ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDMAL140T0
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Sphaeralcea gierischii* N.D. Atwood & C.L. Welsh
COMMON NAME: Gierisch mallow; Gierisch globemallow
SYNONYMS:
FAMILY: Malvaceae

AUTHOR, PLACE OF PUBLICATION: Atwood, N.D. & S.L. Welsh, Novon 12(2): 161-163, f. 1. 2002.

TYPE LOCALITY: United States of America. Arizona. Mohave Co. North of Black Rock Gulch, W of road.

TYPE SPECIMEN: HT: BRY. N.D. Atwood #25293, B. Furniss and L.C. Higgins, 24 Apr 2000. IT: ARIZ, ASU, GH, MO, NY (collectors Atwood & Furniss; photologue also included Higgins), RM, US, UTC.

TAXONOMIC UNIQUENESS: In North America the species *Sphaeralcea gierischii* is 1 of 28 in the genus *Sphaeralcea*, and in Arizona it is 1 of 17 species in the genus (BONAP, accessed 25 Aug 2010).

DESCRIPTION: A flowering perennial, which produces few to many stems from a woody caudex (short, thickened, woody stem that is usually subterranean or at ground-level). The stems are 4.3-10.3 dm (1.4-3.4 ft) tall, often dark red-purple, produced in tall, open clumps, and are only sparingly leafy. The foliage is bright green and glabrous (not hairy). The main foliage leaves in the lower portion of the stems are large, oval shaped in outline (central lobe greatly elongated, having a long-crenuate base). Three to five lobed leaf blades are 1.2-4.0 cm (0.47-1.57 in) long and 1.0-5.0 cm wide (0.4-1.9 in); usually longer than wide. The inflorescence is open, panicle-like, with more than one flower per node. The calyx is 5-10 mm (0.2-0.4 in) long, green, becoming stramineous in fruit, uniformly glabrous externally, the lobes ovate to lance-acuminate. Petals are 1.5-2.5 Cm (0.6-0.98 in) long, orange (grenadine) in color; carpels 10-15, 4.5-5.5 mm high. (Atwood and Welsh 2002; Tiley et al. 2011; USFWS 2009b).

AIDS TO IDENTIFICATION: Although they both share an open inflorescence, *Sphaeralcea gierischii* differs from *S. rusbyi* (Rusby globemallow) by its larger flowers (1.5-2.5 cm), glabrous foliage, few or no stellate (star-shaped) hairs restricted to the leaf margins, and restricted range and habitat. It differs from *S. moorei*, another closely related species, by

having 3- to 5-parted narrow leaf lobes, bright green leaves (sometimes suffused with red-purple), and different habitat. (Atwood and Welsh 2002; USFWS 2009b). *S. ambigua* (desert globemallow) differs vastly from *S. gierischii* in its dense white to yellow canescent, thick, usually rugose, prominent veined, deltoid to nearly orbicular cordate-based leaves, short pedicels, and larger prominent reticulate carpels (1.2-1.6 cm high). (Atwood and Welsh, 2002).

ILLUSTRATIONS:

Line drawing from Holotype (*in* Atwood and Welsh, 2002: fig. 1)
Line Drawing (*in* UNPS, 2003-2005)
Color photos of plant and habitat (L. Hughes, *in* UNPS, 2003-2005)
Color photos of plant and habitat (A. Frates, *in* UNPS supplemental information, 2003-2005)
Color photo of plant in habitat (W. Hunter, *in* UNPS supplemental information, 2003-2005)
Color photo of Isotype (Atwood and Furniss, US-3376462, *in* http://ravenel.si.edu/botany/types//fullRecords.cfm?myFamily=)
Color photo of Isotypes (NYBG, *in* http://scisun.nybg.org:8890/searchdb/owa/wwwspecimen.search_list?)
Color photo (USFWS, ECOS http://ecos.fws.gov/docs/species_images/)

TOTAL RANGE: Endemic to one population in Washington County in southwestern Utah, and eight populations in Mohave County in northwestern Arizona. Historical range of this species is unknown. It is possible that the gypsum hills supported populations of *S. gierischii* before active mining (and removal of the gypsum) began; there is also no information that the species occurred outside of its current range (USFWS 2009b).

RANGE WITHIN ARIZONA: Mohave County, vicinity of Black Rock Gulch, Black Knolls, and Pigeon Canyon.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial. Because this species is woody at the base and the same individuals have been observed for more than one year, the U.S. FWS (Service) believes that this plant is perennial (USFWS, ECOS 2010).

PHENOLOGY: Re-sprouts from the base in late winter and spring (January-March), depending on rainfall and daytime temperatures. Plants die back to the ground during the winter.

BIOLOGY: According to the Service (USFWS, ECOS 2010), it is not known how the flowers are pollinated, nor the pollination system (self-pollinated or obligate out crosser), seed dispersal mechanisms, or the conditions under which seeds germinate.

HABITAT: A scarcely scattered obligate gypsohile (plant limited to gypsum based soils), often found growing on the cooler north facing slopes on gypsum outcrops in the warm desert scrub (Mohave desert scrub) community, in association with the Harrisburg Member of the Kaibab Formation (Atwood and Welsh 2002; Tilley et al. 2011; USFWS 2010). The area receives approximately 13 to 20 cm (5 to 8 in) of annual precipitation (WRCC 2011, in Tiley et al. 2011).

ELEVATION: In Arizona, they have been found at elevations between 2,715 – 4,262 feet (828-1300 m), and in Utah they have been observed around 2,400 feet (732 m) elevation. Welsh et al. (2003, in Tiley et al. 2011), reports elevation approximately 1090 m (3,576 ft).

EXPOSURE: Collected on north facing slopes of 5-30%.

SUBSTRATE: Grows on clay to rocky gravelly substrate. In both Arizona and Utah, Gierisch mallow is mainly found on gypsiferous outcrops of the Harrisburg Member of the Kaibab Formation, but has also been collected on the Moenkopi Formation and on limestone rock/soil. In Utah, *S. gierischii* has been collected on sandy, gravelly soil.

PLANT COMMUNITY: Warm desert scrub (shrub) plant communities of the northern Mohave Desert. Plant communities were they have been observed include Blackbrush-Larrea-Yucca, Yucca-Ambrosia-Larrea-Ephedra, and Larrea-Coleogyne-mixed scrub communities. Associated species include: *Ambrosia dumosa* (burrobush), *Atriplex canescens* (four-wing saltbush), *Brickellia*, *Coleogyne ramosissima* (blackbush), *Dalea* (prairie-clover), *Ephedra* (Mormon tea), E. nevadensis (), Eriogonum inflatum (), *Hymenoclea salsola* (burrobrush), *Larrea tridentata* (creosotebush), *Lycium andersonii* (water jacket), Malcolmia africana (), *Opuntia*, *Petalonyx* (sandpaper-plant), Phacelia pulchella (), *Psorothamnus* (indigo bush), P. fremontii (), *Purshia* (cliffrose), and *Yucca*. (SEINet, 2005 & 2010). In Utah, found scattered with *Bromus rubens* (red brome), *Chrysothamnus* (rabbitbrush), *H. salsola*, *L. tridentata*, *L. andersonii*, and *Pleuraphis jamesii* (James' galleta) (SEINet, 2010).

POPULATION HISTORY AND TRENDS: Unknown. A rare but locally common species. According to USFWS (2009b), there are nine known populations on a total of 24.12 hectares (ha) (59.5 acres (ac)). Of these, seven occur on about 22.3 ha (55 ac) of lands managed by BLM, Arizona Strip District. In addition, there is one population on approximately 0.81 ha (2 ac) of land managed by the Arizona State Land Department (ASLD), and one population on about 1.01 ha (2.5 ac) in Utah on BLM lands. Over 90% of the estimated population is found in Arizona, primarily on BLM lands. "Atwood and later Hughes (Service 2008, p. 5), estimated population size from four of the Arizona locations; the populations are referred to as "Hills" and three populations are on lands managed by the BLM, and one on lands managed by ASLD. There is a population on Hill 3, but there are no

estimates for it….. Surveys estimate total population size to be between 7,000 and 12,000 individuals in Arizona." (*in* USFWS 2009b).

In 2001, one population located on 15-20 acres in Arizona, was estimated at 5,000-9,000 plants. Another 4 transects in nearby sections revealed approximately 200 plants. (Lee Hughes, monitoring information, date unknown).

In Utah, the total population size in 2005 was estimated to be 200+ individuals (Franklin 2007); in spring 2008 Hughes (BLM 2008b) estimated the population to be between 5,000 and 8,000 individuals. (*in* USFWS 2009b). The Utah population is not monitored on a regular basis.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: C (USDI, FWS 2008)
[C USDI, FWS 2009-2011]

STATE STATUS: None

OTHER STATUS: None

MANAGEMENT FACTORS: In Arizona, gypsum mining is an on-going source of habitat destruction for the Gierisch globemallow. Many of the most valuable gypsum deposits are not at ground level, meaning that surface materials need to be removed and stockpiled, while the gypsum is mined from below. This type of activity completely removes the plant's habitat, and reclaimed sites following mining activities may not provide suitable habitat. The Utah population is not threatened by mining operations at this time. However, off-road vehicle (OHV) activity is evident in the area. Population growth in St. George, Utah, along with an increase in OHV, threatens their habitat there, along with habitat degradation from target shooting and trash dumping. (USFWS 2009b).

Other concerns/threats include the palatability of the plant to wildlife and livestock. The flowering stems are grazed primarily in drought years, reducing seed production and recruitment opportunities Tiley et al. 2011). Climate change could restrict their distribution, along with other species.

PROTECTIVE MEASURES TAKEN: Recommended conservation measures by the U.S. Fish ad Wildlife Service (Service) in an April 2009 Species Assessment and Listing Priority Assignment Form (2009b), proposes the following recommendations. The Service "recommends that the BLM evaluate the effects to this species and its habitat when reviewing proposed mining plans of operation." They "recommend that mine operators store topsoil, and use it for reclamation, so that if a seed bank for Gierisch mallow is present, some plants may be able to germinate and reclaim the disturbed area." The Service "recommends

immediate protection for the remaining populations, by withdrawing the areas for mineral extraction." They "recommend fencing and patrol for the population in Utah, to reduce habitat degradation." The Service also recommends "fencing or livestock reduction near all populations to reduce the amount of herbivory, especially during drought."

SUGGESTED PROJECTS: Life history studies for this newly described species, along with pollination and seed dispersal studies are needed, along with the effect of fragmentation on the remaining populations, (USFWS, 2009b, USFWS 2011).

LAND MANAGEMENT/OWNERSHIP: BLM – Arizona Strip Field Office and St. George Field Office, Utah; Arizona State Land Department (ASLD) lands. Note - 90% of estimated population is found in Arizona primarily on BLM lands. (USFWS, 2009).

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION:

Specific epithet honors the late Ralph K. Gierisch, ardent collector of plants in the Intermountain West for more than five decades, who spent several years in the latter part of the century (1970s and 1980s) investigating the flora of the Mohave Strip, Mohave County, Arizona. He made the first collection of the species in 1978.

The largest population in Arizona is affected by an existing gypsum mining operation (Black Rock Gypsum Mine), in which the operator would like to expand. The proposed expansion would remove the entire population and its habitat. The U.S. FWS, based on the Environmental Assessment (EA) it received for expansion of the quarrying activities, assume that the expansion will occur in the near future. (USFWS 2009b).

The gypsum mine operated by Georgia-Pacific, is on ASLD lands and is located near Hill 5, the second largest Arizona population. Due to lack of permission to enter the area, Service biologists were unable to visit the site in February 2008. Although there has been no mining

activity on ASLD lands since 2007, this inactivity is temporary and the Service believes that mining will resume when the housing market improves over the next few years. (USFWS 2009b).

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