

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Plant Abstract

Element Code: PMAGA01030

Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Agave x arizonica*

COMMON NAME: Arizona Agave, Arizona century plant

SYNONYMS: *Agave arizonica*

FAMILY: Agavaceae

AUTHOR, PLACE OF PUBLICATION: Gentry, H.S. and J.H. Weber, Cactus and Succulent Journal [U.S.] 42: 223, f. 1-2. 1970.

TYPE LOCALITY: Near the summit of the New River Mountains, Arizona, near Maricopa-Yavapai county line.

TYPE SPECIMEN: HT: US. J.H. Weber s.n. Live plant collected; flowered at Desert Botanical Garden (60-6628), Phoenix, 1-7 June 1968. Specimen prepared from transplant: leaf and flower. Clonal type is still living. IT: ASU, DES.

TAXONOMIC UNIQUENESS: *Agave arizonica* is 1 of 17 species and 1 of 21 taxa of *Agave* in Arizona. It is in Gentry's Urceolatae Group, distinguished by their small size, subspicate inflorescence, small flowers and urn-shaped flower form. Per NatureServe (2002), "Recognized in Kartesz (1999 Synthesis) as a species. The US Forest Service believed to be a hybrid, and petitioned the US Fish and Wildlife Service to delist it from the ESA. The USFWS did not find conclusive evidence supporting the USFS view, and the federal Endangered status was not changed (Federal Register Vol. 52, No. 13, 1987). Proposed federal policy on hybrids (2/96 FR) also maintain ESA protection. Kartesz (pers. comm. to L. Morse, 12/99) noted that his treatment is following H.S. Gentry's 1982 *Agave* book. DeLamater and Hodgson (1987) considered the entity a "species of recent hybrid origin," involving the *A. chrysantha* and *A. toumeyana* var. *bella*. (Hodgson, 2011). In 2006, the USFWS delisted this plant due to hybrid origin. Controlled pollination studies were done at the Desert Botanical Garden (DBG). (Hodgson, 2011). See **BIOLOGY** for further discussion.

DESCRIPTION: Small, dense rosette, 40 cm (15.7 in) wide, and 30 cm (11.8 in) high. Leaves deep green with a reddish-brown (mahogany) to light gray callose margin (although considerable variation in color may occur) extending nearly to the base; 13.0-31.0 cm (5-12.2 in) long, 2.0-4.0 cm (0.8-1.6 in.) wide; broadest at middle of leaf. Marginal teeth curve downward, denser toward the base, to 5.0 mm (0.2 in.) long; terminal spine 1.0-2.5 cm (0.4-1.0 in.) long. Inflorescence is borne on stalks 3-4 m (9.8-13 ft) tall, with 35-50 short, lateral branches. Pale yellow um-shaped

flowers, in dense clusters of 10-20, are 25.0-32.0 mm (1.0-1.28 in.) long; tepals clasping filaments. Fruits are dry pods, 2 cm long; splitting into three sections when dry.

AIDS TO IDENTIFICATION: The larger *A. chrysantha* is a central Arizona endemic; flowers deep yellow, leaves variable, pointing out, a deep green to glaucous-blue with faint coloration on the leaf margin, with large teeth; occurs in Arizona Upland habitats. *A. toumeyana* ssp. *bella* another Arizona endemic, is a small, dense rosette, with small white flowers off stalk (spicate), with fibers on the leaf margin; occurs in chaparral and pinyon-juniper woodland. Habit suggests that of Organ Pipe National Monument *A. x ajoensis*, a triploid and hybrid involving the diploid *A. deserti* var. *simplex* and tetraploid *A. schottii* var. *schottii* (and not conspecific with *A. schottii* var. *treleasei*). (Hodgson, 2011).

ILLUSTRATIONS:

Line drawings of leaf, flower and capsule (Gentry 1980 Fig. 11.4:255).

Black and white photos of inflorescence (Gentry 1982 Figs. 11.5-11.6:256).

Black and white photo of natural habitat (Gentry 1982 Fig 11.7:256).

Line drawing. USFWS (no date).

Line drawing of plant and parts (FWS in ARPC 2001)

Color photo (Arizona Rare Plant Council (ARPC) 2001)

Color photo (DBG 1999, <http://www.dbg.org/>)

Color photos (Faucon 1998-2003, in http://www.desert-tropicals.com/Plants/Agavaceae/Agave_arizonica.html)

Color photo (Lynda Pritchett-Kozak, accessed 4/30/2003, http://ridgwaydb.mobot.org/cpcweb/CPC_ProfileImage.asp?FN=44a)

TOTAL RANGE: Central Arizona. New River Mountains, Maricopa and Yavapai counties; Green Valley Hills (SE of Payson) and Sierra Ancha Mountains, Gila County.

RANGE WITHIN ARIZONA: See "Total Range."

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial succulent; monocarpic.

PHENOLOGY: Flowers May to July. Hummingbirds, insects (sweat bees, halactids, and bumblebees) major pollinators.

BIOLOGY: Plants mature in 22-35 years; flower once, then die. Suckers produced (producing of pups from base of mother plant) sparingly. Seed production, albeit low, known in wild. Tolerates poor soil and drought, but requires good drainage. Was early on believed to be of hybrid origin be DeLamater and Hodgson, but whether or not it was a species was up for debate (Hodgson, 2011). Yatskievych (198?) collected plant resembling *A. x arizonica*, which is probably a hybrid

involving *A. palmeri* and *A. parviflora* resulting in a plant morphology similar to *A. x arizonica* (Hodgson 2011) along Ruby Road; identification was in question and additional plants not relocated. Hodgson (2011) has collected similar types of plants involving *A. palmeri* and/or *A. parryi* hybridizing with *A. parviflora* and/or *A. schottii* var. *schottii*. They are somewhat morphologically similar to *A. x arizonica* (Hodgson 1994) in possessing subspicate inflorescences and sub-entire leaves but do not have the maroon margins (Hodgson 2011). However, for any of these plants, the putative parents are not the same and thus are not *A. x arizonica*. Several crosses between different paniculate and spicate agaves produce remarkably similar, yet noticeably distinct forms. The Star Valley (east of Payson) clone is a hybrid between *A. chrysantha* and *A. toumeyana* ssp. *toumeyana* and is thus not *A. x arizonica*.

HABITAT: Open, rocky slopes and mesas in Sonoran desertscrub, chaparral, or juniper-grassland, 3,600-5,800 ft (1095-1765 m) elevation (ARPC 2001).

ELEVATION: 3,600 – 5,820 ft. (1098 - 1,775 m).

EXPOSURE: Various. In Gila County, this species was found on an east-facing slope with about a 50% grade.

SUBSTRATE: Mixed gravelly loam from Mazatzal quartzite and other parent materials of volcanic origin including basalt. Granitic outcrops.

PLANT COMMUNITY: Open chaparral; Desert Grassland; transition between grassland and pinyon-juniper zone. Associated plant species include: *Agave chrysantha*, *Agave toumeyana* var. *bella*, *Cheilanthes* spp., *Echinocereus fasciculatus*, *Opuntia* spp., *Quercus turbinella*, *Q. dunnei*, *Q. engelmannii*, *Juniperus monosperma*, *Juniperus deppeana*, *Juniperus* spp., *Cercocarpus montanus*, *Prosopis velutinus*, *Pinus edulis*, *Yucca baccata*, *Eriogonum wrightii*, *Dasyilirion wheeleri*, *Gutierrezia sarothrae*, *Bromus rubens*, *Festuca pacifica*, *Muhlenbergia* sp., and *Sporobolus* sp.

POPULATION TRENDS: Very poor reproduction, cloning evident. Stability of population unknown. As of December 1990, 65 clones (sites) were known. This included one clone southeast of Payson (?), two clones in Parker Creek, 3 clones in the Bradshaw Mtns (collected by Eric Anderson, 2009) and the remainder in New River Mountains, primarily in upper Cave Creek drainage. Densest area of *A. x arizonica* is in Benchmark Mountain vicinity. Two additional clones in New River Mountains located during 1992.

SPECIES PROTECTION AND PRESERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 2006)
[LE USDI, FWS 1984, without Critical Habitat]

STATE STATUS: [C1 USDI, FWS 1980]
[PE USDI, FWS 1976]
[PT-E USDI, FWS 1975]
Highly Safeguarded (ARS, ANPL 2010, and accessed 2011)
[Highly Safeguarded (ARS, ANPL 1993, 1999)]

OTHER STATUS: Not Forest Service Sensitive (USDA, FS Region 3 2007)
[Forest Service Sensitive, USDA FS Region 3 1990, 1999]

MANAGEMENT FACTORS: Limited distribution and low numbers (about 65 clones). Herbivore of flower stalks by cattle and deer; loss of flower stalk before maturity prevents potential seed production, decreasing reproductive rates. Rodents tunnel up caudex and eat roots and caudex. Snout-weevil beetles damage plants and transmit (or make the plant susceptible to) a fungal disease which can kill the plant within a single year. Plants are "collectible" but difficult to find. They are extremely slow to reproduce, and will not repopulate an area easily.

CONSERVATION MEASURES TAKEN: A Cooperative Agreement between Tonto National Forest and Desert Botanical Garden (DBG) signed in 1990. DBG constructed an enclosure around transplants in a 20m x 30m square area to study factors influencing transplanted plants. To be an experimental plot in the New River Mountains at Little Squaw Peak monitored by Liz Slauson of the DBG.

Benchmark Mountain enclosure, containing individual clones, fenced in 1990/1991; monitoring plots established here by DBG. One clone (8-12 plants) at Parker Creek, Sierra Ancha Mountains also fenced.

Allotment Management Plan for New River Allotment (signed 1989) requires water developments to be placed greater than one-half mile from *A. arizonica* (now *A. x arizonica*) clones, fences to be one-quarter mile from clones keeping cattle out of pastures where clones are present during flowering periods. These considerations made to reduce livestock density and trailing in close proximity to *A. arizonica* clones.

Agave x arizonica was considered Endangered (as *Agave arizonica*) by the IUCN (Walter and Gillett 1998), and was also listed on Appendix I of CITES on the July 29, 1983 (Mathew 1994). It has since been delisted due to its presumed hybrid status.

SUGGESTED PROJECTS: Investigations to determine taxonomic status; electrophoretic DNA studies. Monitoring of known clones and fencing to protect from livestock. Determine effect of fire on *A. x arizonica*.

Additional surveys, especially on the east flank of the Mazatzal Mountains (along the route of Highway AZ 87 from the Verde River to the top of the pass) where no specimens have yet been found. Surveys in areas where the presumed "parent" plants (*A. chrysantha* and *A. toumeyana bella*) are sympatric, generally between 3,400 - 5,500 feet elevation.

LAND MANAGEMENT/OWNERSHIP: USFS - Tonto National Forest (Grazing Allotments: New River and Bronco); Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Revised:	1990-03-09 (SST)
	1990-10-15 (SR)
	1991-10-18 (BKP)
	1992-09-16 (BKP)
	1995-02-28 (WCH)
	1997-11-05 (SMS)
	2003-05-01 (SMS)

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