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Memorandum:

To: Regional Director, NPS, Atlanta, Georgia

From: ~~acting~~ Regional Director, FWS, Atlanta, Georgia

Subject: Section 7 Consultation for Installation of Cave Gates, Mammoth Cave National Park, Kentucky (4-2-80-F-280)

This is in response to your June 11, 1980, request for consultation under Section 7 of the Endangered Species Act of 1973, as amended, on the impacts of your proposal to replace the existing gates on several caves within the Park on the Endangered Indiana bat (Myotis sodalis). We reviewed the information provided when you requested this consultation, the information provided directly to Mr. Robert Currie of the Service's Asheville Area Office by Mammoth Cave National Park, and other information in our files. In addition we contacted the Indiana/Gray Bat Recovery Team, and where appropriate incorporated their comments into this Biological Opinion. Copies of pertinent documents are contained in an administrative record of this consultation maintained in the Service's Asheville Area Office.

It is our Biological Opinion, which includes an analysis of the cumulative effects of the proposal, that your plan to replace the existing entrance gates for Bat, Colossal, and Long's Caves and to alter the fence around the entrance to Dixon Cave will promote the conservation of the Endangered Indiana bat (Myotis sodalis).

In order to permit the Park to complete the proposed gate alterations prior to the beginning of the 1980-1981 hibernating season, this Opinion was relayed to Mr. Leon Lipscomb of Mammoth Cave National Park on July 17, 1980.

Descriptions of the Proposals and History of Bat Use of the Caves

1. Bat Cave

1934 - Passage blasted shut to exclude vandals. Apparently there were a large number of bats using the cave before this occurred (unpublished special report by C. W. Hibbard, 1935). Jegla (1961) states that a large deposit (approximately 300,000) of primarily Myotis sodalis skeletons was recently deposited in silt near the entrance. He speculates that these individuals were killed in catastrophic flooding of Bat Cave.

- 1960 - 6 Myotis sodalis (Hall, 1960)
- 1969 - 250 Myotis sodalis (Keefer, 1969)
- 1975 - 68 Myotis sodalis (Humphrey, 1975)
- 1978 - 69 Myotis sodalis (Cope, 1978)

The cave entrance is about 85 feet above the Barren River on a very steep, but vegetated bluff overlooking the River. The Park plans to remove the existing wall and gate and replace it with a gate similar to that shown in Figure 1. In addition to the construction method depicted in this figure, the Park plans to bolt the 4" x 4" steel posts which are next to the cave walls directly to the cave walls with bolts on 12-inch centers and imbeded 6" to 12" into the walls. The vertical bars will be anchored at the base in a concrete foundation. The top of the foundation will not extend above the natural floor level.

2. Colossal Cave

Commercialized prior to acquisition for Mammoth Cave National Park.

- 1951 - 1,680 Myotis sodalis (Hall, 1951)
- 1953 - 6,000 Myotis sodalis and several other species
(Note in files, NCRF)
- 1957 - 1,000 Myotis sodalis (Hall, 1960)
- 1958 - 1,000 Myotis sodalis (Hall, 1960)
- 1959 - 2,000 Myotis sodalis (Hall, 1960)
- 1960 - 2,000 Myotis sodalis (Hall, 1960)
- 1962 - 6,000 Myotis sodalis (Humphrey, 1975)
- 1967 - 2,000 Myotis sodalis (Humphrey, 1975)
- 1969 - 100 Myotis sodalis (Keefer, 1969)
- 1975 - 14 Myotis sodalis (Humphrey, 1975)
- 1978 - 105 Myotis sodalis (Cope, 1978)

The existing concrete/stone wall and gate will be removed and replaced by a structure similar to that shown in Figure 2. The 4" x 4" steel posts along the walls will be anchored directly to the walls in addition to being attached to the floor and ceiling (6" to 12" anchors spaced about 12" apart). The vertical bars will be anchored in a concrete foundation. The top of this foundation will not extend above the natural floor level.

3. Dixon Cave

The rather large entrance to Dixon Cave is now protected by a chain link fence around the top of the sink above the entrance. This cave is used in both summer and winter by Myotis sodalis.

1947 - Several thousand (Hitchcock, 1947)

1957 - 2,500 Myotis sodalis (Hall, 1960)

1958 - 2,500 Myotis sodalis (Hall, 1960)

1959 - 2,500 Myotis sodalis (Hall, 1960)

1960 - 2,500 Myotis sodalis (Hall, 1960)

1969 - 4,000 Myotis sodalis (Keefer, 1969)

1975 - 3,600 Myotis sodalis (Humphrey, 1975)

1978 - 3,800 Myotis sodalis (Cope, 1978)

At the present time the bats in Dixon Cave are periodically disturbed by unauthorized visitors. Rather than install a gate now, the Park plans to improve the security of the existing fence. If this does not significantly reduce or eliminate unauthorized visits, the Park will construct a gate similar to that depicted in Figure 3.

4. Long's Cave

Once commercialized and reportedly also the home of a hermit for a while.

1947 - 50,000+ Myotis sodalis and other species (Hitchcock, 1947)

1953 - 22,000 (several species) (Note in files, MCNP)

1957 - 1,200 Myotis sodalis (Hall, 1960)

1958 - 3,000 Myotis sodalis (Hall, 1960)

1959 - 2,000 Myotis sodalis (Hall, 1960)

1960 - 1,500 Myotis sodalis (Hall, 1960)

1969 - 6,000 Myotis sodalis (Keefer, 1969)

1975 - 7,600 Myotis sodalis (Humphrey, 1975)

1975 - 7,600 Myotis sodalis (Humphrey, 1975)

1978 - 5,057 Myotis sodalis (Cope, 1978)

The existing concrete/stone wall and steel gate will be removed and a new structure similar to that shown in Figure 4 installed. The 4" x 4" steel posts along the walls will be anchored directly to the walls with 6" to 12" anchors spaced about 12" apart in addition to being anchored at the floor and ceiling. The vertical bars will be anchored in a concrete gate foundation. The top of this foundation will not extend above the natural floor level. In order to facilitate access when this gate is installed the door will actually be constructed to the right of the area shown in Figure 4.

At all cave entrances the Park plans to install signs which provide an explanation of the reasons for closing the caves and the benefits to the Indiana bat which closure will provide. Additionally the signs will indicate the penalties under the Endangered Species Act for harassing an Endangered species. All signs should be placed in areas where they will not restrict air or bat movements. To assist you in developing the wording on these signs, we have enclosed examples used at other caves by other Federal or state agencies.

We wish to commend Mammoth Cave National Park and the National Park Service for their efforts to enhance the value of their cave resources to the Endangered Indiana bat. Disturbance of bats during hibernation has been cited by numerous authors as a significant factor in the drastic declines which have been observed in cave dwelling bats.

The present structures at the entrances to these caves (except at Dixon Cave) were constructed without considering the effects they would have on bats using the caves. Consequently they have had a direct adverse impact on the bats by restricting movement into and out of the caves and an indirect adverse impact on them by restricting airflows at the cave entrances. Airflow restriction results in increased temperatures in the caves. Increased temperatures reduce or eliminate the suitability of the caves as hibernating sites.

The planned gates for Long's, Bat, and Colossal Caves were designed to effectively eliminate unauthorized entrance to the caves while providing minimal restrictions to bat and air movements. The planned gate design has not been used anywhere else. The Indiana/Gray Bat Recovery Team was therefore asked to review and comment on this design. They determined that the proposed structures appeared to meet the objectives of excluding people while allowing bats free access to the caves. Additionally they commended the Park Service for removing the present inadequate structures.

To assist you in exercising your authority for the conservation of this listed species, the following action is recommended:

1. Bat populations should be monitored for 1 year to determine if these new gates modify behavior or inhibit movement.

Should you have any questions concerning the Opinion, please contact Mr. Robert R. Currie, Mr. Gary Henry, or Ms. Nora Murdock in the Service's Asheville Area Office.

Walter G. Schleglitz

Attachments

cc: Director, FWS, Washington, D. C. (AFA)
Area Manager, FWS, Asheville, North Carolina (SE) - Attn: Gary Henry