

**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). 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-crenulate 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* (Moore's globemallow), 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://collections.mnh.si.edu/search/botany/> ) Use scientific name in keyword search.

Color photo of Isotypes (NYBG, *in*

<http://sciweb.nybg.org/science2/vii2.asp.html> Search by scientific name.

Color photo (USFWS, ECOS

<http://www.fws.gov/southwest/es/arizona/images/SpeciesImages/Hughes/6-14-2008-04%20Lee%20Hughes%20BLM.jpg> )

**TOTAL RANGE:** Endemic to one population in Washington County in southwestern Utah, and seventeen 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, USFWS 2012).

**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. Fish and Wildlife Service (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 gypsophile (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 where 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* sp. (Mormon tea), *E. nevadensis* (Nevada ephedra), *Eriogonum inflatum* (desert trumpet), *Hymenoclea salsola* (burrobrush), *Larrea tridentata* (creosotebush), *Lycium andersonii* (water jacket), *Malcolmia africana* (African mustard), *Opuntia* sp., *Petalonyx* sp. (sandpaper-plant), *Phacelia pulchella* (beautiful scorpionweed), *Psoralea* sp. (indigo bush), *P. fremontii* (Fremont's psoralea), *Purshia* sp. (cliffrose), and *Yucca*. (SEINet, 2005 & 2010). In Utah, found scattered with *Bromus rubens* (red brome), *Chrysothamnus* sp. (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 (2011), there are eighteen known populations on a total of 186 hectares (ha) (460 acres (ac)). Of these, sixteen occur on 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). The two populations on Hills 4 and 5 include over half of all known Gierisch mallow plants (USFWS. 2012).

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:** PE with Critical Habitat (USDI, FWS 2012)  
[C USDI, FWS 2008-2011]  
**STATE STATUS:** ANPA: Highly Safeguarded  
**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.

The progressive incursion of the non-native, invasive red brome grass into Gierisch Mallow habitat is also a matter of concern. This species has evolved in sparsely vegetated habitats, and is unlikely to be adapted to survive the high frequency fires that usually accompany these exotic annual grasses (USFWS, 2012).

**PROTECTIVE MEASURES TAKEN:** Recommended conservation measures by the U.S. Fish and 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.” In spite of these recommendations, both the Black Rock Gypsum Mine (affecting the largest population in Arizona on Hill 4, BLM land), and the Georgia-Pacific operated mine on ASLD land (affecting the large population near Hill 5), have received approvals for their Mining Plan of Operation, and are expected to commence operations again within 3-10 years, depending upon the recovery of the housing market. Although these plans do include reclamation activities, and some reclamation planting has been done, it is not certain whether these activities will be successful, or the re-established populations viable over the long term (USFWS, 2012).

**SUGGESTED PROJECTS:** Research is needed on the life history of this recently described species. Studies are also needed on pollination vectors and seed dispersal, 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**

### **REFERENCES:**

- Atwood, N.D., and S.L. Welsh. 2002. Overview of *Sphaeralcea* (Malvaceae) in Southern Utah and Northern Arizona, U.S.A., and Description of a New Species. *Novon*, 12(2): 159-166.
- Harvard University Herbaria. Index of Botanical Specimens. <http://brimsa.huh.harvard.edu/cms-wb/>. (Accessed: 5/16/2005).
- International Plant Name Index (IPNI). <http://www.ipni.org/ipni/plantsearch>. Accessed: 5/16/2005.
- Missouri Botanical Garden. 1995-2003. Research: Publications: Abstractid=597. At <http://ridgwaydb.mobot.org/mobot/mbgpress/abstract.asp?abstractid=597>.

- Missouri Botanical Garden – TROPICOS, Nomenclatural Data Base. *Sphaeralcea gierischii* N.D. Atwood & S.L. Welsh. [http://mobot.mobot.org/cgi-bin/search\\_vast](http://mobot.mobot.org/cgi-bin/search_vast). (Accessed: 16 May 2005).
- SEINet. Collections Search Result. Accessed 5/16/2005 at <http://seinet.asu.edu/collections/list.jsp>.
- The New York Botanical Garden. NYBG Specimens Detailed Results. <http://scisun.nybg.org:8890/>. (Accessed: 5/16/2005).
- Tiley, D., L. St. John and D. Ogle. 2011. Plant guide for Gierisch globemallow (*Sphaeralcea gierischii*). USDA-Natural Resources Conservation Service, Idaho Plant Materials Center. Aberdeen, ID.
- U.S. National Herbarium Type Specimen Register (US). Accessed 5/16/2005. <http://ravenel.si.edu/botany/types/fullRecords.cfm?myFamily=>.
- USDI, Fish and Wildlife Service. 2008. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Descriptions of Progress on Listing Actions; Notice of Review. Federal Register 73(238):75176-75244.
- USDI, Fish and Wildlife Service. 2009a. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Descriptions of Progress on Listing Actions; Notice of Review. Federal Register 74(215):57808-57878.
- USDI, Fish and Wildlife Service. 2009b. Species Assessment and Listing Priority Assignment Form: *Sphaeralcea gierischii* (Gierisch mallow). Region 2, April 2009.
- USDI, Fish and Wildlife Service, Environmental Conservation Online System (ECOS). 2010a. Species Profile: Gierisch Mallow (*Sphaeralcea gierischii*). Accessed: 6/2/2010. <http://ecos.fws.gov/speciesprofile/>.
- USDI, Fish and Wildlife Service. 2010. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Descriptions of Progress on Listing Actions; Notice of Review. Federal Register 75(217):69292.
- USDI, Fish and Wildlife Service. 2011. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Descriptions of Progress on Listing Actions; Notice of Review. Federal Register 76(207):66438.
- USDI, U.S. Fish and Wildlife Service. 2011. Species Profile: Gierisch mallow (*Sphaeralcea gierischii*). Environmental Conservation Online System. <http://ecos.fws.gov/speciesprofile/>
- USDI, U.S. Fish and Wildlife Service. 2012. Endangered and Threatened Wildlife and Plants; Determination of Status for Gierisch Mallow and Designation of Critical Habitat; Proposed Rule. Federal Register 77(160): 49894.
- Utah Native Plant Society. 2003-2005. Utah Rare Plant Guide. Salt Lake City, UT: Utah Rare Plant Guide Home Page. <http://www.utahrareplants.org>.

**MAJOR KNOWLEDGEABLE INDIVIDUALS:**

N.D. Atwood – Brigham Young University, Provo, Utah.

S.L. Welsh – Brigham Young University, Provo, Utah.  
Mima Falk – U.S. FWS, Tucson, Arizona.

**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).

**Revised:** 2005-05-19 (SMS)  
2005-06-30 (SMS)  
2010-08-25 (SMS)  
2011-11-03 (SMS)  
2012-08-29 (BDT)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

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.