

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

Plant Abstract

Element Code: PMAGA010W0

Data Sensitivity: YES

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Agave delamateri*
COMMON NAME: Tonto Basin Agave, Rick's Agave
SYNONYMS: *Agave* sp. nov. /ined
FAMILY: Agavaceae

AUTHOR, PLACE OF PUBLICATION: Hodgson, W.C. and L. Slauson, *Haseltonia* 3: 133-140, f. 1-5. 1995.

TYPE LOCALITY: Foothills of Mazatzal Mountains, above Tonto Basin, Gila County, Arizona.

TYPE SPECIMEN: DES, 33683. DeLamater, Ecker and Hodgson 5478.

TAXONOMIC UNIQUENESS: The species *delamateri* is 1 of 34 in the genus *Agave*. This species was first discovered by Susan McKelvey in the 1920's and rediscovered by Rick Delamater in 1988. It was not formally described until 1995 by Wendy Hodgson and Liz Slauson. "*Agave delamateri* appears to be most closely related to *A. fortiflora* and *A. palmeri*" (Hodgson and Slauson 1995). *Agave delamateri* separated from *A. palmeri* and *A. fortiflora* by distinct distribution and flower morphology and measurements (Hodgson and Slauson 1995). *Agave delamateri* may be another species disseminated further north by man (Hodgson 1994). It hybridizes with *A. chrysantha* in Yavapai County, Arizona (ARPC 2001).

DESCRIPTION: Large, suckering perennial succulent with very tall, open, unfruited flower stalk 4.5 – 6 m (14.75-19.7 ft) tall. Dense rosette of bluish-gray/green leaves with purple/maroon tinge, erect, conspicuously incurved at apex, about 50.0 - 74.0 cm (20.0 - 29.0 in.) long, 7.0 - 9.0 cm (2.8 - 3.6 in.) wide; conduplicate (U-shaped folding one leaf around the next younger leaf). Marginal teeth on leaves are straight to recurved, to 6.0 mm (0.24 in.) long, slender, dark brown or gray in color; terminal spine to 3.5 cm (1.4 in.) long. Inflorescence is broadly paniculate with 12 – 27 widely spaced, long branchlets on the upper half of stalk; without fruits ("naked"). Lateral branches, perpendicular to main flowering stalk. Flowers robust, 4.7-7.0 cm (1.85-2.76 in) long, pale cream tinged with light green, in clusters of 14 - 20. The outer tepals are ovate, longer and narrower than inner tepals, light cream-green with maroon-rust, rugose, hooded tips. The filaments are inserted in the tube at the same level. Closed appearance.

AIDS TO IDENTIFICATION: "*Agave delamateri* is distinguished from *A. fortiflora* and *A. palmeri*, by its numerous rhizomatous offsets, easily cut leaves, and 1-, not 2-seriate filaments. It further differs from *A. fortiflora* in having glaucous purple-tinged leaves,

greenish-ochroleucous, apically rusty-maroon tepals and slightly flattened, maroon rather than strap-shaped, yellow filaments. In addition, it differs from *A. palmeri* in having broadly lanceolate, apically incurved rather than lanceolate or linear-acuminate straight leaves, more numerous lateral branches in the inflorescence, and in its wider perianth tube and longer tepals” (Hodgson and Slauson 1995). *Agave palmeri* has similar teeth but leaves are more linear, splay out, and not erect. *Agave delamateri* can be confused with *A. chrysantha*, which has leaves 5.0 - 10.0 mm (0.2 - 0.4 in.) long, splayed out and larger marginal teeth. Inflorescence branches of *A. chrysantha* are ascending, not perpendicular. Flower similar to *A. palmeri*, but longer. At a distance, look for isolated stalks not eaten by livestock. Distribution of these species is also distinct.

ILLUSTRATIONS: Black and White Drawing (Hodgson and Slauson 1995: Fig. 1, P. 131).
 Photos (Hodgson and Slauson 1995: Fig. 3-5, Pp. 133-134).
 Black and White line drawing (ARPC 2001).
 Color photos of plant and habitat (ARPC 2001).
 Color photos of plant and habitat (DBG 1999 and 2001,
http://www.dbg.org/Involved/agave_delamateri.html or
http://www.dbg.org/Collections/agave_delamateri.html).
 Black and White drawing (M. Chamberland, *in* Kelly and McGinnis 1994)
 Color photo (Fish and Wildlife Service, *in* Kelly and McGinnis 1994)
 Color photos of plant and habitat (Doug Von Gausig, 1999, 2000,
<http://www.naturesongs.com/vvplants/tontoagave1.html>)

TOTAL RANGE: Small geographic area in Central Arizona.

RANGE WITHIN ARIZONA: About 90 clones known, from Young (5700 ft.) to San Carlos Reservoir, foothills of Mazatzal and Sierra Ancha mountains, Gila County; Mazatzal Mountains near Sunflower, Maricopa County; in the Verde Valley area, Yavapai County (Hodgson and Slauson 1995).

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Succulent perennial

PHENOLOGY: Inflorescences begin to emerge in May and early June, and mature in late June through July with flowers on the lowermost lateral branches opening first. This plant is monocarpic with synchronized flowering. Flowers usually abort early. Seed capsules and seeds are not known. No bulbils produced. The Tonto Basin Agave reproduces by pups formed at the base of the parent plant.

BIOLOGY: Occurs as isolated clones. Flowers in summer, with flowers usually aborting early. Flower and fruit development may be inhibited due to climatic conditions. Anthers will not emerge from sepals if season has been dry. Produces rhizomatous off-sets prolifically. Virtually no variation among individual plants. As with most *Agaves*, *A. delamateri* is probably self-incompatible. Clones may be hundreds of years old.

As with other Agaves, roots are shallow and spreading to derive maximum benefit from light rains and other habitat conditions that limit moisture to upper soil layers. The outwardly radial arrangement of leaves intercepts rainfall and conducts it toward the base and roots of the plant center. A thick waxy cuticle covering the leaves conserves moisture. Nighttime opening of leaf stomates also prevents water loss through transpiration during the hotter daylight hours.

The naked flowering stalk is rarely eaten by cattle or wildlife.

HABITAT: Usually found atop benches (often high benches), at edges of slopes, and on open hilly slopes in desert scrub, overlooking major drainages and perennial streams, from 2,350-5,100 ft (725-1554 m) elevation. Occasionally found in chaparral or juniper-grassland. Found in direct or indirect association with archaeological features, including multi-room foundations and also above check dams and linear alignments. As with most *Agaves*, *A. delamateri* requires a well-drained soil, being susceptible to root-rot.

ELEVATION: 2,190 to 5,100 ft. (668 - 1556 m). Based on unpublished records (AGFD, HDMS accessed 2003), elevation ranges from 2,190 – 4,600 ft (668-1403 m).

EXPOSURE: Usually south and southwest facing slope edges (atop benches); also on northeast facing gentle slopes.

SUBSTRATE: Cobbly and gravelly, deep and well-drained soils. These often occur on conglomerate benches in the Tonto Basin area, including limestone soils.

PLANT COMMUNITY: Arizona Upland Subdivision of Sonoran Desertscrub. Associates include *Carnegiea gigantea*, *Prosopis*, *Juniperus*, *Gutierrezia*, *Fouquieria splendens*, *Calliandra eriophylla*, *Menodora scabra*, *Echinocereus fasciculatus* (both var. *fasciculatus* and *bonkeriae*), *Erodium cicutarium*, and occasionally *Rhus trilobata*, *Opuntia engelmannii*, *Canotia holacantha*, *Yucca baccata*, and *Psilostrophe*. A few sites occur in Interior Chaparral and Great Basin Conifer Woodland as defined by Brown (1982).

POPULATION TRENDS: The greatest concentration of sites occurs near the northwest end of Roosevelt Reservoir in an area referred to as Tonto Basin, situated between the Sierra Ancha and Mazatzal Mountains (Hodgson and Slauson 1995). Approximately 70 plants are known from the Tonto Basin. No fertile seed is produced. (NatureServe 2002). In all, 90 clones are known, all in direct or indirect association with Mogollon or Salado agricultural and settlement features, suggesting cultivation by pre-Columbian people (DBG 2001).

Factors that can effect populations of *A. delamateri* include stress and weevil damage. Signs of stress can occur during the arid months of May and June. Agave Snout Weevil damage occurs when the beetles transmit a fungus which has the potential of destroying clones. This fungus hits cultivated agaves the most, particularly *A. americana*.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: SC (USDI, FWS 1996)
[C2 under *Agave* sp. nov./ined (USDI, FWS 1993)]
[C2 under *Agave* sp. nov./ined (USDI, FWS 1990)]

OTHER STATUS: Highly Safeguarded (ARS, ANPL 1999)
[Highly Safeguarded (ARS, ANPL 1993)]
Forest Service Sensitive (USDA, FS Region 3 1999)
[Forest Service Sensitive USDA, FS Region 3 1990]

MANAGEMENT FACTORS: Small range and few individuals. Urban sprawl, expansion of reservoirs and associated activities, road improvements and realignments, off-road vehicle and other recreational activity.

CONSERVATION MEASURES TAKEN:

SUGGESTED PROJECTS: Further surveys, on upper cobbly benches by Verde Valley and tributaries; San Carlos Indian Reservation near Gila and upper Salt rivers; especially near archaeological sites along major drainages, including southern Arizona and the Coronado National Forest; studies of the plant within its archaeological context; determine species presence at archaeological sites; map individual plants within a clone and monitor survival of these plants for population trends; determine evolutionary origin.

Pollination studies may shed light on other problems, such as whether distances between plants inhibit cross-pollination. Climatic factors may affect the mode of reproduction in agaves, and are not well understood.

LAND MANAGEMENT/OWNERSHIP: BIA – San Carlos Reservation; USFS – Coconino, Prescott, and Tonto National Forests; Private.

SOURCES OF FURTHER INFORMATION**REFERENCES:**

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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Liz Slauson - Desert Botanical Garden, Phoenix, Arizona

ADDITIONAL INFORMATION:

Desert Botanical Garden (Phoenix) conducted pollination studies (using pollen from other clones) which was unsuccessful.

Hodgson (Special Status Plant Workshop, Verde Valley April 17, 1993) suggested that these plants (like *A. murpheyi*) were grown during pre-Columbian times, but were grown on benches above drainages where check dams and alignments were found for growing more drought-intolerant crops. This occurrence of cultivation, was believed to have been grown by Hohokam and Salado cultures for food, fiber, and trade (ARPC 2001)

This species originally found by Susan McKelvey. Trelease wanted to call it *A. repanda*.

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1991-10-18 (BKP)
1992-09-15 (BKP)
1995-02-28 (WCH)
1997-04-08 (BGP)
1997-04-21 (SMS)
2003-05-08 (SMS)

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