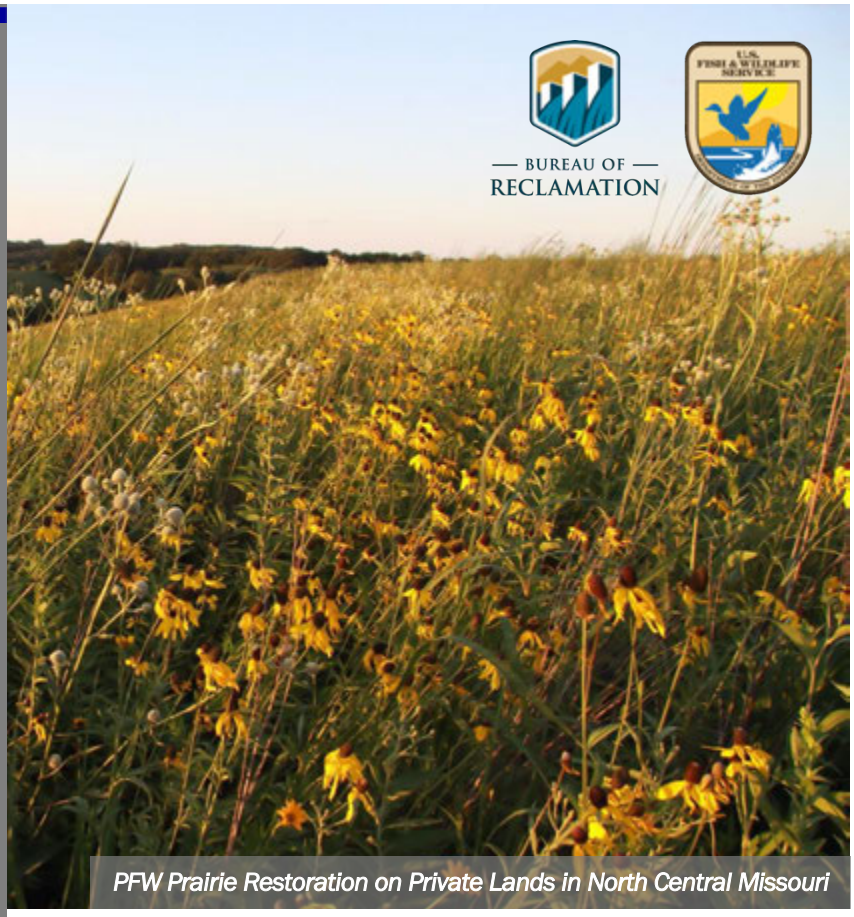
ACTIONABLE SCIENCE

Camera Trap Monitoring to Document Pollinator Use of Restored Private Lands in Missouri

The U.S. Fish and Wildlife Service's (USFWS) Partners for Fish and Wildlife Program (PFW) is a national cost-share program that works with private landowners to restore degraded habitat to benefit species of conservation concern. The PFW primarily uses before and after photos of restored habitats to measure restoration success, but these types of photos are insufficient for documenting wildlife use of restored areas. The PFW Missouri Private Lands Office (MOPLO) tested camera traps as a tool for monitoring and documenting monarch butterfly (*Danaus plexippus*) use of restored native grasslands on private lands.



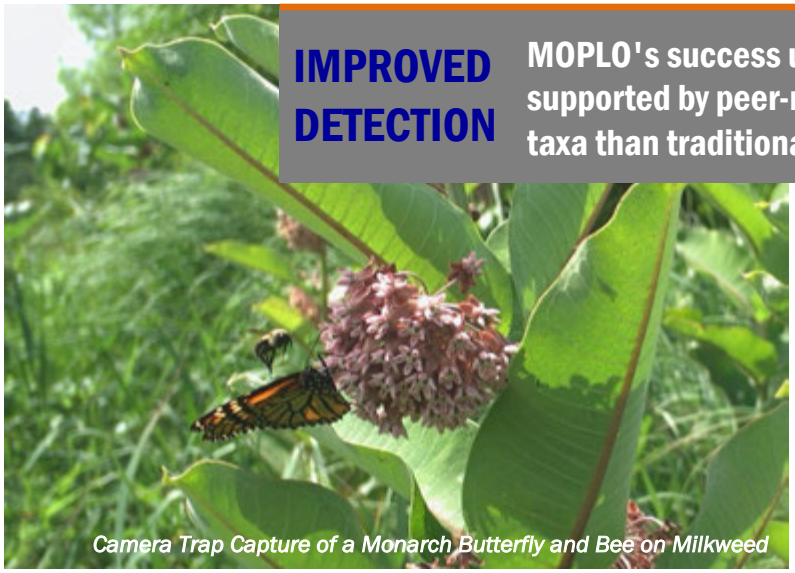
PFW Prairie Restoration on Private Lands in North Central Missouri

KEY ISSUES ADDRESSED

Monarchs are a priority species of concern for USFWS. These butterflies are important pollinators in Missouri when they visit during their spring and fall migration. However, monarch numbers have decreased largely due to habitat loss and fragmentation along migration routes as well as in overwintering areas in Mexico and California. Additionally, abundance of milkweed (*Asclepias* spp.), essential for monarch caterpillars, has decreased due to agricultural expansion. Though the MOPLO restores several acres of native grassland habitat each year, the office had little documentation of monarch butterfly use of their restoration projects. With limited time and funding for monitoring, the MOPLO tested whether camera traps could be used as a time- and cost-efficient option for monitoring.

PROJECT GOALS

- Explore improved, more efficient, methods for assessing monarch butterfly use of restored native grasslands on private lands
- Test two trail cameras for effectiveness in monitoring of invertebrates



Camera Trap Capture of a Monarch Butterfly and Bee on Milkweed

IMPROVED DETECTION

MOPLO's success using camera traps to monitor pollinators is supported by peer-reviewed research that cameras capture more taxa than traditional methods.

PROJECT HIGHLIGHTS

Monitoring Innovations: The MOPLO is a habitat restoration office with no formal research or monitoring focus. However, in order to provide evidence of monarch usage of restored habitats, the MOPLO deployed two commercially available trail cameras on privately owned, restored native grasslands. Both cameras were focused on milkweed flower clusters. Deployment of the cameras ranged from four consecutive days to three weeks. Motion sensors were disabled, and time-lapse features were set to take three photos, spaced three seconds apart, every five minutes from 6:00 am to 8:00 pm. This project expanded the office's scope of work to include research on monitoring methods, yielding a more precise and cost-efficient method for monitoring habitat usage.

From Ants to Butterflies: Both cameras captured identifiable invertebrate photos. Close focus and time-lapse features allowed for recordings of monarch butterflies, other butterfly species (Lepidoptera), and several species of ants, bees, and wasps (Hymenoptera).

Collaborators

- U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program
  - Illinois Private Lands Office
  - Missouri Private Lands Office

LESSONS LEARNED

Deploying camera traps is easy and inexpensive, but processing photos is time-intensive. Using time-lapse features resulted in many photos that can be difficult to sort through given time and staffing constraints.

The timing of camera deployment is critical. In 2020, the MOPLO deployed camera traps too early before the migration, resulting in camera batteries dying before monarchs arrived.

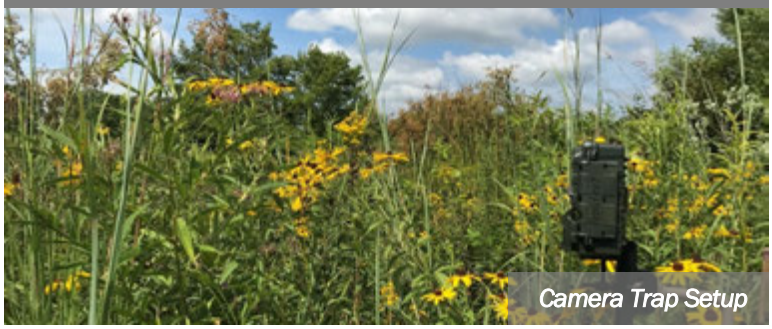
Camera traps placed in smaller patches of restored habitat captured more photos of monarchs than those placed in larger patches, likely because monarchs in the smaller patches were concentrated on a limited number of milkweed plants.

Certain camera modifications provided better results. The MOPLO disabled motion-detection sensors because they cannot capture the small movements of invertebrates. Furthermore, focal lengths of 26 to 27 inches were ideal for clear photos. Directing cameras at the middle of flower clusters also improved photo quality.

NEXT STEPS

- Use camera trap images as outreach materials to landowners and other conservation community partners
- Continue documenting usage of monarch butterflies on restoration sites
- Expand camera trap monitoring to restored woodland, glade, and wetland habitats
- Concurrently place landscape time-lapse cameras to document plant recovery post management actions such as prescribed fire

For more information on this project, contact Chris Woodson: chris_woodson@fws.gov



Camera Trap Setup

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Photos courtesy of Chris Woodson/USFWS
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