ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDFAB3C013
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Psorothamnus arborescens* var. *pubescens*
COMMON NAME: Mohave Indigo Bush, Mohave Smokebush, Marble Canyon Indigo Bush, Marble Canyon Dalea
SYNONYMS: *Parosela johnsonii* var. *pubescens, Psorodendron pubescens, Dalea amoena* var. *pubescens, Dalea fremontii* var. *pubescens*
FAMILY: Fabaceae

AUTHOR, PLACE OF PUBLICATION: Barneby, Rupert Charles. Memoires New York Botanical Garden 27: 38. 1977.

TYPE LOCALITY: United States: Arizona.

TYPE SPECIMEN: GH 53582 (holotype of *Dalea amoena*). E.P. Thompson, #s.n. April 1872.

TAXONOMIC UNIQUENESS: NatureServe (2015) lists nine species of *Psorothamnus*, with 10 varieties. Seven of the species are found in Arizona, along with four of the varieties. *Psorothamnus arborescens* has two varieties that occur within the State: *pubescens* and *minutifolius*.

DESCRIPTION: Armed shrubs 4-10 dm tall; leaves 1.4-3.8cm long, leaflets 7-15, glandular beneath, strigose on both sides. Racemes 11-21 flowered, 1.8-4.5cm long. Calyx 8-10mm long, the tube 3.8-4.8mm long, 10-ribbed, villous, the teeth 3.6-5.2mm long, linear-lanceolate, as long as the tube; flowers 8.1-10.6 mm long, indigo; valves of pods with large, round, discrete yellowish or orange blister glands, pubescent between blister glands (Roth 2008)

AIDS TO IDENTIFICATION: The following key from Rhodes et al (2011) can be used to distinguish *P. arborescens* var. *pubescens* from the other *Psorothamnus* species:

1. Leaves pinnately compound (not simple or absent)…….……..……2
2. Glabrous to pubescent shrub more than 1 m tall; fruit 7-10 mm long……..….3
3. Calyx teeth 3.6–5.2 mm long, longer than the tube; fruits glabrous or finely hairy, sparsely covered with rounded or elliptic glands……*P. arborescens* var. *pubescens*

The two varieties of P. *arborescens*, *pubescens* and *minutifilius*, can be separated by the following traits identified in Cronquist et al 1989:

Leaflets linear-oblanceolate, not over 1.5 mm wide; calyx-tube either pilosulous or strigulose and the teeth separated by equally deep sinuses; pod pubescent between the glandular pustules; endemic to House Rock Valley, N. Coconino Co., on rocky knolls and talus under sandstone cliffs, +/- 1030 – 1470 m……..……var. *pubescens*
Leaflets lanceolate to rhombic-ovate or –elliptic, some over 2 mm wide; calyx-tube glabrous or nearly so and the sinus between the adaxial air (behind the banner) shallower than the rest; widespread over the Mohave Desert, calcifuge, at 150 – 1890 m; barely entering the Intermountain region in Deep Springs valley, NE Inyo Co., CA……...var. *minutifolius*

Differs from *P. fremontii* only in the ornamentation of the pod. *P. fremontii* has small orange glands that are confluent lengthwise into crowded ridges towards the pod's beak. *P. arborescens* has large round blister glands separated from one another by spaces as wide as their diameter (Roth 2008).

ILLUSTRATIONS:

Line drawing and photos: http://aznps.org/rareplants.html.
Photos:
http://swbiodiversity.org/seinet/taxa/index.php?taxon=Psorothamnus+arborescens+var.+pubescens.
Photos and Herbarium Mounts: http://eol.org/pages/642687/media.
Photos: http://nnhp.nndfw.org/.

TOTAL RANGE: See Range within Arizona.

RANGE WITHIN ARIZONA: Endemic Northern Coconino County, AZ, in the vicinity of Marble Canyon. There are also some populations as far as 125 miles downstream along the Colorado River from fortuitous seed distribution and establishment.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial shrub, armed, 4-10 dm tall.

PHENOLOGY: Flowering and fruiting from May to June (Roth 2008). Flowering starts late April per Rhodes et al 2011. Arizona collections records confirm flowering dates from May 2 to June 22

BIOLOGY:

HABITAT: On soils derived from the Moenkopi Formation in mixed desert shrub communities between 3400 – 4900ft (Roth 2008). Also, rocky knolls and talus at the base of sandstone cliffs (Rhodes et al 2011). There are several collections from banks along the Colorado River.

ELEVATION: Elevations reported in the literature (Cronquist 1989 and Roth 2008) range from 3380 to 4900 feet (1030-1495 m). Some Arizona collections in recent years have extended the upper range to 6075 feet (1850m). The lower range can also be extended to 1900 feet (580m), but this seems to be the result of seeds floating downstream along the Colorado and becoming established along the sandy river shores.

EXPOSURE: Not specified. However, one collection noting an open slope and the "rocky knoll" habitat type suggests the variety at least tolerates and possibly even prefers an open exposure.

SUBSTRATE: Soils derived from Moenkopi Formation (Roth 2008); Hakatai shale or Dox mentioned in one collection report. Sandy and reddish sandy soils noted, including "disturbed" sandy soil and the lower slope of a large sandy dune.

PLANT COMMUNITY: Desert shrub. Associated species include: *Atriplex canescens, Achnatherum hymenoides, Opuntia polyacantha erinacea, Bromus tectorum, Ericameria, Xylorhiza tortifolia, Encelia resinifera resinifera, Ephedra torreyana, Sphaeralcea grossulariifolia, Hilaria jamesii, Psorothamnus arborescens, Opuntia basilaris, Atriplex confertifolia, Encelia frtuescens, Tiquilia latior, Gutierrezia sarothrae, Coleogyne ramosissima, Ephedra nevadense, Pleuraphis jamesii, Amsonia tomentosa* var. *stenophylla, Thamnosma montana, Psoraldium junceum, Hymenopappus, Stanleya pinnata, Atriplex canescens, Eriogonum corymbosum, Sphaeralcea, Yucca angustissima, Ericameria nauseosa, Astragalus newberryi.* Two grasses, *Oryzopsis hymenoides* and *Sporobolus compactus*, were noted at one of the Colorado River downstream bank collection sites.

POPULATION HISTORY AND TRENDS: Unknown for Arizona. NatureServe (2015, but based on a 1999 assessment) considers *P.a*. var. *pubescens* to be imperiled because it is a narrow endemic, with few populations (probably not more than five rangewide) and few individuals (typically a few dozen plants in a good occurrence). Currently, there are about 12 known distribution clusters found along Marble Canyon, along the base of the Vermillion Cliffs, and at several river bank sites along the Colorado River to at least River Mile 125. Although first collected in the late 1930s and early 1940s, most of the collections have been made since the 1990s. Perhaps contrary to the 1999 NatureServe assessment that a "good occurrence" might have a few dozen plants, several of the collections noted that the plant was locally frequent, and one noted over 100 individuals. It is also noteworthy that the distribution may be expanding down river from Marble Canyon. Based on the more recent collections, it seems that the overall trend might be at least stable, and the total population might be greater than originally assessed.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None.

STATE STATUS: None.
OTHER STATUS: Category 4 (NNDFW, NESL 2008)
Bureau of Land Management Sensitive (USDI, BLM AZ 2010)

MANAGEMENT FACTORS: Roth (2008) recommends a 200 foot buffer zone to avoid disturbance; may be more or less depending on the size and nature of the project.

PROTECTIVE MEASURES TAKEN: Listed as a Category 4 species by the Navajo Nation, and as Sensitive by the Bureau of Land Management. Sites within the Grand Canyon NP and Glen Canyon NRA are offered some level of protection by the National Park Service.

SUGGESTED PROJECTS: Roth (2008) comments that proper identification can only be made during the flowering and fruiting season between May and June. It might be useful to re-visit some of the older collection sites to determine presence and status. This information would help to define the population trend.

LAND MANAGEMENT/OWNERSHIP: USDI Bureau of Land Management (Arizona Strip Field Office) including some collections within the Paria Canyon-Vermillion Cliffs Wilderness Area; USDI National Park Service (Grand Canyon National Park and Glen Canyon Recreation Area), the USDI Bureau of Indian Affairs (Navajo Nation), and private land holdings.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html.

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NatureServe Explorer, an online encyclopedia of life, accessed 9/15/2015, http://explorer.natureserve.org/index.htm.

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Roth, Daniela. 2008. Species account for *Psorothamnus arborescens* var. *pubescens*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/.

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Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT. p. 452-453.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

ADDITIONAL INFORMATION:

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