AUGUST 2020

VOLUME 16

Missouri Bird Conservation Initiative Newsletter

Working together to conserve bird populations and their habitats

Note from the Chair

MoBCI Works to Change the Trajectory of a Curve

by Bill Mees

Missouri Bird Conservation Initiative Chair

Planning for a successful conference begins months before the actual event. The venue, the theme of the meeting, identifying speakers, so many decisions that must be made. The Steering Committee initiated this process last December in preparation for the August 29, 2020 MoBCI Annual Conference. And then… well, you know, a virus spread across the globe and suddenly, the MoBCI Annual Conference, like so many other special events, fell victim.

There are reasons and goals for holding conferences and a cancellation doesn't eliminate those. Without the Annual Conference this year, MoBCI must rely on this newsletter to share news and updates about all bird conservation in Missouri.

The past months that caused the cancellation of the MoBCI Annual Conference have all been about a new virus and how to "flatten the curve" to mitigate its impact. MoBCI and its affiliates are focused on changing the trajectory of a different curve: the decline in bird populations.

As an organization, MoBCI focuses on reversing large-scale habitat loss which accounts for much of the problem affecting bird populations, but that doesn't relieve individuals of their personal responsibilities. Each of us can improve mini habitats like the backyard. Become a responsible cat owner and don't let the family pet

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run free. Prevent window strikes which adds to countless deaths each year. Many of us have felt that twinge of guilt when we hear the loud bang on a window or sliding door leading to the deck, and it's never a house sparrow that is found lifeless. Each of these pertinent topics receives attention in this newsletter. The recently released *Missouri Bird Conservation Plan: Outreach Section* offers other suggestions and is available online from the Missouri Department of Conservation[1].

If you are interested in the future you will want to read about the new Boone County Nature School. It's an exciting collaboration between the Missouri Department of Conservation, Columbia Public Schools, and other Boone County school districts. Read how the incoming students are being primed to become nature's future guardians.

In this newsletter, readers will also find articles submitted by some of the MoBCI affiliates which will acquaint or re-acquaint you with fellow bird enthusiasts from like-minded organizations and what they're up to. You may identify a future project partner. Coming together as MoBCI, we work to make a difference for birds, and individually each affiliate and each of us personally can make a difference too.

If you are contemplating submitting a grant proposal for a habitat improvement project, please focus your attention to the revised Call for Proposals that updates the criteria for successful grant applications. Years of bird species and population declines must be brought under control and MoBCI will help select projects that will lead the charge to change that curve.

We all believe "Birds are Awesome," but we're going to have to step up our game if there will be any progress that changes the trajectory of the curve depicting the decline in bird populations.

Happy Bird Watching,
Bill Mees, Chair
MoBCI Steering Committee

1. https://mdc.mo.gov/sites/default/files/downloads/MO-BirdConservationPlanOutreach.pdf

Photo by Jan Mees

Bill Mees has dedicated many years to the service of the Columbia Audubon Society. Here he is at the Columbia Audubon Nature Sanctuary located in central Columbia. This was the site of a MoBCI grant for prairie restoration for the benefit of wildlife and park users.

Photo by Sarah Kendrick

Retired State Ornithologist Brad Jacobs and State Ornithologist Sarah Kendrick on their way to watch birds during the 2019 fall migration.

Remembering Brad Jacobs

by Allison Vaughn

MoBCI Newsletter Editor

We are sad to report that longtime MoBCI friend and all around wonderful person Brad Jacobs passed away on May 1, 2020. The conservation world mourns his loss, and we will all miss his passion not only for birds but for global bird habitat. The Missouri Birding Society, formerly Audubon Society of Missouri, will publish an article in the fall celebrating the life of Brad which we will share with you through our mailing list. We are sharing the article[1] that ran in the Columbia Missourian that details many of his accomplishments and paints the picture we all know and love of Brad as a kind, unpretentious man who shared his love of birds with everyone. If you attended the 2019 MoBCI Conference, you were able to hear him speak of his accomplishment of the Big Year in 2018. Before his passing, Brad set up a fundraiser to continue his legacy of protecting birds throughout the Americas.

You may make a donation here[2] to help support birds in Brad's honor.

1. https://www.columbiamissourian.com/obituaries/missourian_life_story/brad-jacobs-was-gentle-kind-and-fun-to-bird-with/article_26ba2dae-8fa4-11ea-8841-1fd20fa7c200.html

2. https://mochf.org/remembering-brad-jacobs/

Update: Motus Wildlife Tracking System in Missouri and the Midwest

by Sarah Kendrick
State Ornithologist, Missouri Department of Conservation

The Motus Wildlife Tracking System (Motus) is a collaborative research network that uses arrays of automated radio telemetry receivers to study movements of small animals. Motus works using ultra lightweight radio tags attached to our smallest migratory birds and bats (even large insects) that are coded to the Motus frequency. When these Motus-tagged animals fly past a receiver on the landscape, the signal of the tag is detected and stored. Currently, there are approximately 850 active Motus receivers worldwide and most of the receiver sites (about 400) are located in southeastern Canada, near the Great Lakes, the northeastern U.S., and along the Gulf of Mexico (Figure 1). The Northeastern U.S. Motus receiver network has added a significant amount of knowledge on migratory species, including information on migration timing, stop-over sites, and other locations that Neotropical migrants and migratory bat species are using throughout the year. This has greatly aided the conservation efforts of the species studied.

However, fewer Motus receivers currently exist in Midwestern states and along the Mississippi Flyway (Figure 1A). The installation of strategically placed Motus receivers attached to existing structures in Missouri will increase the potential to detect other wildlife species tagged in existing or future Motus projects moving through the state. Motus tracking projects help pinpoint areas and pathways that Missouri's migratory birds and bats use during migration and hone in on high-use areas where conservation dollars and management can be of greatest benefit on the breeding and non-breeding grounds.

With the help of partners including the Missouri Department of Conservation, Missouri Conservation Heritage Foundation, Burroughs Audubon Society, Greater Ozarks Audubon Society, the St. Louis Zoo and other generous donors, Missouri has already installed 9 active Motus receivers in the last year—8 in southern Missouri, one in Jefferson City, and 7 more waiting to be placed in north Missouri (Figure 2). The goal is to set up two "digital fences" of receivers with overlapping detection diameters so that any Motus-tagged animal passing through the state will be detected.

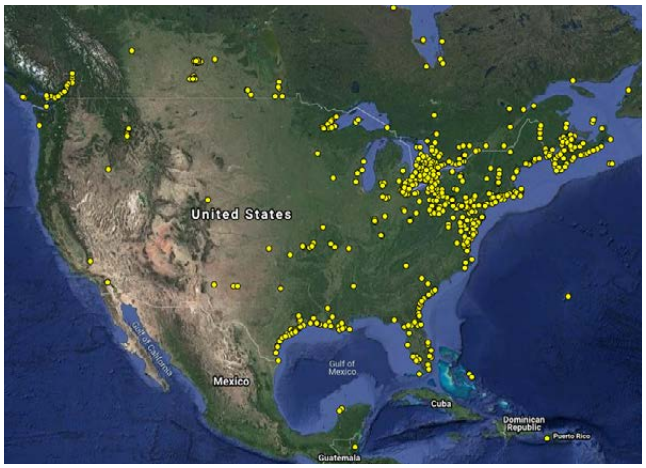
Last year, MDC and their partners were awarded a U.S. Fish and Wildlife Service grant to purchase 12 new Motus receivers in Missouri, Illinois, and Guatemala. A competitive

Black-throated Blue Warbler fitted with a Motus nanotag transmitter.

Photo by Bethany Thurber

Motus.org

Figure 1. Motus tower locations, worldwide



Motus.org

Figure 1A. Zoomed-in image of U.S. Motus coverage and lack of coverage in Midwest

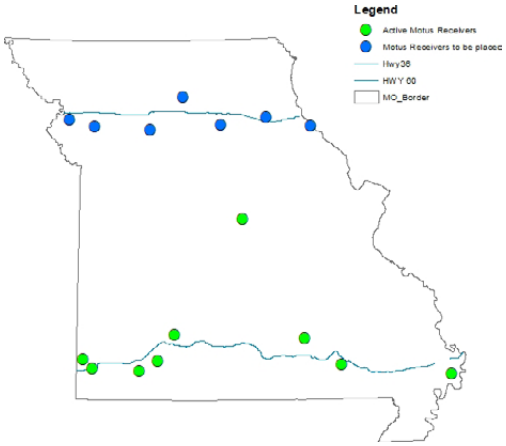


Figure 2. Eight Motus receivers in the southern line along Highway 60 are active; receivers in north Missouri along Highway 36 are waiting to be placed.

multi-state U.S. Fish and Wildlife Service grant was just submitted in June with MDC as the lead entity to purchase and place an additional 59 new Motus receivers (48 of those to be placed in Minnesota, Wisconsin, Michigan, Iowa, Missouri, Illinois, Indiana, and Ohio; and 11 to be placed in Mexico, Costa Rica, and Colombia) on stop-over sites and wintering grounds of many migratory bird species. The grant proposal also supports three research projects tracking Golden-winged Warblers in Wisconsin, American Kestrels in Minnesota, and Golden-winged Warblers and Wood Thrush on spring migration north from Nicaragua.

Motus is growing in the Missouri and across the Midwest. If you'd like to contribute to this exciting research opportunity, you can donate to the Missouri Conservation Heritage Foundation[1] and choose Missouri Wildlife Tracking Motus Towers as the Designation for Funds.

For more information, visit Motus.org[2] and this Missouri Conservationist article[3].

ffiliation

1. https://mochf.org/donate-online/
2. http://www.motus.org/
3. https://mdc.mo.gov/conmag/2019-10/flight-tracker

Grouse Restoration Efforts Underway

Reina Tyl

Resource Scientist, Missouri Department of Conservation

Missouri is located at the southwestern edge of the historic range of ruffed grouse (*Bonasa umbellus;* hereafter grouse) in the United States. Grouse were once present throughout most of the state; however, by the early 1900s, habitat loss and market hunting resulted in low grouse abundance. Efforts to restore Missouri's grouse population using wild-trapped grouse from other states began in the 1950s and 1960s and continued until 1996. Although initial evaluations of most grouse releases were favorable, grouse populations have been declining in abundance and distribution since the late 1990s and are vulnerable to extirpation.

In response to declining grouse numbers in the River Hills Region in east-central Missouri, the Missouri Department of Conservation (MDC) formed the River Hills Forest Habitat Partnership with the Missouri Chapter of the Ruffed Grouse Society and the Audubon Society of Missouri in 2000. The partnership has since expanded to include the National Wild Turkey Federation, U.S. Fish and Wildlife Service, Quail Unlimited, the Quail and Upland Wildlife Federation, and a number of private landowners and corporate sponsors. The goal of the partnership was to restore and maintain regenerating oak-hickory forests that will benefit early-successional forest habitat species, such as ruffed grouse.

Since the partnership formed, thousands of acres of habitat management occurred on private lands within the River Hills Region to compliment habitat restoration efforts on Daniel Boone Conservation Area (DBCA) and Little Lost Creek Conservation Area (LLCCA). Despite these efforts, grouse numbers remained low, prompting discussion of an interstate translocation effort to bolster the population.

To inform a decision about a possible translocation, MDC and the USDA Forest Service's North Central Forest Experiment Station conducted a study to determine the amount of early-successional forest habitat (ESFH) within a portion of the River Hills Region. Additionally, through the use of a population viability analysis (PVA), the study would determine whether establishment of a self-sustaining grouse population through a translocation effort was possible. The study found that—with increased habitat management efforts—a grouse population could be sustained in the region.

After several years of intensive habitat management efforts on DBCA, LLCCA, and private lands in the area, MDC developed a plan to restore grouse populations in the River Hills Region. The plan proposed translocation of grouse from a source state to several release sites. In June 2018, MDC and the Wisconsin Department of Natural Resources (WDNR) signed a memorandum of understanding allowing MDC to capture and translocate 300 grouse from Wisconsin to Missouri over 3 years.

In August and September of 2018, 100 ruffed grouse were trapped from northern Wisconsin and translocated to LLCCA. An additional 100 grouse were translocated to DBCA in 2019. To monitor the success of the restoration effort, MDC has begun conducting annual grouse drumming surveys.

In April 2019, staff conducted drumming surveys on LLCCA (since this is where the 2018 release had occurred). Unfortunately, no drumming grouse were detected during the surveys that spring; however, about half-a-dozen grouse were

Photo by Reina Tyl, MDC

MDC Wild Turkey and Ruffed Grouse Biologist Reina Tyl has a close encounter with ruffed grouse #159 on private property in the River Hills Region during April 2020. This grouse was captured as a juvenile male from northern Wisconsin and was released onto Daniel Boone Conservation Area in September 2019.

flushed while walking around LLCCA setting up and conducting the surveys. In April 2020, staff conducted drumming surveys on both LLCAA and DBCA. While conducting the surveys this spring, staff detected seven drumming grouse and flushed an additional three grouse. In addition to the grouse detected during the surveys, several private landowners in the area have reported grouse sightings on their properties.

The success of the drumming surveys this past spring have staff and partner organizations excited about the progress of the restoration effort thus far. Unfortunately, due to the COVID-19 pandemic, MDC and WDNR agreed to delay the last year of the grouse translocation until August and September 2021. In the meantime, habitat work on the conservation areas and on private properties in the River Hills Region continues. Maintaining ESFH throughout the region will be paramount for the success of the restoration. MDC staff are looking forward to the next round of drumming surveys in April 2021 and the final translocation of 100 grouse to the River Hills later that year.

Targeting the non-targets

Tim Kavan

Private Land Conservationist, Missouri Department of Conservation

Grassland bird populations have experienced long-term, widespread habitat fragmentation, dissection, and population decline. A September 2019 article in the journal Science, *The Decline of North American Avifauna* highlighted and quantified serious, ongoing declines in North American bird populations (Rosenberg et al. 2019). The article's findings indicate that America's bird populations have declined 29% (3 billion birds) since 1970. To put that into perspective, that's slightly greater than 1 in 4 birds that have disappeared in the last 50 years.

The causes for the declines include a complex array of factors that include human population growth, increased pesticide use, outdoor cats and collisions with windows, towers, and other infrastructure. But most likely the primary contributor to these losses is the loss of habitat through land-use change. By far, the most threatened habitat in North America is the native grasslands. The *Science* article reported that grasslands have lost nearly 720 million birds since 1970—a decline of over 40%. But it's not all bad news in the world of conservation for birds and other wildlife.

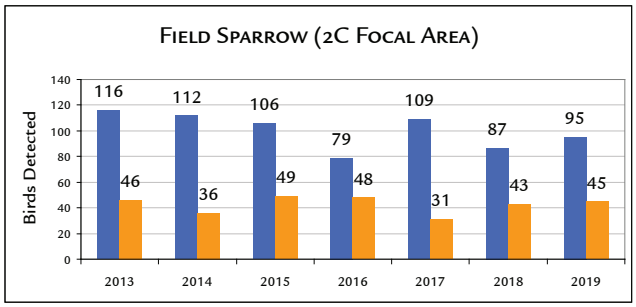
Research findings continue to be published throughout the nation that have positive responses from Northern Bobwhite Quail and other grassland birds. The report *Efficiency of the Conservation Reserve Program in Context of Focused Landscape Management for Northern Bobwhites and Associated Species* published by the University of Tennessee and the University of Georgia, emphasized that the nation's largest private lands conservation program, the Conservation Reserve Program (CRP), has the potential for great impacts on quail, grassland birds, and other wildlife if applied to the landscape at scale and in locations already targeted by complementary management activities. Research in this report has demonstrated a 75% chance of improving grassland bird populations in areas with as little as a 5% increase in whole-field vegetation practices.

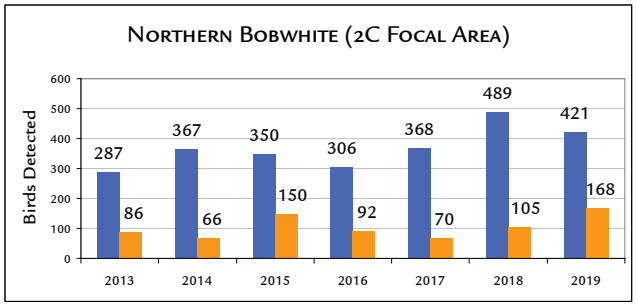
Missouri is one of six states that participate in the National Bobwhite Conservation Initiative's (NBCI) Coordinated Implementation Program (CIP) in a collaborative effort to monitor and share data tracking the population response within focus areas over a ten year period. Research teams in these focus area landscapes have seen and heard noticeable differences in population responses amongst the four bird species that have been determined as indicator species for healthy grasslands (Northern Bobwhite, Dickcissel, Eastern Meadowlark and Field Sparrow). The focal areas in Missouri that are contributing to this study include the 2C Quail Restoration Landscape (QRL) in Carrol and Caldwell counties, and the Bee Ridge QRL in Knox County. The Sand Prairie QRL in Scott, New Madrid and Mississippi Counties completed its own 5-year study but did not contribute to the NBCI's CIP. In each of the studies, it was evident and encouraging that conservation practices, when applied to a targeted geography and managed accordingly can have positive results for grassland bird species. Some differences were as high as 400%. The following graphs are from the three respective study areas that highlight the responses from the different grassland birds. The blue bars represent focal areas and the orange bars represent reference sites.

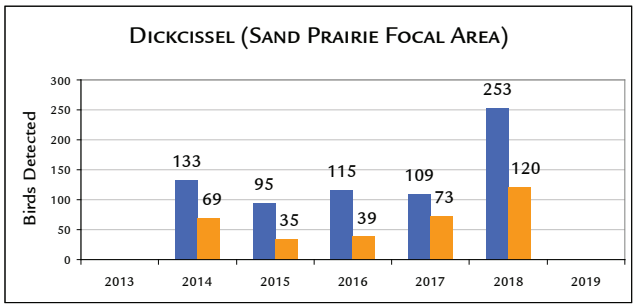
It goes without saying that some habitat is better than no habitat, but in most cases when that habitat is managed accordingly (mostly through prescribed burning and conservation grazing), it is at that time that we see the greatest rewards.

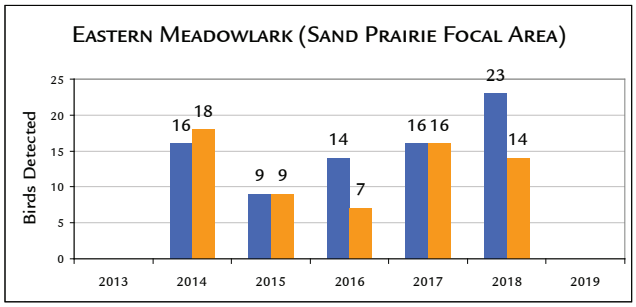
In other bird news, biologists are installing barn owl boxes on managed grasslands on public and private lands in southeast Missouri and have seen promising results:Annually, nearly 40% of installed nesting boxes are occupied by barn owls.

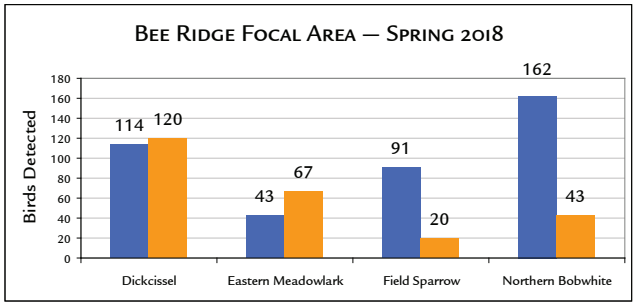
So where do we go from here? Locally, we must continue to highlight our private-land successes.











Focal Area Reference

Photo by Elizabeth Yohe, MDC

Barn Owl nestlings in a provided barn owl box.

Though most programs may be viewed as a short-term solution to a long-term global issue, they still provide hope. The Missouri Department of Conservation's Private Land Conservationists and Quail Forever's Farm Bill Biologists are hired to provide assistance to agricultural producers and landowners to adopt conservation programs such as State Acres for Wildlife Enhancement (SAFE), Habitat Buffers for Upland Wildlife (also known as CP-33) and the Pollinator Program (CP-42) on agricultural and forest lands to protect and improve water quality and quantity, soil health, wildlife habitat, and air quality. MDC State Ornithologist Sarah Kendrick led a statewide, multi-organizational team in developing the Missouri Bird Conservation Plan. The Missouri Bird Conservation Plan is broken up into two sections (Technical and Outreach). The Technical Section identifies Missouri's bird conservation priorities and provides a go-to reference for public and private land managers for breeding season land management practices for our most threatened bird species. The Outreach Section was built by a separate multi-organizational team of folks who educate the public about bird conservation. It identifies the highest priority, high-level bird conservation messages that all groups can disseminate to the public with a unified voice. More localized, statewide collaboration as evidenced in the Missouri Bird Conservation Plan triggers programs and funding sources at the regional and national level that are necessary to slow, stop, or reverse widespread bird population declines.

The Boone County Nature School will consist of four classrooms, a lab room with demonstration kitchens, and a museum-like lobby. Each classroom will be themed after one of Missouri's habitats: forest, prairie, aquatic, caves. The building will be surrounded by gardens, native prairies, ponds, and forests.

Nature School Coming to Boone County

Mike Szydlowski

Science Coordinator, Columbia Public Schools

For the past 10 years, the Columbia Public Schools science and administration departments have been continually enhancing Place-Based Learning opportunities for all of its students. What started as local field experiences turned into long-distance and overnight field experiences, and eventually into the development of a county-wide Nature School that will serve all students in Boone County. This incredible opportunity has been made possible because of a partnership between Columbia Public Schools, the Missouri Department of Conservation, and generous community donations and partnerships. Here is our journey:

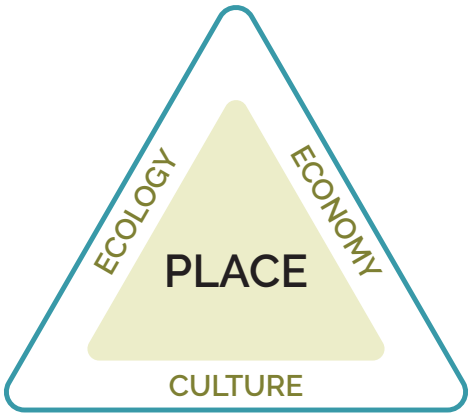
What is Place-Based Learning?

Environmental education has been around for a very long time and it continues to offer quality experiences for students. The difference between environmental education and place-based education (PBL) is that PBL will focus on our place first then move out from there—from local to global. Instead of learning about ecosystems from far-away places in textbooks and videos, students and teachers will concentrate on the ecosystem in their own place (community) first before using that knowledge to study more global issues.The important note is that it's not place-based science—it's place-based learn-

ing, and this distinction is important. Numerous research studies have found that when students focus on their place when learning any subject, the following happens:

- Student interest increases
- Teacher satisfaction increases
- Behavior issues decrease
- Attendance increases
- Community service increases

While science seems like a natural fit for place-based learning (and it is), math, social studies, language arts, and the elective courses all benefit when the existing standards are taught in reference to their place/community.



The Place-Based Triangle

Place-Based Learning is best described by this image created by the Teton Science School, in Jackson, Wyoming. This is where we first started learning about Place-Based Education and where we take hundreds of students to every year to explore and learn. Place-Based Learning uses the existing standards in all subject areas but teaches those standards in an environmental, cultural, and economic lens.

This is where environmental and place-based learning differ slightly. Place-based learning incorporates environmental learning while also balancing our human culture and economy. For example, it's easy to say "don't cut down any trees." However, place-based learning will take a deeper look at the issue and balance out good environmental stewardship while learning about the cultural and economic impacts of any action. Instead of not cutting down any trees, students may study the issue using standards from multiple subject areas, and may propose a data-supported idea that honors all three areas of the triangle.

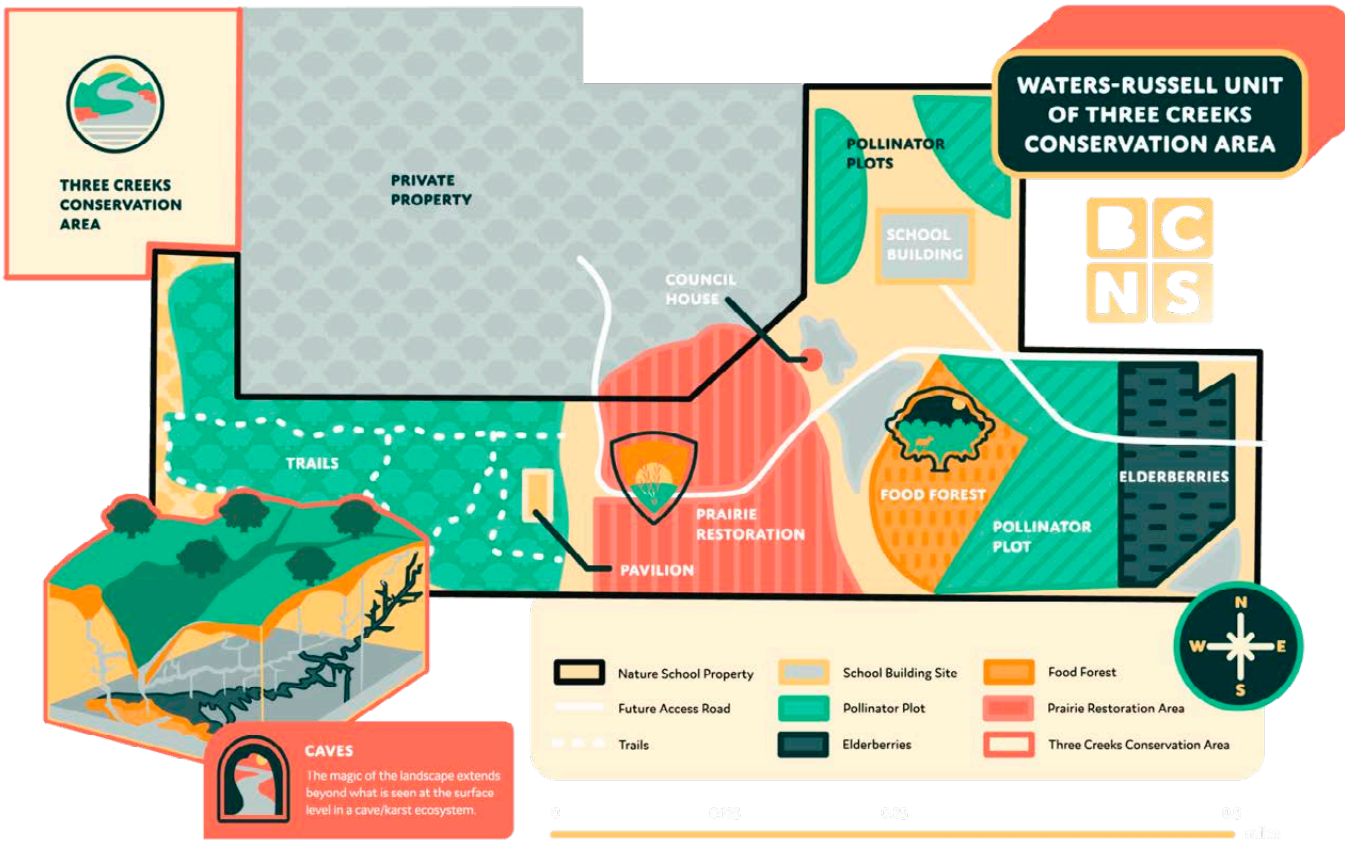
Placed-Based Experiences

Columbia Public Schools has developed the following experiences or projects as we continue through our place-based journey:

- All 2nd graders attend a Band with Nature Field trip sponsored by the Columbia Audubon Society where students experience four learning stations that include bird banding, Raptor Rehab, Adaptations, and ecosystem activities.
- All 4th graders learn and experience the Missouri River sponsored by Missouri River Relief where students rotate through four learning stations that include a boat ride, hike, nature art, and Missouri River fish.
- All middle students experience an overnight camp, which for many students, is their first camping experience.
- Fairview Elementary School was designated a Place-Based School—the first in Missouri. Their school follows the same standards as other schools but with a much greater emphasis on place-based experiences and community connections in all subject areas.
- All interested 5th graders can experience a 4-day place-based learning trip at the Great Smoky Mountain Institute in Tremont, Tennessee. Last year, 400 students attended.
- All interested middle and high school students can experience a 7-day place-based learning trip to the Teton Science School in Jackson, Wyoming. Last year, 700 students attended.

And Now—The Nature School!

While all of the above and expanding experiences have proved to be very beneficial, there was a desire to expand Place-Based Learning in an even greater way to even more students and subject areas. Missouri is blessed to have the Missouri Department of Conservation—one of the best conservation departments in the country. Through a partnership between Columbia Public Schools, the Missouri Department of Conservation, and some other very great com-



PHASE 1: NATURE SCHOOL CAMPUS

munity organizations, the development of the Nature School went from a dream to a reality. It was quite a process that could take up many more pages, but for an introduction we will focus on what the Nature School will become.

- The Nature School will serve all 5th grade students in Boone County, Missouri. Every 5th grader will spend four consecutive days at the Nature School learning and exploring their local ecosystem, culture, and history through a variety of activities and explorations.
- Activities at the Nature School will include exploration hiking, scientific and historical research, outdoor skills, native food gathering and preparations, sustainability, and the development of personal action plans.
- The teachers and students will spend part of their first four days, planning a place-based local action project that improves their community in some way. Over the next several months, they will carry out their community project.
- The same group will then come back to the Nature School for three more consecutive days for more exploration and learning. The groups will also present the results of their project and celebrate their successes.
- This will provide every 5th grade student with 7 full days at the Nature School split into two session with a community action project in between.

The reason this schedule was selected was to ensure that the experience was more than a wonderful field trip. By providing guided action planning time and follow up, students will be able to plan, design, and evaluate a high quality project in or around their normal school. This not only provides the students with a valuable experience from start to finish, it will also provide the community with annual projects that improve either the environment or life for the people in it. Improving your place is a central idea in place-based learning.

The Council House will serve as our central outdoor gathering spot for discussions, presentations, and reflections. The Council House was made possible by a $30,000 donation from the Columbia Audubon Society.

Nature School Funding

This project was made possible by the following funding sources:

- The land that the Nature School will sit on consists of 207 acres that was provided by Hank Waters and Vickie Russell, who were the former owners of the Columbia Daily Tribune. The Nature School land connects to the Three Creeks Conservation area to provide over 1,000 additional acres for students to explore.
- Columbia Public Schools provided $2 million to the Boone County Nature School project.
- The Missouri Department of Conservation has provided $1 million to the project as well as a pavilion, bathroom, and site improvements and maintenance.
- Private donations including $100,000 from Orscheln Farm and Home Stores and $77,000 from the Columbia Public Schools Foundation, $30,000 from the Columbia Audubon Society, and numerous other donations have been added to the project fund.

The project is currently more than 75% funded with the remaining funding being sought from community donations.

The Boone County Nature School is designed and scheduled to be completed and open in the winter of the 2021–2022 school year. In the meantime, students are already scheduled to use the Nature School property for single-day experiences while the school buildings are constructed.

You can learn more about this project at www.boonecountynatureschool.com.

Those interested in helping this project can contact Columbia Public Schools science coordinator, Mike Szydlowski, at mszydlowski@cpsk12.org.

Photo courtesy of National Wild Turkey Federation

What Is Happening to Missouri's Wild Turkey Population?

Could this popular game bird be opening additional eyes to problems that face ground nesting birds in general?

John Burk

District Biologist, National Wild Turkey Federation

NWTF
Conserve. Hunt. Share.

As District Biologist for the National Wild Turkey Federation and an obsessed turkey hunter, I am painfully aware of the turkey decline that Missouri has been experiencing over the last 10–15 years. Most of our (NWTF) members have become intimately aware of this problem and their growing concerns are all but demanding that something must be done to address it.

Most of our (NWTF) bird watching is done down the barrel of a shotgun and is consumptive in nature. However, you will not find any group of people more enthusiastic or dedicated to improving the health and well-being of the population that supports their addiction than turkey hunters in general, and NWTF members more specifically. That is why many are demanding regulations changes that they pray will reverse the decline. Below I will address what factors are resulting in population declines and what is and can be done to address these alarming trends.

Turkey harvest is a good indicator of turkey population trends and most turkey hunters are aware of these numbers. John Lewis thought that spring harvest in his day (based upon mark & recapture data) represented about 10% of the overall population. Although hunter harvest is additive (takes more than would naturally be taken by predators and disease) it is not suppressing population growth at the levels occurring in Mis-

souri. Things have obviously changed over time (season structure, technological advancements in hunting equipment, methods of hunting, etc.). However, whatever the proportion of the population the harvest actually represents (10% or more) there is no denying that the 36% decline between the high water mark of 60,744 in 2004 and the 38,788 we harvested in 2019 represents a population in significant decline. Although this decline is real it is also important to note that hunter numbers have also decreased by 21% since the mid-2000's so some of the decline in harvest can probably be attributed to fewer hunters. Regardless, the declining numbers have become more unacceptable to many NWTF members in recent years, and it is their passion that drives them to ask "what can we do?" on behalf of the resource.

Why is the Turkey Population Declining?

Wild Turkey population dynamics is a complicated system, especially considering that the wild turkey is a landscape-level species that may occupy more than 4-square miles annually as part of their normal home range. It is not uncommon to document movements on transmittered birds of more than 10 miles. As with most matters related to wildlife, there are a multitude of factors that collectively have an impact on populations. People, habitat, weather, predators, competition, and diseases can all contribute to changes.

Land Conversion

Overall landowner property acreage continues to get smaller each year. Additionally, overall conversion of land into developed, non-wildlife friendly space is creeping upward. This combination of factors will yield more challenges for managing human impacts over a larger area.

CRP Acreage Declines

Nationally, when we were setting turkey harvest records annually in the early 2000s we had almost 40 million acres of CRP and 1.6 million of it was in Missouri. Starting in 2007, CRP acreage in Missouri declined from 1.6 million to 1.0 million by 2014. When you lose 600,000 acres of nesting and brood rearing habitat, ground nesting bird populations will decline. The smaller strips or ribbons of habitat versus the larger contiguous blocks increase predation rates and lowers overall turkey production.

Changes in Available Waste Grain

Harvesting equipment is much more efficient, waste grain does not exceed a bushel to the acre, and operator instructions are provided on how to manage for this or less. A waterfowl study measuring changes in average available waste grain between 1978 and 1998 indicated a 50% decline. More recent information from Tennessee indicated the decline is greater than 90%. Waste grain used to be visible on fields throughout the winter, and this important high energy supplemental winter food was undoubtedly important to fueling the productivity of both deer and turkey populations throughout the Midwest. Juvenile and adult hen nesting and re-nesting rates can be influenced by declines in body condition as a result of dietary deficiencies; therefore, reproductive potential decreases. If juvenile hen and re-nesting rates are significantly lower as a result of dietary shortfalls, this would have a significant effect on the reproductive potential of North Missouri turkey populations much like mast failures influence this in the Ozarks.

Predator Population Increases

Between 1977 and 2017, which includes the period prior to the fur market crash in the 1980's, scent station visitation rates (a furbearer population monitoring index), by raccoon and opossum, have each increased over 200%. Between 1994 and 2017, furbearer observation rates made by archery hunters (another index to monitor furbearer populations) raccoon and opossum observation rates increased by over 60%. Predator populations influence turkey production and we have more predators on the landscape today than in years past.

Spring Rainfall

Wet springs negatively impact production regardless of habitat quality, especially when combined with high predator populations and habitat configuration (i.e. linear and easily searched areas versus larger blocks). Historical spring (March–May) rainfall records from 1895–2015 indicate an average of 12 inches. When comparing the spikes and troughs between our brood survey records and these rainfall records, in nearly every case where we had a spike in production we had a corresponding trough in spring rainfall. Weather patterns tend to be cyclical as do turkey population fluctuations. Although wet springs are bad for ground nesting birds, habitat quality, quantity, and configuration can mitigate some of the effects of weather and definitely sets the table for boom years when conditions are favorable.

Diseases

There are several turkey diseases such as avian pox and blackhead disease that are well known; however, there are other disease vectors that are being looked at more closely, such as West Nile Virus and Lymphoproliferative Disease, to understand potential impacts to populations. Localized populations could have marked declines due to some diseases especially when turkeys are congregated at locations with supplemental feed and/or bait. In these cases, disease incidence and transfer increases dramatically.

There is No Easy Fix:

Everyone is concerned about declining turkey populations and many are insistent that NWTF lead the charge to do something about it. Many think that the problem can be solved with simple regulatory modifications. "All we have to do is "x" and everything will go back to the way it was."The problem is that the decline is the result of a combination of factors and there is nothing simple that can be done to change the trajectory. The following 7 suggestions are the more common being offered as necessary changes as well as the logic behind why these are not workable solutions.

Predator control in the form of contests or outright bounties.

"Predator control" does not work and paying for, or even supporting, contests that make this claim is not in our best interest. They will NOT have any measurable impact on predator populations at a landscape scale. They WILL make us an easy target for groups that are totally opposed to any form or hunting for any reason; the cost benefit cannot be justified. Sport hunting or trapping predators as an additional and enjoyable outdoor recreational activity that responsibly and respectfully uses these native wildlife populations is something we can support.

In order for a bounty to be effective it has to be high enough to achieve the desired effect. Historical trapping harvest data going back to 1991 (well after the fur market crash) shows that two peaks existed as a response to increased fur demand, one in 1997 when we harvested around 220,000 animals and one in 2013 when we harvested 160,000 (note:in 2019 we harvested around 35,000). Both of those increases happened when we had a $15/pelt or higher average. Therefore, to even approach meaningful harvest through a bounty, the bounty would have to be $15 or greater and stay there. At 1997 harvest levels the bill for that bounty would be 3.3 million unbudgeted dollars.The only way to meaningfully influence fur harvest is to restore the fur market. This is obviously not something that could be immediately accomplished and would require a wide reaching, aggressive, and committed marketing campaign.

Eliminate the fall season(s)

At first glance this seems to make sense. Why allow the harvest of even one hen when our turkey population is declining like it is? Although hen wild turkeys live a little longer than other ground nesting birds, they are still relatively short lived animals with fairly high mortality rates and the majority of this mortality is not human induced (annual mortality of hens is

about 40%). The study that we just concluded put hen fall harvest rates at less than 1%. These results are similar to the last study conducted in the Ozarks where hunters shot less than 1% of the radio-tagged hens. Therefore, elimination of the fall season would not have any measurable effect in reversing population trends because the problem is not harvest related. All ground nesting birds rely on high reproductive potential that allows the population to respond quickly and significantly to favorable weather patterns and habitat conditions. We still have plenty of hens we just need better conditions for them to respond. Successfully recruiting, retaining, and reactivating hunters is a critical part of our mission and needless regulations that minimize opportunity or access are an obstacle to our success. The science says this change would not fix our problem of low turkey numbers. This is Missouri; we should always support what the science says.

Restrict the spring harvest to males only

Bearded hens harvested in the spring only comprise 1% of the harvest, and is considered statistically insignificant. Harvest restrictions are established to maintain spring turkey hunting quality, which is defined by the Missouri turkey hunter as the reasonable opportunity to hear and hunt a gobbling adult male turkey. The science tells us that our current season structure does not affect population growth or the quality of spring turkey hunting. Therefore, like fall harvest restrictions, we should not be in favor of regulations changes that needlessly deny opportunity.

Return to one bird in the spring

Missouri already has one of the most restrictive spring seasons in the country and these regulations (ex., Monday opener, one bird the first week, and only 3 weeks long) does help maintain some gobblers in the population that may have otherwise been harvested under a different structure. However, there is a limit to how many you can realistically carry through a season or over to the next season. Although the majority of mortality on gobblers is harvest-related, hunted or not, gobblers don't typically live very long. Also, only about 5% of hunters harvest both of their birds. Although dropping to one bird may bank a few, what is more likely to happen is that a one bird limit would have the same effect as the one bird the first week rule. The "second bird" not shot by the 5% will be someone else's "first bird." Therefore, the overall harvest probably would not change much. The upside may be that it would potentially create more mentors but this too could actually increase the overall harvest because someone being mentored by the 5% is probably more likely to harvest a bird. Although there may be some benefits (increased hunter success, increased hunter satisfaction, more mentors) the change would not affect the overall population so this too would be a decision of; if the science says no population effect, why should we lobby for it?

Shorten the season

The majority of the harvest (about 85%) happens the first 2 weeks of the season so to significantly reduce gobbler harvest would require limiting the season to a week. Restricting gobbler harvest may bank a few gobblers but the same arguments apply here that applied to restricting the harvest to one bird: 1) you can only bank so many gobblers, 2) restricting gobbler harvest does not impact the overall turkey population.

Implement county or region-specific regulations

Our current framework of regulations was designed by a string of the most reputable and respected wild turkey biologists in the country based upon the best available science. The regulatory framework they built has made Missouri one of the best destinations for eastern turkey hunting in the country by providing high quality turkey hunting without being needlessly complicated and restrictive. Despite the fact that we are looking at nearly a 40% decline since the early 2000s our harvest is still higher than most other eastern turkey states. Complicated regulations are an obstacle to recruitment, retention, and reactivation. Here again, our problem is not related to harvest and we cannot solve the

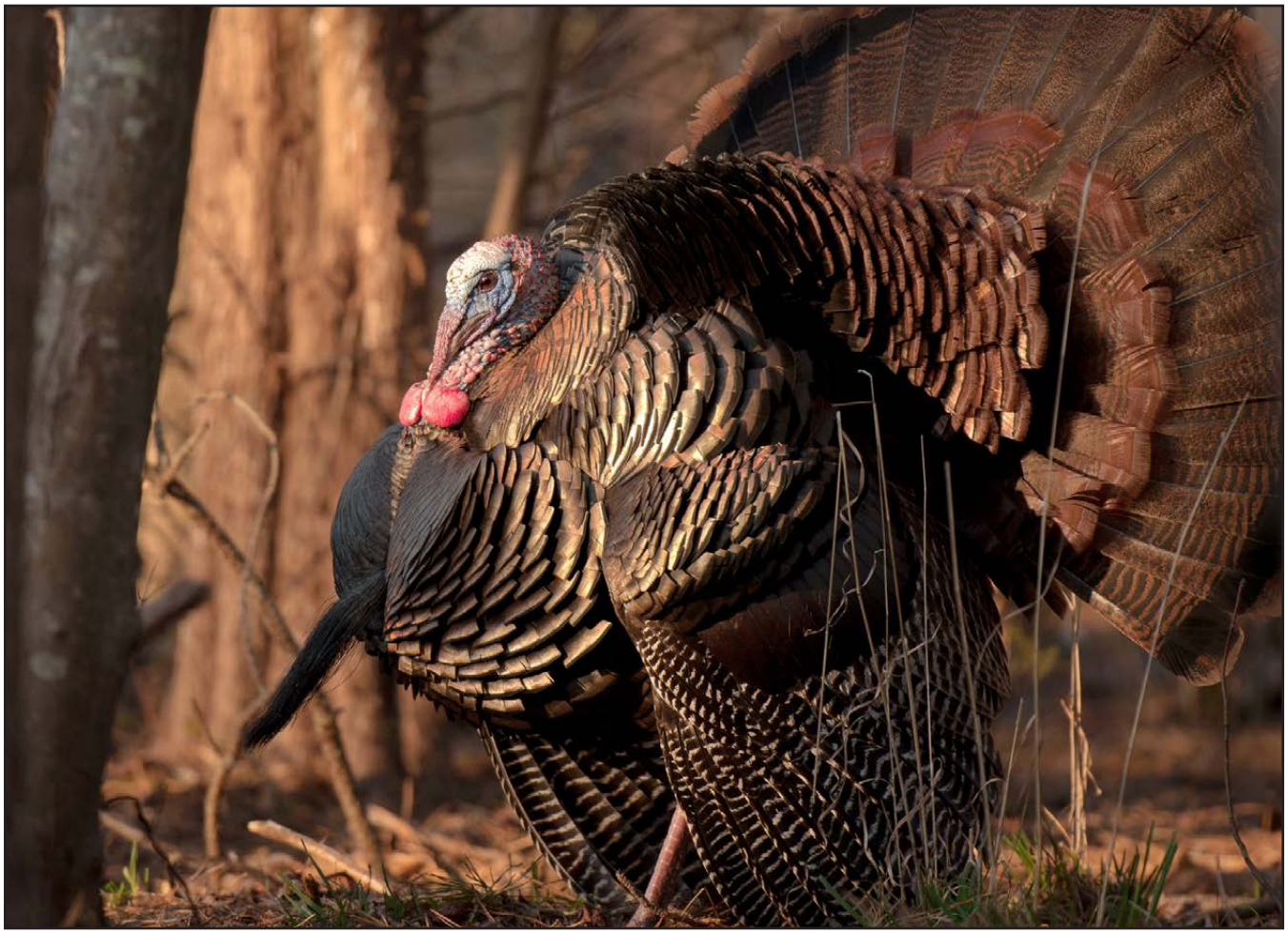


Photo courtesy of National Wild Turkey Federation

problem by manipulating regulations. Therefore, we should not pursue this.

Close season even in the spring until they bounce back.

Current spring harvest levels do not impact turkey population growth so this restriction would have no effect on the overall population. This needless restriction of hunting opportunity should not be considered for the same reasons previously outlined.

What is NWTF doing to Address the Issue?

As a Biologist, avid turkey hunter, and NWTF sponsor member, one thing that really bothers me is when I hear folks expressing that NWTF is not doing enough or, in some cases, not doing anything to solve the problem. The following is a list of things that we are doing and that are making a difference.

National and State Policy

Our Chief Executive Officer, Becky Humphries, is a nationally respected career resource professional as are other members of our management team that work with Cornerstone Government Affairs in Washington D.C. on big ticket items like the Farm Bill. The 2018 Farm Bill cap is 25 million acres, not the 40 million we had in the heydays, but twice what was originally proposed by Congress.The NWTF and partners had significant influence to maintain wildlife-friendly practices within the Farm Bill. Additionally, NWTFmajorly influenced forestry related activity through increased funding for forestry related practices. We also influenced Congress to stop the practice of "fire borrowing" within the U.S. Forest Service where program budgets throughout the national forest system were robbed to pay for fire suppression efforts out west. This funding will now come from disas-

ter relief funding and enable our national forest staff to more effectively manage our national forests. USFS Stewardship agreements are a product of our national staff, past and present, that help us enable the USFS to more effectively manage our public lands. Will Reckhemmer is responsible for delivering these projects on the Mark Twain National Forest, and his work has influenced thousands of acres of private forest land and hundreds of acres of Mark Twain nesting and brood rearing habitat. Lastly, the NWTF secured a $5.3 million dollar Natural Resources Conservation Service (NRCS) agreement to support 24 forester positions in 23 states to help deliver forest management and conserve and enhance a minimum of 350,000 acres. Justin Ferguson and Tyler Cooper are positively impacting private lands through our NRCS agreements in Northwest and Southeast Missouri to improve forest management.Other non-governmental biologists and I serve on the state technical committee for NRCS. The Farm Bill and the cost share assistance programs associated with it provides the single largest source of funding and technical support available to private landowners that control and manage the majority of the habitat throughout the Midwest and are influenced by the technical committee. Significant improvements have been made to maximize the wildlife benefits when these practices hit the ground in every successive iteration of the Farm Bill as a result.

Super Fund Dollars at Work

NWTF super fund dollars have been used to support 5 separate cost share programs that have helped improve thousands of acres of private land in southwest, central, southeast, northeast, and northcentral Missouri. The work that we are helping make happen on those properties are creating source populations and demonstration sites that are expanding demand for similar work elsewhere. Many of these private landowners have positively commented about the increase of turkeys on their tracts.The NWTF super fund has also enabled the purchase of 77 individual pieces of habitat equipment including: fully equipped prescribed burning trailers, no-till drills, oscillating seeders, tillers, tractors, UTVs, sprayers, chainsaws, etc. The majority of this equipment is housed at local Soil &Water Conservation District offices across the state and available for use by any private landowner that requests it on a first come first served basis. This equipment enables NWTF to conserve an average of over 27,000 acres of private land annually. Since the start of the Save the Habitat. Save the Hunt. initiative NWTF has annually helped the Mark Twain augment their prescribed burn program by paying for additional helicopter time. The Mark Twain is able to burn an average of 10,000 additional acres annually because of NWTF assistance. The restoration of open woodlands through thinning and burning and the restoration of glades are critical to increasing the quality of nesting and brood rearing habitat that is making a difference.

Overall *Save the Habitat. Save the Hunt.* Goal for Missouri

NWTF is on track to exceed our goal of conserving 400,000 acres of habitat between 2013 and 2023. The majority of this goal is concentrated on nesting and brood rearing habitat improvement work. This does not quite make up for the 600,000 acres of CRP we lost but we are making a difference. Our goals were aggressive but realistic. If we really want to do something to help improve the turkey population, then we each need to be better ambassadors.

- Support the programs and policies we have in place that are helping improve things (state and federal cost share programs, push back on anti-agency project proposal resistance).
- Respond to damaging legislation proposals when made aware of the problem.
- Resist the temptation to "group think," take the easy way out, and lobby for changes that will not make a difference just to appear to "do something"
- Get more folks to support our cause; more members mean a louder voice on the big issues and more money to impact more acres that will actually make the difference we seek.

Photo by Dana Ripper

Birds documented on 20 October 2019 after having struck windows of buildings on the downtown Kansas City survey route

Keeping Birds Safe in Missouri:

BirdSafe Kansas City and BirdSafe St. Louis

Dana Ripper

Co-founder and Director, Missouri River Bird Observatory

Jean Favara

Vice President of Conservation, St. Louis Audubon Society

BirdSafe Kansas City

In 2019, the Missouri River Bird Observatory (MRBO), in partnership with Burroughs Audubon Society of Greater Kansas City and Johnson County Community College, launched a new program to document bird mortality resulting from window collisions in the Kansas City metropolitan area. The ultimate goal of BirdSafe Kansas City is to work with building owners and managers to reduce the number of collisions by installing proven window treatments on the portions of buildings that are found to have the highest frequency of bird strikes.

Collisions with building windows pose a significant risk to birds, particularly migrants (e.g., Banks 1976, Ogden 1996). Transparent glass causes birds to attempt to fly "through" to the other side, while reflective glass can provide a disorienting view of vegetation that, to a bird, looks like a real object they desire to reach for foraging or shelter. Additionally, our most densely populated cities are often right in the middle of migratory pathways. The proximity of birds to potential window-strike zones is compounded by the fact that many species migrate at night. The

illuminated glow of urban and suburban areas can disorient migrants, particularly on nights with a low cloud ceiling, causing them to descend into developed areas (Parkins et al. 2016).

While avian collisions with windows have been studied intermittently across the U.S. and Canada, studies were typically small-scale and results were not widely published. However, over the past few years, researchers have been able to extrapolate the results of hundreds of such studies to estimate the nationwide rates of avian mortality from collisions with windows (Loss et al. 2014). Estimates range from 365 to 988 million bird mortalities each year in the U.S. This is in addition to large numbers of mortalities caused by birds colliding with vehicles, communications towers and energy infrastructure, which are significant but not as numerous as window collisions (Loss et al. 2015).

Recent data, extensively publicized by many media outlets in 2019, indicate that North America has lost almost 30% of its birds in the past 50 years (Rosenberg et al. 2019). While there are many causes of this significant decline that need to be addressed, one of the most direct ways to contribute to bird conservation is to implement minor collision-reducing structural changes to windows on commercial and residential buildings. Based on an extensive examination of avian migratory and survey data along with the relative illumination levels of urban areas and their geographic locations in migratory pathways, it was recently determined that Kansas City ranks 7th in the top 10 most dangerous cities in the country for migrating birds in terms of window collisions (Horton et al. 2019). This information, along with a variety of anecdotal reports from Kansas City residents regarding bird strikes, inspired MRBO and its partners to launch BirdSafeKC.

For the preliminary season of spring 2019, volunteer surveyors chose buildings to survey. Buildings were selected based on two factors: 1) numerous anecdotal reports of bird carcasses being spotted outside the building and 2) building and landscaping factors that are known to result in window strikes. These factors include window area, transparency and/or reflectivity and proximity and height of surrounding vegetation (Klem Jr. et al. 2009; Hager et al. 2013). In the fall, we also established survey routes in situations where survey sites were clustered. Permission to survey individual buildings was requested from management staff and/or surveyors walked only on public sidewalks. Volunteer effort and the number of sites surveyed increased significantly during the fall season relative to spring.

Surveys were conducted from 1 April to 31 May and from 1 September to 15 November. Since the pilot year of this project was focused on documenting birds that had struck windows during their typical morning activities (as opposed to the catastrophic but infrequent collision events that occur when a flock of migrants strikes a building during the night; see this article from the Houston Chronicle[1], for example), surveys occurred during the mid-morning to early-afternoon hours.

BirdStrikesKC surveys follows methodology established by Johnson County Community College (K. Anton 2018, unpub.), Hager and Cosentino (2014) and the American Bird Conservancy (B. Lenz 2019, pers. comm). Surveyors walked the perimeter of buildings or walked area routes and scanned within 30 feet of buildings for bird carcasses. Once a carcass was located, the surveyor used the application iNaturalist to photograph the bird and take a context photo showing a wide-angle view of the bird and the side of the building. The context photo allowed us to

1. https://www.houstonchronicle.com/neighborhood/bayarea/news/article/Houston-news-11125529.php

Photo by Dana Ripper

Nashville Warbler window causality found on Grand Avenue in Kansas City, 24 October 2019

identify the window with which the bird collided. Daily survey data were also entered into an Excel spreadsheet to indicate whether any carcasses were found at a building or on a route, and if so, the number, species and location. Data were compiled by building to display the number of strikes, the species affected and the average number of strikes per survey day. Because there are a number of factors that affect whether or not a carcass remains in place – such as removal by maintenance or street-sweeping crews or scavenging by other wildlife species — our estimates of the number of bird strikes are probably quite conservative.

In spring 2019, volunteers conducted a total of 122 surveys of 12 buildings and associated structures such as pedestrian skybridges. During April and May, 51 bird carcasses were documented representing 19 species, plus specimens that were unidentifiable due to carcass condition.

Fall 2019 surveys included several of the same buildings, plus the establishment of several new routes and the consolidation of clusters of sites into logical routes. Volunteers conducted more than 200 surveys of six routes and an additional four individual buildings. A total of 228 bird carcasses were recorded representing 54 species plus those unidentifiable. Thirteen window-struck birds were also reported to Bird-SafeKC from buildings that were not regularly surveyed, which we term incidental reports.

Based on the 2019 dataset, some patterns among the sampled buildings have emerged regarding windows that are particularly strike-prone. Additional surveys will further elucidate these trends and allow us to target windows for mitigation in partnership with building owners and managers. Unfortunately, Spring2020 surveys were suspended due to Covid-19 and the associated stay-at-home orders throughout the Kansas City region. We anticipate that surveys will recommence during fall migration.

BirdSafe St. Louis

Unfortunately, the challenges birds face due to both commercial and residential buildings, glass and light pollution in Kansas City are repeated in other urban areas of Missouri. The St. Louis metropolitan region, with a population of close to 3 million,is another urban/suburban area with impacts on bird mortality. The St. Louis region sits underneath the Mississippi Flyway, one of the major migration pathways in the United States.60% of North American songbird species as well as40% of North American waterfowl species utilize this flyway on their seasonal migrations in the spring and fall. The nearby confluences of the Mississippi, Illinois and Missouri Rivers in the region act as migration highways and provide important resources for migrating birds. Examining a combination of geography, light pollution and bird migration intensities, Horton et al.(2019) found that St. Louis ranks as the 5th most probable dangerous city for migrating birds in the spring and the 6th most probable dangerous city during fall migration.

The BirdSafeKC project, as well as past St. Louis Audubon Society bird mortality surveys and the Silent Skies/Lights Out program developed by the St. Louis Arts Chamber of Commerce all served as models as St. Louis Audubon Society initiated a new effort focused on these issues in the St. Louis region in the fall of 2019. Earlier efforts looking at bird mortality in the downtown area of St. Louis in 2000–2003 led to a partnership agreement with the Gateway Arch National Park in 2002. This agreement turns off exterior spotlights at the Gateway Arch during the peak bird migration periods in May and September. TheBirdSafe St. Louis project goal includes the establishment of long-term community relationships that support bird-safe practices and reduce bird fatalities due to light pollution and window or building collisions. Collaborations with the Missouri Chapter of International Dark-Sky Association will emphasize the role light pollution plays in bird mortality in the region and facilitate the initiation of Lights Out campaigns during migration periods. Bird mortality surveys in an 8-block area of downtown St. Louis anticipated for the spring of 2020 were postponed to the fall migration period due to Covid-19. These surveys will allow us to identify areas of downtown St. Louis with the highest bird mortalities and help us work collaboratively with organizations and businesses to mitigate and reduce bird fatalities in the St. Louis region.

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Brown-headed Nuthatches Returning to Missouri

by Sarah Kendrick

State Ornithologist, Missouri Department of Conservation

The Missouri Department of Conservation, in partnership with the University of Missouri and the U.S. Forest Service Mark Twain National Forest (MTNF) with support from Arkansas Game and Fish Commission, plans to reintroduce a small population of Brown-headed Nuthatch to Missouri shortleaf pine woodlands from Arkansas' Ouachita National Forest. Fifty birds will be captured and transported from Arkansas to Mark Twain National Forest in Missouri in August 2020, followed by an additional 50 in August 2021.

Brown-headed Nuthatches are pine-woodland obligates that historically existed in Missouri but are now extirpated from the state. With the removal of nearly all shortleaf pine woodlands across Missouri's Ozarks in the late 1800s and early 1900s, the species disappeared from the state. Now, after extensive restoration of pine woodlands in Mark Twain National Forest, the necessary habitat exists to bring the birds back. These birds are resident (non-migratory), fairly sedentary, and weak fliers, so their dispersal north without connecting shortleaf pine habitat is highly unlikely. Also, Forest Service staff and Mizzou's School of Natural Resources have shown that climate change will favor pine woodlands in the Missouri Ozarks and even farther north, ensuring habitat for these birds into the future.

The Missouri Department of Conservation (MDC), U.S. Forest Service, University of Mis-

The charismatic Brown-headed Nuthatch will be introduced in Missouri's pine woodland restoration areas of the Ozark Highlands.

Photo by Bill Hubick

souri (Mizzou), and the Arkansas Game and Fish Commission are partnering to reintroduce Brown-headed Nuthatches to Missouri in August of this year and August 2021. MDC, Forest Service, and Mizzou will reintroduce about 100 birds total (50 per year for two years) from Ouachita National Forest in Arkansas to pine woodland sites on the Mark Twain National Forest that have been managed with tree thinning and prescribed fire for up to 20 years. Brown-headed Nuthatches are common across their range, which extends from Arkansas south through the open pineries of the southeastern states.

The topic of Brown-headed Nuthatch reintroduction has been discussed for a decade and this effort has been two years in the making communicating with state and federal partners in Arkansas and Missouri and the Central Hardwoods Joint Venture. Nuthatch reintroduction is an option because of shortleaf pine woodland restoration — an ecosystem that was almost totally removed by human hands in Missouri. The reintroduction is a relatively low-risk, low-cost step toward part of that shortleaf pine ecosystem's recovery and one way that we can work to repair a heavily impacted landscape.

Look for an update on the nuthatch reintroduction in a spring 2021 Missouri Conservationist article! We're bringing the squeak back to Missouri (seriously, they sound like a rubber ducky[1]).

1. https://www.allaboutbirds.org/guide/Brown-headed_Nuthatch/overview

Pine woodland restoration efforts have occurred in the past several years, allowing visitors to the southern Ozarks to witness this historic landscape type that will be home to the reintroduced Brown-headed Nuthatch.

Photo by Jane Fitzgerald, American Bird Conservancy

Photo by Steve Heying

Red-tailed Hawk nest on Scott Boulevard in Columbia, Missouri during the spring of 2020.

They Are Here!

Urban Wildlife Living Among Us

Steve Heying

Missouri Falconers Association

Beyond the rabbit in Mr. McGreggor's garden, the ubiquitous squirrel in the bird feeder, and the bird feeder full of birds year-round, there are numerous examples of animals normally found far from the human environment, making their homes among us humans, and not being bothered by us humans: deer in front yards that turn around and stare back at you; fox and ground hogs under front porches; coyotes calling from the Russell tract located within the western Columbia, Missouri city limits; and there is the example most dear to my life, birds of prey nesting, raising young, hunting and fully living in our neighborhoods.

All of these examples do not pretend to hide from human sight or activity. One "in your face" example I am very familiar with is the annual spring active nests of Red-tailed hawks: one overhanging Scott Boulevard at Rainbow Trout Drive, and the other Red-tailed hawks nest almost in sight of the first at Scott and Chapel Hill Road in West Columbia. I also know of three Red-shouldered hawks nests within urban back-

yards — and Barred owls seem to be calling from all over the city. All that is needed for a couple of hawks or owls to pair up and raise young is a large tree, a prey base, and to be left alone to do their thing. Human habitat is no longer a restriction to where a bird of prey sets up house.

And any of these human-wildlife interfaces can lead to remarkably tame experiences with a still 'wild' animal. As an example, the offspring of the Scott and Chapel Hill pair spent this summer through July flying right-tight overhead around the Georgetown neighborhoods screaming to the adults for food. They would land on back deck railings, sit in trees while the neighborhood kids would talk to them, and generally not show any fear of humans. The female offspring even let me walk up to her after she missed a neighborhood rabbit and was sitting on a chain link fence. In the big cities, Peregrine falcons are raising young on apartment balconies! These are some examples that serve as proof that wildlife, which is normally far from direct human contact, either need to or are willing to live full and complete life cycles among humans. It is now for us to learn how to properly enjoy this interface without either humans or the wildlife suffering unwanted consequences from this relatively new change in environmental dynamics. We as humans can and must learn to properly live in harmony with this truly wild wildlife in what was normally considered our exclusive environment. A very engaging book on this phenomenon is *The Way of Coyote – Shared Journeys in the Urban Wilds* by Gavin Van Horn.

Photo by Steve Heying

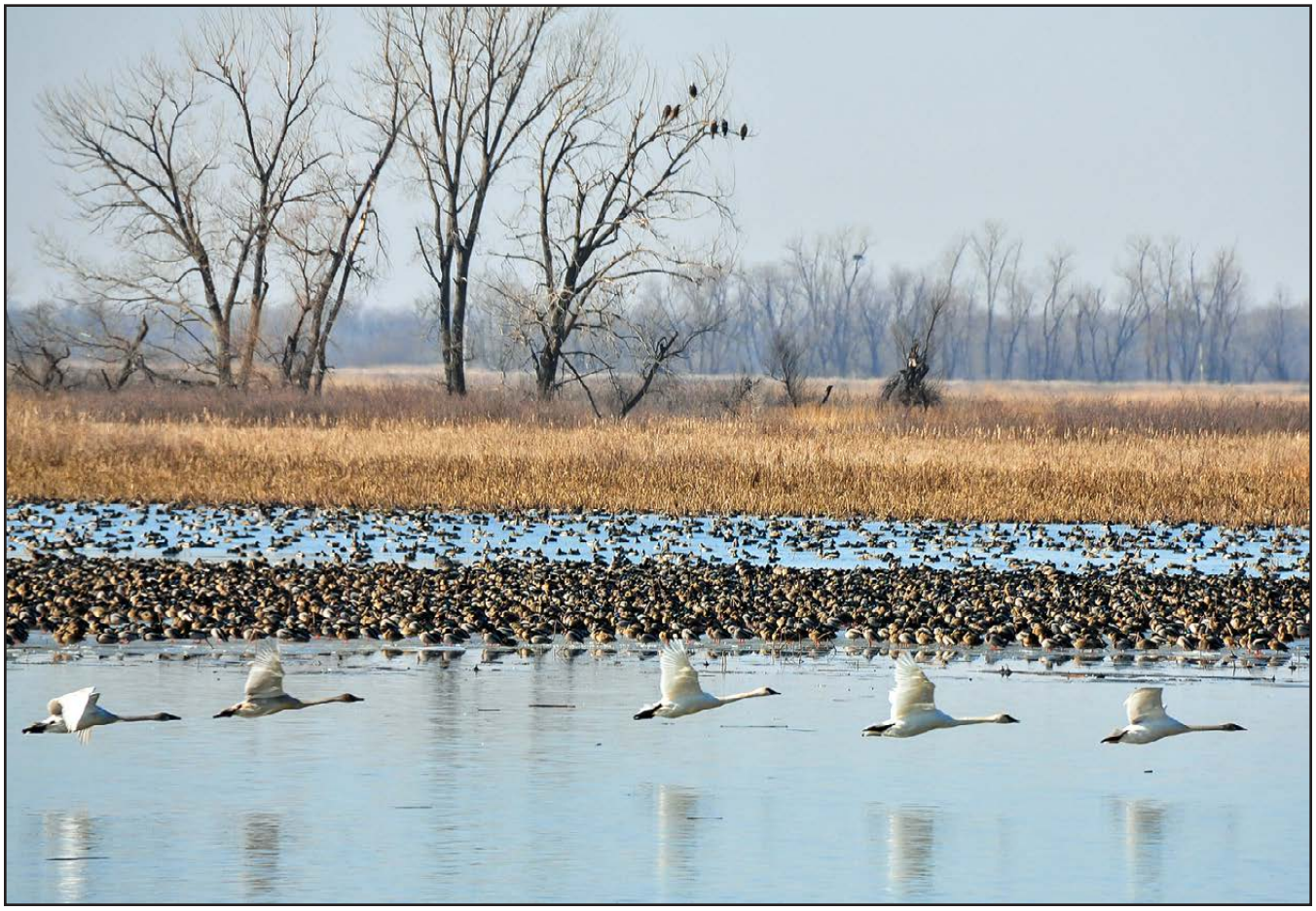

Photo by Angie Orr

A variety of species enjoy the refuge in this photo from the annual Loess Bluffs NWR photography contest.

Loess Bluffs Restoration Begins

Mike Shannon

Regional Biologist, Ducks Unlimited

After delays from last year's flooding and working through the approval and permitting process, the Loess Bluffs NWR project is making some progress. Ducks Unlimited engineers have completed designs for 3 new wells to provide water to refuge pools in times of drought. These wells will be located in the Moist Soil units in the northeast part of the refuge, between Mallard and Pintail pools, and on the south end between Eagle and Pelican Pools. The project includes not only drilling the wells and buying a portable pump and fuel trailer, but also installing buried pipe so that each well can provide water to multiple wetlands.

While the wells are under construction, Ducks Unlimited staff will also begin the topographic survey for the new Eagle Pool Levee. This proposed levee will stretch approximately 6,000 feet along the north end of the Eagle Pool. The new levee will allow refuge staff to better manage water levels in Eagle Pool, while maintaining the wet prairie habitat in the Long Slough unit. Currently, high water in Eagle Pool backs into Long Slough, potentially causing the wet prairie to transition to more persistent wetland vegetation such as cattails. The Long Slough Unit is the largest tract of wet prairie remaining in Missouri. This new levee will allow the refuge to meet multiple habitat objectives for priority species.

Photos courtesy of National Wild Turkey Federation

Timber stand improvement on the Roeslein Tract in Putnam County.

MoBCI Grant Report

Savanna and Open Woodland Restoration in Northeast Missouri

John Burk

District Biologist, National Wild Turkey Federation

Conserve. Hunt. Share.

In 2012, the NWTF state board adopted Missouri-specific goals outlined in the State Save the Habitat. Save the Hunt. Strategic Plan[1] to guide super fund dollar allocation. These goals ensure that the dollars raised at banquets are spent on the best projects to achieve mission delivery across the state addressing conservation and hunting heritage deliverables.

Primary conservation goals are to increase the use of prescribed fire, increase forest management activities, and increase the establishment of native warm season grass (NWSG). These practices are all pivotal in providing key nesting and brood rearing habitats for ground nesting birds widely accepted as the most significant limiting factor for successful reproduction.

Since it is not practical to use an opportunistic shotgun approach when implementing conservation related projects, especially when precious dollars are limited, the best strategy is to use a focused approach. Identifying key landscapes and combining efforts and dollars with other interested partners gains the biggest bang for the buck.

NWTF worked with key partners beginning in 2008 to identify the specific area we wished to target. Our interest was driven by a significant regional decline in turkey populations that our membership wished to address. The original circle was drawn to include the Southern Iowa Oak Savanna Alliance (SIOSA) landscape in southcentral and eastern Iowa and the Thousand Hills and Union Ridge Conservation Opportunity Areas (COAs) in northeast Missouri. Since that time, the Missouri Department of Conservation redefined a smaller focus area within our larger circle called the Spring Creek Comprehensive Conservation Area and our circle was increased and called the MO/IA Oaks focal landscape as a key part of our *Save the Habitat. Save the Hunt.* strategic conservation work in Missouri and Iowa (figure 1).

1. http://www.monwtf.org/super-fund/

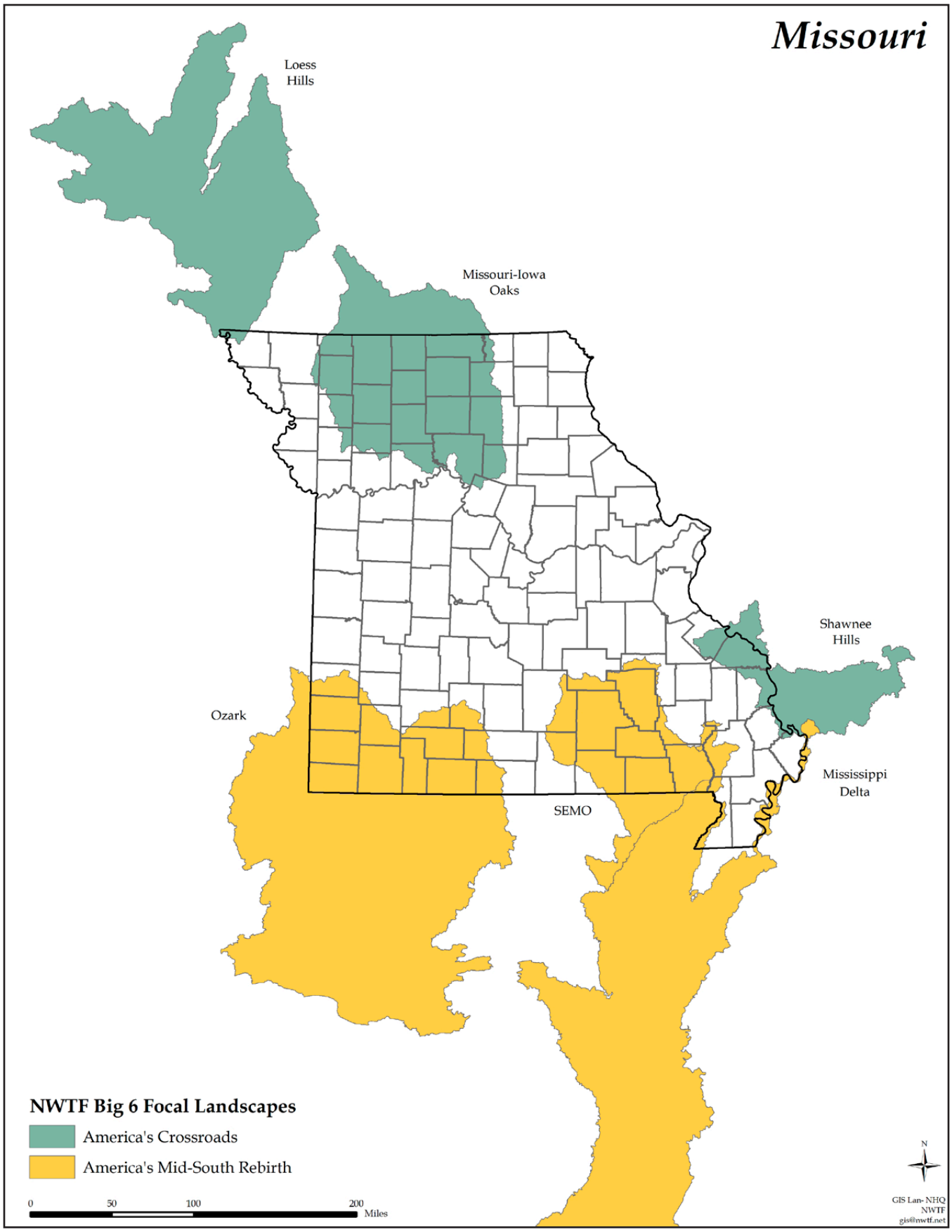

Figure 1. National Wild Turkey Federation Focal Landscapes in Missouri.

The primary function of this initiative is to provide cost share money prioritizing practices designed to restore open woodland and savanna conditions on private lands throughout the focus area. Since 2009, MoBCI grant funds have been matched 4:1 by other partners including: USFWS Partners dollars, Audubon Society of Missouri, NWTF, and Missouri Department of Conservation (MDC) Habitat Challenge Grant dollars. The cumulative $280,000 was used to augment the existing MDC cost share program in the participating counties to pay primarily for timber stand improvement (TSI), prescribed burning (PB), and NWSG establishment. One additional practice that was implemented was woody cover control (WCC). Woody cover control is the mechanical removal of smaller diameter woody vegetation to enhance the process of savanna and open woodland restoration in areas where burning alone would take longer and be less effective. The MDC Private Lands Conservationists and Forester work with interested landowners to develop management plans, line up contractors, and approve completed projects.

To date, this initiative has impacted 92 landowners and achieved 1,027 acres of PB, 1,531 acres of TSI, 126 acres of WCC, and 95 acres of NWSG establishment on private land totaling 2,779 acres conserved. The 55 open woodland units restored by this project through TSI thinning and burning average 26 acres in size and are scattered throughout the focus area. As previously stated, the vegetative structure of these units provides ideal nesting and brood rearing habitat. Although it is impossible to accurately measure the actual influence of these units in additional birds produced, it is probably safe to assume that their impact goes far beyond the actual acres improved.

Obligations associated with the MoBCI grant ($20,000 that the NWTF was required to match 1:1 and deliver in northeast Missouri) were met. However, we were able to expand the effort as part of an additional 5 year agreement with the USFWS and an opportunistic grant that arose with Bass Pro Shops. Our agreement with the Partners Program included an additional focal landscape in southwest Missouri and we are in the final year of delivering upon that agreement so we included work in that region with this agreement. We also used the synergy generated by the ongoing efforts within our MO/IA Oaks Focal Landscape to deliver upon an opportunity presented by Bass Pro Shops. Therefore, we were actually able to increase our partner match by $19,269 to complete additional work under this project. The $59,269 was allocated to 19 different landowners to implement 240 acres of TSI,284 acres of PB, 18 acres of NWSG establishment, and 13 acres of WCC for a total of 537 acres conserved. Partnerships remain vital to the success of our projects.

Prescribed burn on the Oliver tract.

MoBCI Member Organization Updates

Without the conference, we are not having the social hour full of camaraderie and great food and libations, no fraternizing in person, so this year we asked our partner organizations to submit a brief report on what they have been up to recently! There is a lot going on in the field of bird conservation in Missouri, so here are a few reports for your reading pleasure.

Audubon Center at Riverlands

Bird Conservation Overview

The Audubon Center at Riverlands (ACR) is playing an important role in bird conservation along the Mississippi River. We are located in the Riverlands Migratory Bird Sanctuary that falls within the Great Rivers Confluence Important Bird Area. Over 300 migratory and residential bird species have visited Riverlands. Since opening our doors in 2011, we have partnered with the Rivers Project Office of the U.S. Army Corps of Engineers (Corps) on numerous projects focused on using science to protect birds and their habitats.

The Audubon Center at Riverlands during our annual Aah-dubon! event in July. Photo by Roger Ottwell.

In 2012, ACR and the Corps initiated bottomland forest avian monitoring focused on nearly 50,000 acres of floodplain forest managed by the Corps along the Upper Mississippi River. These annual surveys occur over an 8 to 10 week period in spring and summer. The surveys span 100 river miles and occur on 25 river islands and adjacent lands starting on Maple Island at the Riverlands Migratory Bird Sanctuary in West Alton, and ending north of Louisiana, Missouri. We knew little about the bird populations or habitat conditions of these forests prior to these surveys. Today, due to our monitoring efforts, combined with scientific analyses performed by Audubon quantitative ecologists, we are gaining valuable insight on bottomland forest bird trends and habitat preferences.

We will continue the surveys with a goal of informing best forest management practices and identifying other ways to mitigate bird population declines. We also aspire to expand the surveys further up the Mississippi River through similar collaborations with other federal and state agencies and conservation organizations. The survey protocol is detailed in our Avian Stewardship Plan, which guides our avian monitoring efforts in the St. Louis area and supports the Upper Mississippi River Systemic Forest Stewardship Plan.

Former Audubon staff conduct a bottomland forest bird survey on one of our Mississippi River Islands. Photo by Lane Richter

Thanks to funding from MoBCI, we are also supporting the Corps' restoration of 1,200 acres of prairie marsh at the Riverlands Migratory Bird Sanctuary. The Corps initiated this effort in 1988 to bring back an example of pre-settlement grassland habitat found in the Great Rivers Confluence area. The Riverlands' prairie marsh is one of the largest grasslands in the St. Louis region today!

Our goals include improved conditions for breeding, migrating, and overwintering birds as well as sustained production of native grassland seed and plants to promote healthy grassland habitat, which can support bird populations long-term. Summer grassland bird surveys, started last year, were designed to gauge the restoration's impact and inform the management necessary for promoting breeding grassland birds.

A Dickcissel sings during a grassland bird survey on Riverlands Migratory Bird Sanctuary. Photo by Tara Hohman.

We are also contributing to bird conservation through two community science driven projects, the Great Rivers Trumpeter Swan Watch and Riverlands Nest Box Monitoring. "Swan Watch" started in 2011 through a partnership with the ACR, Corps, St. Louis Audubon Society, Audubon Society of Missouri, and Trumpeter Swan Society, to aid in the recovery of North America's largest waterfowl species.

Trumpeter Swans were once nearly extinct and remain a species of concern in our region. Today, a large population of "Trumpeters" typically migrates to Riverlands in early November and stays through mid-February. During this period, volunteer community scientists from the St. Louis Audubon Society and Audubon Center at Riverlands conduct a series of bi-weekly swan counts. Data from these surveys is helping land managers understand the habitat conditions Trumpeter Swans need, as well as to continually track their population trends. The overwintering population of Trumpeter Swans at Riverlands has reached as high as 2,300.

Trumpeter swans on Riverlands Migratory Bird Sanctuary taking off in the early morning to forage in surrounding farm fields. Photo by Roger Ottwell.

We've also initiated a Nest Box Monitoring program focused on Eastern Bluebirds and American Kestrels at Riverlands. Bluebirds were once in steep decline due to the lack of natural tree cavities. This species, and other secondary cavity nesters, continue to rely on supplementary nest boxes. Eastern Bluebird populations have rebounded thanks to conservation efforts, but this species along with other cavity nesters, still rely on appropriately maintained and available nest boxes.

We installed eight bluebird boxes this year at Riverlands. Throughout the breeding season, community scientists from the Audubon Center at Riverlands and area Master Naturalist groups are monitoring and reporting on nesting status twice a week. The protocol complies with the Cornell Lab of Ornithology's NestWatch program, thus adding to a broader network of knowledge to improve the status and trends in the reproductive biology of birds. The Eastern Bluebird and Tree Swallow are two species that have utilized the next boxes this year.

Male Tree swallow guards his nest box outside of the Audubon Center at Riverlands. Photo by Tara Hohman.

Populations of the American Kestrel, North America's smallest falcon, are in decline for unknown reasons. Since kestrels are year-round residents in Missouri, they provide an opportunity to promote their population while contributing data on to larger efforts focused on kestrel demographics and conservation.

ACR and the Corps installed 10 kestrel boxes at Riverlands earlier this year. Funded through St. Louis Audubon Society's Creley Memorial Conservation Grant, and in partnership with World Bird Sanctuary and Ameren Missouri, community scientists are monitoring the breeding success of kestrel pairs once a week during the breeding season. We enter the data collected into the Peregrine Fund's American Kestrel Partnership, a network of community and professional scientists focused on understanding and conserving kestrels. Two pairs of kestrels have nested in our boxes this season. While a seemingly small step, this is a huge leap in our work to understand kestrel behavior and use of Riverlands, as well as for the kestrel population in our region.

Audubon and World Bird Sanctuary partners hold up 3 of 4 American kestrel chicks banded in correspondence to Riverlands Nest Box Monitoring Program. Photo by: Insiyaa Ahmed.

For more information or questions regarding our conservation programs, please contact Conservation Science Associate Tara Hohman at tara.hohman@audubon.org.

Columbia Audubon Society

CAS donated $30,000 for a council house at the new Boone County Nature School. The council house offers a 360-degree, stadium-seating, outdoor amphitheater. It includes a fire pit and has a capacity for 140 people. Every fifth grader for all six Boone County school districts will attend the nature school for seven days.

Last year, over 1,350 second graders, their parents, and teachers participated in Columbia Audubon's Band with Nature program. 2019 marked the eighth year CAS has conducted this program in conjunction with the Columbia Public Schools Science Department. CAS partnered with the Missouri River Bird Observatory and the Raptor Rehabilitation Project to provide programs at the event.

Ethan Duke of the Missouri River Bird Observatory shows Columbia Public School second-graders a Black-capped Chickadee.

CAS is also expanding the 15-acre prairie and the Columbia Audubon Nature Sanctuary (CANS) by converting an additional six acres of former cattle pasture to Missouri native grasses and wildflowers.

Columbia Audubon Society is converting an additional six acres of old fescue field to native prairie. Here is the result of an herbicide application in May 2019. Photo by Jim Gast.

CAS is a Partnership Friend with the Science Department of Columbia Public Schools and the place-based curriculum at Fairview Elementary School. This year grades 3, 4, and 5 will be using Bonnie View and CANS for their outdoor classroom for the place-based curriculum.

Columbia Audubon Society members regularly participate in citizen-science bird counts including submitting eBird checklists, National Audubon's Christmas Bird Count, the Great Backyard Bird Count and the Global Big Day count. For more information visit www.columbia-audubon.org.

Missouri Birding Society (formerly ASM)

MBS Funds and Volunteers Available for Partnership Grants

At the September, 2019 fall business meeting of the Audubon Society of Missouri (ASM) and after a lengthy process, the society's membership voted to change the name of ASM, held for 118 years, to The Missouri Birding Society (MBS). The MBS continues to serve as the independent statewide ornithological organization open to all with an interest in birds of Missouri. Preservation and protection of birds and habitats, participation in collection of bird distribution data, bird and natural history awareness and education, and communications within the birding community remain central to the organization's concerns and activities.

MBS, in its role as the nexus of communication for the Missouri birding community, supports the Missouri Bird Records Committee[1], the MOBIRDS listserv, a Facebook birders' page, The Bluebird quarterly journal, and provides many additional resources for birders. Learn more about MBS on the organization's website at https://mobirds.org.

MBS is committed to continuing support of partnership activities that further our understanding of bird occurrence and of education about birds in Missouri. MBS has funds and/or volunteer activities to contribute toward the application for and conduct of MoBCI habitat improvement grants. (This table[2] shows MBS's participation in partnership projects/activities and includes a link to submit a proposed partnership.) MBS is eager to contribute to efforts to further the knowledge of bird occurrence and habitat development and preservation in Missouri.

1. https://mobirds.org/RecordsCommittee
2. https://mobirds.org/Conservation

Missouri River Bird Observatory

We at the Missouri River Bird Observatory (MRBO) have been fortunate to be able to advance many different projects to fulfill our mission during the tumultuous series of events 2020 has brought. For those unfamiliar, our organization's mission is as follows:

- To contribute to the conservation of Missouri's migratory and resident birds through scientific research, community outreach, and education.
- 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.
- To provide opportunities for Missourians of all ages to learn about species and habitat conservation.
- To advocate for sound, science-based conservation policy that benefits birds, other wildlife and environmental quality.

In a typical year, MRBO hires seasonal staff to assist with study of bird migration across many of the state's wetlands and grasslands. We monitor spring and fall migration on wetlands and add breeding season monitoring on grasslands. Additional staff and interns lead numerous education and outreach events to a diversity of audiences across the state (ranging from summer primary school camps to Missouri Master Naturalists). However, the circumstances of this year have led to a pause on some of these tasks and a pivot to other methods of research and communication.

While gathering information about avian communities and habitat has been challenging, MRBO has been able to collect a limited set of data during the spring migration and breeding seasons. Our wetland surveys were curtailed due to the high amount of intrastate travel required for the project, but a few sites were surveyed in early April. Thankfully, these surveys were successful in detecting the presence of a high number of target, wetland-obligate species. Our grassland migration and breeding bird surveys faced a similar approach: only surveys within an hour's drive of our employees' home offices were to be completed. Fortunately, our third active research project, nest monitoring of grassland birds, was able to be continued as usual. This is because we have a field office in close proximity to the focal sites, making travel a non-issue (and being out in the middle of a grassland is largely a safe destination in the times of COVID-19)!

To achieve our mission of community outreach and education, at the onset of shelter-in-place advisories and mandates with the COVID-19 pandemic, MRBO cancelled in-person events and launched a series of weekly webinars. We believe these webinars have been largely successful with live viewing of 30–60 attendees, and almost 100 independent viewers of the recordings. We have received good, positive feedback, and several 'regulars' return each week. Webinars have been designed for education and enjoyment by people of all ages, and a few have been particularly focused on bird-friendly activities for the whole family. You can find these webinars on our website at www.mrbo.org/mrbo-webinars. If you or your organization would be interested in collaborating on a future webinar, please contact Zebadiah.yoko@mrbo.org.

Advocacy for sound science and conservation policy has been a primary shift of direction for our organization as well. Working from home has provided time for our staff to attend and participate in many partner organizations' trainings,

forums, and webinars promoting conservation and legislative action. During our webinar series, we hosted a screening of *The Story of Plastic*, followed by a panel discussion with local experts. We have also taken the time to update our website, create a monthly e-newsletter, and even launched a new resource for study and discussion of bird audio recordings on www.mobirdsong.org. We continue to produce reports for landowners and partner conservation organizations detailing our findings and the benefits of conservation for birds in the state of Missouri.

National Wild Turkey Federation

The National Wild Turkey Federation (NWTF) was founded in 1973. The organization was created by a core group of enthusiastic turkey hunters wanting to see the wild turkey resource expanded. The initial purpose of the organization was to generate the funding necessary to support research efforts that would improve our understanding of the bird and its management. The national population at our inception was estimated to be about 1.3 million. From the research that we helped support and the programs and management that was enabled as a result, the national population, at its peak in the early 2000's, grew to an estimated seven million or more.

The mission of the NWTF is the conservation of the wild turkey and the preservation of the hunting heritage. Nationally, the organization has 220,000 members with about 9,000 of those residing in Missouri. Missouri is one of our top fund raising states in the country and the roughly 90 chapters in communities across the state, generate about $225,000 annually for mission delivery. In 2013 NWTF nationally established the 10 year *Save the Habitat. Save the Hunt*. initiative. This initiative established goals (conserve and enhance 4 million acres of habitat, enable hunting access to an additional 500,000 acres, and recruit, retain, and reactivate 1.5 million new hunters) that were designed to improve fund raising efforts. Each state established a plan designed to achieve their portion of the national goals. Missouri's portion was 400,000 acres conserved, 4,000 acres of access gained, and 20,300 hunters created. Missouri is on track to achieve our state specific goals and, with 2.5 years left in the initiative, the national access and hunter creation goals have already been surpassed and the conserved acreage goal stands at a little over 3.6 million acres.

The way our system works is a little different from other nongovernmental organizations. The funds that are raised at the banquets are deposited into a state specific account at our headquarters in Edgefield, South Carolina. This account is called the super fund. In order to access the funding for projects, each project requires the approval of the state chapter president, the

Technical Committee Representative (the state biologist responsible for the turkey resource in their state), and the NWTF District Biologist. Every year in September, the District Biologist works with the Technical Committee Representative to produce a call for project proposals (CFP). The CFP contains all of grant specifications for interested applicants and is distributed to partner agencies and organizations, fund raising staff, and is posted on our website monwtf.org under the super fund tab. Applications are accepted throughout the year but the annual deadline is mid-November. In early December the Executive Committee establishes the annual budget and ranks projects. In early January, the full 18 member volunteer board meets and approves the budget and project recommendations for that calendar year.

NWTF has also been a significant player as a MoBCI affiliate with the District Biologist serving on the steering committee since its inception. NWTF, with significant help from MoBCI, the USFWS, and MDC Private Land Services has also been able to put $280,000 to work since 2009 restoring over 2,700 acres of open woodland and savanna habitat on private land in northeast Missouri.

St. Louis Audubon Society

St. Louis Audubon Uses Technology to Continue Habitat Consultations

Since 2012, the St. Louis Audubon Society Bring Conservation Home program (BCH) has been providing detailed, written advice to landowners in the St. Louis region on how their landscapes can be improved for birds, pollinators and people. In those 8 years over 1,200 on-site consultations have been conducted, averaging two hours in length and involving at least two volunteer Habitat Advisors. With such an up-close and in-person program, COVID-19s arrival in March put the entire program at risk of indefinite hiatus.

The BCH leadership team spent most of April investigating various apps and processes that would support the in-depth, personalized consultation without the need to physically visit with landowners on-site. A video call tool was clearly called for, but all such platforms are not created equal. After testing several and exploring the potential for the landowner using a smart phone on a video call walking their landscape in real time, a less demanding two-step process was chosen. On April 27th, the BCH program resumed.

Bring Conservation Home
A St. Louis Audubon Society Community Partnership

After receipt of a consultation request form, the BCH coordinator calls the landowner to review the program and process, answer their questions, and schedule the video call. The Zoom platform was used initially for the video call, but GoToMeeting has since replaced it for logistical reasons. The week before the video consult, BCH staff or volunteers stop by the owner's landscape to take pictures and notes. The owner is aware of this quick visit, but also knows not to engage with the visitors in person. The pictures are uploaded to a Google folder, accessible by staff and volunteers, which are used during the

video consult to conduct a virtual walk-through of the landscape. As of this writing, nearly 60 consults have been conducted via this approach and landowners have provided enthusiastic 'thumbs-up' about the process.

This approach is a compromise, of course. In particular, plant identification can be a real challenge, and the more complicated the landscape, the harder it is to capture everything with the pictures. Yet, there are upsides as well. The consults are no longer limited by weather conditions or daylight — as long as the power stays on and the internet stays connected. Being online with screen sharing also makes it very easy to show examples of plant ideas or other recommendations by simply opening a browser window.

Demand for the BCH service is as strong as ever, and in spite of the six-week hiatus, consults in 2020 will likely exceed the long-term yearly average by 30% and push our total potential habitat restoration since 2012 to over 600 acres. That will only be possible because of the continued support from volunteers and partners, both essential to the program's success since it was created. In particular, the volunteer Habitat Advisor ranks are staffed largely with Missouri Master Naturalists, Wild Ones St. Louis Chapter members and Master Gardeners. Also, the Missouri Department of Conservation has been a critical financial partner and technical advisor. They provided critical startup funds in 2012, and a cooperative agreement provides essential sustaining funding each year.

None of us knows what the future holds and just when it might be completely safe to engage up-close with strangers. Even after effective treatment or a vaccine is available, many people may remain hesitant to engage as they did before. The video consult approach makes the BCH habitat advice and consultation service available without waiting for either the medicine or the total easing of anxiety. That's important since the birds, pollinators and nature in general need all the help they can get!

MoBCI Grant Opportunity Now Available!

The Request for Proposals for Fiscal Year 2022 MoBCI grants is now available. A copy of the application information may be found at the end of this newsletter or on the MoBCI website.

Please review the RFP carefully as the criteria for successful applications have changed. Ranking of proposals will be based in the Comprehensive Conservation Strategy revised in 2020. Links to the Priority Geography Tiers and other relevant documents are included in the RFP.

Applications are due September 30, 2020 for work to begin July 1, 2021.

We look forward to discovering how many great projects are out there designed to help birds and their habitats!

MISSOURI BIRD CONSERVATION INITIATIVE

Missouri Bird Conservation Initiative Grant Program
FY2022 Call for Proposals
Proposals due September 30, 2020
Work Period July 1, 2021 – June 30, 2022

The Missouri Bird Conservation Initiative (MoBCI) serves as a conduit in providing financial support from the Missouri Department of Conservation (other partners provide funding at times) to private and public organizations, or to individuals who have partnerships that carry out bird habitat conservation projects in Missouri. **MoBCI financial support is to be specifically spent on bird-habitat improvement projects that meet the needs of native birds that use native habitats in Missouri and must address bird conservation goals/objectives.** Eligible activities include projects that protect, enhance, or restore bird habitats in priority areas (defined below) in Missouri. All projects should be habitat-based and not strictly designed for monitoring; however, monitoring can be a component of the project (<10% of the MoBCI request); some component to monitor effectiveness is recommended. MoBCI grant funds cannot assist applicants with administrative overhead costs and cannot be used to purchase equipment. Applicants can include their administrative overhead as match provided it is directly related to the bird habitat improvement project or monitoring of the project being proposed through this current Call for Proposals.

Strong priority in the review scoring will be given to projects that address habitats found in MO's Natural Community/Habitat Management Tiers from the Comprehensive Conservation Strategy (Appendix A) and partnerships generated through MoBCI. Priority habitats are founded on the Conservation Opportunity Areas (COAs) identified in the 2015 State Wildlife Action Plan, which is being revised in 2020 (Figure 1; https://mdc.mo.gov/sites/default/files/downloads/SWAP.pdf, page 31). Names of individual COAs can be found in the chapters relating to the primary habitat type for that COA. Appendix A at the end of this call for proposals describes the tiers and includes maps showing the locations encompassed by them. Higher scores will be given to projects occurring within higher priority tiers. Due to budget constraints, few projects will be funded in tiers 4 – 6. If your project is on land found in a priority tier (e.g., priority geography, natural area, other COA), please include the name of that geography within your proposal.

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MoBCI Foundation Financial Report

Dave Erickson

MoBCI Foundation Treasurer

MoBCI's financial affairs are handled by its sister organization—the MoBCI Foundation—which was incorporated for the sole purpose of handling MoBCI's finances. As a not-for-profit 501(c)(3), the MoBCI Foundation is a tax exempt charitable organization. Financial reports are provided to the Steering Committee at every Steering Committee meeting and, annually, to all member organizations at the MoBCI General Assembly meeting at the annual conference.

Because the 2020 annual conference has been canceled, it is important to share financial information with member organizations via the Newsletter. Fortunately, MoBCI's financial health remains strong, and this is depicted in the statement to the right. Every dollar of MoBCI income and expenditures for the past fiscal year is itemized in our checking and PayPal accounts (current balance—$896.81). Most annual expenditures pertain to the sponsorship of the annual conference, and lacking a conference this year, most of these expenses have been deferred. Other expenses relate to web site maintenance/support, communications, and our Conservation Federation of Missouri affiliation. Similarly, virtually all MoBCI income is derived from the annual conference, and that income will be deferred as well for 2020. Investment accounts (Vanguard Group) are used to hold invested funds of the Jerry Wade Youth Habitat Program Fund (current balance—$33,147.53) and a MoBCI Reserve Fund (current balance—$4,660.96). The Reserve Fund is a modest accumulation of funds to be used for emergency or opportunity issues should these surface.

Any questions regarding MoBCI finances should be directed to MoBCI Foundation Treasurer Dave Erickson at davidwerickson@gmail.com or 573-999-2129.

Jerry Wade Youth Habitat & Education Program

MoBCI offers grants to promote bird habitat conservation projects that provide an educational component for youth.

These grants may be awarded to private and public organizations, or to individuals who partner with organizations. Eligible activities include projects that protect, enhance or restore bird habitats on any lands in Missouri. All projects should be habitat based and include a specific educational component for youth.

To find out more information or to apply for a Youth Habitat and Education Program grant, please visit: mobci.net/yhep.

MOBCI FOUNDATION FINANCIAL STATEMENT

August 24, 2019 to June 27, 2020

FOR MOBCI 2020 NEWSLETTER AND JULY 14 SC MTG.

FY START TOTAL					CURRENT ACCOUNT TOTAL
	Checking Account—Central Bank of Boone County				
$3,704.94	(Checking Balance August 24, 2019)				
	FY 2020 Deposits				
	08/26/19	2019 Conference registration deposits via PayPal		$86.78	
	08/26/19	2019 Conference deposits as below		$1,302.50	
		~Registration Checks from prior to conference	$90.00		
		~Cash registrations	$77.50		
		~Check registrations	$180.00		
		~Cash conference auction proceeds/donation	$390.00		
		~Check conference auction proceeds	$465.00		
		~$100 cash for conference change returned to account	$100.00		
	09/04/19	2019 Conference income via CFM credit card system as below		$1,047.50	
		~Auction	$705.00		
		~Registrations	$342.50		
	09/05/19	2019 Conference registration deposit/Bill Mees check		$45.00	
			Deposits Total	**$2,481.78**	
	FY 2020 Expenditures:				
	08/24/19	Peachtree Catering and Banquet—balance due for conference Ck 160		-$2,535.87	
	08/30/19	Douglas A. Miller—2019 Newsletter Design Ck 161		-$250.00	
	11/11/19	Vanguard—Sweep of surplus operating funds to investments—Ck 162		-$1,400.00	
	02/07/20	Columbia Country Club Deposit for 2020 Conference—Check 163		-$500.00	
	03/11/20	Go Daddy—SSL Certificate Renewal—ACH from Checking		-$79.99	
	04/13/20	Go Daddy—Economy Linux Hosting with cPanel Renewal—ACH from Checking		-$107.88	
	04/13/20	Go Daddy—MoBCI.NET Domain Renewal—ACH from Checking		-$20.17	
	06/02/20	Conservation Federation of Missouri affiliate dues—Check 164		-$300.00	
	06/02/20	Reimburse Kevin Wehner for MoBCI share of P.O. Box rental—Check 165		-$96.00	
			Expenditures Total	**-$5,289.91**	
	(Checking Balance June 27, 2020)				$896.81
	PayPal Account				
$86.78	Pay Pal Balance (August 24, 2019)				
	08/26/19	Remaining Conference deposits transferred to checking	-86.78		
	(PayPal Balance June 27, 2020)			$0.00	$0.00
	Investment Accounts—Vanguard Group				
$33,044.07	J.Wade YHEP Fund (Balance on August 22, 2019)				
	06/27/20	Unrealized Gain/Loss		$103.46	
	J.Wade YHEP Fund (Balance on June 27, 2020)			$33,147.53	
$3,686.77	MOBCI Reserve Fund (Balance on August 22, 2019)				
	11/15/19	Addition of funds swept from operating account		$1,400.00	
	06/27/20	Unrealized Gain/Loss		-$425.81	
	MOBCI Reserve Fund (Balance on June 27, 2020)			$4,660.96	
		TOTAL – ALL INVESTMENT ACCOUNTS (June 27, 2020)			$37,808.49
		TOTAL – ALL MoBCI ASSETS (June 27, 2020)			$38,705.30

MoBCI Member Organizations

As of August 2020, the following 76 organizations have signed a Memorandum of Agreement to participate in the Missouri Bird Conservation Initiative:

Academy of Science of St. Louis
American Bird Conservancy/
  Central Hardwoods Joint Venture
Audubon Center at Riverlands
Audubon Missouri
Audubon Society:
- Chariton Valley Chapter
- Columbia Chapter
- Grand River Chapter
- Greater Kansas City Chapter, Burroughs Audubon Society
- Greater Ozarks Chapter
- Midland Empire Chapter
- River Bluffs Chapter
- St. Louis Chapter

Avian Conservation Alliance
Bellefontaine Cemetery & Arboretum
Birding Society of Missouri
City of Des Peres Parks & Recreation Department
Clay County Dept. of Parks,
  Recreation & Historic Sites
Coldwater Outing and Game Preserve
Conservation Federation of Missouri
Ducks Unlimited
Eleven Point River Conservancy
Forest Park Forever
Forrest Keeling Nursery
Great Rivers Habitat Alliance
Greenbelt Land Trust of Mid-Missouri
Kansas City Wildlands/Bridging The Gap
LaBarque Watershed Stream Team Association
L-A-D Foundation
Litzsinger Road Ecology Center
Mark Twain National Forest, USDA Forest Service
Massasauga Flats, LLC
Missouri Army National Guard
Missouri Conservation Heritage Foundation
Missouri Department of Conservation
Missouri Department of Natural Resources,
  Division of State Parks
Missouri Department of Transportation
Missouri Falconers Association
Missouri Master Naturalists:
- Boone's Lick Chapter
- Hi Lonesome Chapter
- Osage Trails Chapter
- Springfield Plateau Chapter

Missouri Native Plant Society:
- Hawthorn Chapter
- Osage Plains Chapter

Missouri Native Seed Association
Missouri Park and Recreation Association
Missouri Prairie Foundation
Missouri Quail & Upland Wildlife Federation
- Grouse Chapter

Missouri River Bird Observatory
Mussel Fork Legacy Marsh LLC
National Wild Turkey Federation, MO Chapter
North American Grouse Partnership, MO Chapter
Ozark National Scenic Riverways
Ozark Regional Land Trust, Inc.
Pheasants Forever
Platte Land Trust
Quail and Upland Wildlife Federation Inc.
Quail Forever
Sierra Club, Ozark Chapter
The Nature Conservancy, Missouri Field Office
Truman State University
U.S. Fish & Wildlife Service:
- Big Muddy National Fish & Wildlife Refuge
- Ecological Services
- Great River/Clarence Cannon National Fish & Wildlife Refuge
- Mingo National Fish & Wildlife Refuge
- Missouri Private Lands Office
- Squaw Creek National Fish & Wildlife Refuge
- Swan Lake National Fish & Wildlife Refuge

University of Missouri-Columbia
Watershed Institute, Inc
  and The Watershed Land Trust
Webster Groves Nature Study Society
Wild Birds for the 21st Century
Wild Bird Rehabilitation Inc.
Wildcat Glades Conservation & Nature Center
Wings Over Weston
World Bird Sanctuary

To find out more about the Missouri Bird Conservation Initiative and how you can participate as a member organization, visit our website: www.mobci.net

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Proposals due September 30, 2020
Work Period July 1, 2021 – June 30, 2022

The Missouri Bird Conservation Initiative (MoBCI) serves as a conduit in providing financial support from the Missouri Department of Conservation (other partners provide funding at times) to private and public organizations, or to individuals who have partnerships that carry out bird habitat conservation projects in Missouri. **MoBCI financial support is to be specifically spent on bird-habitat improvement projects that meet the needs of native birds that use native habitats in Missouri and must address bird conservation goals/objectives.** Eligible activities include projects that protect, enhance, or restore bird habitats in priority areas (defined below) in Missouri. All projects should be habitat-based and not strictly designed for monitoring; however, monitoring can be a component of the project (<10% of the MoBCI request); some component to monitor effectiveness is recommended. MoBCI grant funds cannot assist applicants with administrative overhead costs and cannot be used to purchase equipment. Applicants can include their administrative overhead as match provided it is directly related to the bird habitat improvement project or monitoring of the project being proposed through this current Call for Proposals.

Strong priority in the review scoring will be given to projects that address habitats found in MO's Natural Community/Habitat Management Tiers from the Comprehensive Conservation Strategy (Appendix A) and partnerships generated through MoBCI. Priority habitats are founded on the Conservation Opportunity Areas (COAs) identified in the 2015 State Wildlife Action Plan, which is being revised in 2020 (Figure 1; https://mdc.mo.gov/sites/default/files/downloads/SWAP.pdf, page 31). Names of individual COAs can be found in the chapters relating to the primary habitat type for that COA. Appendix A at the end of this call for proposals describes the tiers and includes maps showing the locations encompassed by them. Higher scores will be given to projects occurring within higher priority tiers. Due to budget constraints, few projects will be funded in tiers 4 – 6. If your project is on land found in a priority tier (e.g., priority geography, natural area, other COA), please include the name of that geography within your proposal.

Projects should benefit an array of bird species (e.g., grassland, forest, wetland, or glade birds). An acceptable project may target one or more high priority bird species, but should include benefits to other bird species, involve habitat and ecosystem level planning and management, and engage partners with shared goals and objectives. Missouri's priority species are outlined in the Missouri Bird Conservation Plan's Technical Section (Appendix B; https://mdc.mo.gov/sites/default/files/downloads/MOBirdConservationPlanTech.pdf, page 16). A checklist of Missouri species and communities of conservation concern can be found at https://nature.mdc.mo.gov/sites/default/files/downloads/2020_SOCC.pdf, bird species listed on page 40. The State Wildlife Action Plan also has a list of Species of Greatest Conservation Need found in Appendix A on pages 36-39 in the 2015 State Wildlife Action Plan. (https://mdc.mo.gov/sites/default/files/downloads/SWAP.pdf).

Applicants need to establish partnerships to qualify for receipt of these funds. Partnerships can enable leveraging of funds as well as providing expertise of others. Partners often educate each other and result in increased conservation of wild bird populations and habitats needed to support them beyond the life of the project being funded.

Grant awards

The Missouri Department of Conservation (Grantor) will consider all selected projects during its FY22 budget process. There will be no total minimum or maximum amount of funding provided to MoBCI. Individual grant awards are available for a minimum award of $1,000 to a maximum award of $25,000 annually. MoBCI grants require a one-to-one match of [local, state, or federal] funds that DO NOT originate from the Missouri Department of Conservation (including Wildlife Diversity Funds, Habitat Challenge match, or any other Department sources).

The match may include acquired realty, partner financial contributions, monitoring and evaluation costs, stewardship costs, volunteer time, etc. Projects which include a significant amount of overhead as match (i.e., indirect administrative expenses) are strongly discouraged. Donated or acquired property or easements may be included as part of the project match for a maximum of 5 years as long as the following conditions are met:

• A copy of the appraisal is included (not included in the page length limit) to document the valuation (must be provided from a non-recipient of the property or easement);

• A table documenting each year and value that the property/easement has been used as match toward MoBCI funding, the cumulative value already used as match toward MoBCI funding, and the current year's requested match provided by the property/easement to document the total use of the property/easement as match and relation to its total value (see example in Table 1).

• The property/easement may not be used as match if the cumulative value of the match claimed toward MoBCI projects exceeds the value of the property/easement.

• At least 50% of the match toward MoBCI funding should be from sources other than donated or acquired property or easements.

Match Plan Partner	**Proposal I**	**Proposal II**	**Proposal III**	**Proposal IV**	**Proposal V**	**Total $**
XYZ Easement	$12,500	$12,500	$12,500	$12,500	$12,500	$62,500
Totals	$62,500	$50,000	$37,500	$25,000	$12,500	$0

Table 1. An example of a spend-down table for the "XYZ Easement" valued at $62,500 used as match over five years.

Application and Review Process

Grant applications **must** follow the format listed in the *General Requirements* section below (see Appendix C for Sample Proposal). The MoBCI Grant Subcommittee will review, score (based on the ranking criteria below), and provide funding recommendations to the MoBCI Steering Committee. The MoBCI Steering Committee will make recommendations for final approval to the Missouri Department of Conservation (MoBCI grant administrator).

Proposals will be ranked by the MoBCI Grant Subcommittee based on

 Priority and non-priority bird species addressed (15 points)
 Priority habitats conserved (e.g., Priority Geography/Natural Area, other COA, Quail Restoration Landscape) (20 points)
 Purpose of grant (detailing goals and objectives) and project description/narrative (15 points)
 Partnerships developed (20 points)
 Capacity of the organization(s)/individual to accomplish the project (10 points)
 Budget (15 points)
 Bonus for first-time MoBCI proposal from an organization (5 points).

General Requirements

(Failure to follow these requirements or failure to include any of these elements will result in your proposal being disqualified.)

 Maximum length is six pages for the entire proposal, including maps, etc., and at least an 11-point font.
 Grant Title
 Purpose of Grant (Clearly define goals, objectives**,** or activities to be achieved with applicable time lines.)
 Project Location (include map)
 Is this the first time you have submitted a MoBCI Grant Proposal? Yes or No
 Project Description including narrative and any pertinent tabular information.
 Habitat types, birds, and other wildlife benefited.

 Project Calendar (work period is July 1, 2021 through June 30, 2022)
 Measurable Outcomes (Identify specific and measurable outcomes that will be used for tracking progress.)
 Measurable Deliverables (Describe products or services that will be provided by the grantee. Note: Mandatory deliverables will include 3-5 good quality digital photographs of people conducting project actions and 1-2 photos clearly illustrating habitat improvements. Semi-annual and annual financial and progress reports are also mandatory deliverables.)
 Budget should include a table including Grant Request Amount and columns for funds requested from MoBCI and funds provided as matching dollars (see Table 2). A detailed narrative of how the funding will be used is also necessary.

Task	MoBCI Funds Requested	Match Source & Amount	Total Costs
Cut and remove cedar trees	$7,500	$3,500 (paid by landowner)	$11,000
Burn crew		$2,500 (from partnership volunteer hours)	$2,500
Pre- and post-monitoring of birds		$1,500 (from Missouri University)	$1,500
Sum of Costs	$7,500	$7,500	$15,000

Table 2. Sample budget table for restoring glade habitat.

 Reporting and monitoring plan (Describe process for monitoring and reporting progress and identify a point-of-contact with e-mail address.)
 Lead organization, point-of-contact and their capacities (Provide names, titles, addresses, electronic addresses and phone numbers of parties who can answer questions relating to the agreement; if applicable, include a list of NGO Board members and officers.)
 List of partners involved in the project and point-of-contact for those other partners (same as above for Lead Organization).
 Fiscal Responsibility/Management (Describe fiscal management and identify grantee fiscal agent.)

A proposal that was funded under slightly different guidelines follows this Call for Proposals to assist you with preparation of your submission.

Deadlines

All grant proposals **must be received by Susan Hazelwood at hazelwoods@missouri.edu no later than 5:00 p.m. September 30, 2020**. **Only electronic applications in pdf format will be accepted.** Please put **"MOBCI GRANT PROPOSAL (Your organization's name)"** in the subject line of your submission email. The MoBCI Grants Subcommittee will notify applicants of their status within three months of due date and indicate recommendation for funding made to

Missouri Department of Conservation or reasons for rejection and/or suggestions for making the proposal more competitive. Grantees will be required to complete a cooperative agreement with the funding agency (i.e., Missouri Department of Conservation).

To learn more about MOBCI go to **www.mobci.net.**

For Grant Assistance Contact:

Susan Hazelwood, Grants Committee Chair
3750 Miller Dr., #1308
Columbia, MO 65201
hazelwoods@missouri.edu
(573) 819-9252

Norman Murray
Missouri Department of Conservation
P.O. Box 180
Jefferson City, Missouri 65102
Phone: 573-522-4115 ext. 3353
E-mail: Norman.Murray@mdc.mo.gov

Appendix A: Natural Community/Habitat Management Tiers from the Comprehensive Conservation Strategy (revised 2020):

1. The Priority Geographies (PGs) ***and*** Natural Areas (NAs)

2. Conservation Opportunity Areas (COAs) not located within PGs or NAs

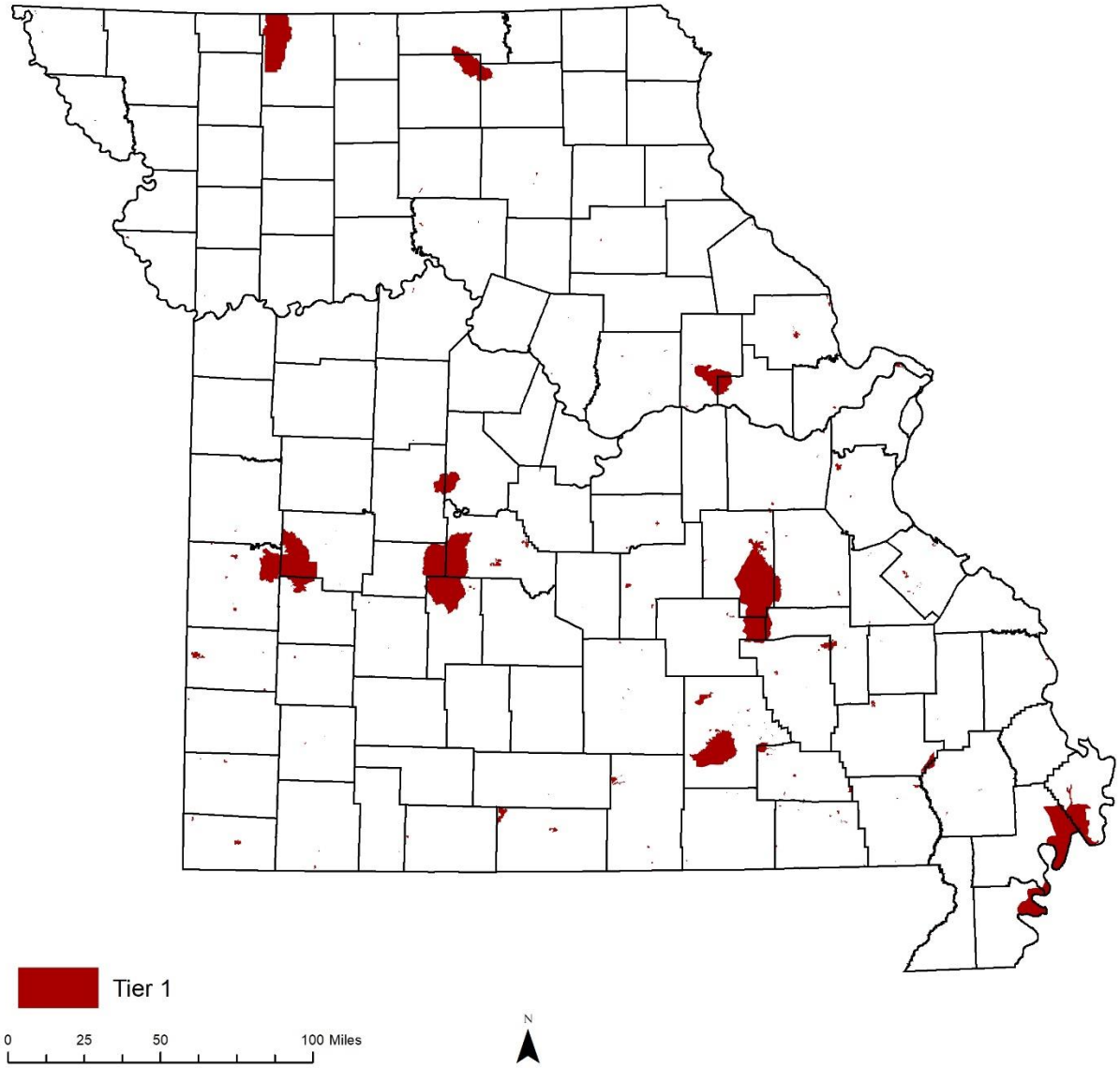
3. Priority Forest Landscapes (PFLs); Quail Restoration Landscapes (QRLs); Priority Watersheds (PWs) that overlap COA Stream Reach Watersheds for Reference; Comprehensive Conservation Wildlife Strategy (CWCS)/Aquatic GAP landscapes within PWs and COA Stream Reach Watersheds for Reference; MO and MS River Alluvium and Riparian (Bootheel); and Department lands adjacent to conservation landowner cooperatives not located within PGs, COAs, or NAs
   (***NOTE:*** Many, or a large portion of these focal landscapes are represented in PGs/COAs.)
   and
   Remaining Missouri communities of conservation concern with state rank = SH, S1, S2
   (***NOTE:*** Many, or a large portion of these communities of concern are represented in PGs/NAs/COAs)
   and
   Remaining natural communities harboring federally threatened and endangered (T&E) species, state endangered species, or select high priority species of conservation concern (typically those with state rank = S1 or S2) when the habitat management contributes to the recovery or persistence of the species
   (***NOTE:*** Many, or a large portion of these communities harboring T&E species are represented in PGs/NAs/COAs)

4. Remaining PWs and CWCS/Aquatic GAP landscapes not located in the above-listed priority landscapes

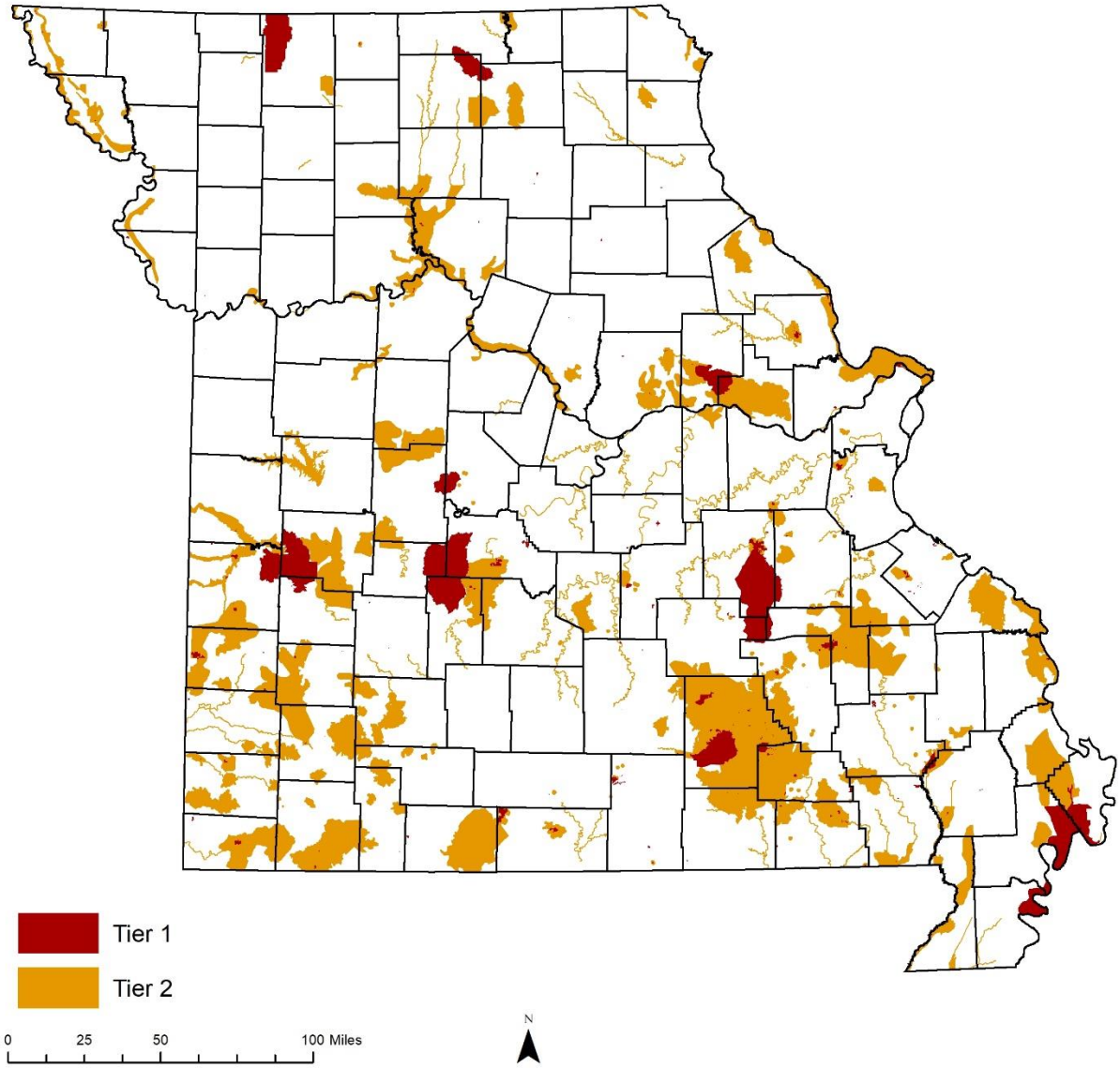
5. Maintenance of high quality natural communities

6. Areas striving toward natural community restoration/management that have high restoration potential

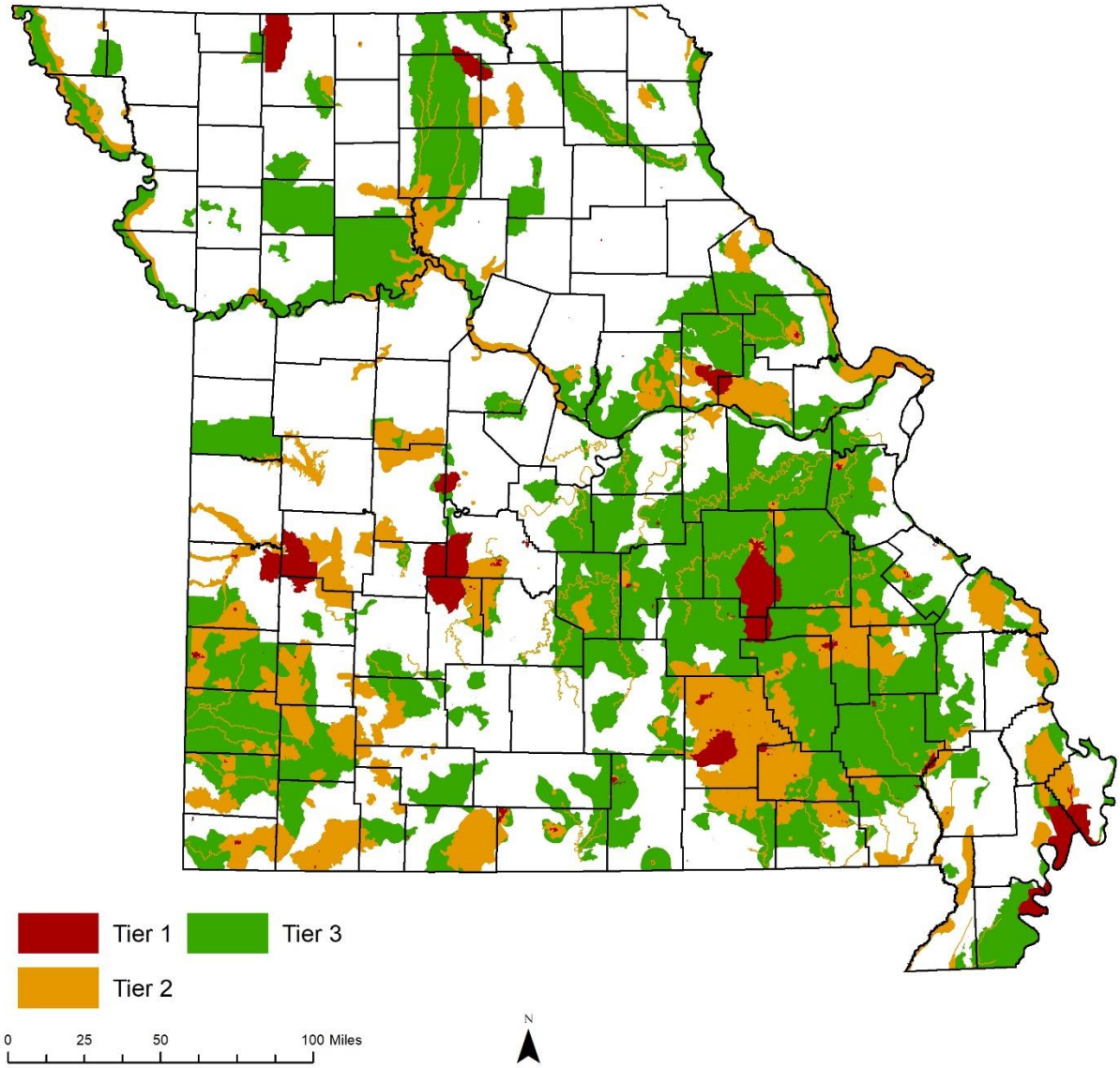
MDC Tiered Approach to Natural Community and Habitat Management



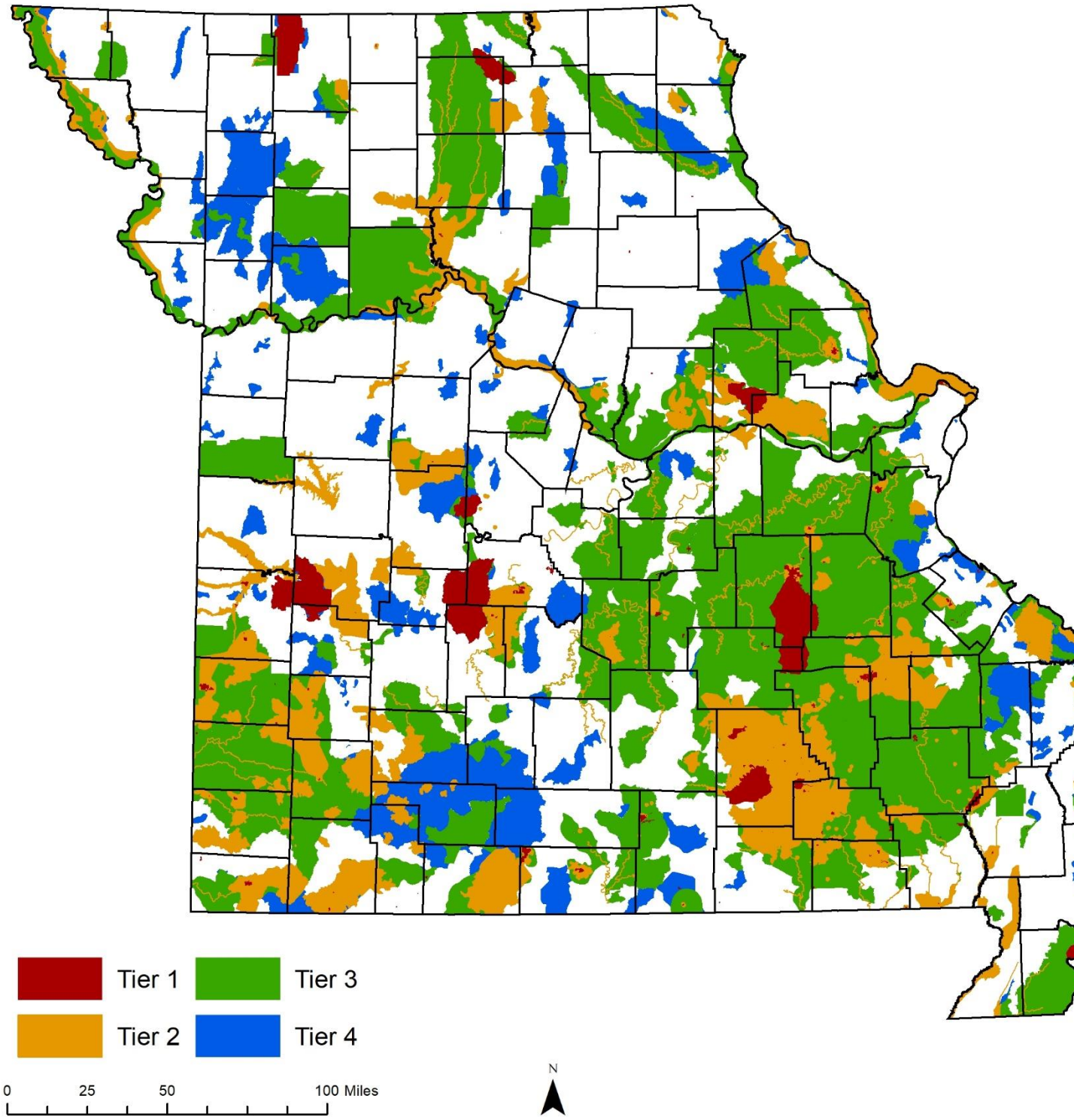
MDC Tiered Approach to Natural Community and Habitat Management



MDC Tiered Approach to Natural Community and Habitat Management



MDC Tiered Approach to Natural Community and Habitat Management



Appendix B: Missouri Bird Conservation Plan's priority bird species.

Natural Community	Common Name	MO Concern Score[1]	Population Trend, MO	Threats to Breeding, MO	Relative Density - Breeding, MO	Population Size, Global	Breeding Distribution, Global
GRASSLAND BIRDS	Eastern Kingbird	15	5	3	4	2	1
	Grasshopper Sparrow	15	5	4	3	2	1
	Henslow's Sparrow	17	2	4	5	4	2
	Bobolink	11	1	4	2	2	2
	Eastern Meadowlark	17	5	4	5	2	1
	Dickcissel	16	4	3	5	2	2
SAVANNA, WOODLAND, AND YOUNG-FOREST BIRDS	Northern Bobwhite	16	5	4	4	2	1
	Yellow-billed Cuckoo	16	5	3	5	2	1
	Chuck-will's-widow	16	5	3	4	2	2
	Eastern Whip-poor-will	18	5	3	5	3	2
	Chimney Swift	16	5	4	4	2	1
	Red-headed Woodpecker	17	5	3	5	3	1
	Eastern Wood-Pewee	14	3	3	5	2	1
	Bewick's Wren	17	5	5	3	2	2
	Brown Thrasher	15	4	3	5	2	1
	Eastern Towhee	15	4	3	4	2	2
	Field Sparrow	17	5	3	5	2	2
	Yellow-breasted Chat	13	3	3	4	2	1
	Orchard Oriole	13	2	3	5	2	1
	Blue-winged Warbler	15	3	3	4	3	2
	Prairie Warbler	18	5	3	5	3	2
FOREST BIRDS	Blue Jay	14	4	3	4	2	1
	Wood Thrush	14	3	3	4	2	2
	Worm-eating Warbler	15	2	3	5	3	2
	Prothonotary Warbler	13	3	3	2	3	2
	Kentucky Warbler	15	2	3	5	3	2
	Cerulean Warbler	18	5	4	4	3	2
WETLAND BIRDS	Green Heron	15	5	3	3	3	1
GENERALIST BIRDS	Common Grackle	16	5	4	5	1	1
SPECIAL CIRCUMSTANCE BIRDS[2]	Ruffed Grouse	-					
	Greater Prairie-Chicken	-					
	King Rail	-					
	Bachman's Sparrow	-					
	Brown-headed Nuthatch *extirpated	-					

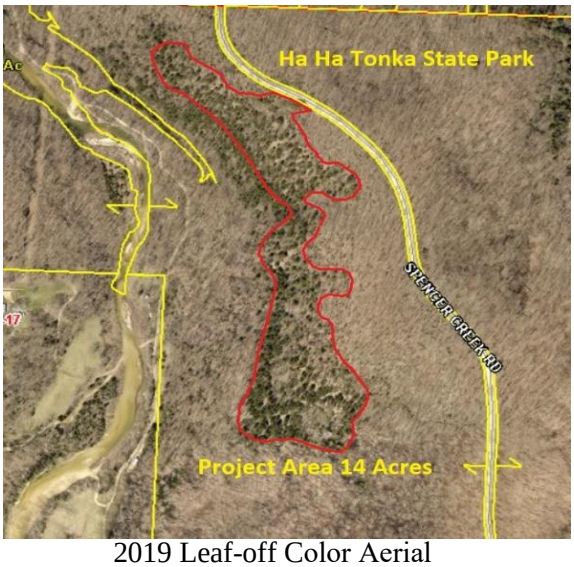
[1] MO Concern Score = sum of other five scores: MO Population Trend, MO Threats to Breeding, MO Relative Density, Global Population Size, and Global Distribution.

[2] Special Circumstance Birds were not scored due to extremely low breeding populations caused by various circumstances. See SPECIAL CIRCUMSTANCE BIRDS section of the Missouri Conservation Bird Plan for more info.

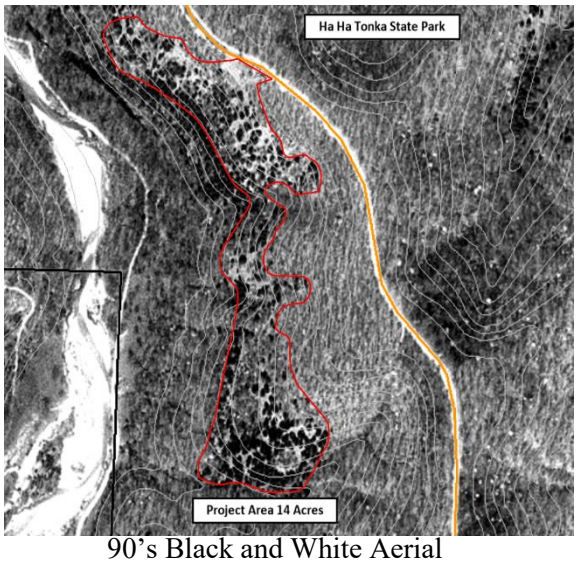
Appendix C: SAMPLE MOBCI GRANT PROPOSAL

Grant Title: Ha Ha Tonka State Park Bank Branch Glade Restoration

Purpose of Grant: Grant funding of $8,607.20 would allow Missouri State Parks to hire a two-person crew for the purpose of restoring 14 acres of dolomite glades and their associated woodland edges through cedar removal.



2019 Leaf-off Color Aerial



90's Black and White Aerial

Project Location: Ha Ha Tonka State Park (3,751.74 acres) is located 3.7 miles via US Hwy 54 and State Rd D, from the town of Camdenton in Camden County. State Rd D bisects the park, and the facility is surrounded by privately owned property of similar land types. The facility contains two Missouri Natural Areas (NA). The Ha Ha Oak Woodland NA consists of 2,995 acres of woodlands, glades, and a large sinkhole possessing glacial relict populations. The 70-acre Ha Ha Tonka Karst NA highlights the park's significant karst resources. Missouri State Parks designated the entire park as an Ecological Stewardship Management Area. This allows for the occurrence of stewardship management activities including prescribed fire, cedar removal projects, and hardwood thinning. Currently 52.73% of the park's woodlands and glades are actively managed with fire and cedar removal projects.

Ha Ha Tonka State Park is within the boundaries of the Upper Niangua Conservation Opportunity Area (COA) and has been designated as an area for active ecosystem restoration activities in the Woodland and Glade Restoration Strategic Conservation Initiative (2008). The facility is also located in the Niangua River Watershed Important Bird Area (IBA) and is highlighted in The Nature Conservancy's (TNC) Ecoregional Assessment for its contribution to the greater conservation goals of the Niangua Basin. Ha Ha Tonka State Park is within the boundaries of the Central Hardwoods Joint Venture Project's Bird Conservation Region (BCR-24) which prioritizes conservation of woodland, grassland-shrubland, and forest interior birds such as Blue Winged Warbler, Kentucky Warbler, Orchard Oriole, Yellow-breasted Chat, Field Sparrow, and Bewick's Wren.

A contributing factor for these designations is the vital role the park's managed woodlands and glades play in the life histories of birds, plants, and other forms of wildlife. Continental Priority species such as American Woodcock, Red-headed Woodpecker, Worm-eating Warbler, and Prairie Warbler are common inhabitants in the park's managed ecosystems. Ha Ha Tonka State Park's woodlands, glades, and karst

features have been nominated in 1976 and in 2012 for National Natural Landmark status, sponsored by the National Park Service. The Missouri Bird Conservation Initiative (MoBCI) awarded three grants for cedar removal, woodland restoration, and fireline construction to Ha Ha Tonka State Park since 2010.

Project Description: This project will be completed on a 14 acre glade complex and their associated woodland edges, situated above Bank Branch. The project area is adjacent to 110 acres of diverse glades and woodlands currently under fire management within the Bank Branch Burn Unit. The project glades are not currently under fire management, and they all possess dense to scattered cedars creating a barrier to native flora growth. The entire glade restoration project will occur in the 2,995 acre Ha Ha Tonka Oak Woodland NA.

The fire-mediated woodlands and glades of the Niangua Basin have existed for thousands of years. Unlike in other regions of the Ozark Highlands, private landowners in the Niangua River watershed have managed their lands with frequent fires since settlement, thus maintaining some of the best remaining examples of this native landscape type. Based on Floristic Quality Indices, a standard guide by which species richness is calculated, Ha Ha Tonka State Park and Bennett Spring Savanna (TNC) possess the highest quality woodlands and glades in the Niangua Basin; scientific research projects frequently occur in both sites. In 1995, 1999, and 2009 researchers conducted extensive bird surveys in the Ha Ha Tonka Oak Woodland NA. The results of the survey suggest that the natural communities managed with fire host a wide array of songbirds, several of which are declining throughout their range and have been identified by Partners in Flight (PIF) as priority species for management objectives. Large populations of breeding Yellow-breasted Chats, Prairie Warblers, Northern Bobwhite Quail, and Field Sparrows were detected in 2012 on the park's glades and surrounding woodlands in the MoBCI grant project areas. This shows a marked increase in populations from the 1995 survey which was conducted after only four prescribed fire events in the area.

Park staff wish to initiate glade restoration efforts on the glades adjacent to Bank Branch to expand the acres treated in order to enhance bird habitat and encourage species richness. The removal of cedars and the following treatments of fire would allow sufficient light to the glades in turn, rejuvenating endemic flora. This correlates to thriving bird, invertebrate, and other vertebrate populations. Currently cedars dominate the land in the project areas, however there are stands of little bluestem, big bluestem, Indian grass, and scattered glade coneflowers restricted to the open pockets between the cedars with no exotics present. The suppression of native flora by the cedars has also allowed understory species such red bud to begin colonizing the cedar shaded portions of the glades. Cedar removal will involve cutting and burning the cedars on site. Prescribed fire will be applied to the area in winter 2021 as a part of the newly expanded Bank Branch Burn Unit (122 acres).

The cedar tree colonization of this glade resulted in their dense to scattered thickets unsupportive of grassland-shrubland birds. Funding would allow for the hiring of a two-person crew, for 400 hours each, to assist park staff with clearing the cedars from the glades. Cedar removal will enhance habitat for grassland-shrubland birds identified in the Partners in Flight Priority List and Central Hardwoods Joint Venture priority list (Prairie Warbler, Blue-winged Warbler, Yellow-breasted Chat, Field Sparrow, Northern Bobwhite). Cedar trees will be cut at the base, placed in windrows, and burned on site while green to mitigate soil damage that comes with burning red needle stage trees. The glades will be burned after the clearing project in winter 2021 during the regularly scheduled prescribed fire for this burn unit. A partnership between The Lake of the Ozarks Chapter of the Missouri Master Naturalists and Missouri State Parks will provide for three birding events in the area by the Missouri Master Naturalists to increase the bird occurrences in the area for the SPARKS checklist program and to track bird occurrence in the

glade complex. This partnership will represent the first collaboration between Ha Ha Tonka State Park and The Lake of the Ozarks Chapter of the Missouri Master Naturalists.

The glade restoration project will begin in winter 2020 and continue through spring 2021, or as funding is available. Grant funding will be matched by the salary and fringe of one fulltime Interpretive Resource Specialist III (IRS III) for 100 hours, who will direct and oversee the project, and one part-time stewardship crew member funded by the Stewardship budget from the Resource Management and Interpretation Program for 400 hours.

Habitat Types and Wildlife Benefited: Restoration of glades identified for this project will result in a larger, more contiguous tract of habitat for both grassland-shrubland and woodland birds, such as those listed on Partners in Flight's Yellow List (Eastern Kingbird, Prairie Warbler, Prothonotary Warbler) and Red List (Golden Winged Warbler). Along with the Partners in Flight priority bird species, breeding populations of the Central Hardwoods Joint Venture priority species including Prairie Warblers, Wild Turkey, and Yellow-breasted Chat are well represented in the surround NA, such as in the glade impacted by the 2010 MoBCI grant. Summer Tanager, Field Sparrow, Bobwhite Quail, Great Crested Flycatcher, Brown Thrasher, and Indigo Bunting are common inhabitants on the park's restored glades. Northern Bobwhite Quail, and other birds that depend on glades and adjacent woodlands are identified in Missouri's Comprehensive Wildlife Strategy as species targeted for conservation actions. Of these, Prairie Warbler and Field Sparrow are recognized as conservation priority species for the physiographic region; 5% of the global populations of these birds breed in the Ozark-Ouachitas (Fitzgerald & Pashley, 2000). The restored glades at Ha Ha Tonka State Park possess characteristics desirable to grassland-shrubland birds such as old growth structure, floristically rich ground layer, and in some areas, a developed shrub layer dominated by oak and sassafras that is managed by regularly occurring fire. Restoration potential of areas indicated in this proposal will directly impact migratory songbirds as well as species which depend on grass-forb structure for their breeding cycles. Confirmed breeding birds from other restored glades and feathered edges of the surrounding woodlands include Field Sparrow, Prairie Warbler, Kentucky Warbler, Yellow-breasted Chat, Eastern Wood Peewee, Norther Flicker, and Orchard Orioles.

Federally endangered gray bat populations at Ha Ha Tonka State Park continue to increase with active management in the surrounding ecosystems and restrictions on caving activities. Thriving populations of invertebrates, namely pollinating insects upon which these and other bat species prey, coincide with the park's managed woodlands and glades. Increasing acreage under active management will also aid in burgeoning bat populations.

The prescribed fire program at Ha Ha Tonka State Park will continue to maintain and restore existing terrestrial natural communities for the sustainability of the park's diverse ecosystems. The glades serve a vital role in the life histories of grassland-shrubland birds, woodland birds, and other endemic fauna. Glade restoration projects involving cedar removal will allow for more contiguous landscape management that will benefit wildlife. Management activities involving prescribed fire remain a stewardship priority to Missouri State Parks.

Public Benefits: Visitation at Ha Ha Tonka State Park averages 550,000 visitors annually. To provide visitors with the highest quality landscapes in which to view native plants and animals as once existed over thousands of acres in Missouri remains a priority to the Missouri State Park system. Restoring these areas will enhance wildlife viewing and research opportunities. The biodiverse character of the project area will likely result in significant invertebrate populations; a two year bee survey on a nearby glade has netted rare and unusual bees with specimens collected on the now-abundant glade flora. Furthermore,

restoration of warm season grasses to the glades directly impacts water quality and quantity in Bank Branch, a tributary of the Niangua River.

Measurable Outcomes: Progress of acres treated with cedar removal will be measured quantitatively by the restoration of herbaceous ground flora following the cedar removal.

Measurable Deliverables: The IRS III for Ha Ha Tonka State Park will serve as project leader. The project leader will provide interim and final written reports detailing the scope of work, bird data, and reports accumulated by the Missouri Master Naturalist volunteers. Photo documentation of work in progress will accompany the report and the IRS III will create a poster if warranted for the 2021 MoBCI Conference.

Grant Request Amount: This grant request is for $8,607.20 to fund a two-person stewardship crew for 400 hours and supplies for cedar removal.

2-person crew x 400 hrs. x $10.00/hr.	=	$8,000.00
Part-time fringe rate 7.59% x $8,000 wages	=	$607.20
TOTAL Grant Request	**=**	**$8,607.20**

Match will be provided by salary and fringe for one of Ha Ha Tonka State Park's seasonal stewardship crew members for 400 hours and one full time IRS III for 100 hours. The Missouri Master Naturalists will provide third party in-kind match in the form of bird monitoring and reports on three occasions during the grant cycle. No funds will be transmitted from Missouri Master Naturalists to DNR.

1 person crew x 400 hrs. x $10.00/hr.	=	$4,000.00
Part-time fringe rate 7.59% x $4,000 wages	=	$303.60
1 IRS III x 100 hrs. x $19.66/hr.	=	$1,966.00
Full-time fringe rate 50.68% x $1,966 wages	=	$996.37
Supplies (bar oil, chainsaw chains, fuel)	=	$200.00
4 Missouri Master Naturalist Volunteers x 30 hrs. x $10/hr.	=	$1,200.00
TOTAL Match	**=**	**$8,665.97**

Reporting and Monitoring Plan: Vegetative monitoring transects, installed in 2020 will be sampled across the project areas and data analyzed using Floristic Quality Analysis. Plots will be sampled following each prescribed fire event on the glades. Bird surveys conducted by the Missouri Master Naturalists will occur in July 2020, August 2020, and again in early June 2021 following the cedar removal. The project contact person, Jacob Bryant (Jacob.bryant@dnr.mo.gov), will provide the reports to the MoBCI Committee to track progress in the project areas.

Budget:

Task	Performed By	Cost Estimate		Contribution		
		Supplies	Labor	MoDNR	MoBCI	Mo Mast. Nat. In Kind
Cutting cedars and burning stacked piles.	Ha Ha Tonka Staff	$200	$7.265.97	**$7,465.97**		
	MoBCI Crew		$8,607.20		**$8,607.20**	

Monitoring bird response to restoration efforts.	Lake of the Ozarks Mo. Master Naturalists	$0	$1,200.00			**$1,200.00**

Lead Organization:
Missouri Department of Natural Resources
Missouri State Parks
P.O. Box 176
Jefferson City, MO 65102
Phone: 573.522.3260

Project Coordinator:
Jacob Bryant
Ha Ha Tonka State Park
1491 State Road D
Camdenton, MO 65020
573.346.2986

Grant Manager:
Rachel Senzee
P.O. Box 176
Jefferson City, MO 65102
573.522.8773

Additional Partners:

Lake of the Ozarks Chapter of the Missouri Master Naturalists, Tricia Barrett

Fiscal Responsibility/Management: Project funds will be administered by Missouri State Parks-Financial and Resource Management (FIRM) Section in association with planning implementation by Missouri State Parks' Natural Resources Management Section, Ozark Regional Office, and Ha Ha Tonka State Park.