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Legacy Resource Management Program**

USFS Monarch-23

**US Forest Service and Department of  
Defense Cooperation on Monarch Butterfly  
Conservation (Interagency Agreement)**

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INTERNATIONAL PROGRAMS | OFFICE OF THE CHIEF



# FY2023 Annual Activity Report

Prepared by:

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## ACRONYMS AND ABBREVIATIONS

BMPs	Best Management Practices
CARCD	California Association of Resource Conservation Districts
CDFW	California Department of Fish and Wildlife
DoD	Department of Defense
ECEC	Elkton Community Education Center
ESA	Endangered Species Act
EFTA	Environment for the Americas
IMMP	Integrated Monarch Monitoring Program
MJV	Monarch Joint Venture
NAVAIR	Naval Air Systems Command
NMFWA	National Military Fish and Wildlife Association
RCD	Resource Conservation District
UIC	University of Illinois-Chicago
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFS IP	United States Forest Service International Programs
USFWS	United States Fish and Wildlife Service
WMA	Western Monarch Advocates
WSU	Washington State University

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# INTRODUCTION

The Department of Defense, Legacy Resource Management Program (DoD Legacy Program) and the United States Forest Service, International Programs (USFS IP) are supporting six focal monarch butterfly conservation projects that were initiated in an FY2022 interagency agreement and continued through additional support during FY2023. The on-going work highlighted in this report will increase the efficiency and effectiveness of managing habitat for monarchs on DoD and other tribal, federal, state and private lands. Increasing knowledge and data from these projects will enhance military readiness by enabling DoD managers to balance habitat protection with training activities and other land uses. This work will contribute to key aspects of DoD land management by identifying priority areas for monarch conservation, providing on-the-ground support in baseline and ongoing data collection, developing best management practices for overwintering and breeding populations, and providing resources and virtual support on all aspects of monarch conservation. Ultimately the outputs of these projects will help DoD land managers maximize the use of their lands for training while considering the needs of a widespread at-risk species.

DoD Legacy Program and USFS IP staff are working collaboratively to ensure that all projects benefit both the monarch butterfly and military readiness. Partner activities supporting this objective include trainings, data collection, technical exchanges, consultations, planning support and developing best management practices (BMPs) for monarch butterfly management on DoD lands.

This FY2023 annual activity report serves as a compiled activity report for the USFS IP and DoD funded partners working on monarch butterfly conservation and management. Each partner submitted comprehensive reports encompassing their 2023 fiscal year activities. These individual reports are shared separately. The intent with this report is to provide a one-file summary of highlighted partner activities. A table summarizing the FY2023 partner and installation interactions and support is also shared separately.

# PROJECT COORDINATION

USFS IP has provided overall project coordination, including maintaining communications with partners and DoD, strategizing with partners and DoD to plan work that meets desired program outcomes, managing grants and contracts, overseeing project implementation, facilitating communication and linkages among partners and projects, and planning meetings.

USFS IP organized or participated in the following coordination meetings in FY2023:

- December 8, 2022: USFS IP & DoD Legacy Program Monarch Partners Meeting
  - Virtual meeting to introduce all partners to DoD and one another, share brief project overviews by each partner, and discuss needs, linkages, and opportunities.
- January 20-22, 2023: International Western Monarch Summit, sponsored by Western Monarch Advocates (WMA) and Deschutes Land Trust (DLT)
  - USFS IP and DoD monarch partners, including Xerces, Monarch Joint Venture (MJV), and Environment for the Americas (EFTA), attended the summit which focused on status of and priorities for conservation of western monarchs in San Luis Obispo, CA.
  - Presentations and networking discussions led to conservation action on DoD lands, including overwintering sites and inland areas.
  - One outcome of the meeting was a 2023-2024 focus on tracking monarchs through the Motus wildlife tracking system. This project is based in California and is co-led by Hillary Sardinias of California Department of Game & Fish and Xerces.
- February 16, 2023: Briefing to DoD Leadership
  - USFS IP worked with all project partners to prepare a virtual presentation briefing to DoD leadership to share information and hear feedback on their priorities.
- March 6-8, 2023, Monarch Conservation Meeting, co-hosted by MJV and University of Illinois Rights-of-Way as Habitat Working Group (UIC-ROWHWG)
  - USFS IP presented on the larger monarch conservation program and included highlights of the USFS DoD partnership.
  - The DoD Legacy Program presented on its work, including the goals of the partnership with USFS IP.
- March 19, 2023: National Military Fish & Wildlife Association (NMFWA) DoD Monarch Conservation Special Meeting
  - USFS IP worked with DoD to organize a half-day in-person meeting with DoD natural resource managers attending the annual NMFWA meeting in St. Louis, MO. USFS IP, Washington State University (WSU), Xerces, MJV, EFTA, and California Association of Resource Conservation Districts (CARCD) were all present and presented.



- The goals, objectives, and priorities of the DoD – USFS IP partnership were presented to DoD land management specialists, and feedback was solicited to allow the Forest Service and its partners to meet the specific priorities of the DoD.
  - DoD natural resource managers were encouraged to provide contact information and request a monarch/pollinator questionnaire by scanning a QR code generated by the MJV to help identifying how the monarch partners can best support natural resource managers with their monarch and other pollinator needs.
- March 23, 2023: National Military Fish & Wildlife Association Pollinator Working Group Meeting
  - USFS IP presented on the monarch program and cooperation with DoD at this in-person meeting in St. Louis, MO.
  - MJV Program Coordinator, Mercy Manzanares, became the Information Chair for the Pollinator Working Group (PWG).
- March 31, 2023: Collaborative Wildlife Protection and Recovery Initiative (CWPRI) Meeting
  - USFS IP presented on the monarch program and cooperation with DoD at this in-person meeting in Arlington, VA.
  - USFS IP also discussed potential connections to other program areas such as habitat for other migratory species, including birds and bats, and invasives species.
- May 16, 2023: Western Monarch Overwintering Science Meeting
  - USFS IP, and other DoD monarch partners, participated in this Xerces-organized workshop in San Luis Obispo, California that brought together researchers, land managers, and conservation groups to prioritize science and conservation needs for western monarch overwintering sites.

Beginning in March 2023, USFS IP coordinated project planning and Scope of Work development for FY2023 - 2024 through regular communications with DoD and project partners, resulting in obligating all FY2023 DoD funds into grants and contracts before the end of FY2023. Five of the six FY2023-funded projects received additional funds for continued work— Xerces, Washington State/ UC Davis, MJV, CARCD, and EFTA. New partners were added to fill gaps and complement ongoing work: James Madison University and Cellular Tracking Technologies for a study on Motus tag impacts on monarch butterflies; UIC Rights of Way as Habitat Working Group for analysis of opportunities to incorporate Rights of Ways in monarch habitat projects, and Dr. Karen Oberhauser for a review of management-relevant research for the Eastern monarch population.

In FY2023 USFS IP also recruited a new team member for their monarch program. The new position began in October 2023 and will increase USFS IP's capacity to coordinate and communicate with DoD and partners, as well as participate in related monarch efforts such as those led by U.S. Fish and Wildlife Service (USFWS).

# PROJECT 1

## Washington State University and University of California-Davis

### Ecological Studies to Advance Conservation and Management of Monarch Butterfly on Public Lands Across the West

Washington State University and its partners at University of California – Davis and James Madison University have built upon work initiated with the DoD Legacy Program in 2017 to determine seasonal timing of western monarch butterflies in locations across the West, and to use this information to increase the efficiency and effectiveness of managing habitat for monarchs on DoD lands in the West. In FY2023 this project supported field research across five western states (CA, ID, NV, OR and WA), working with installation staff in each state and many public agencies on multiple research projects. The primary objectives of this work are to monitor breeding phenology across the west, study larval performance in sunny vs shady habitats in the arid west, evaluate the potential use of Motus technology for tracking monarch movement, and understand the potential of monarch habitat to serve as an umbrella for native pollinator communities.

#### *Installation engagement summary*

<b>Installation</b>	<b>Region</b>	<b>Project Engagement to Date</b>
Beale Air Force Base	Northern California	Western monarch breeding phenology surveys; focal site studies for <i>Bombus crotchii</i> – CA endemic species associated with <i>Asclepias eriocarpa</i> ; candidate species in CA
Fallon Naval Air Station	Nevada	Western monarch breeding phenology surveys
Mountain Home Airforce Base	Idaho	Western monarch breeding phenology surveys; requested recommendations for planting more milkweed on base
Naval Weapons Systems Training Facility Boardman	Oregon	Western monarch breeding phenology surveys
Vandenberg Space Force Base	Southern California	Western monarch breeding phenology surveys; distribution of breeding habitat; overwinter habitat (see Xerces report for more on VSFB)





Yakima Training Center	Washington	Western monarch breeding phenology surveys; provided larvae for shade structure field experiment
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## FY 2023 Highlighted Accomplishments

### Breeding phenology

- Conducted monarch surveys at 6 installations and nearby areas in Southern California, Northern California, Nevada, Oregon, Idaho and Washington.
- Sites were visited approximately monthly throughout the breeding season to monitor presence and abundance of monarchs in different life stages.
- Data are still being analyzed but preliminary results suggest intermediate monarch breeding numbers compared to 2017-2019 (Figure 1).

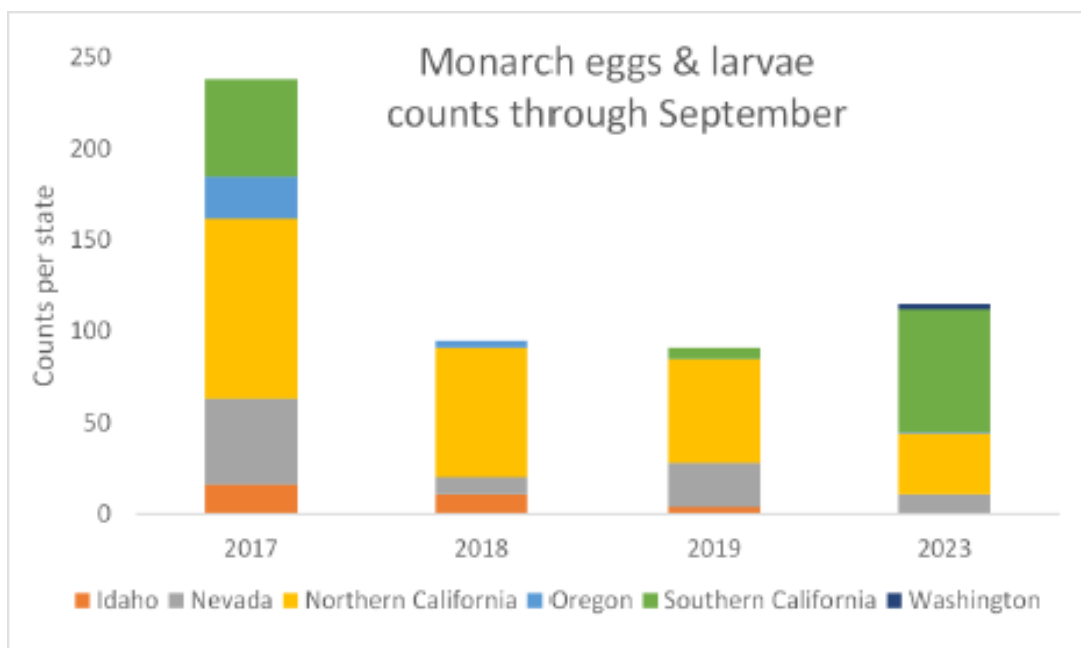


Figure 1: Counts of monarch larvae per state in 2017-2019 study and preliminary data to-date in 2023. Source: Cheryl Schultz.

### Larval performance study

- Research was conducted from mid-July through late September on the Umatilla National Wildlife Refuge McCormack, near Naval Weapons Systems Training Facility Boardman, with the objective to investigate the effects of shade structure and milkweed species on monarch growth and survival in arid environments of the Great Basin.
- Monitored survival to adult on two milkweed species and in sun and shade treatments.

- Data are still being analyzed but will ultimately lead to management recommendations for habitat enhancement, restoration and prioritization during times of year and in places when hot, dry conditions might be a limiting factor for monarch performance.

### **Motus**

- Analyzed previously collected data from California Department of Fish & Wildlife on 18 tagged monarchs near San Luis Obispo, CA to understand movement of tagged monarchs and make recommendations for receiver placement.
- Conducted a preliminary study on movement of tagged vs. non-tagged monarchs from June to August on 31 butterflies in Virginia.
- Designed a larger study, to be implemented in 2024, on movement impacts on tagged monarchs to provide more definitive data to support decision-making on future use of Motus tags on monarchs.

### **Native Bee Monitoring**

- Conducted field work to catalogue identifiable native bees at monarch monitoring sites.
- Tried non-lethal monitoring methods for native bees.
- Ultimate aim is to develop methods to monitor native bees in tandem with monarch butterflies, and to evaluate the role of habitat used by monarch butterflies for native bees.



## PROJECT 2

### Xerces Society for Invertebrate Conservation

#### Recovering Monarch Butterflies in California and the West: Habitat Restoration at Overwintering Sites and within the Breeding Zone

The Xerces Society is working with the Department of Defense (DoD) natural resource managers, US Forest Service International Program (USFS IP), community scientists, and other conservation partners to protect and restore overwintering sites and restore habitat where monarchs breed, especially in the early spring and on/near DoD lands in the West. They are also partnering with researchers, DoD natural resource managers, and local stakeholders to advance monarch overwintering conservation science. The main aim of this project is to address the lack of focused conservation work within the monarch's overwintering sites, early-breeding zone, as well as on or near DoD installations that occur in other key breeding areas in the West. The strategies they employ—protecting and restoring overwintering and breeding habitat—are likely to be the most effective short-term strategies to prevent further decline and ultimately allow the western monarch population to rebound.

Their work from October 2022 through September 2023 aligns with each of the following major focal areas in their multi-year grant: 1) Develop management guidance for monarch overwintering habitat on DoD installations in California; 2) Develop site-specific management guidance for monarch breeding habitat on DoD installations in western states; 3) Identify and fund priority research, monitoring, and habitat enhancement projects to advance western monarch conservation; and 4) Expand western monarch community science programs, with a focus on improving the end user experience and on engaging more diverse and underserved communities.

#### FY 2023 Highlighted Accomplishments

##### Overwintering Habitat

- Connected with key DoD installation natural resource managers in coastal California to begin working together on overwintering monarch population and habitat monitoring as well as discussing future management goals.
- Completed habitat assessments for 16 overwintering sites for Vandenberg Space Force Base (confirmed overwintering habitat).
- Completed an initial overwintering site visit at Camp San Luis Obispo (potential overwintering habitat) and planned a follow-up visit.
- Planned an overwintering site visit for Marine Corps Base Camp Pendleton (confirmed overwintering habitat).

##### Breeding Habitat

- Provided technical assistance on planning breeding habitat surveys including by pulling milkweed and monarch data records for multiple DoD installations as well as providing other resources related to habitat management and outreach.

- Provided model Integrated Natural Resource Management Plans (INRMP) language related to monarchs and their habitat to multiple DoD installations.
- Connected with relevant Resource Conservation District (RCD) partners and Washington State University western monarch phenology researchers to maximize collaboration and effectiveness to address DoD priorities.
- Awarded monarch breeding habitat kits and associated technical assistance to two DoD installation partners.

## Applied Science

Planned and led a Western Monarch Overwintering Science Meeting (including multiple DoD representatives) to identify high priority research areas. A report on the meeting is available here: <https://xerces.org/publications/fact-sheets/western-monarch-overwintering-science-priority-themes>.



*Figure 2: Western Monarch Overwintering Science Meeting participants at the Pismo overwintering grove in May 2023. Source: Xerces.*

- Participated in a pilot western monarch Motus study with California Department of Fish and Wildlife (CDFW) and launched a western monarch movement working group with Point Blue Conservation Science, university researchers, CDFW, and Vandenberg Space Force Base (SFB) to plan an upcoming telemetry (Motus) exploratory study.



- Funded a novel research study and working group with California Polytechnic State University (CalPoly), DoD, United States Geological Survey (USGS) and other partners to take place on Vandenberg SFB and Pismo State Beach in fall 2023 as part of a pilot “super study.” The goal of the study is to examine and link monarch overwintering presence and abundance with environmental variables by integrating tools like Lidar, infrared cameras, cluster mapping, and weather meters.

### **Western Monarch Community Science**

- Coordinated approximately 275 volunteers and partners, including staff of at least three DoD installations, who participated in the annual Thanksgiving and New Year’s counts: [www.westernmonarchcount.org](http://www.westernmonarchcount.org).
- Improved tools for overwintering site managers (including DoD managers) and volunteers to participate in and utilize data generated from the program. This included modernizing data gathering tools, expanding volunteer training and support for regional coordinators, and launching streamlined data sharing and improved interactive map: [www.westernmonarchcount.org/map-of-overwintering-sites](http://www.westernmonarchcount.org/map-of-overwintering-sites).
- Began developing a plan to address language, technology, and other barriers in our western monarch community science program to align with our diversity, equity, and inclusion goals.

# PROJECT 3

## Monarch Joint Venture (MJV)

### Partnerships in Habitat Conservation, Science, and Education On and Near DoD Installations

The Monarch Joint Venture (MJV), a partnership of federal and state agencies, non-governmental organizations, businesses and academic programs that work together to protect the monarch migration across the United States, entered into a partnership with USFS IP and the DoD Legacy Program to focus on monitoring, conservation, and connectivity of DoD lands with other public and private lands. Through this partnership, the MJV is working closely with the DoD, USFS IP, and other partners to ensure coordination and impact along flyways, with emphasis on the Eastern monarch flyway. Both the DoD and USFS IP benefit from access to an incredible network of partners with experience and expertise that can assist government agencies navigate science-based approaches to monarch conservation. Support includes providing recommendations and information to national-level coordinators of the DoD Legacy Programs as well as on-the-ground and virtual guidance to natural resource managers at the installation-level.

#### FY 2023 Highlighted Accomplishments

##### DoD Project Coordination and Communication

The MJV hired a program coordinator to be dedicated to supporting monarch conservation efforts on DoD installations across the Eastern and Western migratory ranges of the monarch as well as acting as a liaison with the DoD, USFS IP, and other partners involved in these efforts. The MJV Project Coordinator took the lead in gathering feedback from DoD Natural Resource managers with the goal of providing assistance in how the MJV and other monarch partners could best support land managers in assessing the presence of monarch and pollinator habitat on DoD lands.

- Working in conjunction with the DoD, the MJV Program Coordinator developed a form to request input from installation natural resource managers to determine specific priorities. Information gathered is assisting MJV and the DoD monarch partners to best place resources and provide direction where it is needed most.
- A QR code was created and shared at the 2023 National Military Fish & Wildlife Association DoD Monarch Conservation Special Meeting in St. Louis, MO, and results were shared with the DOD, USFS IP, and other monarch partners. The request for information was divided into 4 categories: 1) Communication and Outreach Materials, 2) Education and Training for Natural Resource Managers, 3) Habitat Management, and 4) Inventory and Monitoring. In addition, the MJV request inquired if any pollinator surveys had been conducted and if data was available for use in this program.



- Results demonstrated that there was a lot of variation in installation manager’s experience. With this information, the MJV, through direct consultations with the DoD, planned to develop case studies that would demonstrate differing experience levels and the variety of approaches already being implemented that would allow the DoD to reach its goals.
- Fort Riley, Fort Cavazos, Fort McCoy, and Camp Ripley have extensive experience with at-risk pollinators and habitat management. Their staff has been identified as mentors whose BMPs and lessons learned will be used to create technical guides for other managers in the region. These pollinator experts will be involved with the NMWFA working group on this effort.
- MJV staff has met with natural resource managers of 43 installations virtually to discuss their needs.
- An updated request for input will be developed for 2024. Information gathered will continue to be shared with the DoD and partners involved in these efforts.
- The MJV Program Coordinator, Mercy Manzanares, became the Information Chair for the Pollinator Working Group (PWG) which regularly highlights new research on pollinators of DoD interest and connects PWG members to relevant educational resources. The PWG listserv comprises over 50 installations from across the monarch range and several private and public partners.



*Figure 3: 2023 Monarch/Pollinator Information Form for pollinator stakeholders distributed to DoD natural resource managers. Source: MJV.*

### **Sentinel Landscape Program**

Founded in 2013 by the United States Department of Agriculture (USDA), DoD, and Department of the Interior, the Sentinel Landscapes Partnership is a coalition of federal agencies, state and local governments, and non-governmental organizations that work with willing landowners and land managers to advance sustainable land use practices around military installations and ranges with the mission of strengthening military readiness, conserving natural resources, bolstering agricultural and forestry economies, increasing public access to outdoor recreation, and enhancing resilience to climate change.

During FY 2023, the MJV was invited to participate in two Sentinel Landscape Program meetings and workshops at Camp Ridley and Middle Chesapeake.

- At Camp Ripley, Minnesota, the MJV provided assistance for their pollinator habitat and Endangered Species Act (ESA) compliance strategies that would reduce impacts and restrictions on training activities while providing ecosystem wide benefits for habitat and species including the monarch.

- At the Middle Chesapeake Sentinel Landscape, anchored by Naval Air Station Patuxent River NAVAIR, DoD coordinated a partner meeting with attendance by 17 participants from 6 different organizations, including the MJV. A 4-hour classroom session was followed by a field trip to implement Integrated Monarch Monitoring Program (IMMP) on the installation.
- The MJV is using this program as a base model for formulating partnerships with DoD installations and conservation partners as it serves as an excellent example of how to build partnerships with local, state, and federal partners to ensure mission success while balancing conservation priorities.
- Using this model, a list of services that MJV offers was compiled and sent to installations. MJV connected managers with monarch habitat management resources or educational material based on their needs.
- With the MJV's involvement in the Sentinel Landscape model and responses from the priority survey, MJV staff has virtually met with staff of 43 installations to discuss their priorities and how best to support their needs.

### **Training and Workshops**

Educational workshops were held in response to the priorities outlined in the survey and from discussions with DoD natural resource managers. These workshops focused on regional information specific to 1) Monarchs and DoD mission, 2) Relevant monarch research. 3) Monarch biology and phenology, 4) IMMP monitoring protocols, and 5) MJV partnership network resources

- The MJV conducted four workshops, effectively engaging with DoD personnel and partners across ten states.
- Virtual technical assistance was provided to 42-installations.
- The MJV worked with USFWS-embedded employee Veronica Reed to organize a full-day workshop on monarch at the Rocky Mountain Arsenal Wildlife Refuge on August 9, 2023. USFWS staff embedded in the DoD from nine Front Range installations in four different states, ten USFWS Refuge employees, and 11 Mile-High Youth Corps interns attended the workshop. This training provided tools to better manage and monitor pollinators on their installations.

### **DoD Field Visits & Surveys**

Installations within the Eastern monarch flyway, which is located across 13 states, were chosen as priority conservation sites for FY2023.

- Of these installations, habitat suitable for monarchs was assessed at 11 installations through 34 IMMP surveys.





- In partnership with DoD natural resource managers, the MJV implemented pilot-BMPs on select DoD installations, resulting in positive habitat improvements.
- To provide additional services, MJV staff conducted native bee surveys while on site and Fort Sill and Fort Riley were also examined for Fall roosts of migrating monarchs.
- Survey crews that focused on monitoring and educational programming were hired through EFTA for FY2023, but they received specialized technical training from MJV staff.



*Figure 4: Pollinator habitat at Naval Air Station Patuxent River (NAVAIR), the location of an Integrated Monarch Monitoring Protocol (IMMP) workshop. Source: MJV.*

### **Challenges and Lessons Learned**

- There is limited availability of data on specific monarch habitat types within DoD installations.
- Difficulties in identifying and locating timely native seed resources in installation areas.
- Adapting BMPs to varying landscapes and climate types across installations in different geographic regions.
- Monarch and pollinator familiarity varies widely among DoD natural resource managers on installations.
- There is variability in funding/priorities for natural resources among DoD land managers.
- At the larger scale, there was limited travel/technical assistance capacity to support widespread support across the monarch range.

# PROJECT 4

## Environment for the Americas (EFTA)

### Internships for Monarchs and Pollinators

EFTA implements an internship program that places young people from diverse background in conservation fields. Through this partnership EFTA is expanding their internship program to focus on monitoring and habitat assessment for monarch butterflies on and near military installations and DoD lands. In addition, EFTA has launched outreach, education, and training programs along the western and eastern flyways that connect military families and community-level groups to monarch conservation. A special emphasis is placed on connectivity of habitat, promoting conservation actions, and boosting awareness of monarchs and other pollinators.

In FY2023 EFTA recruited and placed four interns in California. They also began building their program east of the Rockies, especially along the I-35 corridor, where interns will be placed in FY2024.



*Figure 5: EFTA intern participating in the Monarch monitoring program. Source: EFTA.*



## FY 2023 Highlighted Accomplishments

### Recruitment and Placement of Interns

- Recruited and hired 4 early career professionals as interns in the project and placed at sites in California, including Audubon Deb's Park in Los Angeles, the Pollinator Posse in Oakland, the Monarch Joint Venture in the Central Valley and Bay Area, and Richardson Bay Audubon Center and Sanctuary in Tiburon (Note: the original Scope Of Work noted 6 interns would be hired, but EFTA changed the length of work so that interns have longer employment).
- Began work with veteran serving organizations, such as Hire Heroes USA and Blue Star Families to promote the program and the internship opportunities that will be available in 2024.
- Established relationships with veterans groups to launch job notices. Hosted a training for current interns in San Diego, California through the North American Monarch Institute.
- Developed community engagement skills through training and partnerships with Deb's Park, Richardson's Bay, MJV, and Pollinator Posse, and EFTA.
- Fulfilled all objectives in training interns to follow MJV's monarch monitoring protocols and culturally relevant program design and facilitation.
- Integrated interns into community-based education programs.
- Promoted the use of Blogs to share intern activities.
- Maintained regular communication with interns to provide direct support that promotes retention, effective engagement, and guidance toward future career goals.

### Products

- Interns have created a variety of materials for use in education programs and other community activities. Files may be requested from EFTA.
- Audubon California published articles about Jansy Alvarado and her work at Audubon Deb's Park.

<https://ca.audubon.org/news/monarch-migration-helping-culturally-significant-pollinator>

### Engagement with Installations

Direct engagement with installations is limited to Vandenberg Space Force Base in 2023, but EFTA is currently working with DoD partners to expand their reach in anticipation of 2024 efforts. They are currently:

- Working with Hire Heroes USA to recruit interns who will work in Texas, Oklahoma, Kansas, Iowa, and Minnesota.
- Collaborating with The Resume Place, which works with military trainers to help veterans and military spouses develop their federal resumes.
- Connecting with Workforce programs to recruit veterans.

### Conservation

- Facilitated 10 pollinator conservation presentations and educational art activities to people ages 5-80 years old reaching a total of 200 people.

- Completed 32 hours of field work, completing the IMMP and the Monarch Larva Monitoring Program (MLMP).
- Monitored 6 acres of land including flora/fauna, irrigation, and overall quality assessments for habitat assessment for Monarch Joint Venture's (MJV) Monarchs & More Western Habitat Program (M&MWHP).
- Facilitated two live webinars about the monarch biology, identification, and migration. Those invited were landowner participants in M&MWHP and Bureau of Land Management's biologists. Complete with a Q&A session at the end with 20 participants.
- Curated 3 different educational presentations for the public, including the material presented at live webinars. Other presentations include voice-recorded presentations on milkweed identification, as a part of MJV's Monarch Essentials course.
- Planted 70 milkweeds alongside the community with a survival rate of 96%.
- Planted 15 milkweeds with the help of 16 middle school students from a Community Based Organization called Heart of Los Angeles.
- Developed a Community Engagement Kit to bring awareness to the life cycle of monarchs and milkweed for teachers to borrow in the future to add to their curriculum.
- Delivered an engaging presentation to the West Los Angeles Community College students, highlighting their project dedicated to building and monitoring habitats for monarch butterflies and other pollinators.
- Educated Western Los Angeles County Council (WLACC) students on the importance of pollinator conservation and demonstrated practical techniques for collecting data on monarch butterfly larvae at various stages of development at the Audubon Center at Debs Park.

## **Monitoring**

- Conducted three Integrated Monarch Monitoring Program surveys at three vineyards in Northern California on a total of about 200 acres.
- Presented on monarch biology and conservation management to 100 landowning farmers and 50 Bureau of Land Management biologists.
- Completed 32 hours of field work, completing the IMMP and the Monarch Larva Monitoring Program (MLMP).
- Monitored 6 acres of land including flora/fauna, irrigation, and overall quality assessments for habitat assessment for Monarch Joint Venture's (MJV) Monarchs & More Western Habitat Program (M&MWHP).



- Surveyed both sites weekly at Ernest E. Deb Regional Park for milkweed and monarch larvae using MLMP protocols and reported the data to the online database.

### **Education and Outreach**

- Engaged 40 individuals through habitat assessment technical assistance, and other educational materials that teach about the monarch in the US with emphasis on the West Coast.
- Engaged with local community of Northeast Los Angeles in creating and caring for monarch habitat by planting 85 narrow-leaf milkweed plants in two plots of one acre size at the Audubon Center at Debs Park.
- Over 800 plants were distributed all over the Northeast Los Angeles area as part of a collaboration event with the Santa Monica Mountain Funds and over 221 people engaged in planting event.
- Created an educational plant identification guide of wildflowers for pollinators to be distributed to 100 landowning farmers.
- Co-created a Monarch Look-A-Likes handout that will be distributed to teachers who check out monarch education kits at Audubon Deb's Park in Los Angeles, to volunteers at the site, and Deb's Park visitors.

# PROJECT 5

## California Association of Resource Conservation Districts (CARCD)

### Implementing Western Monarch Habitat Projects in Priority Action Zones

CARCD is an organization that provides technical support, funding, and coordination for conservation work implemented by the 95 RCDs in California. In this partnership CARCD is providing support to RCDs for planning and implementation of monarch and pollinator habitat restoration projects on or near DoD lands in Early Breeding Priority Action Zone 1. CARCD is working closely with five military installations focusing on various aspects of monarch conservation and management including habitat restoration and pollinator-friendly resource management.

In FY2023 CARCD selected five RCDs as partners: Monterey County RCD, Coastal San Luis RCD, Solano RCD, Mission RCD, and Cachuma RCD. They planned habitat restoration projects and initiated agreements with each one to cover RCD personnel and sub-contractor costs for planning and implementation, plant materials, irrigation and maintenance for the first two to three years after planting (to allow establishment of native plants if drought conditions return), and monitoring through the end of the grant period.

#### FY 2023 Highlighted Accomplishments

- CARCD mapped out areas in the Priority 1 Restoration Zone to determine which RCD jurisdictions included military installations.
- CARCD used the map to determine which RCDs met the criteria to be invited to participate in the project. Final partners and associated installations are:
  - Monterey County RCD: Fort Hunter Liggett
  - Coastal San Luis RCD: Camp San Luis Obispo
  - Mission RCD: Camp Pendleton
  - Cachuma RCD: Vandenberg Space Force Base
  - Solano RCD: Travis AFB
- CARCD began a series of meetings with RCDs and partners to discuss and plan for work to be done under the award to start in 2023 and be completed in May 2026.
- CARCD Program Manager worked on contracts with all RCD sub-contractors.
- CARCD Program Manager attended Overwintering Science meeting and made site visit to Camp San Luis Obispo with Coastal San Luis RCD Project Manager, Xerces staff, Environmental Scientist, and DoD personnel to view current work, discuss expanded work under the grant, and to assess potential Overwintering site on the property.



- CARCD Program Manager met with Monarch Joint Venture regarding monitoring and collaboration and met with Rob Rule from Readiness and Environmental Protection Integration (REPI) on potential future additional RCD work on and around installations.
- CARCD Program Manager met with Mission RCD and Xerces about approach to projects at Camp Pendleton.
- CARCD Program Manager attended REPI webinar for future leveraging of current work on installations to expand monarch and pollinator work with DoD.
- CARCD Program Manager convened planning meeting with Solano RCD.
- CARCD Program Manager visited a potential future site- the Santa Cruz National Guard Armory- with biologist from RCD of Santa Cruz County and the Environmental Scientist handling natural resource/conservation projects for both Cal Guard and US Army to assess potential future pollinator projects on the site.

# PROJECT 6

## Deschutes Land Trust

### Plants for Monarchs

Deschutes Land Trust (DLT) and Western Monarch Advocates (WMA) implemented flood plain restoration and community education and engagement projects in both central and western Oregon. Additionally, DLT and WMA expanded the distribution of native milkweed and other native pollinator-friendly plants throughout Central Oregon to build western monarch migration corridor connectivity, increase monarch conservation awareness, and inspire community engagement. The objectives of the floodplain restoration projects are to expand the native plant palette of large-scale floodplain restoration projects in Central Oregon to include more native milkweed and other native pollinator-friendly plants to better support western monarchs, hummingbirds, bats, and bees. Focal areas for floodplain restoration projects include Rimrock Ranch near Sisters OR, Ochoco Preserve near Prineville OR, Bear Creek in southern OR, and Pittock Mansion in Portland OR. Community education and engagement occurred through a variety of events with central OR communities and Tribes, including Prineville, Madras, La Pine, Redmond and Bend OR.

### FY 2023 Highlighted Accomplishments

#### Central Oregon Activities

##### Floodplain Restoration

- DLT completed the final phase of floodplain restoration in Sisters, OR at Rimrock Ranch, a 1123-acre property owned and managed by the Deschutes Land Trust. <https://www.deschuteslandtrust.org/news/blog/2020-blog-posts/rimrock-ranch-virtualltour>
  - For more information about the restoration and a video of the work: <https://www.deschuteslandtrust.org/visit/rimrock-ranch-restoration>
- Phase 1 of the three-phase floodplain restoration project in Prineville, OR was implemented at Ochoco Preserve, a 185-acre property owned and managed by the Deschutes Land Trust. <https://www.deschuteslandtrust.org/visit/ochoco-preserve>
  - To learn more about the scope and scale of this work:
    - <https://www.deschuteslandtrust.org/visit/ochoco-preserve/op-vision-future>
  - Over 18,000 native plants were added to our phase 1 restoration area at Ochoco Preserve. Species included diverse mix of grasses, forbs, and shrubs - including native milkweed and other pollinator friendly plants.





- Over 40,000 native plants were planted in fall 2022 and another round of planting is underway in Fall 2023.



*Figure 6: Adding diverse species mix of grasses, forbs, and shrubs - including native milkweed and other pollinator friendly plants to Ochoco Preserve restoration area. Source: DLT.*



*Figure 7: Phase 1 Floodplain restoration at Ochoco Preserve, near Prineville, OR. Source: DLT.*

## **Community Education & Engagement in central Oregon**

- DLT has donated thousands of native milkweed and other pollinator-friendly plants to local community gardens and events, backyards, schools, public libraries and other locations and individuals throughout central OR, including Prineville, Madras, La Pine, Redmond and Bend - with a focus on underserved and underrepresented populations, as well as local Tribes.
- DLT also developed a new bilingual form to track the survivorship of the plants and remain engaged with the recipients. DLT will be checking back with everyone next summer to see how their monarch waystations and pollinator gardens are faring.

## **Southern Oregon - Bear Creek Restoration Initiative (BCRI)**

- Maintained (weeding, mulching, adding additional native milkweed and pollinator-friendly plants) and expanded existing monarch waystations and established new ones – including collaboration with the Lomakatsi Restoration Project. The Lomakatsi Project works to advance social equity by layering in education, tribal partnerships, and workforce training while helping to create more resilient ecosystems and communities. <https://lomakatsi.org/>
- Southern Oregon Monarch Advocates joined forces with BCRI to host several volunteer work parties to help engage local communities and schools in this work.

## **Umpqua River Valley – Elkton Community Education Center (ECEC)**

- 82 flats of milkweed, 282 one-gallon shrubs and 117 4" shrubs were grown last fall and distributed to ensure monarch habitat was incorporated into restoration projects covering more than 320 acres of land.

ECEC is deepening their partnership with the Cow Creek Band of Umpqua Tribe of Indians to create a 14-acre site for tribal education and inter-tribal gatherings. The project includes reintroducing native plant species to land on the Umpqua River. Some of those plants are also pollinator habitat and we will use grant funds for those varieties. Other plantings include oak savannah, camas, etc and will be sourced with other funds.

- ECEC has also distributed 2,356 4" plants and 12 one-gallon plants to environmental restoration projects this year.

## **Northern Oregon - Portland**

- Completed several volunteer work parties to tend (weed, mulch, add additional plants) the newly established monarch garden at the Pittock Mansion.



- Worked with Portland Parks and Recreation on interpretive materials to distribute at the site.
- Worked with local nurseries to grow native milkweed and other pollinator-friendly plants to distribute as “habitat kits” to underserved local communities to help educate the public and expand habitat availability.