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The Rectrix

A Newsletter of the Missouri River Bird Observatory

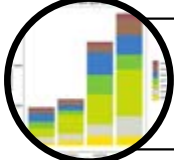


Our Mission




Conservation

To contribute to the conservation of Missouri’s migratory and resident birds through scientific research, community outreach, and education.




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 & Outreach

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



Advocacy

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

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 Front cover: Killdeer baby and Back cover: Killdeer family by Paul Moffett.



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Letter from the MRBO Directors

Greetings, friends of MRBO!

Many readers will have heard of the “7 Simple Actions to Help Birds”. This public action campaign came about in response to the October 2019 news that we’ve lost 2.9 billion North American breeding birds in the past 50 years (3billionbirds.org). While anyone familiar with birds and concerned about their welfare already suspected significant population losses, this was the first time ornithologists compiled decades’ worth of data and applied robust metrics to the decline. This report did come with a positive side though. Avian guilds such as waterfowl and raptors showed net increases through this same 50-year time period. Why? Because they were the target of concerted conservation efforts, including habitat protections and restoration, better management practices, and bans on certain pesticides. Conservation works!

The 7 Simple Actions were framed as a way to let each of us as individuals know what we can do to contribute to conservation. These actions are important, effective, and simple. While we engage in these activities in everyday life, we also wanted to let you know what MRBO is doing as an organization. We touch on all of the seven actions in various ways throughout our research, education, and advocacy work. For example, we continually encourage people to protect birds and cats by keeping their cats indoors; this is a regular part of conversations and presentations. MRBO has only bird-friendly coffee in our Arrow Rock visitor center and always offers it at any event or festival we’re hosting – that’s probably the easiest and most fun of all the actions.

Some of the 7 Simple Actions are prominent in our programs in more targeted, formal ways – these are programmatic foundations that, through reaching more people, we hope will greatly magnify the beneficial effects to birds and all life.

- Make windows safer: MRBO is the primary coordinating entity behind BirdSafe Kansas City, a project that documents bird collisions with windows across the KC Metro area. We are working with partner organizations to provide data to building tenants and owners and help encourage them to take action on their most strike-prone windows. Since 2019, BirdSafeKC



Some of the birds found on a BirdSafeKC survey, 16 May 2021.







Do Citizen Science



Use Less Plastic



Drink Shade-Grown Coffee



Make Windows Safer



Keep Cats Indoors



Use Native Plants



Avoid Pesticides

7

SIMPLE ACTIONS

TO HELP BIRDS

volunteer surveyors have documented many hundreds of carcasses resulting from window strikes. The survey data allow us to determine which exact windows are the problem, so that we're not asking for expensive and unnecessary mitigation. Please see: birdsafekc.org



- Use native plants: both of MRBO's facilities in Arrow Rock feature native plantings that we're continually expanding. This allows us to point out and discuss natives with our visitors, including the Young Explorers' Club campers and tourists visiting Arrow Rock. MRBO also takes part in many native plant outreach events each year, working with partners such as the Missouri Prairie Foundation, Deep Roots, and Missouri Master Naturalists and Master Gardeners. On an even broader scale, we are involved with initiatives to conserve, manage and restore native vegetation (typically prairie plants) on working ranches and other private lands. MRBO's role is often assessing bird response to changes in vegetation, but we're also in the beginning stages of a project that measures insect response and the abundance of nectar plants.

- Avoid pesticides: the word "pesticide" encompasses all of the -cides. Fungicides, herbicides and insecticides all have some effect on the food chain that eventually ends with birds (and people!). Pesticide use, or lack thereof, is one of the significant factors contributing to bird declines on many agricultural lands.

MRBO is extremely active in the development and implementation of ecologically-minded food production throughout Missouri. Whether it's involvement with the Audubon Conservation Ranching program, the Missouri Coalition for the Environment's Known & Grown program, or advocating policies that support sustainable and regenerative agriculture, this topic is woven into MRBO's work on many levels.

- Use less plastic: a couple decades ago, this may not have made the list of 7 Simple Actions. However, as you may know, the exponential proliferation of single-use, disposable plastic has become a massive environmental quality, human health, and wildlife concern. From the extraction of its building blocks to its eventual discarding, throwaway plastics are a problem that has multiplied throughout our consumer lives and our environment. Unfortunately, recycling hasn't been the success we wish it were (less than 9% of plastic actually gets recycled) and the entities that produce single-use disposables are very determined to continue ramping up manufacturing (please see: <https://www.beyondplastics.org/learn>). MRBO is addressing this issue (as are many organizations around the world) by ramping up outreach aimed at providing the facts about plastic production and waste. For example, we hosted a community screening of, and panel discussion about, the movie *The Story of Plastic* attended by over 100 Missourians. After a six-week course through Bennington College this spring, we are now poised to hold two Plastic Brand Audits in conjunction with trash clean-ups this fall. Brand Audits contribute to global data on the most prolific sellers of single-use plastic, with the goal of enacting change at the production level (please see: <https://www.breakfreefromplastic.org>).
- Do citizen science: MRBO engages in crowdsourced community science efforts and helps others do the same! Data collected by individuals and families have been shown to be a crucial contribution to the world's knowledge of wildlife, even when these community members are not necessarily trained in a particular methodology and are not conducting "official" science projects. Prominent examples of such contributions are eBird and iNaturalist. In fact, eBird data comprised some of the information used in the study that resulted in 3billionbirds.org and the 7 Simple Actions. These excellent apps are used by MRBO biologists and are often a component of education and outreach programs as well. MRBO's grassland and wetland bird data are contributed to eBird, and data for the BirdSafeKC project are collected entirely in iNaturalist. This is another fun way to make a substantial contribution to conservation whatever your level of experience in ecology.

We hope you will join us in doing some or all of these 7 Simple Actions in your own way. Remember, though we have lost billions of birds, there are some that have rebounded – because what people do for conservation matters!

Sincerely,
Dana & Ethan



Upcoming Events



Register for MYBC meetings and field trips at: <https://www.moyoungbirders.org/events/>

July 10 @ 8:30 am - 10:30 am Field Trip!
Burr Oak Woods Conservation Area
1401 NW Park Rd, Blue Springs
Our first in-person event

of the year! Join us for our first Greater Kansas City Chapter field trip of the year at Burr Oak Woods Nature Sanctuary in Blue Springs, MO All are welcome to this free event! For safety we are limiting the number of participants for our in-person events, so reserve your spot ASAP!

July 24th @ 9:30 am - 11:30 am Field Trip!
Peers Prairie
Meet at Peers Store 16011 Concord Hill Rd, Marthasville
Join us for an awesome birding trip to Peers Prairie along the Katy Trail! We are joining in partnership with Magnificent Missouri to learn more about prairie reconstruction and, of course, the birds that use it. We might also do some bug exploration. Can't wait to see what we find! Event is free and ALL ARE WELCOME! We will be providing a small snack half way through the event. Space is limited to 20 kids (ages 8-17) so sign up soon! Families welcome.

September 4 @ 8:30 am - 10:30 am Field Trip!
Knob Noster State Park - 873 SE 10 Rd, Knob Noster
We hope you can join us for our first Central Region field trip to Knob Noster State Park. We haven't quite figured out all the details, but we will be birding. That we know. Event is free and all are welcome!

August 26 @ 5:30 p.m. MRBO BirdHouse Ribbon Cutting
406 Main Street, Arrow Rock
MRBO's BirdHouse Grand Opening and ribbon cutting ceremony presented by the Marshall Chamber of Commerce. Join us as we officially open our office, visitor and nature center, and gift shop at our new location!



September 22 - 24
Plan It Native Conference
Virtual
MRBO is pleased to support the Plan It Native conference hosted by Deep Roots KC. With excellent presentations, exhibitors, and interactive sessions focused on landscaping with native plants, this year's conference is sure to be as engaging and inspiring as it's always been. See <https://planitnative.org>.

September 24 -26
Women's GO WYLD Weekend
Osceola
MRBO Director Dana Ripper will join friends from Pheasants Forever/Quail Forever and WildHERness for this hands-on experiential weekend. Women who love the outdoors will gather for learning sessions; Dana will lead an immersive bird ID experience. Registration opens July 1st. See: <https://fb.me/e/1fuLs3lsr> or find Pheasants Forever/Quail Forever in Missouri on Facebook.

As the Covid-19 pandemic winds down (!!) we're sure to be adding more events in the coming months. Check in with the MRBO calendar at <https://mrbo.org/events/>





Science

To contribute to the conservation of Missouri's birds and their habitats 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.



From April through July, the MRBO staff doubles as we are joined by skilled seasonal technicians that spend every day in the field documenting birds. In May and June, the wetland bird survey project overlaps with grassland bird surveys and nest-monitoring.

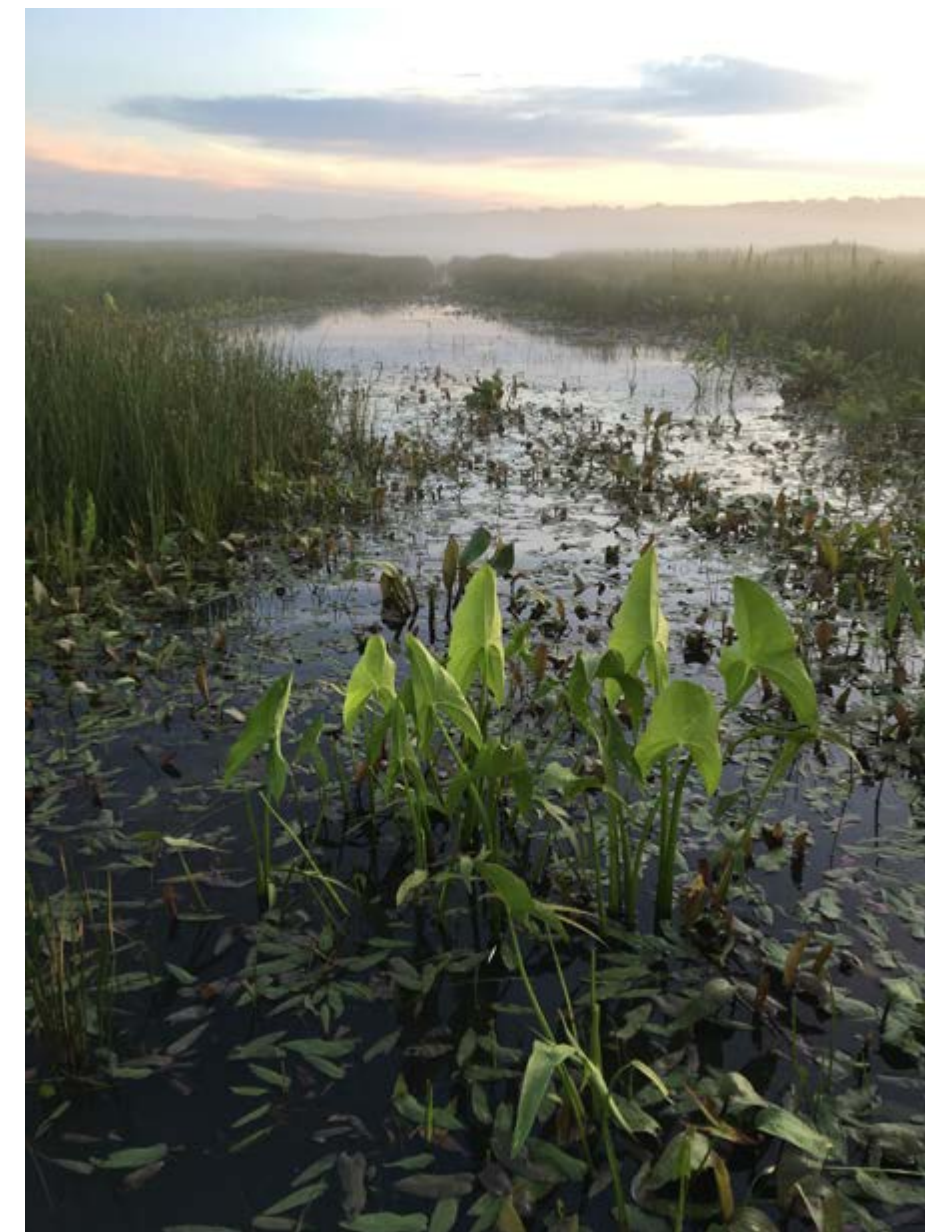
The field crews travel all over Missouri and into eastern Kansas surveying both public and private land. The data collected provide landowners with everything from a snapshot of bird use of managed habitat to in-depth documentation of the nesting success of declining species.

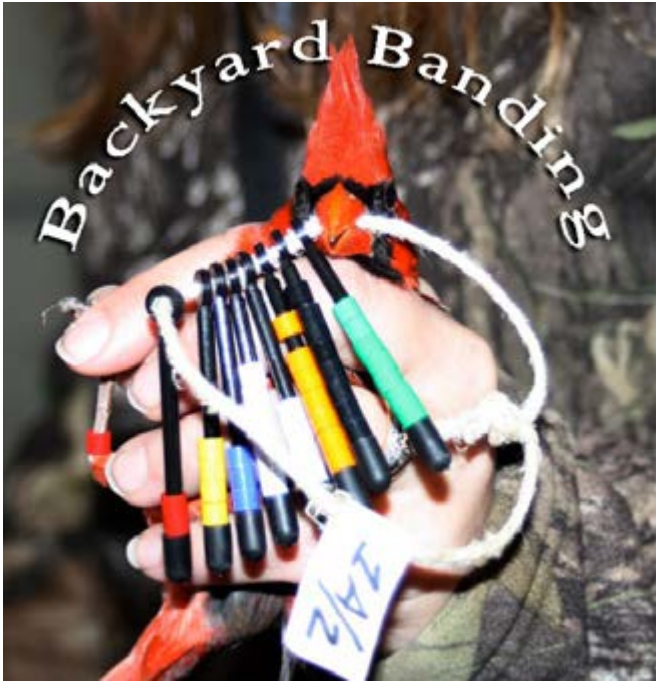
Field data are entered using the ArcGIS Collector app (please see the screen capture on the next page). This allows us to share accurate data in real time, and there's no need for paper datasheets and compasses!

Thanks to all of the dedicated field technicians for their hard work, and to the landowners that are providing crucial habitat for grassland and wetland birds!



Do you like pictures of birds, nests, and habitat delivered to you straight from the field? Follow MRBO on Instagram! Our field crew and educators post often about all things birdy! @moriverbirdobs





A ten year project concludes

INTRODUCTION

Pioneers in ornithology were the first to consider the potential of banding wild birds. It is a well known anecdote that John James Audubon banded a few birds with thread for personal observation, but Leon J. Cole was the first to fully outline the potential applications of banding using stamped aluminum:

*"...it is evident that not less important, to a person who operates traps at the same place all of a season, or all of a year, is the opportunity, by this method, of keeping in touch with the daily life of birds living in the vicinity; of knowing just when they come; just when young leave the nest; just how long they remain in the vicinity; and when they leave; and watching the exact movements of individual birds during migration. Indeed, the careful observer, in a fixed location, may obtain facts of greater scientific value on the daily records than from year to year."*¹

Ever since, bird banding has been a widely used tool to record, monitor, and observe bird populations, becoming a particularly widespread method after WWII². The idea of bird banding was to be able to identify individual birds³, to obtain information such as age, life expectancy, site fidelity, body condition with migration, and other metrics that could only be obtained on birds in the hand.

In the present day, a specific protocol is conducted by banders, and records go to the USGS⁴. This protocol features intensive measurements collected during banding that gather age data, and can be used to estimate the age or success of a population^{5,6} (given enough samples and the right design) and lifespan of individuals from different species. In the *Survey Designs and Statistical Methods for the Estimation of Avian Population Trends* compendium, a review of banding by Deanna Dawson (pp 37-40) discusses how banding as a tool had to shift focus very near its onset. This is because the recapture rate was (and still is) so low, making it a challenge to accurately estimate any of the aforementioned demographic traits⁷. Despite these shortcomings, banding has provided data to support site fidelity (birds return to the same location) for breeding⁸, and scant evidence—but still some evidence—of fidelity to stopover sites⁹. Furthermore, banding birds provides a powerful educational tool and outlet for promoting conservation.

MRBO has conducted bird banding activities in a number of arenas and for a variety of purposes. Bird banding has been conducted for the Monitoring Avian Production and Survivorship (MAPS) program sites on prairie breeding grounds. Through encouragement and collaboration with other researchers, a Northern Saw-whet Owl banding

program was started that continues each fall and early winter. An additional project undertaken was hummingbird banding. In 2014, hummingbirds were banded at mist nets and traps set around feeders in Van Meter State Park and the Village of Arrow Rock. MRBO also operated banding stations at outreach events, and even operated in a few urban and suburban 'backyards.' The backyard birds were given specific color bands for identification of individual birds in part for education and engagement with the public, but also again because the recapture rate, where birds successfully get trapped in nets again, is very low¹⁰. However, to better fulfill the mission of our organization, MRBO has shifted to different monitoring efforts and other tools for science, conservation, education and advocacy.

For the duration of this report we will be focusing on our 'backyard' banding projects. The vast majority (over 90%) was done during the winter, an otherwise low-activity time period for our staff to work in the field. As such, records are most robust for wintering birds such as Slate colored Juncos, and tough, year-round residents of Missouri like the Northern Cardinal and Chickadees. Here we present our findings of our backyard bird observations: ranging from number of resight, average frequency of resighting, and proportion of birds that were ever resighted, and maximum age from banding.

METHODS

Birds were captured in mist net arrays and extracted as early and safely as possible. Birds were then transported in cotton bags to the banding station, where Aluminum bands (obtained from the USGS bird banding lab, BBL) were affixed to one of the bird's legs. In addition to aluminum bands, a locally unique combination of plastic color bands were placed on birds to make individual birds identifiable from a distance rather than only by recapturing. The addition of color bands has not been found to affect bird behavior or cause other detrimental impacts on banded birds¹¹. Data on banded birds was submitted to the overarching USGS BBL¹².

Banding was done at frequently-birded sites where volunteers (including local MDC and Audubon Society staff) were able to watch the banding process and see birds up close in the hands of MRBO staff. Volunteers were then able to assist by keeping a look out for uniquely identifiable color banded birds. A total of 107 sites have undergone banding programs from the Missouri River Bird Observatory. Of those, 50 are considered 'backyard banding' sites (Fig. 1). Sites are referred to by three- to five-letter codes to preserve partners' privacy. Bird data are presented with species either referenced by their common name, or their AOS four letter code¹³.

RESULTS

Species Captured: As previously stated, winter birds were most captured and color banded for this project (Table 1). In total, 27 different species were represented in this project. While not separate species, a category of hybrid chickadees was also captured, and some White-crowned Sparrows were assigned a specific subspecies. (Note: Slate-colored Junco is a subspecies of the Dark-eyed Junco). The most frequent was Black-capped Chickadee (416), followed by Slate-colored Junco (378, Table 1). Downy Woodpeckers and Tufted Titmouse were the only other species with the total number banded exceeding 300, with 329 and 301, respectively. Four more species had totals exceeding 100: Carolina Chickadee, Northern Cardinal, American Goldfinch, and White-breasted Nuthatch (Table 1).

Resight data: 2,244 birds were included in the color band/re-sight data. Of those, 750 were resighted at least once (33%). The total average number of resights amounted to 1.81 resights per bird. Excluding birds that were never resighted, birds that were resighted at least once were resighted 5.42 times on average. Individual Downy Woodpeckers had the highest number of resights, with four of the top six species (all resighted over 50 times) being Downy Woodpeckers. (Table 2).

1. Leon J. Cole, "The Early History of Bird Banding in America," *The Wilson Bulletin* 34, no. 2 (1922): 108–14.

2. John R. Sauer and Sam Droege, *Survey Designs and Statistical Methods for the Estimation of Avian Population Trends* (U.S. Department of the Interior, Fish and Wildlife Service, 1990).

3. Aldo Leopold, "Band # 65290 (From A Sand County Almanac)," 1949.

4. "Bird Banding Laboratory," accessed May 31, 2021, <https://www.usgs.gov/labs/birdb-lab>.

5. Robert B. Payne and Laura L. Payne, "Survival Estimates of Indigo Buntings: Comparison of Banding Recoveries and Local Observations," *The Condor* 92, no. 4 (November 1990): 938, <https://doi.org/10.2307/1368730>.

6. G. S. Zimmerman et al., "Estimating Migratory Game-Bird Productivity by Integrating Age Ratio and Banding Data," *Wildlife Research* 37, no. 7 (December 17, 2010): 612–22, <https://doi.org/10.1071/WR10062.a>

7. Sauer and Droege, *Survey Designs and Statistical Methods for the Estimation of Avian Population Trends*.

8. Mark Shieldcastle, "Migrational Movements and Habitat Usage of Migrant Passerines in the Great Lakes Region: Ottawa National Wildlife Refuge, Ohio" (Black Swamp Bird Observatory, 2013), https://www.bsbo.org/uploads/3/0/8/0/30807041/bsbo_2013_passerinemigration_pr.pdf.

9. Shieldcastle.

10. Sauer and Droege, *Survey Designs and Statistical Methods for the Estimation of Avian Population Trends*.

11. Jessica L. Milligan, Andrew K. Davis, and Sonia M. Altizer, "Errors Associated with Using Colored Leg Bands to Identify Wild Birds," *Journal of Field Ornithology*, 2003, 111–18.

12. "Bird Banding Laboratory."

13. R Terry Chesser et al., "Sixty-First Supplement to the American Ornithological Society's Check-List of North American Birds," *The Auk* 137, no. ukaa030 (July 24, 2020), <https://doi.org/10.1093/auk/ukaa030>.

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Common Name	Number Banded	Number Resights	Resight:Banded Ratio
Black-capped Chickadee	416	357	0.858173077
Slate-colored Junco	378	467	1.235449735
Downy Woodpecker	329	1146	3.483282675
Eastern Tufted Titmouse	301	487	1.617940199
Carolina Chickadee	181	481	2.657458564
Northern Cardinal	160	137	0.85625
American Goldfinch	129	48	0.372093023
White-breasted Nuthatch	120	330	2.75
Red-bellied Woodpecker	46	150	3.260869565
White-throated Sparrow	40	128	3.2
House Finch	34	11	0.323529412
Eastern White-crowned Sparrow	22	24	1.090909091
Hairy Woodpecker	21	95	4.523809524
Hybrid Chickadee	13	12	0.923076923
Eastern Bluebird	11	7	0.636363636
Henslow's Sparrow	8	0	0
Red-breasted Nuthatch	8	33	4.125
House Sparrow	5	7	1.4
White-crowned Sparrow	4	0	0
Brown Creeper	3	0	0
Carolina Wren	3	136	45.33333333
Eurasian Tree Sparrow	3	0	0
Pine Siskin	2	2	1
Blue Jay	1	0	0
House Wren	1	0	0
Mourning Dove	1	0	0
Orange Crowned Warbler	1	4	4
Purple Finch	1	0	0
Red-headed Woodpecker	1	0	0

Table 1. Species of Bird banded and resighted. Number banded represents the number of individuals within a species banded. Number of resights is the total number of times a bird of the corresponding species was resighted. Resight to banded ratio represents the proportional number of resights (of a species) to the number of birds banded (of the same species). All numbers represent data received during the full extent of time observer data reported to MRBO.



Dan Bernskoetter



Michael O'Keefe

Date	Species	Age at Banding	Sex	Total # Times Resighted
1/30/2016	DOWO	TY	F	280
1/22/2017	CARW	AHY	U	133
11/19/2012	CACH	HY	U	98
1/7/2013	DOWO	TY	F	81
3/13/2012	DOWO	TY	M	66
1/30/2016	DOWO	SY	M	64
1/30/2016	SCJU	AHY	U	44
1/21/2012	WTSP	AHY	M	40
1/22/2017	SCJU	SY	U	36
12/12/2014	TUTI	HY	U	34

Table 2. Ten birds most frequently resighted. Date is date originally banded. Species is AOU four letter code. Age at banding consists is determined by physiological & morphological metrics which can vary by species: AHY (after hatch year), HY (hatch year), SY (second Year), or TY (third year). Sex is Female (F), Male (M), or Unknown (U) if no dimorphism within species. Total # times resighted is the total number of times a bird was resighted during the full extent of time observer data reported to MRBO.

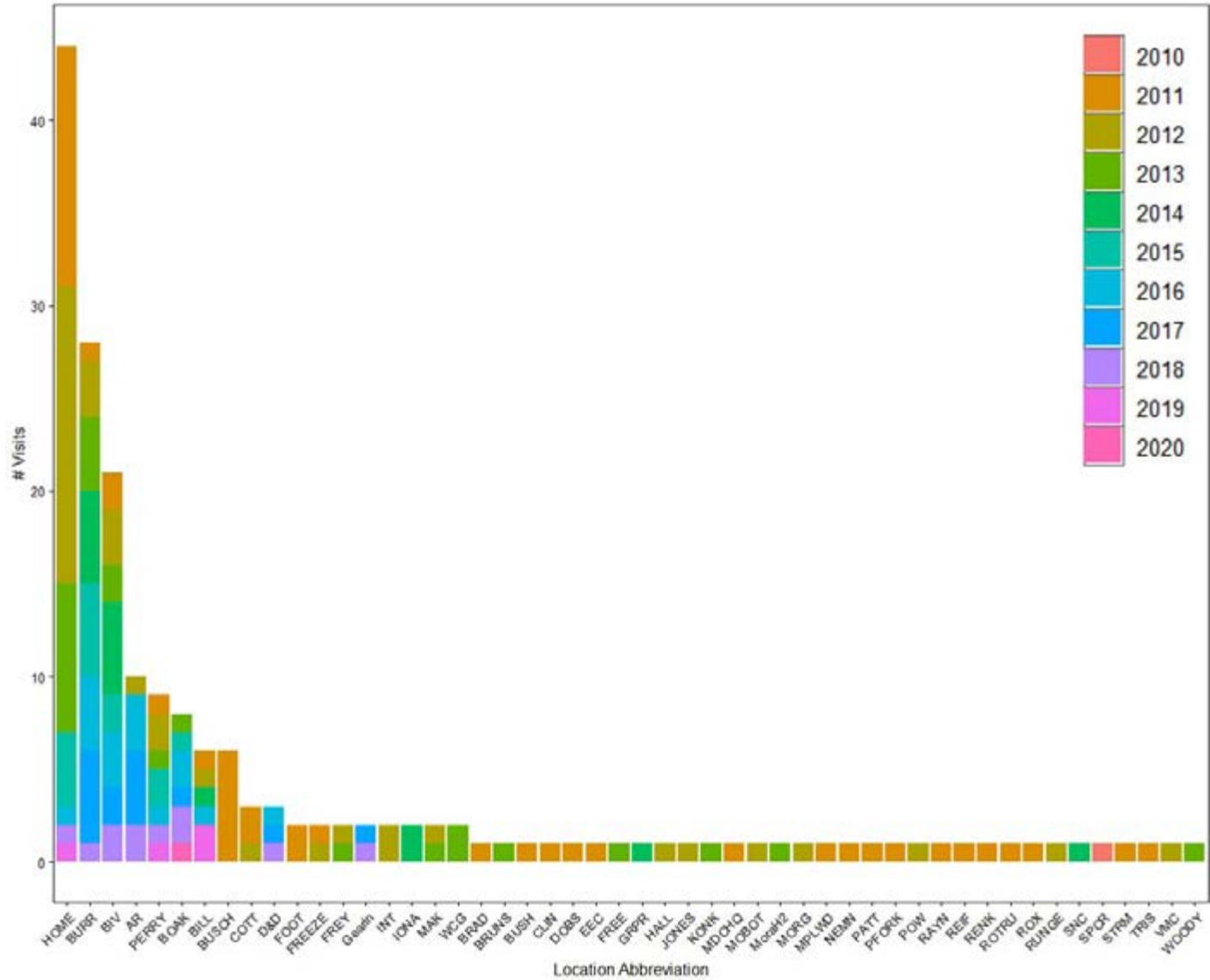


Fig. 1: Number of visits to a 'backyard' banding project site. The width of different colored segments of each bar represent the count of visits in a particular year corresponding to the legend at the right of the graph.

Resight Longevity: Of the birds that were resighted, most were resighted within their first year after banding (422). 315 birds were resighted in the second year after banding, and 201 were resighted in the third year after banding. The steady decline continues, with roughly half the number of resights every subsequent year. 122 birds were resighted Year 4 after banding. 5 years after banding 61 were resighted. 6 years after banding 18 were resighted; 7 years after banding 8 were resighted. 1 bird was resighted 8 years after—it was an after hatch year Northern Cardinal. 1 bird was resighted 9 years after, and this was also an after hatch year bird when banded: a Carolina Chickadee!

DISCUSSION

While we do enjoy bird banding activities and there is a real benefit to outreach by being able to present birds up close to the public, banding is stressful for birds¹⁴, though stress may not cause negative effects long-term¹⁵. Additionally, as previously mentioned, it can be challenging to scientifically analyze banding data for research and monitoring. As such, we have largely suspended banding activities as an organization.



For most sites, there was no standardization of resight effort. The objective was to capture the greatest number of birds for recording maximum number of resights and volunteer engagement. Again, most species were banded over the winter months, so species were specifically those here during that time. Additionally, banding was done in yards or areas near feeders, which increases capture and ability to resight when birds visit easily observable feeders.

From our data, Downy Woodpeckers appear to stay the most local, or at least remain the most conspicuous at our sites. Evidence of longevity and reports of site fidelity for migrants such as Slate-colored Junco and White-throated Sparrow obtained from colorband resighting can be useful, and valuable to the birding community. However, a thorough, robust ecological metric such as population life expectancies or a percentage of site fidelity for migrant populations would require more robust methodology—standardizing effort with consistent amounts of days and time surveyed for example would be crucial. Our resight data is a product of citizen science, albeit good birders trained by our staff. A variety of skill levels in observers can lead to errors in resight data. According to Milligan et al, in a trial specifically examining error in resight reports, they found a minimum error of 5-16%¹⁶. Errors and questions in integrity of data can limit potential interpretation of results. Indeed, ecology as a field has shifted from these observational studies to more complex analyses examining specific effects and thorough statistical models¹⁷.



Dan Bernskoetter

Scientific interpretation aside, the benefit of outreach and advocacy at banding events including the ability for visitors to areas to re-sight and identify one of their 'adopted' birds can be an invaluable tool in supporting conservation efforts. An additional narrative that can be presented with bird banding is the historical aspect of this tool increasing knowledge and engagement with the field of ornithology.

Looking forward, there is great potential to advance bird movement study in a variety of ways. One of the foremost is a hybrid model of banding while attaching motus trackers¹⁸. This requires greater investment in both trackers and the infrastructure: Motus radio towers. Fortunately, costs can be spread across institutions, because collaboration runs deep through ornithology. The Midwest Migration Network is actively conducting projects using radio tower telemetry to better understand bird movements¹⁹. Better understanding of movement during migration, such as association with weather patterns, could be of interest and studied with an array of towers and tracked birds. Banding and tracking at migration sites could even yield metrics of distance traveled and fecundity based on body condition during migration. This will require towers near breeding sites and possibly associated nest-monitoring and recapture efforts.

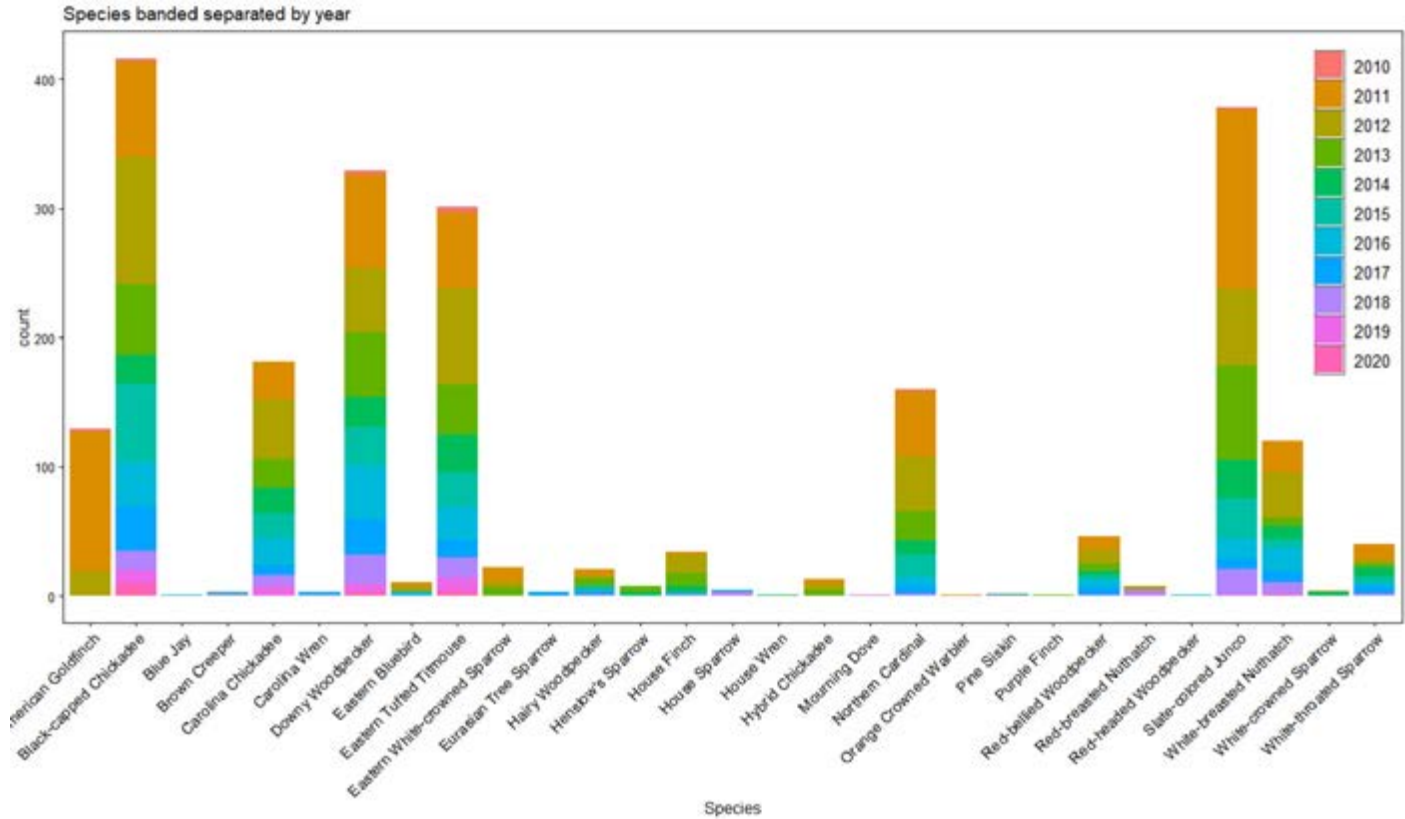


Fig. 2: Count of species banded in backyard banding projects. Different colored segments represent the proportion of birds banded in the year corresponding to the legend at the right of the graph. All species presented by their English names.



Chris Bothwell

Additional related projects examining migratory and breeding bird populations provide insightful data. The Breeding Bird Survey (BBS), for example, is a long-term monitoring program that provides population averages, which was one of the original objectives of bird banding. MRBO has also developed other innovative methods of monitoring using distance sampling protocol to cover large swaths of natural areas across the state²⁰. Other novel non-capture projects are just getting off the ground; these consist of radar ornithology²¹ and wind farm carcass searching²². Bird migration still fascinates people and there is much yet to be learned about this phenomenon.

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15. Valeria Marasco et al., "Repeated Exposure to Stressful Conditions Can Have Beneficial Effects on Survival," *Experimental Gerontology* 69 (September 2015): 170–75, <https://doi.org/10.1016/j.exger.2015.06.011>.

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18. "Motus Wildlife Tracking System," accessed June 1, 2021, <https://motus.org/>.

19. "Our Projects," accessed June 1, 2021, <https://midwestmigrationnetwork.org/our-projects>.

20. Dana Ripper and E. C. Duke, "Prairie Bird Surveys on Audubon Conservation Ranching Program Lands in Missouri," Missouri River Bird Observatory report to the National Audubon Society and the Missouri Department of Conservation (Missouri River Bird Observatory, 2018), www.mrbo.org.

21. Sidney A. Gauthreaux and Carroll G. Belser, "RADAR ORNITHOLOGY AND BIOLOGICAL CONSERVATION," *The Auk* 120, no. 2 (April 2003): 266–77, [https://doi.org/10.1642/0004-8038\(2003\)120\[0266:ROABC\]2.0.CO;2](https://doi.org/10.1642/0004-8038(2003)120[0266:ROABC]2.0.CO;2); Isabel Rosa et al., "Classification Success of Six Machine Learning Algorithms in Radar Ornithology," *Ibis* 158 (January 1, 2016): 28–42, <https://doi.org/10.1111/ibi.12333>.

22. Sergio A. Cabrera-Cruz et al., "Estimates of Aerial Vertebrate Mortality at Wind Farms in a Bird Migration Corridor and Bat Diversity Hotspot," *Global Ecology and Conservation* 22 (June 1, 2020): e00966, <https://doi.org/10.1016/j.gecco.2020.e00966>; Janine Aschwanden et al., "Bird Collisions at Wind Turbines in a Mountainous Area Related to Bird Movement Intensities Measured by Radar," *Biological Conservation* 220 (April 2018): 228–36, <https://doi.org/10.1016/j.biocon.2018.01.005>.





Education

To contribute to the conservation of Missouri's birds and their habitats by providing opportunities for Missourians of all ages to spend more time outdoors and to learn about species and habitat conservation.

What's Happening in Education and Outreach

The education department is excited to share with you some updates about a few of the awesome projects we have going on.

Virtual Nature School

Our Virtual Nature School program is well underway, but not finished yet! Our goal was to provide standards-based lessons tied specifically to Missouri ecosystems built to be used in both in-person and virtual classroom settings. We wanted to assist teachers in adapting to the COVID-19 pandemic in any way we could and provide new ways for students to learn about Missouri's birds, their habitats, and other Missouri fauna and flora. We believe we have accomplished this from the start of the program in the fall of 2020, through the spring of 2021. For the Grades 6-8 Materials, "Unit 1: Reproduction" is available on our website and "Unit 2: Adaptation" is not far behind. We hope to roll out "Unit 3: Ecosystems" in the fall of 2021 and "Unit 4: Earth's Systems and Climate" in the spring of 2022. This portion of the project has taken a great deal of time and energy and we could not have done it without the help of our first ever Education Virtual Intern, Pammi Price. Pammi was essential in helping us develop these materials for students and teachers to use now and into the future.

The Grades 3-5 portion of the project has also seen a lot of progress. The project for teachers and students in grade levels 3-5 consists of what we call, "Weekly



Weekly Webinar Series: A grades 3-5 project with 12 teachers and classrooms.



MRBO's Virtual Nature School provides grade 6-8 standards-based lessons tied specifically to Missouri ecosystems for teachers teaching in virtual-classroom or in-person settings.



Weekly Webinar Series screenshot: A grades 3-5 project with 12 teachers and classrooms.

Webinars". Each webinar discusses a certain topic related to birds that ties into the Missouri Learning Standards and uses Missouri-specific examples when appropriate.



Topics include Bird Beaks, Bird Migration, Bird Communication, Feathers, Habitat, the Nesting Cycle, various avian organ systems, and more! This program had a total of 12 teachers and classrooms participating, reaching over 200 students in Missouri. There were over 50 webinars presented to these students, greatly expanding not only their knowledge of birds but also their ability to ask thoughtful questions.

We plan to continually grow this project throughout the next couple of years to provide the best possible resources for Missouri's teachers and students. This project helps us accomplish our mission to provide opportunities for Missourians of all ages to spend more time outdoors and to learn about species and habitat conservation.



Kids enjoy exploring and learning about the natural world at MRBO's Young Explorers' Camp (YEC).



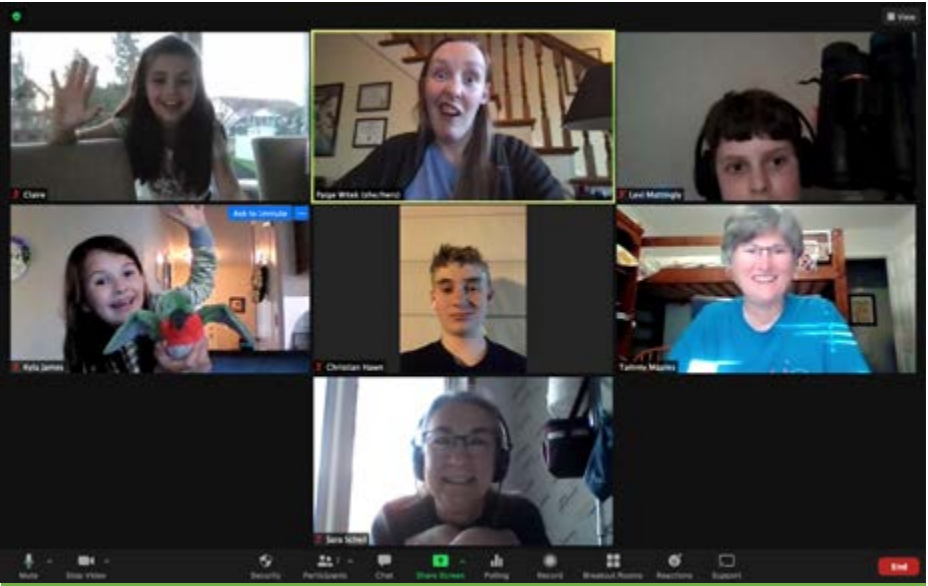
Young Explorers' Camp

Summer is here and that means our summer day camp, the Young Explorers's Camp, is here as well. This summer marks our fourth year of in-person camp in Arrow Rock and our second year of virtual camp at home. How is that possible?! This year we are providing both an in-person camp option during the month of June at our facilities in Arrow Rock and a virtual option for families to participate anywhere they are during two weeks in July. At the time of writing, camp will not yet have begun, but by the time you are reading this, our in-person camp will be well under way!

We are so excited to have FULL REGISTRATION for our in-person summer camp in June as well as participants for our virtual camp. Each camper will be provided their own Exploration Kit which includes a backpack, water bottle, nature journal, navigation compass, butterfly net, aquatic insect net, hand lens, bug observation container, writing utensils, a pencil case, colored pencils, and a Young Explorers' Club T-shirt! We have some fun activities planned that should spark observation, critical-thinking and exploration. It's going to be a fun and busy summer!

Missouri Young Birders Club

The Missouri Young Birders Club (MYBC) is our year- round program that aims to bring together young people (ages 8-17) to enjoy, experience, and conserve Missouri's birds and other wildlife. During the pandemic, we have been meeting virtually every month to discuss all things birds and birding. We've discussed bird-related career fields, the best birding gear, bird songs, warblers and vireos, and this month Guest Presenter, Kelly Koch with Missouri State Parks, is going to talk to us about bird nesting. The benefit of these virtual meetings is that



Missouri Young Birders Club is psyched about birds!

young birders from all over the state get to meet and get to know one another, further growing their interest in birds. We are excited to have some in-person field trips planned in different areas of the state coming up! We will be meeting at Burr Oak Woods Nature Center and Conservation Area in Blue Springs on July 10th, Peers Prairie with Magnificent Missouri in Marthasville on July 24th, and at Knob Noster State Park outside of Sedalia on September 4th. You can find out more about these upcoming events and how to get involved on the website: moyoungbirders.org.

You know you need to join MYBC if:

1. You love to spend time outside.
2. You need to spend more time outside.
3. You are fascinated by all things nature.
4. You aren't afraid to get dirty looking for bugs or other critters.
5. You like learning about what surrounds you.
6. You like helping your community.
7. Your artistic inspiration comes from nature.
8. You are curious.
9. You know things about nature your other classmates don't or want to know things about nature your other classmates don't.
10. You are looking for a community of people that love being outside as much as you do!



We are excited to announce that MRBO recently received generous support from the Outdoor Fund for education!

New Education and Outreach Internship!

Last, but not least, we would like to welcome our new Education and Outreach Intern, Evelyn Kirtley, to the team! Evelyn's main task will be assisting Paige with our Young Explorers' Camp and a big task it is to help plan, organize, prepare and run an in-person and virtual summer day camp. She will be vital in making camp a great experience for all. She will also be assisting with the Missouri Young Birders Club and other education programs occurring during the summer months. You can learn more about Evelyn and the other seasonal staff in this newsletter. Welcome to the team!

Hello everybody! My name is Evelyn and I am super honored to be working with MRBO this summer. I am currently having a blast pursuing a degree in wildlife biology at the University of Central Missouri. I love all things wild (especially birds), so I have no doubt that I will fit in just fine around here. My desire to learn more about conservation through education led me to this position. I'm so glad to have the opportunity to learn more from Paige and all the campers this summer. I look forward to discovering more about birds, and how we can better use them as education devices to make the world a friendlier place!





Advocacy

At MRBO we have continued to formalize our advocacy processes within our Board of Directors Advocacy Committee. There are many pressing conservation matters that come up each year with varying degrees of intersectionality with MRBO's mission and core values. We actively track legislation and communicate within our peer networks throughout the entire legislative session in order to prioritize and eventually formally write and contact legislators with our position statements.

This year, we were most pleased to see the passage of HB 369 through both chambers, which allows for landowner liability coverage for prescribed fire used during habitat management activities. This legislation was sponsored by freshman Rep. Tim Taylor, who represents the

district that is home to MRBO's headquarters.

None of the bills that we formally opposed made it through the session, but we anticipate future legislation that will impact our mission to conserve Missouri's birds and their habitats.

We encourage all of those who care about conservation to keep up with legislation and understand the issues beyond the polarizing political lens and from the perspective of how policy may impact wildlife and natural resources. Below are a few of the resources we use to stay informed about legislation throughout the session. You can use these sources as a good filter for condensing conservation related issues from the deluge of bills filed each year.

To contribute to the conservation of Missouri's birds and their habitats by advocating for sound, science-based conservation policy that benefits birds, other wildlife and environmental quality.

Missouri Stream Teams United
Conservation Federation of Missouri
Missouri Coalition for the Environment
Sierra Club Missouri Chapter
Missouri Rural Crisis Center
National Wildlife Federation
National Audubon Society
League of Conservation Voters

We are pleased to present a summary of the legislative session, originally written for the Missouri Parks Association (<https://missouriparksassociation.org>) by MPA board member Mary Nemecek. MRBO Directors Dana Ripper and Ethan Duke serve with Mary on the policy committee of the Conservation Federation of Missouri. Our organizations share similar conservation values and we often work together on legislative issues.

By Mary Nemecek
Missouri Parks Association Board Member

The 2021 legislative session did not begin in the usual way. Still in the grips of a pandemic, House leaders cancelled the freshman bus tour of state parks and other facilities. The House then started the session by voting 46-105 against following CDC recommendations, so lawmakers did not have to wear masks. Later, the House cancelled session for the week of January 18 after several lawmakers and staffers tested positive for COVID-19.

As action resumed on the House floor the following week, the House canceled its invitation to Governor Parson to deliver his State of the State speech just hours before it was to occur. The event quickly changed venues and was livestreamed from the Senate chamber. Days later the Governor aired his displeasure over the incident, calling the cancellation a "stunt and petty show of arrogance." The disfunction within the super majority was now documented in the Governor's letter to his party.

On the legislative front, over 700 bills had been pre-filed. By early February, a perennial bill authorizing the sale of Eleven Point State Park (HB 1046) was starting to move in the Corrections and Public Institutions Committee and became MPA's primary concern. During the hearing, bill sponsor Chris Dinkins, who represents Iron, Reynolds, and other mining counties, asserted that funds for the state's purchase of the new park in Oregon County had been intended for the cleanup of mined areas. That cleanup is proceeding under EPA's separate superfund. MPA and others testified during the hearing that the state had used a fund legally designated for projects intended to replace natural resources damaged by mining with equivalent lands elsewhere. Rep. Dinkins also repeatedly stated her bill was intended to require the divestment of only the 625-acre strip under scenic easement along the Eleven Point River, when the legal description in the bill was clearly for the entire 4000+ acres. As misstatements and confusion continued, the bill was voted "do pass" out of both the Corrections and the Rules committees along party lines.



Since the Eleven Point bill was then eligible to be taken up on the House floor at any time, MPA and its partners turned to educating other legislators and citizens. More than 2,000 Missourians contacted their representatives in an inspiring show of support for the park and opposition to the bill. As the citizen response grew, the bill lingered in limbo, but vigilance was required to the end, lest it be brought up quickly or amended into another bill.

MPA also kept close tabs on HJR 55, another bill sponsored by Rep. Dinkins, to increase the size and politicize the Conservation Commission. After a hearing jam-packed with opponents, it seemed headed for bi-partisan defeat in the Conservation and Natural Resources Committee. Then, before the vote was taken, the Speaker of the House added more members to the committee, and the measure passed on an 11-8 vote. Once in the Rules Committee, however, action was "postponed," and it never came up again.

Yet another bill (SB 40)—this one to hobble DNR, the parent agency of state parks—was even more worrisome and confusing to the very end. The initial version prohibited DNR from raising any air, land, or water protection fees, or making any rules stricter than federal standards. Along the way it was amended to eliminate vehicle emission inspections in three counties bordering St. Louis. The fiscal

note on that item alone was up to \$1.5 million/year plus the potential loss of \$52 million in federal highway funds for not meeting EPA air quality standards. The amendment was considered so egregious it was sure to sink the bill. At first glance that is what happened; SB 40 failed to pass out of the Fiscal Oversight Committee for lack of a second. But two days later it rose again, was quickly passed out of committee, and by noon the same day passed the Senate in a 23-10 party-line vote.

"If signed into law," warned the Joplin Globe, "history will identify this bill as the worst piece of legislation ever produced by Missouri lawmakers, and that is a high bar to pass." Yet once in the House the bill moved quickly through committees, including fiscal review, and was still alive on the last day but did not make it to the floor. In a highly disturbing twist, however, the language eliminating emissions inspections and threatening a \$52 million loss in highway funding—the provision that it was thought would surely sink the entire bill—was amended onto HB 661 with an odd caveat that would sunset the measure in three years if federal highway funds were lost. It is now sitting on the Governor's desk waiting to be signed into law.

On the positive side in the chaos of the closing days, a bill (HB 369) containing several measures sought by MPA and other conservation groups managed to squeak through in the very last hour. A prescribed burning provision would limit the liability of landowners for damages or smoke from burns conducted according to a proper plan unless proven to be negligent; Missouri was one of only five states without such a law.

A feral swine provision includes a fine of \$2,000 for release of swine to the wild. Both measures are important for the health of our state and our state parks. The bill also authorizes DNR to acquire the Antioch Cemetery in Clinton, a Black cemetery still accepting burials. MPA did not take a position on the cemetery, as MSP has yet to review it for suitability as a state park.

Highly sought by DNR and MSP was inclusion in the state parks budget of authority to issue some \$60 million in revenue bonds to enable new or upgraded campgrounds, lodging, and other facilities that could be repaid within ten years by earnings of the new facilities. Revenue bonds had been used years ago (e.g., the Emory Melton Lodge at Roaring River), but the projects now authorized in twenty-two parks statewide will be a major advance for the system. For a list, <https://bit.ly/3cyhclZ>

Also important for the park division is the restoration of funding from the Artists and Entertainers Trust Fund for the Historic Preservation Revolving Fund after its having been eliminated for three years.

It was a legislative session of high stress, often baffling, chaotic, and disappointing, including in the behavior of certain lawmakers, with one censured, one expelled, and another pending criminal charges. For state parks and for MPA, however, it was in many ways productive, with the overwhelming support of Missourians standing up for our state parks and a legislative team and coalition functioning more effectively than at any time in years. We look forward to the fruits of the restored funding and new revenue bonds. Enjoy your time this summer in Missouri's state parks. They are a treasure and the work to protect and enhance them goes on.



Community News



We at MRBO are grateful to all of the sponsors, contributors, and attendees of our successful hybrid version of the Arrow Rock Birds and Bees Festival. Presenters from across the state and even other states discussed all things birds and bees. In-person field trip offerings were a delight and native plant vendors were present at the Annual Arrow Rock Garden Market and Vintage Bazaar.

Ethan Duke described the event as “a strong turnout of professional and regular community members who are grassroots and grasstop individuals from across the state.”

State ornithologist Sarah Kendrick gave focused and inspiring opening remarks and MRBO’s co-Director Dana Ripper offered an overview into the variety of virtual presentations offered throughout the festival along with the fun and educational activities that took place.

The closing keynote, co-sponsored by the Missouri Birding Society (mobirds.org), was delivered spectacularly by author Doug Tallamy. He discussed simple steps that each of us can - and must! - take to reverse declining biodiversity and explained why we, ourselves, are nature’s best hope.

You can see the offerings of virtual presentations (right) on MRBO’s YouTube channel under the Birds and Bees Festival playlist.

Thanks again to all of you who made this another successful event. Please check out all of the sponsors on the opposite page.

Right: If you missed any of the virtual offerings at this year’s Birds and Bees Festival, you can view the recordings on MRBO’s YouTube channel under the Festival Playlist. https://youtube.com/playlist?list=PLAOy_N5MQ85eoMAhn6B_zP_k0gapVuQ7X



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Karen Miller	Doug & Barb Doughty	Wicky Sleight

We at MRBO were honored attend the Sappington African American Cemetery State Historic Site dedication ceremony on June 5th, just southwest of Arrow Rock. This event included a very well-organized and well-attended ceremony at the cemetery hosted by Missouri State Parks followed by a community luncheon at the Schoolhouse in Arrow Rock. Attendees, many of whom were descendants of the souls interred, experienced moving oration from several speakers on this sunny day.

Key people were highlighted at the event for their work over many years to bring the 92nd addition to Missouri State Parks. Many of descendants traveled from other geographies and it was great to see distant and close family share in remembrance, reverence, and celebration.

We were happy to contribute in a small way to the ceremony by providing attendees with cold water in reusable MRBO water bottles. Observatory staff and board also aided the community by providing well-sourced and well-prepared food along with other community members. Ethan Duke attended the ceremony and video-taped the speakers. The video can be seen on MRBO’s YouTube Channel at <https://youtu.be/Pvpchr69GMc>.



To the Rescue!

How A Team Came Together To Save Viola & Piccolo
By Sandy Selby, Executive Director of the Friends of Arrow Rock

Except for an occasional gust of wind through the trees and the distant rumble of a train, all was quiet on this chilly March morning at the Henry Blosser House & Barn in rural Saline County. Historic preservationist Marty Selby was walking the grounds, checking for damage from a storm that rolled through the night before, when an unexpected sound intruded.

Clack. Clack clack. Clack clack clack! It was a noise reminiscent of the plastic wind-up teeth Marty had played with as a child. He followed the noise to a raised planter. Nestled in with the early spring plantings were two fluffy, cranky, beak-snapping owlets. Marty scanned the trees above, but there was no obvious sign of a nest and as the owlets continued to snap insistently, he knew he was in over his head. It was time to call in the professionals.

His friends, Dana and Ethan Duke of MRBO, answered his S.O.S. and traveled to the Blosser House to assess the situation. Like Marty, they hoped to find a nest nearby, but there was no nest or telltale owl pellets anywhere near the planter. With the temperature dropping and more rain on the way, Dana and Ethan had to take immediate action to save the owlets. They loaded the pair up for a trip to the Raptor Rehabilitation Project at the University of Missouri.

The Raptor Rehab team evaluated the Great Horned owlets, dubbed them Viola and Piccolo, and found that despite their adventure, both were in excellent health. On the day following their discovery, the pair were on their way back to the Blosser House, accompanied by Raptor Rehab team members. Everyone hoped,



but no one was sure, that if the owlets were re-nested on the property, their parents would find them and continue to care for them.

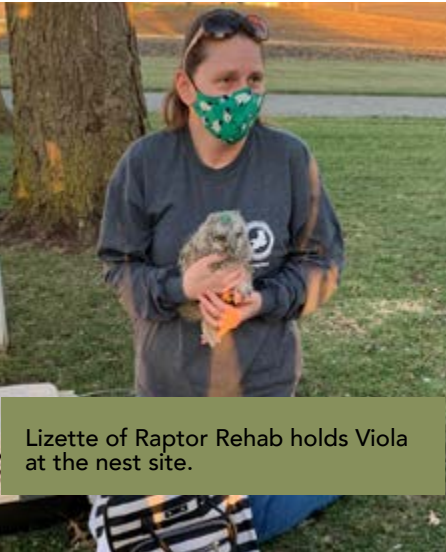
The first order of business was to find the original nest, so the team fanned out on the property and finally located the nest tree, many yards from where the owlets were found. The parents had made a poor choice of location when they set up housekeeping in a hollowed out stovepipe of a trunk without a single



Two Great-horned Owlets upon discovery by Marty Selby.

branch. Perhaps the owlets had ventured too close to the edge or maybe they had been blown out of the nest during the storm, but somehow they survived the fall and made a long and dangerous journey across the yard to the planter where Marty found them.

The original nest was such an unsuitable spot that the Raptor Rehab team decided to relocate the owlets to a tree just a few feet away, and created a comfy nest for the youngsters in a laundry basket. After several trips up a tall ladder to secure the nest and deliver Viola and Piccolo to their new home, there was nothing left for the anxious rescuers to do but wait and hope that game cameras mounted on nearby trees would bring good news.



Lizette of Raptor Rehab holds Viola at the nest site.



Those cameras delivered the very best news! Within hours of the owlets' arrival back home, their parents found them and were back at work feeding and caring for their young.

Marty and the Raptor Rehab team continued to monitor the owlets over the next several weeks, and the cameras caught the milestones as they grew and began to explore their surroundings. The last photos captured showed that the pair were branching, preparing to leave the nest and start their training to become skillful hunters.



Young owl ready to "branch out".

Piccolo and Viola's journey from planter box to the skies brought joy to all who helped them along the way.



Thank you for your Support

The following individuals or organizations have provided support since the publication of our Winter 2020 newsletter. We give thanks to them and to all who have supported the Missouri River Bird Observatory!

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