

Arkansas Wildlife Action Plan, State Wildlife Grants Proposal
Cover Page

Project Title: Surveys for grassland birds, Ornate Box Turtle, Arogos Skipper and Prairie remnant habitat

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Total funding requested: \$26,400

Source of matching funds: Total match will be a minimum of \$26,400. Matching funds will come primarily from salaries, benefits, and travel of Arkansas Natural Heritage Commission staff and Dr. Bill Baltosser. We project that a significant amount of in-kind match will come from volunteers from the Arkansas Herpetological Society, Central Arkansas Master Naturalist, and Herpetology classes at Arkansas State University and the University of Arkansas.

Project summary: Surveys will be conducted in the Arkansas Valley Ecoregion to determine the size and status of prairie and potential prairie remnants. This will provide critical data for conservation action strategies such as connecting currently protected prairie habitat and increasing prairie block size. Surveys will also be conducted for grassland birds, Ornate Box Turtle, and the Arogos Skipper.

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Surveys for grassland birds, Ornate Box Turtle, Arogos Skipper and Prairie remnant habitat

Need

Grassland birds and other grassland dependent species have declined dramatically due to habitat loss, degradation, and fragmentation. Habitat loss has followed large scale conversion of prairie habitats to agricultural and urban development. These developments, along with roads and other supporting infrastructure, have also created large scale fragmentation of habitat. This fragmentation has divided large blocks of contiguous habitat into smaller blocks that much too often are too small for many grassland dependent wildlife species to persist. In addition, in many cases the native grasses and forbs have been replaced by cool season non-native grasses and forbs in the few large blocks of remaining grassland habitat. Further, loss of ecological processes such as fire and browsing by native herbivores has resulted in a shift in the normal disturbance regime. Without the disturbance regime that occurred historically the structure and species composition of many prairies has slowly changed to that more typical of woodlands or even forests. Many wildlife species such as Painted Bunting (*Passerina ciris*), Henslow's Sparrow (*Ammodramus henslowii*), Ornate Box Turtle (*Terrapene ornata ornata*), Arogos Skipper (*Atrytone arogos*), Prairie Mole Cricket (*Gryllotalpa major*), and Northern Bobwhite (*Colinus virginianus*) do best in habitats that are frequently disturbed and support native grasses and forbs. Indeed, many of these species predictably disappear completely in the absence of such habitat and the remaining decline dramatically.

Arkansas, like many portions of eastern North America, has lost much of its grassland habitat. For example, the Grand Prairie Region of eastern Arkansas supported approximately 320,000 acres of tallgrass prairie prior to European settlement. There are now fewer than 600 acres of tallgrass prairie remaining in that ecosystem. Despite large scale loss of grassland habitat, prairie and savanna remnants remain scattered across the state. This is particularly true in the Arkansas Valley, where relatively large tracts of prairie are protected and other remnant prairie tracts of unknown status occur on privately owned land. Further, prairie habitat within the Arkansas Valley is in general surrounded by a large landscape of grassland habitat managed for grazing and hayfields. The Arkansas Valley Ecoregion contained extensive areas of tallgrass prairie and savanna at the time of European settlement which supported large populations of grassland dependent species such as Greater Prairie-Chicken (*Tympanuchus cupido*). Thus, this area contains great potential for habitat restoration at a scale that would benefit many grassland dependent wildlife species.

However, to maximize the efficiency of any strategy of conservation action in the Arkansas Valley we first need to identify the location, size, and status of remnant prairie patches. We need to know what is out there to be restored, what shape it is in, and its location relative to existing protected prairie and other land that could be potentially restored. This is far from trivial because the majority of grassland birds have declined since 1966, some with rapid population changes. These population declines cannot be offset without conservation actions at a scale that will protect area sensitive species and provide opportunities for a mosaic of habitat management prescriptions. Because habitat conversion continues to negatively impact prairie remnants, if we wish to conduct restoration activities to benefit the recovery of grassland birds we need to determine the location, size, and status of remnant prairie patches now before conservation action opportunities in the Arkansas Valley Ecoregion are lost forever.

To further maximize the efficiency of conservation actions in the Arkansas Valley we need to fill data gaps on Arkansas CWCS species of conservation concern. We need additional data on the status and distribution of grassland birds to help focus restoration efforts and to help better determine which birds are most in need of habitat restoration. We also need to better determine the distribution and abundance of other grassland dependent species such as the Ornate Box Turtle and the Arogos Skipper. Ornate Box

Turtles have declined dramatically due to loss of suitable habitat, collection for use in the pet trade, and the increase in roads which has led to road mortality and isolated populations. Current distribution and abundance data are inadequate for useful inferences regarding population size and trends. The Arogos Skipper is experiencing population declines over most of its range and is no longer considered to be common anywhere its range. In Arkansas this species is known only from Cherokee Prairie Natural Area. This is a prairie dependent species and NatureServe has identified surveys in prairie habitat as a global inventory need.

Project Objectives \ Goals

1. Determine the size and status of tallgrass prairie remnants in the Arkansas Valley Ecoregion and their locations relative to existing protected prairie and other land that could be potentially restored. This knowledge is critical for use in future restoration projects that are of the scale to increase the block size of high quality grassland areas as well as to provide opportunities of connecting protected prairie habitat. It also provides data that can help steer future grassland bird surveys. This objective addresses two of the AR State Wildlife Action (SWAP) conservation priorities: Arkansas Prairie and Grassland Initiative, Terrestrial Habitat, Increase Block Size and Connectivity and Arkansas Prairie and Grassland Initiative, Grassland Birds, Status and Distribution Surveys.
2. Increase knowledge of the distribution and abundance of grassland birds breeding and wintering in the Arkansas Valley Ecoregion. This type of information is lacking in much of the Arkansas Valley Ecoregion and is needed to better focus future restoration and monitoring efforts. This objective addresses the following AR SWAP conservation priority: Arkansas Prairie and Grassland Initiative, Grassland Birds, Status and distribution surveys.
3. Determine the approximate population size of the Ornate Box Turtle in protected prairie sites in the Arkansas Valley Ecoregion. Though known to occur in the Arkansas Valley in protected prairie sites, general abundance estimates are totally absent. Such information is needed to better assess population viability. This objective addresses the following AR SWAP conservation priority: Freestanding, Ornate Box Turtle, distribution and abundance assessment.
4. Increase knowledge of the distribution of the Arogos Skipper in the Arkansas Valley Ecoregion. This very rare grassland dependent species is currently known in Arkansas only from Cherokee Prairie Natural Area which is located in the Arkansas Valley. This objective addresses a need in the AR SWAP of collecting data on a species of conservation concern to fill a data gap.

Methods

Objective 1 will be addressed by “ground truthing” areas over a two year period in the Arkansas Valley Ecoregion (Figure 1) that were mapped as prairie remnant or potential prairie remnant by an AR Comprehensive Wildlife Conservation Strategy (CWCS) mapping project. This CWCS mapping project, conducted by The Nature Conservancy and the Arkansas Natural Heritage Commission, mapped habitat for the Arkansas SWAP. Areas were mapped as prairie remnant or potential prairie remnant based on a combination of different factors such as aerial photography, soil maps, and site surveys. However, site surveys were in many cases completed two to three decades ago and habitat use has potentially changed since the surveys were done. Therefore, new surveys need to be conducted to inspect the size and status of the prairie remnants or potential prairie remnants. The size of remaining remnants will be estimated and the status of each remnant will be categorized as poor, fair, or good. Status will be assessed by sampling vegetation using standardized methods.

Objective 2 will be addressed by conducting inventory over a two year period for breeding and wintering grassland birds in the Arkansas Valley Ecoregion in prairie remnants or potential prairie remnants that were surveyed for their size and status (see previous paragraph). Because some species

such as Henslow's Sparrow are not easily detected using standardized survey methods such as point counts, a variety of survey methods will be used. Inventory methods will include no distant line transects (Franzerb 1981, Bibby et al. 2000) and area searches (Ralph et al. 1993). Surveys will be conducted by ANHC staff and Catherine Rideout of Arkansas Game and Fish Commission (AGFC). Audubon Arkansas will provide professional expertise and will assist with surveys as needed and as time allows.

Objective 3 will be addressed by conducting inventory for Ornate Box Turtles in the spring of 2008. Inventory will be conducted by ANHC staff and numerous volunteers at Cherokee Prairie Natural Area, H.E. Flanagan Prairie Natural Area, and Presson-Oglesby Prairie Preserve. Kelly Irwin of AGFC will provide technical expertise and will assist with surveys as needed and as time allows. Inventory for box turtles will be conducted using strip transects and area searches beginning at 0730 and ending at 1200. This time span encompasses the peak daily activity (0800 to 1000) of ornate box turtles (Converse et al. 2002). ANHC staff and volunteers will work in groups to conduct timed searches. Searchers will walk transects in a fixed direction spaced 10-15 m apart along roughly parallel routes scanning the ground for box turtles. When a box turtle (ornate or three-toed) is found, data will be recorded as to time of observance, activity, age (adults or juveniles), sex, and location using a GPS unit.

Objective 4 will be addressed by conducting inventory for the Arogos Skipper over a two year period at Cherokee Prairie Natural Area, H.E. Flanagan Prairie Natural Area, Presson-Oglesby Prairie Preserve, and/or Massard Prairie within Fort Chaffee. Inventory efforts will be conducted by Dr. Bill Baltosser of the University of Arkansas at Little Rock Biology Department, whose research interests include Conservation Biology and Community and Population Ecology. Search methods will include a combination of area searches, spot-mapping, and transects following standardized methods established by Frazer (1973), Douwes (1976), Pollard (1977), Gall (1985), and New (1991). There are several "look-a-like" species in the State and thus positive identification will require knowledge, skill, patience, and flexibility in methodology. Identification is made more difficult because this species, as well as numerous other species of skipper, tends to keep its wings folded (thereby hiding key identification characteristics). To help offset this problem some individuals will be collected for identification and for vouchers. Additional considerations include the fact that, at least in Southwest Missouri, the Arogos Skipper has two broods; the first in June that produces the most individuals and another brood in mid-August into September (Heitzman 1996). However, according to Spencer (2006), the species is single brooded in Arkansas. The lack of a second brood in Arkansas may be real, an oversight due to rarity, or may vary from year-to-year. We hope this project will help clarify this issue.

Inventory methodologies will be entered in the Natural Resources Monitoring Partnership (NRMP) internet accessible database. All surveys in this project will be for inventory. Inventory is an effort to determine the location or condition of a parameter of interest (e.g., distribution, abundance) at a specific point in space and/or time, whereas monitoring is used to determine if there is change in a parameter of interest over time (e.g., progress toward meeting management objectives) (Elzinga et al. 1998). The NRMP is a collaborative effort led by the United States Geological Survey to improve monitoring efforts in order to drive effective management decisions and evaluation of those decisions. This important resource provides information to researchers on existing, tested monitoring methodologies.

Results / Outcomes

The results from this study will provide critical data for conservation action strategies such as prescribed burning, restoring native vegetation, connecting currently protected prairie habitat, and increasing prairie block size in the Arkansas Valley Ecoregion. The top recommendation by Vickery et al. (2000) for management of grassland dependent birds is to identify and protect large grassland sites (>100 ha). This prevents additional loss and fragmentation of habitat and provides suitable habitat for species that are area-sensitive, rare, or declining. Further, it provides the means for a strategy at a scale (>500 ha) that would allow a mosaic of different management prescriptions, which is important because some grassland dependent species differ in their preference for the time since disturbance in the habitat they use. We know where prairie remnants or potential prairie remnants occurred a few decades ago and this study will

help determine the status of those remnants, which is critical to the development and implementation of conservation actions in the Arkansas Valley.

Surveys for grassland dependent birds, Ornate Box Turtles, and the Aragos Skipper will help fill data gaps. This is important for understanding the distribution, abundance, and status of these Arkansas CWCS species of concern. These surveys will provide data that help focus conservation efforts to those areas where it is needed the most.

Updating the Comprehensive Wildlife Conservation Strategy

ANHC is committed to the success of the Arkansas SWAP and will provide updated information to the Arkansas CWCS database. ANHC staff will update the CWCS database at the AGFC office at the conclusion of this project.

Updating the Scientific Community

The Arkansas Natural Heritage Commission has presented and published numerous research and conservation papers to the scientific community. Several avenues frequently used to present research and conservation management techniques include but are not limited to the Arkansas Academy of Sciences or the Natural Areas Conference. One of these or other similar venues will be selected for presenting this project to the scientific community at the conclusion of this two-year project.

Making a Public Connection

Addressing, engaging and educating the public about species of conservation concern are keys to protecting and managing CWCS species of concern. As part of this project, we are dedicated to informing the public about the results of our Arkansas Valley Ecoregion project. This will be accomplished by using resources such as the internet, print media and/ or television media. The Arkansas Natural Heritage Commission frequently uses the associated press, local newspapers, television interviews or internet articles to inform the public and our partners of our conservation activities.

Timeline / Deliverables

All project objectives will be completed in two years from the start date. The projected start date is July 1, 2007 which is well into the summer. This will delay surveys for Ornate Box Turtle until 2008. Preliminary surveys for the Arogos Skipper and breeding season grassland birds will be conducted in 2007 given that much of the prime period for searching will have passed for that year. Prairie remnant surveys will be a continuous process throughout the project period. The following is a summary of the timing of project activities.

Task	July 2007 - Sept. 2007	Oct. 2007 – March 2008	April 2008 – Sept. 2008	Oct. 2008- March 2009	March 2009 – June 2009
Prairie remnant surveys	Begin	Continue	Continue	Continue	Complete
Grassland bird surveys	Breeding Surveys	Winter surveys	Breeding Surveys	Winter surveys	Complete
Ornate box turtle surveys			surveys		Complete
Arogos Skipper	Preliminary surveys		Majority of search efforts		Complete
Reports			Interim report		Final report (due within 90 days of project end date)

Species of greatest conservation concern that may be addressed in project

Northern Bobwhite (<i>Colinus virginianus</i>)	Henslow's Sparrow (<i>Ammodramus henslowii</i>)
Short-eared Owl (<i>Asio flammeus</i>)	Le Conte's Sparrow (<i>Ammodramus leconteii</i>)
Sedge Wren (<i>Cistothorus platensis</i>)	Painted Bunting (<i>Passerina ciris</i>)
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	Ornate Box Turtle (<i>Terrapene ornata ornata</i>)
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	Arogos Skipper (<i>Atrytone arogos</i>)

Estimated Cost

The estimated total cost of this project is \$52,800. The grant share is \$26,400 and the total match is \$26,400. Much of the match for the Ornate Box Turtle surveys will come from volunteer time (e.g., Arkansas Herpetological Society, Central Arkansas Master Naturalists, and university-level herpetology classes). The budget follows below.

<u>Item</u>	<u>Total</u>	<u>Match</u>	<u>Grant</u>
Salaries/Benefits			
Prairie remnant surveys	\$ 15,000	\$ 7,500	\$ 7,500
Grassland bird surveys	10,000	5,000	5,000
Ornate box turtle surveys	10,000	5,000	5,000
Subtotal	\$ 35,000	\$ 17,500	\$ 17,500
Operating Expenses			
Travel	5,800	2,900	2,900
Contract with Dr. Baltosser-Surveys for Arogos Skipper	10,000	5,000	5,000
Supplies	2,000	1,000	1,000
Subtotal	\$ 17,800	\$ 8,900	\$ 8,900
GRAND TOTAL	\$ 52,800	\$26,400	\$26,400

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Figure 1. All surveys will be conducted within the four counties highlighted above in the Arkansas Valley Ecoregion.

Qualifications of individuals and the organization involved

Organization: The Arkansas Natural Heritage Commission (ANHC) is charged with the responsibility of establishing and maintaining a System of Natural Areas. Natural areas are those lands specifically managed to preserve, and sometimes restore, natural communities that are now rare across the state. The ANHC also maintains the Natural Heritage Inventory, the central repository for information on rare species and natural communities in Arkansas. The Natural Heritage Inventory gathers information on the location of rare species and natural communities in the form of Element Occurrence Records. Data from the Natural Heritage Inventory are commonly used as a tool in land conservation programs, environmental review/information sharing, and habitat management plans.

Project Leader: Bill Holimon is an Ornithologist and is Chief of Research for the Arkansas Natural Heritage Commission. Bill received a B.S. in biology from the University of Arkansas at Little Rock and an M.S. in biology from New Mexico State University. Bill previously worked for The Nature Conservancy in Texas on conservation of two federally listed endangered bird species, the Golden-cheeked Warbler (*Dendroica chrysoparia*) and Black-capped Vireo (*Vireo atricapilla*). In addition, he has conducted extensive work on various taxa of Red Crossbills (*Loxia curvirostra*) throughout North America. Bill is a native Arkansan who has published three scientific papers on rare birds of Arkansas; two on grassland birds and the third on the endangered Red-cockaded Woodpecker (*Picoides borealis*).

Jennifer Akin is a Plant Community Ecologist for the Arkansas Natural Heritage Commission. Jennifer received a B.S. in biology and an M.S. in botany both from the University of Arkansas at Fayetteville. Jennifer has worked for The Nature Conservancy documenting the recovery of restored wetland and uplands and the National Park Service performing surveys in over two hundred vegetation types in the Sierra Nevada Mountains for production of a vegetation map. She has published two scientific papers on algae in relation to aquatic vegetation in Arkansas.

Doug Fletcher is a herpetologist and is the Chief of Stewardship for the Arkansas Natural Heritage Commission. Doug received a B.S. in Wildlife Management and a M.S. in Biology from Arkansas State University at Jonesboro, Arkansas. He has worked for over seven years in applying concepts of conservation biology to natural resource management for the Arkansas System of Natural Areas. He has published on a variety of animal species found within the state, including county records.

Michael D. Warriner is a field ecologist with the Arkansas Natural Heritage Commission. In that role, Warriner conducts surveys on animal species of conservation concern, particularly invertebrates. He also coordinates citizen-science activities for the agency, including forming partnerships with volunteer groups. Warriner holds B.S. and M.S. degrees in biology.

Dr. Bill Baltosser is a Professor in the Department of Biology at the University of Arkansas at Little Rock. His research interests include conservation biology and community and population ecology. Dr. Baltosser is currently conducting a study in Arkansas on Diana Fritillary (*Speyeria diana*), a butterfly that is an Arkansas CWCS species of concern. He has conducted research on a variety of butterflies in Arkansas and New Mexico.

Catherine W. Rideout has worked as the Passerine Bird Program Coordinator at Arkansas Game and Fish Commission since 2003. She received a B.S. degree in Biology at Davidson College in North Carolina in 1994 and an M.S. degree in Biology from Boise State University and has been represented AGFC by participating in Joint Ventures and Partners in Flight. She coordinates bird conservation and management of nongame birds for the agency and is a member of the Wildlife Society and several ornithological societies.