

**Gierisch Mallow
(*Sphaeralcea gierischii*)
5-Year Review:
Summary and Evaluation**



Photo credit: USFWS

**U.S. Fish and Wildlife Service
Arizona Ecological Services Office
Phoenix, Arizona
July 2024**

5-YEAR REVIEW

Gierisch Mallow (*Sphaeralcea gierischii*)

1.0 GENERAL INFORMATION

1.1 Listing History

Species: Gierisch mallow (*Sphaeralcea gierischii*)

Date listed: August 13, 2013

FR citation: 78 FR 49149

Classification: Endangered

Critical habitat rule: We designated three critical habitat units totaling approximately 5,189 hectares (12,822 acres) in Mohave County, Arizona, and Washington County, Utah (78 FR 49165).

1.2 Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (ESA), the purpose of a 5-year review is to assess each threatened species and endangered species to determine whether its status has changed and it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (FWS) evaluated the biology and status of the Gierisch mallow as part of a Species Status Assessment (SSA; USFWS 2024a, entire) to inform a recovery plan and this 5-year review.

The FWS provides notice of status reviews in the Federal Register and requests new information on the status of the species (*e.g.*, life history, habitat conditions, and threats). We solicited data for this status review from interested parties through a Federal Register notice on January 25, 2024 (89 FR 4966). We received one response.

Our analysis in this 5-year review relied on the SSA report (USFWS 2024a, entire), completed on February 22, 2024, that represented the best available scientific information, including the resource needs and the current and future condition of the species. The FWS coordinated with partner representatives and species experts to develop and review the SSA report before we used it as the scientific basis to support our recovery planning and 5-year review decision-making processes.

1.3 FR Notice citation announcing the species is under active review:

89 FR 4966, Initiation of 5-Year Status Reviews of 22 Species in the Southwest, January 25, 2024.

2.0 REVIEW ANALYSIS

Section 4 of the ESA (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of

“endangered species” or “threatened species.” The ESA defines an “endangered species” as a species that is “in danger of extinction throughout all or a significant portion of its range,” and a “threatened species” as a species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The ESA requires that we determine whether a species meets the definition of “endangered species” or “threatened species” due to any of the five factors described in section 4(a). These include A) the present or threatened destruction, modification, or curtailment of its habitat or range; B) overutilization for commercial, recreational, scientific, or educational purposes; C) disease or predation; D) the inadequacy of existing regulatory mechanisms; or E) other natural or manmade factors affecting its continued existence.

The identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an “endangered species” or a “threatened species.” In assessing whether a species meets either definition, we must evaluate all identified threats by considering the expected response of the species, and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species—such as any existing regulatory mechanisms or conservation efforts. The FWS recommends whether the species meets the definition of an “endangered species” or a “threatened species” only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

2.1 Distinct Population Segment (DPS) policy (1996):

Not applicable.

2.2 Updated Information and Current Species Status

The SSA report contains an extensive review of the species’ taxonomy, distribution, biology, habitat, trends, and threats (USFWS 2024a). In sections 2.2.1 and 2.2.2 below, we provide a summary of new information that is not in the 2013 listing rule.

2.2.1 Biology and Habitat:

Gierisch mallow is a short-lived perennial; in a greenhouse study, 15 of 21 plants survived for less than four years (Cort and Pavlik 2016, p. 9). The plants produce flowers after about 1.5 years (Cort and Pavlik 2016, p. 10). Flowering occurs from April through June and can also occur again in the late summer to early fall with sufficient monsoon moisture (Cort and Pavlik 2016, p. 10; McBride 2022, p. 17). A variety of small- to medium-sized solitary bees pollinate Gierisch mallow in the spring (McBride 2022, p. 14). We do not know if Gierisch mallow is capable of self-pollination (McBride 2022, p. 18); based on the importance of outcrossing in other *Sphaeralcea* species (Pendery and Rumbaugh 1993, p. 128; Dreher 2014 p. 9), Gierisch mallow reproduction is likely largely dependent on pollinators (McBride 2022, p. 18).

In field experiments, germination occurred in the fall, not in the spring (Cort and Pavlik 2016, p. 8). In general, Gierisch mallow seeds need a period of cold stratification during the winter before germinating the following fall, although a small proportion of seeds germinate without this dormant period (Cort and Pavlik 2016, p. 9). Gierisch mallow seeds likely persist for several years in the seedbank and germinate when conditions are favorable (Cort and Pavlik 2016, p. 10).

Gierisch mallow plants are concentrated on gypsum rock outcrops of the Harrisburg Member of the Kaibab Formation (Atwood and Welsh 2002, p. 161), which has soils that contain high levels of gypsum (Clark 2021, p. 1). In our SSA report, we grouped records of Gierisch mallow plant concentrations occurring on gypsum outcrops into 24 subpopulations in three populations (USFWS 2024a, p. 9). The North population contains two subpopulations, the Central population 20 subpopulations, and the South population two subpopulations.

In addition to the 24 subpopulations, there are records of Gierisch mallow plants in soils containing gypsum in geological layers other than the Harrisburg Member of the Kaibab Formation (Rink and Hazelton 2024, p. 25–26). Several records document Gierisch mallow within mapped populations but outside of mapped subpopulations. Two historical herbarium records and recent observations document Gierisch mallow in Pigeon Canyon near Grand Wash Cliffs in Grand Canyon-Parashant National Monument (Rink and Hazelton 2024, p. 23). These records are outside our mapped populations and expand Gierisch mallow’s range approximately 75 kilometers (47 miles) south of the southern extent of the range we describe in the SSA report. We do not know how abundant Gierisch mallow plants are outside of our subpopulations and populations.

We have abundance estimates for eight of the 24 subpopulations. We do not have abundance estimates for the remaining 16 unsurveyed subpopulations. Recent observations indicate that at least eight of the unsurveyed subpopulations likely contain at least 100 Gierisch mallow plants (Miller 2024, p. 1). In the SSA report we assumed that the Hill 5 subpopulation was extirpated by mining activity. Recent observations confirm that Gierisch mallow plants continue to occur outside of and near the edge of the mined area within Hill 5 (Hughes 2024, n.p.). We do not know the current abundance of the plants remaining at Hill 5.

The Bureau of Land Management (BLM) has consistently collected abundance data each year from six subpopulations for at least the past nine years (Table 1). The data show annual fluctuations in plant abundance at subpopulations with no clear trends. The data have never been analyzed with annual weather conditions, which may explain some of the fluctuations. We lack the data and analysis necessary to understand trends at Gierisch mallow subpopulations.

Table 1. The number of Gierisch mallow adult plants in monitoring transects from 2016 to 2024 (BLM 2024, n.p.; BLM 2022, p. 1–2) in six subpopulations. The SSA report includes earlier monitoring data for the sites in years they were available from as early as 2001 (USFWS 2024a, p. 17).

Transect	2016	2017	2018	2019	2020	2021	2022	2023	2024
Hill 4, Trend Belt Transects (2)	181	145	119	62	55	56	51	28	39
Hill 6, Trend Belt Transect	27	29	21	19	19	15	56	15	22
Small Rehab, Count Transect	702	833	660	231	314	445	450	420	735
Large Rehab, Count Transect	519	451	340	219	210	459	275	406	527
Large Rehab, Trend Belt Transect	64	57	50	16	14	36	56	69	71
Hill 1, Count Transect	77	35	34	59	26	13	83	131	168
Hill 2, Count Transect	214	335	328	285	237	246	146	203	207

2.2.2 Threats Analysis (threats, conservation measures, and regulatory mechanisms):

Mineral Extraction

At the time of listing, we identified destruction and modification of habitat (Factor A), specifically from mineral extraction, as the primary threat to Gierisch mallow, and we continue to identify it as the primary threat to the species. In 2009, prior to the Final Rule listing Gierisch mallow as endangered, the BLM approved Western Mining and Minerals, Inc. to expand the Black Rock Mine. The expansion area includes four Gierisch mallow subpopulations (Hill 4, 16, 17, and 18), one of which is the subpopulation with the largest known abundance (Hill 4). Western Mining and Minerals, Inc. has not begun mining in the expansion area. Though regulatory mechanisms allow the BLM, the land manager of most of Gierisch mallow’s range, to

require reclamation of mined areas, gypsum mining is subject to the Mining Law of 1872 (30 U.S.C. 21 *et seq.*) which limits the agency's discretion in permitting the mines (Factor D).

In the late 1990s, Western Mining and Materials, Inc. restored small gypsum outcrops that were surface mined in the late 1980s to early 1990s (BLM and Red Butte Garden and Arboretum 2018). The company recontoured the mined pits, supplemented the topsoil with gypsum red-fines, a by-product of gypsum extraction, and sowed native seeds. Giersch mallow established naturally in the restored areas, and the BLM monitors these two subpopulations. Since the listing rule, we have 10 more years of monitoring data for these subpopulations. The numbers of plants peaked around 2015 to 2017 in the monitoring transects and then decreased, which is expected in species that thrive in disturbed habitats as those habitats transition to later seral stages. Abundances at the sites have fluctuated annually, as is typical of other Gierisch mallow subpopulations, and the subpopulations have supported over 200 plants every year from 2016 through 2024 (Table 1).

Recreation

Recreation may cause destruction and modification of habitat (Factor A). Recreational use, especially off-highway vehicle use, continues to be a potential threat to the North Population, and, because of the growing population in the St. George, Utah area, we anticipate this threat will increase and may expand to other populations.

Livestock Grazing

In addition to destruction and modification of habitat (Factor A), livestock grazing damages the plants themselves and could affect survival and reproduction (Factor C). At the time of listing, we did not consider livestock grazing a major threat, because we assumed that livestock did not commonly access Gierisch mallow habitat due to its steep terrain. However, recent observations indicate that livestock graze Gierisch mallow (Reisor 2012, n.p.; McBride 2022 p. 20; Miller 2024, entire). Because of this and the active grazing allotments across the species' range, we now consider grazing a potential threat to Giersch mallow, but we do not know the extent to which grazing is affecting the viability of subpopulations.

Collection

Gierisch mallow is not typically a plant of horticultural interest; however, we do have information about commercial vendors offering Gierisch mallow seeds for sale (Factor B) (Roth 2011, n.p.; Frates 2012, n.p.; Taylor 2023, n.p.). We think this is likely occurring intermittently and on a small-scale.

Other Threats

Other threats (Factor E) may be affecting Gierisch mallow, and multiple threats may be having interactive effects. Gierisch mallow's restricted range makes it likely that a large portion will be vulnerable to similar threats. Additionally, the small subpopulations are

particularly vulnerable to extirpation. Climate change will alter Gierisch mallow habitat and potentially exacerbate the effects of the other threats by stressing plants and making them less resilient to other threats, such as increasing grazing pressure in Gierisch mallow habitat; facilitating the spread of nonnative, invasive species; and altering fire regimes. We do not know the extent to which these threats are affecting the viability of Gierisch mallow subpopulations.

2.3 Synthesis:

We delineated concentrations of Gierisch mallow into 24 subpopulations in three populations. We have little to no data on the abundance of plants in 16 of the subpopulations. Gierisch mallow also occurs outside of our delineated subpopulations; we do not have a good understanding of that distribution.

The threats to Gierisch mallow have not been reduced. Four subpopulations are within a proposed mine expansion area. In addition, livestock grazing occurs in Gierisch mallow subpopulations more frequently than we initially thought. Multiple potential threats may be affecting Gierisch mallow plants, but we lack data and analysis to understand the effects they are having on species viability. Additional research is needed to understand species viability; we include this in recommendations for future actions below (section 4.0).

3.0 RESULTS

3.1 Recommended Classification:

No change is needed.

3.2 New Recovery Priority Number:

14c. The degree of threat is low, because, though mining is likely an imminent threat, we have no information that it is an immediate threat over a large area of Gierisch mallow's range. The recovery potential is high, because we have a good understanding of the effects of the primary threat, mining, to the species, and post-mining restoration has shown some success. Additionally, we expect the threat to affect a small, occupied area at any given time and to advance slowly, allowing time to apply and adapt conservation measures. The taxonomy is species.

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

We have identified recovery actions in the draft recovery plan (USFWS 2024b, p. 13) and will specify recovery activities in a recovery implementation strategy. We emphasize the following that, once completed, would inform other recovery actions:

- Survey the 16 subpopulations that lack abundance data to estimate the abundance of plants rangewide. Collecting this data will improve our understanding of the species' current condition and the proportion of plants potentially affected by threats.

- Map the extent of Gierisch mallow plants outside of subpopulations in the North population to either expand the area of the current subpopulations or add new subpopulations.
- Further investigate Gierisch mallow and other *Sphaeralcea* species in the Pigeon Canyon area and in between Pigeon Canyon and the South population to understand the extent of the species occurrence and the range of morphological characteristics of Gierisch mallow and related species.
- Develop and implement a standardized monitoring plan and protocol to collect data sufficient to understand trends of plant abundance. The monitoring plan and protocol should incorporate methodology and data analysis that account for annual abundance fluctuations and are sufficient to estimate if annual fluctuations will allow for subpopulation persistence. Additional data will also help us understand the extent that potential threats such as livestock grazing and nonnative, invasive species are having on the species.

5.0 REFERENCES

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U.S. FISH AND WILDLIFE SERVICE

5-YEAR REVIEW of Gierisch Mallow

Current Classification:

Endangered

Recommendation resulting from the 5-Year Review:

No change needed.

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service, Arizona Ecological Services Office

Approve _____