FINAL REPORT

SECTION 6

ENDANGERED SPECIES ACT

FEDERAL AID PROJECT E-22

Management and Cave Protection for the
Ozark Big-eared Bat (*Corynorhinus townsendii ingens*)

SEPTEMBER 27, 1993 - SEPTEMBER 26, 1998

Final Report

State: Oklahoma

Project Number: E-22

Project Period: September 27, 1993 - September 26, 1998

Project Title: Management and Cave Protection for the Ozark Big-eared Bat (*Corynorhinus townsendii ingens*)

Abstract:

Protective gates/grills were constructed within nine entrances to six caves which were identified as important maternity sites or hibernacula for the Ozark big-eared bat in the species recovery plan. Eight of these gates/grills were constructed within previously unprotected caves, and one gate was constructed to replace a vandalized gate originally constructed in 1982. Monitoring of these gates has demonstrated that they are effective at deterring human disturbance and do not have a negative effect on bat usage of these cave. At least two caves, AD-13 and AD-21 have shown an increase in their use by Ozark big-eared bats. Continued monitoring may demonstrate increases in bat use at other caves over time.

Objective:

To locate, determine ownership, develop and implement protection/management plans for caves inhabited by Ozark big-eared bats in eastern Oklahoma.

Introduction:

Bats fulfil an important ecological role as controllers of night-flying insects (Tuttle 1987). The disturbance of bats at maternity roosts and hibernacula by humans has been a major cause for population declines in many cave dwelling species including the Ozark big-eared bat (McCracken 1989, Tuttle 1979). Although bats are relatively long-lived, they have very low reproductive rates and once populations decline, they recovery at a slow rate. It is for this reason that conservation efforts concentrating on the protection of bat roosts, especially caves, may be the most important issue in bat conservation (American Soc. Mamm. 1992). Certain caves in eastern Oklahoma which serve as habitat for Ozark big-eared bats need protection from human disturbance in order to maintain and enhance their bat populations (Grigsby and Puckette 1982, U.S. Fish and Wildlife Service 1993). The construction of gate/grill systems and fences are needed at cave openings to serve as deterrents to human entry while allowing bats to freely enter and leave their roosts inside the cave (U.S. Fish and Wildlife Service 1982, 1993).

Objective:

To locate, determine ownership, develop and implement protection/management plans for caves inhabited by Ozark Big-eared and Gray Bats in eastern Oklahoma.

Expected Results/Benefits:

Prior to the initiation of this project endangered bat populations had been protected by gate/grill systems in three caves in northeastern Oklahoma. These caves located in Adair, Delaware and Cherokee counties are still utilized by maternity colonies of Gray Bats (Grigsby and Puckette, 1982 and Grigsby et al, 1991). The incorporation of this project was intended to assist in bringing the Ozark Big-eared Bat population in Oklahoma up to optimum levels, and to continue the protection efforts previously initiated at Gray Bat caves in eastern Oklahoma. These efforts may allow for re-colonization of previously known caves that were historically inhabited by these species (Grigsby and Puckette, 1984). The gate/grill system design that was utilized in these caves was patterned after similar systems in Oklahoma and Virginia that have been successful in deterring human entry and have proven to be "bat friendly". The structures were placed inside each cave approximately 25'-50'. This internal placement has proven to be less of an obstruction to bats than external systems both in Oklahoma and other states. Similar internal structures have been successful at caves inhabited by gray bat maternity colonies at DL92 in Delaware County, AD-8 in Adair County, and CZ-9 in Cherokee County, Oklahoma.

Results:

Nine entrances to caves that are utilized by a variety of cave fauna were protected by internal gates during the project period. The following is a brief narrative report of the gating projects that were completed during the project period 1993-98.

Site AD-13:

Site AD-13 is a cave located in Adair County that is periodically inhabited by a small maternity colony of endangered Big-eared bats. Several years of population increases in the colony were followed by three years of marked declines in 1991-93. The population estimate for the site in 1993 indicated that the population was at its lowest point since estimates began in 1984. Both verbal and written permission to construct a deterrent system inside the cave was obtained from the landowner in September 1993. Preliminary excavation and construction plans were initiated in October 1993. Actual construction of the gate/grill system began in early December and was completed on January 22, 1994.

The highest maternity population estimates for this Big-eared Bat site was 150 individuals in July 1989. This number steadily declined to an estimate of less than 10 bats in 1993. A gate/grill system was installed during the first year of the current project in early 1994. Subsequent annual monitoring efforts place the population between a low of 10 bats in July 1994. to a recent high population estimate of 40 bats in July 1996.

Site AD-15:

Site AD-15 is a cave located in Adair County that is inhabited by a maternity colony of Big Brown bats (*Eptesicus fuscus*) and limited numbers of hibernating Ozark Big-eared bats, Gray bats, and Eastern Pipistrels (*Pipistrellus subflavus*). Prior to the initiation of management procedures the colony was unprotected, and had received repeated human disturbance and vandalism. Surrounding vegetation and habitat were also threatened by encroachment and clearing. Verbal permission to construct a deterrent system inside the cave was obtained from the landowner in March 1994. Preliminary excavation and construction plans were discussed at that time. Actual construction of the gate/grill system began in April and was completed in June 1994.

Annual winter surveys of this cave in 1995-96 continue to indicate hibernacula use of generally 0-2 big-eared bats as a hibernacula. A summer survey to the cave in June 1995 noted a maternity colony of big brown bats estimated at approximately 125 bats.

SITE: AD-21

This cave is located in Adair County and is inhabited by small numbers of hibernating Ozark Big-eared bats and Big Brown Bats. Prior to the initiation of the management procedures the colony was unprotected from human disturbance. Verbal permission to construct a deterrent system inside the cave was obtained from the landowner in September 1994. Preliminary construction of the gate/grill system began in October, and was completed in December 1994.

Annual winter surveys of this cave continue to indicate hibernacula use of generally 1-2 Big-eared Bats. A monitoring visit to the cave in July and September 1995 noted two big-eared bats during each visit. These were the first non-hibernacula uses noted by the bat at this cave.

SITE: AD-14

This cave system is the largest limestone system known to exist in the state of Oklahoma. With as many as 14 different entrances it is difficult to manage and monitor. The system has a widespread reputation among recreational caving grottos and

therefore receives a large amount of human disturbance annually. The system as a whole is known to be utilized by the Big-eared bat, but to what extent is not known due to severely limited access by landowners in the past. On a monitoring visit to one entrance in September 1995 four species of bats were captured in a Harp Trap and then released. These species were the Gray Bat, Northern Long-eared Bat (*Myotis septentrionalis*), Eastern Pipistrell, and Red Bat (*Lasiurus borealis*). Four entrances to this system were gated during the course of the project period. The system has been targeted for aggressive management and protection due to its importance both geologically, and from an endangered wildlife perspective. Many of the entrances are now a part of the Bat Caves National Wildlife Refuge in eastern Oklahoma, managed by the U.S. Fish and Wildlife Service.

Site: DL-34

This cave contains past guano remains from gray bat usage, but is not currently being utilized by the species. It has been identified in the past as an Ozark Blind Cavefish (*Amblyopsis rosae*) and an Ozark Blind Crayfish (*Cambarus* sp.) site. In spite of excessive human entry and vandalism at the site the landowners were very reluctant in the past to allow a gate/grill system to be placed within the cave. A visit was made to the site in July 1996 to discuss future protection plans with the landowners, and permission was granted to place a restrictive gating system inside the cave. After permission was received we monitored the cave and noted one Blind Crayfish in a clear pool within 100' of the cave entrance. On a second visit to the site in August 1996, a Blind Cavefish was noted in the same pool. On this second visit construction of the gate system was initiated. The gating project for this cave was completed in December 1996.

Site: AD-8

This cave has historically been utilized by a maternity colony of endangered Gray Bats. The cave was initially protected by the installation of an internal grill system in 1982 that has since been vandalized, allowing human entry into the cave. During a preliminary visit to the site in August 1997, it was determined that the cave has not been inhabited by a maternity colony of gray bats for at least the previous two maternity seasons. Indications of human entry and disturbance to the colony were very evident. During the monitoring visit to the site in August, permission to replace the existing grill structure with a new one was sought, and granted from the current landowner. These objectives were completed on December 22, 1997.

An inspection of the grill system was conducted on February 7, 1998. There were four species of bats noted as utilizing the cave: Gray bats, Eastern Pipistrelles, Northern Long-eared bat, and Big Brown bats.

During the course of this project, we constructed cave gates/grills at nine entrances to six biologically important Ozark caves. Our results indicate that gate/grill structures which follow our designs and are constructed within the entrances of caves, are effective at deterring human disturbance to bat maternity colonies and hibernacula and do not diminish bat use of these caves. The Recovery Plan for the Ozark big-eared bat identifies at least another seven important caves for this species in Oklahoma which currently are not protected. In addition, recent field work indicates that gray bats regularly inhabit at least 10 unprotected caves in Adair, Delaware, Cherokee and Ottawa counties. We recommend continuation of this project to further these efforts to protect important bat caves in the Ozark region. Depending upon funding and landowner cooperation, we plan to develop and implement protection plans for caves CZ-9, DL-34 and OT-13 in the near future. Each of these is an important gray bat maternity site. In subsequent years, we will concentrate our effort on the following Ozark big-eared bat caves: AD-3, AD-10, additional entrances to AD-14, AD-16, AD-17, AD-125 and DL-21.

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Literature Cited:

American Society of Mammalogists. 1992. Guidelines for the protection of bat roosts. J. Mamm. 73:707-710.

Grigsby, E.M. and W.L. Puckette. 1982. A study of three endangered bats occurring in Oklahoma. Report to the U.S. Fish and Wildlife Service: Contract number 14-16-0002-81-202. 53 Pp.

Grigsby, E.M. and W.L. Puckette. 1984. A study of three endangered bats occurring in Oklahoma. Report to the U.S. Fish and Wildlife Service: Contract number 14-16-0002-81-202. 23 Pp.

McCracken, Gary F. 1989. Cave conservation: Special problems of bats. National Speleological Society Bull. 51:49-51.

Skeen, J., E.M. Grigsby, W.L. Puckette, and K.W. Martin. 1991. Gray bat (Myotis grisescens) and Ozark big-eared bat (Plecotus townsendii ingens) cave protection. Report to the Oklahoma Department of Wildlife Conservation. Project E-9 12Pp.

Tuttle, M.D. 1979. Status; Causes of decline and management of endangered gray bats. J. Wildl. Manag. 43(1):1-17.

Tuttle, M.D. 1987. The importance of bats. Natural Science. April: 203-209.

U.S. Fish and Wildlife Service. 1982. A recovery plan for the Ozark Big-eared Bat and the Virginia Big-eared Bat. Twin Cities, Mn. 61 Pp.

U.S. Fish and Wildlife Service. 1987. 1986 Rangewide Survey of Ozark and Virginia Big-eared Bat Maternity Colonies. Jackson, Miss. 27 Pp.

U.S. Fish and Wildlife Service. 1993. Ozark Big-eared Bat recovery plan Revised. Albuquerque, N.M. 80pp.


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