The Rectrix

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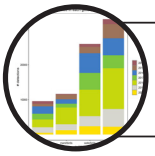
Our Mission

To contribute to the conservation of birds and all wildlife through scientific research, education and outreach, and conservation policy advocacy**.**



Science

To gather information about avian communities and habitat use that will assist state, federal, and private natural resource managers in their efforts to implement conservation programs.

Education

To provide opportunities for people of all ages to learn about species and their habitats.

Advocacy

To advocate for sound, science-based conservation policies that benefit birds, other wildlife and environmental quality.

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MRBO's Core Values

- Robust data and scientific integrity
- Time-and-cost-efficiency and use of technological innovations
- Fostering the formation of partnerships
- Embracing and encouraging equity, diversity and inclusion
- Empowering and providing opportunities for young people

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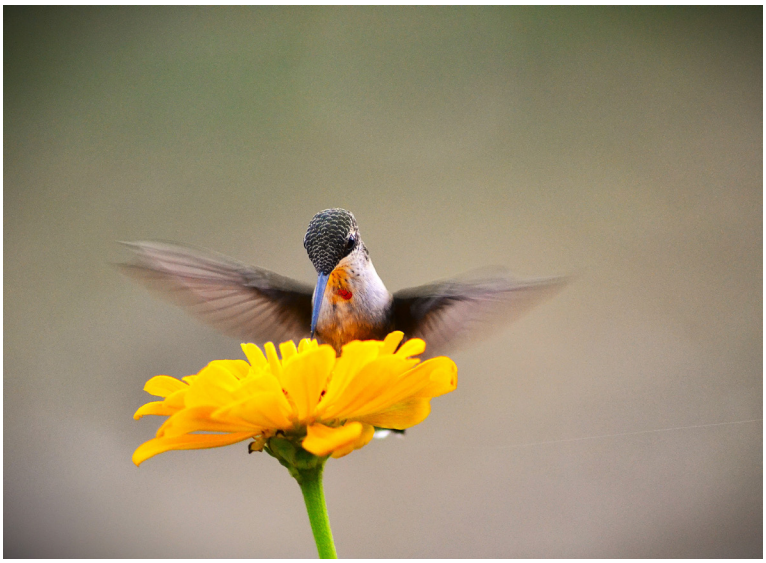
In this Issue of the Rectrix

On the Cover
Yellow Warbler Singing by Eric Flanagan



On the Back
Sipping from the Nectar of Life
Juvenile Ruby-throated Hummingbird by Rebecca Roseman

Letter from the MRBO Directors

Greetings, MRBO supporters and friends,

In mid-February, we had the great privilege of traveling to Peru for both work and holiday. We started at the first-ever International Conservation Technology Conference in Lima, where Ethan presented a session on his ongoing research and development, and where we both benefitted enormously from attending a variety of excellent sessions. While it might first appear that a conference such as this would be highly technical and very "niche", it was actually completely digestible and enlightening to anyone with an interest in conservation. Here is a sampling of the sessions we attended:

- From Data to Action: Leveraging Motus for Inclusive Bird Conservation
- Mapping Conservation Futures: Whose Values, Whose Maps?
- Communicating Conservation Science
- Interactive Storytelling
- Data-driven Decision Making for Conservation and Policy
- Building Capacity & Empowerment in Conservation Technology
- The Future of Wildlife Protection: what we need to strengthen decisions, safety, and impact now
- Super-Intelligence for Nature: A Global Architecture for Local Biodiversity Protection

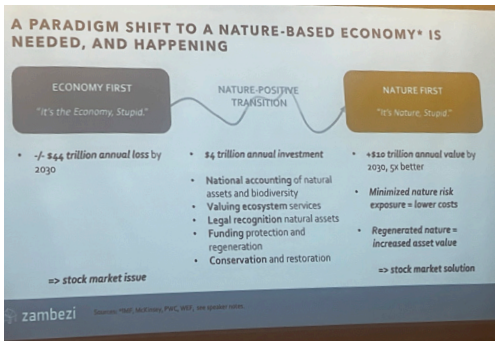
We both came away from this conference with new and exciting conceptual frameworks, an improved "toolbox" for delivering our conservation work, and a much broader and more optimistic perspective on the capacity of the global conservation community to achieve our critical mission of preserving biodiversity and environmental quality.

From Lima it was on to the Amazon basin, 100 kilometers east of Iquitos. Otorongo River Expeditions is a rustic lodge founded by a fellow ecologist and long-time friend of Ethan's from university. We got to spend five days experiencing a vast, diverse ecosystem as we were guided through the Amazon River and its channels, tributaries, flooded forests, and adjacent upland terra firma. The life of the Peruvian Amazon is among the most biodiverse in the world and we had the chance to observe many birds, reptiles, amphibians, insects, and mammals on both diurnal and nocturnal expeditions. Perhaps the most significant experience was simply being part, for a brief time, of a truly functioning ecosystem. Here in Missouri, as in almost all of the Lower 48 states, we have only small patches of intact habitat dispersed amongst rivers that are dammed, channelized, and controlled. Seeing a system that functions naturally was unique and eye-opening – in that part of the Amazon basin, people live on, with, and from the river, not in domination of it.

From the ecological to the technological, we learned an enormous amount from this trip, and have brought it home to MRBO's mission.

With gratitude,
Dana & Ethan

PS – in the interest of transparency, our readers should know that no part of this trip was funded by MRBO, though our attendance at ICTC was in representation of MRBO and its work.

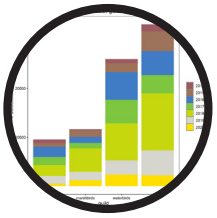


Top: At the first International Conservation Technology Conference (ICTC) in Lima
Middle: One of the many thought-provoking presentations at the ICTC
Bottom: Leaving Iquitos for Otorongo lodge

Giant water lilies - about five feet across!

Ethan and Dana on the River

A red-bellied piranha



Science

To contribute to conservation by gathering information about avian communities and habitat use that will assist state, federal, and private natural resource managers in their efforts to implement conservation programs.

Conservationist's Vision for the Future

By Ethan Duke, featured in the Missouri Natural Areas newsletter

Innovations and evolving science tools have played a key role in providing a sound basis for ecological management decisions. Aerial imagery, mobile field tools, and web based reporting, are routinely used now by land stewards to manage our infrastructure. Data today are collected analyzed and then shared at scales never dreamed of by conservation pioneers. These new methods do not wholly replace traditional surveys, but instead offer a more comprehensive and enhanced view to help further connect patterns seen on the ground with patterns revealed from above. High-resolution drone imagery is a literal change in vision.

History

Aldo Leopold's bold and clear visions that led to the innovative *Game Survey of the North Central States* (1931) pioneered the path for Missouri's "first approach to scientific wildlife management"—a study that took place from 1934–1936. This National Park Service project was funded under the auspices of the Emergency Conservation Work Program, and was completed just prior to the formation of the Missouri Conservation Commission (Nagel 1970).

Biologists, game wardens, and 3,000 Missourians contributed to those surveys, collecting data on wildlife and habitat. Delivery of the original vision, albeit analog, provided the first informational baseline on Missouri's wildlife resources. The result was a clear snapshot of the current state of wildlife and habitat that yielded focused inferences.

Today

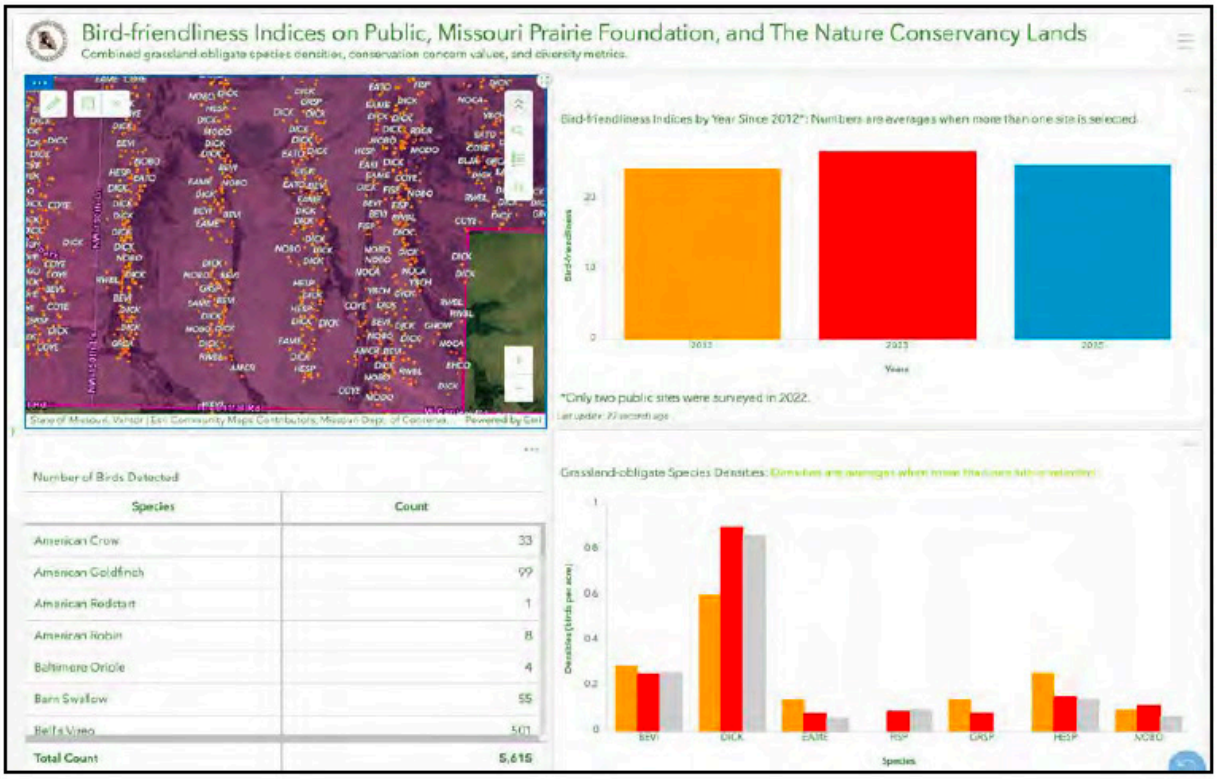
Recent work by the Missouri River Bird Observatory (MRBO) offers several examples of how approaches to modern workflows, including drone data aquisition, is used. In 2025, MRBO continued its long running grassland bird surveys across many of the state's remnant prairies, reconstructions, and grasslands. At the same time, we've collected aerial imagery that provides a clear view of habitat features often difficult to see without extensive ground work. The tools employed are now becoming commonplace, just in time when we need them most.

In 2012, MRBO began collecting spatially explicit data on every bird detection at multiple sites. For over a decade since, Line Transect Distance surveys have been used to document breeding birds across and beyond Missouri's priority grassland geographies. These surveys generate tens of thousands of spatially accurate detections each season. They form one of the most consistent records of grassland bird populations in Missouri and can display how species use habitats and respond to management actions. These data are available to researchers, practitioners, and the public in multiple formats via ArcGIS Online.

These results are now shared widely through interactive dashboards that serve many partners at once. Landowners, agency biologists, and local collaborators can explore species densities, annual trends, and site level summaries without waiting for formal reports. This format allows managers to see how bird communities change through time and how those changes align with their own management actions. The dashboards have become an important bridge between field surveys and real world decisions, and they demonstrate how biological information can be delivered in a clear and accessible way (Figure 1, next page).

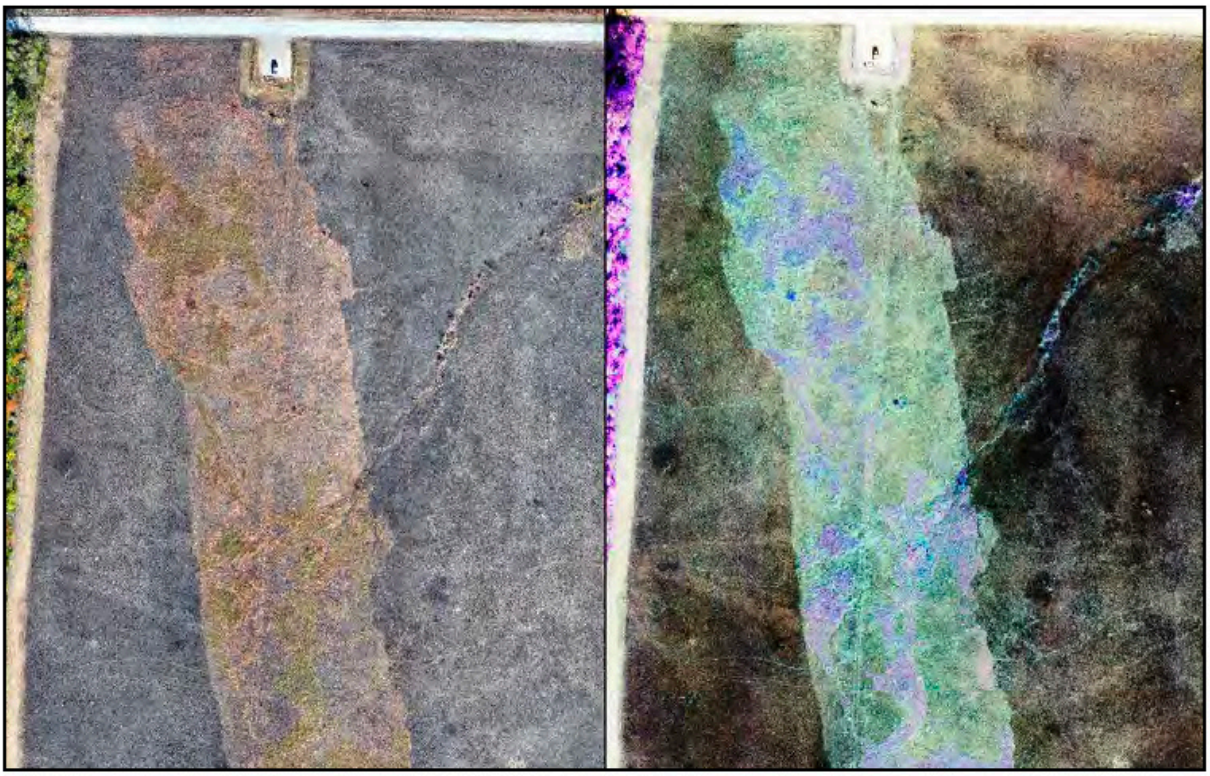
A New Vision from Above

In the past two years vegetation and habitat data were also captured with drone imagery. This added a new way of seeing the landscape. Burn patterns appeared as broad sweeping shapes across areas. Grazing effects created textured mosaics that varied in both height and density. Edges where an interspersion of woody species were beginning to advance became more apparent. Subtle differences in structure that affect bird occupancy can now be seen (Figure 2, next page.)



Missouri River Bird Observatory

Figure 1. A screenshot of MRBO's public facing bird-friendliness dashboard visible at https://bit.ly/47uJD5v. Survey results containing over a quarter million bird detections and related analyses are delivered to multiple stakeholders in this format, providing data and insights to researchers and the general public alike.



ESRI

Figure 2. Orthomosaics provide clear visualizations of prescribed fire at Paint Brush Prairie in the Hi-Lonesome grassland priority geography. The extent of the prescribed fire can be clearly seen in both RGB (left) and multispectral (right) views. Additional standard data include elevation models and point cloud data.

Missouri's biologists decipher and learn from drone data collection. Andrew Braun, Natural Resource Ecologist at Prairie State Park, instigated a drone mission that provided a striking example of the value of aerial imagery.

A fall flight was timed when warm season grasses were fading in color but certain woody and invasive species remained bright. In the layout seen here, false color frames on the left and natural color frames on the right revealed clumps of sericea and young sumac that were difficult to detect from the ground. Their late season color contrast stood out against the fading prairie and allowed managers to see patterns of establishment that had gone unnoticed. This success came not from advanced sensors but from knowing *when* to fly. Phenology created the contrast. With well-timed flights, land stewards can identify targets that appear only briefly each year. These moments open a practical path toward more precise and useful products for a variety of stakeholders and their purposes. Repeating such flights will allow us to track how these species expand or contract through time and how management actions influence their spread.

Strategic and methodical applications of this technology requires aggregating ecological expertise. It is crucial for numerous experts to weigh in and help lay the groundwork for Drone work, as it is for of other technological applications (Figure 3).

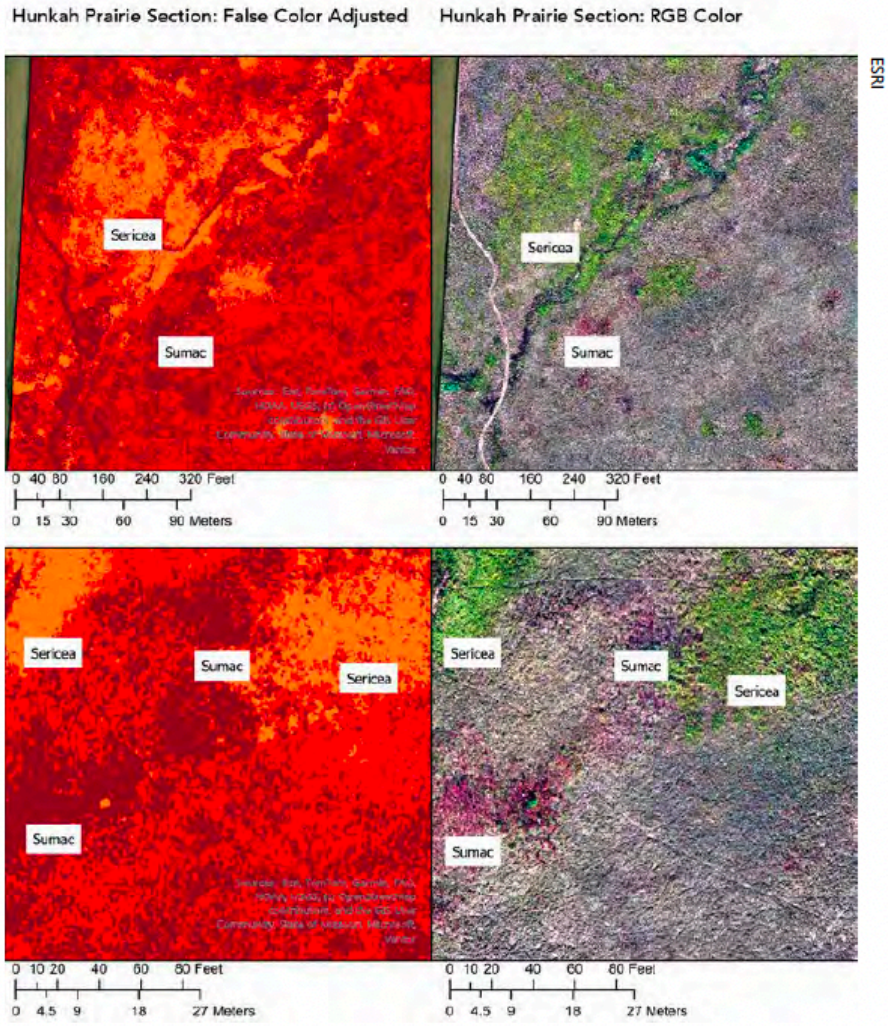


Figure 3. Seen from above, the late fall prairie tells a different story than in other seasons. Sericea and young sumac hold their color while native grasses fade, and the contrast becomes clear in the false color frames on the left and the natural color frames on the right. These images offer an early look at how aerial tools can support stewardship. With careful seasonal flights, managers will one day be able to measure the acres of invasive plants, follow their spread through time, and judge the success of control efforts. The same information could appear in shared dashboards that help everyone who cares for grasslands understand how these landscapes are changing.

The Future

Nearly a century ago, conservation pioneers devised the four fundamentals of a successful game restoration and management program: administration, research, training, and public relations.

This concept holds true to this day. Training is a key component and those being trained in conservation fields now have the tools to intersect with the other three fundamentals.

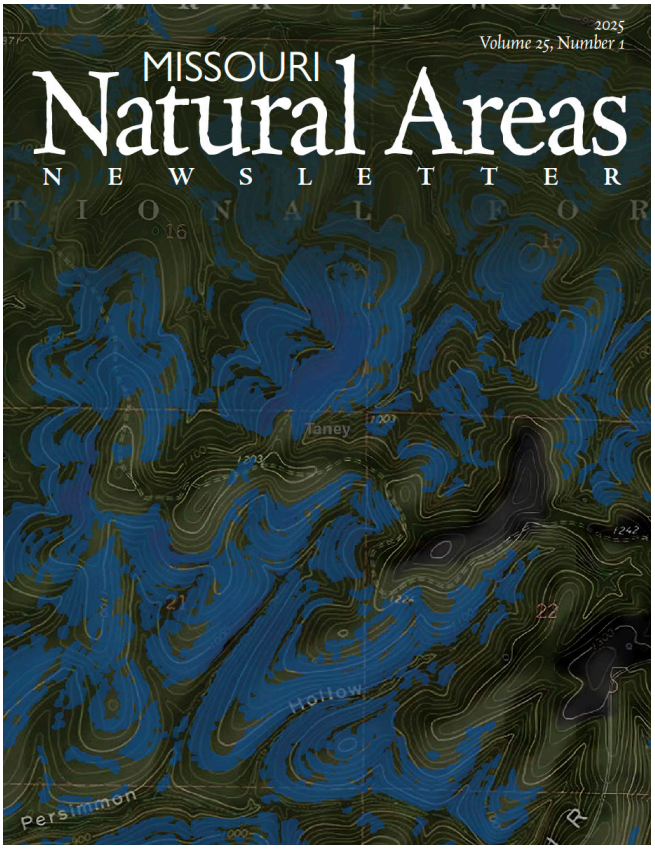
Only now, that training should incorporate the utilities of the powerful tools we now have at the ready. The tools need to be harnessed by those with an ecological understanding to provide the most useful products for decision makers.

Not all ecologists have strong technological aptitudes or interest, but their perspectives, ideas, and insights are crucial. Whether working on study design, collecting and analyzing data, or producing measurable results, knowing these tools are part of the future of conservation work is essential. Further, the work of conservationists can now be scaled and shared more broadly and effectively than ever.

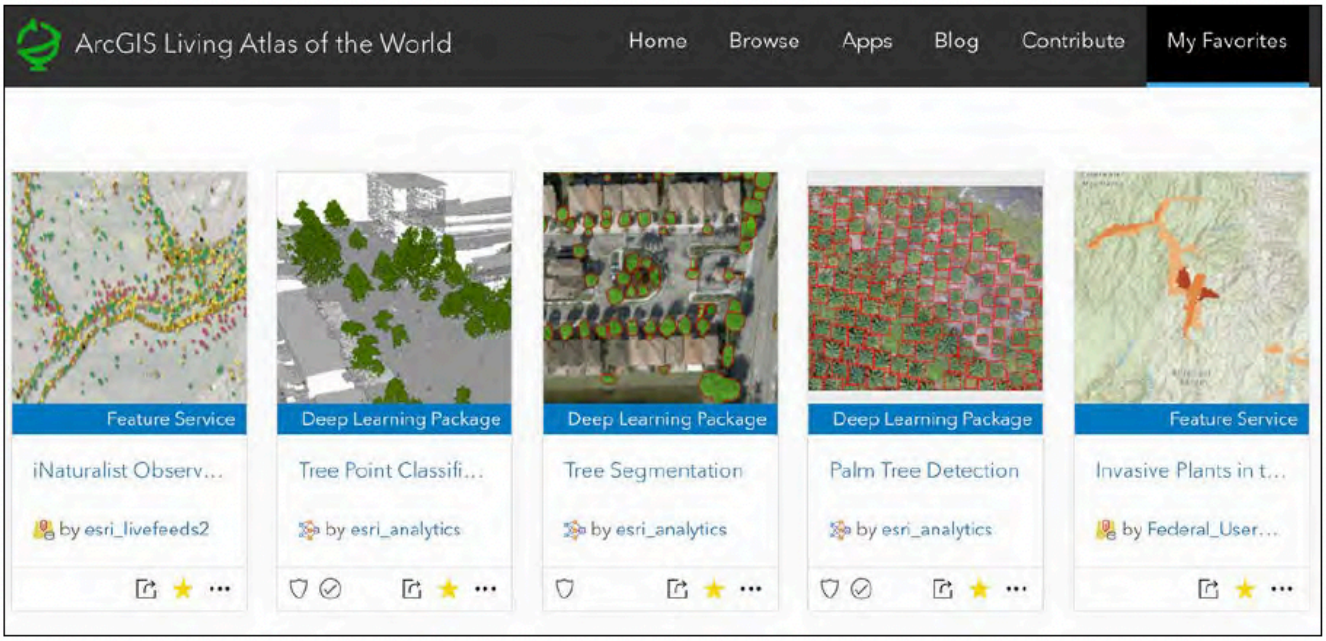
Toward a Shared Ecological Record for Missouri

One of the most promising developments is the potential to share data widely. Missouri has a strong tradition of cooperation among agencies and organizations. Many of the needed tools are already in place. Field staff use mobile data collection tools. Survey results are accessible through dashboards and the ArcGIS Online platform.

Similarly, and with coordination, Missouri could build a statewide archive of imagery and biological data that grows with each field season. Such a resource could live in MSDIS or a similar platform that encourages long term use. Students, researchers, landowners, and managers could explore these landscapes together. Natural area managers could compare sites and conditions. Restoration planning would be supported at a more granular scale. Over time, this system could also show how well treatments are working and track the acreage of invasive species across entire grassland complexes.



For more information on MRBO's data collection efforts, see: https://mrbo.org/Reports/pdf/2025_Grassland_Breeding_Bird_Surveys_and_Drone_Work.pdf



ESRI

Figure 4. A screenshot of a few of ESRI's Living Atlas Pre-trained Deep Learning Models. These models can be used to automate the detection of targets captured by imagery.

Looking Forward

Imagine where this work will lead! In the next few years drone-derived aerial imagery will become routine for documenting prescribed burn extents, grazing impacts, and patches of invasive species. In only a few years Missouri could have a complete and regularly-updated baseline of its major prairies and grasslands. In less than a decade the state could maintain one of the most complete ecological archives in the country, accessible to anyone who wishes to understand or care for these places.

The uses of these data are unlimited. Machine learning and deep learning models are already accelerating the mundane work on which ecologists of the past deemed as necessary. ESRI's Living Atlas provides a glimpse at this potential. Pre-trained deep learning models have already been created for a variety of purposes to automate tasks such as counting plants and animals from remote imagery. Leaning into Missouri's vast repository of ecological expertise, one can only imagine the possibilities of quickly quantifying plants and animals in our natural communities.

MRBO is currently working on pre-training deep learning models for identifying and quantifying invasive species from drone data (Figure 4).

Our work shows that this future is within reach. Field biologists continue to gather the information that defines the character of each natural area. Aerial imagery adds the broader view that helps interpret those observations. Together they create a clearer picture of how these landscapes function and how they change through time.

Missouri has led in conservation innovation before. With thoughtful use of modern tools and a shared commitment to documenting our natural areas, our state can lead well into the future. This work, both on the ground and in the air, will help ensure the continuance and furtherance of the vision for successful stewardship of our natural areas for the generations that follow.

Ethan Duke is Director and co-founder of the Missouri River Bird Observatory

Contact: Ethan.duke@mrbo.org

Citations:

Nagel, Werner O. 1970. *Conservation Contrasts: Three Decades of Non-Political Management of Wildlife and Forests in Missouri.* Jefferson City, MO: Missouri Department of Conservation.

Female Song

By Matt Longabaugh, MRBO Field Crew Leader

Throughout much of the history of ornithology, scientists have focused primarily on male bird songs. Early researchers assumed that song evolved mainly as a male trait used to attract mates and defend territories, so studies often recorded and analyzed male vocalizations while overlooking female ones. We now know that females in many bird species also sing—sometimes regularly and with complex structures. Paying attention to female bird songs helps correct these historical biases and provides a more accurate understanding of how birds communicate.

House Wren Singing

A major reason for this historical oversight is geographic bias in bird research. Much of the foundational work on bird song was conducted in Europe and North America, regions dominated by temperate ecosystems. In many temperate species, females sing less frequently than males, which reinforced the assumption that song was primarily a male behavior.

As new research methods, broader datasets, and more skilled observers have emerged, the pervasiveness of female song is becoming increasingly clear, revealing our lack of knowledge on the topic. To date, female song has been documented in 42% of passerine species found in the US and Canada—a number which continues to grow as observers watch closely for this behavior. For example, researchers have documented female singing in the Eastern Bluebird. Female Eastern Bluebirds produce a soft but distinctive warbling song that can be used in several contexts, including communication with mates and responses to territorial threats. While the male's brighter song is more conspicuous and often highlighted in field guides, the female's vocalizations play an important role in coordinating pair behavior and defending nesting areas.

Female vocalizations have also been recorded in other familiar North American birds such as the Northern Cardinal and the House Wren. In Northern Cardinals, both males and females sing full songs, and females often sing while sitting on the nest, possibly to signal their mate to bring food. In House Wrens, females produce songs that can resemble those of males but may be used differently during territorial disputes or mate interactions.

Female Cardinal By Lauralyn Fry

Studying female bird songs also helps scientists better understand the evolution of communication. By comparing species where both sexes sing with those where only males do, researchers can investigate how ecological pressures, mating systems, and migration patterns shape vocal behavior. For instance, recent findings suggest that in the ancestors of modern songbirds, both males and females likely sang, and that female song was later reduced or lost in some temperate lineages.

Birdwatchers can benefit from paying attention to female songs as well. Many birding traditions emphasize male vocalizations, but learning female songs can improve identification skills and reveal behaviors that might otherwise go unnoticed. Observing when and how females sing—whether responding to rivals, coordinating with mates, or guarding nests—adds another layer of insight into familiar species.

Ultimately, listening for female bird songs enriches both science and birdwatching. It challenges long-standing assumptions shaped by historical and geographic biases, highlights the complexity of avian communication, and encourages observers to pay closer attention to the full range of voices in the natural world. When both male and female birds are included in our observations, we gain a fuller and more accurate picture of how birds communicate.

To learn more, visit the Female Bird Song Project at http://femalebirdsong.org.

Education

To contribute to conservation by providing opportunities for Missourians of all ages to spend more time outdoors and to learn about species and habitat conservation.

Kansas City Education Update

Education and outreach efforts in Kansas City are off to a strong start in 2026, highlighted by two successful Conservation Cafés and continued partnership programming with the Missouri Department of Conservation.

The Conservation Café model continues to build momentum on both sides of the Missouri-Kansas state line. Designed to create welcoming spaces for meaningful dialogue, these gatherings invite neighbors to share their perspectives on local environmental priorities and identify how they would like to engage with and steward the green spaces in their communities.

On the Kansas side, MRBO partnered with the Organization for Community Preservation (OCP) in northeast Wyandotte County. Over the past year, OCP has worked intentionally to bring residents outdoors and activate Preservation Park, their small neighborhood green space. Under the leadership of Vice President Camille Caldwell, the organization has hosted community-centered events such as Movies in the Park and a Summer Enrichment Camp for neighborhood youth.

The MRBO/OCP Conservation Café provided an opportunity for residents to reflect on topics such as community beautification, clean and safe water, and outdoor engagement. Participants shared thoughtful ideas and priorities for future environmental education and stewardship projects, including neighborhood clean-up events, youth-focused outdoor programming, and workshops on urban gardening and native plants. In response to this feedback, Camille and MRBO's Tessa Thomas have begun organizing a Community Clean-Up event in late March, followed by a neighborhood gardening day in April. MRBO looks forward to continuing to build this partnership and establish consistent programming within the OCP community.

MRBO also co-hosted a second Conservation Café with the Pendleton Heights Neighborhood in northeast Kansas City, Missouri, near Kessler Park and Kansas City University. The Pendleton Heights Neighborhood Association recently received a PLANT Grant to support improvements to their community garden. Whitney Barnardo, a garden leader and former PHNA board member, utilized the Café model to gather input from residents about their vision for the space.

Participants were invited to share their ideas about desired programming, educational opportunities, accessibility improvements, and new features that could enhance the garden's role as a neighborhood learning hub. With more than 40 participants in attendance, the Café demonstrated strong community engagement and pride. MRBO looks forward to supporting Pendleton Heights and the neighborhood with programming and technical assistance throughout the upcoming growing season.

First Seed Saving event at the Pendleton Heights Pocket Park. Students from the local elementary learned about the benefits of native plants while helping gather seeds to share with their neighbors.

Beyond the Conservation Cafés, MRBO's partnership programming with the Missouri Department of Conservation at the Burr Oak Woods Conservation Nature Center continues to thrive.

In preparation for the American Kestrel nesting season, Tessa partnered with MDC Naturalist Susan Harris to host the third year of the Help a Kestrel! program. Participants learned about the natural history and identification of American Kestrels, the specialized adaptations of raptors, and best practices for becoming responsible nest box landlords and monitors. Over the past three years, at least two participants have installed American Kestrel nest boxes and connected with MRBO's American Kestrel monitoring program.

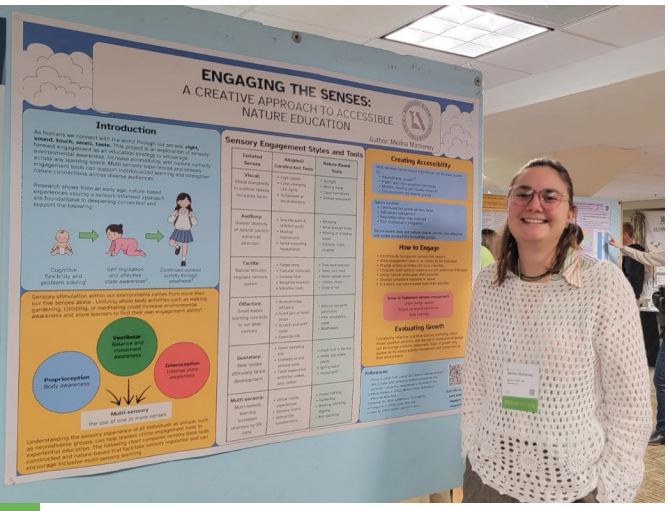
Maintaining this momentum, Tessa and Susan also co-hosted a February DIY Feeder workshop. Participants built and took home three bird feeders made from all-natural, biodegradable materials. The program also emphasized the importance of responsible bird feeding, including proper feeder maintenance and offering diverse food sources. Attendees were introduced to simple, practical steps they can take to make their homes and personal spaces more bird-friendly.

We look forward to continuing these collaborative programs throughout the spring and deepening community connections through education, stewardship, and hands-on engagement!

Left: Tessa introducing MRBO to the Pendleton Heights community before the Conservation Cafe.

Right: Pendleton Heights community members sharing their thoughts and interests about their local environment and community garden during their Conservation Cafe.

Central Region Education Udpate



Central Region Education Coordinator Melina Matheney presenting a poster at the Missouri Natural Resources Conference in February

The start of 2026 has opened the door to meaningful collaboration and fresh opportunities for creativity to thrive! Planning is already underway for a dynamic year of programming, including mindful birding, bird walks, library-partnered programs, Arrow Rock Nature School, summer camps, and more. Each program aims to cultivate our natural curiosity and deepen our sense of connection to the natural world.

January and February set a positive tone for the year, as members of the education team represented MRBO at the Wild Things Conference, Missouri Natural Resources Conference, and Interface Conference. These gatherings fostered new professional relationships, welcomed first-time attendees, and created space for exchanging innovative ideas in environmental education.

Beyond conference networking, MRBO's central region educator has been actively partnering with the library in Marshall to deliver engaging STEAM programs. Storytelling serves as the foundation of these experiences to spark imagination and open the door to discovery regardless of age. From that starting point of wonder, hands-on exploration transforms curiosity into joy. In these moments, learning unfolds naturally through play. Recent programs included:

Bird Beak Lab

Participants investigated how different beak shapes are adapted to specific food sources. Using tools to model real-life examples, participants discovered how form meets function. For instance, chopsticks—representing the beak of a timberdoodle (American woodcock)—proved far more effective at "digging" worms from soil than a pipette, which resembled the slender beak of a hummingbird. Through experimentation and friendly challenges, students experienced adaptation in action.

Bird Feather Lab

This interactive lab explored the remarkable variation and purpose of feathers. Participants examined real bird feathers with magnifiers, observing differences in structure and texture before designing and coloring their own feather creations. The program concluded with a water-resistance experiment, demonstrating how feather structure contributes to waterproofing.

Check out MRBO's 2025 Education and Outreach report at: https://mrbo.org/Reports/pdf/2025_Education_Report.pdf

Plastic Education Update

This fall and winter, MRBO made significant progress in its plastics education and reduction efforts. Through school partnerships, community building, and continued outreach to new audiences, we boosted Missouri's collective action toward healthier communities of wildlife and people.

Since the start of the 2025-26 school year, MRBO has introduced plastic programming to six schools in the Greater St. Louis, Central, and Southwest regions of the state. These visits reached over 300 students, with repeat visits to over 250 elementary schoolers. Students spent entire class periods learning how plastic is produced, how it affects wildlife and communities, and why reducing its production is the true solution to plastic pollution.

Three schools also participated in lunch audits. Students sorted their lunch waste by category (e.g. recycling, food, non-plastic trash, single-use plastic), measured the amount in each category, and calculated how quickly one day's worth of plastic compounds over the school year. This made plastic pollution personal. Students practiced scientific decision-making, data collection, and math skills in the context of a real-world problem. They witnessed the magnitude of single-use, discovered opportunities for collective action, and celebrated steps their school had already taken to avoid certain items. These lunch audits also helped demonstrate to faculty members how influential their school can be in reducing plastics.

As a result of these programs, administrators at multiple schools are looking forward to continued partnership with MRBO and taking action to reduce single-use plastics across their campuses.

Out in the broader community, MRBO and Stream Teams United (STU) organized multiple events to increase Missouri's capacity to address plastic at the local level. In January, we hosted our fifth Show-Me Less Plastic Community Workshop. This three-and-a-half-hour event brought activists together, deepened their understanding of the plastic crisis, and empowered them with tools to engage their communities in plastics reduction. Due to weather, this event was held virtually but still fostered connection among participants and drew in a record number of attendees. Over forty people with various backgrounds—naturalists, educators, church committee members, and more—actively participated in the entire event.

MRBO and STU also hosted a public movie screening of the award-winning documentary, Plastic People: The Hidden Crisis of Microplastics. This event included a social hour and panel discussion to allow attendees to connect, voice their concerns, and meet with our plastics team.

Events like these have so far spurred the development of two local plastic reduction chapters that made great strides this fall and winter. In Columbia, the MidMoLessPlastic Coalition built partnerships with multiple schools and began collecting data about plastic use at restaurants and festivals. In Springfield, Beyond Plastics Ozarks became an official group and shared information about microplastics on a local podcast. MRBO and STU provide support as needed, but both chapters operate independently. It's been truly rewarding to watch these leaders shape their communities.

In addition to events we organized, our plastics team presented at conferences, tabled at festivals, and educated members of multiple organizations across the state in recent months. We shared insights about plastic pollution and provided opportunities to join local action. Overall, we reached hundreds of people at the forefront of various efforts, including natural resource protection, education, and community empowerment.

MRBO is looking forward to the next season of plastics education and reduction projects! If your school or organization is interested in joining this growing collective action, please reach out to stori.smith@mrbo.org.

Left: Students prepare a graph showing the results of a plastic audit, incorporating mathmatics into plastic education sessions.
Right: Students "pollute" water to understand the volume of plastic that ends up in our rivers and oceans.

Left: A school waste audit, which allowed students to determine just how much plastic is produced by a typical lunch. The school then had a Plastic Free Lunch Day and studied the significant decrease in waste.

Middle: Stori Smith and Melina Matheney provided a session for teachers at the 2026 Department of Elementary and Secondary Education Interface Conference.

Right: Stori at one of the many in-classroom sessions she has provided to schools throughout the state.

Advocacy

To contribute to conservation by advocating for sound, science-based conservation policy that benefits birds, other wildlife and environmental quality.

Advocate now to reduce plastic use in Missouri - starting at our treasured State Parks and Historic Sites!

By Mary Culler of Stream Teams United

Missouri's 57 state parks and 36 historic sites are special places to be preserved for future generations, providing habitat for diverse wildlife and plant communities and peaceful settings for people to escape into nature. But, have you ever been to a Missouri State Park and seen a plastic bag or plastic water bottle littering the property? What about a piece of Styrofoam broken up into a hundred pieces in an otherwise pristine and remote location?

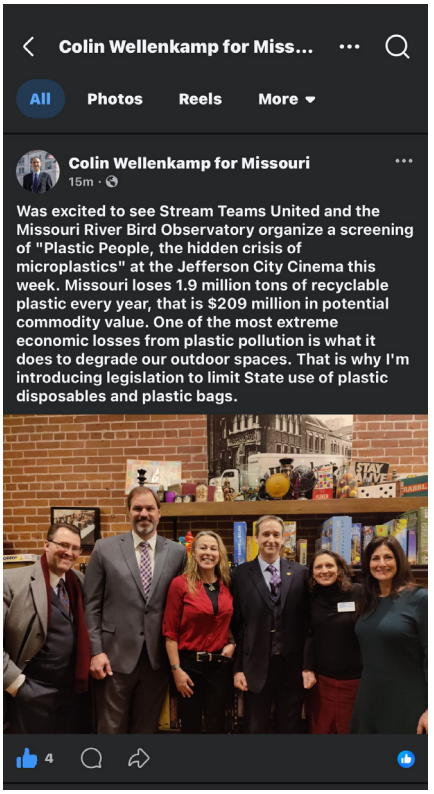
House Bill 3193, sponsored by Representative Colin Wellenkamp of St. Charles proposes to phase out certain single-use plastic products at Missouri State Parks and Historic Sites. The bill would require the state to give procurement preference to suppliers for non-plastic alternatives in lieu of single-use plastic products, and proposes to phase out single-use plastic bags, single-use bottled water, and polystyrene beverage cups and food containers at Missouri State Parks and Historic Sites. The bill would also repeal the statewide preemption on local laws that seek to regulate plastic bags in Missouri communities.

Missourians can advocate for House Bill 3193 by contacting the Speaker of the House, Representative Jonathan Patterson at 573-751-0907 or at Jonathan.Patterson@house.mo.gov, and asking him to refer the bill to a committee for a public hearing this spring. Share your thoughts about reducing plastic use at our treasured Missouri State Parks and Historic Sites.

Missouri is the Show-Me State. Our state facilities, especially at our state parks and historic sites, should be leading by example to reduce the harmful effects of plastic pollution to the environment and to our human health.

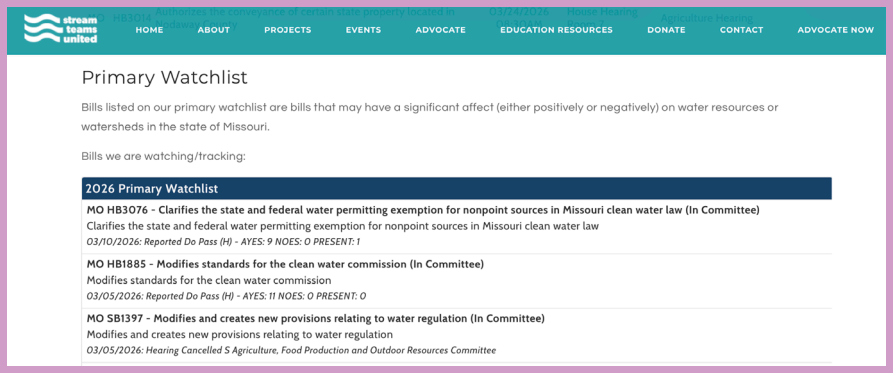
In a world that is filling up with plastic, the actions we take at local levels to reduce plastic can begin to encourage behavioral and societal changes to reduce single-use plastic consumption, and in turn contribute to larger reductions in plastic pollution over time.

Help support change at the local level by supporting House Bill 3193 and ask our Speaker of the House to refer the bill for a public hearing this spring legislative session.



Missouri Stream Teams United Bill Tracker

Stream Teams United provides an excellent Missouri Legislative Outlook webpage that allows anyone to learn about any bill in the Missouri State House that is related to natural resources. You can view bills by category, such as public land, water quality, or wildlife conservation, and there is also a calendar showing House and Senate hearings. In addition to providing a running list of important bills and their status in the legislative process, Stream Teams United uses this tracker to issue alerts when a bill of particular interest has a public hearing or progresses through the legislature for voting. This publicly-available online tracking tool is a valuable service to Missourians and MRBO encourages everyone to engage in its use.



Sunlight on Demand - An emerging threat to natural nighttime

by Jean Nock and Vayujeet Gokhale, DarkSky Missouri

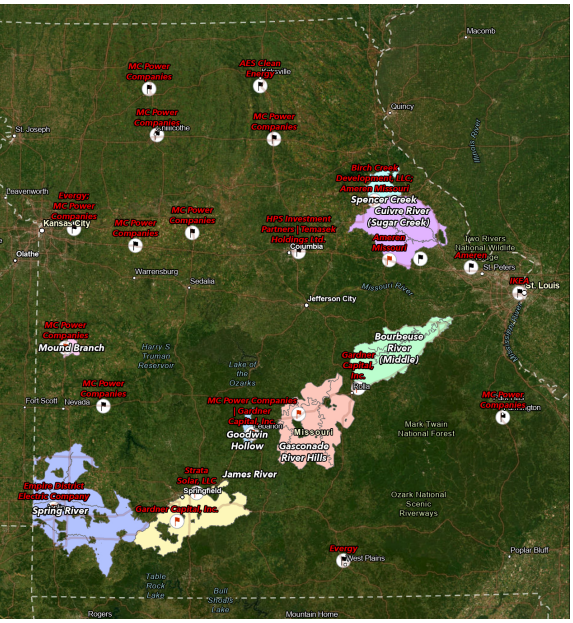
This article was originally published in the Conservation Federation magazine, March/April 2026 edition.

Sunlight on Demand

Astronomers have been the first to notice the loss of night due to terrestrial light pollution. The increasing use of blue-rich LED lights, and the corresponding increase in light pollution at a rate of close to 10% per year in the past decade, has rightly alarmed ornithologists, entomologists, human-health experts, and all people who are concerned about the well-being and ecological health of our communities and wilderness areas. In the last few years, astronomers have kept a wary eye on the sky as Low Earth Orbit (LEO) becomes increasingly crowded thanks to the commercialization of space. Satellites reflect sunlight and appear as small, star-like bright dots moving across the sky, especially just after sunset and before sunrise. By the end of 2030, it's projected that 50,000 satellites will be in low Earth orbit – a 2,400% increase in a single decade. The reflected light from these satellite swarms may increase the night sky's brightness and erase 50% of all stars from view. Astronomers are working with space companies like SpaceX to reduce the reflectivity of these satellites to make them effectively invisible to humans, migratory birds, and other animals that need natural nighttime darkness for foraging, hunting, mating, resting, and migrating. However, a new company called *Reflect Orbital* has come up with an idea that will further threaten natural darkness at night.

A simulated depiction of a solar farm illuminated at night by reflected sunlight from RO's satellite-mounted mirrors (Photo Credit: Reflect Orbital).

Reflect Orbital is an "orbital illumination system" that will use large space-based mirrors mounted on satellites to reflect sunlight down to Earth at night. (Figure I). The idea is to provide this "service" to solar farms so they can generate energy even at night. In order to do so, *Reflect Orbital* plans to eventually launch close to 250,000 satellites, each with mirrors as large as 580 square feet. These satellites will be stationed at about 650 km above the Earth's surface, and about 3000 of these satellites will be able to provide about 20% of the energy provided by the midday Sun for only about 4 minutes over a three-mile radius. As a given location goes out of view for one set of satellites, another set will take over in order to continue providing reflected sunlight to that particular location. Speaking at the *International Conference on Energy from Space*, the company's CEO, Ben Nowack, said, "It would be really great if we could get some solar energy before the Sun rises and after sunset, because then you could actually charge higher prices and make a lot more money." The first such *Reflect Orbital* satellite-mirror will be launched in April 2026 on a *SpaceX rocket*.



The Missouri Department of Conservation uses a tiered approach for habitat management, prioritizing landscapes and areas based on ecological significance. At least 9 of these areas are adjacent to significant solar farms (Map Credit: Ethan Duke, MRBO).

This array of huge reflecting surfaces in orbit will result in the polluting of the night sky with a brightness close to that of the Full Moon. The consequences of this on casual stargazing and professional astronomy are self-evident. The impact of RO's mirrors on the brightness of the night sky could disrupt the migration patterns of animals that navigate by the stars and the Moon. While it is unlikely that these bright objects will cause permanent damage to the naked eye, telescope users accidentally stumbling on one of these RO reflectors will be risking permanent damage to their eyes or cameras. These bright space-mirrors could also pose a significant threat to drivers and pilots. Add to this the risks posed by the increased potential for malfunction and the likelihood of collision of such large surfaces and numbers of satellites. And since these satellites will only have a lifetime of a few months to a couple of years, the constant launch and burn-up on re-entry of hundreds of satellites on a weekly basis will introduce alarming amounts of heavy metals into the Earth's sensitive upper atmosphere, altering its chemistry in ways that are hard to model and predict.

Solar Energy in Missouri

Astronomers and experts in the solar energy industry have called into question the feasibility of RO's approach towards increasing the duty-cycle of solar farms, given the technical challenges mentioned above. Setting these critiques aside, could we imagine a (dystopian?) future in which "Sunlight on demand" might become a factor in our great state?

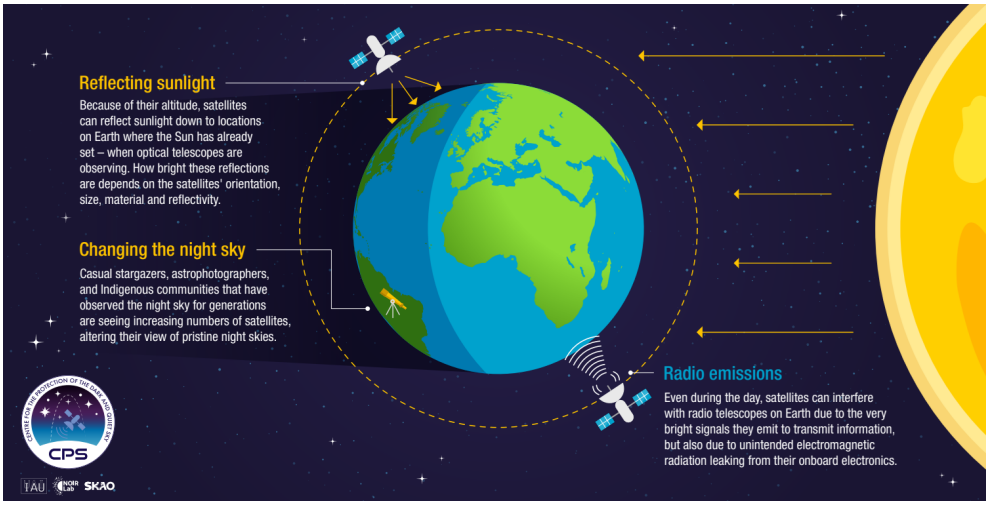
As of January 2026, there were 33 utility-scale solar farms in Missouri (Figure II). Their total operating capacity is 1,170 megawatts (MW). The largest one is in Adair County, with a capacity of about 250 MW. "Sunlight on Demand," as proposed by RO, is only viable, to the extent that it is, for extremely large solar farms that approach 1,000 MW of production. The possibility of an increased duty-cycle will incentivize the construction of ever larger and centralized solar farms, run by multi-national conglomerates or companies owned by multi-billionaires. Indeed, according

to Cleanview's tracker, as of January 2026, there are 59 solar power projects in development in Missouri, with a total planned capacity of 11,517 MW expected to come online in the next five years. This is a 10-fold increase in capacity in 5 years! Indeed, *Ameren* is currently finalizing the plans for a 250 MW solar facility at the **Reform Conservation Area** in consultation with the Missouri Department of Conservation. This farm will result in the shrinking of the Reform Conservation Area and will shutter hiking, hunting, and fishing spots in the affected areas. Similarly, the *Beavertail Solar Project* in Henry County, north of Kansas City, is a 400 MW solar farm, constructed to provide electricity to a *Google* data center in the area. Note that solar farms require large expanses of land, and increasingly these farms are showing up in rural areas and taking over farmland and other open spaces in the countryside. Given the planned tenfold increase in solar energy production, it is reasonable to expect increasing numbers of conflicts between folks residing in tranquil, picturesque rural areas with ready access to wilderness and nature, and having to deal with "ugly" solar farms that offend their aesthetic sensibilities.

In principle, the idea of generating "clean" solar energy is appealing to a large swath of folks that transcends traditional political and cultural divides. In practice, akin to wind farms, no one really wants one of these mega-farms in their own backyard. And for good reason. Some folks find it particularly jarring if the generated electricity is not helping reduce electricity costs for regular folks but is instead transmitted to far-off cities or to electricity-guzzling data centers that are increasingly popping up across rural Missouri. It is in this overall context that we want to view developments and ideas such as "Sunlight on Demand" using large mirrors in space.

Let there be Night

Commercial space-based activities are polluting the space around our planet, and with it, changing the nature of the night sky and the night itself. Statistically speaking, ostensibly well-intentioned projects such as RO are unlikely to succeed in the long run, but what they do leave behind is a trail of pollutants and bad ideas, the cost of which the public eventually has to bear. As such, RO will not really be an option for small-scale local or roof-top type solar installations. Despite its stated intent of being "Sustainable and Efficient by lowering reliance on fossil fuels, while minimizing land and material requirements", RO has a different business model for small-scale customers. They intend to provide the "Sunlight on Demand" service to anyone who can afford it, as novelty projects and gimmicks at rock concerts, sporting events, and more. For whatever it is worth, some astronomers and *DarkSky* have drawn a line in the sand: The *incidental* pollution caused by the increasing numbers of artificial satellites is one thing, but the *intentional* use of satellites to artificially illuminate our night is a bridge too far.



By the end of 2030, it's projected that 50,000 satellites will be in low Earth orbit – a 2,400% increase in a single decade. The reflected light from these satellite swarms may increase the night sky's brightness and erase 50% of all stars from view. The impact of thousands of "moving stars in the sky" on migratory birds and nocturnal animals remains undetermined. (Photo Credit: Center for Protection of Skies, International Astronomical Union)

Our insatiable need for "cheap" energy knows no bounds. The advent of data centers and the simultaneous commercialization of space are significant paradigm shifts. The ethical, financial, and environmental implications of the potential degradation of the local landscape (including the night sky) need to be addressed in a holistic and balanced manner before communities find themselves in a "no-win" situation. Examples abound of similar situations regarding the degradation of air, water, and soil quality in communities across Missouri. And now, "final frontier" is also under assault. Who owns space and the night sky? Does an individual or a community have the right to simply enjoy the most basic natural circumstances on Earth: the day-night cycle? Or is this negotiable and up for sale as well? What are the consequences of these measures on plants, animals, birds, and insects? What is an acceptable trade-off to forever lose our deep personal and cultural connections to the night sky and its many mysteries?

Aldo Leopold's wise counsel is instructive in helping us decide how to address these questions: "Conservation, at the bottom, rests on conviction that there are things in this world more important than dollar signs and ciphers… Cease being intimidated by the argument that a right action is impossible because it does not yield maximum profits, or that a wrong action is to be condoned because it pays..."

The views and opinions expressed here are those of the authors, and do not necessarily reflect the views of DarkSky Missouri or any other organizations and entities the authors represent.

SpaceX's Million Satellite Data Centers

Reflect Orbital is not the only threat posed to our natural nighttime conditions on Earth. As the space around our fragile planet gets commercialized, additional threats have emerged. *SpaceX* has asked the Federal Communications Commission (FCC) for permission to launch as many as **one million** new satellites to function as datacenters to run Artificial Intelligence. Each of these satellites will be at a much higher orbit than, say, *SpaceX's Starlink* satellites and hence will be visible all night, all year, since they will never be in Earth's shadow. *SpaceX's* FCC filing is scant on details, but it is reasonable to assume that to be commercially viable, each of these satellites will have to be enormous: about 100 meters end-to-end, and hence significantly brighter than other satellites. Experts are concerned that the industrial scale of this proposal, if it comes to fruition, could ruin dark skies worldwide, pollute the atmosphere due to the constant flux of launches and re-entries, and worsen the amount of space debris.

Community News

Bird-friendly Communities Update

Each passing season brings new chances to create positive change. Understanding our connection with the natural world is something to cherish. Spring migration, nesting season, and our changing landscapes all contribute to telling a story of resilience and renewal. Creating bird-friendly communities invites us to rethink how our shared spaces can better support both people and wildlife. As we move through this quarter, we're encouraged by the growing network of communities embracing bird-friendly practices and taking those meaningful steps forward. It's important to pause, take a deep breath, and celebrate the wins, big or small!

Education and Outreach

As 2026 starts to take flight, we are already inspired by the work and passion communities have shown across the state. The Bird-friendly Communities program has participated in and presented at programs, workshops, and conferences, reaching over 100 people so far. One standout event was Kaylee and Tessa's presentation at the Missouri Parks and Recreation Conference, where they shared specific strategies communities can implement in their parks and provided time for attendees to discuss ideas, ask questions, and connect with one another in small groups. Another highlight was Kaylee's presentation at the St. Joseph Public Library, where she connected with the community members passionate about conservation and eager to learn more about creating bird-friendly spaces in their region. Kaylee also attended the Missouri Natural Resources Conference alongside Stori and Melina, where she valued the opportunity to strengthen prior partnerships, while also expanding her professional network.

Kaylee is gearing up for upcoming spring festivals and can't wait to connect with more communities, have impactful conversations, share resources and practical tips, and celebrate the growing movement to create safer spaces for birds. In the upcoming months, the program will continue building partnerships with more municipalities, community leaders, campuses, and residents who are passionate about protecting our birds.

Bird-friendly Communities Coordinator Kaylee Woelfel hosted a public workshop at the Saint Joseph Library

Kaylee, Stori, and Melina with their quail friend at the Missouri Natural Resources Conference

DarkSky Business

Comments to the Federal Communications Commission (FCC)

As is detailed in the article on Reflect Orbital and SpaceX on the previous pages, these two proposals currently being considered by the FCC represent a very concerning threat to night sky conservation. People and wildlife already face health, biorhythm, and ecological consequences with the current state of light pollution. Projects of the proposed magnitude could result in irreparable ramifications to our ecosystems that depend on natural light and dark cycles and also pose serious human safety concerns. On behalf of MRBO, Kaylee submitted public comments for both proposals to urge the FCC to fully assess through a science-based process, to reject these proposals.

For more information on these proposals, visit: https://darksky.org/news/two-satellite-proposals-threaten-the-night-sky-the-window-to-act-is-now/

Kaylee and Stori provided information on bird-friendly communities at the Missouri State Parks employees conference

BFC Spotlight

Welcoming Missouri's First Official Bird City Designation!

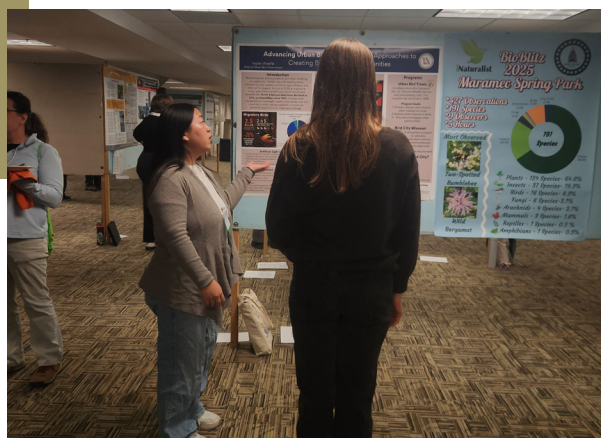
We are very proud to announce and welcome our first official Bird City Missouri designation - St. Louis! This achievement reflects meaningful local action to improve habitats, reduce bird collisions with windows, address light pollution, engage the community, and promote sustainability efforts. This designation sets the stage for other communities across Missouri to follow. We extend our sincere gratitude to the St. Louis City Board of Aldermen for passing Resolution #240 in support of the working group's Bird City application and their commitment to bird-friendly practices. A special thank you to Matt Barton, Urban Conservation Specialist with the St. Louis Audubon Society, for his leadership and dedication in guiding this effort to completion.

"St. Louis is excited to join the Bird City Missouri program," said Matt. "Bird City Missouri is not only useful as a recognition tool for communities engaged in conservation efforts, but it also provides guidance on how new communities can get involved. The program's action list helps guide communities on how they can improve conservation efforts in their area and ultimately earn Bird City Missouri designation."

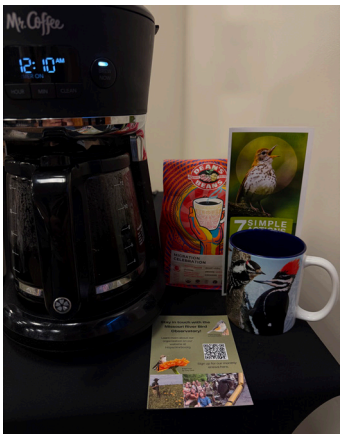
Interested in Being a Bird City?

Communities or campuses interested in learning more or beginning the designation process can visit www.birdcity.org/missouri or email birdfriendlycommunities@mrbo.org.

Check out MRBO's 2025 Bird-friendly Communities Report - which also serves as an outreach guide for interested municipalities and businesses! https://mrbo.org/Reports/pdf/2025_Bird-friendly_Communities_Report.pdf



Kaylee presented a poster at the Missouri Natural Resources Conference.



Providing bird-friendly, shade grown coffee is always an important part of MRBO events.

Kaylee, Tessa, and partner Sarah Kendrick of the USFWS, presented a program on bird-friendly communities at the Missouri Parks & Recreation Association conference.

MRBO Around Missouri

Conservation Federation of Missouri 90th annual convention - (left) Dana, Ethan, and partner Mary Culler of Missouri Stream Teams United presented a learning session on Missouri's declining water quality, (middle) Ethan got sworn in as secretary of the CFM Board of Directors, and (right) Kaylee received a David Risberg Memorial Grant to support the Bird-friendly Communities program.

Kansas City MRBO Supporters' Party - Marlee, Tessa, Dana, and Ethan were able to express appreciation for our many KC-area supporters and volunteers.

Tessa with her sister Savannah and mother Lynette at the Pendleton Heights Conservation Cafe. Lynette and Savannah host frequent community events through their social service work and assisted with the Pendleton Cafe.

Left: MRBO and Stream Teams United hosted a screening of the documentary film Plastic People at the Capitol City Cinema in Jefferson City. The event was attended by more than 40 community members and several legislators. Middle: Ethan and Kaylee installed a bird-collision deterrent pattern on a company's window in Jefferson City. Right: Dana presented on the relationship between native plants and migratory birds at the Deep Roots Plan It Native Conference.

Enjoy Spring Migration!

Bird migrations are one of the most inspiring natural phenomena on earth. Every year, millions of birds fly astonishing distances to claim territories, raise young, and forage food. Each migration is a seasonal dance in search of the perfect place. That is why spring in Missouri does not arrive quietly but on the wings of birds.

In March, when frost melts away and the green flags of seedlings appear, the first migrants slip in like scouts. Flocks of snow geese lift in white, their calls announcing winter has finally loosened its grip. You can expect songbirds such as American Robin, Eastern Phoebe, and Brown Thrasher to appear.

By April, the state hums. The forests soften into green haze just as warblers begin to appear in flecks of gold, cobalt, and coal flitting through budding sycamores. Now you become witness to the rapid gleaning insects from the undersides of new leaves along the Missouri River. Missouri is both banquet and crossroads, a place to rest, refuel, and rise again. The morning has become a symphony while the evening has become an inconspicuous passage of flight. You can expect Green Heron, Indigo Bunting, Purple Martin, and Ruby-throated Hummingbird as newcomers.

In May the air feels charged with energy, a bird buzz. Scarlet Tanagers flare like living embers against fresh leaves. Indigo Buntings glow as though the sky has taken feathered form. Warblers and sparrows are heartily singing their songs. You can expect Prothonotary Warbler, Baltimore Oriole, and the White-eyed Vireo.

If you haven't considered it yet, MRBO encourages you to get out and about this migration season to enjoy the pops of color and energizing chirps of spring.

Missouri migration viewing spots:

- Riverlands Migratory Bird Sanctuary (West Alton, MO)
- Loess Bluffs National Wildlife Refuge (northwest Missouri)
- Eagle Bluffs Conservation Area (near Columbia)
- Swan Lake National Wildlife Refuge (north-central Missouri)
- Tower Grove Park (St. Louis)
- Weston Bend State Park (near Kansas City)

Keep an eye out for bird walks hosted by the Missouri Department of Conservation, Missouri Birding Society, or Audubon Society near you!

Melina offered several migration games and activities at a Powell Gardens family event in February.

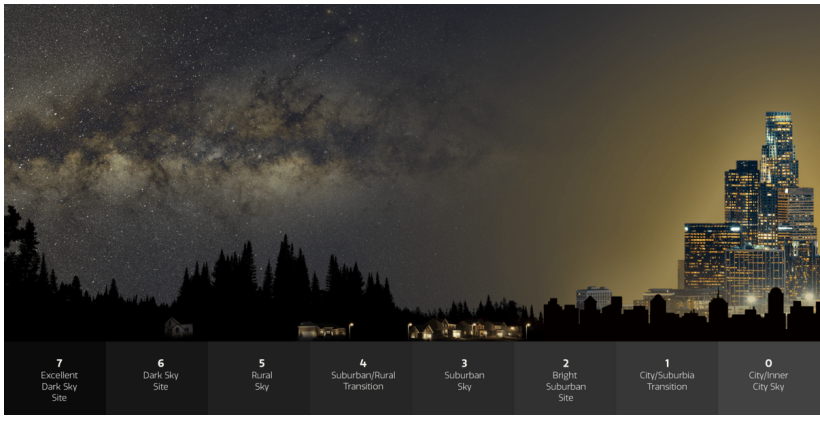
Resources:

Observe a bird? Here are some tools you can use to keep track of your favorite migrants!

- eBird
  - o See real-time sightings and migration hotspots
  - o Use the "Bar Charts" and "Hotspots" features for Missouri counties.
- Merlin Bird ID
  - o Sound ID identifies birds by song (great for spring warblers).
  - o Also shows likely species based on location and date.
- BirdCast (Cornell Lab)
  - o Nightly migration forecasts and radar maps
  - o Helps predict big migration nights before birds arrive.

Arrow Rock Dark Sky

The night sky: one of the natural resources that is so often overlooked or forgotten in our light polluted world. Dark skies are important for both wildlife and people. Many migratory birds travel at night and use the moon and stars to navigate. Artificial lights can confuse them, causing exhaustion or collisions. Nocturnal animals and insects depend on darkness for feeding, reproduction, and avoiding predators. Darkness is important for human health as well, helping regulate sleep cycles and the body's natural rhythms. With all of this in mind, MRBO, our partners, and engaged communities have continue to encourage Dark Sky practices.



In an effort to increase awareness and protect what dark skies we have in Missouri, MRBO is taking steps to make Arrow Rock a designated DarkSky Community. This multi-year process will be in collaboration with the community of Arrow Rock, Arrow Rock State Park, volunteers, and a DarkSky Missouri Representative. This designation could be a foundation of wellness for all life around Arrow Rock, MO. More information will be shared in upcoming newsletters. Stay tuned!

Message from MRBO Supporter Bill McGuire

Last week Brenda and I visited the farm where she was raised. The falling-down house was where her dad lived when he was a kid and the land was part of the family farm until sold when her parents retired from farming. The house Brenda grew up in was about a half mile away via farm lanes. As her husband, I had the run of the farm for nearly 20 years so recall how it was. The land around the house in the photo became a prairie restoration after her parents sold the land and it is diverse in prairie grasses and forbs. Both of us remember the farm in this area being alive with birds flying everywhere this time of year back in the day. The air was nearly lifeless on this visit, despite many acres of prairie restoration and other conservation measures. And, with a stream and riparian corridor right across the gravel road from this house. Sad. Anecdotal but it goes to the contemporary challenges facing wildlife and conservation. Unless those like us carry the torch, no one will. Thanks for all each of you contribute to the cause!

Thank you for your support!

The following individuals and organizations and several anonymous donors have provided support since the publication of the December 2025 newsletter. We give thanks to them and to all who have supported the Missouri River Bird Observatory! YOU make our work possible. Please note that donations received after March 20th, 2026 - the date this issue went to print - will be acknowledged in the next issue of the Rectrix.

Samda Aaron
Dan Alldredge and Gary McCarthy
Krystal Anton and Steve Huey
Kathy Baird
Alpha Benedetti
Toni and George Blackwood
Burroughs Audubon Society of Greater KC
Jeff Cantrell
Vincent Chau
Jamie Coe
Brett Creason
Bobby Dearth
Kathy Digges
Meredith Donaldson
Harold and Jill Draper
Dennis Figg
Elizabeth Fuemmeler
Christine Garhart
Linda Garza
Kathy and Kirkland Gates
Linda Graue
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Maria Moore
Maureen Murphy
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Bill and Margaret Rowe
Steve Schnarr and Mel Cheney
Pam Sebastian
Marie Sevigny-Penrod
Cindy Stevens
Allison Tellman
Frederick and Rosemarie Thompson
David and Jennifer Urich
Virginia Wallace
Brad and Suzanne Wright
Susan Wrasmann
Tom Tucker and Tina Yochum-Magaz

With ongoing reductions to federal and state conservation budgets, and the cascading effect these cuts are having on nonprofits, MRBO is more reliant on its supporters than ever before. If you would like to help keep our many projects operating, please consider donating at https://mrbo.org/MRBO/Support.aspx or PO Box 16, Arrow Rock MO 65320. Thank you!

Upcoming Events
See more at https://mrbo.org/Events/Calendar.aspx

Birdwatching Basics – In Person Presentation
Tuesday, April 14th from 6 pm to 7 pm
Jefferson County Library, Arnold MO

Curious about birds but not sure where to begin? Join the Missouri River Bird Observatory for an engaging introduction to the fundamentals of birdwatching. This in-person presentation will cover simple identification tips, common backyard birds, and helpful resources to build your confidence in the field. Discover how easy it is to connect with nature right in your own backyard or community. Open to teens and adults. Registration is required: https://jeffcolibrarymo.libcal.com/event/15225217

Signs of Spring - MRBO's 2026 Spring Auction - Online
Sunday, April 19th at 10 am to Sunday, April 26th at 6 pm

As we head into another beautiful spring season, we are delighted to welcome you to MRBO's annual online auction. This is a bit like walking through a garden that is bursting into bloom; so much to see and experience and then you can pick your bouquet.

As always, we strive to offer a variety of foods that are organic in nature and sustainably sourced from local producers whenever possible; items that reflect our commitment to the environment, both educational and fun; and experiences that encompass all.

Birds, Bees & Blooms Festival
Saturday, April 25th from 10 am - 4 pm
Village of Arrow Rock, MO

Get ready for a fun-filled day at Birds, Bees & Blooms, Arrow Rock's annual spring festival hosted by MRBO and the Village of Arrow Rock! This vibrant celebration of nature is perfect for the whole family, bringing together animals, plants, and the great outdoors in an exciting and interactive way.

With over 40 booths, you'll find hands-on activities, live demonstrations, crafts, delicious food, native plants, and nature-inspired treasures for sale. Explore the beauty of Arrow Rock on guided birding and wild edible hikes through the historic site and the Big Muddy National Wildlife Refuge.

Plus, don't miss the chance to visit MRBO's KnOwledge Nest diorama inside our fully open visitor center! Stop by, say hello, and immerse yourself in the wonders of Missouri's natural world. See you there!

Columbia Earth Day Festival
Sunday, April 26th from 12 p.m. to 6 p.m.
Peace Park, Columbia, MO

Join the Missouri River Bird Observatory at the Columbia Earth Day Festival at Peace Park in Columbia, MO! Stop by our booth to learn about local bird conservation, explore interactive activities, and discover how you can help protect Missouri's wildlife and habitats. The festival will have educational resources, fun giveaways, and plenty of ways to connect with nature.

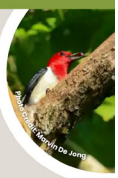
Bugs, Birds & Blooms Pollinator Festival
Saturday, May 2nd from 10 a.m. to 3 p.m.
Maramec State Park, St James, MO

The Missouri River Bird Observatory is excited to be part of the Bugs, Birds & Blooms Pollinator Festival! Stop by our booth to learn how birds and pollinators work together to support healthy ecosystems across Missouri. We'll be sharing information about native habitats, bird conservation, and simple ways you can make a difference in your own backyard. We hope to see you there as we celebrate Missouri's incredible natural resources!

MID-MISSOURI NATURE RENEWAL

EMBRACING FIVE ESSENTIALS FOR LASTING COMMUNITY WELL-BEING

Guided by The Resilient Activist's Founder, Sami Aaron



The Five Essentials for a Resilient World offer simple concepts to help participants understand, make decisions, and take action in ways that benefit humans, non-humans, and our planet's ecosystems.

Join us for an inspirational retreat day with The Resilient Activist, co-hosted by the Missouri River Bird Observatory!

RECONNECT WITH NATURE | RESPECT ALL LIFE | REGREEN THE PLANET | REVAMP OUR SPENDING | REPLENISH OUR RESOURCES

Saturday, May 2nd - 10:30am to 4:00pm

Runge Conservation Nature Center
330 Commerce Drive, Jefferson City, MO

EVENT DETAILS AND REGISTRATION

https://bit.ly/Resilient5Essentials

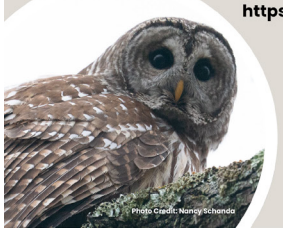


Photo Credit: Nancy Schanda

Native Grassland Celebration & Learning Opportunity:

A Free Community Event

Date: Saturday May 30th, 2026
Time: 8:30 am field trips, 11 am lunch, 11:30 am - 2:45 pm learning sessions

Field Trips

Locations to be announced: public and private grasslands just south of Sedalia

Ecology of Plants & Animals

Grassland Management for Landowners & Producers

Learning Sessions

Heckart Community Center
1800 W 3rd St, Sedalia, MO
Community Rooms A, B, & C

Choose from three tracks (or mix it up!)

Local Landscapes - natural history & ecology of the area

Food production - grazing methods, cost-share programs, best management

Community science - contributing your outdoor skills to conservation science

Register

https://bit.ly/GrasslandsCelebration

For more information
please contact:
dana.ripper@mrbo.org

Hosted by

MISSOURI RIVER BIRD OBSERVATORY

stream teams united

"SHOW-ME LESS PLASTIC" COMMUNITY WORKSHOP

Join the Missouri River Bird Observatory and Stream Teams United for a hands-on workshop designed to empower you with the knowledge and skills to join the effort to reduce plastic use and pollution in Missouri

APRIL 11, 2026

Mid-America Regional Council
The Board Room

11:00AM - 2:30PM
600 Broadway Blvd
Kansas City, MO 64105

LUNCH IS INCLUDED

WHAT YOU WILL LEARN :

- The State of the Plastic Crisis
- Community Outreach Strategies
- Effective Messaging Through Media
- Empowering Grassroots Action

REGISTRATION IS FREE!

ENROLL NOW ***HERE***
OR SCAN THE QR CODE

For more info, contact: tessa.poolman@mrbo.org

https://bit.ly/PlasticWorkshopKC

MISSOURI RIVER BIRD OBSERVATORY

stream teams united

"SHOW-ME LESS PLASTIC" COMMUNITY WORKSHOP

Join the Missouri River Bird Observatory and Stream Teams United for a hands-on workshop designed to empower you with the knowledge and skills to join the effort to reduce plastic use and pollution in Missouri

MAY 9, 2026

Phelps County Courthouse

11:00AM - 2:30PM
200 N. Main Street
Rolla, MO 65401

LUNCH IS INCLUDED

WHAT YOU WILL LEARN :

- The State of the Plastic Crisis
- Community Outreach Strategies
- Effective Messaging Through Media
- Empowering Grassroots Action

REGISTRATION IS FREE!

ENROLL NOW ***HERE***
OR SCAN THE QR CODE

For more info, contact: stori.smith@mrbo.org

https://bit.ly/PlasticWorkshopRolla

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