

## The BLM Program in Arizona for Threatened and Endangered Plants

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The Federal effort to protect endangered species was initiated by the passage of the Endangered Species Preservation Act of 1966 and later by the Endangered Species Conservation Act of 1969. Both Acts lacked adequate provisions for the conservation of endangered species and were enacted exclusively for the protection of wildlife. The enactment of the Endangered Species Act (ESA) of 1973 (P.L. 93-205), mandated *all* Federal agencies to "utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of threatened and endangered species." For the first time species was defined as fish, wildlife or plants. This is the strongest United States legislation yet enacted to protect endangered or threatened plants.

In Section 12 of the Act, the Smithsonian Institution was "directed to review (1) species of plants which are now or may become endangered or threatened and (2) methods of adequately conserving such species." The report (House Document 94-51) submitted to the Congress of the United States by the Smithsonian in response to Section 12 became the basis for the subsequent list of threatened and endangered plants presented as a "Notice of Consideration" by the Fish & Wildlife Service (40 FR 27823-27924). Of the approximately 3000 plant species identified, there were 106 candidate threatened species and 64 candidate endangered species for the State of Arizona. One year later (41 FR 24523-24572) the FWS proposed a rulemaking that would determine 1700 plants native to the United States (64 in Arizona) to be endangered. These 64 proposed endangered plant species and the previously listed 106 candidate threatened species are the plants Federal agencies consider in their efforts to comply with the purposes of the ESA.

Shortly after these lists were issued, the Bureau of Land Management (BLM) soon adopted the policy of protection, conservation and management of all sensitive, threatened or endangered plants and vowed to ensure that all actions authorized, funded or carried out by them would not jeopardize the continued existence of these species.

Initial efforts in Arizona to comply with the intent and spirit of the ESA by the BLM involved the compilation of existing data on the proposed endangered and candidate threatened species. Herbarium and literature searches conducted primarily by contract to local universities determined which species were possibly located on BLM administered lands in Arizona and thus dependent upon the BLM for protection. Intensive field searches and studies of these T&E plants were limited during the first few years, mainly due to the lack of funding and manpower.

In spite of the limitations on field work, BLM Botanists, primarily Mr. Ralph Gierisch, the Regional Forest Service Botanist and local professionals began to accumulate the much-needed ecological data on the T&E plants in Arizona. As funding and manpower restrictions eased, botanists were added to field office staffs; previously acquired data was disseminated; and our efforts to obtain ecological data necessary to manage the ecosystems occupied by these unique plants increased.

Since these early efforts, thousands of acres have been inventoried, hundreds of hours have been spent in field searches, and hundreds of on-site inspections of proposed BLM projects have been made in an attempt to protect and conserve threatened and endangered plants and their habitats.

Under the Federal Land Policy & Management Act of 1976 (FLPMA), the Bureau was given the charge to inventory all public lands and manage those lands in a manner that will protect the quality of scientific, scenic, ecological and environmental values. During this past year (1979) a vegetative inventory with emphasis on threatened and endangered plants was conducted in the Phoenix District of the BLM. The area inventoried extended south and east from Kingman through the Hualapai Mountains, the southern extension of the Aquarius Mountains, the Burro Creek drainage with adjacent mesas, and bordered on the south by the Santa Maria River. Elevations were between 1100' and 8300', with an equally wide representation of vegetative types, ranging from Mohave and Sonoran Desert scrub to mixed conifer and aspen. Over 900 taxa were documented during the study. Among them were several range extensions, a number of state records and a new variety of cactus.

Similar inventories have been conducted, or are planned for other areas in Arizona administered by the BLM. The information gleaned from inventories of public lands, whether a vegetative, wildlife, archaeological, etc. inventory, is incorporated into the Bureau's Planning System. First the results are presented to the public for their review and comment via public meetings and workshops. It is then used by district and area managers to identify uses of public lands and then manage them on the basis of multiple use and sustained yield.

To date, the BLM in Arizona has not had the funds nor manpower to conduct such inventories on all the lands it administers. However, through the original herbarium and literature searches, we are aware of the possible localities of the T&E plants. Over the last couple of years we have either by contract or our own personnel's expertise conducted field searches and studies throughout the State on some of these

species. We have gained an understanding of the geographical distribution and ecological requirements of many of these species which has assisted us in determining the level of protection needed to conserve them.

These efforts have resulted in the recommended delisting of about 25 species originally reported on BLM lands, and the recommended listing of another 25. Presently five species (all members of the Cactaceae) have been determined endangered by the Secretary of the Interior (44 FR 61556-6558, 61784-61788, 61922-61924 and 61927-61929). Included in this group are *Pediocactus bradyi*, *P. sileri* and *P. peeblesianus* var. *peeblesianus*, all from northern Arizona; *Echinocactus horizonthalonius* var. *nicholii* from Pinal and Pima counties; and *Echinocereus triglochidiatus* var. *arizonicus* from Gila and Pinal counties. More field work is needed before recommendations can be made on other species or before conservation programs can be developed for those species that have been listed or are proposed for listing.

Aside from taxonomic problems and misidentifications encountered during our studies, we have found that many species are restricted to a specific geologic formation or soil type. However, their existence is not threatened as defined in the ESA. Some of these plants, primarily those susceptible to collection, are protected by the Arizona Native Plant Law. The majority, however, are without Federal recognition or protection. It is for this reason that the BLM's policy has been expanded to include the protection of sensitive plants to the end that official listing as endangered or threatened is not necessary.

In Arizona, we are currently considering over 50 species as sensitive and add to this number as the information or recommendation is received. They include such species as: *Balsamoriza hookeri* (its southernmost extension is in northwestern Arizona); *Townsendi smithii* (a newly described species); *Phacelia constancei* (a soil specific species, but not threatened); *Astragalus geyeri* var. *triguetrus* (reported only from northwestern Arizona, however, to date, not located); *Tumamoca macdougallii* (an uncommon gourd from southern Arizona); and *Sophora arizonica* and *S. formosa* (question as to the taxonomic status, but potentially threatened). Many of the unique cactus species in Arizona are also among this group. We are currently monitoring some of these species so that declines in populations can be detected early and the proper actions taken.

We are trying to alleviate some of the pressure of overcollection of native plants for commercial purposes by making available to the public native



**Figure 1.** Probably the greatest efforts to protect rare species are made by the species themselves. In the center of this photo is a mature plant of *Pediocactus peeblesianus* var. *fickeiseniae*. It is easily visible now, because it is in flower. However, during the majority of the year it, like other *Pediocactus* species, rarely protrudes above ground level.



**Figure 2.** *Pediocactus peeblesianus* var. *fickeiseniae*, a candidate threatened species. A few populations have been depleted. Fortunately, the majority of its habitat remains undisturbed by collectors and fanciers. We are monitoring several of these populations to detect and correct any degradation of habitat or species numbers.

plants from areas where a proposed project would destroy the vegetation.

We occasionally work with the Arizona Commission of Agriculture and Horticulture and then support them in their efforts to protect Arizona's native flora. In spite of all our efforts, the illegal removal and transportation of native plants for commercial purposes continue to be major concerns. It is virtually impossible for the BLM, U.S. Forest Service or any other agency to police lands they manage for the illegal removal of native plants.

An equally serious problem is the impact of private collectors on the populations of the more rare and unique cacti in the Southwest. An article published several years ago portrays the problem we are faced with. We quote . . . "During early September of 1966 sixteen people went out to search for *Pediocactus papyracanthus*. This is a species which for collection requires a considerable amount of patience and endurance. The area being hunted had a large population of these species eight or ten years ago. It had not been hunted for about six years and sufficient time had elapsed to permit the plant to be reestablished under normal conditions. Even grazing had been removed from the area, but due to drought there were almost no plants to be found. . . . It is difficult to portray Hazel's excitement at finding three specimens of *Pediocactus papyracanthus* and it is also difficult to portray the frustration of the 14 persons who were empty handed that evening." (Castetter and Pierce, 1967). Again, police action is not a solution. We have recently, under contract, investigated

the possibility of the micro-propagation of these rare cacti. Several major hurdles are still before us. However, initial results are encouraging. We feel that commercial availability of these species would remove much of the pressure on their natural populations.

The management of public lands for the protection and conservation of Sensitive, Threatened or Endangered plants is dependent upon our understanding of their habitat and other ecological requirements. Yet, to gain such an understanding of the nearly 200 plants in Arizona originally suspected to be endangered or threatened is an overwhelming task. It is for this reason that many of these plants remain inadequately studied. Proper protection of Arizona's native flora obviously requires the cooperation of all concerned groups and individuals.

#### Literature Cited

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