



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ARIZONA ECOLOGICAL SERVICES STATE OFFICE
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2-21-93-F-414

March 24, 1994

MEMORANDUM

TO: Area Manager, Vermillion Resource Area, Bureau of Land Management, St. George, Utah.

FROM: State Supervisor, Arizona Ecological Services State Office, Phoenix, Arizona.

SUBJECT: Formal Section 7 Consultation: Marble Canyon Area of Critical Environmental Concern Management Plan.

This biological opinion is in response to your request of July 1, 1993, to initiate formal consultation pursuant to section 7 of the Endangered Species Act of 1973 (Act), as amended, on the implementation of the Marble Canyon Area of Critical Environmental Concern (ACEC) Management Plan, Vermillion Resource Area, Arizona Strip District, Bureau of Land Management (BLM), Coconino County, Arizona.

The species of concern in this biological opinion is the endangered Brady pincushion cactus (Pediocactus bradyi). The following biological opinion is based on the 1993 Marble Canyon ACEC Management Plan and Environmental Analysis (EA) (U.S. Bureau of Land Management 1993), other maps and information provided by BLM, information from experts on this species, data in our files, and an ACEC interdisciplinary team meeting and field evaluation on January 28, 1993, with Resource Area wildlife and range personnel.

BIOLOGICAL OPINION

It is my biological opinion that implementation of the proposed Marble Canyon ACEC Management Plan, as described in the 1993 management plan and EA (U.S. Bureau of Land Management 1992), is not likely to jeopardize the continued existence of the Brady pincushion cactus.

BACKGROUND INFORMATION

Description of the Proposed Action

The following is a summary of the proposed action which has been described in detail in the Marble Canyon ACEC Management Plan and EA (U.S. Bureau of Land Management 1993). The proposed action will guide management of the 10,700 acre Marble Canyon ACEC, located along the west rim of Marble Canyon, from approximately below Navajo Bridge south to Bedrock Canyon. This ACEC was created with the finalization of the Arizona Strip District Resource Management Plan (RMP), January 31, 1992. The RMP identified the values and management prescription for the ACEC. The primary goal of the ACEC is to provide for the conservation of Brady pincushion cactus.

Planned management actions within the ACEC include:

Recreation/Road Management: 1.3 miles of existing roads will be closed within the ACEC and approximately 4.2 miles of existing roads will remain open. All spur roads and tracks extending from open roads will be closed, and travel off of existing roads prohibited. Dispersed recreational activities include sightseeing (scenic overlooks of Marble Canyon), car camping, and hiking (primarily trail access to the Colorado River). Appropriate signing, monthly ranger patrols, and traffic counters will be utilized to determine visitor use and insure visitor compliance with road closures.

Minerals: Mining Plans of Operation are required for all phases of mineral activity except casual use. Oil and gas leases are subject to seasonal stipulations (open August 11 through March 1). There are no current claims within the ACEC.

Lands: One section of State land has been identified for acquisition, when available. No construction of right-of-ways, airports, landfills, or other surface disturbance will be allowed within the ACEC.

Range Management: Four grazing allotments occur within the ACEC: the Badger Creek, Soap Creek, Cram, and Buffalo Tank allotments. There are currently no identified grazing management problems within the ACEC, however, there are areas of heavy livestock use in close proximity to the ACEC and pasture boundary fences cross the ACEC. No range improvements exist within the ACEC and no livestock waters will be developed within the ACEC.

Ecological Studies for Brady Pincushion Cactus: Four study plots have been monitored since 1984. These annual monitoring studies will be continued and expanded to include analysis of population viability. Studies on soil texture and chemistry will be implemented and studies on Brady pincushion cactus reproductive biology and pollination will be finalized.

To determine the effectiveness of meeting Brady pincushion cactus conservation goals through the implementation of the management plan, a quantified population size-structure objective has been established: to manage toward a population size structure that reflects about 70 percent (%) (60 to 80%) juveniles (1 to 15 millimeters (mm) width class), and about 30% (20 to 40%) adults (15.1 to 40+ mm) in 15 years or the life of the ACEC plan. A population of this structure is expected to be sustaining within the context of naturally occurring environmental extremes/variables.

Species Account and Environmental Baseline

Brady pincushion cactus was listed as endangered under the Endangered Species Act of 1973 (Act) on October 26, 1979 (U.S. Fish and Wildlife Service 1979). Critical habitat was not designated. A recovery plan was completed in 1985 (U.S. Fish and Wildlife Service 1985).

Brady pincushion cactus is a small, semiglobose cactus of usually one stem, up to 6 centimeters (cm) tall and 5 cm in diameter. There are 14-15 whitish radial spines spreading from each areole, and the central spine is generally absent. The straw-yellow flowers are about 2.5 cm in diameter. During the dry season, the plants largely retract into the soil (Phillips et al. 1979).

This species is a narrow endemic, occurring only in the vicinity of Marble Canyon of the Colorado River, Coconino County, Arizona. Very local, discrete populations are scattered along the rim on both sides of Marble Canyon and tributary canyons, and may be found up to three miles from the canyon rim. Populations have been found from below Lee's Ferry to the vicinity of Bedrock Canyon, a distance of about 40 kilometers (km) (25 miles). Brady pincushion cactus occupies a very restricted habitat which includes Kaibab limestone chips overlying soils derived from the shales, siltstones and mudstones of the Moenkopi Formation. The cactus grows in gravelly alluvium on gently sloping benches and terraces in sunny, exposed situations. Total potential habitat has been estimated to be 17,000 acres, though only 10-20% appears to be occupied (U.S. Fish and Wildlife Service 1985). Brady pincushion cactus populations occur on land administered by BLM (Vermillion Resource Area), National Park Service (Glen Canyon National Recreation Area), and the Navajo Nation.

Following the listing of Brady pincushion cactus, BLM conducted searches to identify the species' distribution and potential habitat. These surveys have continued to present, being conducted as time and funding have permitted. To date, 40 miles of the canyon rims have been inventoried on BLM lands using belt transects, and 600 live cacti have been counted. It has been estimated that there may be as many as 10,000 individual plants (U.S. Bureau of Land Management 1993). Surveys on the Navajo Nation (Navajo Natural Heritage Program 1993a) suggest that Brady pincushion cactus has a more restricted distribution on the east side of Marble Canyon.

Monitoring of Brady pincushion cactus has been conducted by BLM for almost 10 years. The data from these studies represents the majority of information currently known on the species (see Hughes 1991). Recently, monitoring plots have also been established by Glen Canyon National Recreation Area (Spence

1992) and the Navajo Nation (Navajo Natural Heritage Program 1993b). Together, these studies provide for a better understanding of the species's ecology and threats from both natural and human-caused factors.

Overall, each monitored population of Brady pincushion cactus is represented by a high proportion of large-sized individuals. This may be the result of a combination of factors, including: the difficulty of finding seedlings and small-sized individuals; that drought conditions may effect smaller individuals more severely, either through mortality or prolonged dormancy; and the episodic nature of reproduction in a harsh environment. Poor representation of smaller size/age classes in a population typically indicates a declining population. However, most monitored populations appear relatively stable. Continued monitoring and more detailed studies and analysis are needed for a full understanding of long-term trends.

Hughes (1991) stated that depredation by rodent herbivory is the single largest killer of the cactus, especially under drought conditions. Drought and frost heaving has contributed to loss of some plants. Other sources of mortality having local impacts include: trampling by livestock; dispersed recreation and off-road vehicle activities; highway maintenance and road alignment (US 89A); and vandalism. The effects of off-road vehicle activities in Brady pincushion cactus habitat appears to be more acute on the Navajo Nation. Threats due to potential mining activities appear to be minimal at this time.

The greatest potential human-related threat to Brady pincushion cactus is illegal collection. Though there is no recent documentation of collecting activities, Brady pincushion cactus is highly desired for its ornamental value in the cactus and succulent trade, but very difficult to cultivate.

Natural factors affecting the continued existence of Brady pincushion cactus include: unique and localized habitat (soil) characteristics; low population levels; and restricted geographic distribution. These factors tend to intensify the adverse affects of any additive human-caused threats to the species (U.S. Fish and Wildlife Service 1985).

IMPACTS OF THE PROPOSED ACTION

Effects of the Action on Listed Species

The Marble Canyon ACEC Management Plan expands on the conservation measures established in the BLM Brady Pincushion Cactus Habitat Management Plan (1986) and further incorporates the guidance and recovery actions outlined in the Brady Pincushion Cactus Recovery Plan (U.S. Fish and Wildlife Service 1985). The ACEC includes the majority of all Brady pincushion cactus habitat. The continued existence and recovery of this species is dependant on BLM actions.

Potential negative effects to Brady pincushion cactus may be realized by not restricting all access routes into the ACEC. However, only limited impacts associated with these roads have been documented to date. BLM has incorporated several measures to restrict visitor activities, enforce off-road

vehicle prohibitions, and to monitor the continuing status of the cactus. BLM maintains the option of more restrictive management if this is determined to be necessary. These measures appear appropriate and are expected to result in improved conditions for the species.

The designation of the ACEC in the RMP did not provide for the withdrawal of these lands from mineral entry. Though currently the mineral resources of the ACEC are considered a low potential for development, there remains the possibility that mineral-based activities may take place within the ACEC sometime in the future. Requirements for Mining Plans of Operation may offset potential adverse effects to the cactus.

Livestock management continues within the ACEC. The potential impacts of livestock use include both direct and indirect effects. Direct impacts usually result from trampling and are typically site specific. These impacts can be reduced by influencing livestock distribution through the placement of range improvements (water sources and mineral supplements). These range improvements are prohibited within the ACEC. Indirect impacts include changes to the species composition of the plant community (reducing the occurrence of palatable forage species and expanding the range of exotic species) and effects to the soils through compaction and hoof action. However, within the ACEC livestock use continues at relatively low levels with little livestock use extending to the canyon rim. Issues concerning livestock use patterns neighboring the ACEC are considered outside the scope of the ACEC management plan.

The implementation of the Marble Canyon ACEC Management Plan is commended as a very positive action in BLM's continued management for the conservation and recovery of Brady pincushion cactus.

Cumulative Effects

Cumulative effects are those effects of future non-federal (state, local government or private) activities on endangered or threatened species or critical habitat that are reasonably certain to occur in the foreseeable future. Future federal actions are subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed action.

As the majority of Brady pincushion cactus habitat is under Federal ownership, most all associated actions will require consultation and are not considered as cumulative effects. However, restrictions on recreational activities within the ACEC may encourage additional visitation on the east side of Marble Canyon, on the Navajo Nation. Currently, the effects of increasing visitor use is being monitored on the Navajo Nation. Much of this use is without permit and considered to be trespass.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of threatened and endangered species. The term "conservation recommendations" has been defined as the Service's suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species, critical habitat or regarding information development. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's sections 2(c) or 7(a)(1) responsibility for these species.

The Marble Canyon ACEC Management Plan is fully supported by the Service. BLM has incorporated all Service recommendations during the informal consultation process. Most of the following conservation recommendations are included within the plan but are re-stated to emphasize their importance. The Service recommends the following actions:

1. Initiate formal consultation on the grazing allotments which include Brady pincushion cactus habitat. Several site specific problems have been identified which should be addressed through an allotment management plan.
2. Evaluate the appropriateness of pursuing withdrawal of the ACEC from all mineral entry.
3. Do not encourage recreational use within the ACEC. Closely monitor/patrol visitor use within the ACEC. If negative effects to Brady pincushion cactus or its habitat become evident, reinitiate consultation.
4. Include Service participation and review in the development of appropriate signing for the ACEC.
5. As part of any information provided to the public, do not include maps which divulge site occurrences of this highly collectable cactus. All site locations must be considered confidential information.

For the Service to be kept informed of actions that either minimize or avoid adverse effects, or that benefit listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

CONCLUSION

This concludes formal consultation on the actions outlined in the Marble Canyon ACEC Management Plan, Environmental Analysis and Biological Evaluation. As required by 50 CFR §402.16, reinitiation of formal consultation is required if: (1) new information reveals effects of the agency action that may affect listed species or critical habitat in manner or extent not considered in this opinion; (2) the agency action is subsequently modified in a manner that

causes an effect to the listed species or critical habitat that was not considered in this opinion; or (3) a new species is listed or critical habitat is designated that may be affected by this action. Please notify the Service of your final decision on this project action.

In future communications on this project, please reference consultation number 2-21-93-F-414. If we may be of assistance, please contact Bruce Palmer or Tom Gatz.

Kirk A. King
for Sam F. Spiller

cc: Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico (AES).
Director, Fish and Wildlife Service, Washington, D.C. (HC).
Director, Arizona Game and Fish Department, Phoenix, Arizona.
Director, Arizona Department of Agriculture, Phoenix, Arizona.
State Office Endangered Species Coordinator, Bureau of Land Management, Phoenix, Arizona.

LITERATURE CITED

- Hughes, L. 1991. Status Report. Bureau of Land Management. Arizona Strip District. St. George, Utah. 25 pp.
- Navajo Natural Heritage Program. 1993a. Pediocactus bradyi inventory on the Navajo Nation. The Navajo Natural Heritage Program, Window Rock, Arizona. 10 pp.
- Navajo Natural Heritage Program. 1993b. Pediocactus bradyi monitoring at Jackass Creek. The Navajo Natural Heritage Program, Window Rock, Arizona. 14 pp.
- Phillips, A.M., B.G. Phillips, L.T. Green, J. Mazzone, and E.M. Peterson. 1979. Status report Pediocactus bradyi L. Benson. Prepared for U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 12 pp.
- Spence, J.R. 1992. A monitoring program for the endangered Pediocactus bradyi L. Benson, Lee's Ferry, Glen Canyon National Recreation Area. Glen Canyon National Recreation Area, Page, Arizona. 25 pp. plus appendix.
- U.S. Bureau of Land Management, Arizona Strip District. 1986. Brady pincushion cactus habitat management plan. St. George, Utah. 12 pp.
- U.S. Bureau of Land Management. 1993. Marble Canyon Area of Critical Environmental Concern management plan and environmental analysis. Vermillion Resource Area, Arizona Strip District, St. George, Utah.
- U.S. Fish and Wildlife Service. 1979. Determination that Pediocactus bradyi is an endangered species. Federal Register 44 (209): 61784-61786 (October 26, 1979).
- U.S. Fish and Wildlife Service. 1985. Brady pincushion cactus (Pediocactus bradyi) recovery plan. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 68 pp.