A. Title: Distribution and habitat use of Bell's vireos and willow flycatchers in Central Arkansas

B. Project summary: My first goal is to develop management protocols to reestablish breeding populations of willow flycatchers in Arkansas. My second goal is to determine how best to manage habitat for Bell's vireos in conjunction with willow flycatchers. Breeding season surveys for willow flycatchers and Bells vireos will be conducted in potential habitat within the Arkansas River Valley. Frog Bayou, Ed Gordon, Galla Creek, Petit Jean River, Bell Slough wildlife management areas and Holla Bend National Wildlife Refuge all contain potential habitat for both species. I will compare occupied and unoccupied habitat so that I can determine which management activities lead to development of suitable habitat for each species. I will also determine whether willow flycatchers are breeding in any of the habitats.

C. Project Leader: Dr. Chris Kellner

D. Affiliation: Professor of Wildlife Science, Arkansas Tech University

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F. Address: Biology Department, Arkansas Tech University, Russellville, AR 72801

G. Phone: (479) 964-0830

H. Project Partners: None

I. Total Cost: $83,642.00

J. SWG (AWAP) Share: $62,116.00

K. Amount and Source of Cooperator Match: Arkansas Tech University will provide $**21,741.00** in salaries (35% of AWAP Share) in matching funds. If the match increases to 50% Arkansas Tech will increase the match with additional salaries.

Project Statement

A. Need

My proposal specifically addresses a need to manage habitat for Willow flycatchers (*Empidonax traillii)* and Bell's vireos (*Vireo bellii*) which are listed as species of conservation interest within Arkansas. Historically, both species were common in suitable habitat within Arkansas and the surrounding states (James and Neal 1986). Unfortunately, populations of both species have declined severely in our region (Sauer et al. 2008). Currently, the only known breeding population of willow flycatchers in Arkansas consists of three pairs located on Baker Prairie in Boone County (Holimon and James 2003). Populations of Bell's vireos have also declined in Arkansas (18.9 % per year from 1966 – 2007; Sauer et al. 2008). Population declines in both species are associated with loss of early successional habitats in prairies and riparian areas. My focus will be on developing techniques to manage early successional riparian habitats in the Arkansas River Valley.

Research conducted at Holla Bend National Wildlife Refuge during the spring and summer of 2010 and 2011 showed that both species used early successional habitat created by initiating reforestation on agricultural areas. During the breeding seasons of 2010 and 2011 willow flycatchers were seen in several reforestation plots (several copulations were observed and one incomplete nest was found). Early successional habitat similar in structure to that found at Holla Bend can be found at several AGFC wildlife management areas within the Arkansas River Valley (Brad Carner, pers. comm., C.K., pers. obs.) and I expect to find both species among those habitats. Unfortunately, willow flycatchers and Bell's vireos are restricted to early successional habitats (Brown 1993, Sedgwick 2000); which are only suitable for a few years (observations at Holla Bend suggest about a five year window of suitability). Consequently, the opportunity to conduct this research in Arkansas is limited to the next few years.

B. Objectives

Five objectives for this project are to: 1) Provide recommendations to AGFC for managing early successional habitats for Bell's vireos and willow flycatchers. Ultimately, my recommendations would be aimed at reestablishing breeding populations of willow flycatchers in the Arkansas River Valley and

maintaining populations of Bell's vireos. 2) Determine the size and distribution of breeding populations of willow flycatchers and Bell's vireos in the Arkansas River Valley. 3) Obtain detailed information on the habitat structure that both species use. 4) Determine features of the habitat that are associated with nesting.

C1. Expected Results

I expect to find a small number of willow flycatchers among managed reforestation plots within AGFC management areas. At Holla Bend NWR, willow flycatchers used three of the ten plots that were studied. In contrast, I expect to find breeding populations of Bell's vireos wherever appropriate habitat exists within the Arkansas River Valley. They bred in every young, regenerating bottomland hardwood forest plot at Holla Bend National Wildlife Refuge in 2010 and 2011 (C.K. unpubl. data).

C2. Benefits

My research is designed to determine which habitat features are associated with habitat use by breeding willow flycatchers and Bell's vireos and also to determine which management procedures were used to produce that habitat. In other words, the results of my research could provide a clear view of how to create and manage habitat for willow flycatchers and Bell's vireos in the Arkansas River Valley. By choosing to create and manage such habitat, we could increase the abundance of willow flycatchers and maintain stable populations of Bell's vireos in the Arkansas River Valley. Further, while not specifically addressed in this proposal, other species of conservation concern would also benefit from management of regenerating bottomland hardwoods in an early successional state. In particular, large numbers of northern bobwhite (*Colinus virgianus*) used regenerating bottomland hardwood plots at Holla Bend during the breeding season. I have also observed Lecont's sparrows (Ammadramus lecontei) and northern harriers (*Circus cyaneus*) using the young regenerating plots during the winter.

D. Approach

My field assistants and I will conduct systematic searches of appropriate habitat for Bell's vireos and willow flycatchers. Bell's vireos sing constantly during the spring and will be easy to find. We will use playback of willow flycatcher songs to aid in locating reluctant singers and females. To locate nests,

we will use area concentrated searches within territories of both species and we will monitor those nests to determine their fate. Vegetation will be characterized following published recommendations.

E. Location of Work

Research will be conducted in the Arkansas River Valley, primarily at Galla Creek, Petit Jean, and Ed Gordon WMA's but I may conduct some surveys of Frog Bayou and Bell Slough. Finally, I will also conduct some surveys at Holla Bend National Wildlife Refuge.

F. Budget

Salaries ….....….....…….....…. $ 18,796.00

Graduate Research Assistant…..…..……..……$ 38,820.00

Supplies….....……...…....……...…….. $ 500.00

Travel ….....….....……... $ 4,000.00

Amount requested AWAP…….…….$ 62,116.00

ATU Match……. $ 21,741.00*

TOTAL COST..….....…….…….....……..……$ 83,857.00

Summary of Qualifications of Dr. Chris Kellner

EDUCATION

Ph.D.	1990	University of Arkansas	Major: Zoology
M.S.	1985	Eastern Kentucky University	Major: Biology
B.S.	1978	University of California Berkeley	Major: Forestry

Currently employed as a full professor of Fish and Wildlife Science at
Arkansas Tech University - August 1991 to present

Research Experience:

I spent last year studying nesting success and habitat use by Bell's vireos and willow flycatchers at Holla Bend National Wildlife Refuge. The approach and objectives of that study were facilitated by my previous experience in avian research. In particular I have spent many years evaluating avian habitat of various species including cerulean, and prairie warblers, yellow-breasted chats and northern bobwhite quail. I am also experienced in using mist nets to capture birds and in general censusing techniques.

Publications:

My last publication was:

Kellner, C.J., J.C. Bednarz, S. Fowler, R. J. Baxter, K. Labrum, J. Cowan. 2009.
Response of bobwhite populations and the associated avian community to landscape-level management in Arkansas pp 129-146 in Burger Jr. L.W. and K.O. Evans Mississippi State Univ. (eds.) Managing working lands for Northern Bobwhite The USDA NRCS bobwhite restoration project. U.S. Dept. of Agriculture, Natural Resources Conservation Service 2009

My next publications will be:

Kellner, C.J. and E.L. Combs. Influence of controlled burning and group-selection timber harvest on abundance of cerulean warblers in the Ozark National Forest.

Sedgwick, D. and C.J. Kellner. Effects of endophyte infected tall fescue on egg size and chick weights in eastern bluebirds.

Institutional Qualifications:

Arkansas Tech currently supports a graduate program in Fisheries and Wildlife Science

Since 2002 23 students have successfully defended their theses at Arkansas Tech (6 under my direction).

Arkansas Tech has the capability to administer the grants and we have the faculty expertise to guide students to a successful completion of their degree.