ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDCAC05033
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Echinocactus polycephalus* var. *polycephalus*
COMMON NAME: Cotton-top cactus, cottontop cactus, cottontop barrel cactus, Clustered barrel cactus, Many-headed barrel, Biznaga-tonel amacollada [Spanish]
SYNONYMS:
FAMILY: Cactaceae

AUTHOR, PLACE OF PUBLICATION: (Engelm. & J.M. Bigelow), Proc. Amer. Acad. Arts and Sci. 3: 276. 1856.

TYPE LOCALITY: LT: USA, California, Mohave Valley (MO).

TYPE SPECIMEN: LT: MO. J.M. Bigelow s.n., 8 Mar 1854. LT designated by Chamberland, Syst. Bot. 22: 311 (1997).

TAXONOMIC UNIQUENESS: *E. polycephalus* is 1 of 3 species in the genus *Echinocactus*, and 1 of 2 in Arizona. Both varieties of *E. polycephalus* occur in Arizona, including var. *polycephalus* and var. *xeranthemoides*.

DESCRIPTION: This is the only barrel in Arizona that branches under normal conditions. Plants branch from the base forming compact mounds of 2-50(-130) branches (5-30 per Benson 1982; 10-20 per NatureServe 2005); mounds to 3 feet (1 m) across and somewhat less high. Stems are gray-green, with 11-25 ribs usually vertical, or somewhat helically (spiral) curving around the stem; rib crests are sharp with flat sides, not constricted between the areoles. The dense, stout spines obscure the plant bodies and restrict the small yellow flowers from opening fully. Spines are straight to curved but not hooked, often twisted, 10-19 per areole, red to gray (infrequently straw colored), canescent. Radial spines 6-14 per areole; central spines 4, abaxial frequently longest, and straight to somewhat curved. Flower up to 5 cm (2 in) in diameter and long (narrower when spines restrict flower from opening fully); inner tepals bright yellow, color uniform from base to apex, 24-26 mm long, sparsely, minutely toothed. Stigma lobes are bright yellow; filaments, anthers, and style yellow. Fruits dehiscent through basal abscission pore, ovoid; scales reddish to maroon, aging tan or black, 10-14 mm, usually shorter than dried tepals at fruit apex, spine tips canescent with strap-shaped, unicellular trichomes. Seeds dark maroon to black, rounded or irregularly obovoid with flat planes transversing the testa, 2.8-4.7 mm, papillate-roughened (from protruding surfaces of testa cells). (Benson, 1982; FNA 1993+; Arizona-Sonora Desert Museum 2000).

AIDS TO IDENTIFICATION: Within Arizona, differences between the two varieties include: var. *polycephalus* is found at 30-750 m in altitude in the Mojavean and Sonoran deserts; has stems

in clumps of 10-30, the longest in the middle; spines are densely canescent, the felt peeling away in sheets; seeds are irregularly obovoid-oblong, markedly papillate-reticulate, not shiny. Var. *xeranthemoides* is found at 1080-1500 m in altitude in the Navajoan Desert; stems in clumps of 5-12 or solitary, the longest on the margin; spines are glabrous or glabrate with hairs falling away separately; seeds are obovoid, papillate-reticulate but the pattern not prominent, shiny. (Benson, 1982).

ILLUSTRATIONS: Color photo (http://www.calflora.net/)
Color photos (*in* CalPhotos http://calphotos.berkeley.edu/cgi/)
Color photo (http://www.desert-tropicals.com)
Color photo (http://www3.nau.edu/cline/)
B&W drawing (Arizona-Sonora Desert Museum, 2000)
Color photos (Benson, 1982: fig. 750-754)
Color photos (Gary A. Monroe, *in* USDA, NRCS 2004 at http://plants.usda.gov/intellect.html)
Color photo of lectotype (MO, *in* http://mobot.mobot.org/cgi-bin/search_vast)

TOTAL RANGE: Arizona (Mohave and Yuma Co.), California (Inyo, San Bernardino, Riverside and Imperial Co.), Nevada (Lincoln and Clark Co.), and Sonora, Mexico. Historically from Utah.

RANGE WITHIN ARIZONA: Occurs in the driest parts of the Sonoran and Mohave deserts in Mohave and Yuma counties.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial stem succulent shrub/subshrub.

PHENOLOGY: Flowers July – August (Anderson [*in* UC/JEP 1993], reports Mar – May), with the flowers set into the spines of the plant, many time preventing the flower from fully opening (FNA 1993+).

BIOLOGY: For the species: this cactus is slow growing and probably very long-lived. For example, plants grown from seed at the Desert Museum are just beginning to branch at nearly 20 years of age. The flowers are pollinated by bees. Though the fruits seem to be imprisoned within the spiny armor, birds and packrats can get to them and disperse the seeds. Bighorn sheep and javelina eat the whole plants and probably function as occasional long-distance seed dispersers. (Arizona-Sonora Desert Museum, 2000).

HABITAT: Rocky flats and washes, bajadas, rock ledges, and rocky, gravely slopes in the driest parts of the Sonoran and Mohave deserts. In California, found on rocky hills and silty valleys (Anderson [in UC/JEP 1993])

ELEVATION: Range within Arizona between 230 – 2,787 feet (70-850 m) (SEINet 2006). Elevation for the entire range between (33-)98 – 5,574 ft ([10-]30-1700 m) (FNA 1993+).

EXPOSURE: Open.

SUBSTRATE: Igneous and calcareous substrates.

PLANT COMMUNITY: Mojave and Sonoran desert scrub. Associated species include: *Ambrosia dumosa* (white bursage), *Carnegiea gigantea* (Saguaro cactus), *Cercidium microphyllum* (=*Parkinsonia*, paloverde), *Echinocereus* sp. (hedgehog cactus), *Echinomastus* (=*Sclerocactus*) *johnsonii*, *Encelia farinosa* (white brittlebush), *Ferocactus cylindraceus* (California barrel cactus), *Fouquieria splendens* (ocotillo), *Larrea tridentata* (creosote bush), *Olneya tesota* (Ironwood tree), *Opuntia arbuscula* (pencil cholla), *O. basilaris* (beavertail prickley-pear), *O. bigelovii* (teddy-bear cactus), *O. ramosissima* (lead-pencil cholla), *O. versicolor* (staghorn cholla), and *Yucca*. (SEINet, accessed 2005, 2006)

POPULATION HISTORY AND TRENDS: For the species: it is geographically stable; its range has not changed for at least the past 30,000 years despite the dramatic climatic swing from ice age to a warm interglacial period (Arizona-Sonora Desert Museum, 2000).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None
STATE STATUS: Salvage Restricted (ARS, ANPL 1999)
OTHER STATUS: Protected (Nevada)

MANAGEMENT FACTORS: Like most cacti, subject to horticultural collecting.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: BLM – Arizona Strip Field Office; FWS – Cabeza Prieta National Wildlife Refuge; NPS – Lake Mead National Recreation Area.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Arizona Revised Statutes. 1999. Arizona Native Plant Law. Appendix A.

Arizona-Sonora Desert Museum. Genera *Ferocactus* & *Echinocactus, Echinocactus polycephalus*. http://www.desertmuseum.org/. Accessed: 8/28/2002.

Benson, L. 1981. The cacti of Arizona. Third edition. The University of Arizona Press. Tucson, Arizona. Pp. 172-174.

Benson, L. 1982. The cacti of the United States and Canada. Stanford University Press. Stanford, California. Pp. 712-716.

Britton, N.L. and J.N. Rose. 1937, 1963 republication. The Cactaceae, descriptions and illustrations of plants of the cactus family. Volumes III and IV. Dover Publications, Inc. New York. P. 174.

CalFlora: Information on California plants for education, research and conservation. [Web application]. 2002. Berkeley, California: The CalFlora Database [a non-profit organization]. Available: http://www.calflora.org/. (Accessed: Aug 28, 2002).

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 7+ vols. New York and Oxford.

Integrated Taxonomic Information System (ITIS). Retrieved 3/23/2005 from ITIS, http://www.itis.usda.gov.

Jaeger, E.C. 1969. Desert wild flowers. Revised edition. Stanford University Press. Stanford, California. P. 165.

Kearney, T.H., and R.H. Peebles with collaborators. 1951. Arizona flora. Second edition with supplement by J.T. Howell, E. McClintock and collaborators. 1960. University of California Press. Berkeley, California. Pp. 573.

McDougall, W.B. 1973. Seed plants of Northern Arizona. The Museum of Northern Arizona. Flagstaff, Arizona. Pp. 319-320.

Missouri Botanical Garden – TROPICOS, Nomenclatural Data Base. *Echinocactus polycephalus* Engelm. & Bigelow. http://mobot.mobot.org/. Accessed: 28 Aug 2002.

Missouri Botanical Garden – TROPICOS, Nomenclatural Data Base. *Echinocactus polycephalus* Engelm. & Bigelow. http://mobot.mobot.org/. Accessed: 23 Mar 2005.

NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.2. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: March 23, 2005).

SEINet. Collections Search Result. Accessed 3/23/2005 at http://seinet.asu.edu/collections/listDisplay.jsp.

USDA, NRCS. 2002. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS. 2004. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Welsh, S.L., N.D. Atwood, S. Goodrich, and L.C. Higgens, eds. 1993. A Utah Flora. Second edition, revised. Print Services, Brigham Young University. Provo, Utah. P. 94.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

ADDITIONAL INFORMATION:

Spanish name: biznaga de chilitos (little chile barrel).

The name "cottontop" refers to the generous tufts of cottony hairs enveloping the flower base and fruits. This woolliness of the fruits is natural and not due to injury by rodents. (Jaeger, 1969).

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