Occurrence of the chicken turtle, *Deirochelys reticularia*, on Arkansas Wildlife Management Area Lands

SUMMARY

A presence/absence survey for the chicken turtle, *Deirochelys reticularia*, will be conducted over the two-year time frame on Arkansas Wildlife Management Area (WMA) lands. Using several sampling techniques, the occurrence of chicken turtles will be established on selected WMA's in order for the Arkansas Game and Fish Commission to effectively manage for the presence of this species-of-concern in the state. To date, there have been no targeted surveys for the chicken turtle in Arkansas. This proposal addresses the priority action to determine the distribution and the presence/absence of the chicken turtle on Arkansas Wildlife Management Area lands as outlined in the Request for Proposals.

PROJECT LEADER

Dr. Ben Cash, Professor and Chair, Department of Biology, University of Central Arkansas, Conway, AR 72035, wbcash@uca.edu, 501-269-7365.

PROJECT BUDGET

SWG amount requested: $58,000

Match amount provided: $42,200 (*satisfies both the 35% and 50% match requirement outlined in the Request for Proposals)

Project total: $100,200

PROJECT STATEMENT

a. Need

The Arkansas Game and Fish Commission and Arkansas Natural Heritage Commission consider the chicken turtle, *Deirochelys reticularia*, as very rare and at risk of extirpation from the state. This freshwater turtle of the Family Emydidae ranges throughout most of the Atlantic Coastal Plain and the Gulf Coastal Plain and into the southern reaches of the lower Mississippi River Valley (Ernst et al., 1994). There are two recognized subspecies; the eastern chicken turtle (*D. reticularia reticularia*) and the western chicken turtle (*D. reticularia miaria*) (Ernst et al., 1994). Arkansas populations are designated as belonging to the western chicken turtle subspecies. Chicken turtles are typically found in association with rivers and streams and the floodplain wetlands found in the riparian zones of these habitats as well as isolated ephemeral wetlands (Trauth et al., 2004). Their natural history, making use of temporary aquatic habitats, makes them unique among freshwater turtles (Buhlmann et al., 2009). The first step in determining the conservation measures needed for this unique species in Arkansas is determining where it occurs; first on state lands as the funding priorities outline clearly. No systematic surveys exist for the chicken turtle statewide. I propose to determine the presence or absence of chicken turtles on Arkansas Wildlife Management Areas.

b. Purpose and Objective

The main objective of the project will be to determine the presence or absence of chicken turtles on Arkansas Wildlife Management Area lands. At minimum, these data will provide the Arkansas Game and Fish Commission (AGFC) with important knowledge in order to make basic conservation management decisions. Secondarily, all pertinent life history data will be collected on individual chicken turtles encountered and these data will be made available to AGFC. The project will also fulfill a significant part of the degree program of a graduate student in our program. I will work closely with this student throughout the duration of the project.

c. Location

There are approximately 132 Wildlife Management Areas in Arkansas (AGFC personal communication). I estimate that 60% of the WMA lands are found within the area that *could* potentially support chicken turtle populations. Chicken turtles have the potential to occur in all ecoregions of Arkansas except the Boston and Ozark Mountain regions. However, all potential historical records of the turtle will be investigated. A systematic process of assessment of all WMA's within the potential occurrence of the chicken turtle will be conducted and evaluated for the existence of available habitat.

d. Approach

The first step to successfully approach the stated priority action provided by the AGFC is to evaluate the potential for habitat to occur on each WMA. Efforts will be

taken to gather information on the habitats that exist on every WMA by working closely with AGFC biologists and by review of the existing historical records available for chicken turtles. Once the WMA lands are ranked for their potential to support chicken turtle populations, presence/absence surveys will be conducted using baited and unbaited hoop nets with leads (3-5 meters in length) within the suitable aquatic habitats. Sampling will occur year-round depending on the climatic factors, however, ideal months for sampling are March through October. When turtles are encountered, basic life history information will be recorded and turtle will be marked with a unique identifying number by notching the marginal scutes following Cagle (1939) and photographed. No turtles will be taken from the population.

e. Expected Results and Benefits

Freshwater turtles provide an excellent system for investigating behavioral and physiological responses to perturbations or seasonal changes in habitat quality. Through their evolutionary and individual longevity, turtles have clearly demonstrated a remarkable ability to persist through periods of environmental change. I have chosen this system because of the life history characteristics of the chicken turtle and its inhabitance in an ecosystem that is dynamic in nature and susceptible to ecological and anthropogenic perturbations. However, the timing and extent of perturbations may vary in their impact on survivorship and reproduction. The research will provide valuable information concerning the presence or absence of a turtle deemed rare and susceptible to extirpation in the state. The data collected from this survey can be used by the state of Arkansas to make management decisions and to outline further research on identified populations. I will use data to design further studies determining when habitat perturbations may have their greatest impact on survival and reproduction and to describe aspects of the hormone physiology of the chicken turtle. From this research, I hope to gain insight into how chicken turtles respond to changes in habitat quality from both a behavioral and physiological standpoint.

f. Budget

*My minimum matching contribution meets both the 35% and 50% goal of the Request for Proposals guidelines.

Category	**Amount**
State Wildlife Grant Request	
Graduate Assistant – Salary, tuition and fees – $19,500 per year	$39,000
Undergraduate Student Workers - $3000 per year	$6000
Travel (mileage and lodging) - $4000 year 1; $3000 year 2	$7000
Materials and Supplies - $4000 year 1; $2000 year 2	$6000
Total Funds Requested	**$58,000**
UCA Matching Funds Provided	
Matching 10% effort per year plus fringe benefits	$26,200
Cash Match - $5000 per year	$10,000
Boat and equipment use	$6000
Total matching funds (*satisfies both the 35% and 50% match categories)	**$42,200**

QUALIFICATIONS

I (Ben Cash) received a Ph.D. in Biology from the University of Mississippi in 2000 and have worked on the biology of turtles for most of my career. My research focuses on the physiology and behavior of turtles. I also have extensive experience in surveying for reptile and amphibian species throughout the Southeastern US. I have completed broad based surveys in ephemeral wetland habitats in southeastern Georgia and I conducted the reptile survey of Great Smoky Mountains National Park as part of the All Taxa Biodiversity Inventory of the park. My current research focuses on wetland dynamics in northern Manitoba, Canada as well as chicken turtle and wood frog research in Arkansas.

REFERENCES

Buhlmann, K.A., J.D. Congdon, J.W Gibbons and J.L. Greene. 2009. Ecology of chicken turtles (*Deirochelys reticularia*) in a seasonal wetland ecosystem: Exploiting resource and refuge environments. Herpetologica, vol. 65, no. 1, pp. 39-53.

Cagle, F. R. 1939. A system for marking turtles for future identification. Copeia, 170-173.

Ernst, C. H., R. W. Barbour, and J. E. Lovich. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington.

Trauth, S.E., H.W. Robison, M.V. Plummer. 2004. The Amphibians and Reptiles of Arkansas. The University of Arkansas Press, Fayetteville. 421 pp.