ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDCAC040C1
Data Sensitivity: YES

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Coryphantha scheeri* var. *robustispina*
COMMON NAME: Pima Pineapple Cactus; Scheer's Strong-spined Cory Cactus
SYNONYMS: *Coryphantha robustispina* ssp. *robustispina; Coryphantha robustispina* ssp. *scheeri; Coryphantha robustispina; Coryphantha scheeri* ssp. *robustispina; Mamillaria robustispina*; *Cactus robustispinus*; *Coryphantha mulenpfordtii*
FAMILY: Cactaceae

AUTHOR, PLACE OF PUBLICATION: L. Benson, 1969. The Cacti of Arizona p. 25.

TYPE LOCALITY: South side of Babuquibari (Baboquivari) Mountains near El Sasabe, Sonora, Mexico.

TYPE SPECIMEN: MO. A. Schott, 1856.

TAXONOMIC UNIQUENESS: The taxon was originally described as *Mammillaria robustispina*. Britton and Rose (1923), transferred the species to *Coryphantha.* The name of the taxon was recombined by Benson (1982) to *C. scheeri* var. *robustispina* and then again to *C. robustispina* ssp. *robustispina* by Taylor (1998). This nomenclature is accepted by Anderson (2001).

Schmalzel (2004) conducted a morphometric study which suggested that a taxonomic cline exists between all *C. robustispina* occurring between Arizona and Texas, and therefore no varieties are valid. Three varieties (*robustispina, uncinata,* and *scheeri*) have been shown to be geographically isolated and significantly different morphologically and genetically, warranting subspecific division (Baker 2003, Baker 2005, Butterworth 2010, Baker and Butterworth 2013).

The taxon is listed under the name *Coryphantha scheeri* var. *robustispina*, and is tracked by the Arizona HDMS as such.

DESCRIPTION: Small perennials, hemispheric to cylindrical stem succulent cactus. Individual stems reach 5 to 46 cm (1.9 to 18.1 in) in height and 5 to 21 cm (1.9 to 8.3 in) in diameter. Stems may be singular or form clumps. Offshoots can number from zero to over 100; but average three to five. The surface of the stem is covered in 2 to 3 cm (0.8 to 1.2 in) long rounded projections, called tubercles. Each tubercle is grooved along the upper surface and contains one to several extra-floral nectaries along the groove. At the tip of each tubercle sits the areole (spine-producing structure), from which groupings of 7 to 20 straw-colored

spines arise. These spines darken with age. There is an average of two thick central spines (1-4), one of which is generally hooked at the abruptly narrowing tip and averages 1.7 mm (0.07 in) thick and 3 cm (1.2 in) long. There are 6 to 16 thinner radial spines, about 1.1 to 3.5 cm (0.43 to 1.38 in). Young areoles are covered densely with deciduous wool which disappears at maturity. Large adult plants produce about ten flowers/fruits a year. Flowers range in size from 6-10 cm (2-4 in) and are showy. They can range in color from pale yellow to salmon in color, and have a narrow floral tube. The fruits are about 3 inches long and ellipsoid. They are succulent and sweet and turn from dark green to light green as they ripen. Fruit extends beyond spines when ripe and are eaten and dispersed by a variety of vertebrates (including rabbits, squirrels, and birds) and invertebrates (ants). Each fruit contains about 80 brown or black finely veined or netted seeds (Benson 1969). Taproots are deeper than most Sonoran Desert cacti, at about 15 cm (5.9 in) deep (Scmalzel 2000). Lateral roots are found between 2 and 5 cm (0.79 and 1.97 in) below the soil surface and extend approximately 1 m (3.28 ft) in depth.

AIDS TO IDENTIFICATION: May be confused with *Mammillaria* and juvenile *Ferocactus*. However, *Ferocactus* spines are flattened and have transverse ridges, in contrast to the round cross-section of *Coryphantha* spines. Also, areoles of *Coryphantha* are on tubercles (bumps) with grooves (or clefts) along upper surface, while areoles of *Ferocactus* and *Mammillaria* are on ridges (ribs).

ILLUSTRATIONS:

Line drawing of tip of tubercle and plant in bloom (Arizona Rare Plant Committee 2001).
Line drawings of plant in flower, and fruit. (Benson, 1982: Fig. 858, p. 821).
Color photos (USFWS 2018).

TOTAL RANGE: South-central Arizona just into north-central Sonora, Mexico. It is unlikely there are significant populations of *C. sheeri* var. *robustispina* in Sonora or elsewhere in Mexico (Baker 2005).

RANGE WITHIN ARIZONA: Southeastern Arizona. The known range includes Altar and Santa Cruz valleys in Pima and Santa Cruz counties bounded by the Santa Rita Mountains (east), the Baboquivari Mountains (west), Tucson (north), and the Arizona-Mexican border (south).

SPECIES BIOLOGY AND POPULATION TRENDS

PHENOLOGY: Buds begin to appear in mid-May, related to photoperiod and rainfall. Flowering usually occurs in early to mid-July with the onset of the monsoon (summer) rains, and continues through the monsoon season.

GROWTH FORM: Succulent, perennial

BIOLOGY: Plants are sparsely distributed on the landscape, with the majority of surveyed plants occurring at densities of fewer than 1 cactus per hectares, and densities as low as 1 plant per 10 hectares have been reported (USFWS 2018). Individuals of the taxon may live more than 30 years in age. Plants likely to do not reach maturity and begin to flower until they are more than 12 years of age, and perhaps as late as 20 to 25 years of age (Schmalzel 2014). Flowers only last one day and open 5 to 7 days after a significant rainfall. Thus, many plants will flower on the same day. Plants are self-incompatible; requiring outcrossing for fertilization. Areas with higher densities of *C. scheeri* var. *robustispina* have greater pollination and fruit production than areas of sparse distribution. The primary pollinator of the taxon is *Diadasia rinconis*, a cactus specialist solitary bee.

Dispersal is probably facilitated by rodents, but possibly also by jack rabbits, birds, and ants (USFWS 2018). An abundance of seeds (an average of 120 per fruit) are produced by the taxon, though germination has ranged from 8% to 88% in studies (Baker 2012, Schmalzel 2002, Roller 1996).

HABITAT: Gently sloping alluvial fans, valley floors, the foothills of mountains, and ridges in semidesert grassland and Sonoran desert scrub (Desert Botanical Garden, 1999).

ELEVATION: Documented between 2,388 – 4,200 feet (728 - 1,280 m).

EXPOSURE: Slopes of less than 10 percent.

SUBSTRATE: generally found on deep, silty and gravely alluvial soils. Schmalzel (2000) suggests both Holocene and Pleistocene soils are needed for persistence.

PLANT COMMUNITY: Lower Sonoran desert-scrubland, desert-grassland and the ecotone between desert-scrubland and desert-grassland. Typically found in association with an assortment of other cactus species such as *Opuntia* englemannii (Engelmann prickly pear), *O. fulgida* (jumping cholla), and *Ferocactus wislizeni* (Arizona barrel cactus). Native bunch grass. Many studies describe common subshrub associates including *Zinnia* species, *Gutierrezia sarothrae* (snakeweed), *Isocoma tenuisectus* (burroweed), and *Eriogonum* spp. (buckwheat) (Schmalzel 2000, McPherson 2002, McDonald 2005, USFWS 2007). Schmalzel noted greater rates of mortality among *C. scheeri* var. *robustispina* occurring under canopies of *Prosopis velutina* (velvet mesquite). At Buenos Aires National Wildlife Refuge, where large amounts Lehmann lovegrass are present, no *C.s. robustispina* occur.

POPULATION TRENDS: Downward due to loss and degradation of habitat. All individuals are considered components of a single population. As of 2018, fewer than 8,000 extant individuals known, with an additional 1,837 individuals known to longer exist, primarily due to development and mining (USFWS 2018).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LE (USDI, FWS 1993)
[C1 USDI, FWS 1990]
[C1 USDI, FWS 1985]
[C1 USDI, FWS 1980]
[PTN-T USDI, FWS 1975]

STATE STATUS: Highly Safeguarded (ADA 1993, 1999, 2016)

OTHER STATUS: Bureau of Land Management Sensitive (BLM, AZ 2017)
None (FS Sensitive USDA, FS Region 3 1999, 2013)
[Forest Service Sensitive USDA, FS Region 3 1990]

MANAGEMENT FACTORS: The major threats facing the Pima pineapple cactus are: 1. habitat loss due to commercial development, particularly mining and urbanization. This taxon occurs on relatively flat land that is well suited for human development. This threat is highest in the Santa Cruz Valley Recovery Unit. 2. Altered fire regime and increased competition resulting from the spread of invasive nonnative grasses. Nonnative grasses create unnaturally dense and evenly spaced canopies with higher fuel loads of highly lignified litter that result in more frequent and higher-intensity fires. Within Buenos Aires NWR it is estimated that competition from Lehmann lovegrass has reduced the longevity of *C. scheeri* var. *robustispina* individuals by more than two thirds (Schmalzel 2000). This threat is highest in the Altar Valley Recovery Unit. 3. Drought and climate change. This taxon is slow growing and has little capacity to recover from disturbance (Portilla-Alonso 2011). 4. Small population size and isolation leading to a lack of species diversity.

Other threats include predation, loss of habitat due to road construction and agriculture, habitat degradation due to grazing, border activitiy, off-road vehicle use, illegal collecting, and range management practices which cause surface disturbances.

CONSERVATION MEASURES TAKEN: Pima County has implemented the Sonoran Desert Conservation Plan since 2001 (Pima County 2000); the Palo Alto Conservation Bank was created; Pima County established a mitigation bank for the taxon; cacti on Buenos Aires NWR are surveyed and protected; Seed collections are maintained at the Sonora Desert Museum, Desert Botanical Garden, Royal Botanical Garden, and Boyce Thompson Arboretum; research into transplanting as a conservation measure is ongoing in several studies; research on germination is underway; and a Recovery Plan with recovery criteria has been finalized for the taxon (USFWS 2018).

SUGGESTED PROJECTS: Major recovery objectives include threat and habitat-based goals and population-based goals. Habitat-based goals include conservation, restoration, and management of habitat including the mitigation and reduction of habitat loss and degradation, spread of invasive plants, and other stressors. Population-based goals include conservation, protection, and restoration of individuals, seedbanks, and pollinator habitat to achieve self-

sustaining, resilient populations representing the full range of geographic and genetic variability.

Recovery outline actions include conserve existing and newly discovered individuals and associated habitats; restore quality habitat in the U.S. and Mexico; develop range-wide standardized long-term monitoring; Encourage scientific study to improve our understanding of biology, ecology, abundance, status, threats, stressors, viability, propagation, restoration of individuals and of habitats, distribution, and genetics in the United States and Mexico; maintain plants in captivitiy at botanic gardens and seeds at storage facilities, encourage research into propagation, germination, and transplanting; develop public outreach, partnerships, and agreements with private landowners (USFWS 2018).

LAND MANAGEMENT/OWNERSHIP: BIA - San Xavier Reservation and Tohono O'Odham Nation; BLM - Tucson Field Office; BOR - Phoenix Area; FWS - Buenos Aires National Wildlife Refuge; USFS - Coronado National Forest; State Land Department; City of Tucson; Private.

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ADDITIONAL INFORMATION:

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1994-12-23 (DBI)
2001-12-12 (SMS)
2008-01-18 (CAS)
2020-11-06 (KSL)

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