ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PMAGA01120
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Agave verdensis*
COMMON NAME: Sacred Mountain Agave
SYNONYMS:

FAMILY: Agavaceae

AUTHOR, PLACE OF PUBLICATION: Hodgson and Salywon, 2013. Brittonia 65(1): 5-15. March 1, 2013.

TYPE LOCALITY: Yavapai County, Arizona, Hill north of Sacred Mountain archaeological site, south of Wet Beaver Creek and US Forest Service Ranger Station, elevation 4033 feet..

TYPE SPECIMEN: Holotype: DES S/N, , W.C. Hodgson and A. M. Salywon (25495), 23 June 2010.

TAXONOMIC UNIQUENESS: The species *verdensis* is one of 36 in the *Agave* family and one of five accepted Arizona *Agave* domesticate species. It is placed in Gentry's informal group Ditepalae (Gentry, 1982) because of its leathery, erect flowers, dimorphic tepals with the outer whorl larger than the inner, and the outer tepal tips cucullate with a dark, corneous and pubescent cap. Its vegetative and reproductive characteristics warrant it as morphologically distinct from other species. The *verdensis* species is similar to *A. delamateri* and *A. chrysantha* Peebles, and *A. shrevei* Gentry. It was first collected in 1995 near Sedona, Arizona and was tentatively determined as "*A.* aff. *delamateri* with influence from *A. chrysantha"* (Hodgson 8889, DES). It differs from *A. chrysantha* by its cloning nature little variability in morphology of vegetative and sexually reproductive structures, leaf size and shape, marginal teeth, number and orientation, flower color, and minimal seed productions, favoring reproduction by rhizomatous offsets. The cohesive nature of this taxon was not realized until eight years later when other populations and collections were identified near the Sacred Mountain archaeological site. (Hodgson and Salywon 2013).

DESCRIPTION: Plants 50-60 cm high and broad, rosettes open, freely offsetting via rhizomes, forming clones of few too many plants. Leaves numerous, short-lanceolate to short-oblanceolate, 28—42(—47) cm x 5.5—10(—13) cm, broadest at, just below, or just above middle, firm, acuminate, erect-spreading, guttered, easily cut with knife, glaucous-gray, flushed with maroon distally; marginal teeth firmly attached, strongly deflexed, occasionally

porrect, recurved, or upturned, especially along distal 1/3 of leaf margin, close-set, gray, brown, dark mahogany to brown-black; interstitial teeth (00—)2—8 along distal2/3 of leaf margin; terminal spine 1.8-3.4 cm, gray to dark gray-mahogany brown. Inflorescence narrowly paniculate, stalk 4.5—6 m tall, maroon-green glaucous, with 18-20 lateral, perpendicular to ascending maroon-glaucous branches in upper 2/5 of stalk, these 13.5—17 cm long at widest point of inflorescence. Flowers 15—49 in individual clusters, 42—57 mm long, with a sweet-musky fragrance at anthesis; tepal lobes persistently erect, claping filaments, becoming leathery with age, in two series, slightly unequal to subequal, the outer series 7.8—11.5 mm long, light cream, with conspicuous brown, papillose, cucullate tips, those of inner series 7—10.2 mm long, light cream with less cucullate and lighter tip, white ciliate hairs within apices, strongly keeled; floral tube 13—15 x 12—15 mm, light green, thick, bulging at base of tepal lobes; filaments cream to cream-yellow, 31—49 mm long, subequally inserted 5.7—8.7 mm above base of tube; anthers 11—20 mm long; ovary 18—28 x 4—7.5(—10) mm, light green, neck 4.5—7 mm long. Capsules only produced in upper 2/5 of inflorescence, linear-oblong to obovoid, with short beak, (26—)32—39 x 14—22 mm, the valves 10—18 mm wide, short-stipitate, the stipe 1—4.5 mm long; viable seed few, dull black, crescentic, rugose, with narrow marginal wing, 6.5 x 5 mm. (Hodgson and Salywon 2013).

AIDS TO IDENTIFICATION: Differs from *A. yavapaiensis* in that it has short-lanceaolate to short-oblanceolate, acuminte, glaucous gray leaves that are tinged with maroon flush distally, strongly deflexed, occasionally porrect, upturned or recurved marginal teeth, conspicuous brown papillose pubescent calloused tips on tepal lobe apices, light green ovary, and short-stipitate, broader fruit with wider valves. Shows the greatest affinity on a morphological basis to *Agave shrevei* spp. *shrevei* and spp. *matapensis* Gentry, their large teats, strongly reflexed marginal teeth, pale gray glaucous leaves are comparable, but characters and reproductive strategies are significantly different. Difficult to distinguish young plants of *A. delamateri* and *A. verdensis* because of the leaf shape and color but they can be differentiated by ploidy level, rosette and flower characteristics. (Hodgson and Salywon 2013).

ILLUSTRATIONS: Line drawings and color photos in Hodgson and Salywon 2013.

TOTAL RANGE: The species only has 43 known populations, each occur near agricultural archaeological sites and habitation associates with pre-Columbian cultures from ca. A.D. 1100—1400, at elevations between 3465 – 4455 feet (1050 – 1350 m).

RANGE WITHIN ARIZONA: Yavapai County: Verde Valley. Sacred Mountain, Page Springs, Montezuma Castle and SE of Sedona localities.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Succulent perennial.

PHENOLOGY: Flowers late June through mid-July and fruits in late summer to fall. All of the plants flowering in the same year are at a similar stage of flowering, also described as synchronous.

BIOLOGY: Relies on vegetative reproduction through the formation of "pups" by the rhizomes, by which few capsules with relatively few, small seeds develop only near the upper part of the inflorescence. Their perceived lack of significant variation in rosette, leaf, inflorescence and flower characters also suggest human manipulation. The species *A. yavapaiensis* possesses traits favorable for harvesting and use for food and fiber. Additionally, their caespitose cloning habit, easily cut leaves and deflexed teeth, synchronous flowering, sweet-tasting heads are all characteristics that may have been selected for pre-Columbian farmers. The baked heads are exceptionally large and dense. (Hodgson and Salywon 2013).

HABITAT: Semi-arid desert grassland to pinyon-juniper woodland, nutrient-poor slopes and ridgelines.

ELEVATION: 3465 to 4455 feet (1050—1350 m).

EXPOSURE:

SUBSTRATE: Grows on rocky, limestone, sandstone or clayey-loamy igneous derived soils.

PLANT COMMUNITY: Sometimes found with Agave yavapaiensis and grows with other domesticates such as A. delamateri and A. phillipsiana, and with A. parryi and A. chrysantha. Associated species Vachellia constricta Bentham, Senegalia greggii (A. Gary) Britton & Rose, Agave chrysantha Peebles, A. delamateri Hodgson & Slauson, A. phillipsiana Hodgson, Berberis haematocarpa Woot., Canotia holacantha Torr., Cylindropuntia acanthocarpa (Engelm. & J.M. Bigelow), C. leptocaulis (DC.) F.M. Knuth, Hilaria jamesii (Torr.) Benth., Ephedra torreyana S. Wats. var. torreyana, Fouquieria splendens Engelm., Gutierrezia sarothrae (Pursh) Britton & Rusby, Juniperus osteosperma (Torr.) Little, Krameria erecta Willd. Ex J.A. Schultes, Larrea tridentate (DC.) Coville, Nolina microcarpa S. Wats., Opuntia engelmannii Salm Dyck ex Engelm., O. phaeacantha Engelm., Pinus monopylla Torr. & Frém., Prosopis velutina Woot., Quercus turbinella Greene, Rhus trilobata Nutt., Yucca baccata Torr., and Y. elata (Engelm.) Engelm. var. verdensis (McKelvey) Reveal. (Hodgson and Salywon 2013).

POPULATION HISTORY AND TRENDS: First collected in 1995, but not understood to be a cohesive taxon until additional populations and collections were made eight years later; considered to be a rare taxon. Trend unknown.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None.
STATE STATUS: None.
OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 2013)

MANAGEMENT FACTORS: None specified.

PROTECTIVE MEASURES TAKEN: None known, other than some plants offered protection by their locations within a National Monument.

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: U.S. National Park Service, Montezuma Castle, U.S. Forest Service Coconino National Forest.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Gentry, H.S. 1982. Agaves of Continental North America. University of Arizona Press, Tucson.

Hodgson, W.C. and Salywon A.M.. 2013. Two new Agave species (Agavaceae) from central Arizona and their putative pre-Columbian domesticated origins. Brittonia 65(1), 2013, pp. 5-15. March 1, 2013. The New York Botanical Garden Press, Bronx, NY.

USDA, Forest Service Region 3. 2013. Regional Forester's List of Sensitive Animals.

MAJOR KNOWLEDGEABLE INDIVIDUALS: Wendy C. Hodgson and Andrew M. Salywon, Desert Botanical Garden, Phoenix.

ADDITIONAL INFORMATION: The Sacred Mountain Agave may represent a specialized, signature regional plant developed by prehistoric Verde Valley farmers (Hodgson and Salywon 2013).

Revised: 2014-02-04 (JRK)

Arizona Game and Fish Department. 20XX **(= year of last revision as indicated at end of abstract)**. X...X **(= taxon of animal or plant)**. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.