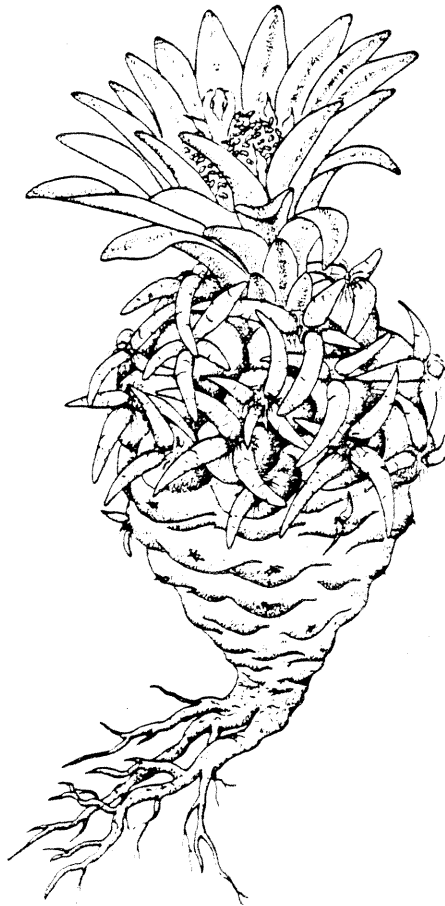


# PEEBLES NAVAJO CACTUS

(Pediocactus peeblesianus var. peeblesianus)

## RECOVERY PLAN



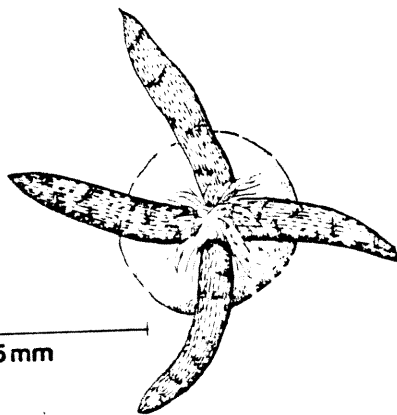
U.S. Fish and Wildlife Service

Albuquerque, New Mexico

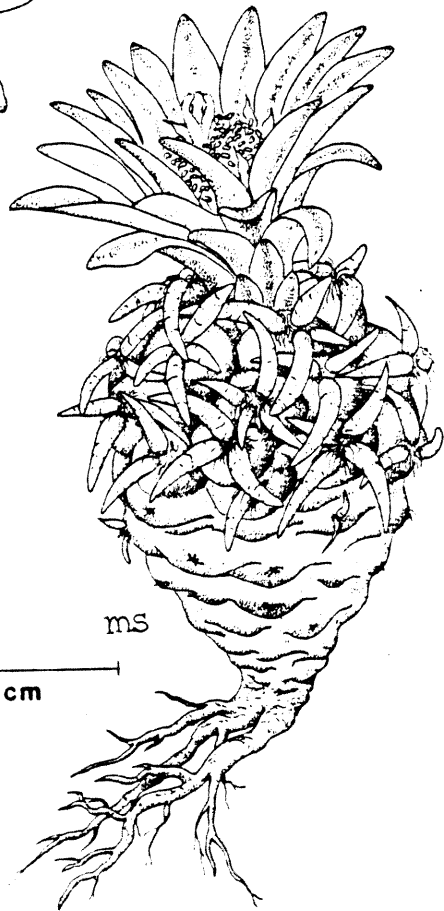
1984



1 cm



5 mm



ms

1 cm

PEEBLES NAVAJO CACTUS

PEDIOCACTUS PEEBLESIANUS (Croizat) L. Benson var. PEEBLESIANUS

RECOVERY PLAN

Prepared by the Arizona Plant Recovery Team

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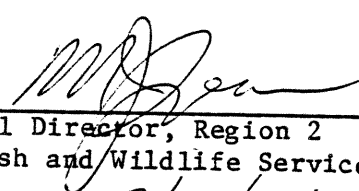
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for

Region 2 of the U.S. Fish and Wildlife Service

Approved: \_\_\_\_\_

  
Regional Director, Region 2  
U.S. Fish and Wildlife Service

Date: \_\_\_\_\_

3/30/84

## DISCLAIMER

This is the completed Peebles Navajo Cactus Recovery Plan. It has been approved by the U.S. Fish and Wildlife Service. It does not necessarily represent official positions or approvals of cooperating agencies and it does not necessarily represent the views of all recovery team members who played the key role in preparing this plan. This plan is subject to modification as dictated by new findings and changes in species status and completion of tasks described in the plan. Goals and objectives will be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints.

Literature citations should read as follows:

U.S. Fish and Wildlife Service. 1984. Peebles Navajo Cactus (Pediocactus peeblesianus (Croizat) L. Benson var. peeblesianus) Recovery Plan. U.S. Fish And Wildlife Service, Albuquerque, New Mexico 58 pp.

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Fish and Wildlife Reference Service  
1776 E. Jefferson Street  
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## SUMMARY

1. GOAL: To remove Pediocactus peeblesianus var. peeblesianus from the Federal list of endangered and threatened species by protecting the existing populations and by increasing the numbers of the taxon in existing and reintroduced populations.
2. RECOVERY CRITERIA: Criteria for the downlisting of the Peebles Navajo cactus include the protection, maintenance, and enhancement of existing natural populations; an increase in the numbers of the cactus from the present approximately 1,000 to 10,000; and establishment of a program to curtail collecting through enforcement and through a commercial artificial propagation program. Because of the small range and naturally limited habitat of this cactus, no intermediate downlisting is recommended at this time.
3. ACTION NEEDED: Major steps needed to meet the recovery criteria include: removal of ORV use, livestock grazing, and mining from the habitat of populations on Federal lands; designation of a restricted use area (ACEC) on BLM lands; development of management plans for all populations; protection of habitat for privately owned populations; monitoring and study of existing populations; and development of an artificial propagation program to provide stock for reintroductions and to provide techniques for use in the commercial cactus trade.

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## PART I

### INTRODUCTION

The Peebles Navajo cactus (Pediocactus peeblesianus (Croizat) L. Benson var. peeblesianus), also known as the Navajo plains cactus, was officially given endangered status by the U.S. Fish and Wildlife Service under the Endangered Species Act of 1973 on November 28, 1979 (44 FR 61922). The taxon is known only from a few small populations in the vicinity of Holbrook and Joseph City, Navajo County, Arizona. Monitoring studies and careful observation indicate that its populations are declining, perhaps alarmingly, and that significant portions of its habitat have been lost in recent years. It is increasingly in danger of extinction, and could become extinct in the wild within a few years without positive action to save it.

The objective of this plan is to outline steps necessary for the recovery of the Peebles Navajo cactus by increasing its numbers in the wild to the point at which its population level is stabilized, and by removing threats to the cactus and its habitat. Obtainment of these goals will lead to the ultimate objective of removal of the Peebles Navajo cactus from the Federal list of endangered and threatened species.

#### Taxonomy

The species that Lyman Benson combined into the genus Pediocactus in 1961-1962 formerly were in six different genera due to their great

diversity in spination, body proportions, and flower color. Benson recognized an overriding similarity: the structure and method of dehiscence of the fruits (dry at maturity and dehiscent usually both by a dorsal slit and by a ring around the circumscissile apex) as well as several other characteristics in common (Benson 1962b).

The Peebles Navajo cactus is separated from its nearest relative, P. peeblesianus var. fickeiseniae (Fickeisen plains cactus), primarily on the basis of spine characters, size, and distribution. Peebles Navajo cactus lacks a central spine, and has fewer of the corky radials [4 (3-5) versus 6 (7)] characteristic of the other variety. It is also smaller in all parts and grows in the vicinity of Holbrook, whereas var. fickeiseniae grows to the west in the vicinity of the Little Colorado and Colorado rivers and on the Arizona Strip (Benson 1962a). See Figure 1.

P. peeblesianus var. peeblesianus is a small, usually solitary, globose cactus, up to 2.5 cm tall and averaging 1.5 cm in diameter. The four spongy-fibrous radial spines form a twisted cross and there are no central spines. The yellow to yellow-green flowers are up to 2.5 cm in diameter, often larger than and hiding the smaller plant body below. The small fruits dry and turn tan at maturity, dehiscing as indicated above. During dry weather, the plants retract into the soil.

Two other members of the genus in Arizona, P. bradyi L. Benson and P. sileri (Engelm.) L. Benson, and one in New Mexico, P. knowltonii, are



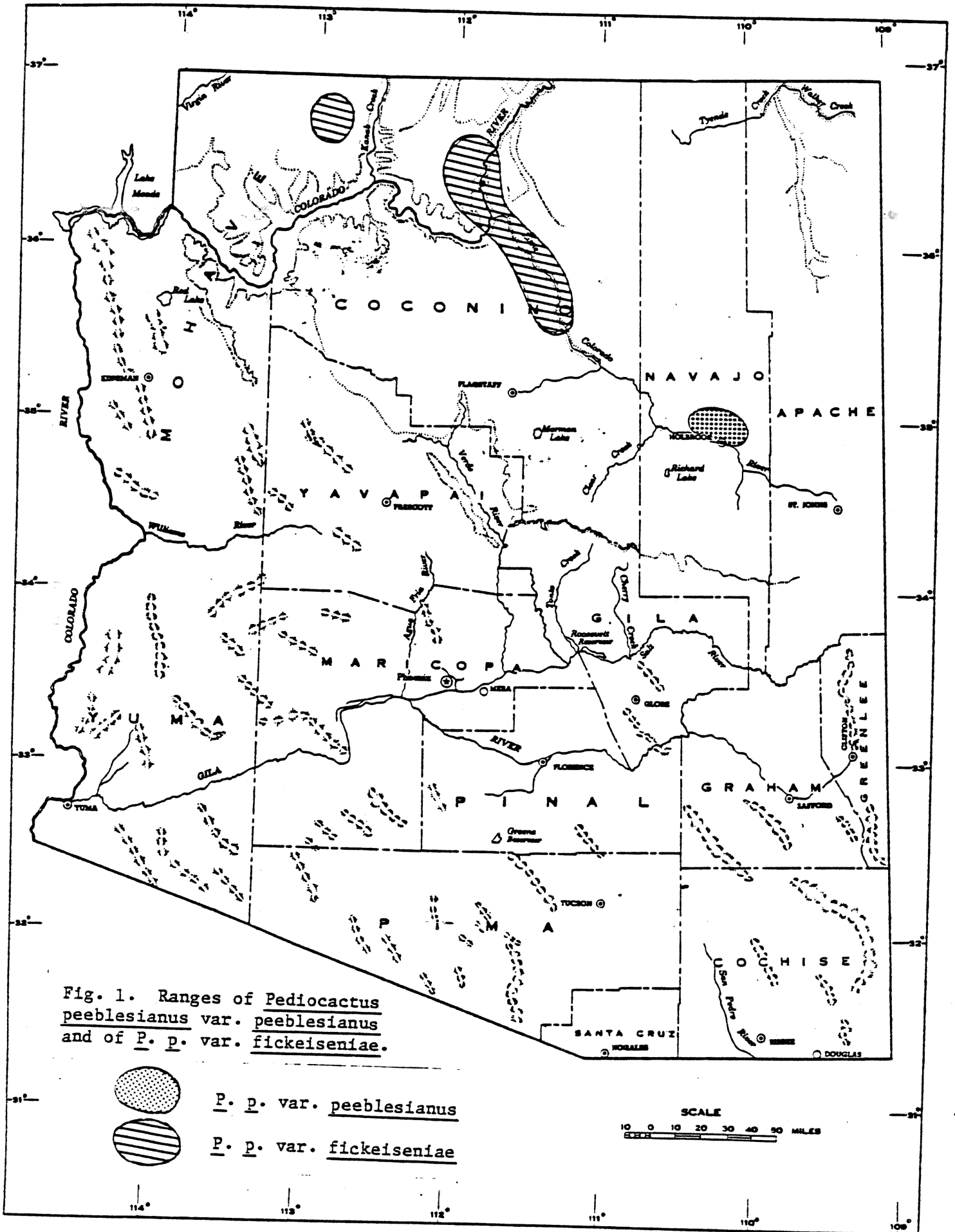




Fig. 1. Ranges of *Pediocactus peeblesianus* var. *peeblesianus* and of *P. p.* var. *fickensiae*.

-  *P. p.* var. *peeblesianus*
-  *P. p.* var. *fickensiae*

SCALE  
0 10 20 30 40 50 MILES

also listed as endangered. Five members, P. despainii Welsh et Goodrich, P. papyracanthus (Engelm.) L. Benson, P. paradinei B. W. Benson, P. winkleri Heil, and P. peeblesianus var. fickeiseniae (Beckeberg) L. Benson, are listed in the 1980 Notice of Review (45 FR 82480) and its 1983 Supplement (48 FR 53640) as candidates for listing under the Endangered Species Act. These pediocacti are narrow endemics, each occupying distinctive restricted habitats on the Colorado Plateau. Considered by Benson (1962b) to be "keystone of the arch" in reclassifying the cactus genera of the United States, Pediocactus and a few other small genera are intermediate between Echinocactus, on the one hand, and Coryphantha and Mammillaria on the other.

#### Current Status

Past and present distribution and abundance. It is assumed that the present and historic range of Peebles Navajo cactus are similar. There are no collections from anywhere other than the Joseph City-Holbrook area. Since the plant was discovered only about 40 years ago, its historic record is rather short. There are presently five known populations, totalling approximately 1,000 individual plants.

A specimen type sheet in the Herbarium of the U.S. Field Station, Sacaton, Arizona (now housed at University of Arizona Herbarium), attributes the discovery of the taxon to Mr. Whittaker of the Arizona Highway Department at a location near Holbrook, Arizona. This type specimen was sent by R.H. Peebles to Croizat who described it (Croizat 1943, p. 88).

A plant was propagated from a graft of this collection and given to the Desert Botanical Garden (DES) by Whitman Evans. The propagated plant was pressed August 20, 1955, (DES) and is designated as the isotype (Benson 1962a).

Mr. and Mrs. Dennis Cowper collected specimens from the Holbrook locality in 1955 and 1956, and specimens from near Cameron, Coconino County, Arizona in 1956. The latter plants were designated as a distinct variety (Pediocactus peeblesianus var. fickeiseniae (Beckeberg) L. Benson) by Lyman Benson (1962a), so the Holbrook plants represent the typical variety for the species.

The Peebles Navajo cactus grows on low hills in the Plains and Great Basin Grassland Biotic Community (Brown and Lowe 1980) near Joseph City and Holbrook, Navajo County, Arizona. Fickeisen plains cactus' populations range from about Grand Falls (Coconino County, Arizona) westward along the Little Colorado and Colorado River drainages. Thus, the Peebles Navajo cactus is isolated from Fickeisen plains cactus by a distance of 100 airline kilometers (Figure 1).

The species is found in an area about 11 km (7 miles) in length, running northwest to southeast, and about 1.6 km (1 mile) in width. A checkerboard pattern of land ownership exists in the Joseph City to Holbrook area, with alternate sections being in private or public ownership (Arizona State Land Department and U.S. Bureau of Land Management).

Two populations have been located on BLM land near Joseph City. Three other populations have been located on the hills near Holbrook, on private land. More than 70 percent of the species' potential habitat is privately owned. A large portion of the potential habitat on State and privately owned lands has not been well surveyed for Peebles Navajo cactus and it is likely that the cactus may occur on those lands.

Habitat. Pediocactus peeblesianus var. peeblesianus grows in soils derived from the Shinarump Member of the Chinle Formation (Figure 2). Although not continuous, the Shinarump Member occurs in about 140,000 square miles of the southwestern two-thirds of the Colorado Plateau region. According to Stewart et al. (1972), the soil is:

"typically yellowish-gray and pale-yellowish-orange fine- to coarse-grained friable sandstone. Lenses of conglomerate containing granules and pebbles predominately of quartz, quartzite, and chert are common."

Both varieties of P. peeblesianus are found in gravelly soils, usually alkaline (Heil et al. 1981); however, soils on which P. peeblesianus var. fickeiseniae grow are derived from Kaibab limestone.

The potential habitat in the Holbrook area is estimated to be 11.3 km<sup>2</sup> but plants have been located on only 15 - 20 percent of the habitat that was searched. The exact edaphic requirements of this cactus need

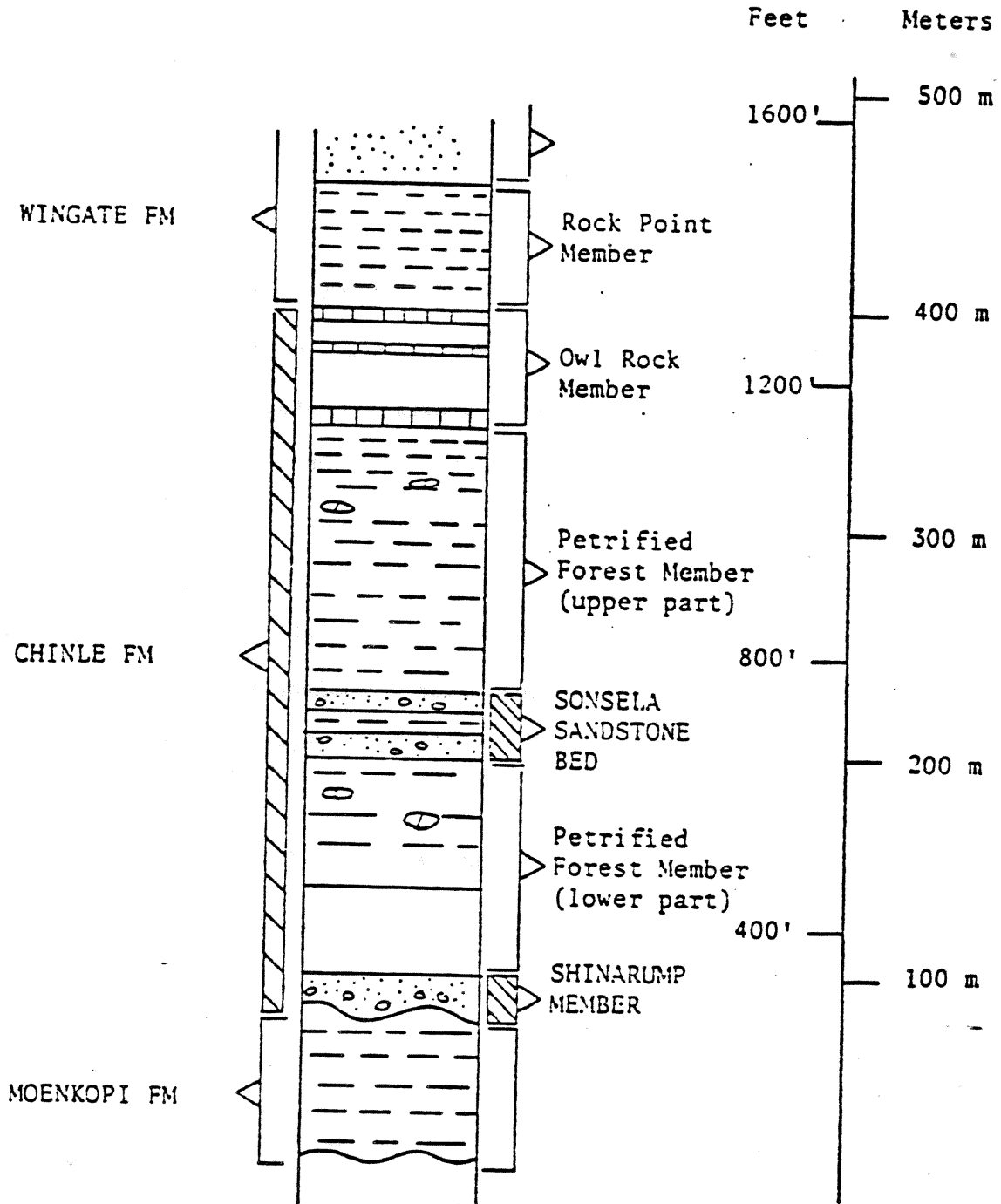


Figure 2. Generalized stratigraphic setting.

Northeastern Arizona and northwestern New Mexico (from Trevena 1975).

to be determined to discover possible reasons for its absence from apparently suitable habitat. Other factors such as succession and competition may also be involved.

The Peebles Navajo cactus occurs between 1700-1750 m (ca 5100 feet), the elevation of the geologic formation around Holbrook. The plants grow in exposed, sunny situations in gravelly alluvium on the 0-30° sloping to flat hill tops. The lower contact of the Shinarump is an erosion surface. The hills are created from cliff-forming sandstone and mudstone members of the Moenkopi Formation that rise above the basal plane (also Moenkopi) as 30-60 m high (100-150 feet) flat-topped mesas.

Higher members of the Chinle Formation, including the Petrified Forest member, are exposed to the east and north of Holbrook. To the south and west, the lower Moenkopi and Coconino Formations are exposed. Drainages in the area, especially north of the Little Colorado River, are broadly filled with alluvial gravel, sand, and silt (Wilson et al. 1969). Thus, the potential habitat for Peebles Navajo cactus stands as mesa islands, surrounded by a sea of unfavorable habitat.

The soils of the habitat have been characterized as belonging to the Gypsiorthids-Torriorthents-Haplargids Association (USDA Soil Conservation Service 1982). These are shallow to deep, well to excessively well drained soils formed in mixed alluvium. Slopes are 5 to 60 percent. Typically, the soil surface is a reddish brown gravelly sandy loam

about 7.5 cm thick. The subsurface layer is a reddish brown gravelly clay loam to very gravelly or sandy loam 12 to 25 cm thick. The substratum varies from beds with horizontal layers of pure white crystalline gypsum in the Gypsiorthids, to stratified sand and gravel. Permeability is slow to rapid. Available water capacity is very low to medium. Water supplying capacity is 7.5 to 15 cm. Effective rooting depth is 25 to 150 cm or more.

#### Associated Species

Where the Peebles Navajo cactus grows, the vegetation is generally open and sparse, characterized by low shrubs, grasses, and seasonal annuals. The biotic community (Brown and Lowe 1980) is the Plains and Great Basin Grassland, near the ecotone and intermingling with species of the Great Basin Scrub community. Dominant plants are: Snakeweed (Gutierrezia sarothrae), Shadscale (Atriplex confertifolia), Four-winged saltbush (A. canescens), Rabbitbrush (Chrysothamnus nauseosus), Sagebrush (Artemisia bigelovii and Artemisia tridentata), Mormon tea (Ephedra torreyana and E. cutleri), and Galleta (Hilaria jamesii). Cactus associates are beehive cactus (Coryphantha vivipara), Whipple devil claw (Sclerocactus whipplei var. whipplei) and several Opuntia species. Occasional junipers are present. The rare endemic Peebles amsonia (Amsonia peeblesii), a candidate for Federal listing, occurs with one of the populations.

Impacts and Threats

Within historic and potential range, much suitable habitat has been destroyed, is being severely impacted, or is in imminent danger of being destroyed. The most immediate threat is quarrying operations which are stripping much of the habitat for gravel used in road construction and commercial purposes. An unknown proportion of the presumed original habitat of this taxon, perhaps 25 percent, has already been destroyed through gravel pit operations on the private and State land on which the plant occurred. One of the gravel pit operations, within 0.2 km of known populations, is stripping much of the area, and the activity is continuing. According to the USDA Soil Conservation Service (1982), the gravel and sand deposits of this unit are used extensively and contribute most of the sand and gravel used in the Holbrook area.

The potential use of this habitat for homesites is a real threat since 70 percent of the potential habitat is in private ownership, including some by a realty company. Holbrook is expanding rapidly into the surrounding countryside and similar hills to the east and south have become populated. Much advertising for "ranch sites" is evident in the Holbrook area. Soil Conservation Service personnel (pers. comm. 1982) indicate that these hills are considered prime land for future development.



Pediocactus peeblesianus var. peeblesianus is in demand by collectors of rare cacti and other succulents, and removal of plants from native habitats by both private collectors and commercial suppliers has occurred (Benson pers. comm. 1979, Newland 1979). The extent to which this has, or is, depleting the population is unknown. However, monitored plots show significant loss of plants over a 2-year interval (1980-1982) from some cause. Pediocacti are also some of the most difficult cacti to grow from their own roots in cultivation (Heil et al. 1981) so it might be that a constant drain for replacement is occurring.

Cattle grazing is adversely affecting the plants through trampling, especially during wet seasons when the ground is muddy, and the plants are emergent. Grazing is a definite threat on portions of the range administered by the Bureau of Land Management and the State of Arizona, as well as on private grazing lands (Phillips et al. 1979).

Much of the habitat has been destroyed or is being disrupted by a variety of human disturbances. The construction of Interstate 40 around Holbrook destroyed some of the taxon's suitable habitat. A powerline access road scraped the topsoil and destroyed habitat adjacent to the BLM monitoring plots. Other roads in the habitat are ranch roads, roads for rock collecting, and roads made by ORV's en route to scenic overlooks. Rock and petrified wood collecting occurs near the Holbrook populations, with resultant trampling of plants and disturbance of the habitat. ORV use in the area has caused damage to the plants and their habitat through crushing of plants, erosion, and soil compaction.

Ecological factors affecting the continued existence of the Peebles Navajo cactus are the taxon's restriction to a very specialized and localized soil type, its limitation to flat areas or gentle slopes in an area which is rather hilly, its low total population and resultant restricted gene pool, and its restriction to a small geographic area. *Pediocacti* are subject to root rot (Heil et al. 1981) so this may be a factor thinning the population during wet years. All of these factors tend to intensify the adverse effects of man's activities.

#### Management and Research Efforts

The distribution of the Peebles Navajo cactus is reasonably well known. Records of specific population sites have always been kept purposefully vague to protect the cactus from cactus collectors. Several geologic studies have been made on the Shinarump Member (Stewart 1957, Stewart et al. 1972, Trevena 1975) including analysis in the Holbrook area. Soil analyses have also been done by SCS personnel (USDA Soil Conservation Service 1982).

*Pediocactus peeblesianus* is on the Arizona State Protected list, Arizona Native Plant law, Arizona Revised Statute, Chapter 7, Sec. 3-901(B) as *Toumeyia peeblesiana*. It is not to be collected except by permit for scientific or educational purposes. On July 29, 1983, *Pediocactus peeblesianus* was placed on Appendix I of the Convention on International Trade in Endan-

gered Species of Wild Fauna and Flora, which requires permits from both the importing and exporting countries before shipment may occur. Only scientific trade benefiting the species' survival is allowed.

The Endangered Species Act of 1973, as amended in 1982, prohibits the removal (from Federal lands) and reduction to possession of plants listed under the provisions of the Act. It is also prohibited for any person subject to the jurisdiction of the United States to sell, offer for sale, import, export, or transport in interstate or foreign commerce in the course of a commercial activity, any listed plant species. Under certain circumstances the Act also provides for the issuance of permits to carry out otherwise prohibited activities involving listed species.

The Lacey Act, as amended in 1981, also provides some protection for the Peebles Navajo cactus. Under this Act it is prohibited to import, export, sell, receive, acquire, purchase, or engage in the interstate or foreign commerce of any plant taken, possessed, or sold in violation of any law, treaty, or regulation of the United States, any Indian tribal law, or any law or regulation of any State.

Off-Road Vehicle Designation. Off-Road Vehicle (ORV) designations have not been made in the Apache and Navajo Planning Units by the Bureau of Land Management. Current BLM policy on ORV use is based on rules and

regulations published in the June 15, 1979 Federal Register (Vol. 44(177):34834-34838). One of the more pertinent regulations reads as follows:

"No person shall operate an off-road vehicle on public lands in a manner causing, or likely to cause significant, undue damage to or disturbance of the soil, wildlife, wildlife habitat, improvements, cultural, or vegetative resources or other authorized uses of the public lands;..."

Off-road vehicle designation work is being done as a part of BLM's normal planning effort and actions will be taken if it is identified as a management issue or concern. However, in order to prevent further, and remedy existing, resource damage BLM can fund interim designations and emergency closures. Establishment of ORV regulations for this area should be subject to consultation with the Fish and Wildlife Service under Section 7 of the Endangered Species Act.

Range Situation. The populations of Peebles Navajo cactus on BLM administered land are situated within the Apache Butte Allotment. This 32,016-acre allotment includes 6,703.48 acres of BLM-leased lands. Sixty-three cattle are grazed year-round on the BLM land. Remaining lands in the allotment are under private and State ownership. Because the BLM portion of the allotment is less than 21 percent, no allotment management plan will be written by BLM. The Soil Conservation Service

has developed a two-pasture deferred rotation grazing system for this allotment. Under this system, the allottee has cattle in each pasture for about 6 months a year. The Savory grazing method which often has a high impact on cactus species due to its high intensity/short duration forage use pattern, has not been implemented in this area.

BLM recently completed an inventory of waters on public lands in the Apache and Navajo Planning Units. There is no record of water developments on the BLM section containing Peebles Navajo cactus.

Navajo Relocation. The BLM is charged with acquiring 250,000 acres of land for Navajo tribal members being relocated under the Navajo-Hopi Relocation Act. Portions of the land must be within 18 miles of the present Navajo Reservation boundaries. Since 250,000 acres of BLM land is not available in this area, BLM will process land trades for private and State land within the 18-mile zone. Land BLM administers elsewhere in Arizona and New Mexico will be used to effect the land trades.

In the event the Navajo Tribe submits an application for land at one of the Peebles Navajo cactus sites, certain issues will have to be addressed:

- 1) What impact will this change in land status have on the populations and habitat of the Peebles Navajo cactus?
- 2) To what extent is the Navajo Tribe and Bureau of Indian Affairs (BIA) mandated to protect this cactus?

3) If management decides to process such an application, what type of memorandum of understanding, cooperative agreement or other arrangement can be negotiated that will assure the protection of this cactus?

The Bureau of Indian Affairs is obligated, as a Federal agency, to comply with all requirements and prohibitions of the Endangered Species Act. All activities which are conducted, funded or authorized by the BIA are subject to Section 7 consultation if they have the potential to affect a threatened or endangered species.

Monitoring. On May 8, 1980, two permanent transects were established within a population of Peebles Navajo cactus located on BLM administered land. Individual plants were plotted using a series of transects run on either side of and perpendicular to a baseline tape. On May 20, 1981, and April 28, 1982, the plots were examined and monitored. Additional plants were recorded during both of these visits.

A summary of the monitoring data is presented in Tables 1 and 2. Three readings of the plots over a 2-year interval have recorded a significant loss of plants. For instance, 9 of the 51 plants originally recorded in 1980 remain. Subsequent visits documented 41 additional plants for a total of 92 plants within the two transects. As of April 1982, 41 of the 92 plants remain.

Table 1. Monitoring Data from Transect #1.

Size Class	No. of Plants, 1980	No. of Plants, 1981	Additional Plants, 1981	No. of Plants, 1982	Plants from 1981	Additional Plants, 1982
(2-6 mm)	2	0	4	0	1	3
(9-19 mm)	5	2	2	2	0	5
(20-29 mm)	18	8	2	2	0	9
(30-35 mm)	1	0	0	0	0	0
Total No. of Plants	26	10	8	4	1	17
Plants in flower/fruit	19	5		14		

Table 2. Monitoring Data from Transect #2.

Size Class	No. of Plants, 1980	No. of Plants, 1981	Additional Plants, 1981	No. of Plants, 1982	Plants from 1981	Additional Plants, 1982
(2-6 mm)	3	2	1	1	0	12
(9-19 mm)	7	3	1	2	0	1
(20-29 mm)	12	5	1	2	1	0
(30-35 mm)	3	0	0	0	0	0
Total No. of Plants	25	10	3	5	1	13
Plants in flower/fruit	13	4		5		

The cause(s) of the apparent downward trend in this population is unknown. The stems of a few plants have been eaten by small animals, possibly rodents or rabbits. In most cases, however, the entire plant is missing. The only evidence of disturbance is a small opening among the pebbles where the plant had previously been recorded. It is likely that at least some of these plants were taken by collectors. Additional studies designed to separate the effects of natural cycles from trends resulting from human impacts are needed.

Propagation. Plant Resources Institute has worked on the tissue culture propagation of several other species of Pediocactus, under contract to BLM. Basically, the procedure involves placing meristematic tissue (seedling tips or areoles) in an agar based medium and culturing it for 6-8 weeks. Hormone levels are varied to achieve growth and multiplication. Usually by 6 weeks, new buds have formed. The buds are removed and replated. The replating is continued until the desired number of plants is obtained. The next step is to root the young cultured cacti and transfer them from the growth chamber to the greenhouse.

Rooting techniques and transfer procedures for establishing the small plants in soil need to be developed for all the pediocacti. Plant Resources Institute was successful in establishing plants of P. sileri, P. paradinei, and P. papyracanthus in culture. Various botanical institutions have expressed an interest in acquiring and maintaining these plants since the Plant Resources Institute is not continuing this work due to withdrawal of BLM funds for the project.





111. Enforce existing laws and regulations.
112. Prohibit ORV use.
113. Withdraw habitat from mineral entry.
114. Manage livestock grazing.
115. Impose access restrictions on existing powerline access road.
116. Special land designations.
117. Develop memorandum of understanding or cooperative management plan between BLM and the Fish and Wildlife Service on management of Peebles Navajo cactus.
118. Prepare and implement a Habitat Management Plan.
119. Monitor populations and habitat.
12. Protect populations on private lands.
121. Enforce existing laws and regulations.

122. Pursue habitat protection through The Nature Conservancy, U.S. Fish and Wildlife Service, or other protection agencies or organizations.
  123. Develop cooperative agreements with private landowners for protection and management of Peebles Navajo cactus.
  124. Develop and implement habitat management plans for cactus populations on private lands under cooperative agreements.
  125. Monitor populations and habitat.
13. Determine the extent of impacts of collecting on Pediocactus peeblesianus var. peeblesianus.
131. Develop a monitoring system to determine the number of individuals at each site and to quantify the loss of individuals as a direct result of collecting.
  132. Develop a study to determine the number of wild and cultivated Peebles Navajo cacti actually in commercial trade.

2. Sustain populations in their natural habitat at the existing sites.
  21. Study the ecological requirements of the Peebles Navajo cactus.
    211. Study soil needs of the Peebles Navajo cactus.
    212. Study water needs of the Peebles Navajo cactus.
    213. Study the role of biotic factors in Peebles Navajo cactus ecology.
      2131. Herbivores.
      2132. Pollinators.
      2133. Other organisms.
  22. Study the population biology of the cactus.
    221. Life history characteristics.
    222. Demographic trends - monitor population numbers to determine which trends result from natural cycles and which result from human impacts.

23. Apply the results of studies under 21 and 22:

231. To determine environmental parameters defining and restricting its habitat, and identify all potential habitat.

232. To develop a habitat management plan for the entire Shinarump-based ecosystem.

24. Inventory all potential habitat for the Peebles Navajo cactus and accurately determine distribution and land ownership.

3. Develop public awareness, appreciation, and support for preservation of Peebles Navajo cactus. Enlist the support of public interest groups in its survival.

4. Develop propagation techniques to provide nursery stocks to reduce collection pressure.

41. Investigate various methods of propagation.

42. Consider transplanting greenhouse-grown stock to depleted natural habitat.

43. Make propagation techniques known to nurserymen in order to provide plants for commercial trade.

Narrative

The objective of this recovery plan is to restore the Peebles Navajo cactus as a secure and stable member of the native flora of Arizona. The actions just outlined should accomplish this goal, through fulfillment of the criteria established for delisting of this cactus. However, delisting of the cactus should not be viewed as the end of the effort toward its recovery. After delisting is accomplished, monitoring of the populations should continue to ensure that the cactus does not once again decline, and opportunities to further enhance this cactus should be sought and exploited.

1. Remove threats to the Peebles Navajo cactus by enforcement of existing regulations and management for protection.

Because of the rarity of the Peebles Navajo cactus, all existing populations must be protected by the enforcement of existing regulations and by management to remove the threats to the taxon.

11. Protect populations on Federal lands.

111. Enforce existing laws and regulations.

All existing regulations for the protection of threatened and endangered species on Federal lands need to be enforced. This includes the Endangered Species Act, CITES, the Lacey Act, Arizona Native Plant Law [A.R.S., Chap. 7, Sec. 3-901(B)] as well as all existing agency regulations on ORV use, grazing, mining, plant collection, etc.

112. Prohibit ORV use.

Because of the vulnerability of this species to damage both to itself and to its habitat, ORV use in known and potential habitat for the species must be prohibited. Signs stating the present pertinent regulations should be posted and such regulations enforced. Because ORV use under present regulations is damaging the Peebles Navajo cactus, a closure should be requested. This will require the preparation of an Environmental Assessment Record, an Implementation Plan, a Federal Register Notice, Section 7 consultation, and public participation. This closure should be included in appropriate permanent BLM planning and regulations, and the closed area should be prominently posted. Closure regulations should be rigidly enforced. Fencing may be required to prevent violations. Establishment of nearby areas open to ORV use might help in enforcement of such a closure.

113. Withdraw habitat from mineral entry.

At present, the only known significant mineral in the Peebles Navajo cactus habitat is sand and gravel. The removal of sand and gravel has already damaged habitat of the cactus on State and private lands, and continues to do so. All known and potential habitats of this species on Federal lands

should be removed from all forms of mineral entry, including administrative curtailment of ongoing sand and gravel removal.

114. Manage livestock grazing.

Livestock grazing has definite negative impacts on the Peebles Navajo cactus through trampling. A grazing management plan should be prepared for the allotment containing habitat for this cactus, and Section 7 consultation should be done on that plan. Such a plan should include the elimination of spring (March-May) grazing on all potential Peebles Navajo cactus habitat, and complete elimination of grazing from areas of known high density cactus populations, probably by use of exclosure fencing. In addition, the plan should not allow the use of the Savory grazing method on this allotment. The high intensity/short duration forage use of the Savory method would have a high impact on this taxon.

115. Impose access restrictions on existing powerline access road.

This road has already destroyed some cactus habitat. The presence of a road, bisecting the only known existing federally controlled populations of Peebles Navajo cactus, encourages and gives access to collectors, ORV users, and other uses detrimental to this taxon and its habitat. Therefore, this road should either be closed or furnished



with locked gates, and access limited only to authorized BLM and utility personnel. Maintenance activities on this road should be strictly regulated to prevent further damage to cactus habitat.

116. Special land designations.

The BLM administered section containing Peebles Navajo cactus, or at least a portion of it, should be designated as an Area of Critical Environmental Concern (ACEC). This is the only known population of the cactus on public lands.

117. Develop a memorandum of understanding or cooperative management plan between BLM and the Fish and Wildlife Service on management of Peebles Navajo cactus.

In order to facilitate the management and protection of this cactus, a memorandum of understanding or cooperative management plan between the BLM and the Fish and Wildlife Service should be developed. Such an agreement should set forth long term objectives and general management activities needed.

118. Prepare and implement a Habitat Management Plan.

A Habitat Management Plan needs to be written for the Peebles Navajo cactus habitat on BLM land. This document should include the needed on-ground activities such as

the signing and enforcement of the ORV closure, grazing management, closure of the powerline road, mining withdrawal, ACEC designation, etc.

119. Monitor populations and habitat.

Two plots for the monitoring of the Peebles Navajo cactus, were set up on BLM land in 1980. These plots have been checked and recorded yearly, and should continue to be monitored. In addition, this monitoring program should be expanded to give more comprehensive data on the entire population.

12. Protect populations on private lands.

Although populations on private lands lack the legal protection afforded those on public lands, it is important for the survival of the taxon that attempts be made to secure those populations.

121. Enforce existing laws and regulations.

The commercial use and interstate and foreign regulation provisions of the Lacey Act, CITES, ESA, and the Arizona Native Plant Law should be enforced to help protect the Peebles Navajo cactus on private lands.

122. Pursue habitat protection through The Nature Conservancy, U.S. Fish and Wildlife Service, or other protection agencies or organizations.

The possibility of obtaining management control of the Peebles Navajo cactus on private lands should be investigated and, if possible, implemented.

123. Develop cooperative agreements with private landowners for protection and management of the Peebles Navajo cactus.

On private lands for which the owner is willing to negotiate a cooperative management agreement for the Peebles Navajo cactus, an agreement should be attempted as the simplest method of protecting the cactus. Such agreements should provide for the protection of the cactus and its habitat, for access to the cactus populations by management biologists, and for certain management tasks including monitoring.

124. Develop and implement habitat management plans for cactus populations on private lands under cooperative agreements.

Once some type of agreement has been obtained, a habitat management plan should be developed for each population. These plans should provide for specific on-ground activities.

125. Monitor populations and habitat.

Monitoring is necessary to ensure maintenance of the existing populations and to avert threats to these populations.

13. Determine the extent of impacts of collecting on Pediocactus peeblesianus var. peeblesianus.

The amount of collecting being done needs to be determined and collecting curtailed.

131. Develop a monitoring system to determine the number of individuals at each site and to quantify the loss of individuals as a direct result of collecting.

A statistically accurate sample of plots should be established. All individuals of Peebles Navajo cactus in each plot should be mapped, measured and recorded. Each plot should be checked twice a year, once during the blooming season and once after fruit has set.

132. Develop a study to determine the number of wild and cultivated Pediocactus peeblesianus var. peeblesianus actually in commercial trade.

This study would probably be part of a national study concerning all cacti in the trade. The study would involve the monitoring of journals and nursery catalogs, interviews with dealers, and undercover work.

2. Sustain populations in their natural habitat at the existing sites.

Because of the rarity of the Peebles Navajo cactus, all existing populations must be sustained in a healthy and vigorous state. An in-depth knowledge of the Peebles Navajo cactus' ecology is needed to understand its habitat requirements. When these are known, they can be used to sustain healthy, natural populations.

21. Study the ecological requirements of the Peebles Navajo cactus.

Studies on specific geological/edaphic parameters need to be done to uncover factors influencing the distribution of the cactus. Both required components and limiting factors should be determined. This will provide an index of how much habitat there is and the type of management necessary.

211. Study soil needs of the Peebles Navajo cactus.

The depth of soil, amount and nature of conglomerate gravels, and amount of petrified wood differs in the Holbrook and Joseph City populations. Areas seemingly identical to others supporting cactus have no plants. Soil factors such as chemical composition, texture, structure, aeration, and temperature need to be assessed.

212. Study water needs of the Peebles Navajo cactus.

Plants are emergent in the spring for reproduction but retract into the soil during dry periods and shrink. Root

rot is evident during extremely wet periods. The timing and amount of rainfall at different seasons, with resulting moisture equivalence of the soil, as well as the effect of the gravel rock cover on evaporation, needs to be determined.

213. Study the role of biotic factors in Peebles Navajo cactus ecology.

Biotic factors influencing the survival of the Peebles Navajo cactus need to be studied. Such factors may be limiting to recovery and/or may be effectively manipulated to facilitate recovery.

2131. Herbivores.

Various herbivores, primarily rabbits and packrats, are abundant in the area. Rabbit droppings are common near the plants, and the concentration of plants at the top of cliffs make them particularly vulnerable to foraging packrats which have dens immediately below the boulders.

2132. Pollinators.

Pollinators of the Peebles Navajo cactus are unknown. A detailed study is needed to identify the organisms

that are pollinators for this cactus and any special mechanisms involved.

2133. Other organisms.

Soil organisms such as fungi and nematodes may play an important role in the ecology of the taxon, especially in relation to root rot. The relationship of frugivores likewise needs to be assessed.

22. Study the population biology of the cactus.

The life history characteristics of the Peebles Navajo cactus should be studied because they reflect the taxon's adaptations to its particular environment. Some microhabitats allow higher fecundity and survivorship of individual plants than others, so characteristics of subpopulations can indicate which abiotic and biotic components are most essential to survival of the taxon. Population biology studies will also provide minimum and optimum numbers of plants for maintenance of viable populations.

221. Life history characteristics.

The frequency of establishment of the seedlings, survivorship, fecundity, growth rates, the density-dependence of the pollination, and the reproductive index of the taxon are some factors that need to be studied.

222. Demographic trends - monitor population numbers to determine which trends result from natural cycles and which result from human impacts.

Natural populations are often cyclical in their numbers of individuals. Often overlying this natural variation are the effects of man-caused environmental perturbations. Monitoring studies carried out in the Joseph City population show a marked reduction in the number of individuals over a 2-year period. The cause for this is unclear, and detailed demographic studies are needed to assess these trends. The establishment of monitoring plots in the Holbrook population would be useful in this regard.

23. Apply the results of the studies under 21 and 22.

231. To determine environmental parameters defining and restricting its habitat, and identify all potential habitat.

Information is needed to explain why the Peebles Navajo cactus occurs in only 15 to 20 percent of the apparently suitable habitat in the area. Once these parameters are understood, then all potential habitat for the species can be identified, and a program developed for expansion of the Peebles Navajo cactus.



232. To develop a habitat management plan for the entire Shinarump-based ecosystem.

As more data is obtained on the Peebles Navajo cactus, the HMP developed for the BLM land should be expanded and updated to include the entire Shinarump-based ecosystem.

24. Inventory all potential habitat for the Peebles Navajo cactus and accurately determine distribution and land ownership.

Final inventories are needed to map the exact range of the cactus and to determine land ownership. These are necessary to determine management responsibilities and cooperative efforts. Similar geologic substrates should be checked again to be sure that populations have not been overlooked.

3. Develop public awareness, appreciation, and support for the preservation of the Peebles Navajo cactus.

Education of the public is a vital part of the recovery process. The cooperation of the public is essential for the ultimate success of the foregoing recovery measures. Public interest groups, especially local ones such as native plant societies, cactus societies, and The Nature Conservancy chapters, need to be involved. The visibility of their support can be instrumental in shaping public opinion. Specific strategies would include lectures, pamphlets, letters, etc., concerning conservation of threatened and endangered species.

4. Develop propagation techniques to provide nursery stocks to reduce collection pressure.

The pressure of collecting on natural populations should be reduced by developing the knowledge and techniques necessary to propagate plants for commercial trade and for establishing new populations.

41. Investigate various methods of propagation.

Peebles Navajo cactus is relatively difficult to propagate and grow, and methods must be developed for mass production to meet the demand.

42. Consider reintroducing greenhouse-grown stock to depleted natural habitat.

The severe reduction of natural populations in recent years may soon reduce them below the level of viability. If the cause for the loss can be found and corrected, reintroductions may be needed as a recovery method. Possible genetic differences between populations should be considered in transplant and reintroduction decisions.

43. Make propagation techniques known to nurserymen in order to provide plants for commercial trade.

Techniques developed for propagation of Peebles Navajo cactus, and techniques already successfully used by nurserymen should

be compiled and published in appropriate journals or newsletters.

This will enable commercial propagation of this cactus to occur,

thus reducing the collecting pressure on wild stocks.

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PART III - IMPLEMENTATION SCHEDULE

Priorities in column four of the implementation schedule are assigned using the following guidelines:

- Priority one (1) - Those actions absolutely necessary to prevent extinction of the species.
- Priority two (2) - Those actions necessary to maintain the species' current population status.
- Priority three (3) - All other actions necessary to provide for full recovery of the species.

Abbreviations used:

- BLM - USDI Bureau of Land Management
- FWS - USDI Fish and Wildlife Service
  - SE - Office of Endangered Species
  - LE - Law Enforcement
- AAH - Arizona Commission on Agriculture and Horticulture

PART III - IMPLEMENTATION SCHEDULE

GENERAL CATEGORY (1)	PLAN TASK (2)	TASK # (3)	PRIORITY # (4)	TASK DURATION (5)	RESPONSIBLE AGENCY			FISCAL YEAR COSTS (EST.)			COMMENTS
					FWS REGION (6)	PROGRAM (6a)	OTHER (7)	FY 1 (8)	FY 2	FY 3	
02	Law enforcement.	111. 121.	1	ongoing	2	LE	BLM AAH	existing funding			
M3	ORV closure and signing.	112.	1	2			BLM	1,000	1,000		
A5	Mineral entry with-drawal.	113.	1	2			BLM	1,000	1,000		
M3	ORV and livestock fencing.	112. 114.	1	1			BLM	3,000			
M3	Grazing management.	114.	1	ongoing			BLM	existing funding			
I1 & 2	Monitor populations and habitat.	119.	1	ongoing	2	SE	BLM	1,000	500	500	
M3	Restrict access on powerline road.	115.	2	1			BLM	500			
M7	ACEC designation	116.	2	2			BLM	2,000	1,000		
A2,3,4, 6	Pursue habitat protection with State and private land-owners.	122. 123.	2	1	2	SE		12,500			
A3	Develop management agreement (BLM lands)	117.	3	1	2	SE	BLM	2,000			
M3	Develop HMP on BLM lands.	118.	3	1	2	SE	BLM	2,000			(9)

PART III - IMPLEMENTATION SCHEDULE

GENERAL CATEGORY (1)	PLAN TASK (2)	TASK # (3)	PRIORITY # (4)	TASK DURATION (5)	RESPONSIBLE AGENCY		FISCAL YEAR COSTS (EST.)			COMMENTS	
					FWS REGION (6)	PROGRAM (6a)	OTHER (7)	FY 1 (8)	FY 2		FY 3
R3	Study ecological requirements of species.	21.	3	3	2	SE		20,000	5,000	5,000	
R3	Study population biology.	22.	3	3	2	SE		20,000	5,000	5,000	
M3	Develop habitat management plan for Shinarump ecosystem	232.	3	1	2	SE	BLM AAH	2,000			
I1,6	Inventory for new locations and populations.	24.	3	3	2	SE	BLM	5,000	5,000	5,000	
R7	Develop propagation methods.	4.	3	3	2	SE		10,000	5,000	5,000	
O1	Develop public awareness	3.	3	ongoing	2	SE		5,000	1,000	1,000	
I14	Develop study of extent of use in commercial and private collection.	132.	3								This will be part of a national study to be developed.

APPENDIX

COMMENTS ON THE DRAFT PLAN

A technical draft was sent out for review on September 30, 1982, and comments were received from the following:

Kenneth D. Heil, Navajo Community College, Shiprock, New Mexico

Joe Dowhan, Office of Scientific Authority, U.S. Fish and  
Wildlife Service, Washington, D.C.

District Botanist, Phoenix District Office, USDI Bureau of Land  
Management

Botanists, U.S. Fish and Wildlife Service, Washington Office of  
Endangered Species, Washington, D.C.

Edward F. Anderson, Whitman College, Walla Walla, Washington

An agency draft was sent out for review on October 18, 1983, to the following:

Director, Arizona Game and Fish Department, Phoenix, Arizona

State Director, Bureau of Land Management, Phoenix, Arizona

Arizona Plant Recovery Team Members

Mr. Kenneth D. Heil, Farmington, New Mexico

Mr. Dick Armstrong, The Nature Conservancy, Tucson, Arizona

Director, U.S. Fish and Wildlife Service, Washington, D.C.

Mr. Thomas C. Gibson, University of Utah, Salt Lake City, Utah

Dr. Rollin D. Sparrowe, U.S. Fish and Wildlife Service, Washington, D.C.

Comments received and FWS responses to them are found in this Appendix.



COMMISSIONERS:

HANK FERGUSON JR. Yuma, Chairman  
LANCE W. WERNER, Tucson  
PAT A. JENNINGS, Scottsdale  
HEN J. GISEL, Flagstaff  
D. S. BAKER, Elgin

-43-



ARIZONA GAME & FISH DEPARTMENT

2222 West Greenway Road Phoenix, Arizona 85023 942-3000

November 21, 1983

Russell Kologiski  
Endangered Species Office  
U. S. Fish & Wildlife Service  
P. O. Box 1306  
Albuquerque, New Mexico 87103

Dear Rusty:

I have completed my review of the Pediocactus peeblesianus and compiled these comments.

Overall the plan seems adequate. It is comprehensive and deals with all the important issues. I can't think of any major fault or lacking in the plan. A minor fault is that the authors avoid strong criticism of collection pressure by the cactus fanciers. On p. 17 para. 3 the obvious conclusion one would reach is that cactus fanciers have plundered the monitoring plots. It should be stated in no uncertain terms that this is undoubtedly what happened. Particularly in view of the recent and very unfortunate publication by Heil et al. (1982) with photographs of localities which could conceivably be used by the unscrupulous to locate high-density sites.

A-1

Other more specific comments are as follows:

p. 4 para. 3: "Navajoan Desert" is a faunistic province, within a biotic classification wholly inappropriate to the topic. The authors should stick with the Brown & Lowe biotic communities classification which is discussed on p. 10.

A-2

p. 8 para. 2: Should read, "According to Stewart et al. (1972), the soil is:". The selection should be enclosed within quotation marks.

A-3

p. 8-9: Edaphic requirements may have nothing to do with the lack of plants in the unoccupied potential habitat. Evolutionary time and plant competition may be other factors involved.

A-4

p. 9 para. 2: 30° is not a gentle slope.

A-5

p. 9 para. 4: This paragraph belongs on p. 8 somewhere after the quotation from Stewart et al. (1972).

A-6

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Russell Kologiski

-2-

November 21, 1983

A-7 p. 10 para. 2: Plains and Great Basin Grassland are two distinct biotic communities which were not mapped as separate units. The vegetation of the area is characteristic of the ecotonal nature of much of the Little Colorado River Valley. The Plains Grassland and Great Basin Grassland biotic communities intergrade and at lower elevations on drier and/or more abused sites are strongly influenced by elements of the Great Basin Desert Scrub biotic community.

A-8 p. 12 para. 1: Should mention the article by Heil et al. (1981) here.

A-9 p. 15 para. 1 and 2: When can we expect action from BLM and the State Land Department on range management and ORV restrictions?

A-10 p. 19: So does this mean PR will never complete the work on Navajo plains cactus?

A-11 p. 20: On pages 11-13 there should be some discussion of the reasoning behind criteria 2. The authors need to explain why an increase in present number of individuals is desirable, they need to identify the factors and quantify their separate impacts.

A-12 p. 23, 233 and p. 35, 233: Only if it is determined from 21 and 22 that this is necessary to protect the Navajo plains cactus.

A-13 p. 25: Why is there no narrative of the prime objective and its criteria?

A-14 p. 31 para. 1: Be sure to change Mesa Verde cacti to Navajo plains cacti.

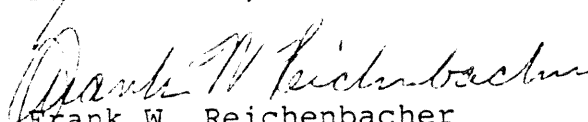
A-15 p. 31 para. 3: How does this conflict with the Prime Objective and its second criteria? In fact the wording of the Prime Objective is quite confusing. It appears to suggest that there are "healthy" natural populations in spite of the preceding pages which stress that there are or may be no healthy populations. The Prime Objective should not be sustaining healthy natural populations (since there are none) but creating healthy natural populations.

A-16 p. 33 para. 2: The "pollination ecology" or the "pollinators".

I hope these comments will be of value. If I can be of any further assistance, please call or write me at your convenience.

Sincerely,

Bud Bristow, Director

  
Frank W. Reichenbacher  
Habitat Specialist

FWR:rp  
cc: John O'Neil, Region I Game Specialist



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
ARIZONA STATE OFFICE  
2400 VALLEY BANK CENTER  
PHOENIX, ARIZONA 85073

JOHNSON
Boyer
Craig
H. Johnson
Kaiser
Kaiser
Hess
Padilla
SANCHEZ
FILE

December 28, 1983

IN REPLY REFER TO  
4510 (932)

- RD
- DRD
- AA
- AFF
- AWR
- AHR
- LE
- PAO
- EEO
- FILE
- Action *SE*
- CL 1-7

Memorandum

To: Regional Director, Region 2, U.S. Fish and Wildlife Service  
Albuquerque, New Mexico

From: State Director, Arizona

Subject: Review of Draft Recovery Plan for Navajo Plains Cactus  
(Pediocactus peeblesianus var. peeblesianus)

*Send by final plh*

Thank you for the opportunity to review the draft recovery plan. We offer the following comments and suggestions.

General

The draft is a good start toward a recovery plan for the Navajo Plains Cactus, but it requires some revision, especially with regard to actions stated as the BLM's responsibility. Some of the actions are not necessarily within the BLM's capability and should be carefully evaluated in preparing the final recovery plan.

Specific Comments

Pages 3-10 - Current Status

B-1 The total acreage occupied by the species and ownership by category (Federal, State, or private) should be identified. This is important information with regard to the status of the species and to determine the impacts such a plan may have on BLM, State or private programs.

B-2 Pages 11-13 - Impacts and Threats

The section refers to historic and potential range of the species and specific actions which may be occurring on this habitat; however, the specific locations which might be involved and the acreage of habitat affected are not listed. Specific locations being impacted should be identified. The amount of habitat being impacted by the various activities should also be identified so that it is possible to determine what percentage of the total habitat is involved.

It would be helpful to include references to studies or data sources substantiating the statements concerning impacts of livestock grazing, recreation, and road developments. You may wish to consider adding a clarification statement explaining that the impacts mentioned are based on professional opinion rather than data or studies.

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B-3 Pages 14-15 - Off-road Vehicle Designation

The statement concerning ORV designations should be rewritten. BLM is now working on issue identification process for the Apache-Navajo planning units. If ORV conflicts are identified during the Management Situation Analysis, then they will be carried through for management action.

B-4 Page 16 - Navajo Relocation

The Navajo Tribe may apply for these lands under the Relocation Act. If the Navajo Tribe so desires, the lands will be transferred and held in trust by the Bureau of Indian Affairs. Attached for your information is a map showing lands selected by the Navajo Tribe on June 24, 1983. Please note that these lands are in Apache County and are a substantial distance from the delineated habitat of the Navajo Plains Cactus shown in the draft recovery plan.

Pages 25-36 - Narrative

B-5 Item 111. We agree that the stated laws and regulations should be enforced. We want to point out, however, that BLM has very limited enforcement capability.

B-6 Item 112. The posting of signs, the closure and fencing might to some degree reduce impacts on the cactus, but they will also draw attention to the area and the resulting adverse impacts may be greater.

B-7 Item 113. The withdrawal of public land from all forms of mineral entry may not be within BLM's capability at this time. In accordance with the 1872 Mining Law, certain types of exploration may occur on public lands; however, there is no indication of any significant minerals within known habitats. Since there is no reference to known locatable minerals within these sites, a total withdrawal for minerals may not be an applicable approach. Sand and gravel operations on private lands seem to be impacting habitat for this species. The authorization for such actions on public lands is discretionary and can be curtailed without a withdrawal.

B-8 Item 115. The closure of an existing powerline access road is dependent upon several factors. If the existing access road is within the granted right-of-way and necessary for maintenance of existing utilities, the company has a vested right in the access. It would be more practical for BLM to impose limited access stipulations. This would provide for fencing areas and providing a locked gate with limited access to only authorized personnel. This would appear to eliminate most of the concerns expressed in this plan.

B-9 Item 116. The proposed special designation is likely to draw attention to the area which may result in greater adverse impacts than would occur without the designation.

B-10 Item 117-118. The recommendation for the MOU should be removed and rewritten to emphasize a cooperative habitat management plan (HMP) for the Navajo Plains Cactus. Under the present MOU between BLM and FWS, a specific MOU for management of a particular threatened or endangered species should not be necessary.

B-11 Item 121. Agencies responsible for enforcement should be identified.  
BLM has no enforcement jurisdiction on private lands.

B-12 Item 233. BLM guidelines provide for HMPs to be prepared on an ecosystem basis. BLM's habitat management actions specified in HMPs apply only to BLM-administered lands.

We appreciate the opportunity to comment on this draft plan. When a final plan is available, we would appreciate a copy for our records. If there are any questions concerning our comments, please contact John Castellano, FTS 261-3141.



Acting

Attachment



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
WASHINGTON, D.C. 20240

✓	ADDITION
✓	ADDRESS ONLY THE DIRECTOR FISH AND WILDLIFE SERVICE
	RD
	DRD
	AA
	✓ AFF F
	AWR
	AHR
	LE
	PAO
	EEO
	2 FILE SE
	Action
	CL-17-150

In Reply Refer To:  
FWS/OES

Memorandum

To: Regional Director, Region 2 (ARD/AFF)

From: Director

Subject: Review of Peebles Navajo Cactus Recovery Plan - Agency Draft

*Robert C. Simmons*

Attached is a copy of the subject plan with specific editorial comments indicated in the margins. In addition, we offer the following comments:

- C-1 1. Throughout the plan (including the title) Pediocactus peeblesianus is referred to as Navajo plains cactus, however, it is officially listed as Peebles Navajo cactus. Therefore, Peebles Navajo cactus is the name that should be used throughout the plan.
- C-2 2. Since collecting is a threat to this cactus, it is important that all maps and references to the locations of wild populations be general enough so as not to jeopardize any wild cactus by facilitating taking.
- C-3 3. Task 1221 calls for Service participation in realty actions. The initial step of Service participation must be the preparation of a Land Protection Plan.
- C-4 4. Task 112 - If ORV use is threatening enough to require an emergency closure of the area, then it should receive additional emphasis in the Impacts and Threats section.
- C-5 5. Item 112 is given a priority 1 in the Implementation Schedule. This priority needs to be better justified in the narrative.
- C-6 6. The Implementation Schedule has inadvertantly excluded tasks 123, 124, 231, and 232.
- C-7 7. Additional editorial and substantive comments are found in the margins of the attached copy of the plan.

As per your request of October 26, 1983, we are actively considering an amendment to the FY84 Program Advice which would delegate signature authority for this plan from the Director to the Regional Director. Should this amendment be

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approved, please notify the Office of Endangered Species (OES) upon approval of this plan by the Regional Director and send a copy of the approval page. When available, please provide OES with 25 copies of the approved plan for distribution.

Attachment



# United States Department of the Interior

IN REPLY REFER TO  
4500 (023)

BUREAU OF LAND MANAGEMENT  
PHOENIX DISTRICT OFFICE  
2929 WEST CLARENDON AVENUE  
PHOENIX, ARIZONA 85017

End. Sp. R-2
JOHNSON
Brown
Carey
Heil
Johnson
Kayser
Miller
Sanchez
FILE

November 17, 1983

Memorandum

To: Regional Director, Region 2, U.S. Fish and Wildlife Service, P. O. Box 1306, Albuquerque, New Mexico 87103

From: District Manager, Phoenix

Subject: Agency Review of Draft Recovery Plan

The district botanist and Phoenix Resource Area personnel have reviewed the agency review draft plan for Pediocactus peeblesianus var. peeblesianus and offer these comments for consideration.

- D-1 1. Page 3, paragraph 2, line 5 - According to Ken Heil (personal communication 8/13/83), additional populations occur on private and state land just east of the BLM section with P. peeblesianus var. peeblesianus. His map shows seven 'X's, possibly indicating seven distinct populations. No estimate of numbers of plants was given. Without additional inventory it is difficult to determine an exact number of populations.
- D-2 2. Page 8, paragraph 1 - The comment above also applies here.
- D-3 3. Page 10, paragraph 2, line 8 - Should read .... Mormon tea (Ephedra torreyana and E. cutleri), ....
- D-4 4. Page 12, paragraph 3, line 7 - Should read .... Rock and petrified wood collecting occurs near ....
- D-5 5. Page 15, paragraph 2, line 2 - This allotment of some 32,016 acres includes 6,703.48 acres of BLM-leased lands.

The remaining lands are under private and state ownership. The Soil Conservation Service developed a two-pasture deferred rotation grazing system for this allotment. Under this system the allottee has cattle in each pasture for about six months a year.

FWS REG 2  
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- D-6 6. Page 18 - The xerox of Tables 1 and 2 is incomplete.
- D-7 7. Page 20, line 6 - Based on Ken Heil's distribution data the number of individuals should be increased.
- D-8 8. Page 21, #1221 - Should read .... Purchase of easement ....
- D-9 9. Page 26, #114 - Since BLM administers less than 21% of the allotment an allotment management plan will not be written for this area. However, stipulations may be placed on the grazing lease that would protect Navajo plains cactus habitat from any negative impacts of livestock grazing.
- D-10 10. Page 27, #115, line 4 - Should read .... controlled populations of .... The allottee does not use this road in his ranching operation.
- D-11 11. Page 27, #116, line 3 - Should read .... designated as an Area ....
- D-12 12. Page 29, #1221, line 1 - Should read .... Purchase of easement by the ....
- D-13 13. Page 31, paragraph 1, line 2 - Should read .... All Navajo plains cacti ....
- D-14 14. Page 34, #221 - A method should be developed for determining growth rates of this taxon.
- D-15 15. Page 34, #222, line 9 - Should read .... and detailed demographic studies ....
- D-16 16. Page 38 - Pediocactus should be underlined in the Heil et al citation.

The district botanist is preparing a habitat management plan that will address the specific tasks assigned to the BLM under this recovery plan. Thank you for the opportunity to comment on this draft recovery plan.

*Luanne H. Zeller*  
*Associate*

Comments received from Kenneth Heil, Farmington, New Mexico.

End. of file
JOHNSON
Lowman
Carley
Holmes
Holmes
Kalowski
Langford
KAYSER
Hoop
Patina
SANCHEZ
FILE

Comments

Pediocactus peeblesianus var. peeblesianus

- E-1 pg. 2 Second paragraph The Navajo plains cactus---
- E-2 pg. 9 spelling--especially to the north---
- E-3 pg. 16 I do not feel that all of the B.I.A. are that concerned.
- E-4 pg. 24 (42.) Is this a good idea?
- E-5 pg. 25 It might be wise to open up areas for ORV use where Navajo Plains cactus does not grow.
- E-6 pg. 26 114 Change plan to plans--
- E-7 pg. 28 12 Nature Conservancy?
- E-8 pg. 31 Second line change Mesa Verde cactus to Navajo Plains cactus.
- E-9 pg. 32 213, Explain.
- E-10 pg. 35 23 & 231 Explain.

Alot of work has gone into this Recovery Plan. My comments above are mostly minor changes--it is basically a sound plan. Is Arizona Public Service one of the private land owners? If so there is the possibility of a land trade.

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Comments - Recovery Plan for the Navajo Plains Cactus  
Agency Review Draft

F-1 p. 20 Prime Objective: increase present number of individuals from approximately 1,000 to 10,000? or 5,000?

F-2 p. 21 Include BIA in MOU?

F-3 p. 27 114 Substitute "..." with "would have..."

F-4 p. 27 116. Substitute "section" for "land" (first line), or delete "or at least a part of it" (line 2)

F-5 p. 31 131 (top) line 2 ~~sub~~ substitute "Navajo Plains" cactus for "Mesa Verde" cactus.

F-6 p. 31 131 should be 132.

A+B Phillips  
12-12-83

12/27/82

*My comments on the technical review draft  
of the plan are in footnotes.  
Reggie*

RECOVERY PLAN FOR THE NAVAJO PLAINS CACTUS

PEDIOCACTUS PEEBLESIANUS (Croizat) L. Benson VAR. PEEBLESIANUS

AGENCY REVIEW DRAFT

G-1

Prepared by:

Barbara G. Phillips  
Arthur M. Phillips, III  
Museum of Northern Arizona  
Flagstaff, Arizona

and

Mary Butterwick  
Phoenix District Office  
Bureau of Land Management

for

Region 2 of the U.S. Fish and Wildlife Service

Approved: \_\_\_\_\_

Regional Director, Region 2  
U.S. Fish and Wildlife Service

Date: \_\_\_\_\_

Comments from Reggie Fletcher, U.S. Forest Service,  
Albuquerque, New Mexico

APPENDIX - cont.

RESPONSE TO COMMENTS ON AGENCY REVIEW DRAFT

- A-1 We do not know for sure what happened to the plants. However, collection is a possible cause of the plant loss. A statement to that effect was added.
- A-2 Suggestion was incorporated.
- A-3 Suggestion was incorporated.
- A-4 Suggestion was incorporated.
- A-5 Suggestion was incorporated.
- A-6 The paragraph is suitable in its present position.
- A-7 The comment was noted; however, the paragraph is suitable as is.
- A-8 Suggestion was incorporated.
- A-9 We do not know the answer to this question. Implementation of recovery plan actions occurs after final approval of the plan.
- A-10 Suggestion was incorporated.
- A-11 Maintenance of the existing numbers of the Peebles Navajo cactus, as in criteria 1, will result in the preservation of this cactus. Full recovery and consequent removal from the endangered species list can only be accomplished by increasing the numbers of cacti, thus restoring it to near its presumed former numbers and range (criteria 2.)
- A-12 Planned management of the habitat which supports the Peebles Navajo cactus is a desirable recovery action no matter what the results of the studies in 21 and 22 determine.
- A-13 Suggestion was incorporated.
- A-14 Suggestion was incorporated.
- A-15 Suggestion was incorporated.
- A-16 Suggestion was incorporated.
- B-1 Information on ownership of existing populations is given on pages 4 and 5. Such information will be gathered on any newly discovered populations, and acreages occupied by this cactus will be determined under task 24, page 35.

APPENDIX - cont.

RESPONSE TO COMMENTS ON AGENCY REVIEW DRAFT - cont.

- B-2 Specific locations will not be given in this plan due to collecting threats. General locations being impacted have been identified. Threat sources have been identified in the task statements concerning grazing, recreation, and road development from BLM biologists and FWS funded status reports.
- B-3 Suggestion was incorporated.
- B-4 Information noted.
- B-5 Although BLM's enforcement capacity is limited, the agency still retains responsibility for the enforcement of their regulations and laws.
- B-6 Signing and closure will not state the presence of the cactus, and therefore with proper enforcement, should be of positive impact to the area and the cactus.
- B-7 Since there are no known significant locatable or leasable minerals in Peebles Navajo cactus habitat, mineral withdrawal should be more easily accomplished. Such withdrawal is desirable since the discovery of unknown minerals or economic changes in the value of previously non-significant minerals can occur at any time, thus threatening the habitat.
- B-8 Suggestion was incorporated.
- B-9 The curtailment of use detrimental to the cactus through special land use designation is expected to exceed adverse impacts which may occur as a result of such designation.
- B-10 Suggestion was incorporated.
- B-11 The agencies involved in enforcement vary from case to case. BLM's enforcement responsibilities are confined to BLM lands under item lll.
- B-12 Information noted.
- C-1 Suggestion was incorporated.
- C-2 Suggestion was incorporated.
- C-3 Suggestion was incorporated.

APPENDIX - cont.

RESPONSE TO COMMENTS ON AGENCY REVIEW DRAFT - cont.

- C-4 Suggestion was incorporated.
- C-5 Suggestion was incorporated.
- C-6 Suggestion was incorporated.
- C-7 Suggestions incorporated where appropriate.
- D-1 In a telephone conversation on March 29, 1984, Ken Heil stated that he felt the number of populations was still about five, depending on exactly how boundaries were drawn between populations. He also felt that 1,000 was still a reasonable estimate of the total present population.
- D-2 See D-1.
- D-3 Suggestion was incorporated.
- D-4 Suggestion was incorporated.
- D-5 Suggestion was incorporated.
- D-6 Corrected.
- D-7 See D-1.
- D-8 The sentence was intended to read as is.
- D-9 Suggestion was incorporated.
- D-10 Suggestion was incorporated.
- D-11 Suggestion was incorporated.
- D-12 See D-8.
- D-13 Suggestion was incorporated.
- D-14 Suggestion was incorporated.
- D-15 Suggestion was incorporated.
- D-16 Suggestion was incorporated.

APPENDIX - cont.

RESPONSE TO COMMENTS ON AGENCY REVIEW DRAFT - cont.

- E-1 Comment incomplete.
- E-2 Suggestion was incorporated.
- E-3 Suggestion was incorporated.
- E-4 See A-11.
- E-5 Suggestion was incorporated.
- E-6 Only one allotment is involved; therefore, only one plan is needed.
- E-7 This is addressed in task 1221.
- E-8 Suggestion was incorporated.
- E-9 Suggestion was incorporated.
- E-10 Suggestion was incorporated.
- F-1 Suggestion was incorporated.
- F-2 BIA at present has no lands on which the Peebles Navajo cactus occurs.
- F-3 Suggestion was incorporated.
- F-4 Suggestion was incorporated.
- F-5 Suggestion was incorporated.
- F-6 Suggestion was incorporated.
- G-1 Suggestions incorporated where appropriate.