ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDCAC0J0H0

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Echinomastus johnsonii*
COMMON NAME: Johnson's Fishhook Cactus
SYNONYMS: *Ferocactus johnsonii, Neolloydia johnsonii, Sclerocactus johnsonii*.
FAMILY: Cactaceae

AUTHOR, PLACE OF PUBLICATION: Parry, Charles Christopher. United States Geological Expolration [sic] of the Fortieth Parallel. Vol. 5, Botany 117. 1871. [Note: as "Jonhsoni"]

TYPE LOCALITY: St. George, Utah

TYPE SPECIMEN: MO 2267165 (Lectotype). Charles C. Parry (#SN). 1870.

TAXONOMIC UNIQUENESS: Although there are differing opinions on the classification of *Echinomastus* and *Sclerocactus*, the USFWS and Arizona Natural Heritage Program use the genus *Echinomastus.* According to Kearney and Peebles (1960) there are three species of *Echinomastus* in Arizona: *johnsonni, intertextus* and *erectocentrus. Echinomastus* is one of 10 genera of the Cactaceae family in Arizona.

DESCRIPTION: Stems 10-25 × 7-15 cm; ribs (13-)18-21; areoles (14-)21-26 mm apart along ribs; areolar glands present at least seasonally. Spines 13-24 per areole, pale yellow to grayish lavender to maroon; radial spines 9-16 per areole; abaxial (shortest) radial spine 6-19 × (0.2-)0.4-0.6 mm; adaxial and lateral (longest) radial spines ca. 27-40 mm; central spines 4-9 per areole, present at all ages, 27-41 × (0.7-)1.1-1.4 mm; longest central spine straight to strongly decurved; abaxial central spine porrect, ca. 27-40 mm Flowers 4-6.5 × 4-7.7 cm; inner tepals yellow or pink to magenta, basal portions blotched with maroon , 2.5-3.7 × 1-1.8 cm; stigma lobes yellowish white to green. Fruits dehiscent only along single, longitudinal split, ± spheric, 17-18 mm (eFlora 2015).

AIDS TO IDENTIFICATION: *E. johnsonii* produces an egg-shaped or cylindrical stem up to 25 centimeters tall by 10 wide. It is covered densely in straight and curving spines which may be up to 4 centimeters long and come in shades of yellow, gray, lavender, and pink or red, with up to 24 per areole. The cactus may have yellow or pink flowers; the species is sometimes divided into two varieties on the basis of flower color. Flowers are up to 8 centimeters wide. The scaly, fleshy fruit is up to 1.8 centimeters long. (EOL 2015.)

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The following criteria from Kearney and Peebles (1960) can be used to identify the genus *Echinomastus* from the other Cactaceae genera:

Areoles not furnished with glochids; spines not barbed or scabrous,
Flowers borne at apex of the tubercles, contiguous with or actually on the spiniferous areole,
Flowers diurnal; stems not greatly elongate; plants cespitose or the stems unbranched,
Hypanthium devoid of spines, commonly scaly, flowers terminal,
Fruit thin-walled, dehiscent by vertical fissure or rarely basal orifice, persisting only a few weeks; spines not annulate. Plants small, rarely 50cm high,
Stems ribbed,
None of the spines hooked or flattened……..*Echinomastus*

E. johnsonii can be distinguished from the other two species based on the following characteristics:

Central spines 4-9 (not 1-4), all alike, straight or slightly curved; flowers yellow or magenta…. ……..……..…….. *E. johnsonii*

ILLUSTRATIONS:
Photos: http://swbiodiversity.org/seinet/taxa/index.php?taxon=Echinomastus johnsonii.
Photos, Herbarium Mounts: http://eol.org/pages/485040/media.

TOTAL RANGE: West-central and northwest Arizona, extreme southwest corner of Utah, southern Nevada and eastern edge of California (east of Death Valley).

RANGE WITHIN ARIZONA: NW Maricopa, SW Yavapai, NE La Paz Counties, and western Mohave County from near Bullhead City N to the Utah border.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial succulent

PHENOLOGY: Flowering (Feb-)Mar-May; fruiting Apr-Jun. (Most Arizona collections noted flowering from early March to later mid-April when recorded).

BIOLOGY:

HABITAT: Mojave desert scrub and upper edge of Sonoran desert scrub, rocky slopes, gravelly rolling hills, washes.

ELEVATION: 1640 – 4590 feet (500-1400m) from eFlora 2015. Arizona collections range from 1500 – 5160 feet (460-1575m).

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EXPOSURE: When reported, the exposures were southern (SW, S, SE) or open.

SUBSTRATE: Low, rolling hills and washes, often with gravel, associated with granitic substrate or materials seem to be the preferred habitat. Other collection records have recorded rhyolite, granite-gneiss, basalt and even limestone substrates.

PLANT COMMUNITY: Desert Scrub. Associated species: *Carnegiea gigantea, Cylindropuntia acanthocarpa, C. bigelovii, Enchinocereus engelmannii, Encelia farninosa, Krameria erecta, Mammillaria grahamii, Olneya tesota. Opuntia chlorotica, Simmondsia chinensis, Cercidium microphyllum, Eriogonum fasciculatum, Erioneuron pulchellum, Fouquieria splendens, Krameria grayi, Larrea tridentata, Opuntia basilaris, Pleuraphis rigida, Dasyochloa pulchella, Parkinsonia microphylla, Escholtzia glyptosperma, Trichoptilium incisum, Langloisia, Astragalus nuttaliana, Lepidium, Cryptantha pterocarya, Cammissonia brevipes, Lupinus sparsiflorius, Allonia incarnata, Perityle emoryi, Acacia constricta, Ephedra, Acamptopappus sphaerocephalus, Larrea divaricata, Viguiera parishii, Yucca baccata, Y. brevifolia. Ericameria laricifolia, Coleogyne ramosissima, Aristida purpurea, Yucca schidigera, Encelia virginensis, Ephedra nevadensis, Lactuca serriola, Cylindropuntia whipplei, Psorothamnus fremontii, Gutierrezia sarothrae, Sphaeralcea, Bromus rubens, Baileya multiradiata, Thymophylla pentachaeta, Brassica tournefortii, Erodium cicutarrium, Atriplex canescens, Bebbia juncea, Bromus madritensis, Calochortus flexuosus, Chaenactis stevioides, C. micranthus, Chorizanthe brevicornu, C. rigida, Delphinium parishii, Descurainia pinnata, Erodium cicutarium, Gilia trasnmontana, Hymenoclea salsola, Krascheninnikovia lanata, Langloisia setosissima, Lepidium fremontii. L. lasiocarpum, Linanthus demissus, Lycium andersonii, Malacothrix glabrata, Mentzelia obscura, Monoptilon bellioides, Muhlenbergia porteri, Senna covesii, Sphaeralcea ambigua, Stephanomeria pauciflora.*

POPULATION HISTORY AND TRENDS: Overall, the species is locally abundant but highly scattered across its distribution. Notes made from the 28 Arizona collection sites often reported that the species was abundant, frequent or common (sometimes locally). One collection record reported 500 individuals from a 2000x2000 m plot. There is perhaps a tendency for the species to be more abundant in very local areas as well. While there is no data to evaluate population trends, the number of collection sites in Arizona, and the size of the populations at these sites suggests that *E. johnsonii* is a relatively common, even if localized, species throughout its range in Arizona. There was only one collection site that recorded the species as "uncommon."

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None.
STATE STATUS: Salvage Restricted (ARS, ANPL 1999)
OTHER STATUS:

MANAGEMENT FACTORS: The species is threatened by mining, grazing, and off-highway vehicle activity.

PROTECTIVE MEASURES TAKEN: The species occurs within several protected areas, such as Lake Mead National Recreation Area, several ACECs and Wilderness areas. These locations offer additional refuge.

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: The majority of the 27 known occurrences are found on BLM lands. Others are on Arizona State Trust land, private holdings and USDI National Park Service (both Grand Canyon NP and Lake Mead NRA). In addition to the NPS lands, collections were also made from Joshua Tree Forest ACEC, Hummingbird Springs Wilderness Area, East Cactus Plain Wilderness Area, Black Mountain ACEC, Beaver Dam Wilderness and Beaver Dam Slope ACEC.

SOURCES OF FURTHER INFORMATION

REFERENCES:

eFlora, accessed 3/31/2015, http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242415274.

Encyclopedia of Life (EOL), accessed 3/31/2015, http://eol.org/pages/485040/details.

JStor| Global Plants, accessed 3/31/2015, http://plants.jstor.org/stable/10.5555/al.ap.specimen.mo-2267165.

Kearney, Thomas H. and Robert H. Peebles. 1960. Arizona Flora (with supplement). University of California Press, Berkeley. P. 574.

Tropicos, accessed 3/31/2015, http://www.tropicos.org/Name/5101010.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

ADDITIONAL INFORMATION: *Echinomastus johnsonii* varies geographically in both flower and spine color. The yellow-flowered plants have been named *E. johnsonii* var. *lutescens*. The pink-flowered plants occur in separate populations, as far as is known, to the north of the yellow-flowered plants, but the interface between the two forms is poorly understood (eFlores 2015).

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