

Cons. #2-22-03-F-0078.2

November 19, 2003

Memorandum:

To: Field Office Manager, Bureau of Land Management, Carlsbad Field Office, Carlsbad, NM (Attn: John Sherman and Ty Bryson)

From: State Supervisor, U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, New Mexico

Subject: Amendment to the Biological Opinion for Determining Effects of Prescribed Fire on Kuenzler's Hedgehog Cactus

This memorandum acknowledges the U. S. Fish and Wildlife Service's (Service) November 10, 2003, receipt of Dr. David Wester's November 7, 2003, letter requesting an additional 48 Kuenzler's hedgehog cactus (*Echinocereus fendleri* var. *Kuenzleri*) (cactus) be included in the proposed prescribed burn project on Bureau of Land Management lands near the Guadalupe Mountains. We completed a biological opinion on July 14, 2003, which allowed 13 of the 259 known plants in the Guadalupe Mountains and 48 of the 948 known plants in the Fort Stanton area be used to determine fire effects on the cactus. Since then, 594 previously unknown cacti, and one unknown population have been discovered within the prescribed burn study area. Extrapolating from the cacti found within the study area, Dr. Wester estimates the Ft. Stanton area to contain 4,148 cacti, and has requested 48 additional cacti be included in the prescribed burn project.

Based on the substantial increase in the known cactus population in the Ft. Stanton area, the addition of 48 of these cacti to the prescription burns will not change the conclusion of our biological opinion. The information gathered by adding a second burning season will help further recovery of the cactus. Therefore, this memorandum amends the biological opinion to include 48 additional cacti. If you have any questions or concerns about this consultation or the consultation process in general, please feel free to contact me or Bill Ostheimer of this office at (505) 761-4737.

/s

Joy E. Nicholopoulos

New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

July 14, 2003

Cons. #2-22-03-F-0078.1

Memorandum

To: Field Manager, Bureau of Land Management, Carlsbad Field Office, Carlsbad,
New Mexico (Attn: Leslie Hiess)

From: State Supervisor, U.S. Fish and Wildlife Service, New Mexico Ecological
Services Field Office, Albuquerque, New Mexico

Subject: Biological Opinion for Determining the Effects of Prescribed Fire on Kuenzler's
Hedgehog Cactus

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (BO) based on our review of the proposed prescription burns and their effects on the endangered Kuenzler's hedgehog cactus (*Echinocereus fendleri* var. *kuenzleri*) (cactus) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Formal consultation was initiated on June 10, 2003.

This BO is based on information provided in the June 5, 2003, Biological Evaluation (BE), and other sources of information available to the Service. On July 2, 2003, we received additional information clarifying the proposed action. A complete administrative record of this consultation is on file at the New Mexico Ecological Services Field Office, Albuquerque, New Mexico.

Consultation history

In November 2002, and May 2003, a proposal was developed to use a burn barrel technique and field-scale (broadcast) burns to determine fire effects on the cactus. The proposal was to burn approximately 131 cacti. In an effort to reduce the number of cacti lost to the population, the methods were changed to combine aspects of the burn barrel technique (to determine heat impacts to individual cacti) and the broadcast burn (to determine the effect of removing vegetation around a plant). The final agreed-upon proposed action was received on July 2, 2003.

The Proposed Action

The Carlsbad Field Office (CFO) of the Bureau of Land Management (BLM) has used prescribed burns within lands it administers for several years in order to reduce fuel loading and improve vegetative diversity. In recent years, due to lack of data on the cactus' response to fire, CFO has not proposed prescribed burns within suitable or occupied cactus habitat. This policy is based on the assumption that fire would be detrimental to the cactus. There is little scientific literature on the effects of fire to this species to either support or refute this assumption. The little information available suggests that only portions of a population be allowed to burn in any single prescribed fire, and that fire be reapplied at sufficiently long temporal intervals to recover and reestablish a seed bank (Sivinski 1999).

Data gathered from the proposed project may be useful to other land management agencies in the area. The Guadalupe Ranger District (GRD) of the Lincoln National Forest has prepared a landscape scale fuels treatment program for piñon - juniper woodlands and removed approximately 62,000 acres from treatment consideration due to suitable or potentially suitable cactus habitat. The Roswell Field Office (RFO) of the BLM has an active fuel management program at Ft. Stanton, a wildland urban interface area near Ruidoso. The RFO avoids areas that may contain cactus, although they do not impose as large a buffer as the CFO or GRD. This proposed project should allow for more informed decisions regarding the use of fire as a management tool in cactus habitat. The proposed project would investigate potential effects to the cactus from prescribed fire management during a three year research project conducted by Texas Tech University.

Objectives for the proposal are to: 1) Determine the effect fire has on individual cactus and what role plant condition and adjacent fuel loading and spatial arrangement have on survivability of the cactus; 2) Determine the effect fire has on population dynamics of cactus populations; 3) Determine habitat manipulations that would potentially mitigate adverse impacts to cactus including burn windows, weather conditions, and cover density from herbaceous and shrub components; 4) Provide a complete characterization of the micro-habitats associated with cactus; 5) Publish findings to assist other land management agencies, universities and public in managing cactus habitats; and 6) Collect seeds to determine germination and establishment requirements for the cactus.

The project proposes that 13 of the 259 known plants in the Guadalupe Mountains and 48 of the 948 known plants in the Fort Stanton area be used to determine fire effects on cactus. Four plots in the Ft. Stanton area and one plot on Texas Hill are proposed for the research project.

Burn plots described in the June 5, 2003, BE are:

plot 1 - T. 10 S., R. 14 E., section 01

plot 2 - T. 10 S., R. 14 E., section 11

plot 3 - T. 09 S., R. 14 E., section 28

plot 4 - T. 10 S., R. 14 E., section 10

plot 5 - T. 22 S., R. 21 E., section 22 (identified as the burn barrel plot in the BE)

The project will use small plots (approximately 1 to 2 meter (m) (3.3 to 6.6 foot) diameter) centered around each plant that will be individually burned under natural fuel load conditions. A metal ring (30-centimeter (cm) (11.8 inches)) tall will be placed around each plant prior to burning. Each plot will be individually burned; however, if two or more plots are close enough together, they may be burned simultaneously. The prescribed burning will be conducted during the spring of 2004.

Prior to burning, all the cacti in each plot would be marked with numbered, permanent stakes. Plant size (number of stems, height and diameter of stems) would be recorded. Each plant would be photographed. Additionally, characteristics of surrounding vegetation would be described within a 3-m (3.9 foot) radius around each cactus. These data would include distance, bearing, height, basal circumference and number of stems of each plant. Ground cover characteristics (bare ground, litter, rock) would also be recorded. These data would be used to describe fuel loading, fuel arrangement surrounding each cactus and subsequent variations in fire intensity. These data would also be available to correlate plant species and density associations with cactus occurrence.

Following a treatment, each cactus would be re-photographed and re-measured. Damage to individual plants would be assessed based on actual damage to the epidermal tissue. These data would be collected within one week of burning, and monthly or bimonthly for the duration of the study. Multiple regression methods would be used to assess effects of surrounding vegetation and habitat features on subsequent growth and survival of the cactus. These effects are expected to change over the duration of the study and repeated measure analyses would be used. Control plots would be established in areas representative of the test plots. Data on plant characteristics in the control plots would be collected and re-measured concurrently with the test plots for the duration of the study.

The initial phase of the study will take three years to complete. The information gained from this research would be used for a graduate student dissertation. The information would be posted on the Fire Ecology Center, Department of Range, Wildlife and Fisheries Management, Texas Tech University website (<http://www.rw.ttu.edu/fec>). The annual reports would be submitted to CFO, RFO, and the Service.

This research project has funding through the Joint Fire Science Program for three years. The CFO will seek additional funding so that Texas Tech University or another research institution would be able to continue monitoring the sites to determine long-term trends and effects of fire on the cactus.

Natural fire frequency and description of the action area

Data on fire regimes suggests that prior to European settlement, low severity surface fires occurred about every 8 to 15 years (range 2 to 30 years) within Guadalupe Mountains plant communities (Cox 1999, Dahms and Geils, 1997). After settlement, the mean fire return interval

(FRI) lengthened due to livestock grazing which reduced the fine fuels needed to carry fire. Fire frequency continued to decline throughout the 20th century due to fire suppression. Most natural ignitions would have occurred in the dry season (April through June) before trees began growth for the year or in the early part of the growing season (Ahlstrand 1981).

The project area is categorized as a Piñon - Juniper Grass Mountain Standard Habitat Site following Integrated Habitat Inventory Classification. Associated plant species include sideoats grama (*Bouteloua curtipendula*), blue grama (*B. gracilis*), black grama (*B. eriopoda*), curlyleaf muhly (*Muhlenbergia setifolia*), purple three-awn (*Aristida purpurea*), beargrass (*Nolina spp.*), banana yucca (*Yucca baccata*), New Mexico agave (*Agave neomexicana*), tree cholla (*Opuntia imbricata*), lechuguilla (*A. lechuguilla*) and one seed juniper (*Juniperus monosperma*). There are several forb species found in the analysis area; however, their frequencies fluctuate based on season of year and climatic conditions. Some of the more common forb species are stickseed (*Lappula spp.*), flax (*Linum spp.*), plantain (*Plantago spp.*) and verbain (*Verbena spp.*). Many wildlife species use the general area. Nearby canyons and draws provide habitat for mammals, birds, herptofauna (reptiles and amphibians), and insects.

Conservation measures that are part of the proposed action and designed to minimize impacts to the cactus include:

1. An approved prescribed burn plan will be prepared which describes the fuel and weather parameters under which the plots will be burned.
2. It is anticipated that the minimum holding forces required for the burning will be a BLM engine with a hose to the plot, along with qualified personnel with bladder bags and handtools, such as flappers. Some plots may require prep work such as using a weed whacker to reduce grass heights and a leaf rake to create a mineral line.

Species Description, Life History, and Populations Dynamics

Horst Kuenzler collected the type specimen of the cactus in 1961. In 1976, the cactus was identified as *Echinocereus kuenzleri* (Castetter et al. 1976). Prior to 1976, the cactus was known as *Echinocereus psudohempelii*, and was included in the 1975 plant notice of review (40 FR 27824) as *Echinocereus hempelii*. When *Echinocereus kuenzleri* was listed as endangered in 1979, many experts in the taxon believed it was a subspecies or variant of *Echinocereus fendleri*, and not a separate species. With Dr. Lyman Benson's 1982 publication, The Cacti of the United States and Canada, the name *Echinocereus fendleri* var. *kuenzleri* became accepted and was changed in the July 1984 list of Endangered and Threatened Wildlife and Plants (Benson 1982).

A single cactus may be single stemmed or branched. The stems are normally 15cm (6 inches (in)) long and 10 cm (4 in) wide with 9 to 12 prominent ribs with tubercles from which spine clusters originate. The spines are not round, bulbous, and fused at the base. Central spines are

usually absent, while radial spines vary from two to six and are variable in size up to 2.5 cm (1 in) long. (Castetter *et al.* 1976).

Flowers are large for the size of the plant, up to 11 cm (4 in) long (Taylor 1985). Fruits are bright red when mature, ovoid to cylindrical, may be over 5 cm (2 inches) long, and are spiny with miniature versions of the stem spines. Seeds are black and pitted. Characteristics used to separate Kuenzler's hedgehog cactus from the other cacti in its range are the few, contorted, white, chalky textured spines and large, magenta flowers (Service 1985).

Typical cactus habitat is the lower fringes of the pinyon-juniper woodland. The dominant tree being one-seed juniper, although the species can be found associated with alligator-bark juniper (*Juniperus deppeana*) and piñon pine (*Pinus edulis*). Soils can be best described as skeletal decomposed limestone (Service 1985).

In addition to one-seed juniper, alligator-bark juniper, and piñon pine, other common plants associated with cactus include yerba (*Baccharis pteroides*), blue grama grass, plains lovegrass (*Eragrostis intermedia*), buckwheat (*Eriogonum havardii*), goldman's silktassel (*Garrya ovata ssp. goldmanii*), false pennyroyal (*Hedeoma pulchella*), bladderpod (*Lesquerella valida*), pincushion cactus (*Mammillaria heyderi*), and sage (*Salvia earlei*) (Service 1985).

Status and Distribution

The cactus was proposed for listing as endangered on June 16, 1976, (41 FR 24523) and was federally listed as endangered on October 29, 1979, with no critical habitat designated due to the threat of collection (44 FR 61924). The recovery plan for the cactus identified two populations of cacti in the Rio Hondo and Rio Peñasco drainages in Lincoln County (Service 1985). There are currently seven locales where the cactus is documented in New Mexico. These areas are found in Chaves, Eddy, Lincoln, and Otero Counties (Blue Earth Ecological Consultants, 2002). The total number of known plants found on U.S. Forest Service and BLM lands is approximately 1,600 (Chauvin *et al.* 2001). Although the cactus is also present on Tribal, private, and State lands, the majority of known plants reside on federally owned lands.

Environmental Baseline

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone section 7 consultation, and the impacts of State and private actions that are contemporaneous with the consultation in progress. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform from which to assess the effects of the action now under consultation.

Status of the species within the Action Area

Within the Guadalupe Mountains, the cactus has been found to range from 1,584 to 2,011 m (5,200 - 6,600 feet) on gentle, gravelly to rocky slopes (typically less than 5 percent) and benches. Habitat for the species occurs on the lower fringes of the piñon - juniper woodland on skeletal soils of limestone outcrop. The soil type the plants are most frequently found on is the Deama soils (0 to 5 percent slope). The Deama soil is described as very dark grayish brown of limestone origin, with a weak granular structure, non-plastic, strongly calcareous and moderately alkaline (USDA Soil Survey, 1972).

The majority of Ft. Stanton Kuenzler's hedgehog cacti are found between 2,011 and 2,103 m (6,600 - 6,900 feet) on open southeast aspects. They are typically found on the upper one-third of 20 percent slopes (DeBruin 1996). Plants are found on soils with an igneous substrate. Plants have not been found on the east side of the Ft. Stanton area where the soils are of limestone origin (DeBruin 1996).

Factors Affecting the Species in the Action Area

Factors that may be affecting the cactus within the action area are collection, ground disturbance associated with road construction or maintenance, and fire. Ground disturbance (e.g., road construction) may occasionally destroy cacti or suitable cacti habitat. Livestock grazing is not currently affecting the cacti that are proposed for either burning or as controls. Ft. Stanton is not open to grazing, and the Texas Hill plot is too distant and steep to be attractive to cattle.

Effects of the Action

The proposed prescribed burns may destroy up to 61 cacti. This represents 3.8 percent of the known population. We do not anticipate burning any cacti unintentionally. The proposed safeguards against fire escaping should adequately protect the cacti outside the scope of this project.

The presence of survey stakes, researchers, burn circles, etc, may educate collectors to the presence of this rare cacti, and subsequently increase the collection pressure on this population. The study area is not currently grazed by livestock. There is no plan to graze the Ft. Stanton population. The Texas Hill plot is within a grazing allotment, but the slope and arid nature of the area where the cactus is found is not attractive to cattle, and no grazing is expected as a result of the proposed action.

Conclusion

After reviewing the current status of the cactus, the environmental baseline for the action area, the effects of the proposed prescription burns, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of this species. No critical habitat has been designated for this species, therefore none will be affected.

Incidental Take Statement

Taking that is incidental to, and not intended as part of the agency action, generally do not apply to listed plant species. However, limited protection of plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

Conservation Recommendations

1. Any suspicious collection related activity within the project area should be reported to BLM and Service law enforcement: BLM law enforcement; (505) 234-5914; or Service law enforcement; (505) 346-7828.
2. The BLM should ensure that employees, students, and others associated with this project know how to report illegal collecting activities.
3. In order to protect these cacti from collectors, the BLM should keep the proposed project activities (including identification and marking plants, burning, and monitoring) inconspicuous.

Reinitiation

This concludes formal consultation on the actions outlined in the request for consultation on the effects of prescribed fire on the cactus. As provided in 50 CFR 402.16, reinitiating formal consultation is necessary where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) new information reveals effects of the agency action that may affect this species in a manner or to an extent not considered in this BO; (2) the agency action is subsequently modified in a manner that causes an effect to the cactus not considered in this BO; or (3) a new species is listed or critical habitat is designated that may be affected by the action.

In future communications regarding this consultation, please refer to consultation #2-22-03-F-0078. If you have any questions, please contact Bill Ostheimer at the letterhead address or at (505) 761-4737.

s/

Joy E. Nicholopoulos

cc:

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico

Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry
Division, Santa Fe, New Mexico

Literature Cited

- Ahlstrand, G. 1981. Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan desert. Report
- Benson, Lyman. 1982. The Cacti of the United States and Canada. Stanford University Press.
- Blue Earth Ecological Consultants. 2002. Biological Survey Report for Realignment and Reconstruction of U.S. 54, Carrizozo to Vaughn (MP 130 to MP 201) prepared for Souder, Miller and Associates and the New Mexico State Highway and Transportation Department.
- Cox, Jerry. 1999. Fire History Review. Lincoln National Forest, Guadalupe Ranger District (Unpublished).
- Castetter, E.F., P Pierce and K.H. Sschwerin. 1976. A new Cactus Species and Two New Varieties from New Mexico. *Cactus and Succulent Journal (U.S.)* Vol. XLVIII.
- Chauvin, Yvonne, A. Kennedy, K Wild. 2001. Survey for Kuenzler's Hedgehog Cactus (*Echinocereus fendleri* var. *kuenzleri*). Report prepared for the BLM Carlsbad Field Office, by the New Mexico Natural Heritage Program, University of New Mexico Biology Department, Albuquerque, NM 87131
- Dahms, Cathy W., Brian W. Geils, tech eds. 1997. An assessment of forest ecosystem health in the Southwest.
- Taylor, N.P. 1985. *The Genus Echinocereus*. The Royal Botanical Gardens, Kew in association with Timber Press, Portland, Oregon.
- Sivinski, Robert. 1999. Kuenzler's Cactus: Wildfire Study, Lincoln National Forest, June 1999. Unpub. Report
- U.S. Fish and Wildlife Service. 1985. Kuenzler's hedgehog cactus recovery plan. U.S. Fish and Wildlife Service, Albuquerque, NM
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