ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PMAGA010L2
Data Sensitivity: YES

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Agave parviflora* Torr. ssp. *parviflora*
COMMON NAME: Small-flowered Agave, Santa Cruz Striped Agave, Little Princess Agave, Smallflower Century Plant, Maguey sóbari (es)
SYNONYMS: *Agave hartmanii*
FAMILY: Agavaceae (Group Parviflorae)

AUTHOR, PLACE OF PUBLICATION: Torrey. 1859. Botany of the boundary. *In* W.H. Emory, Report of the United States and Mexico Boundary Survey. House Exec. Doc. 135, 34th Congress, 1st Session, Vol. 2, Part 1., p.214.

TYPE LOCALITY: Mexico: Sonora: Pajarito Mountains. Gentry (1982) notes that the type locality "was located by Trelease (1911) as near international boundary marker No. 129, between Sonora and Arizona, 10-15 miles W of Nogales. Locally, these mountains are referred to as the "Pena Blanca Mountains" and on some road maps are shown as the "Atasco Mountains."

TYPE SPECIMEN: HT: US. A. Schott s.n. July 1855.

TAXONOMIC UNIQUENESS: Gentry (1982) lists 136 species within the genus *Agave*, while Breitung (1968) lists 116 species, and USDA, NRCS (2002) lists 34 species in genus. The subspecies *parviflora* is 1 of 2 in the species *A. parviflora*, and the only one endemic to the U.S. (Arizona). Kartesz (1999 Synthesis) recognized the species *A. parviflora*, but without indication of subspecies, and as being only in Arizona. Gentry (1982) reported the subspecies *flexiflora* as endemic to Mexico (in Sonora), whereas the subspecies *parviflora* is in the U.S. (Arizona) and Mexico.

DESCRIPTION: Perennial succulent of small, single or caespitose rosettes, 10-25 cm (4-10 in) high and 14-20 cm (6-8 in) broad. Leaves 5.0-10.0 cm (2.0-4.0 in) long (6-20 cm [2.4-8 in] per DBG 1999), less than 2.5 cm (1.0 in) wide, tapering towards the apex. The leaves are dark green in color with a waxy coating, bearing white markings on upper and lower sides from imprints of inner leaf buds, possessing a stout but not very stiff brown to gray spine 5.0-8.0 mm (0.2-0.32 in.) long at tip. The leaf margins are outlined in white, with tightly curled white fibers peeling off the outer edges. Flowering stalk from 10-25 dm (3.3-8.2 ft.) tall, slender and green to reddish in color, with 1.0-3.0 cm (0.4-1.2 in.) long bracts scattered along it becoming much smaller higher on stalk. Small flowers are erect, 14-17 mm long, pale yellow or cream (greenish to pink per ARPC 2001; pink or whitish, becoming darker purple on drying per Benson and Darrow 1981), in loose clusters of 2-4, on very short branches of

stalk. Flowers are broadly urn-shaped with five short tepals, 2-5 mm long. Fruits mature into ovoid capsules 6.0-10.0 mm (0.24-0.4 in.) in diameter. Seeds half-round, 3.0 mm x 2.5 mm (0.12 in. x. 0.1 in.) in diameter, and black. Plant can grow in clumps or isolated.

AIDS TO IDENTIFICATION: No other *Agave* in the U.S. (southern Arizona) is as small as *Agave parviflora* ssp. *parviflora*. White markings on their leaves are distinctive. Flowers of the subspecies *flexiflora* are reflexed and leaves are spatulate. *A. p.* ssp. *parviflora* differs from *A. schottii* and *A. toumeyana* var. *bella* by its smaller, strict, abruptly tapered, and curly-fibered leaves, and small, cream-green-pinkish flowers with very small tepals. *Agave schottii* (shin dagger) has longer leaves that have no white markings.

ILLUSTRATIONS: Line drawing of leaf (Gentry 1982: Fig. 10:55).
Line drawing of leaf and flower (Gentry 1982?: Fig. 8.4)
B&W photo of species (Gentry 1982?: Fig. 8.5)
B&W photo of species storage roots and leaves (R.H. Peebles, *in* Benson and Darrow 1981: Fig. 3.35:66).
B&W photo of species (R.A. Darrow, *in* Benson and Darrow 1981: Fig. 3.36:66).
Line drawings of species parts (Benson and Darrow 1981: Fig 3.37:66).
B&W line drawing (M. Chamberland, *in* ARPC 2001)
Color photo of plant (USFS, *in* ARPC 2001)
Color photo of habitat (J. Rorabaugh, *in* ARPC 2001)
Color photo (USFWS, *in* Kelly and McGinnis 1994)
B&W line drawing (M. Chamberland, *in* Kelly and McGinnis 1994)

TOTAL RANGE: Southern Arizona and northern Sonora, Mexico, "in the Pajarito Mountains, near the border; in the Sierra Cibuta, approximately five miles south of the border; and near Sasabe" as well as south of Douglas in the Sierra San Diego (Malusa et al. 1993).

RANGE WITHIN ARIZONA: Pima County: vicinity of Arivaca and Arivaca Lake, Las Guijas, Pozo Verde, San Luis, and Santa Rita mountains; Santa Cruz County: Sonoita Creek vicinity, South of Sasabe, Fraguita Peak, Cobre Ridge, and Atascosa, Las Guijas, Oro Blanco, Pajarito, Patagonia, and Santa Rita Mountains.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Succulent perennial shrub/subshrub.

PHENOLOGY: Plants offset freely, flowering between the ages of 10 and 25 years. Flowering typically occurs from May to August. Seeds are gradually released from drying capsules in fall and winter.

BIOLOGY: Obligate outcrosser (Schaffer and Schaffer 1977). Pollinators include carpenter bees and bumblebees. Seed viability is high (40-60%). Relative importance of sexual vs. asexual reproduction is unknown. May be a cyclic reproducer (not successful in reproducing every year). They produce rhizomatous offsets sparingly during its slow growth to maturation.

HABITAT: Middle elevations of mountains on open rocky or gravelly slopes and ridges, in desert grassland and oak woodland, 3,600-4,600 ft (1095-1400 m). Appears to prefer gravelly soils on rounded ridge-tops where grasses and shrubs are sparse and soil is bare or nearly so (20-30% open, this plant does not compete well).

ELEVATION: 3,560 - 5,200 feet (1086-1586 m), based on unpublished data from the Heritage Data Management System (AGFD, accessed 2003). ARPC (2001) reports elevation range of 3,600-4,600 ft (1095-1400 m). DBG (1999) reports elevation as high as 7869 ft (2400 m).

EXPOSURE: Various.

SUBSTRATE: Reichenbacher (1986) notes that there may be a tendency for the plants to occur on soils derived from rhyolites, andesites, and volcanic tuffs, and occasionally granites and sedimentary conglomerates composed of weathered volcanics. On the Buenos Aires NWR, they seem to be restricted to white outcroppings of quartzite.

PLANT COMMUNITY: Semi-desert grassland sometimes with scattered oaks; shrubs, stem and leaf succulents (ca. 10 - 50% cover) usually with grasses (between 0 - 20% cover). Associated species may include: *Arctostaphylos pungens*, *Agave palmeri*, *Agave schottii*, *Calliandra eriophylla*, *Dasylirion wheeleri*, *Erythrina flabelliformis*, *Eysenhardtia polystachya*, *Garrya wrightii*, *Gutierrezia* sp., *Juniperus deppeana*, *Krameria parviflora*, *Mimosa dysocarpa*, *Ocotillo*, *Prosopis* sp., *Quercus emoryi*, *Q. oblongifolia*, *Q. toumeyi*, *Rhus choriophylla*, and grasses including *Aristida* sp., *Bouteloua* spp., and *Heteropogon contortus*.

POPULATION TRENDS: Permanent monitoring plots were established in the Atascosa Mountains (Malusa 1993). Low mortality since 1992. According to NatureServe (2002), they are known from 43 element occurrences in southern Arizona, primarily from Santa Cruz County; believed to have fewer sites in Sonora, Mexico.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[Category 2 USDI, FWS 1993]
[Category 2 USDI, FWS 1990]
[Category 2 USDI, FWS 1985]

STATE STATUS: Highly Safeguarded (ARS 1993)

OTHER STATUS:

Forest Service Sensitive (USDA, FS Region 3 1990, 1999)
None (USDI, BLM AZ 2005)
[Bureau of Land Management Sensitive (USDI, BLM AZ 2000)]
Determined Threatened in Mexico (Secretaría de Medio Ambiente 2000)
Rare by the IUCN (Walter and Gilbert 1998)
Most Critically Endangered (CITES, 1996 Appendix I)
[Most Critically Endangered (CITES, 1983 Appendix I)]

MANAGEMENT FACTORS: Some populations appear to have declined due to collection not only in Arizona, but in northern Mexico. Collecting along well-traveled roads is greatest threat. However, easily grown from seed. Loss of habitat due to mining and road construction; degradation of habitat due to livestock grazing and reproduction may be reduced by destruction of flower stalks by browsing; controlled burns are occurring but nothing is known about its fire ecology. Ice cream plant for cattle. In 1993-1994, all flowering stalks eaten by cattle. Forest Service will begin visiting all known sites in 1995 to get population estimates. One site in Warsaw Canyon (1994) destroyed by Joint Task Force (JTF) activities (heliport construction). Number of individuals destroyed unknown.

CONSERVATION MEASURES TAKEN: Buenos Aires NWR is investigating effects of fire. More than 50 plants (individuals and offshoots) in the Summit Motorway plot. The plot is 50 m long and 12 m wide. All individuals within the plot are monitored. The data collected are: number of heads, diameter of largest and smallest head within the clump and general notes on growth and herbivory. Now have 3 years worth of data. Very difficult to distinguish individuals (clones come off main plant).

The Desert Botanical Garden has propagules from three populations in Santa Cruz County, Arizona. Garden staff has conducted controlled cross-pollinations, keeping each population separate and producing a total of 10,554 seeds. Ongoing plans are to continue to produce seed on cultivated plants, and to back up the living plant collection by removing offsets as they form. (DBG 1999).

SUGGESTED PROJECTS: Setting up monitoring plot on ungrazed land. Further research into the effects of fire. Monitor population trends. Enter recorded observations into data base.

LAND MANAGEMENT/OWNERSHIP: BLM - Tucson Field Office; FWS - Buenos Aires National Wildlife Refuge; USFS - Coronado National Forest; State Land Department; TNC Patagonia-Sonoita Creek; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Peter Warren (10-12 August, 1990) found this subspecies in the Pajarito Mountains a few miles south of the Arizona-Mexico border.

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1991-10-18 (BKP)
1991-12-04 (SR)
1994-10-17 (PLW)

1994-12-12 (DBI)
1994-12-29 (MF)
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