

The Monarch Joint Venture (MJV) is utilizing a digital mapping tool provided by a technology partner, POLLi, which remotely quantifies grassland habitat features - rapidly expanding the scale and consistency of monitoring habitats that benefit monarchs and other pollinators.

Drones equipped with standard cameras photograph the landscape, and images are processed within the user-friendly POLLi interface to identify features such as milkweed stems and forb cover.

Downloadable reports include maps of the feature's distribution, density estimates, proportion of site covered by a feature, and other useful metrics. This tool can also support habitat monitoring requirements under the Monarch Candidate Conservation Agreement with Assurances for Energy & Transportation Lands.



Conservation Benefits

- **Increases the scale and consistency of habitat monitoring, complementing more in-depth field research studies.** *For example, milkweed density in a 2.5-acre field may be estimated in 15 minutes using remote sensing and 1-4 hours using field-based surveys. Note that field surveys can assess certain metrics (e.g., monarch reproduction) that remote sensing cannot.*
- **Expands capability to fill information gaps quickly to inform conservation decisions.**
- **Improves repeatability for detecting change.**
- **Provides opportunities for future expansion of the technology (e.g., additional algorithms)**

Current Accomplishments and Accuracy

A **common milkweed** (*Asclepias syriaca*) model detects milkweed stems ≥ 8 " tall, detecting at least 80% of the common milkweed stems in an image (i.e., recall) at 93% accuracy (i.e., precision).

A **habitat model** assesses the percent cover of landcover types such as grasses, herbaceous plants, bare soil, and trees.

Additional vegetation models are underway; contact MJV or POLLi for details or suggestions.

POLLi's software platform provides a centralized location for data processing, storage, and reporting, and its **flight planning app** enables pilots to plan and execute automated flights.



80% recall

93% precision



Next Steps

MJV collaborates with POLLi to test existing models in new geographies and landscapes, including areas with potential confounding factors such as similar-looking species. This ongoing work also generates imagery that can contribute to new models. MJV provides biological expertise, conservation partner input, and relevant priorities to POLLi to ensure new developments align with the latest and most significant conservation assessment needs.

MJV is committed to making this technology accessible and useful for conservation practitioners. We offer survey services, survey training, and support for interpreting and applying your data.

POLLi creates a “digital thread” to link raw imagery to traceable, verifiable, and complete records for management. POLLi offers support to consider how this process can integrate with your existing work flow and tools.

How To Engage

**Contribute to the program and set yourself up for its use!
Scan the QR code below to learn more and express your interest in any of the following:**

- Share what UAS equipment and platforms you use and how you use them
- Test existing software using your drone
- Collect and share aerial imagery of grasslands
- Conduct field surveys
- Sign up for technology announcements and developments
- Invest in the development of this technology



What drones are compatible with this program?

- DJI Phantom 4 Pro V2.0
- Sony Airpeak S1
- Astro Freely
- Others depending on their camera sensors

At what altitude must the drone fly?

- As needed to collect 0.25 cm ground sample distance (GSD)
- Typically 30 - 120 feet above ground level



Scan to learn more about Monarch Joint Venture's Remote Sensing Program

