

# **FINAL PERFORMANCE REPORT**



**Federal Aid Grant No. F19AF00836 (T-113-R-1)**

**Conservation Collaboration, Population Monitoring and Data  
Management for Species of Greatest Conservation Need in  
Oklahoma**

**Oklahoma Department of Wildlife Conservation**

**October 1, 2019 – September 30, 2022**

## FINAL REPORT

**STATE:** Oklahoma

**GRANT NUMBER:** F19AF00836 (T-113-R-1)

**GRANT TYPE:** State Wildlife Grants

**GRANT TITLE:** Conservation Collaboration, Population Monitoring and Data Management for Species of Greatest Conservation Need in Oklahoma

**REPORTING PERIOD:** 1 October 2019 – 30 September 2022

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### **PRINCIPAL INVESTIGATORS:**

Mark Howery, Oklahoma Dept. of Wildlife Conservation  
Curtis Tackett, Oklahoma Dept. of Wildlife Conservation  
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Jena Donnell, Oklahoma Dept. of Wildlife Conservation  
Kurt Kuklinski, Oklahoma Dept of Wildlife Conservation

### **ABSTRACT:**

The conservation of species of greatest conservation need is the highest priority for the Oklahoma Wildlife Diversity Program and we approach this through multiple avenues including coordinated partnerships with the U.S. Fish and Wildlife Service (USFWS) and other governmental agencies, species-specific biological surveys, and working with interested members of the public to obtain observational records that we could not have obtained on our own. Working under this grant, we collaborated with our counterparts in other state wildlife agencies across the southeastern and western United States to share information and insights into the ecology of a wide range of species of greatest conservation need and especially those species that have been federally-petitioned for listing under the Endangered Species Act and migratory birds that move annually across our borders. These cooperative efforts help states more effectively conserve the declining species under their stewardship authority and assist the U.S. Fish and Wildlife Service in their management of migratory birds. During this grant period, we participated in nine Species Status Assessments for federally petitioned species, four five-year status reviews for federally threatened and endangered species, and compiled existing information for the USFWS in response to four notices of intent to submit federal listing petitions from nongovernmental organizations. We coordinated with the regional conservation community on other at-risk species including grassland birds, wildlife living within Ozark karst systems, the swift fox, and freshwater mussels in the Interior Highlands. We participated in the national Breeding Bird Survey to help monitor a wide range of terrestrial bird species on two long-term routes and conducted targeted surveys to collect current distribution data for the Crawfish Frog (*Lithobates areolata*) that resulted in the documentation of approximately 134 breeding ponds and wetlands in a six-county area. We managed and promoted citizen science outreach projects that targeted the Whooping Crane (*Grus americana*) and Texas Horned Lizard

(*Phrynosoma cornutum*) that garnered 31 confirmed or probable reports of migrating groups of Whooping Cranes, and 784 reports of Texas Horned Lizards across 50 counties. Finally, we conducted outreach efforts that highlighted the conservation needs of the Leopard Darter (*Percina patherina*), Eastern Spotted Skunk (*Spilogale putorius interrupta*), Texas Horned Lizard, Whooping Crane, Prairie Chub (*Macrhybopsis australis*), Long-billed Curler (*Numenius americanus*), and Alligator Gar (*Atractosteus spatula*).

## **OBJECTIVES:**

### **Objective 1 (TRACS Strategy: Stakeholder Involvement)**

Engage 9 organizations by September 30, 2022.

Activity Tag 1: Organizational engagement - 9 organizations (SEAFWA Wildlife Diversity Committee, WAFWA Endangered Species Act Informational Work Group, Central Flyway Council, Lower Mississippi Valley Joint Venture, Oaks and Prairies Joint Venture, Alligator Snapping Turtle Species Status Assessment Team, Longnose Darter Species Status Assessment Team, Swift Fox Conservation Team, Interior Highlands Freshwater Mollusk Conservation Committee)

#### Narrative sub-objective:

Conduct administrative activities that facilitate the conservation of species of greatest conservation need through partnerships and collaborations between ODWC and other conservation agencies and organizations from October 1, 2019 to September 30, 2022.

### **Objective 2 (TRACS Strategy: Research, Survey, Data Collection, and Analysis)**

Conduct 8 investigations by September 30, 2022.

Activity Tag 1: Fish and wildlife species data acquisition and analysis – 8 investigations

Activity Tag 2: Swift Fox, American Bumble Bee, Bell's Vireo, Bachman's Sparrow, Black-tailed Prairie Dog, Texas Horned Lizard, Arkansas Darter, Crawfish Frog

#### Narrative sub-objective:

Research, Survey, Data Collection, and Analysis; Conduct Eight Investigations by 2022  
Conduct field surveys that collect spatial data and monitor populations of species of greatest conservation need using low-impact techniques that do not alter their habitat, do not affect local populations, and do not affect threatened or endangered species from October 1, 2019 to September 30, 2022.

### **Objective 3 (TRACS Strategy: Research, Survey, Data Collection, and Analysis)**

Create or manage 1 database by September 30, 2022.

Activity Tag 1: Information management and technology – 1 database

### **Objective 4 (TRACS Strategy: Outreach/Communication)**

Produce 3 products by September 30, 2022.

Activity Tag 1: Digital Products – 3 products (Digital outreach article for American Bumble Bee, Digital outreach article for Texas Horned Lizard, Digital outreach article for Eastern Spotted Skunk )

## **APPROACH AND DISCUSSION:**

### **Objective 1: Stakeholder Involvement, Engage 9 Organizations by September 30, 2022.**

Conduct administrative activities that facilitate the conservation of species of greatest conservation need through partnerships and collaborations between ODWC and other conservation agencies and organizations from October 1, 2019 to September 30, 2022

Coordination with other conservation organizations is a large component of the work conducted under this grant and short summaries of the conservation partnership activities with which we were involved are listed below. During the three years of this grant, there was an increasing trend toward the use of virtual meeting platforms such as Zoom, Webex, and Microsoft Teams which was accelerated by the COVID-19 pandemic. The grant period was an active one for partnership meetings and involvement in U. S. Fish and Wildlife Service-led Species Status Assessments.

### **SEAFWA At-risk Species and WAFWA Endangered Species Working Group Partnerships:**

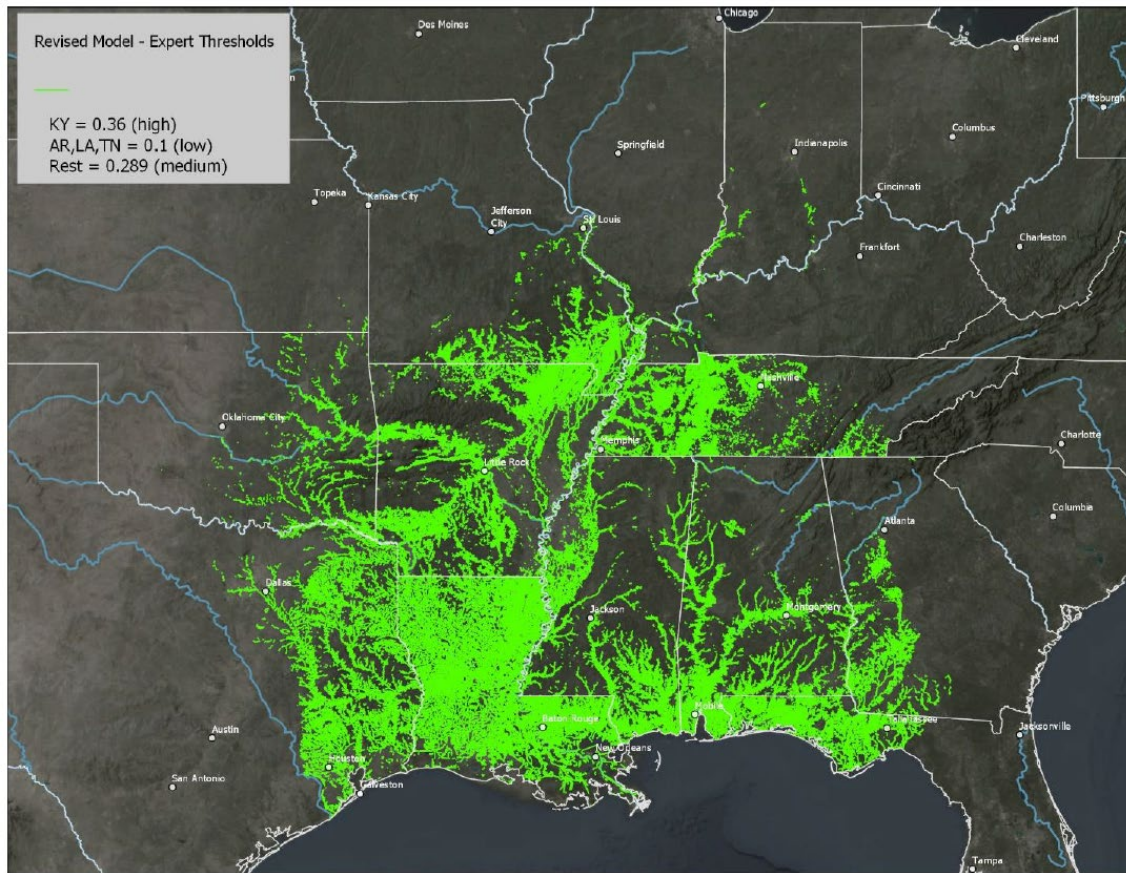
The Southeastern Association of Fish and Wildlife Agencies' (SEAFWA) Wildlife Diversity Committee and staff from the U. S. Fish and Wildlife Service (USFWS) Region 4 regional office formed a partnership in 2012 called the Southeastern At-risk Species Initiative (SEARS) that was designed to pool resources and share data for assessing species of greatest conservation need and federally petitioned species across the region. Throughout the grant period, this partnership held monthly virtual meetings to share information regarding federally petitioned species such as the Alligator Snapping Turtle (*Macrochelys temminckii*), American Bumble Bee (*Bombus pennsylvanicus*), Southern Plains Bumble Bee (*Bombus fraternus*), Purple Lilliput (*Toxolasma lividus*), Black Rail (*Laterallus jamaicensis*), and Tricolored Bat (*Perimyotis subflavus*). These meetings were held as conference calls in 2019 and early 2020 but transitioned to Webex and Zoom platforms in late 2020 and beyond. In January of 2021, Mark Howery stepped into the role of vice-chair for the SEAFWA Wildlife Diversity Committee and helped to organize virtual meetings and agendas. He also created an information sharing database that identifies all of the animal species within the SEAFWA region that are included in the current USFWS National Listing Work Plan, the lead USFWS point of contact for each species' Species Status Assessment, and a catalogue of the states with past and current projects addressing the status, ecology and conservation needs of each species.

During this grant segment, the SEAFWA Wildlife Diversity Committee initiated work toward voluntary standardization of state wildlife action plans that includes a more objective and similar approach to identifying species of greatest conservation need. All of the SEAFWA states will revise their state wildlife action plans between 2022 and 2025, therefore, the next two years represent an important window of time for standardizing action plans across states. The SEAFWA Wildlife Diversity Committee cooperated on the development of a Competitive State Wildlife Grant (C-SWG) proposal to fund a pilot project to develop recommendations and best practices to help states across the southeast standardize their plans. That C-SWG proposal was selected for funding by the USFWS, and the state of

Georgia serves as the grant lead. The five western states within SEAFWA (Arkansas, Louisiana, Missouri, Oklahoma, and Texas) collaborated on a C-SWG proposal to fund a range-wide assessment of the distribution, density, genetic diversity, and reproductive biology of the Western Chicken Turtle to collect data ahead of that species' Species Status Assessment. That proposal was first submitted in 2020 but not funded, then it was refined and submitted in 2021. However, that proposal was not selected for funding in 2021 either and the state wildlife agencies are pursuing parallel projects within their individual states using State Wildlife Grants and ESA Section 6 funding.

The SEAFWA Wildlife Diversity Committee collaborated on a joint project with Nature Serve to pool all verifiable spatial records and biological information for the Alligator Snapping Turtle, Eastern Diamond-backed Rattlesnake (*Crotalus adamanteus*) and Gopher Frog (*Lithobates capito*) to assess each species' historic distribution and to develop three predictive models of suitable habitat and current distribution for each species based upon different thresholds of habitat suitability. The Alligator Snapping Turtle is the only species of the three that occurs in Oklahoma and its predicted current distribution is shown in Figure 1. The model will be used to focus distributional surveys to fill the apparent gaps in Alabama, Arkansas, and Mississippi, and to help states like Oklahoma prioritize watersheds that need updated records (e.g., Canadian, Illinois, and Kiamichi rivers).

**Figure 1.** SEAFWA Range Wide Predictive Model of Alligator Snapping Turtle Current Distribution



The Western Association of Fish and Wildlife Agencies' Endangered Species Informational Work Group (ES-IWG) was formed in 2015 and involves state wildlife agency representatives throughout the WAFWA states as well as state field office and regional U.S. Fish and Wildlife Service staff from Regions 2 and 6. The primary purpose of the Work Group is to share information about ongoing and upcoming projects on federally listed species, petitioned species, proposed species, and species of greatest conservation need that are of interest to western states. The USFWS regional offices provide updates on the status of specific listing actions, on-going species status assessments, and petitions in addition to the annual changes in the National Listing Workplan and any de/down-listing updates. Curtis Tackett represents ODWC on the Work Group and shares updates on surveys and projects funded through the State Wildlife Grants program for federally-petitioned species. Species updates relevant to Oklahoma include the Plains Spotted Skunk (*Spilogale putorius interrupta*), Peppered Chub (*Macrhybopsis tetranema*), and Prairie Chub (*Macrhybopsis australis*). Six bimonthly conference calls were held each year throughout the period of the grant.

### **Central Flyway Council Coordination:**

The Central Flyway Council is a regional partnership involving ten state wildlife agencies, three Canadian provinces, the Canadian Wildlife Service and two U.S. Fish and Wildlife Service regions (Regions 2 & 6) which encompass the Central Flyway. Since 2007, the Council has supported a Nongame Migratory Bird Technical Committee (NMBTC) that serves as a forum through which the state, provincial and federal agencies can communicate, share data, and review federal regulation proposals. Most of its work is focused on migratory bird species of greatest conservation need and changes in regulations promulgated under the Migratory Bird Treaty Act and the Endangered Species Act. Each year, the NMBTC holds four or five conference calls or virtual meetings via the Zoom platform, and one two-day annual meeting during the late summer. The 2020 annual meeting was held virtually, the 2021 annual meeting was held in-person in Angel Fire, New Mexico, and the 2022 annual meeting was held in-person in Padre Island, Texas. Mark Howery represented the state of Oklahoma on the technical committee and completed a term as the technical committee's chair in calendar year 2020. During the grant period, the NMBTC was an active participant in the Midcontinental Shorebird Conservation Plan's development and focused on declining shorebirds that nest in or migrate through the Great Plains such as Upland Sandpiper, Buff-breasted Sandpiper, and American Golden Plover. The technical committee also was engaged in the review of the USFWS's Species Status Assessment for the Whooping Crane (*Grus americana*), assisted the USFWS in the development of incidental take regulations under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, participated in the development of a post-delisting monitoring plan for the Interior Least Tern, and assisted the USFWS in their on-going Bald Eagle and Peregrine Falcon status assessments. Mark served on two ad hoc, cross-flyway teams. One of these was a team comprised of two representatives from each of the four flyways that met virtually to update the Golden Eagle Falconry Allocation Procedure to address communication challenges and complaints generated by the falconry community during calendar years 2019 and 2020. The other team was comprised of three state representatives from each of the four flyways and ten USFWS migratory bird division biologists to help develop a national monitoring plan for Double-crested Cormorants. This effort was initiated in April 2021 and will continue at least through calendar year 2023 with implementation of a monitoring protocol during the 2024 nesting season. The ten states that comprise the Central Flyway have a shared interest in the conservation of Black Rails, Burrowing Owls, Piping Plovers, Mountain Plovers, grassland-obligate birds including longspurs and pipits, and the full community of shorebirds. We continued to share

information on our on-going efforts to collect status and ecological data for Black Rails, Piping Plovers, Long-billed Curlews, and Burrowing Owls. We also continued to work with the USFWS on the refinement of the High Plains Grassland Bird Conservation Plan (focused on two species of longspurs, Sprague's Pipit, Mountain Plover, and five species of grassland sparrows). We engaged with the Mississippi Flyway and other organizations in the initial stages of developing the Midcontinental Shorebird Conservation Plan, which will be the interior counterpart to the existing Atlantic Coast and Pacific Coast Shorebird Conservation Plans.

#### **Interior Highlands Mussel Conservation Working Group:**

In March 2021, Mark Howery and Curtis Tackett attended the first virtual meeting of the Interior Highlands Mussel Conservation Working Group. This regional partnership involving resource agencies in Arkansas, Kansas, Missouri, and Oklahoma, has been meeting biennially for eight years, but explored the feasibility of meeting virtually in the intervening years. The meeting included updates covering on-going mussel research, population restoration projects, and status surveys in the four-state region. There was particular emphasis on the federally endangered Neosho Mucket (*Lampsilis rafinesqueana*) and the federally threatened Rabbitsfoot (*Quadrula cylindrica*) and updates were given by the USFWS on the development of the draft Neosho Mucket Recovery Plan and an overview of the recent range-wide genetic assessment of populations between major river drainages.

Mark and Curtis also attended the 2022 Interior Highlands Mussel Conservation Working Group meeting that was held virtually in February and hosted by the USFWS's Missouri Field Office. We provided a presentation covering ongoing and upcoming freshwater mussel research and population surveys across eastern Oklahoma. Other meeting topics included; Glover River unionid relocation efforts conducted by EcoAnalysts as result of a bridge crossing construction project, an update on mussel propagation and culture efforts at the Neosho National Fish Hatchery, thoughts about Neosho mucket propagation, culture, and release, developing a toxicology test for mussel reproduction by Missouri State University, discovery of a new corbicula form in the U.S. by the Illinois Natural History Survey, and state updates from Missouri, Kansas, Arkansas, and Oklahoma.

#### **Fisheries Division Endangered Species Conservation Workshop:**

Curtis Tackett and Kurt Kuklinski developed and presented a training workshop for ODWC's Fisheries Division during their June 2022 annual meeting. The workshop provided an overview the agency's State Wildlife Grant and ESA Section 6 projects specifically focused on Species of Greatest Conservation Need including federally listed species. It also addressed the USFWS's National Listing Work plan, current and past species petitions, and upcoming proposed ESA listings. On the second day of the meeting program staff performed a workshop for fisheries division staff focused on the use of the USFWS Information for Planning and Consultation (IPAC) system, the distinction between Informal and Formal ESA Section 7 Consultations, and a presentation on the National Environmental Policy Act.

#### **Swift Fox Conservation Team:**

The Swift Fox (*Vulpes velox*) Conservation Team (SFCT) was formed in 1994 in response to a federal listing proposal and the Team is comprised of representatives from each of the state wildlife agencies within the Swift Fox's geographic range. Following a three-year period with no meetings, the SFCT held a virtual meeting in May of 2021 that was attended by Mark Howery and Curtis Tackett. Updates were

provided by each state and the meeting included presentations over current research and management projects in Kansas, Montana, Texas, and Wyoming. All states continue to monitor their Swift Fox population in some way. For most states, this is accomplished through presence/absence surveys using camera traps established at a subset of locations. Except in the state of Texas, Swift Fox populations appear to be stable or increasing; Wyoming has seen a substantial increase in the Swift Fox's range during the past 15 as Swift Foxes have appeared to colonize new sites in Central Wyoming. One of the projects initiated during this meeting was a two-year commitment to revise/update the Swift Fox Conservation Strategy, which was last revised in 2011. The Oklahoma representatives volunteered to assist with the status update section of the conservation strategy.

An in-person meeting was tentatively planned for April of 2021 in Kansas; however, the SFCT members voted to hold a short virtual meeting instead because of travel restrictions and some personnel turnover within some of the member states (Montana and Wyoming). The focus of the virtual meeting was on reviewing the 2011 Swift Fox Conservation Strategy and discussing text edits to update it.

We have fallen behind in our effort to continue with Swift Fox population monitoring in Oklahoma. The monitoring protocol that we used is a series of timed searches for Swift Fox tracks in specific townships. We traditionally conduct this monitoring in the fall (October) after young foxes have dispersed from their natal dens. In October 2019, the Oklahoma Wildlife Diversity Program had the opportunity to participate in a Red-cockaded Woodpecker translocation effort that moved five pairs of woodpeckers from national forest service units in Texas to the McCurtain County Wilderness Area to augment the population there. The timing of the translocation conflicted with the Swift Fox monitoring period, and we decided to forego monitoring for one year. In September 2020, just a few weeks before we planned to conduct Swift Fox monitoring (timed searches for tracks), the biologist who coordinated the survey left to take a position with the U.S. Fish and Wildlife Service. With the temporary loss of the ODWC organizer and one third of our survey team, we had to postpone the monitoring work for another year. In October of 2021, we resumed our Swift Fox monitoring effort; however, the persistent drought in the southern High Plains created very poor and limiting substrate conditions for track searches. We attempted to survey 12 townships in Cimarron and western Texas counties; however, we were able to confirm Swift Fox presence in only seven of those townships due to hard and dry soil conditions. This success rate of 58% is far below our typical occupancy rate of 80% - 85%. We do not believe that Swift Fox populations have declined substantially in Oklahoma and the poor success rate is much more likely to be an artifact of poor tracking conditions than a true population phenomenon. We decided to forego monitoring one more year in the hopes that a normal rainfall pattern will return next year, and tracking substrate conditions will be much better. The townships for which we located Swift Fox track lines in 2021 were: T03N, R14E and T04N, R13E in Texas County and T01N, R02E; T02N R01E; T02N, R03E; T03N, R02E, and T03N, R08E in Cimarron County. Each of these is a township where we have traditionally found Swift Fox track lines in less than an hour of search time.

### **Ozark Karst Working Group:**

In 2019, the U.S. Fish and Wildlife Service launched an effort to revive regular meetings of organizations working on bats and cave fauna in the Ozark Highlands. Annual meetings had rotated between the states of Arkansas, Missouri, and Oklahoma from 2001 through 2010, but stopped as a result of shifting priorities and restructuring within the U.S. Fish and Wildlife Service and the U.S. Geological Survey. In



October 2019, an Ozark karst-focused meeting was hosted by the USFWS's Arkansas Field Office in Bentonville, AR. The first day of the meeting was dedicated to updates on cave-dependent bats (e.g., Gray Bat (*Myotis grisescens*) and Ozark Big-eared Bat (*Corynorhinus townsendii ingens*) and the second day was focused on the aquatic organisms in this system including the Ozark Cavefish (*Amblyopsis rosae*) and cave-obligate invertebrates (crayfish, isopods).

The following year, program biologists attended the virtual meeting of the Ozark Karst and Bat Conservation Working Group hosted by the USFWS on November 9-10, 2021. We provided updates on bat and cave conservation work in the region that was conducted in Oklahoma. This included updates on Section 6 projects, SWG projects, and other state funded activities. Other meeting agenda items included; Using LIDAR to locate caves on WMA's in Arkansas, using seepage runs and dye tracing to understand base flow in subterranean streams in Arkansas, the use of eDNA in caves to document aquatic species, new TIR/NIR bat counting software and acoustic bat counting, changes in the forest bat community in the Ouachita Mountains after the arrival of WNS, Indiana bat 2021 spring tracking and summer netting efforts, four years of Indiana bat tracking summary, upper buffalo Indiana bat maternity colony update, cave gating project updates for Arkansas, habitat use of the Ozark big-eared bat from maternity colony in the AR Boston mountain region, and an Ozark big-eared bat working group session.

#### **Bat Acoustics Training at Hulah WMA:**

Program staff attended an internal training event at Hulah WMA that covered the use and operation of the Wildlife Acoustics Echo Meter detector. This product uses wildlife recording technology to turn a smart phone or tablet into a professional-quality interactive bat sound detector which allows the user to hear and record bats flying and echo-locating in real time. The training included a field exercise covering the use of the software and device set up, additional settings tutorial, and the planning and logistics involved in running bat survey routes on WMAs across eastern Oklahoma.

#### **USFWS Species Status Assessments:**

We continued to be active participants in the species status assessment process for every listed or petitioned species occurring within Oklahoma. During the grant period, we provided updated information to the U.S. Fish and Wildlife Service for their Regal Fritillary (*Speyeria idalia*) Species Status Assessment (SSA) and attended three SSA virtual workshops. We also attended the 2021 kick-off meeting for the Western Chicken Turtle (*Deirochelys reticularia miaria*) SSA, the 2022 meeting, and compiled all of the historic and recent records of occurrence, which included inspecting and vetting the museum specimens for this species that are housed at the Oklahoma Museum of Natural History at the University of Oklahoma and the teaching collection of East Central University in Ada. We reviewed the draft SSAs for the Tri-colored Bat (*Perimyotis subflavus*) and the Little Brown Bat (*Myotis lucifugus*) and provided comments and updated status information. We compiled existing information for the Kiamichi Crayfish (*Faxonius saxatilis*) in response for a data request from the U.S. Fish and Wildlife Service, which will kick-off the SSA process for this species in late 2022. We reviewed the SSA and the 12-month finding for the Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) that recommended its reclassification to a threatened species and coordinated the agency's comment letter. The draft SSA for the Longnose Darter (*Percina nasuta*) was reviewed and comments with updated information were provided to the USFWS's lead office in Conway, Arkansas. We participated in a range-wide meeting of agencies to discuss the proposed listing of the Alligator Snapping Turtles as a threatened species and

provided updated information to the USFWS for consideration as they develop their Final Listing Decision. We also coordinated a regional response letter on behalf of the Southeastern Association of Fish and Wildlife Agencies recommending against a federal listing of the Alligator Snapping Turtle. We attended two workshops hosted by the USFWS to share updates, status information, and a draft recovery plan for the Eastern Black Rail, which was listed as a federally threatened species in 2019. We also responded to data requests for the five-year status reviews for the federally threatened Neosho Madtom (*Noturus placidus*), the federally endangered Whooping Crane (*Grus americana*), the federally endangered Ozark Big-eared Bat (*Corynorhinus townsendii ingens*), and the federally threatened Ozark Cavefish (*Amblyopsis rosae*).

### **Advanced Notices of Federal Petitions:**

The current federal petitioning procedure under the Endangered Species Act requires potential petitioners to submit a letter to each state wildlife agency in the range of a petitioned species at least 30 days prior to submission of the petition to the U.S. Fish and Wildlife Service. This provides the state agencies with an opportunity to compile information and provide this to their USFWS Regional Office and Field Office(s).

### **Variable Cuckoo Bumble Bee:**

In March 2021, a notice to submit a petition was received from the Center for Biological Diversity for the Variable Cuckoo Bumble Bee (*Bombus variabilis*). We worked with the Oklahoma Natural Heritage Inventory to compile all of the known and documented historic records for this rare species of bumble bee which lays its eggs in the nests of other bumble bees (primarily *Bombus pennsylvanicus*) and uses the host colony to raise its young. There are 21 documented specimens of this species from Oklahoma housed in three museum collections (11 at the University of Oklahoma, 8 at Oklahoma State University, and two at the Illinois Natural History Survey) and these were collected from eleven counties between 1929 and 1975. The 1975 specimen is the last documented occurrence for this species in the state.

### **Southern Plains Bumble Bee:**

In July 2021, we received a notice of intent to submit a listing petition for the Southern Plains Bumble Bee (*Bombus fraternus*) from the Center for Biological Diversity. We again worked with the Oklahoma Natural Heritage Inventory and searched several online data sources including GBIF and iNaturalist to compile a list of historic and recent records for this species. This species is much more common and widespread across Oklahoma and the southern United States. We compiled a list of 83 documented records from within Oklahoma. These included 31 recent records (2000 through 2021) and 52 historic records (1899 through 1999). Historic and current records are distributed almost statewide and indicate that the Southern Plains Bumble Bee is most common in central and western Oklahoma. These data were provided to the USFWS's Tulsa Field Office so that they will be available as reference material once the petition is received and evaluated.

### **Pinyon Jay:**

In March 2022, we received a letter from Defenders of Wildlife notifying us of their intent to submit a petition to list the Pinyon Jay (*Gymnorhinus cyanocephalus*) under the Endangered Species Act. This species has a very limited distribution in Oklahoma and is restricted to the Black Mesa area in the northwest corner of the western-most county in the Oklahoma panhandle (an area of about eight townships in size). Pinyon Jays are a mobile and social species that move over large landscapes to track

their main fall and winter food source - the seeds of the Pinyon Pine (*Pinus edulis*). Pinyon Jays occur irregularly in Oklahoma; there are often small numbers that nest in the Black Mesa area during the spring and summer, but their numbers fluctuate dramatically between years in the fall and winter depending upon the Pinyon Pine seed crop. We compiled a list of Museum specimen records (28 spanning the period from 1914 through 1982), and a list of observational records from iNaturalist and eBird (12 spanning the period from 2014 through 2022) and provided those to the USFWS's Tulsa Field Office. Within the Oklahoma range of the Pinyon Jay, there is one Christmas Bird Count circle that has been active for 53 years between 1960 and 2021. During those 53 Christmas Bird Count days, Pinyon Jays were absent 31 times (58% of the counts), Pinyon Jays were seen in numbers of less than 25 individuals on seven occasions (13% of the counts), and Pinyon Jays were seen in number of 25 individuals or more on 15 occasions (28% of the counts) with no discernable pattern of an increasing or decreasing trend.

### **Plains Arogos Skipper:**

In August of 2022, we received a letter from the Center for Food Safety notifying us of their intent to submit a federal listing petition for the Plains Arogos Skipper (*Atrytone arogos iowa*). We compiled a list of 102 records for this species in Oklahoma based on a combination of museum records and iNaturalist observations. The Plains Arogos Skipper is prairie butterfly whose caterpillars use Big Bluestem (*Andropogon gerardi*) as their primary food source. This species is widespread but uncommon in central and western Oklahoma where tallgrass prairie habitats remain. It occurs in a minimum of 27 counties in Oklahoma and most records for this species are less than 20 years old. This species is fairly common in the Flint Hills and Osage Plains regions of north-central and northeastern Oklahoma, and it occurs on over a dozen wildlife management areas and wildlife refuges where the populations and their habitats are protected. Populations persist in urbanized counties such as Cleveland and Payne, which suggests that it may be tolerant of moderate levels of habitat fragmentation.

### **Oklahoma Conservation Exchange Group:**

One of the longest running partnerships in Oklahoma for the conservation of rare and declining species is the Oklahoma Conservation Exchange Group (OCEG), which is comprised of the ODWC Wildlife Diversity Program, the Oklahoma Field Office of the USFWS, the Oklahoma Chapter of The Nature Conservancy, the Oklahoma Biological Survey, and the Sutton Avian Research Center. The OCEG member agencies meet each winter (usually in February), and the meeting host responsibilities rotate between the five principal partners. Each year all or most of the Wildlife Diversity Program biologists attend and provide updates for each of the projects that we support with State Wildlife Grants and Endangered Species Act Section 6 funding. Because of the relatively large number of subawards administered through ODWC, we typically focus our updates on six to eight projects that are in their final year or have recently been completed. Some of the survey, monitoring, and research efforts that we highlighted including projects developed to foster the conservation of Ozark Big-eared Bat, Western Chicken Turtle, Regal Fritillary (*Speyeria idalia*), Tri-colored Bat, Prairie Mole Cricket (*Gryllotalpa major*), Peppered Shiner (*Notropis perpallidus*), Leopard Darter (*Percina pantherina*), Red-cockaded Woodpecker (*Picoides borealis*), Eastern Spotted Skunk, Ouachita Dusky Salamander (*Desmognathus brimleyorum*), and Southern Hickorynut (*Obovaria jacksoniana*). We annually update the partners on our successful effort to solicit Texas Horned Lizard (*Phrynosoma cornutum*) sightings from the public to fill gaps in their known current distribution. Each year, we use this meeting as an opportunity to discuss potential new SGCN conservation projects and obtain recommendations and suggestions from the other

conservation organizations in the partnership about the types of projects that we should include in our Request-for-Proposal process for the State Wildlife Grants program.

One of the collaborative projects that has arisen from this multi-agency partnership is the development of teams of technical experts that are assisting the Oklahoma Natural Heritage Inventory in their re-assessment of the conservation status (i.e., Natural Heritage State Ranks) of all of the native mammal, reptile, and amphibian species in Oklahoma with an emphasis on species of greatest conservation need. Wildlife Diversity Program staff participate on the mammal and reptile review teams. The Oklahoma BioBlitz is another project fostered by the Conservation Exchange Group meetings and organized by the Oklahoma Biological Survey. This event is a 24-hour rapid biological assessment that takes place at a different location each year during early October. We aided the bird, fish, and reptile taxa teams during the October 2019 BioBlitz at Sequoyah State Park and the virtual BioBlitzes that were held in 2020 and 2021.

### **Objective 2: Research, Survey, Data Collection, and Analysis; Conduct 8 Investigations by September 30, 2022**

Conduct field surveys that collect spatial data and monitor populations of species of greatest conservation need using low-impact techniques that do not alter their habitat, do not affect local populations, and do not affect threatened or endangered species from October 1, 2019 to September 30, 2022.

Our efforts to collection distribution and ecological data for specific Species of Greatest Conservation Need are described below. During the grant, we placed particular emphasis on the following projects: Crawfish Frog (*Lithobates areolata*) surveys, the national Breeding Bird Survey, Bachman Sparrow (*Peucaea (Aimophila) aestivalis*) distribution assessment, identification of Black-tailed Prairie Dog (*Cynomys ludovicianus*) colonies, American Bumble Bee surveys, Whooping Crane migration monitoring, a Texas Horned Lizard citizen science survey, and surveys for SGCN land snails.

#### **Crawfish Frog Survey Summary**

Curtis Tackett and Mark Howery participated in a newly formed Crawfish Frog Working Group that was organized by the Midwest Partners for Amphibian and Reptile Conservation initiative. The group held its first meeting virtually in September of 2021 with representatives from Indiana, Illinois, Missouri, Kansas, Arkansas, Oklahoma, and Texas. Follow-up meetings were held in February 2022 and September 2022. Included within this group are herpetologists who have been studying Crawfish Frogs in Indiana and Missouri for two decades and bring a wealth of experience to the discussions. Their insights were very helpful when we planned our 2022 surveys, and they provided their observations that Crawfish Frogs can call on cold nights that follow warm sunny days because it appears that sunny conditions can warm shallow breeding ponds enough to hold water temperatures in the range of 50 degrees in the early evenings to encourage males to call.

In March of 2020, we conducted nocturnal Crawfish Frog (*Lithobates areolata*) calling surveys on three nights in three locations in March. The first survey was conducted along a six-mile route in Wagoner County, near the Verdigris River on March 15. Small numbers of Southern Leopard Frogs (*Lithobates sphenoccephala*), Cajun Chorus Frogs (*Pseudacris fouquettei*), Dwarf American Toads (*Bufo americanus charlesmithi*) and one Small-mouthed Salamander (*Ambystoma texanum*) were heard or observed, but no

Crawfish Frogs. We speculate that the weather may have been too cool, and a portion of the survey route had been inundated for nearly six weeks in May and June of 2019, which may have displaced Crawfish Frogs from their burrows and caused them to resettle outside of the survey area.

The second survey was conducted along a 12-mile route west of Okemah along the Seminole/Okfuskee County Line on March 18. The survey stops along this route were near or within the flood plain of the North Canadian River. We listened for calling frogs at 17 locations and detected a minimum of 73 male Crawfish Frogs across eleven sites (Table 1.). Other anurans seen or heard at these locations were Dwarf American Toad (16 sites), Cajun Chorus Frog (17 sites), Strecker's Chorus Frog (*Pseudacris streckeri*) (7 sites), Gray Treefrog (*Hyla versicolor/chrysoxcelis*) (4 sites), and Southern Leopard Frog (10 sites).

The third survey was conducted along more than 16 miles of roads near Morris, Oklahoma in eastern Okmulgee County and western Muskogee County, on March 31, 2020. Despite apparently good habitat and many flooded ditches and pools, we did not hear any Crawfish Frogs. The temperature dropped quickly after sunset that night and the skies were mostly clear. We speculate that the weather conditions were too cool and dry that night to trigger calling activity by Crawfish Frogs. We heard small numbers of Dwarf American Toads, Cajun Chorus Frogs, Southern Leopard Frogs and at least three American Bullfrogs, but calling activity was generally lower than what we had experienced on March 18.

In 2021, Oklahoma experienced cooler and drier weather conditions in late March. We conducted anuran calling surveys on two nights in Creek and Tulsa counties but had no success detecting attempted Crawfish Frogs. We heard Cajun Chorus Frogs, Dwarf American Toads, and a limited number of Southern Leopard Frogs, but calling activity in general was lower than what we experienced in 2020.

In 2022, we devoted more effort into nocturnal calling surveys. Following the advice of herpetologists in Indiana, we conducted surveys on several cold nights that followed one or more days of sunny and relatively warm weather (daytime temperatures in the mid to high 60s). These surveys paid off and we documented Crawfish Frog calling activity at wetlands and small ponds at a staggering 134 locations along public roads in Hughes, McIntosh, Okfuskee, Okmulgee, Seminole, and Tulsa counties. These results are included in Table 1. One complication created by surveys during cold nights is that the survey window is relatively short and appears to last for only three to five hours after sundown. In order to maximize the number of sites that could be surveyed in one night, we recorded only presence/absence of Crawfish Frogs along some of our routes and did not conduct a full count of the other anuran species calling at those same sites. There seems to be a strong correlation between the presence of Crawfish Frogs and Southern Leopard Frogs as the two co-occurred at every pond where we heard Crawfish Frogs. The Cajun Chorus Frog is a ubiquitous early spring species in eastern Oklahoma and was the most frequently heard anuran (it occupied almost every site where there were calling frogs). Strecker's Chorus Frogs were heard a more than 30 sites as well; this is a regionally endemic species to the south-central U.S. and seems to be frequent in upland sites with native grass and open oak woodland habitats.

**Table 1. Summary of Early Spring Crawfish Frog Calling Surveys in 2020 and 2022**

Date	Est. Number of Crawfish Frogs	Location / County	Other Anuran Species
March 18, 2020	3	35.38127, -96.45818 Seminole Co.	Southern Leopard; Strecker's Chorus, Cajun Chorus, Dwarf American Toad
March 18, 2020	4	35.37705, -96.44039 Seminole Co.	Southern Leopard, Strecker's Chorus, Cajun Chorus, Dwarf American Toad
March 18, 2020	10	35.37693, -96.40675 Okfuskee Co.	Southern Leopard, Strecker's Chorus, Cajun Chorus, Dwarf American Toad
March 18, 2020	8	35.36225, -96.37161 Okfuskee Co.	Southern Leopard, Cajun Chorus, Dwarf American Toad
March 18, 2020	7	35.35400, -96.37000 Okfuskee Co.	Cajun Chorus Frog
March 18, 2020	2	35.34928, -96.37044 Okfuskee Co.	Strecker's Chorus, Cajun Chorus Frog, Dwarf American Toad
March 18, 2020	1	35.34802, -96.36271 Okfuskee Co.	Gray Treefrog, Cajun Chorus Frog, Dwarf American Toad
March 18, 2020	8	35.34787, -96.35328 Okfuskee Co.	Southern Leopard, Strecker's Chorus, Cajun Chorus, Dwarf American Toad
March 18, 2020	19	35.36789, -96.37070 Okfuskee Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
March 18, 2020	2	35.38252, -96.37108 Okfuskee Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
March 18, 2020	9	35.42639, -96.42197 Okfuskee Co.	Southern Leopard, Cajun Chorus, Dwarf American Toad
March 21, 2022	8+	36.39471, -95.89666 Tulsa Co.	Southern Leopard, Cajun Chorus
March 21, 2022	10+	36.39470, -95.89102 Tulsa Co.	Southern Leopard, Cajun Chorus
March 21, 2022	4-6	36.39468, -95.90203 Tulsa Co.	Southern Leopard, Cajun Chorus
March 21, 2022	5	35.2369, -96.4623 Seminole Co.	Southern Leopard, Cajun Chorus
March 21, 2022	Present	35.2365, -96.4058 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
March 21, 2022	Present	35.2591, -96.4058 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
March 21, 2022	Present	35.2655, -96.4058 Hughes Co.	
March 21, 2022	Present	35.2754, -96.4057 Hughes Co.	
March 21, 2022	3	35.2805, -96.4057 Hughes Co.	

March 21, 2022	3	35.3047, -96.4058 Okfuskee Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
March 21, 2022	3	35.3218, -96.4058 Okfuskee Co.	Southern Leopard, Cajun Chorus, Dwarf American Toad
March 21, 2022	Present	35.3315, -96.4056 Okfuskee Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
March 21, 2022	2	35.3477, -96.4058 Okfuskee Co.	Southern Leopard, Cajun Chorus, Dwarf American Toad
March 24, 2022	2	35.3618, -96.3720 Okfuskee Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
March 24, 2022	3 – 5	35.3191, -96.4051 Okfuskee Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
March 24, 2022	6 – 8	35.3050, -96.4056 Okfuskee Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
March 24, 2022	8 – 10	35.2903, -96.4047 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
March 24, 2022	10+	35.2800, -96.4067 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
March 24, 2022	10+	35.2639, -96.4055 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
March 24, 2022	10+	35.2587, -96.4057 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
March 24, 2022	10+	35.2337, -96.4052 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
March 24, 2022	3-5	35.2403, -96.3879 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
March 24, 2022	6+	35.2466, -96.3823 Hughes Co.	Southern Leopard, Cajun Chorus
March 24, 2022	8+	35.2460, -96.3621 Hughes Co.	Southern Leopard, Cajun Chorus
March 24, 2022	8+	35.2303, -96.3498 Hughes Co.	Southern Leopard, Cajun Chorus
March 24, 2022	8+	35.2304, -96.3555 Hughes Co.	Southern Leopard, Cajun Chorus
March 24, 2022	4	35.2807, -96.4594 Seminole Co.	Southern Leopard, Cajun Chorus
March 25, 2022	Present	35.4149, -96.4410 Okfuskee Co.	
March 25, 2022	1	35.4090, -96.4412 Okfuskee Co.	
March 25, 2022	Present	35.4046, -96.4481 Seminole Co.	
March 25, 2022	Present	35.3966, -96.4566	

		Seminole Co.	
March 25, 2022	Present	35.4008, -96.4524 Seminole Co.	
March 25, 2022	Present	35.4353, -96.4493 Seminole Co.	
March 25, 2022	Present	35.4294, -96.4589 Seminole Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
March 26, 2022	Present	35.2902, -96.3927 Okfuskee Co.	
March 26, 2022	Present	35.2901, -96.3826 Okfuskee Co.	
March 26, 2022	Present	35.2900, -96.3681 Okfuskee Co.	
March 26, 2022	Present	35.2900, -96.3647 Okfuskee Co.	
March 26, 2022	Present	35.2900, -96.3569 Okfuskee Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
March 26, 2022	Present	35.2900, -96.3527 Okfuskee Co.	
March 26, 2022	Present	35.2945, -96.3526 Okfuskee Co.	
March 26, 2022	Present	35.3045, -96.3499 Okfuskee Co.	
March 26, 2022	Present	35.3046, -96.3391 Okfuskee Co.	
March 26, 2022	Present	35.3072, -96.3174 Okfuskee Co.	
March 26, 2022	Present	35.3165, -96.3173 Okfuskee Co.	
March 26, 2022	8	35.3190, -96.3528 Okfuskee Co.	
March 26, 2022	Present	35.3191, -96.3640 Okfuskee Co.	
March 26, 2022	Present	35.3192, -96.3705 Okfuskee Co.	
March 26, 2022	8	35.3268, -96.3705 Okfuskee Co.	
March 26, 2022	Present	35.3297, -96.3705 Okfuskee Co.	
March 26, 2022	Present	35.3390, -96.3704 Okfuskee Co.	
March 26, 2022	Present	35.3743, -96.3704 Okfuskee Co.	



March 29, 2022	3 – 5	35.7215, -96.1749 Okmulgee Co.	Southern Leopard, Cajun Chorus, Dwarf American Toad
April 5, 2022	2	34.9809, -96.3182 Hughes Co.	Southern Leopard, Strecker's Chorus, Cajun Chorus, Dwarf American Toad
April 5, 2022	3 - 4	35.0709, -96.3484 Hughes Co.	Strecker's Chorus, Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	7	35.0726, -96.3364 Hughes Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	2	35.0728, -96.3174 Hughes	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	6 - 8	35.0915, -96.3169 Hughes Co.	Strecker's Chorus, Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	2 - 3	35.1027, -96.3178 Hughes Co.	Strecker's Chorus, Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	2 – 3	35.1065, -96.3167 Hughes Co.	Strecker's Chorus, Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	2 – 3	35.1144, -96.3193 Hughes Co.	Strecker's Chorus, Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	6 – 8	35.1242, -96.3173 Hughes Co.	Southern Leopard, Cajun Chorus, Dwarf American Toad
April 5, 2022	4 – 6	35.1299, -96.3171 Hughes Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	5 – 7	35.1370, -96.3174 Hughes Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	2	35.1438, -96.3147 Hughes Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	10+	35.1599, -96.3062 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
April 5, 2022	2 – 4	35.1586, -96.2970 Hughes Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	6 – 8	35.1595, -96.2879 Hughes Co.	Southern Leopard, Cajun Chorus, Dwarf American Toad
April 5, 2022	4 – 6	35.1592, -96.2762 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
April 5, 2022	3 - 6	35.1605, -96.2501 Hughes Co.	Strecker's Chorus, Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	8+	35.2425, -96.2493	Strecker's Chorus, Southern Leopard,

		Hughes Co.	Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	5 – 8	35.2515, -96.2469 Hughes Co.	Strecker's Chorus, Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	2-3	35.2667, -96.2468 Hughes Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	10+	35.2750, -96.2491 Hughes Co.	Southern Leopard, Gray Treefrog, Cajun Chorus, Dwarf American Toad
April 5, 2022	6-8	35.3030, -96.3184 Okfuskee Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus, Dwarf American Toad
April 5, 2022	5 – 7	35.3177, 96.3168 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 5, 2022	present	34.9760, -96.3179 Hughes Co.	
April 5, 2022	present	34.9829, -96.3179 Hughes Co.	
April 5, 2022	present	34.9829, -96.3273 Hughes Co.	
April 5, 2022	present	35.0660, -96.3532 Hughes Co.	
April 5, 2022	present	35.0723, -96.3532 Hughes Co.	
April 5, 2022	present	35.0783, -96.3533 Hughes Co.	
April 5, 2022	present	35.0910, -96.3532 Hughes Co.	
April 5, 2022	present	35.0999, -96.3532 Hughes Co.	
April 5, 2022	present	35.1097, -96.3532 Hughes Co.	
April 5, 2022	present	35.1158, -96.3534 Hughes Co.	
April 5, 2022	present	35.1303, -96.3509 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
April 5, 2022	present	35.1320, -96.3355 Hughes Co.	
April 5, 2022	present	35.1446, -96.3356 Hughes Co.	
April 5, 2022	present	35.1497, -96.3358 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
April 5, 2022	present	35.1632, -96.3192 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus

April 5, 2022	present	35.1741, -96.3177 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
April 5, 2022	present	35.1848, -96.3179 Hughes Co.	
April 5, 2022	present	35.1885, -96.3034 Hughes Co.	
April 5, 2022	present	35.1884, -96.2831 Hughes Co.	
April 5, 2022	present	35.1883, -96.2654 Hughes Co.	
April 5, 2022	present	35.2027, -96.2653 Hughes Co.	
April 5, 2022	present	35.2028, -96.2565 Hughes Co.	
April 5, 2022	present	35.2030, -96.2485 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
April 5, 2022	present	35.2175, -96.2417 Hughes Co.	
April 5, 2022	present	35.2196, -96.2290 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
April 5, 2022	present	35.2247, -96.2287 Hughes Co.	
April 5, 2022	present	35.2348, -96.2288 Hughes Co.	
April 5, 2022	present	35.2394, -96.2286 Hughes Co.	
April 5, 2022	present	35.2393, -96.2117 Hughes Co.	Strecker's Chorus, Southern Leopard, Cajun Chorus
April 5, 2022	present	35.2465, -96.2111 Hughes Co.	Strecker's Chorus Southern Leopard, Cajun Chorus
April 5, 2022	present	35.2465, -96.1938 Hughes Co.	
April 5, 2022	present	35.2373, -96.1934 Hughes Co.	
April 6, 2022	4 - 5	35.4506, -96.2569 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	2 - 3	35.4504, -96.2473 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	3	35.4638. -96.2104 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	10+	35.4666, -96.2117 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	2 - 3	35.5226, -96.2615	Southern Leopard, Cajun Chorus

		Okfuskee Co.	
April 6, 2022	8+	35.5233, -96.2496 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	3 – 5	35.5318, -96.2451 Okfuskee Co.	Strecker’s Chorus, Southern Leopard, Cajun Chorus
April 6, 2022	8+	35.5311, -96.2640 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	6 – 8	35.5257, -96.2655 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	2 – 4	35.5175, -96.2636 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	10+	35.5027, -96.2993 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	2 – 4	35.5159, -96.2990 Okfuskee Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2393, -96.0880 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2275, -96.0696 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.1964, -96.0288 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	8+	35.2319, -96.0522 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2319, -96.0375 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2317, -96.0343 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2319, -96.0253 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2319, 96.0165 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.24.4, -96.0345 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2501, -96.0344 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2612, -96.0344 Hughes Co.	Southern Leopard, Cajun Chorus
April 6, 2022	present	35.2607, -96.0076 Hughes Co.	Strecker’s Chorus, Southern Leopard, Cajun Chorus
April 6, 2022	1	35.2646, -95.9105 McIntosh Co.	Southern Leopard, Cajun Chorus
April 6, 2022	2	35.2610, -95.8976 McIntosh Co.	Southern Leopard, Cajun Chorus

### **Breeding Bird Surveys**

Each year, we ran two of the approximately 50 Breeding Bird Surveys that are coordinated in Oklahoma by the U.S. Geological Survey. In 2020, the USGS suspended the Breeding Bird Survey for a year due to the COVID-19 pandemic. This is the first time that the Breeding Bird Survey underwent a nationwide pause, and fortunately, the surveys resumed in 2021 and 2022. The results of the two Breeding Bird Survey routes that ODWC staff conducts, Holdenville and Pushmataha, are summarized in Table 2. Both routes were conducted in June each year and under very favorable weather conditions (light wind and moderate temperatures). Seventy species and 63 species were recorded on the Holdenville BBS route in 2021 and 2022 respectively. Notably, six of the seven warbler species that could be found along the route were observed during 2021, and four of the seven in 2022. Yellow-throated Warblers, a species rarely detected along this route, were heard both years. Six species of greatest conservation need were documented on this route – Northern Bobwhite, Red-headed Woodpecker, Bell’s Vireo, Louisiana Waterthrush, Kentucky Warbler, and Painted Bunting. All of these were seen in small numbers except for the Painted Bunting which is relatively common in the area covered by this route. Fifty-nine species and 61 species were detected along the Pushmataha BBS route in 2021 and 2022 respectively. Several species were detected in record-high or near-record-high numbers in 2021 – Indigo Bunting (102), Yellow-breasted Chat (71), Orchard Oriole (46), Prairie Warbler (25), and Red-headed Woodpecker (17), but the numbers for these species were within the normal range of annual variation in 2022. Eight species of greatest conservation need are regularly documented on this route – Northern Bobwhite, Red-headed Woodpecker, Brown-headed Nuthatch, Kentucky Warbler, Louisiana Waterthrush, Prairie Warbler, Bachman’s Sparrow, and Painted Bunting. A ninth species, Bald Eagle, was detected for the first time in 2022. The Northern Bobwhite, Red-headed Woodpecker, Prairie Warbler, and Bachman’s Sparrow have shown increasing population trends on this route during the past 25 years and have maintained relatively high population counts when compared to other routes in southeastern Oklahoma. Two of the most noteworthy species detected on this route during the two-year period were two Brown-headed Nuthatches in both years and one American Kestrel in 2021, which most likely represents the rare Southeastern race (*Falco sparverius paulus*) of this otherwise widespread and common species. A few species were seen in much lower numbers than usual on both routes in 2021 and 2022 and the regional populations for these species appear to have been impacted by a thick polar air mass that covered Oklahoma for two weeks during the middle two weeks of February. Only one Eastern Bluebird was seen on each route in 2021 and this is a reduction of about 90% as compared to the typical numbers of bluebirds seen on these routes. In 2022, the numbers for Eastern Bluebird had increased slightly to six and four on the Holdenville and Pushmataha BBS routes, respectively. Eastern Phoebe, Carolina Wren, and Bewick’s Wren numbers also were lower than normal – the numbers seen were half or less than half of what are typically seen along these routes.

**Table 2. Summary of the birds detected on the Holdenville and Pushmataha Breeding Bird Survey routes in 2021 and 2022. Oklahoma species of greatest conservation need are shown in bold font.**

Common Name	Holdenville BBS 4 June 2021	Holdenville BBS 17 June 2022	Pushmataha BBS 17 June 2021	Pushmataha BBS 22 June 2022
<b>Northern Bobwhite</b>	<b>11</b>	<b>9</b>	<b>38</b>	<b>38</b>
Wild Turkey	1		3	1
Great Blue Heron	3			1
Great Egret	7	1		
Cattle Egret		16		
Green Heron			1	
Turkey Vulture	8	7	5	6
Black Vulture	3	2		
Mississippi Kite	1		2	3
Red-tailed Hawk	1	2	1	
Red-shouldered Hawk	2	1	1	2
Broad-winged Hawk	1	2	1	
<b>Bald Eagle</b>				<b>1</b>
Killdeer	1	1		
Rock Pigeon	4			
Eurasian Collared Dove	1	3		
Mourning Dove	41	19	28	26
Yellow-billed Cuckoo	19	28	6	18
Greater Roadrunner		1		
Common Nighthawk	3			
Chuck-will's-widow	2	2	6	6
Chimney Swift	2		3	5
Ruby-throated Hummingbird	6	4	2	3
<b>Red-headed Woodpecker</b>	<b>2</b>	<b>1</b>	<b>17</b>	<b>14</b>
Red-bellied Woodpecker	9	11	7	7
Downy Woodpecker	3	5	3	3
Hairy Woodpecker				1
Northern Flicker				1
Pileated Woodpecker	1	1	3	3
American Kestrel			1	
Eastern Wood Pewee	3	2	21	11
Eastern Phoebe	8	8	2	3
Great Crested Flycatcher	18	21	19	12
Western Kingbird	1	3		
Eastern Kingbird	2	5	8	6
Scissor-tailed Flycatcher	14	16	9	7
White-eyed Vireo	13	10	10	7
<b>Bell's Vireo</b>	<b>1</b>	<b>1</b>		
Red-eyed Vireo	9	12	31	26

Yellow-throated Vireo		1		
Blue Jay	5	4	8	4
American Crow	20	22	16	17
Fish Crow	2	2	1	2
Purple Martin	3	3		
Northern Rough-winged Swallow	1			
Cliff Swallow	9	25	12	6
Barn Swallow	10	6	5	2
Carolina Chickadee	13	15	5	9
Tufted Titmouse	63	46	27	19
White-breasted Nuthatch		1	5	5
<b>Brown-headed Nuthatch</b>			<b>2</b>	<b>2</b>
Carolina Wren	13	20	23	18
Bewick's Wren	1			
Blue-gray Gnatcatcher	14	21	13	13
Eastern Bluebird	1	6	1	4
American Robin	1	1		1
Brown Thrasher	1			
Northern Mockingbird	23	24	8	4
European Starling	4	2		
Black-and-White Warbler	2			
<b>Kentucky Warbler</b>	<b>1</b>		<b>2</b>	<b>2</b>
<b>Louisiana Waterthrush</b>	<b>1</b>	<b>1</b>		<b>1</b>
Common Yellowthroat	1	1	28	20
Northern Parula	1	4	1	1
Yellow-throated Warbler	2	1	4	1
<b>Prairie Warbler</b>			<b>25</b>	<b>17</b>
Pine Warbler			41	46
Yellow-breasted Chat	6	4	71	53
<b>Bachman's Sparrow</b>			<b>7</b>	<b>8</b>
Field Sparrow	26	31		2
Chipping Sparrow			13	12
Lark Sparrow	6	8	1	1
Summer Tanager	10	12	60	49
Scarlet Tanager			2	2
Northern Cardinal	101	87	22	20
Blue Grosbeak	9	10	44	39
Indigo Bunting	39	46	102	88
<b>Painted Bunting</b>	<b>26</b>	<b>31</b>	<b>2</b>	<b>6</b>
Dickcissel	7	17		5
Red-winged Blackbird	9	4		
Eastern Meadowlark	15	13	1	1

Common Grackle	3	4	1	
Brown-headed Cowbird	13	7	2	5
Orchard Oriole			46	34
Baltimore Oriole	3	2		
American Goldfinch	1	1	1	
Total Species/Route	70	63	59	61

**Bachman’s Sparrow Assessment:**

We initiated an assessment of the current range and distribution of the Bachman’s Sparrow in Oklahoma by compiling our own records and observational records from the community science platforms of eBird and iNaturalist. The Bachman’s Sparrow is a Tier I species of greatest conservation need in Oklahoma due to its relative rarity across its range. We began by searching records from the past ten years and found that all recent records for Bachman’s Sparrows originated from a few wildlife management areas in southeastern Oklahoma. On these areas, the ODWC maintains tracts of open woodland habitat (open shortleaf pine woodlands and open oak/pine woodlands) that is preferred by Bachman’s Sparrows, and existing interior road provide access to biologists and birders searching for this species and other woodland associated birds. Bachman’s Sparrows have a distinctive song and are fairly easy to detect early in the morning and early in the evening during their nesting season, which spans the period from early April through late July. Outside of the nesting season, this species is quiet and secretive, so it’s not surprising that all of the recent documentations for this species have occurred in that four-month period. Nesting populations appear to occur on and in the vicinity of Atoka WMA (Atoka County) and Pushmataha WMA (Pushmataha County). Based on eBird reports, a population likely exists also in southern McCurtain County in the vicinity of Red Slough WMA. Observation records are listed below in Table 3.

**Table 3. Recent Observational Records for Bachman’s Sparrow in Oklahoma (2014-2022)**

Common Name	Date	# indiv.	Location	County
Bachman’s Sparrow	06/17/2014	1	Pushmataha WMA; 34.52876, -95.35817	Pushmataha
	06/22/2016	2		
	06/19/2017	2		
Bachman’s Sparrow	06/12/2015	1	Pushmataha WMA; 34.53013, -95.35029	Pushmataha
	06/22/2016	1		
	06/19/2017	1		
	06/15/2018	2		
	06/17/2021	1		
	06/22/2022	1		
Bachman’s Sparrow	06/17/2014	3	Pushmataha WMA; 34.5331, -95.36202	Pushmataha
	06/12/2015	2		
	06/22/2016	1		
	06/19/2017	2		
	06/15/2018	2		
	06/21/2019	1		



	06/17/2021	1		
	06/22/2022	1		
Bachman's Sparrow	06/12/2015	1	Pushmataha WMA; 34.52469, -95.39147	Pushmataha
Bachman's Sparrow	06/17/2014	1	Pushmataha WMA; 34.53023, -95.37806	Pushmataha
	06/19/2017	1		
Bachman's Sparrow	06/12/2015	1	Pushmataha WMA; 34.52469, -95.39147	Pushmataha
Bachman's Sparrow	06/19/2017	1	Pushmataha WMA; 34.52157, -95.39775	Pushmataha
Bachman's Sparrow	06/17/2014	1	Pushmataha WMA; 34.51797, -95.40550	Pushmataha
	06/22/2016	2		
	06/15/2018	2		
	06/21/2019	1		
Bachman's Sparrow	06/19/2017	1	Pushmataha WMA; 34.51538, -95.41165	Pushmataha
	06/15/2018	1		
Bachman's Sparrow	06/22/2016	2	Pushmataha WMA; 34.51263, -95.41929	Pushmataha
	06/19/2017	2		
	06/15/2018	1		
Bachman's Sparrow	06/19/2017	1	Pushmataha WMA; 34.50941, -95.42693	Pushmataha
	06/17/2021	1		
Bachman's Sparrow	06/22/2016	1	Pushmataha WMA; 34.49911, -95.42391	Pushmataha
	06/22/2022	1		
Bachman's Sparrow	06/22/2016	2	Pushmataha WMA; 34.49832, -95.41300	Pushmataha
	06/19/2017	1		
	06/15/2018	2		
	06/21/2019	1		
Bachman's Sparrow	06/12/2015	2	Pushmataha WMA; 34.49340, -95.41184	Pushmataha
	06/22/2022	1		
Bachman's Sparrow	06/12/2015	1	Pushmataha WMA; 34.48796, -95.40978	Pushmataha
	06/22/2022	1		
Bachman's Sparrow	06/21/2019	1	Pushmataha WMA; 34.49832, -95.41300	Pushmataha
Bachman's Sparrow	06/19/2017	1	Pushmataha WMA; 34.48254, -95.38561	Pushmataha
	06/15/2018	1		
Bachman's Sparrow	06/17/2014	1	Pushmataha WMA; 34.47959, -95.37830	Pushmataha
Bachman's Sparrow	06/15/2018	1	Pushmataha WMA; 34.48254, -95.38561	Pushmataha
Bachman's Sparrow	06/15/2018	1	Pushmataha WMA; 34.48451, -95.37517	Pushmataha
	06/17/2021	2		
Bachman's Sparrow	06/12/2015	1	Pushmataha WMA; 34.49000, -95.37156	Pushmataha
	06/15/2018	1		
	06/21/2019			
Bachman's Sparrow	06/12/2015	1	Pushmataha WMA; 34.49977, -95.36263	Pushmataha
	06/15/2018	2		
Bachman's Sparrow	06/17/2014	2	Pushmataha WMA; 34.50800, -95.35557	Pushmataha
	06/22/2016	1		
	06/15/2018	1		

	06/21/2019	1		
	06/17/2021	1		
	06/22/2022	1		
Bachman's Sparrow	06/17/2014	1	Pushmataha WMA; 34.51346, -95.25405	Pushmataha
	06/15/2018	1		
Bachman's Sparrow	06/22/2016	1	Pushmataha WMA; 34.53044, -95.34492	Pushmataha
Bachman's Sparrow	06/19/2017	1	Pushmataha WMA; 34.53068, -95.35384	Pushmataha
Bachman's Sparrow	06/17/2014	2	Pushmataha WMA; 34.53585, -95.35318	Pushmataha
	06/12/2015	1		
	06/22/2016	2		
	06/19/2017	1		
	06/15/2018	1		
	06/21/2019	1		
	06/17/2021	1		
	04/30/2022	3		
	06/22/2022	2		
Bachman's Sparrow	05/17/2018	2	Pushmataha WMA; 34.5369, -95.3516	Pushmataha
Bachman's Sparrow	06/30/2017	1	Atoka WMA; 34.52592, -96.00617	Atoka
Bachman's Sparrow	07/08/2017	4	Atoka WMA; 34.52595, -95.89956	Atoka
Bachman's Sparrow	04/29/2020	2	Atoka WMA; 34.52595, -95.89956	Atoka
Bachman's Sparrow	06/01/2022	2	Atoka WMA; 34.52832, -95.91990	Atoka
Bachman's Sparrow	05/02/2020	1	Red Slough WMA;	McCurtain

### **Black-tailed Prairie Dog Survey Summary**

The Black-tailed Prairie Dog (*Cynomys ludovicianus*) and the Burrowing Owl (*Athene cunicularia*) are two of the highest priority species of greatest conservation need in western Oklahoma and frequently co-occur together because Burrowing Owls show a strong affinity for nesting in prairie dog colonies in Oklahoma. We continued to use current Google Earth imagery to conduct systematic searches for potential prairie dog colonies in the vicinity of historic sites in the main body of state and then used. We identified 166 potential Black-tailed Prairie Dog colony locations by examining satellite imagery across 26 counties in the main body of the state in western Oklahoma. We conduct road-based surveys around a small subset of these likely prairie dog colonies in an attempt to ground-verify whether colonies existed at these locations. Out of 24 likely sites in seven counties (Beckham, Comanche, Grady, Kiowa, Roger Mills, Stephens, and Tillman), we were able to confirm the presence of prairie dogs at 21 of these. One site was not visible from any public roads and could not be verified, one small site appeared to have had prairie dogs in the recent past but did not have any at the time of the survey, and the third location was an over-grazed paddock that did not appear to have supported prairie dogs in the past. The number of potential colony sites by county is listed below in Table 4.

**Table 4. Summary of Potential Black-tailed Prairie Dog (BTPD) Colony Locations by County**

County	Number of Potential Colonies	County	Number of Potential Colonies
Beckham	9	Harmon	6

Blaine	2
Caddo	1
Canadian	14
Comanche	7
Cotton	14
Custer	1
Dewey	1
Ellis	19
Garvin	2
Grady	6
Grant	6
Greer	7

Harper	12
Jackson	8
Jefferson	9
Kiowa	3
Major	2
McClain	2
Roger Mills	9
Stephens	2
Tillman	12
Washita	9
Woods	2
Woodward	1

### **American Bumble Bee Survey Summary**

After being notified in December of 2018 about a pending federal listing petition for the American Bumble Bee (*Bombus pensylvanicus*) by the Center for Biological Diversity, the Oklahoma Wildlife Diversity Program initiated an assessment of the species beginning in April of 2019. This assessment had two components; one was a citizen science campaign, described in the last section, to solicit observations statewide from the public via iNaturalist and other platforms (i.e., ODWC Facebook page, email, etc.), and the other component was a series of targeted *B. pensylvanicus* surveys conducted at locations throughout the state, primarily wildlife management areas, where observational data were lacking.

In 2019, we initiated an iNaturalist project to encourage the documentation of American Bumble Bees across Oklahoma, and we publicized this project through ODWC’s social media platforms in April and July of 2020 and again in May of 2021. Currently, iNaturalist contains slightly more than 750 American Bumble Bee observations from within Oklahoma, and approximately 380 of these were added during the period between October of 2019 and September of 2022. After subtracting duplicate locations (sites where American Bumble Bees were documented multiple times within a year or between years), there were 308 unique American Bumble Bee locations that were documented on iNaturalist during the grant period. Each of these records is documented with one or more photographs and we included only those observations that were considered “research grade” meaning that they had been verified by one or more iNaturalist user as well as one or more ODWC biologists. These observations are distributed across 59 of Oklahoma’s 77 counties (Figure 2) as follows: Atoka (1), Beckham (2), Blaine (2), Bryan (2), Caddo (4), Canadian (1), Carter (3), Cherokee (3), Choctaw (3), Cleveland (38), Comanche (8), Creek (8), Custer (2), Delaware (2), Ellis (3), Garfield (2), Garvin (1), Grady (1), Greer (1), Harper (3), Haskell (3), Hughes (1), Jefferson (1), Johnston (8), Kingfisher (1), Kiowa (1), Lincoln (8), Logan (3), Love (8), Major (1), Marshall (3), Mayes (4), McClain (4), McCurtain (1), McIntosh (2), Murray (7), Muskogee (1), Noble (2), Nowata (1), Okfuskee (2), Oklahoma (42), Okmulgee (3), Osage (10), Pawnee (4), Payne (26), Pittsburg (2), Pontotoc (3), Pottawatomie (3), Pushmataha (1), Roger Mills (4), Rogers (1), Seminole (3), Stephens (1), Texas (3), Tillman (1), Tulsa (31), Wagoner (2), Washington (5), Washita (2), and Woodward (10). Observations were documented in every region of the state and were most frequently recorded in the central and western thirds of Oklahoma as well as the counties with population centers where most iNaturalist users live. The area with the fewest reports occurs in the Ouachita Mountains in the southeastern quarter of the state. This could be influenced by at least two factors: 1) that part of the

state is primarily forested and may support lower overall habitat suitability for American Bumble Bees and 2) that part of the state is not heavily populated and is home to fewer iNaturalist users.

**Figure 2. American Bumble Bee iNaturalist Reports Oct. 2019 – Sept. 2022; Counties with Reports (59) are Shaded in Green**



In 2020, the Wildlife Diversity Program staff made a concerted effort to conduct American Bumble Bee surveys in central Oklahoma. The following eleven locations in seven counties were surveyed:

- 1) Lake Carl Blackwell, Payne Co. (36.1169, -97.2311); April 7<sup>th</sup>, 2020  
 Observers: Matt Fullerton and Curtis Tackett; Search Time: Approx. 3 hours (0830 – 1130)  
 Number of *B. pensylvanicus* individuals observed: 0  
 While queens should be active in early April, very few blooming plants were observed, which likely contributed to the lack of observations of any *Bombus* species.
  
- 2) Candy Creek Wildlife Management Area – Avant Unit, Osage County; April 16<sup>th</sup>, 2020  
 Observers: Matt Fullerton, Mark Howery, Curtis Tackett; Search Time: 2.5 hours (1330 – 1600)  
 Number of *B. pensylvanicus* individuals observed: 4  
 Two female American Bumble Bees were observed nectaring on Hairy Vetch (*Vicia villosa*) at 36.499970, -96.032373, and two American Bumble Bees were observed nectaring on Red Clover (*Trifolium pratense*) at 36.500057, -96.036234.
  
- 3) Lake Heyburn Wildlife Management Area, Creek County; April 29, 2020  
 Observers: Mark Howery and Matt Mattioda; Search Time: 1 hour (1230-1330)  
 Number of *B. pensylvanicus* individuals observed: 2  
 American Bumble Bee observed nectaring on Common Vetch (*Vicia sativa*) at 35.90446, -96.368793 and another observed nectaring on Carolina Larkspur (*Delphinium carolinensis*) at 35.940536, -96.329573.
  
- 4) Larry Andrews’ property, Pawnee Co. (36.4741, -97.0287); May 1, 2020  
 Observers: Matt Fullerton; Search Time: 2 hours (1000 – 1200)  
 Number of *B. pensylvanicus* individuals observed: 1

Other *Bombus*: Brown-belted Bumble Bee (*B. griseocollis*) – 4, Eastern Bumble Bee (*B. impatiens*) - 2  
*Bombus pensylvanicus* was observed foraging on non-native Vetch (*Vicia* sp.) and Green Antelopehorn Milkweed (*Asclepias viridis*).

5) Okmulgee Wildlife Management Area, Okmulgee County; May 8, 2020

Observers: Mark Howery and Curtis Tackett; Search Time: 2 hours (1100 – 1300)

Number of *B. pensylvanicus* individuals observed: 2

American Bumble Bees observed nectaring on both Green Antelopehorn Milkweed (*Asclepias viridis*) and Indian Paintbrush (*Castilleja indivisa*) in a tallgrass prairie clearing at 35.637780, -96.052275.

6) Keystone Lake WMA, Cottonwood Creek Unit Pawnee County (36.1056, -96.4264); July 21, 2020

Observers: Mark Howery, Curtis Tackett, Matt Fullerton; Search Time: 45 minutes (1030-1115).

Number of *B. pensylvanicus* individuals Observed: 2

Other *Bombus* sp. observed: Eastern Bumble Bee (*B. impatiens*) – 19, Brown-belted Bumble Bee (*B. griseocollis*) – 11, Southern Plains Bumble Bee (*B. fraternus*) – 1

Primary nectaring plants for *Bombus pensylvanicus* were Winged Loosestrife (*Lythrum alatum*) and Plains Coreopsis (*Coreopsis tinctoria*). Additional nectar sources included Trumpet Creeper (*Campsis radicans*), Small-flowered Gaura (*Gaura parviflora*), Long-flowered Gaura (*Gaura longiflora*), Bracted Verbena (*Glandularia bracteata*), Nuttall's Mock Bishopweed (*Ptilimnium nuttallii*), and Late Boneset (*Eupatorium serotinum*).

7) Keystone Lake WMA, House Creek Unit, Pawnee County (36.1705, -96.4464); July 21, 2020

Observers: Mark Howery, Curtis Tackett, Matt Fullerton; Search Time: 45 minutes

Number of *B. pensylvanicus* individuals Observed: 0

Other *Bombus* sp. observed: *Bombus impatiens* – 3, *Bombus griseocollis* – 1

Primary nectaring plant was Buttonball Bush (*Cephalanthus occidentalis*). Also present were Trumpet Creeper (*Campsis radicans*), Small-flowered Gaura (*Gaura parviflora*), Scarlet Ammannia (*Ammannia coccinea*), Plains Coreopsis (*Coreopsis tinctoria*), Bitter Sneezeweed (*Helenium amarum*), India Heliotrope (*Heliotropium indicum*), and Smartweed (*Polygonum* sp.)

8) Keystone Lake WMA, North of Cleveland, Osage County (36.3294, -96.4446); July 21, 2020

Observers: Mark Howery, Curtis Tackett, Matt Fullerton; Search Time: 45 minutes

Number of *B. pensylvanicus* individuals Observed: 0

Other *Bombus* sp. observed: Eastern Bumble Bee (*Bombus impatiens*) – 5

Primary nectaring plant was Buttonball Bush (*Cephalanthus occidentalis*). Additional species present were Trumpet Creeper (*Campsis radicans*), Small-flowered Gaura (*Gaura parviflora*), Plains Coreopsis (*Coreopsis tinctoria*), Curlytop Gumweed (*Grindelia squarrosa*), India Heliotrope (*Heliotropium indicum*), Bracted Verbena (*Glandularia bracteata*) and Smartweed (*Polygonum* sp.).

9) Skiatook WMA, Crystal Bay Marina Road, Osage County (36.3860, -96.1191); July 21, 2020

Observers: Mark Howery, Curtis Tackett, Matt Fullerton; Search Time: 45 minutes

Number of *B. pensylvanicus* individuals Observed: 1

Other *Bombus* sp. observed: *B. impatiens* – 2, *B. griseocollis* – 2

American Bumble Bee was observed nectaring on Winged Loosestrife (*Lythrum alatum*) and American Germander (*Teucrium canadense*). Other nectar sources present were Trumpet Creeper (*Campsis radicans*), Rattlesnake Master (*Eryngium yuccifolium*; 83 plants, no sign of borers), Ashy Sunflower (*Helianthus mollis*), Small-headed Sneezeweed (*Helenium microcephalum*), Baldwin's Ironweed (*Vernonia baldwinii*), and Slender Mountain Mint (*Pycnanthemum tenuifolium*).

10) Lake Longmire, Garvin County (34.758295, -97.056145); August 2, 2020

Observer: Mark Howery; Search Time: 30 minutes (1330 – 1400)

Number of *B. pensylvanicus* individuals Observed: 2

Other *Bombus* sp. observed: Brown-belted Bumble Bee (*Bombus griseocollis*) – 2

American Bumble Bees and Brown-belted Bumble Bees observed nectaring on Buttonball Bush (*Cephalanthus occidentalis*).

11) Illinois River near SH 59, Adair County (36.129563, -94.565250); August 27, 2020

Observers: Mark Howery and Curtis Tackett; Search Time: 45 minutes (1400 – 1445)

Number of *B. pensylvanicus* individuals Observed: 2

Other *Bombus* sp. observed: Eastern Bumble Bee (*Bombus impatiens*) - 3

All bumble bees were nectaring on Cutleaf Coneflower (*Rudbeckia laciniata*).

### **Whooping Crane Migration Monitoring**

We participated in a Central Flyway-wide effort to monitor migrating Whooping Cranes and to document the locations which Whooping Cranes use as stopover roosting and feeding sites in Oklahoma. These records also refine the spatial extent of the cranes' migration corridor. We maintain a Whooping Crane page on the ODWC website that includes a reporting portal through which field employees, waterfowl hunters, and the public can report their Whooping Crane observations and upload photographs (<https://www.wildlifedepartment.com/wildlife/wildlife-diversity/report-whooping-crane-sighting/form>).

When we receive reports, either over the phone or through the Internet-based application, we speak to the reporting individual to verify the accuracy of their identification and to collect first-hand information from them about the location, age, behavior, and apparent health of the cranes. To raise awareness of Whooping Cranes and the reporting portal, we promoted the webpage on social media in April 2020, October 2020, March 2021, and October 2021. During the three-year period of the grant, we received over 40 reports of possible Whooping Crane sightings. Of these reports, we were able to confirm 18 of them with either a photograph or independent verification by an ODWC employee. Four more reports could not be confirmed, but we classified them as probable based upon the detail and quality of the information that was provided about the observation. An additional nine confirmed reports, all of them from Alfalfa County, were shared with us by the staff at Salt Plains National Wildlife Refuge. The 31 confirmed and probable reports received between October 2019 and September 2022 are listed in Table 5. All confirmed reports were submitted to the U.S. Fish and Wildlife Service's migration monitoring lead in the Grand Island, Nebraska office. Confirmed reports were received during each fall migration period (2019, 2020, and 2021) and two of the spring migration periods (2020 and 2021); however, no reports were received during the 2022 spring migration period. The spring of 2022 was unusually windy and there were many days with strong southerly winds in March and April that would have assisted cranes in migrating over Oklahoma without a need to stop. Among the more noteworthy reports, were three confirmed fall migration observations of cranes along the eastern edge of their migration corridor. Ten

adult Whooping Cranes were observed and photographed at Lake Thunderbird, Cleveland County on November 1-2, 2019, and two adults observed and photographed at Lake Thunderbird on October 20, 2020. A family group (two adults and one juvenile) was observed repeated on a two-mile reach of the Arkansas River near Marland in Noble County between October 22 and November 11, 2020 and confirmed with video footage.

**Table 5. Whooping Crane Observational Reports Fall 2019, 2020, 2021 and Spring 2020, 2021, and 2022 Migrations**

Date	County	Number of WHCRs	Status
November 13, 2021	Cotton	4 adults	Confirmed; photographed
November 9, 2021	Alfalfa	23 adults & 5 juveniles in three groups	Confirmed; some photographed
November 6, 2021	Kiowa	3 adults	Confirmed; human-caused mortality
November 4 – 5, 2021	Alfalfa	2 adults, 1 juvenile	Confirmed
November 4, 2021	Alfalfa	6 adults, 1 juvenile	Confirmed; photographed
November 4, 2021	Alfalfa	10 adults	Confirmed
November 2, 2021	Alfalfa	2 adults, 1 juvenile	Confirmed; photographed
October 21, 2021	Alfalfa	2 adults	Confirmed; photographed
March 26 – 27, 2021	Garfield	4 adults, 8 undetermined	Confirmed; some photographed
March 25, 2021	Cotton	6 adults	Confirmed; photographed
March 24 – 26, 2021	Garfield	4 adults	Confirmed
March 23, 2021	Alfalfa	2 adults	Confirmed; photographed
March 15 – 17, 2021	Garfield	2 adults	Confirmed
November 10, 2020	Custer	1 adult	Probable
November 10, 2020	Comanche	2 adults	Probable
Oct. 22 – Nov. 11, 2020	Noble	2 adults, 1 juvenile	Confirmed with video footage
November 6, 2020	Greer	10 adults, 2 juveniles	Probable
October 27, 2020	Ellis	2 adults	Confirmed; photographed
October 22, 2020	Alfalfa	4 adults	Confirmed
October 20, 2020	Cleveland	2 adults	Confirmed; photographed
October 19-20, 2020	Tillman	1 adult	Confirmed; photographed
October 18, 2020	Kingfisher	4 adults	Probable
April 13, 2020	Cotton	4 adults	Confirmed; photographed
April 3, 2020	Alfalfa	2 adults	Confirmed
March 28-29, 2020	Canadian	2 adults	Confirmed; photographed
March 24, 2020	Garfield	2 adults	Confirmed; photographed
November 1-2, 2019	Cleveland	10 adults	Confirmed; photographed
October 30, 2019	Alfalfa	6 adults	Confirmed
October 29, 2019	Alfalfa	4 adults	Confirmed
October 24-25, 2019	Alfalfa	2 adults, 1 juvenile	Confirmed; photographed
October 24, 2019	Alfalfa	1 adult	Confirmed; photographed

### **Texas Horned Lizard Observations**

One of our most successful citizen science projects to date has been the ODWC Texas Horned Lizard webpage that contains information about the natural history of this species and provides a portal for reporting horned lizard observations and photographs (<https://www.wildlifedepartment.com/wildlife-diversity/citizen-science-programs/report-texas-horned-lizard-sightings>). During 202, 2021, and 2022 combined, we received 784 complete observation reports representing 50 counties in central and western Oklahoma (Table 6). Another 28 reports of Texas Horned Lizard sightings were received from locations in the states of Texas and New Mexico and these out-of-state reports will be forwarded to the state herpetologists at the Texas Parks and Wildlife Department and the New Mexico Department of Game and Fish. Of the 784 complete reports from Oklahoma, 403 (51.4%) included one or more photographs for verification and the other 381 did not. Reports were received from all of the counties along and west of I-35 except for Love and Murray counties, and from eleven counties east of I-35 (Craig, Creek, Lincoln, Nowata, Osage, Pawnee, Pottawatomie, Seminole, Tulsa, Wagoner, and Washington). Although the Texas Horned Lizard is not as common and as well-distributed as it was 70 years ago, it appears to be widespread across most of the western half of Oklahoma and still occupies most of the western 2/3 of its historic range in the state. Historically, Texas Horned Lizards occupied all or portions of 65 counties in western, central, and northeastern Oklahoma. Texas Horned Lizards now appear to be extirpated from or have a very limited distribution within 20 counties in their Oklahoma range - the fifteen historic counties not represented by reports in this survey and the counties of Craig, Garvin, Nowata, Seminole, and Wagoner, which are represented by only one report each. Texas Horned Lizards were represented by fewer than four reports in seven counties. Of these, a photographic record exists for verification in Craig, Garvin, and Nowata counties, but no photographic record exists for the reports from Creek, Lincoln, Seminole or Wagoner counties. We received 19 or more reports from 19 counties – primarily in the western third of the state. The counties with the largest number of reports were Grady (54), Beckham (50), and Comanche (45).

We recognize that there is an inherent bias in this citizen science project, because the Texas Horned Lizard sightings are reported opportunistically and voluntarily. The distribution of the reports has some degree of bias toward the counties where there is a larger human population or higher human visitation, rather than a bias toward areas with higher horned lizard populations or better habitat conditions. Because of this bias, counties such as Cleveland, Garfield, and Grady that contain large towns, but patchy suitable horned lizard habitat, tend to have as many or more reports than the rural counties that contain a greater acreage of potentially suitable habitat for Texas Horned Lizards (e.g., Dewey, Harper, Jefferson, and Woods). Counties that are well represented by the citizen science project are ones in which there are large towns surrounded by suitable habitat, or frequently visited sites such as state parks that support horned lizard habitat (e.g., Beckham, Comanche, Garfield, Grady, Jackson, and Woodward counties). Washita and Kiowa counties run counter to this tendency, but they are well-represented in the project despite having a small human population and low outside visitation, which suggests that they may support some of the largest Texas Horned Lizard populations in the state.

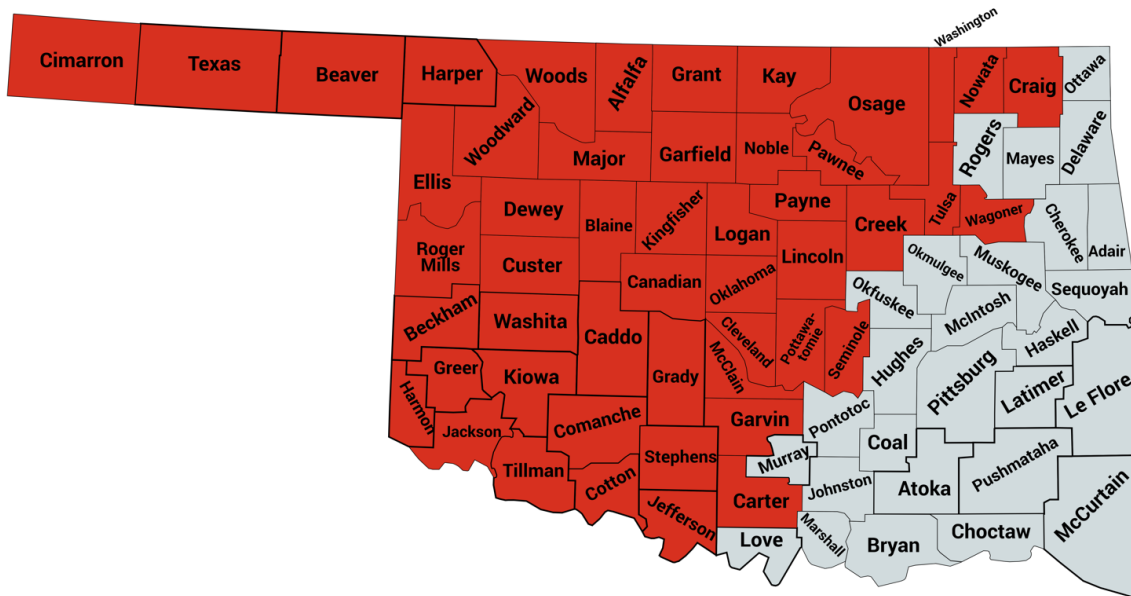


**Table 6. Texas Horned Lizard Observations Reported in 2020, 2021, and 2022**

County	Sightings with Photos	Sightings without Photos	Total for County
Alfalfa	3	1	4
Beaver	8	7	15
Beckham	25	25	50
Blaine	4	4	8
Caddo	11	12	23
Canadian	12	12	24
Carter	1	5	6
Cimarron	17	4	21
Cleveland	18	7	25
Comanche	27	18	45
Cotton	4	3	7
Craig	1		1
Creek		2	2
Custer	10	13	23
Dewey	10	9	19
Ellis	7	7	14
Garfield	11	20	31
Garvin	1		1
Grady	24	30	54
Grant	4	4	8
Greer	10	10	20
Harmon	4	5	9
Harper	3	4	7
Jackson	16	19	35
Jefferson	2	5	7
Kay	4		4
Kingfisher	13	9	22
Kiowa	13	12	25
Lincoln		2	2
Logan	6	8	14
Major	5	2	7
McClain	5	5	10
Noble	11	8	19
Nowata	1		1
Oklahoma	14	10	24
Osage	7	4	11
Pawnee	2	2	4
Payne	3	5	8
Pottawatomie	3	3	6
Roger Mills	10	11	21
Seminole		1	1
Stephens	5	7	12

Texas	8	3	11
Tillman	9	8	17
Tulsa	1	5	6
Wagoner		1	1
Washington	6	5	11
Washita	17	22	39
Woods	8	2	10
Woodward	19	20	39
Total	403	381	784
	51.4%	48.6%	
50 counties	46 counties	46 counties	

Figure 3. Presence/Absence of Texas Horned Lizard Reports by County 2020 - 2022



## **Phylogeography of Wichita Mountains Pillsnail *Euchemotrema wichitorum* in Oklahoma**

New ODWC research biologist Alex Cooper conducted work on the Wichita Mountains Pillsnail (*Euchemotrema wichitorum*) one of Oklahoma's terrestrial snail species of greatest conservation need, which built upon work that was conducted under an earlier State Wildlife Grant. His work looked at the phylogeographic patterns of *Euchemotrema* in Oklahoma to delineate the range of *E. wichitorum* and its closely related and more widespread congener *E. leai*. The ranges of the two species are much closer than previously believe and there appear to be populations of intermediate morphology. This phylogeographic pattern in snail populations may give us insight into how they migrated into Oklahoma and may provide a proxy for the pattern of expansion and contraction in the Cross Timbers by other rare invertebrates in Oklahoma. The work on this project was primarily morphometric and genetic. The morphometric component focused on photographing and measuring all snails collected in surveys conducted (primarily) before Alex's hiring, but includes new information collected during surveys in the Navajo Mountains (western extension of the Wichita Mountains in Kiowa County) that documented the western extent of *E. wichitorum*. The goals of this work are to look for morphological differentiation across the state and to have individual morphometric profiles coupled with genetic profiles. The genetic component consisted of DNA extractions and associated quality control.

Work also was accomplished on the preparation of a manuscript detailing the geographic distribution of *E. wichitorum* which is larger than previously known and encompasses portions of five counties surrounding the Wichita Mountains in southwestern Oklahoma. The paper documents field surveys at more than 80 locations and includes a predictive distribution model that is under development. This predictive model will incorporate LiDAR data in addition to available vegetation and soil data. Work was accomplished on a manuscript with co-author Kathryn Perez at the University of Texas that examines the phylogeny of the Stenotrematini subfamily that encompasses most of the Oklahoma SGCN snails. We have been analyzing the mitochondrial and nuclear sequence data for the *Stenotrema* and *Euchemotrema* species in this region and all specimens used in this project have been photographed and sequenced.

In addition to the Wichita Mountains Pillsnail surveys, survey trips were conducted to the eastern tier of Oklahoma counties to document locations for two other terrestrial snail species of greatest conservation need – the Ouachita Mountains Slitmouth Snail and the Rich Mountain Slitmouth Snail. Two additional trips were made to sites with Cross Timbers woodland habitat in Creek and Tulsa counties to search for the Oklahoma-endemic Tulsa Whitelip Snail (*Neohelix lioderma*). Two individual snails located in Chandler Park are suspected of being Tulsa Whitelip but the genus *Neohelix* as a whole is difficult to distinguish from other landsnail genera such as *Mesodon* because of their simple shell forms. These snails were taken into captivity for future examination and DNA extraction that should help ascertain their species identity. The results for these surveys are listed below in Table 7. The surveys for the Rich Mountain Slitmouth Snail were conducted with the assistance of the biologist for the Ouachita National Forest. The Ouachita National Forest has a long-term annual monitoring program for this species because it is endemic to Rich Mountain and most of the known sites that harbor this species occur on the Ouachita National Forest. We have discussed the potential of modifying to the Rich Mountain Slitmouth Snail survey protocol to increase the survey's efficiency and reduce potential disturbance to snail habitat.

**Table 7. Land Snail SGCN Survey Results 2021/2022**

Common Name	Scientific Name	Date	# indiv.	Location	County
Wichita Mountains Pillsnail	<i>Euchemotrema wichitorum</i>	03/14/2021	2	34.67825, -99.14705	Jackson
Wichita Mountains Pillsnail	<i>Euchemotrema wichitorum</i>	03/14/2021	3	34.74392, -98.97392	Kiowa
Rich Mountain Slitmouth Snail	<i>Stenotrema pilsbryi</i>	04/15/2022	6	34.70328, -94.49923	LeFlore
Rich Mountain Slitmouth Snail	<i>Stenotrema pilsbryi</i>	04/14/2022	2	34.69992, -94.54500	LeFlore
Ouachita Slitmouth Snail	<i>Stenotrema unciferum</i>	04/15/2022	1	34.70134, -94.51883	LeFlore
Ouachita Slitmouth Snail	<i>Stenotrema unciferum</i>	04/14/2022	1	34.69946, -94.55171	LeFlore
Tulsa Whitelip?	<i>Neohelix lioderma</i>	08/03/2022	2	36.12667, -96.07546	Tulsa
Ozark Slitmouth Snail	<i>Stenotrema labrosum</i>	08/11/2022	9	35.59811, -95.03245	Sequoyah
Ozark Slitmouth Snail	<i>Stenotrema labrosum</i>	08/11/2022	5	35.61103, -95.01625	Sequoyah
Ouachita Pillsnail	<i>Euchemotrema imperforatum</i>	03/10/2022	5	34.3089, -94.7095	McCurtain
Ozark Slitmouth Snail	<i>Stenotrema labrosum</i>	05/26/2022	1	35.71577, -94.84085	Cherokee
Ouachita Pillsnail	<i>Euchemotrema imperforatum</i>	04/08/2021	1	34.21326, -94.83427	McCurtain
Rich Mountain Slitmouth Snail	<i>Stenotrema pilsbryi</i>	04/08/2021	2	34.68837, -94.62556	LeFlore
Wichita Mountains Pillsnail	<i>Euchemotrema wichitorum</i>	04/ /2021	2	34.86979, -98.36432	Caddo

**Objective 3: Research, Survey, Data Collection, and Analysis; Create or Manage 1 Database by September 30, 2022.**

One component of an earlier State Wildlife Grant (F14AF01230; T-84) was the development of a simple geospatial databased for maintaining and organizing ODWC’s records for Tier I and Tier II species of greatest conservation need. We continued to add observational records to that database for the species highlighted in this report (e.g., Whooping Crane, Crawfish Frog, Texas Horned Lizard, Bachman’s Sparrow, and Black-tailed Prairie Dog) as well as species of greatest conservation need that are encountered incidentally through surveys for other species (e.g. Bell’s Vireo (*Vireo bellii*), Razor-backed Musk Turtle (*Sternotherus carinatus*), Arkansas Darter (*Etheostoma cragini*), and Monkeyface (*Quadrula metanevra*). These records came from a combination of field surveys conducted by ODWC biologists, reliable reports received from the public (typically with one or more photographs for verification) and captures reported to ODWC by Scientific Collector’s Permit holders. In 2021, ODWC transitioned away from a Google-based data management system to a Microsoft-based system and the database was transferred from its original form in Google Sheets to a Microsoft Excel spreadsheet. The database is modeled after the Oklahoma Natural Heritage Inventory’s (ONHI) Element Occurrence Database and

formatted in such a way that the records within it can be migrated into the ONHI Oklahoma Biodiversity Information System periodically. There are fields for the common and scientific names of each species, the date of the record and number of individual animals seen, the location for each record in decimal degrees, the observer's name, the context for the collection of that record, and general notes.

#### **Objective 4: Outreach/Communication; Produce 3 Products by September 30, 2022.**

Communication products were created and digitally distributed during the grant. In addition to promotion of two citizen science projects connected to species of greatest conservation need, at least 15 longer form articles were created to share information about 13 grants addressing species of greatest conservation need. Content was shared in Oklahoma's Wildlife Diversity Program's monthly electronic newsletter, the Wild Side, as well as at [www.wildlifedepartment.com](http://www.wildlifedepartment.com) and on socials media. Examples of the content are shown below, with related information about readership and reach.

- **F17AF01213 Survey Team Evaluates Potential of Five River Segments for Alligator Snapping Turtles**

Wild Side Article: Nov. 14, 2019

- Delivered to 10,731 addresses; Opens 2,742; Unique Full Report Clicks 40

#### **Survey Team Evaluates Potential of Five River Segments for Alligator Snapping Turtles**

Conservation agencies and groups have been partnering for nearly two decades to release young alligator snapping turtles into four Oklahoma rivers as a way to restore the behemoth turtles in our state. After fine-tuning the release strategy and monitoring the growth and survival of the released turtles, the Wildlife Department is considering adding young turtles to more rivers. To find out which rivers are best suited as potential reintroduction sites we partnered with Missouri State University in 2018 to gauge the overall turtle community and habitat conditions of five river segments.

#### **Survey Highlights**

- More than 1,200 turtles were tagged and released as part of the survey; red-eared sliders made up nearly 70 percent of the captures. Eight species of turtles were documented, with the highest diversity rating in the Deep Fork River.
- Twenty alligator snapping turtles were found in two river segments. The majority were juveniles with an average weight of 9.6 pounds. The largest alligator snapping turtle captured and released during the study was a female that weighed 92.6 pounds.
- Alligator snapping turtles need different habitat characteristics at different stages of life. Survey sites with the turtles present typically had a low current, were shaded by a moderately full tree canopy and had tall, steep slopes.
- A stretch of the Neosho and Poteau rivers had reproducing populations of alligator snapping turtles that currently do not need to be supplemented. A second stretch of the Neosho River and its secluded tributaries are most suitable for future reintroductions.

*This project was funded by ODWC's State Wildlife Grants Program Grant F17AF01213 and Missouri State University.*

See Appendix Figure 1.

Facebook: *Posted Nov. 18, 2019*

- *Reach 2,460; Reactions 110; Shares 18*

**WILDLIFE BY THE NUMBERS:** Researchers with Missouri State University surveyed five segments of eastern Oklahoma rivers to find suitable habitat for alligator snapping turtles. Along the way they found 20 of the turtles in two river segments. The majority were juveniles that weighed an average of 9.6 pounds. The largest alligator snapping turtle captured and released during the study weighed 92.6 pounds. The survey was funded by ODWC's State Wildlife Grants Program Grant F17AF01213 and Missouri State University.

- **Insights from a Decade of Wildlife Study**

Wild Side Article: Dec. 19, 2019

- Delivered to 10,943 addresses; Opens 3,108; Unique Article Clicks 184

**Insights from a Decade of Wildlife Study**

The Wildlife Department has long been dedicated to the discovery of what makes our fish and wildlife populations thrive. Sometimes that discovery starts with a search of the state to find where the animals are living, and sometimes the search leads to more questions. As we prepare to enter a new decade of wildlife study, we checked in with the Wildlife Department's Wildlife Diversity staff for their insights into research and surveys that have wrapped up in the past 10 years.

See Appendix Figure 2.

Facebook: Dec. 31, 2019

- Reach 1,100; Reactions 148; Shares 14

As we prepare for a new decade of wildlife study, we checked in with the Wildlife Department's Wildlife Diversity staff for lessons learned from research and surveys that have wrapped up in the past 10 years. One positive and reoccurring theme was that targeted surveys for one species often help us better understand the entire fish or wildlife community.

<https://www.wildlifedepartment.com/wildlife/wildlife-diversity/wildside/insights-decade-wildlife-study>

- **Texas Horned Lizard Report Sighting Request**

Facebook: July 15, 2020

- Reach 129,677; Like 676; Comment 429; Share 806

Whether you call them horned frogs, horned toads, or horned lizards, the Wildlife Department wants to know where you're seeing one of our state's most familiar reptiles. Share your sightings at <https://www.wildlifedepartment.com/wildlife/wildlife-diversity/report-texas-horned-lizard-sightings/form>. With your help the Wildlife Department can keep tabs on this species of greatest conservation need by identifying areas where it can still be found, or areas where it hasn't been reported for a number of years.

See Appendix Figure 3.

Facebook: Aug. 26, 2020

- Reach 45,056; Reactions 1,267; Comments 281; Share 215

Last month we asked where you were seeing Texas horned lizards and received hundreds of reports across much of the lizard's historic range! From July 15 – July 31, sightings from 46 counties were shared, with several reports coming from towns like Elk City, Burns Flat, Kingfisher, Altus, Moore, Rush Springs, Enid, and Perry. Keep sharing your sightings of this species of greatest conservation need at [wildlifedepartment.com/wildlife/wildlife-diversity/report-texas-horned-lizard-sightings/form](https://wildlifedepartment.com/wildlife/wildlife-diversity/report-texas-horned-lizard-sightings/form).

See Appendix Figure 3.

- **Eastern Spotted Skunk Communication**

Wild Side Species Spotlight: Nov. 20, 2020

- Delivered to 11,050 addresses; Opens 3,275; Unique Spotlight Clicks 25

**Species Spotlight: Eastern Spotted Skunk**

At least four species of skunk have been documented in Oklahoma, the striped skunk, hog-nosed skunk, western spotted skunk, and the secretive and occasional tree-climbing eastern spotted skunk. When compared to the more widespread and common striped skunk, the eastern spotted skunk is smaller in size; has several broken stripes on the sides and back; a spot on the forehead instead of a stripe; and is limited to rocky woodlands and grasslands.

Share your spotted skunk sightings with the Wildlife Department's furbearer biologist, Jerrod Davis.

Please include information about the location and habitat along with any available photos.

Learn more in the Wildlife Department's Online Guide

Facebook: **2/19/2021**

- Reach 41,479; Share 277; Like 1,019, Comment 129

See Appendix Figure 4.

Tree-climbing skunks? As bizarre as it sounds, the eastern spotted skunk is a skilled climber and will even use standing hollow trees as den sites. Though spotted skunks have a unique pattern of broken black and white stripes, they are best differentiated from the more common striped skunk by having a spot instead of a stripe on their forehead. These secretive skunks are associated with rocky outcrops in woodlands and prairies. 🐾

Twitter: 2/19/2021

- Impressions 2,405; Engagements 221; Retweets 2; Likes 25

The eastern spotted skunk is a skilled climber and will even use standing hollow trees as den sites. They are best differentiated from the common striped skunk by having a spot on their forehead. These secretive skunks are found in rocky outcrops in woodlands and prairies. <https://t.co/OSrTgxtEeq>

See Appendix Figure 5.

- **Announcement of the American Burying Beetle Downlisting**

Facebook: Sept. 4, 2020

- Reach 21,065; Reactions 178; Comment 44; Share 55

BEETLE STAGES COMEBACK The @USFWS announced it is downlisting the American burying beetle from endangered to threatened under the Endangered Species Act. Their decision is based on the beetle's improved status and the collaborative efforts of conservation partners. When first listed in 1989, the beetle was only known to occur in Oklahoma and Rhode Island. It has now been confirmed in eight states. Unusual among insects, American burying beetles care for their young. Adult beetles find and bury the carcass of a small animal and then mate. Eggs are laid in a nearby tunnel and both parents feed and tend the young.

- **Whooping Crane Sighting Promotion**

Wild Side Article: Oct. 22, 2020

- Delivered to 11,825 addresses; Opens 3,360; Unique Report Form Clicks 71

### **Endangered Birds Expected in Oklahoma**

After spending several months at nesting grounds in Canada, the wild flock of endangered whooping cranes is making the return trip to its wintering grounds in coastal Texas by way of the Great Plains. The first wave of migrating whooping cranes has reached our state and Oklahomans can help track the bird's migration path by sharing photographs and sighting details with the Wildlife Department.

Their entire journey can take nearly two months, and the first migrating family groups of cranes reach Oklahoma in mid- to late-October. The birds may touchdown in our wetlands or wheat fields for a few days to rest and refuel on crustaceans, other small animals, or grain before continuing on to Texas.

Help track their migration path across Oklahoma

See Appendix Figures 6 and 7.

Facebook: Oct. 29, 2020

- Reach 22,298; Reactions 318; Comments 29; Share 64

Jump if you're excited about whooping crane migration! North America's tallest bird has been spotted visiting Oklahoma's wetlands and wheat fields as it migrates to coastal Texas from Canada. These large, white birds have black wingtips and fly with their long legs and neck outstretched. Share sightings of this endangered bird with the Wildlife Department at <https://www.wildlifedepartment.com/.../report.../form> Jim Hudgins/USFWS

See Appendix Figure 7.

- **Alligator Gar National Trivia Day**

Facebook: Posted Jan. 2, 2021

- Reached 37,297; Shared 123; Like 497; Comment 85



Did you know alligator gar have three types of teeth? The primary teeth, conical teeth, and small tooth patches help gar hold the gizzard shad and carp they catch. Tooth count varies by individual ... how many primary and conical teeth do you think this gar skull has? Biologists at our Oklahoma Fisheries Research Lab counted 132 primary teeth and 1,026 conical teeth for a grand total of 1,158 teeth!

Twitter: Posted Jan. 4, 2021

- Impressions 7,733; Engagements 314; Retweets 10; Likes 35

#DYK alligator gar have three types of teeth? The primary teeth, conical teeth, and small tooth patches help gar hold the gizzard shad and carp they catch. Tooth count varies by individual, how many primary and conical teeth do you think this gar skull has? #NationalTriviaDay <https://t.co/AHag8vSJU2>

- Impressions 1,084; Engagements 11; Retweets 0; Likes 5

Biologists at our Oklahoma Fisheries Research Lab counted 132 primary teeth and 1,026 conical teeth for a grand total of 1,158 teeth!

See Appendix Figure 8.

Instagram: Posted Jan. 3, 2021

- Reach 9,516; Impressions 10,045; Likes 379; Comments 3

Did you know alligator gar have three types of teeth? The primary teeth, conical teeth, and small tooth patches help gar hold the gizzard shad and carp they catch. Tooth count varies by individual ... how many primary and conical teeth do you think this gar skull has? Biologists at our Oklahoma Fisheries Research Lab counted 132 primary teeth and 1,026 conical teeth for a grand total of 1,158 teeth!

- **Leopard Darter Post for Endangered Species Day**

Facebook: Posted May 26, 2021

- Reach 21,097; Shares: 39; Likes 200; Comments 17

The leopard darter, one of Oklahoma's 19 federally threatened and endangered species, was never thought to be common and has only ever occurred in two states. Each year, the Wildlife Department teams up with the U.S. Fish and Wildlife Service and the US Forest Service - Ouachita National Forest to monitor the threatened fish by conducting snorkel surveys of several Ouachita Mountain streams in Oklahoma and Arkansas.

Twitter: Posted May 31, 2021

- Impressions 932; Engagements 58; Retweets 1; Likes 6

The leopard darter, one of OK's 19 federally T&E species was never thought to be common and has only ever occurred in two states. The Wildlife Department teams up with the @USFWS and @forestsERVICE to monitor the fish by conducting snorkel surveys in Ouachita Mountain streams.

See Appendix Figure 9.

- **F20AF10405 Texas Horned Lizard Headstart Update**

Facebook: Posted June 14, 2021

- Reach 138,070; Share 473; Likes 2,619; Comments 430

The ODWC is working with several partners to see if a new technique that focuses on improving the overwinter survival of juveniles could help boost existing Texas horned lizard populations. Eggs from Tinker Air Force Base were hatched at the Oklahoma City Zoo and Botanical Garden and the young lizards were reared over the winter before being returned to the base's natural reserves. Researcher Sam Eliades and others with The University of Oklahoma will be tracking all 34 head-started lizards throughout the summer. 📷 Have you spotted Texas horned lizards recently? Report your sighting here! <http://ow.ly/qfe550F9KNq> Sightings shared only in social media comments aren't added to the database.

See Appendix Figure 10.

Twitter: Posted June 14, 2021

- Impressions 5,475; Engagements 549; Retweets 7; Likes 41

The ODWC is working with several partners to find ways to improve the overwinter survival of juvenile Texas horned lizards in hopes of boosting existing populations! Lizard eggs from @Team\_Tinker were hatched at the @OKCZoo -- <https://t.co/RDh0tb0rn7>

- Impressions 1,009; Engagements 30; Retweets 1; Likes 5

Where the young lizards were reared and overwintered before being returned to the base. Researchers with the @UofOklahoma will be tracking the head-started lizards throughout the summer. Funding in part by SWG F20AF10405. <https://t.co/kxyZ50g6iT>

See Appendix Figures 11 and 12.

Instagram: Posted June 14, 2021

- Reach 13,008; Impressions 13,683; Likes 620; Comments 9; Share 66

The ODWC is working with several partners to see if a new technique that focuses on improving the overwinter survival of juveniles could help boost existing Texas horned lizard populations. Eggs from Tinker Air Force Base were hatched at the Oklahoma City Zoo and the young lizards were reared over the winter before being returned to the base's natural reserves. Research Sam Eliades and others with the University of Oklahoma will be tracking all 34 head-started lizards throughout the summer. Have you spotted Texas horned lizards recently? Report your sightings at the Wildlife Department website.

- **Leopard Darter Survey Video**

Facebook: Posted Aug. 6, 2021

- Reach 8,416; Share 15; Like 95; Comments 4

Summer can take biologists into the heart of Oklahoma, and sometimes requires a dip in a river. 🐡 Snorkel surveys done in partnership with the U.S. Fish and Wildlife Service and U.S. Forest Service, are a key method used to monitor Oklahoma's rare leopard darter populations.

Twitter: Posted Aug. 6, 2021

- Impressions 6,407; Engagements 95; Retweets 7; Likes 28

Summer can take biologists into the heart of Oklahoma, and sometimes requires a dip in a river. Snorkel surveys done in partnership with the U.S. Fish and Wildlife Service and U.S. Forest Service, are a key method used to monitor Oklahoma's rare leopard darter populations. <https://t.co/if4f7YgQnF>

See Appendix Figure 13.

- **F20AF10405 Texas Horned Lizard Headstart Update**

Wild Side Article: Sept. 23, 2021

- Delivered to 12,616 addresses; Opens 3,414; Unique Article Clicks 206

**Tinker “Toads” Land at OKC Zoo for Temporary Duty**

The squadron of Texas horned lizards found on Tinker Air Force Base serves as Oklahoma's most well-studied population and has offered valuable insights into the species' daily needs and behaviors. This heritage of research continues with a new trial headstart program that focuses on Tinker's "horny toads" most vulnerable members, its recruits.

Read more about the trial program and the partnerships that make it possible

See Appendix Figure 14.

- **IN WILD HISTORY: Rare and Unique Crayfish Discovered in Oklahoma Cave**

Wild Side Article: December 16, 2021

- Delivered to 13,363 addresses; Opens 4,779; Unique Article Clicks 86

**In Wild History: Rare and Unique Crayfish Discovered in Oklahoma Cave**

Oklahoma's cave life is wrapped in intrigue and filled with many unique and mysterious creatures. While much is yet to be discovered, biologists have long explored and shed light on our underground world. One such exploration, conducted 50 years ago on April 11, 1971, revealed a new and unique species of cave crayfish. Later named the Oklahoma cave crayfish, this colorless invertebrate is known only from 1.3 miles of underground passage in northeastern Oklahoma. This state-endangered species is one of 17 animals that can only be found in Oklahoma.

See Appendix Figure 15.

Instagram: Posted 12/27/2021

- Likes 176; Comments 3; Views 4,859

Twitter: Posted 12/27/2021

- Impressions 3,352; Engagement 96; Retweets 6; Likes 46

IN WILD HISTORY: 50 years ago, on April 11, 1971, a rare and unique crayfish was discovered in an Oklahoma cave. The Oklahoma cave crayfish, a state-endangered species, lacks pigment, has reduced eyes, and is only known from two caves in northeastern Oklahoma.

Posted: In wild history we're throwing it back to 1971, when a rare crayfish was discovered in an Oklahoma cave. The Oklahoma cave crayfish (a state endangered species) lacks pigment has reduced eyes, when us only known from two caves in northeastern Oklahoma.

- **F18AF000575 Red River Research: Prairie Chub Lives a Life of Current Events**

Facebook: Posted 06/27/2022

- Likes 254; Comments 8; Shares: 15

Did you know the prairie chub faces harsh living conditions including high salinity and regional droughts followed by localized flooding? As a result, they hedge their reproductive bets by spawning in times of higher flows. Their fertilized eggs absorb water, become semi-buoyant, and are transported downstream by current for about 28 hours before hatching. The juvenile fish grow quickly and are just shy of the adult length of 1.7 inches within 90 days.

Wild Side Article: March 24, 2022

- Delivered to 13,827 addresses; Opens 6,027; Unique Article Clicks 64

In 2016, two years after an extensive drought dried out several western Oklahoma streams, the Wildlife Department's Streams Team surveyed the upper Red River basin and found an unmistakably resilient fish community. Among the hardy fish documented was the prairie chub, a species of greatest conservation need.

To get a better understanding of where the prairie chub can be found and more about their life cycle needs, the Wildlife Department partnered with researchers from Texas and Oklahoma from 2018 to 2021. Prior to the study, most of what biologists "knew" about this fish was based on research done on similar species.

Red River Research: Prairie Chub Lives a Life of Current Events

See Appendix Figures 16 and 17.

- **4,352 Acres Enhanced by Prescribed Fire**

Wild Side Article: March 24, 2022

- Delivered to 13,827 addresses; Opens 6,027; Unique Article Clicks 76

See Appendix Figure 18.

Facebook: Posted 3/29/2022

- Reach 516; Share 15; Like 121; Comments 3

Biologists are using prescribed fire to enhance the Wildlife Department's oldest management area, the McCurtain County Wilderness Area. More than 4,000 acres were burned cooperatively with the US Forest Service - Ouachita National Forest earlier this month to keep the forest open for the federally endangered red-cockaded woodpecker. Learn more in our Outdoor Oklahoma journal.

<http://ow.ly/FQ0t50ItLL1>

4,352 Acres Enhanced by Prescribed Fire.docx

- **Migrating Cranes Expected to Make Spring Stops**

Wild Side Article: March 24, 2022

- Delivered to 13,827 addresses; Opens 6,027; Unique Article Clicks 44

As the bird-watching calendar pushes further into spring, Oklahoma birders can look forward to the arrival of many migrating birds, including the whooping crane, a federally endangered bird whose wild flock numbers just over 500 birds. The spring migration is the first of the crane's two annual migrations and consists of a 2,500-mile flight north to Canadian nesting grounds, with brief stops in Oklahoma expected in early April. The return journey to coastal Texas wintering grounds will take place in late fall, with Oklahoma stopovers expected in late October and early November.

As one of North America's tallest and most rare birds, the whooping crane is fairly distinguishable. The bird has bright white feathers across most of the body, except for red feathers on top of the head and face and black wingtips seen only when in flight. Like the sandhill crane, the whooping crane has a long neck and legs that remain outstretched in flight, and a large rump bustle that helps identify birds standing in a field.

Link to full newsletter

To be shared in Outdoor Oklahoma Journal: March 31, 2022

See Appendix Figure 19.

- **New Survey Efforts Launch This Spring**

Wild Side Article: April 21, 2022

- Delivered to 13,827 addresses; Opens 6,027; Unique Article Clicks 76


One of the first steps in conserving Oklahoma's fish and wildlife is documenting where the animals can be found, and how many can be found there. While this basic information is available for most game species, it is less broadly understood for species that aren't hunted or fished. That's why the Wildlife Department partners with universities and conservation groups to conduct field surveys of nongame species across their suspected ranges.

See Appendix Figure 20.

Facebook: Posted 04/21/2022

- Likes 233; Comments 18; Shares: 33

The Wildlife Department regularly partners with universities and conservation groups to learn more about our state's fish and wildlife. Three new survey projects, focusing on species of greatest conservation need, launch this spring. Read more project details in our Outdoor Oklahoma Journal! <http://ow.ly/LNkv50IP3jr>

 Eastern whip-poor-will by Andy Reago & Chrissy McClarren

- **Survey of Oklahoma Lakes Bags Invasive Plants**

Wild Side Article: May 26, 2022

- Delivered to 14,104 addresses; 5,922 Opens; 229 Unique Article Clicks

"It doesn't look like you're here to fish."


Priscilla Crawford, conservation biologist with the Oklahoma Biological Survey, heard that observation multiple times from 2016 to 2021 as she made her way to every Oklahoma public lake's boat ramp. Instead of carrying the fishing pole and tackle box familiar to many lake-goers, Crawford carried a clipboard, two rake heads attached to each other and a rope, and other gear needed to search for and collect aquatic invasive plants.

See Appendix Figure 21.

Facebook: Posted 06/15/2022

- Likes 66; Comments 1; Shares: 18

After those long summer days out on the lake this summer, let "Clean, Drain, Dry" be your mantra.

 Cleaning boats, gear, boots, draining bilges, live wells, drying equipment can help slow the spread of nuisance plants and animals. Learn more about how to help slow the spread and get some good news from a study of invasive aquatic plants in our Outdoor Oklahoma Journal. <http://ow.ly/fqXu50Jy42A>

- **The Quest for an Uncommon Butterfly**

Wild Side Article: June 23, 2022

- Delivered to 14,135 addresses; 5,671 Opens; 122 Unique Article Clicks

In 2019, a survey team from Oklahoma State University embarked on a quest to find one of the rarest butterflies in Oklahoma, the regal fritillary. Over the course of three years, the team conducted more than 450 surveys across an eight-county area in northeastern Oklahoma's tallgrass prairie, finding nine individuals.

See Appendix Figure 22.

- **Assessment of Texas Horned Lizard Populations in Western Oklahoma**

Facebook: Posted 08/01/2022

- Likes 144; Comments 29; Shares: 28



A research team from The University of Oklahoma has spent the summer studying Texas horned lizards at Cooper WMA. In addition to collecting location data and body measurements for every lizard encountered, they've also been testing the best survey methods for this species of greatest conservation need.

- Have you spotted a Texas horned lizard this summer? Share your sighting details with us here: <http://ow.ly/EcqQ50K8BKq>

TikTok: Posted 08/08/2022

- Likes 121K; Comments 222

A research team from the University of Oklahoma has been studying these guys all summer on one of our wildlife management areas. This is a species of greatest conservation need, and huge thank you to the team for sharing these life altering clips

  #Oklahoma #wildlife #conservation #nature #outdoors #funny #biology #animals

- **Wildlife Department Partners to Study Red Slough Alligators**

Wild Side Article: July 21, 2022

- Delivered to 14,206 addresses; 5,763 Opens; 43 Unique Article Clicks

American alligators have been documented in southeastern Oklahoma as far back as the late 1800s, and the bulk of current population remains near the Red River and the present-day Red Slough Wildlife Management Area. To learn more about this species of greatest conservation need, the Wildlife Department has partnered with Southeastern Oklahoma State University, located in Durant, and Southwestern Adventist University, located in Keene, Texas.

For the next two years, the research teams will conduct a variety of surveys to get a headcount of alligators on the management area and evaluate the age and sex structure of the population. Individual alligators will also be tracked to learn more about their daily patterns, movements, and habitat needs. Additional surveys will be conducted off the management area to better evaluate the status of species in the state.

The companion projects both started on July 1 and are expected to continue until 2024.

See Appendix Figure 23.

Facebook: Posted 07/05/2022

- Likes 1.8K; Comments 335; Shares: 730

Don't mind us - we're just sliding into your feed to let you know the Wildlife Department has kicked off two alligator research projects at Red Slough Wildlife Management Area with our partners at Southeastern Oklahoma State University and Southwestern Adventist University. For the next two years, we'll be studying the native population, tracking individuals, and developing a long-term management plan for the species.

 Jared Wood

- **Texas Horned Lizards at Tinker AFB**

Wild Side Article: July 21, 2022

- Delivered to 14,206 addresses; 5,763 Opens; 51 Unique Article Clicks

Summer is the peak season of one of Oklahoma's most beloved reptiles, the Texas horned lizard. These spikey species of greatest conservation need forage primarily for ants and other insects by lying motionless along ant trails and capturing insects as they pass by. The lizards do best in sandy soils with moderate grass cover where they can easily navigate the landscape in the active season and can burrow in the ground during the dormant season.

This female Texas horned lizard is part of a squad of lizards found on Tinker Air Force Base, near Oklahoma City, which have been providing biologists with information about the species. It first joined the long-term study as a hatchling in 2018 and was tracked by University of Oklahoma and Oklahoma City Zoo staff for two years before shedding its tracker. It was recaptured in 2022 during a summer sweep of the study area and will once again share information about its movements with researchers.

See Appendix Figure 24.

- **Long-billed Curlews Make Long-distance Flights through Oklahoma**

Wild Side Article: August 25, 2022

- Delivered to 14,282 addresses; 5,995 Opens; 116 Unique Article Clicks

North America's largest shorebird, the long-billed curlew, has captured the attention of a research team working in the prairies of North and South Dakota. Their multi-year study focuses on the movements and habitat preferences of curlews as the birds nest in the Northern Plains states but also tracks curlew migrations through other states, including Oklahoma. This year the movements of nine birds have been tracked, eight of which flew through Oklahoma as they migrated south in June and July.

"We want to know more about how they're using the North Dakota landscape – how they're using grasslands and cropland and wetlands," said Sandy Johnson, Conservation Biologist for the North Dakota Game and Fish Department. "But we also want to know how long it takes them and what path they're taking to migrate south."

Long-billed Curlews Make Long-distance Flights through Oklahoma

See Appendix Figures 25 and 26.

Facebook: Posted 08/29/2022

- Likes 57; Comments 2; Shares: 7

It feels like summer is still far from over but that hasn't stopped the start of migration! Our friends in North Dakota have been tracking long-billed curlews, North America's largest shorebirds, as they nest and migrate. Eight of the nine birds tracked this year made use of Oklahoma airspace, with one bird touching down in the Panhandle.



- **MIGRATION UPDATE: Endangered Cranes Approach Oklahoma**

Notice to 2018-2022 HIP Holders

- Delivered to 117,500 addresses; 54,445 Opens; 167 Unique Article Clicks

Wild Side Notice: October 25, 2022 (video available on Outdoor Oklahoma)

- Delivered to 14,513 addresses; 6,032 Opens; 13 Unique Clicks (65 Unique Clicks for Video)

See Appendix Figures 27 and 28.

**SIGNIFICAN DEVIATIONS:**

There were no significant deviations that prevented us from completing the grant's objectives. We had three unanticipated constraints placed upon our ability to conduct some of our planned surveys, especially the Swift Fox track survey; however, we made progress in each area. Like many agencies, our travel was restricted during the height of the COVID pandemic between March of 2020 and March of 2021. We also experienced some personnel turnover with the departure of Matt Fullerton, the transfer of Curtis Tackett, and the arrival of Alex Cooper. Our Swift Fox survey was negatively affected by severe drought conditions that existed in western Oklahoma throughout the second half of the grant period.

**OVERMATCH:**

Final expenditures for this grant were higher than anticipated. All expenses incurred were within the scope of work as described in the project statement. ODWC drew reimbursement monthly, and federal funds were exhausted in the last month of the grant (September 2022) but not known until the final draw in October 2022. Even if the overrun had been anticipated, an amendment to add federal funding would not have been a necessary and efficient use of staff time, for a relatively minor cost overrun (62.4% federal share). This 3-year grant ended very close to the estimated budget and 65/35 cost share ratio.

**PREPARED BY:** Mark Howery, Wildlife Diversity Biologist  
Curtis Tackett, Wildlife Diversity Biologist  
Jena Donnell, Wildlife Diversity Information Specialist  
Alex Cooper, Research and Wildlife Diversity Biologist  
Kurt Kuklinski, Research and Wildlife Diversity Supervisor  
Oklahoma Department of Wildlife Conservation

**DATE:** 15 November 2022

**APPROVED BY:** Russ Horton, Wildlife Division Assistant Chief  
Oklahoma Department of Wildlife Conservation

Andrea Crews, Federal Aid Coordinator  
Oklahoma Department of Wildlife Conservation



### **Survey Team Evaluates Potential of Five River Segments for Alligator Snapping Turtles**

Conservation agencies and groups have been partnering for nearly two decades to release young alligator snapping turtles into four Oklahoma rivers as a way to restore the behemoth turtles in our state. After fine-tuning the release strategy and monitoring the growth and survival of the released turtles, the Wildlife Department is considering adding young turtles to more rivers. To find out which rivers are best suited as potential reintroduction sites we partnered with Missouri State University in 2018 to gauge the overall turtle community and habitat conditions of five river segments.

#### **Survey Highlights**

- More than 1,200 turtles were tagged and released as part of the survey; red-eared sliders made up nearly 70 percent of the captures. Eight species of turtles were documented, with the highest diversity rating in the Deep Fork River.
- Twenty alligator snapping turtles were found in two river segments. The majority were juveniles with an average weight of 9.6 pounds. The largest alligator snapping turtle captured and released during the study was a female that weighed 92.6 pounds.
- Alligator snapping turtles need different habitat characteristics at different stages of life. Survey sites with the turtles present typically had a low current, were shaded by a moderately full tree canopy and had tall, steep slopes.
- A stretch of the Neosho and Poteau rivers had reproducing populations of alligator snapping turtles that currently do not need to be supplemented. A second stretch of the Neosho River and its secluded tributaries are most suitable for future reintroductions.

Figure 1. Wild Side article from November 14, 2019.



# OKLAHOMA

DEPARTMENT OF WILDLIFE CONSERVATION

**WILD**

**SIDE**



DECEMBER 2019 EDITION



## Insights from a Decade of Wildlife Study

The Wildlife Department has long been dedicated to the discovery of what makes our fish and wildlife populations thrive. Sometimes that discovery starts with a search of the state to find where the animals are living, and sometimes the search leads to more questions. As we prepare to enter a new decade of wildlife study, we checked in with the Wildlife Department's Wildlife Diversity staff for their insights into research and surveys that have wrapped up in the past 10 years.

Figure 2. Wild Side article December 31, 2019.

## Report Texas Horned Lizard Sightings



Share your Texas Horned Lizard sightings with the Wildlife Diversity Program to help us better understand this fascinating reptile's current range. Reports can be submitted year-round online or the below form can be printed and mailed to the Wildlife Department.

Texas horned lizards are active in Oklahoma from early April through September and are usually found in open areas with sandy soil. Learn more about this species of greatest conservation need in the Wildlife Department's [online field guide](#).

[Submit Texas Horned Lizard Sighting](#)

Figure 3. Facebook posts: July 15, 2020 and August 26, 2020.



### Species Spotlight: Eastern Spotted Skunk

At least four species of skunk have been documented in Oklahoma, the striped skunk, hog-nosed skunk, western spotted skunk, and the secretive and occasional tree-climbing eastern spotted skunk. When compared to the more widespread and common striped skunk, the eastern spotted skunk is smaller in size; has several broken stripes on the sides and back; a spot on the forehead instead of a stripe; and is limited to rocky woodlands and grasslands.


Share your spotted skunk sightings with the Wildlife Department's furbearer biologist, [Jerrod Davis](#). Please include information about the location and habitat along with any available photos.

[Learn more in the Wildlife Department's Online Guide](#)

Figure 4. Wild Side Species Spotlight article November 20, 2020.

← Tweet



**Oklahoma Department of Wildlife Conservation**   
@OKWildlifeDept

...

The eastern spotted skunk is a skilled climber and will even use standing hollow trees as den sites. They are best differentiated from the common striped skunk by having a spot on their forehead. These secretive skunks are found in rocky outcrops in woodlands and prairies.



12:11 PM · Feb 19, 2021

Figure 5. Twitter tweet dated February 19, 2020.



*Brett Thompson/ODWC*

### **Endangered Birds Expected in Oklahoma**

After spending several months at nesting grounds in Canada, the wild flock of endangered whooping cranes is making the return trip to its wintering grounds in coastal Texas by way of the Great Plains. The first wave of migrating whooping cranes has reached our state and Oklahomans can help track the bird's migration path by sharing photographs and sighting details with the Wildlife Department.

Their entire journey can take nearly two months, and the first migrating family groups of cranes reach Oklahoma in mid- to late-October. The birds may touchdown in our wetlands or wheat fields for a few days to rest and refuel on crustaceans, other small animals, or grain before continuing on to Texas.

**[Help track their migration path across Oklahoma](#)**

Figure 6. Wild Side article from October 22, 2020.



/ Wildlife

## WHOOPING CRANE SIGHTING REPORT FORM

Oklahoma's Wildlife Diversity Program is tracking federally endangered whooping cranes as they migrate through the state. Complete the following report to help our biologists document where these unusual birds occur.

**How to Identify North America's Tallest Bird**

- Height: ~ 5 foot
- Wingspan: ~ 7 foot
- Adult is white with red facial skin.
- Black wingtips shown in flight.
- Neck and legs outstretched in flight.

[Whooping Crane Field Guide](#)

[USFWS Species Profile](#)

### ABOUT THE OBSERVER

First Name

Last Name

Address

Address 2

City/Town

State/Province

- None -

ZIP/Postal Code

Observer Phone

Observer Email

### ABOUT THE SIGHTING

Adults Observed

How many adults were observed?

Juveniles Observed

How many juveniles were observed?

Unknown Age Observed

How many individuals of unknown age were observed?

Figure 7. Wild Side article from October 22, 2020.



← Thread



9:02 AM · Jan 4, 2021

7 Retweets 2 Quote Tweets 33 Likes



**Oklahoma Department of Wildlife C...**  @OKWildl... · Jan 4, 2021 ...

Replying to [@OKWildlifeDept](#)

Biologists at our Oklahoma Fisheries Research Lab counted 132 primary teeth and 1,026 conical teeth for a grand total of 1,158 teeth!



Figure 8. Twitter tweet from January 4, 2021.

← Tweet



Oklahoma Department of Wildlife Conservation 

@OKWildlifeDept

...

The leopard darter, one of OK's 19 federally T&E species was never thought to be common and has only ever occurred in two states. The Wildlife Department teams up with the [@USFWS](#) and [@forestservice](#) to monitor the fish by conducting snorkel surveys in Ouachita Mountain streams.



8:03 AM · May 31, 2021

1 Retweet 6 Likes



Figure 9. Twitter tweet from May 31, 2021.

facebook

https://www.facebook.com/OKWildlifeDept/photos/a.262353923814227/4185096074873306/

Email or phone Password Log In Forgot Account?

Oklahoma Department of Wildlife Conservation (ODWC)  
June 14, 2021

The ODWC is working with several partners to see if a new technique that focuses on improving the overwinter survival of juveniles could help boost existing Texas horned lizard populations.

Eggs from Tinker Air Force Base were hatched at the Oklahoma City Zoo and Botanical Garden and the young lizards were reared over the winter before being returned to the base's natural reserves. Researcher Sam Elades and others with The University of Oklahoma will be tracking all 34 hea... See more

1.4K 290 481

Like Comment

Most relevant

Meredith Yarnold  
Had this dude hanging out in my yard yesterday.

39

See more of Oklahoma Department of Wildlife Conservation (ODWC) on Facebook

Log In or Create new account

## Report Texas Horned Lizard Sightings



Share your Texas Horned Lizard sightings with the Wildlife Diversity Program to help us better understand this fascinating reptile's current range. Reports can be submitted year-round online or the below form can be printed and mailed to the Wildlife Department.

Texas horned lizards are active in Oklahoma from early April through September and are usually found in open areas with sandy soil. Learn more about this species of greatest conservation need in the Wildlife Department's [online field guide](#).

Submit Texas Horned Lizard Sighting

Figure 10. Facebook post from June 14, 2021.

← Thread



Oklahoma Department of Wildlife Conservation

@OKWildlifeDept



The ODWC is working with several partners to find ways to improve the overwinter survival of juvenile Texas horned lizards in hopes of boosting existing populations! Lizard eggs from @Team\_Tinker were hatched at the @OKCZoo --



8:42 AM · Jun 14, 2021

6 Retweets 41 Likes



Figure 11. Twitter tweet from June 14, 2021.

← Thread



**Oklahoma Department of Wildlife Conservation** ✓  
@OKWildlifeDept



Where the young lizards were reared and overwintered before being returned to the base. Researchers with the [@UofOklahoma](#) will be tracking the head-started lizards throughout the summer.

Funding in part by SWG F20AF10405.



8:43 AM · Jun 14, 2021

1 Retweet · 5 Likes

Figure 12. Twitter tweet from June 14, 2021.

← Tweet



Oklahoma Department of Wildlife Conservation

@OKWildlifeDept



Summer can take biologists into the heart of Oklahoma, and sometimes requires a dip in a river. 🤿 Snorkel surveys done in partnership with the U.S. Fish and Wildlife Service and U.S. Forest Service, are a key method used to monitor Oklahoma's rare leopard darter populations.



9:30 AM · Aug 6, 2021

5 Retweets 2 Quote Tweets 28 Likes



Figure 13. Twitter tweet from August 6, 2021.



## TINKER "TOADS" LAND AT OKC ZOO FOR TEMPORARY DUTY

By Jena Donnell - Sep 23, 2021

[/ Outdoor Oklahoma](#) / [Journal](#)

Oklahoma's leading edge of the Texas horned lizard's range may not be as fortified as more western strongholds, but that hasn't stopped an eastern population from building a foundation of understanding for one of the state's most beloved reptiles.

The squadron of lizards found on Tinker Air Force Base near Midwest City and Del City is a unique example of urban-dwelling "horny toads" that serves as Oklahoma's most well-studied population. With nearly 20 years of research and monitoring behind it, this population has provided valuable insights into the species' daily needs and behaviors.

The population's downward trend, a story familiar to many lizard enthusiasts, is driving biologists to search for innovative ways to bolster the lizard's numbers. Plans to continue managing for quality lizard habitat remain firmly in place, but Tinker's natural resources staff also has called in reinforcements from the Sam Noble Museum at the University of Oklahoma and the Oklahoma City Zoo and Botanical Garden. Their current mission? To pioneer a trial head start program



Figure 14. Wild Side article and link from September 23, 2021.

**PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON**

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A NEW TROGLOBITIC CRAYFISH FROM OKLAHOMA  
(DECAPODA: ASTACIDAE)

BY HORTON H. HOBBS, JR. AND MARTHA R. COOPER  
*Smithsonian Institution, Washington, D.C. 20560*

With the discovery of *Cambarus (Jugicambarus) tartarus*, new species, in the subterranean waters of northeastern Oklahoma by Jeffrey H. Black, four members of the subgenus are known to have become adapted to a spelean existence. One of these, *C. (J.) cryptodytes* Hobbs (1941: 110) is found in the panhandle of Florida and southwestern Georgia, and three inhabit the Ozark region: *C. (J.) setosus* Faxon (1889: 237) in southwestern Missouri, *C. (J.) zophonastes* Hobbs and Be-  
dinger (1964: 11) in north-central Arkansas, and *C. (J.) tar-  
tarus*.

## **In Wild History: Rare and Unique Crayfish Discovered in Oklahoma Cave**

Oklahoma's cave life is wrapped in intrigue and filled with many unique and mysterious creatures. While much is yet to be discovered, biologists have long explored and shed light on our underground world. One such exploration, conducted 50 years ago on April 11, 1971, revealed a new and unique species of cave crayfish. Later named the Oklahoma cave crayfish, the colorless invertebrate is known only from 1.3 miles of underground passage in northeastern Oklahoma. This state-endangered species is one of [17 animals](#) that can only be found in Oklahoma.

While the Oklahoma cave crayfish is only known from two cave systems, both caves receive conservation protection.

---

Figure 15. Wild Side article from December 16, 2021.





*Prairie chub. Photo by Shannon Brewer*

## **Red River Research: Prairie Chub Lives a Life of Current Events**

In 2016, two years after an extensive drought dried out several western Oklahoma streams, the Wildlife Department's Streams Team surveyed the upper Red River basin and found an unmistakably resilient fish community. Among the hardy fish documented was the prairie chub, a species of greatest conservation need.

To get a better understanding of where the prairie chub can be found and more about their life cycle needs, the Wildlife Department partnered with researchers from Texas and Oklahoma from 2018 to 2021. Prior to the study, most of what biologists "knew" about this fish was based on research done on similar species.

[Read How the Fish Have Adapted to Harsh Conditions](#)

Figure 16. Wild Side article from March 24, 2022.



## RED RIVER RESEARCH: PRAIRIE CHUB LIVES A LIFE OF CURRENT EVENTS

By Jena Donnell - May 1, 2017

[/ Outdoor Oklahoma / Journal](#)

**Editor's Note:** In the March/April 2017 issue of *Outdoor Oklahoma*, author Jena Donnell provided an account of the Wildlife Department's Streams Team as the members conducted biological surveys at 48 sites on the Upper Red River in southwestern Oklahoma in an article titled "[Red River Research: Biologists Get Their Feet Wet During Streams Team's Survey](#)." In this article, she provides additional detail about one of the fish species the surveyors found, the prairie chub, which is unique to that area and is considered a species of greatest conservation need.

The fish found in Oklahoma's prairie rivers are survivalists. They eke out an existence during hot summers when rivers and streams often go underground, and they resurface when flows increase after a rain event.

While theirs is a risky lifestyle, Oklahoma's native fish are well-adapted to these flood-prone rivers and streams.

The Oklahoma Department of Wildlife Conservation Streams Team's recent sampling of the Upper Red River revealed an unmistakably resilient population.

Species considered to be of greatest conservation need, such as the prairie chub, were documented in the Upper Red River and some of its major tributaries two years after an extensive drought, when several western Oklahoma streams went dry.



The prairie chub is among 17 species of greatest conservation need that were documented by the Streams Team.

Prairie chub are only found in the Upper Red River basin that crosses the southwestern part of the state and parts of northwestern Texas. Breeding, or spawning, season for this species can extend from early spring to late summer, and biologists theorize the fish use the river's erratic flows to their advantage.

The bulk of prairie chub seem to synchronize spawning efforts in times of high flow, broadcasting their semi-buoyant eggs into the current to be carried

Figure 17. Link to *Outdoor Oklahoma Journal* article by Jena Donnell in *Wild Side* March 24, 2022.



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## THE WILD SIDE



### 4,352 Acres Enhanced by Prescribed Fire

Biologists are using prescribed fire to enhance the Wildlife Department's oldest management area, the [McCurtain County Wilderness Area](#). More than 4,000 acres were burned cooperatively with the Ouachita National Forest to keep the forest open for the federally endangered red-cockaded woodpecker.

[Read How Teamwork Makes the Dream Work](#)

Figure 18. Wild Side article from March 24, 2022.



*Whooping crane. Photo by Josh More/Flickr*

## **Migrating Cranes Expected to Make Spring Stops**

As the bird-watching calendar pushes further into spring, Oklahoma birders can look forward to the arrival of many migrating birds, including the whooping crane, a federally endangered bird whose wild flock numbers just over 500 birds. The spring migration is the first of the crane's two annual migrations and consists of a 2,500-mile flight north to Canadian nesting grounds, with brief stops in Oklahoma expected in early April. The return journey to coastal Texas wintering grounds will take place in late fall, with Oklahoma stopovers expected in late October and early November.

As one of North America's tallest and most rare birds, the whooping crane is fairly distinguishable. The bird has bright white feathers across most of the body, except for red feathers on top of the head and face and black wingtips seen only when in flight. Like the sandhill crane, the whooping crane has a long neck and legs that remain outstretched in flight, and a large rump bustle that helps identify birds standing in a field.

[Share Whooping Crane Sightings](#)

Figure 19. Wild Side article from March 24, 2022.



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## THE WILD SIDE



*Eastern whip-poor-will. Photo by Andy Reago and Chrissy McClarren/CC-BY-2.0*

### **New Survey Efforts Launch this Spring**

One of the first steps in conserving Oklahoma's fish and wildlife is documenting where the animals can be found, and how many can be found there. While this basic information is available for most game species, it is less broadly understood for species that aren't hunted or fished. That's why the Wildlife Department partners with universities and conservation groups to conduct field surveys of nongame species across their suspected ranges.

Figure 20. Wild Side article from April 21, 2022.



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## THE WILD SIDE



### **Survey of Oklahoma Lakes Bags Invasive Plants**

"It doesn't look like you're here to fish."

Priscilla Crawford, conservation biologist with the Oklahoma Biological Survey, heard that observation multiple times from 2016 to 2021 as she made her way to every Oklahoma public lake's boat ramp. Instead of carrying the fishing pole and tackle box

Figure 21. Wild Side article from May 26, 2022.






*Regal fritillary/Emily Geest*

## The Quest for an Uncommon Butterfly

In 2019, a survey team from Oklahoma State University embarked on a quest to find one of the rarest butterflies in Oklahoma, the regal fritillary. Over the course of three years, the team conducted more than 450 surveys across an eight-county area in northeastern Oklahoma's tallgrass prairie, finding nine individuals.

[Read More](#)

   **June 20 – 26 is Pollinator Week!** Celebrate Oklahoma's pollinator power by sharing your observations of these beneficial organisms and the native plants on which they rely!

[Share Your Sightings](#)

Figure 22. Wild Side article from June 23, 2022.



*Provided by Jared Wood.*

## **Wildlife Department Partners to Study Red Slough Alligators**

American alligators have been documented in southeastern Oklahoma as far back as the late 1800s, and the bulk of current population remains near the Red River and the present-day Red Slough Wildlife Management Area. To learn more about this species of greatest conservation need, the Wildlife Department has partnered with Southeastern Oklahoma State University, located in Durant, and Southwestern Adventist University, located in Keene, Texas.

For the next two years, the research teams will conduct a variety of surveys to get a headcount of alligators on the management area and evaluate the age and sex structure of the population. Individual alligators will also be tracked to learn more about their daily patterns, movements, and habitat needs. Additional surveys will be conducted off the management area to better evaluate the status of species in the state.

The companion projects both started on July 1 and are expected to continue until 2024.

[Get scholarly reports from other Oklahoma-based alligator surveys](#)

Figure 23. Wild Side article from July 21, 2022.





*Katherine Stroh*

## Species Spotlight: Texas Horned Lizard

Summer is the peak season of one of Oklahoma's most beloved reptiles, the [Texas horned lizard](#). These spikey species of greatest conservation need forage primarily for ants and other insects by lying motionless along ant trails and capturing insects as they pass by. The lizards do best in sandy soils with moderate grass cover where they can easily navigate the landscape in the active season and can burrow in the ground during the dormant season.

This female Texas horned lizard is part of a squad of lizards found on Tinker Air Force Base, near Oklahoma City, that has been providing biologists with information about the species. It first joined the long-term study as a hatchling in 2018 and was tracked by University of Oklahoma and Oklahoma City Zoo staff for two years before shedding its tracker. It was recaptured in 2022 during a summer sweep of the study area and will once again share information about its movements with researchers.

[Share Your Lizard Sightings with the Wildlife Department!](#)

Figure 24. Wild Side article from July 21, 2022.



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## THE WILD SIDE



### **Long-billed Curlews Make Long-distance Flights through Oklahoma**

North America's largest shorebird, the long-billed curlew, has captured the attention of a research team working in the prairies of North and South Dakota. Their multi-year study focuses on the movements and habitat preferences of curlews as the birds nest in the Northern Plains states but also tracks curlew migrations through other states, including Oklahoma. This year the movements of nine birds have been tracked, eight of which flew through Oklahoma as they migrated south in June and July.

"We want to know more about how they're using the North Dakota landscape – how they're using grasslands and cropland and wetlands," said Sandy Johnson, Conservation Biologist for the North Dakota Game and Fish Department. "But we also want to know how long it takes them and what path they're taking to migrate south."

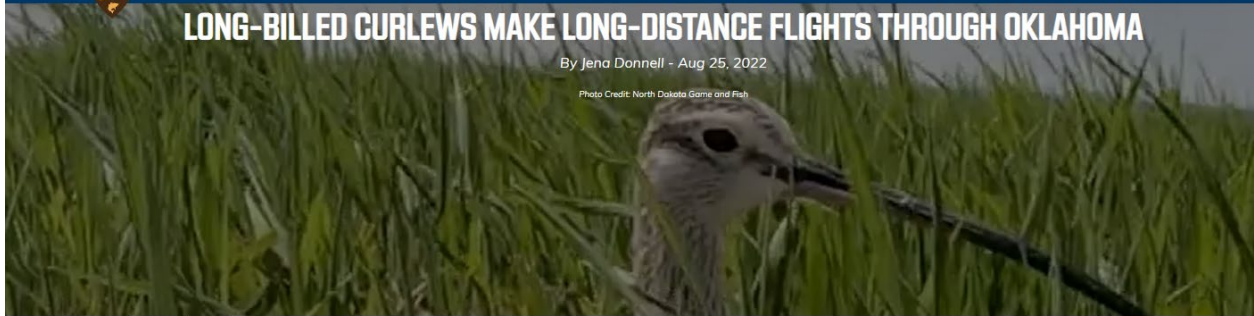
Figure 25. Wild Side article from August 25, 2022.



# LONG-BILLED CURLEWS MAKE LONG-DISTANCE FLIGHTS THROUGH OKLAHOMA

By Jena Donnell - Aug 25, 2022

Photo Credit: North Dakota Game and Fish



/ Outdoor Oklahoma / Journal



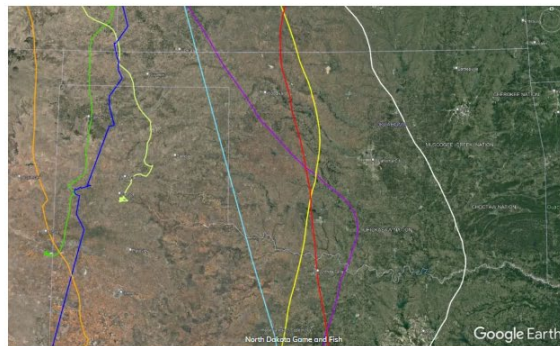
North America's largest shorebird, the long-billed curlew, has captured the attention of a research team working in the prairies of North and South Dakota. Their multi-year study focuses on the movements and habitat preferences of curlews as the birds nest in the Northern Plains states but also tracks curlew migration through other states, including Oklahoma. This year the movements of nine birds have been tracked, eight of which flew through Oklahoma as they migrated south in June and July.

"We want to know more about how they're using the North Dakota landscape – how they're using grasslands and cropland and wetlands," said Sandy Johnson, conservation biologist for the North Dakota Game and Fish Department. "But we also want to know how long it takes them and what path they're taking to migrate south."

By mid-July, all of the tagged curlews had started their southbound migration and were sending data back to Johnson and the research team. Eight of the nine tagged birds made use of Oklahoma airspace; seven flew directly over Oklahoma without stopping, and one landed in Texas County for about 20 hours before continuing south. The eight birds passed through Oklahoma in a 24-day window.



The migration of nine long-billed curlews were tracked from North and South Dakota to Texas and Mexico.



Eight of the nine tracked curlews made use of Oklahoma airspace; seven flew directly over Oklahoma without stopping, and one landed in Texas County for about 20 hours before continuing south.

Figure 26. Outdoor Oklahoma Journal article by Jena Donnell from August 25, 2022.



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*Endangered whooping cranes will often join flocks of sandhill cranes during their 2,500-mile migration. Look for the larger whooping crane's white body and black wingtips to distinguish the two species. (Courtesy Mike Endres)*

## **Endangered Cranes Approach Oklahoma**

One of North America's rarest birds, the federally endangered whooping crane, is nearing Oklahoma as it migrates south through the Central Flyway. Hunters afield can help the Wildlife Department track the crane's path through Oklahoma by sharing photos and sighting details at [wildlifedepartment.com](http://wildlifedepartment.com).

The first migrating family groups of whooping cranes typically reach Oklahoma in mid-to late-October.

Figure 27. Notice to 2018-2022 HIP Holders via email on October 20, 2022.




Learn more about the whooping crane migration in this *Outdoor Oklahoma Field Note!* (Photos by Brett Thompson and Mike Endres.)

## Species Spotlight: Whooping Crane

One of North America's largest and most rare birds is migrating through the Great Plains with expected stops in Oklahoma in mid- to late-October. **Whooping cranes** are best identified by their large white bodies and contrasting black wingtips which can be seen only when in flight.

The federally endangered birds are undertaking a 2,500-mile journey from nesting grounds in Canada to wintering grounds in coastal Texas. The birds may touch down in Oklahoma's wetlands or grain fields for a few days to rest and refuel before continuing to Texas.

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Figure 28. Wild Side article from October 25, 2022.