicates the monarch message to 10s of thousands of people each year. Connections: Our monarch diet is now being used in 4 laboratories for research on the genetic basis of behavior and to establish the relationships between monarchs, plants, pathogens, and mycorrhizal fungi. We are continuing to develop and test a model that both explains and predicts monarch numbers from year to year.

Monarchs Across Georgia: Established in 2000, Monarchs Across Georgia (MAG) is a volunteer-based committee of the non-profit 501(c)(3) Environmental Education Alliance of Georgia (EEA) that is dedicated to monarch education, habitat restoration, and citizen science. Our mission is to inspire caretakers of the natural environment through monarch and pollinator education. Our current programs include the Pollinator Habitat Certification Program Although the majority of our 230+ certifications are within Georgia including 56 of our State Parks, this is a national program with monarchs as the focus, but also benefiting many other pollinators. Suggested plant lists and sample designs have been developed to simplify this process. These habitats are also registered with The Greater Atlanta Pollinator Partnership, an award-winning project of the USFS International Programs. Another program is the Pollinator Habitat Grants funded with the profits from our native plant sales and our partner, USFWS, we have awarded thirty-five pollinator habitat restoration grants at schools and organizations in Georgia since 2012. We administer these grants, totaling \$49,500, for a period of 10 years. MAG hosts educator workshops and sessions accredited by the GA Department of Education and utilizing Monarchs in the Classroom's Monarchs and More curriculum, our 10-hour workshop targets formal and non-formal educators and includes training in citizen science projects (Monarch Health, Monarch Larva Monitoring, Journey North and tagging). In 2016 alone, over 60 educators completed this workshop. Additionally, sessions were presented at the annual EEA Conference and Outdoor Learning Symposium. MAG helps out at the Speaker's Bureau by invitation, we make presentations, set up displays and activities at meetings and events in Georgia. In 2016 we have traveled over 5,000 miles and carried our message to over 6,000 people. We also work on web pages and newsletter links and resources for citizen science, education, habitat restoration and conservation are provided through <http://www.eealliance.org/mag> and our semi-annual e-newsletter, The Chrysalis, is distributed to our list-serve.

National Recreation & Park Association: NRPA is a national non-profit organization of 50,000 professional and citizen members from public parks across the nation. As part of NRPA's focus on conservation, the Association has worked to promote and coordinate monarch conservation activities in local, urban, regional, and state parks. Through articles in its national publication, Parks and Recreation Magazine; education sessions at its national conference; webinars; an online resources guide; social media; blog posts, and other social and print media, NRPA works to create an interconnected network of public parks for monarchs and other pollinators. NRPA especially promotes the involvement of children and youth in monarch conservation in parks, the engagement of the public in citizen science projects, and the planting of milkweed and establishment of Waystations in suitable habitat in parks. NRPA's "Parks for Monarchs" campaign, launched in 2015 now has over 500 park agencies in support and the goal is to engage 1,000 public park agencies over the next three years in monarch conservation activities. Notable in the past year is the completion of a new resources guide for parks in cooperation with MJV. Titled "Parks for Monarchs: A Resources Guide for Monarch Conservation," this 36 page guide provides excellent information on how park and recreation agencies can begin or enhance monarch conservation activities in parks. The guide is also suitable for volunteers and organizations supporting monarch conservation on public lands. This guide and other info on NRPA's Parks for Monarchs campaign is available at www.nrpa.org/parks4monarchs

National Wildlife Federation: Since NWF signed an MOU with USFWS in 2015 to formally collaborate on saving the monarch butterfly, NWF has increased education and engagement of citizens and leadership nationwide to create more habitat for monarch conservation. All efforts support MJV's implementation plan. Particular emphasis

MONARCH JOINT VENTURE 2009-2016

has been in the central flyway states. NWF regions, affiliates and staff efforts partnering with USFWS, Fish and Wildlife Agencies and MJV have resulted in the Missourians for Monarchs summit, and a guide for convening state monarch conservation planning summits: http://www.nwf.org/~media/PDFs/Garden-for-Wildlife/NWF-Monarch-Summit-Guide_08152016.ashx. We have coordinated efforts in Michigan, Illinois and have engaged cities in the St Lawrence collaborative. Several hundred schools have been supported in monarch habitat activities throughout Texas and Oklahoma. The six state DOTs comprising the I-35 corridor have signed an MOU to identify this federal highway as the “Monarch Highway”. NWF has been coordinating with the leadership from these state DOTs, White House OSTP, USFWS, and MJV partners to look at strategies to educate the public about roadside habitat and expand habitat throughout communities surrounding the highway. Over 200 Mayors have taken the Mayors’ Monarch pledge. The National Pollinator Garden Network has expanded to over 40 national organizations that promote the Million Pollinator Garden Challenge (MPGC), engaging 15,000 schools, 10,000 garden centers and nurseries and millions of individuals. ~200,000 gardens are providing pollinator friendly garden habitat to date. NWF continues to promote Monarch Lab Curricula and compiled an inventory of K-12 resources. NWF developed a STEM based monarch outdoor classroom curriculum piloted in Connecticut through funding from Lego. Approximately 100,000 Butterfly Heroes Garden Starter milkweed kits were distributed as part of the 2016 spring campaign. 50,000 kits were distributed directly through Subaru. The total effort resulted in over 85,000 youth and families engaged to create milkweed habitat.

Native Plant Society of Texas: NPSOT developed site plans, an interpretation plan, and planting plans for the monarch waystations to be established in four Texas Department of Transportation (TxDOT) rest areas on Interstate 35 between Austin and Dallas. Phase I of the Hill County Safety Rest Area monarch waystations was implemented in September and October, culminating in the Welcome the Monarchs! Field Day held on October 13, 2016, when over 30 volunteers planted 13 species of native pollinator plants in landscape beds totaling 1,400 sq. feet in front of the visitors’ center. Milkweed species planted included *Asclepias asperula*, *A. tuberosa*, and *A. viridis*. In addition, volunteers and staff representing NPSOT, TxDOT, U.S. Fish and Wildlife Service, Journey North, Monarch Watch, and the Hill County Master Gardeners were on hand with exhibits, including live monarch butterflies, to provide outreach to visitors. For the Bring Back the Monarchs to Texas (BBMT) grant program applications far exceeded expectations. 74 applications were received with 63 applications meeting the criteria. \$16,375.00 was distributed to these applicants in amounts of \$50 - \$400 to purchase native milkweeds and native nectar plants to create or supplement Monarch demonstration gardens or Monarch Waystations. All funds were donated by chapters or individuals with the USFWS adding a \$5,000 donation. BBMT committee members visited many of the sites offering consultation, additional resources and outreach and education. There was great interest and a predominant number of applications in the Dallas, Houston, Austin, and San Antonio urban and suburban areas showing a promising new interest in creating native habitat in these otherwise habitat desert areas. We are reaching a greater diversity of demographics as well, seeing many more inner city community gardens and schools.

Naturedigger: Naturedigger’s Monarch SOS app is a dynamic citizen science tool that has evolved, and continues to evolve, in cooperation with the Monarch Joint Venture. Initially, it was launched as a butterfly and milkweed field guide to assist the general public, but more specifically, citizen scientists collecting monarch population, migration and conservation data as well as milkweed habitat data for MJV programs. It now includes a Twitter feed for MJV partners and citizen science reporting, which is expected to deliver more timely, accurate and complete reports, making analyzing data easier for partners using the app. Throughout 2016 the app incorporated reporting for Southwest Monarch Study, Xerces Society for Invertebrate Conservation and US Fish and Wildlife Service. These reports include Tagging and Reporting a Tag, Western Monarch and Western Milkweed Sightings and the Western Monarch Count. Other organizations’ reports are complete or nearly complete and available for testing now or this winter/early spring. We are currently working with MJV partners to add additional reports and to deliver Monarch SOS data to partners’ individual databases in real time. Updating and improving the app is a priority. Improvements include enhanced reporting with guidance and input received by MJV partners and citizen scientists in the field. We’ve noticed an uptick in usage of the milkweed section possibly due to increased

MONARCH JOINT VENTURE 2009-2016

funding for habitat restoration projects in key areas critical to monarch survival. This section would be even more beneficial with additional milkweed images, data, and an easy to use identification key. We are developing a server to make data collection and retrieval easier and more efficient for MJV partners who are unable to support that level of infrastructure. The server should be available for testing in spring 2017 and the Android version is scheduled for release by the end of 2017.

North American Butterfly Association: NABA is currently implementing the Southernmost Monarch Waystation project funded by NFWF at the National Butterfly Center. We continue to look for new partnerships and collaborative opportunities to address Monarch decline. Our Garden/Habitat Program (and coinciding certification program) provides information and technical assistance to our members and others about which plant species to use in plantings, how to deal with pest issues using earth-friendly alternatives to pesticides. NABA's National Butterfly Center educated thousands of people annually about Monarch life history, habitat requirements and population threats. With a new (first) Executive Director we are looking to scale up on-the-ground conservation practices particularly for prairie butterflies and forging new relationships with other professionals in the US, Canada and Mexico. Founding Member/Steering Committee for Monarch Joint Venture, Pollinator Protection Campaign, Million Pollinator Challenge, National Pollinator Garden Network and more.

Ohio Pollinator Habitat Initiative: We have worked hard since our start to establish a presence within the State of Ohio through outreach events and word of mouth. In just two years, OPHI partners have participated in over 60 outreach events giving us the ability to create a successful social media presence (mainly Facebook). We have developed a steady following on this format and have brought about the creation of an informational website about our projects, educational resources, information about pollinators and habitat creation. Most recently, OPHI interns have set up a twitter account to reach a broader audience, sharing information and news from OPHI from the field. To help foster the creation of habitat for the monarch butterfly, OPHI in cooperation with Ohio Soil and Water Conservation Districts along with multiple state partners has organized the first Annual Statewide Milkweed Pod Collection. All milkweed pods collected during this time will be processed by OPHI partners and all of the seed collected will be used to establish new plantings and create additional habitat for the monarch butterfly throughout Ohio. In addition, our partnership with the Ohio Department of Transportation has fostered the creation of over 400 acres of roadside pollinator habitat not to mention the creation of a statewide roadside pollinator habitat creation and maintenance handbook. We are continually establishing partnerships throughout the state including working with the Pollinator Partnership on a successful NFWF grant proposal that will incorporate over 300 seed collections over five states that will generate over 9,000 nectar seedlings for use within the Eastern Broadleaf Forest-Continental Province. We had our first annual symposium August 31, 2016 in which we had over 400 attendees and many wonderful not to mention knowledgeable speakers. We hope to continue in these efforts creating habitat for monarchs and other native pollinators throughout the state while continuing to foster partnerships to strengthen this initiative for years to come.

Pacific Grove Museum of Natural History: The PG Museum is supporting monarch conservation in a few different ways: 1) providing monarch school education programs at the Museum and the Pacific Grove Monarch Sanctuary 2) providing docents for the Monarch Sanctuary 3) handing out free seeds to residents of California 4) lead Xerces Society Western Monarch Thanksgiving Counts for Monterey County 5) Science Saturday- Monarchs (free family science event) and 6) developing pollinator gardens and education programs for 11 local elementary schools. Seeds program: For those near monarch overwintering sites, we have been supplying the seeds of native nectar plants to provide food sources during the overwintering season. For those that are more than 10 miles away from overwintering sites, we have been supplying milkweed seed packets and seed packets that are a mix of milkweed and nectar flower seeds. This is growing in large part because the increased partnership with the Master Gardener community and their outreach efforts. Pilot Program: During the 2014-15 overwintering season, the PG Museum took on a monarch tagging and parasite sampling project in partnership with Monarch Alert and Monarch Health Lab that was a success, but we didn't have funding to continue the program for the 2015-16 year.

MONARCH JOINT VENTURE 2009-2016

We are hopeful that in the next few years we will be able to continue this program to benefit resource managers and the larger monarch research community.

Pheasants Forever and Quail Forever: Pheasants Forever, Inc. and Quail Forever are nonprofit conservation organizations whose mission “is dedicated to the conservation of pheasants, quail and other wildlife through habitat improvements, public awareness, education and land management policies and programs”. Through our structure of local chapters, we have grown since 1982 to 146,000+ members in 750+ chapters across the country. On an annual basis, our team of 130 Farm Bill Wildlife Biologists that are co-located in local USDA service centers work on 35,800+ individual landowner contacts and impact over 1.3 million acres by helping landowners enroll in USDA and state conservation programs, design high quality seeding mixtures and develop conservation plans. As an organization, we spent \$69.2 million on over 1.4 million acres of habitat projects to deliver our mission last year (\$634 million spent and 14.1 million acres impacted since inception in 1982). Because high quality pollinator habitat is closely aligned with high quality wildlife habitat, the organization has improving pollinator health as a strategic initiative. Some of the impactful ways that PF can help deliver high quality pollinator habitat include: access to habitat equipment, the design of seeding mixtures, educational materials, youth pollinator habitat programs, access to pollinator seeding mixtures, incentive payments for habitat projects, development of innovative pollinator programs, the design and implantation of USDA conservation programs, etc. In 2016, PF planted 312.5 million milkweed seeds to provide critical monarch butterfly habitat in the Midwest and Great Plains. In 2016, PF and its partners completed a pilot program called the Honey Bee & Monarch Butterfly Partnership. The success of that pilot program has led us to launch a larger, regional program in 2017 that will be available in IA, MN, MO, NE, SD and ND. The program offers incentives to establish and manage high quality pollinator habitat for 3 to 6 year contracts with seed mixtures that are cost effective, deliver high quality pollinator benefits, handle weed competition issues and are readily accepted by landowners. The project and its seeding mixtures are being evaluated in 3 separate research projects to document their pollinator benefits.

Pollinator Partnership: In 2016, Pollinator Partnership (P2) was awarded a grant from the National Fish and Wildlife Foundation to begin a new project, Monarch Wings Across the Eastern Broadleaf Forest - Continental Province (MWAEBF-CP). This project focuses on increasing monarch habitat by facilitating an ecoregional seed collecting program, providing technical assistance to public and private land managers, and ensuring long-term monarch habitat establishment. P2 is working in parts of Arkansas, Illinois, Indiana, Missouri, and Ohio, utilizing the Eastern Broadleaf Forest - Continental Province ecoregion as the boundary for target states. Additional core partners include U.S. Fish and Wildlife Service’s Partners for Fish and Wildlife Program, Illinois Department of Natural Resources - Mason State Nursery, Ohio Department of Natural Resources, Ohio Pollinator Habitat Initiative, and Pheasants Forever. The objective is to complete 300 seed collections of milkweed and monarch nectar species throughout the region over a two year period, provide technical assistance to land managers through workshops, trainings, and webinars, and create 4,688 new acres of monarch habitat. This ecoregional approach will help maintain genetic diversity within an ecoregion and boost both the resiliency and adaptability of our newly created monarch habitat. This new project is an extension of P2’s larger, Monarch Wings Across America program, which has already been launched in Ohio, with Monarch Wings Across Ohio (MWAO). Thirteen monarch habitat research plots have been established across Ohio in urban areas, public gardens, farms and corporate lands including utility rights-of-way. Data is being collected off of each of the plots to develop Ohio-specific monarch habitat planting manuals with plant lists for urban areas, farms, public gardens and corporate lands. In addition, P2 will award the second Monarch Sustainer of the Year Award to a corporation, this January, at the U.S. Business Council for Sustainable Development meeting.

Prairie Restorations, Inc.: Prairie Restorations, Inc. has been working to restore native plant communities since 1977. I think we are the oldest full service restoration company in America. In that regard, we are very gratified by what has been accomplished but very anxious about what needs to be done. Although we win some battles, we may be losing the war. We know that the stability of species, whether monarchs or another species, depends on diverse native habitats. The synergies that exist between insects and their hosts plants requires both parties to be

MONARCH JOINT VENTURE 2009-2016

in the dance and our job is to make certain of that possibility. Our support of MJV is just another logical synergy. Our missions are closely aligned with species preservation being the strongest common bond. At PRI we will continue to introduce supporting plant species whenever we can. We will also offer opportunities for research and education as needed or requested. Currently Karen and students studying with her are utilizing dozens of PRI restoration sites to evaluate species presence and use. We are confident that these sites and thousands of other restoration sites can and will make a difference in the fight to save the Monarch. We are extremely proud to be allies with MJV in this effort. Although it is difficult to know what lies ahead, our commitment to plant community restoration and to MJV will remain in place for as long as there is work to do. In that regard, we anticipate many good years of this great team effort and wish MJV every success going forward.

San Antonio Zoo: The San Antonio Zoo is a leader in butterfly conservation with our seasonal butterfly house exhibit where we educate over a million visitors about monarchs and pollinators yearly. All of the proceeds from the butterfly house are sent to help conservation of butterflies worldwide. We also spend over 30,000 dollars each year on the conservation of exotic butterfly species. The San Antonio Zoo's monarch and milkweed butterfly conservation program provides the Zoo with the beauty of returning monarchs, provides an educational opportunity for our guests to see a native species that they can help directly, connects them to the world of butterflies - thereby fostering an appreciation for invertebrates and the plants they depend on - and also provides Zoo guests, volunteers and butterfly interpreters an opportunity to participate in citizen science programs onsite and offsite. This project also helps bolster the relationship with our citizen science conservation partners at Cibolo Nature Center and Farm, Texas Parks and Wildlife, Master Naturalist, San Antonio River Authority, National Wildlife Federation, state, national and local universities and the San Antonio community. We have dedicated ourselves to a yearly monarch conservation education festival (Monarch Fest) and to help highlight the monarch conservation efforts in our city. We have dedicated to dedicated to supplies plants, labor and install 16 school pollinator gardens throughout San Antonio Texas as part of the Mayor's Monarch Pledge from Sept 2016 to May 2017. We are working to make a train the trainer workshop for citizen science. And work on a petition to local gardens to provide them with a list of natives that citizens are trying to get. We will continue our citizen science efforts with Monarch Watch, Monarch Larva Monitoring Project, Monarch Health and Journey North.

Sand County Foundation: SCF is a non-profit conservation organization supporting private landowners to advance voluntary, ethical, and scientifically sound land management practices that benefit people and the environment. Our Monarch and Pollinator Conservation Initiative focuses on private farms and energy facilities within the monarch migration corridor. We are providing guidance to utility companies and electric cooperatives regarding habitat restoration opportunities, and benefits of joining coordinated state and national recovery efforts. We are also developing a program to engage high school students participating in FFA with hands-on habitat restoration activities on farms and energy facilities. We have published monarch-focused articles in magazines of the Wisconsin Farm Bureau, the National Cattlemen Beef Association, the Edison Electric Institute, the Utility Arborist Association, and Transmission and Distribution World. In addition to being a partner of the Monarch Joint Venture, Sand County Foundation is an active member of the Keystone Policy Center's Monarch Collaborative, a partner of the Iowa Monarch Conservation Consortium, and participant with the University of Illinois-Chicago Rights of Way as the Habitat Working Group.

Southwest Monarch Study: SWMS is a citizen science project dedicated to monitoring and tagging *Danaus plexippus* in the Southwestern United States of Arizona, New Mexico, Utah, Nevada and the deserts of Southern California. Our mission is to identify and describe the migration flyways of monarch butterflies by tagging monarchs each fall. We encourage tagging monarchs in the winter if monarchs are present and monitoring of any breeding activity. We monitor monarch breeding habitats and advocate for monarch conservation including native milkweed seed collection and distribution. We offer educational programs on the monarch life-cycle in the Southwest and tagging/monitoring training. So far in 2016 we've conducted 64 workshops and presentations, as well as covering monarch awareness tables at 22 events. In addition we've participated in numerous planning meetings with NGOs and government agencies. We are proud to present our first published paper, "Status of

MONARCH JOINT VENTURE 2009-2016

Danaus plexippus in Arizona” available on our website. Lastly, we provide a meaningful research project for citizen scientists of all ages. Everyone is welcome.

Tallgrass Prairie Center: The TPC restores native vegetation for the benefit of society and the environment. Our Natural Selections program has released 36 species of native nectar plants for commercial seed producers. We are currently developing three new species of milkweed and a prime, late-summer nectar species, meadow blazingstar, for eventual release. We share our experience in agronomic production methods for the benefit of tallgrass prairie restorations across the region. The Integrated Roadside Vegetation Management (IRVM) program applies for federal funding to purchase about 1500 acres worth of native, source-identified seed per year to Iowa counties each year. The seed mixes include generous helpings of swamp and butterfly milkweed, plus grasses and dozens of species of nectar plants. The IRVM program also encourages county governments to hire roadside vegetation managers and develop Integrated Roadside Vegetation Management plans. Counties who do this are actively trying to reduce mowing and herbicide use on roadside weeds, which further benefits monarchs. The Prairie on Farms project is extending habitat to prairie strips within crop fields. We have installed 34 acres of high quality prairie strips on nine farms so far this year with eleven more sites lined up for this fall and next spring. Workshops, field days, and how-to information, including the on-line Iowa Prairie Seed Calculator, are available for landowners, operators and conservation professionals who are planting prairie. Finally, we are conducting research to improve seed mixes and management methods, while minimizing weeds and reducing costs.

Three Rivers Park District: Three Rivers Park District has been actively managing native habitats, especially our 2000 acres of prairies for a wide variety of wildlife, including invertebrates for over 40 years. We regularly seed our prairies and woodlands with up to 6 species of milkweed and numerous nectar plants. In 2016, we spread 240 pounds of forb seed on a new 160 acre prairie, 5 pounds of which were milkweed species and 30 pounds were blazing stars. This is part of the District’s initiative to increase its prairies. We have planted 500 acres in the last 3 years and have an additional 400 acres planned for the future. We are modifying our prescribed burn plans to be more insect friendly by adjusting burn locations, intervals between burns, and unit size. The District has also been involved in using monarchs in our environmental education programs for over 30 years. Some of the original monarch tags recovered from Mexico were from Lowry Nature Center. All of our Nature Centers are still involved with monarch tagging through Monarch Watch at Univ. of Kansas. They are also participating in the Monarch Larva Monitoring Project through the Monarch Lab at the Univ. of Minnesota. The District is a partner in a new group concerned on the increase of “pollinator” and “monarch” seed mixes that are being widely distributed. Many contain improper seed and seed of unknown origin. We are discouraging their use in Minnesota.

Wild Ones: Wild Ones has put together a power point presentation that is shared with community groups, schools, the public and others to promote monarch education and awareness. A new citizen science presentation has been added. Our Wild for Monarchs program has distributed thousands of milkweed seeds and plants at festivals, farmers markets, presentations, libraries, nurseries, schools, churches, and clubs. Wild Ones chapters throughout the country have partnered with other like-minded organizations to promote monarch waystations, provide bilingual workshops on monarchs, and have also encouraged law makers including the President and Governors to plant milkweed and other native plants to help monarchs. One of our chapters is involved in rehabilitating a 9½ acre abandoned landfill with native flowering forbs intending to recapture some vital habitat for pollinators in general and monarchs in particular. Last year Wild Ones promoted a Citizen Science Monitoring project to promote monarch butterfly conservation. For more information go to www.wildones.org/citizen-science. Our chapter members who attended our annual conference were trained how to be citizen scientists. Wild Ones offers grants through our Seeds for Education (SFE) program to non-profit organizations that are planning to develop an outdoor learning center using native plants. This year we had 40 applications from across the country. We also continue to publish a regular column in our Journal called Monarch Matters, as well as posting articles on our website, blog and twitter of monarch events and happenings.

MONARCH JOINT VENTURE 2009-2016

WWF U.S.: World Wildlife Fund U.S.'s monarch strategy has four main elements. Though our Monarch Squad, now at 220,000 members and growing we are building awareness and action by expanding the base of support among WWF grassroots constituents and digital activists for monarch conservation, especially in the flyway states. We'll use the Monarch Squad plus other communication assets like our Wildlife Magazine to engage and inform the public about the importance of the monarch, its migration, impacts of climate change, and threats to its migration, and offer concrete things that can help. For example, the Feb 2017 edition of Wildlife Magazine will include a story showcasing how agricultural policy and farming practices impact monarch conservation, and profile 5 monarch champions. We are also working to broaden corporate awareness and support for monarch conservation through our work with the private sector, especially agribusiness companies. We are identifying agricultural policy reforms that would create positive (or remove negative) incentives for adoption of conservation practices and exploring opportunities to engage with farmers and ranchers adopting these practices. And, we are developing a coordinated effort with WWF Mexico and WWF Canada to enhance and support the refinement and implementation of an integrated tri-national strategy across the monarch's migratory flyway. We are starting with a focus on the flyway in Texas and Northern Mexico and will be integrating milkweed and nectar sources into our restoration efforts along the Rio-Grand/Rio Bravo River, deploying our monarch squad to support citizen science and other habitat restoration activities, and working to identify and address knowledge gaps about the monarch's migratory route to inform the design of effective conservation measures.

The Xerces Society for Invertebrate Conservation: Xerces has the world's largest pollinator conservation team, with 8 FTE currently working on monarch conservation. Our efforts include working with farmers to restore tens of thousands of acres of habitat for monarchs and educating thousands of farmers about its importance; increasing the availability of native milkweed and nectar seed for restoration efforts in multiple regions of the monarch breeding range; identifying key conservation areas for protection and restoration and developing management guidance for these sites, including overwintering sites in California and breeding areas through the West; providing technical resources to help land managers, farmers, and others protect and restore monarch habitat; engaging decision makers and government agencies in making monarch conservation a priority; working to better understand the monarch's status and the current threats it faces; and enlisting citizen scientists to monitor the species' status and recovery. We partner or contract with university researchers, NGOs, and federal agencies (such as NRCS, USGS, USFWS, USFS, BLM, and FHA) on monarch conservation and recovery projects. Executive Director Scott Hoffman Black co-chairs the Monarch Joint Venture, is an ex officio member of the Federal Monarch Butterfly High Level Working Group, and is a member of the National and Tri-National Monarch Science Partnerships. Mace Vaughan, Pollinator Program Co-Director and a partner biologist with the NRCS, is worked with the NRCS to develop their monarch conservation strategy and is working with Xerces partner biologists and NRCS staff to implement the strategy. Sarina Jepsen, Endangered Species Program Director, serves on the Keystone Monarch Collaborative steering committee and is working with the USFWS to develop a monarch habitat suitability model that will guide management and restoration in the western U.S.

Appendix 3: MJV Mission and Vision

Mission. Recognizing that North American monarch (*Danaus plexippus*) conservation is a responsibility of Mexico, Canada and the United States, as identified in the North American Monarch Conservation Plan, this Joint Venture will work throughout the U.S. to conserve and protect monarch populations and their migratory phenomena by implementing science-based habitat conservation and restoration measures in collaboration with multiple stakeholders.

Our mission will be achieved by coordinating and facilitating partnerships and communications in the U.S. and North America to deliver a combination of habitat conservation, education, and research and monitoring.

MONARCH JOINT VENTURE 2009-2016

Vision. The vision of this Joint Venture is abundant monarch populations to sustain the monarch migratory phenomena into perpetuity, and more broadly to promote monarchs as a flagship species whose conservation will sustain habitats for pollinators and other plants and animals.

References

Monarch Joint Venture Funded Projects Page: <http://www.monarchjointventure.org/our-work/mjv-funded-projects/>

Monarch Joint Venture Resources Page: <http://monarchjointventure.org/resources/downloads-and-links/>

Oberhauser, KS, D Cotter, D Davis, R Décarie, AE Behnumea, C Galino-Leal, MP Gallina Tessaro, E Howard, J Lauriault, W Macziewski, S Malcolm, F Martínez, JM González, M McRae, D Nernberg, I Pisanty Baruch, I Ramírez, J J Reyes, and A Wilson. 2008. North American Monarch Conservation Plan. Commission for Environmental Cooperation. Montreal, Canada.

Oberhauser, KS, MD Prysby, HR Mattila, DE Stanley-Horn, MK Sears, G Dively, E Olson, JM Pleasants, WF Lam, R Hellmich. 2001. Temporal and spatial overlap between monarch larvae and corn pollen. *Proceedings of the National Academy of Science* 98(21):11913-11918.

Pleasants, JM 2015 "Monarch butterflies and agriculture." *Monarchs in a changing world: biology and conservation of an iconic butterfly*. Ed: KS Oberhauser, Kelly R Nail, Sonia Alitzer. Cornell University Press, Ithaca.

Pleasants, JM 2016. Milkweed restoration in the Midwest for monarch butterfly recovery: estimates of milkweeds lost, milkweeds remaining and milkweeds that must be added to increase the monarch population. *Insect Conserv Divers*. doi:10.1111/icad.12198

Pleasants, JM, and KS Oberhauser. 2013. Milkweed loss in agricultural fields because of herbicide use: effect on the monarch butterfly population. *Insect Conservation and Diversity*. 6:135-144

Wassenaar, LI and KA Hobson. 1998. Natal origins of migratory monarch butterflies at wintering colonies in Mexico: New isotopic evidence. *Proc. Natl. Acad. Sci.* 95: 15436-15439. doi: 10.1073/pnas.95.26.15436

Contact Information

Coordinator, Wendy Caldwell: monarchs@monarchjointventure.org

Science Coordinator, Holly Holt: hholt@umn.edu

Communications Specialist, Cora Preston: mjv@umn.edu

Education Assistant, Shelby Kilibarda: kilib006@umn.edu

Monarch Joint Venture
2003 Upper Buford Circle, 135 Skok Hall
St. Paul, MN 55108
Tel: 612-625-8304
www.monarchjointventure.org

