**§ 1.7002 Frequency of reports.**

Entities subject to the provisions of § 1.7001 shall file reports semi-annually. Reports shall be filed each year on or before March 1st (reporting data required on FCC Form 477 as of December 31 of the prior year) and September 1st (reporting data required on FCC Form 477 as of June 30 of the current year). Entities becoming subject to the provisions of § 1.7001 for the first time within a calendar year shall file data for the reporting period in which they become eligible and semi-annually thereafter.

## PART 43—REPORTS OF COMMUNICATION COMMON CARRIERS AND CERTAIN AFFILIATES

■ 7. The authority citation for part 43 continues to read as follows:

**Authority:** 47 U.S.C. 154; Telecommunications Act of 1996; Pub.L. 104–104, sec. 402(b)(2)(B), (c), 110 Stat. 56 (1996) as amended unless otherwise noted. 47 U.S.C. 211, 219, 220, as amended; Cable Landing License Act of 1921, 47 U.S.C. 35–39.

■ 8. Amend § 43.01 by revising paragraphs (a), (b), and (d) to read as follows:

**§ 43.01 Applicability.**

(a) The sections in this part include requirements which have been promulgated under authority of sections 211 and 219 of the Communications Act of 1934, as amended, with respect to the filing by communication common carriers and certain of their affiliates, as well as certain other providers, of periodic reports and certain other data, but do not include certain requirements relating to the filing of information with respect to specific services, accounting systems and other matters incorporated in other parts of this chapter.

(b) Except as provided in paragraphs (c) and (d) of this section, carriers and other providers becoming subject to the provisions of the several sections of this part for the first time, shall, within thirty (30) days of becoming subject, file the required data as set forth in the various sections of this part.

* * * * *

(d) Common carriers and other service providers subject to the provisions of § 43.11 shall file data semi-annually. Reports shall be filed each year on or before March 1st (reporting data required on FCC Form 477 as of December 31 of the prior year) and September 1st (reporting data required on FCC Form 477 as of June 30 of the current year). Common carriers and other providers becoming subject to the provisions of § 43.11 for the first time within a calendar year shall file data for the reporting period in which they become eligible and semi-annually thereafter.

■ 9. Amend § 43.11 to revise paragraphs (a), (b), and (c) to read as follows:

**§ 43.11 Reports of local exchange competition data.**

(a) All common carriers and their affiliates (as defined in 47 U.S.C. 153(1)) providing telephone exchange or exchange access service (as defined in 47 U.S.C. 153(16) and (47)), commercial mobile radio service (CMRS) providers offering mobile telephony (as defined in § 20.15(b)(1) of this chapter), and Interconnected Voice over IP service providers (as defined in § 9.3 of this chapter), shall file with the Commission a completed FCC Form 477, in accordance with the Commission's rules and the instructions to the FCC Form 477.

(b) Respondents identified in paragraph (a) of this section shall include in each report a certification signed by an appropriate official of the respondent (as specified in the instructions to FCC Form 477) and shall report the title of their certifying official.

(c) Disclosure of data contained in FCC Form 477 will be addressed as follows:

(1) Emergency operations contact information contained in FCC Form 477 are information that should not be routinely available for public inspection pursuant to § 0.457 of this chapter.

(2) Respondents may make requests for Commission non-disclosure of the following data contained in FCC Form 477 under § 0.459 of this chapter by so indicating on Form 477 at the time that the subject data are submitted:

(i) Provider-specific subscription data and

(ii) Provider-specific mobile deployment data that includes specific spectrum and speed parameters that may be used by providers for internal network planning purposes.

(3) Respondents seeking confidential treatment of any other data contained in FCC Form 477 must submit a request that the data be treated as confidential with the submission of their Form 477 filing, along with their reasons for withholding the information from the public, pursuant to § 0.459 of this chapter.

(4) The Commission shall make all decisions regarding non-disclosure of provider-specific information, except that the Chief of the Wireline Competition Bureau may release provider-specific information to:

(i) A state commission provided that the state commission has protections in place that would preclude disclosure of any confidential information, and

(ii) ''Eligible entities,'' as those entities are defined in the Broadband Data Improvement Act, in an aggregated format and pursuant to confidentiality conditions prescribed by the Commission, and

(iii) Others, to the extent that access to such data can be accomplished in a manner that addresses concerns about the competitive sensitivity of the data and precludes public disclosure of any confidential information.

* * * * *

[FR Doc. 2013–19493 Filed 8–12–13; 8:45 am]

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## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

### 50 CFR Part 17

**[Docket No. FWS–R2–ES–2012–0049; 4500030113]**

**RIN 1018–AY58**

## Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Sphaeralcea gierischii (Gierisch Mallow) Throughout Its Range

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service, determine that *Sphaeralcea gierischii (*Gierisch mallow) meets the definition of an endangered species under the Endangered Species Act of 1973, as amended (Act). Gierisch mallow is a plant species found in Mohave County, Arizona, and Washington County, Utah. This final rule implements the Federal protections provided by the Act for this species. The effect of this regulation is to add this species to the List of Endangered and Threatened Plants.

**DATES:** This rule is effective on September 12, 2013.

**ADDRESSES:** This final rule and final economic analysis are available on the Internet at *http://www.regulations.gov* and at *http://www.fws.gov/southwest/es/arizona/.* Comments and materials we received, as well as supporting documentation we used in preparing this rule, are available for public inspection at *http://www.regulations.gov.* Comments and materials received, as well as supporting documentation used in preparing this final rule is available for public inspection, by appointment, during

normal business hours, at U.S. Fish and Wildlife Service, Arizona Ecological Services Office, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ, 85021; by telephone (602) 242–0210; or by facsimile (602) 242–2513.

**FOR FURTHER INFORMATION CONTACT:** Steve Spangle, Field Supervisor, U.S. Fish and Wildlife Service, Arizona Ecological Services Office, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ 85021; by telephone (602) 242–0210; or by facsimile (602) 242–2513. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

**SUPPLEMENTARY INFORMATION:**

**Executive Summary**

This document consists of a final rule to list as endangered *Sphaeralcea gierischii* (Gierisch mallow). In this final rule, we will refer to *Sphaeralcea gierischii* as Gierisch mallow.

*Why we need to publish a rule.* Under the Act, a species may warrant protection through listing if it is endangered or threatened throughout all or a significant portion of its range. Listing a species as an endangered or threatened species can only be completed by issuing a rule. In this final rule, we are explaining why Gierisch mallow warrants protection under the Act. This final rule lists the Gierisch mallow as an endangered species throughout its range in Mohave County, Arizona, and Washington County, Utah. Elsewhere in today's **Federal Register**, we designate critical habitat for the Gierisch mallow under the Act.

*The Endangered Species Act provides the basis for our action.* Under the Act, we can determine that a species is an endangered or threatened species based on any of five factors: (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.

We have determined that the Gierisch mallow meets the definition of an endangered species due to the combined effects of:

- Habitat destruction, modification, and degradation resulting from gypsum mining operations; livestock grazing; the spread of nonnative species; and increased risk of wildfire.
- Predation (herbivory) during drought years and during the reproductive period.
- Existing regulatory mechanisms that could provide protection to the Gierisch mallow through mining operations management by the Bureau of Land Management (BLM) and Arizona State Land Department (ASLD) but are inadequate to protect the species from existing and future threats.
- Small population size and restricted range of the species, which make the Gierisch mallow increasingly susceptible to further declines through stochastic wildfire events, spread of the nonnative grasses, and climate change.

*Peer review and public comment.* We sought comments from independent specialists to ensure that our designation is based on scientifically sound data, assumptions, and analyses. We invited these peer reviewers to comment on our listing proposal. Generally, the peer reviewers agreed with our interpretation of the science and provided information regarding population numbers and additional information regarding the threats and biology of the species. We also considered all comments and information we received during the comment period.

**Previous Federal Actions**

Please refer to the proposed listing rule for the Gierisch mallow (77 FR 49894; August 17, 2012) for a detailed description of previous Federal actions concerning this species.

Elsewhere in today's **Federal Register**, we designate critical habitat for the Gierisch mallow under the Act.

**Background**

It is our intent to discuss below only those topics directly relevant to this final rule listing the Gierisch mallow as endangered.

*Species Information*

Gierisch mallow is a perennial, flowering member of the mallow family. It produces few to many stems from a woody caudex (short, thickened, woody stem that is usually subterranean or at ground level). The stems are 43 to 103 centimeters (cm) (17 to 41 inches (in)) tall, and are often dark red-purple. The foliage is bright green and glabrous (not hairy). The leaf blades are 1.2 to 4 centimeters (cm) (0.47 to 1.57 inches (in)) long; 1 to 5 cm (0.4 to 1.9 in) wide; and usually longer than wide. The leaves are usually flat and egg-shaped; the leaf base is heart-shaped to truncate, with 3 to 5 lobes. The inflorescence is compound, with more than one flower per node. The outer envelope of the flower is 0.5 to 1.0 cm (0.2 to 0.4 in) long, green, and uniformly glabrous, and the orange petals are 1.5 to 2.5 cm (0.6 to 0.98 in) long (Atwood and Welsh 2002, p. 161).

Gierisch mallow was named as a unique, distinct species in 2002 (Atwood and Welsh 2002, p. 159). This species of mallow is distinguished from similar species, such as *Sphaeralcea rusbyi* (Rusby's globemallow), by the glabrous (smooth) foliage, few or no stellate (star-shaped) hairs restricted to the leaf margins, larger flowers, and restricted range and habitat.

Another closely related species is *Sphaeralcea moorei* (Moore's globemallow); distinguishing characters are the 3 to 5-parted narrow lobes, bright green leaves, and different habitat. As discussed by Atwood and Welsh (2002, p. 159), the genus *Sphaeralcea* consists of taxa whose morphological distinctions are compromised by overlap of many characters. The characteristics of the mature fruiting carpels (seed-bearing structures) are one of the more important distinguishing characters, but specimens were rarely collected with mature carpels. Atwood and Welsh (2002, pp. 161–163) collected globemallow species in northern Arizona and southern Utah, and reviewed previous collections. The characteristics described in their 2002 taxonomic key allow for the discrimination of the related and similar taxa known to occur in southern Utah and adjacent northern Arizona, thus making Gierisch mallow a species and, therefore, a listable entity under the Act. The work was published in the peer-reviewed journal *Novon,* which publishes short articles with the primary purpose of the establishment of nomenclature (scientific naming) of vascular plants. Dr. Atwood and Dr. Welsh are very familiar with the flora of Utah; Dr. Atwood is the Collections Manager of the S. L. Welsh Herbarium, and Dr. Welsh is Emeritus Curator of Vascular Plants at Brigham Young University, Utah. After careful review of the 2002 Atwood and Welsh publication and its recognition by the Integrated Taxonomic Information System (ITIS 2012) and its inclusion in the Utah Rare Plant Guide (Utah Rare Plants 2012), it is our conclusion that Gierisch mallow is a valid species because the characteristics described above can be used to distinguish this species from similar species. We also consider it a separate species due to its acceptance in peer-reviewed literature and recognition by taxonomic authorities, as described above.

*Biology, Habitat, and the Current Range*

Gierisch mallow is only found on gypsum outcrops associated with the

Harrisburg Member of the Kaibab Formation in northern Mohave County, Arizona, and adjacent Washington County, Utah (Atwood and Welsh 2002, p. 161). The Harrisburg Member is the most recent (topmost) exposed geologic layer of the Kaibab Formation. The Harrisburg Member is known for its soils containing high levels of gypsum (gypsiferous soils) (Biek and Hayden 2007, p. 58). The Kaibab Formation comprises a continuous layer of exposed limestone rock in the Grand Canyon region (USGS 2012, p. 1). The surrounding plant community is warm desertscrub (Mojave desertscrub). Very little is known about the life history of the Gierisch mallow, as it was only recently described. Gierisch mallow appears to be associated with biologic soil crusts within the gypsum deposits (Frates 2012, pers. comm.). Similarly, we know that other rare plants associated with gypsum soils are associated with a heavy cover of cryptogamic plants (lichens, mosses, and blue-green algae), except where natural erosion or other manmade factors have destroyed that cover (Nelson and Harper 1991, p. 168). Drohan and Merkle (2009, p. 96) state, however, that plant species that appear to be soil-specific can be found in those soils as a result of other factors in addition to soil chemistry. Although there are likely other factors that contribute to Gierisch mallow having a limited distribution, it is currently only found in gypsum soils. The species may be perennial because it is woody at the base and the same individuals have been observed for more than 1 year. It dies back to the ground during the winter and re-sprouts from the base during late winter and spring (January to March), depending on daytime temperatures and rainfall. Information from the BLM indicates that many of the Gierisch mallow populations occur on hillsides or steep slopes; however, Gierisch mallow has been documented growing on all slopes and aspects. While we do not know the specifics about Gierisch mallow, we know that several species of the genus *Sphaeralcea* grow well in disturbed soils (Wallace and Romney 1981, p. 32; Abella 2009, pp. 704–706; Abella 2010, pp. 1263–1264).

The pollination system (self-pollinated or obligate out-crosser), seed dispersal mechanisms, and the conditions under which seeds germinate are not known. Although we do not know how the species is pollinated, other species of the genus *Sphaeralcea* (globemallows) are pollinated by *Diadasia diminuta* (globemallow bee), which specializes in pollinating plants of this genus. Globemallow bees are considered important pollinators for globemallows (Tepedino 2010, p. 2). These solitary bees, as well as other *Diadasia* species, are known to occur within the range of the Gierisch mallow (Sipes and Tepedino 2005, pp. 490–491; Sipes and Wolf 2001, pp. 146–147), so it is reasonable to assume that they are potential pollinators of Gierisch mallow and other associated vegetation in the surrounding community. Winter rainfall in 2008 produced many seedlings of Gierisch mallow, indicating that they grow from seeds stored in the seed bank (Hughes 2009, p. 13). Higher densities of seedlings were located within known locations in Arizona and Utah after these winter rain events. Additionally, young plants have been observed on two reclaimed areas within an active gypsum mine (Service 2008a, p. 1), further indicating that seeds are stored in the seed bank; however, we do not know the long-term viability of these plants due to the disruption of the original soil composition. Furthermore, Hughes (2011, p. 7) has documented a decline in the numbers of plants in both of the two reclaimed areas over the last 5 years.

We have no information on the historical range of this species because it is a newly discovered plant. Currently, there are 18 known populations of the Gierisch mallow restricted to less than approximately 186 ha (460 ac) in Arizona and Utah. The main populations in Arizona are located south of the Black Knolls, approximately 19.3 km (12 mi) southwest of BLM's Arizona Strip Field Office in St. George, Utah, with the southernmost population of this group being on the edge of Black Rock Gulch near Mokaac Mountain. There is another population approximately 4.8 kilometers (km) (3 miles (mi)) north of the Black Knolls, on ASLD lands near the Arizona/Utah State line. The Utah population is located on BLM lands within 3.2 km (2 mi) of the Arizona/Utah State line, near the Arizona population on ASLD land. Habitat for the Gierisch mallow occurs on Utah State Trust lands managed by the State of Utah School and Institutional Trust Lands Administration (SITLA).

There are no other known populations of the Gierisch mallow. We theorized that, because gypsum outcrops associated with the Harrisburg Member are scattered throughout BLM lands in northern Arizona and southern Utah, additional populations may exist. Dr. Atwood and Dr. Welsh conducted extensive surveys in these areas because numerous other rare plant species are associated with these landforms (Atwood 2008, p. 1). One record of a Gierisch mallow from the Grand Canyon-Parashant National Monument was presented to us (Fertig 2012, p. 3); however, after careful scrutiny, Johnson and Atwood (2012, p. 1) determined that this record is actually Rusby's mallow and not Gierisch mallow.

*Status and Population Estimates*

Atwood (2008, p. 1), and later Hughes (Service 2008a, p. 1), estimated the population size of the Gierisch mallow from six of the Arizona locations. These populations are referred to as ''Hills.'' There are a total of 18 populations rangewide, with 17 populations on lands managed by the BLM, and 1 on lands managed by the ASLD. Seventeen populations occur in Arizona, and one occurs in Utah.

Atwood and Hughes' population estimates were simple visual estimates and have only been conducted for four of the 17 populations. Hughes' estimates were conducted using belt transects that are 1.83 m (6 ft) wide and 91.44 m (300 ft) long. Hughes carried a 1.83-m (6-ft) long plastic pipe and counted every Gierisch mallow plant that was within the length of the pipe as he walked the belt transects (Hughes 2012a). These estimates are presented in Table 1 for the areas surveyed in Arizona. Hughes (2012b, pp. 2–4) established these belt transects on six of the ''Hills'' (Hills 1, 2, 4, 5, 6, and 7) and began to count the number of individuals. The populations on Hills 6 and 7 were monitored, and the numbers of individuals within the populations were counted for the first time in 2012. There is a population on Hill 3, but there are no estimates for it. Data in Table 1 are from files in BLM's Arizona Strip Field Office and St. George Field Office, and the Service's Arizona Ecological Services Office. The actual transect counts appear in Table 1 in bold, in parentheses. Surveys estimate total population size to be between 11,000 and 18,000 individuals in Arizona.

TABLE 1—POPULATION NUMBERS FOR GIERISCH MALLOW FROM SIX LOCATIONS IN ARIZONA

| Site | Numbers 2001 | Numbers 2003 | Numbers 2007 | Numbers 2008 | Numbers 2009 | Numbers 2010 | Numbers 2011 | Numbers 2012 |
|---|---|---|---|---|---|---|---|---|
| Hill 1 (BLM) | 150+ (100) | 50 (30) | (58) | No data | 300 (155) | 200 (85) | * | 200 (no data) |
| Hill 2 (BLM) | 150+ (100) | 40 (31) | (15) | 50 (37) | 40 (23) | No data | * | 30 (26) |
| Hill 4 (BLM) | No data | 5,000–9,000 (180). | (176) | (65) | No estimate (108). | No estimate (170). | No estimate (136). | 5,000–9,000 (116) |
| Hill 5 (ASLD) | No data | 2,000–3,000 (115). | No data | No data | No data | No data | No data | No data |
| Hill 6 (BLM) | No data | No data | No data | No data | No data | No data | No data | 3,000–4,000 (610) |
| Hill 7 (BLM) | No data | No data | No data | No data | No data | No data | No data | 1,200–2,000 (129) |

* These sites were visited in 2011, and Gierisch mallow plants were observed; however, no data were collected.

Total population size in Utah was estimated to be approximately 200 individuals in 2005 (Franklin 2007, p. 1). In spring 2008 and 2009, Hughes (2008a, p. 12; Hughes 2009, p. 15) conducted more extensive surveys of gypsiferous soils in Utah and estimated the population to be between 5,000 and 8,000 individuals. The Service plant ecologist and staff from the BLM's Arizona Strip Field Office visited all of the known locations in February 2008 (Service 2008a, p. 1). Population estimates were not made at this time because the plants were just emerging from winter dormancy, but there were plants present at all of the known locations visited.

Since surveys began, no new populations have been found outside of the known areas. In addition to the information provided in Table 1, Hughes (2008a, p. 12) reported counts for transects on two rehabilitated sites within the Western Mining and Minerals, Inc., gypsum operation on and near Hill 4, where 85 and 60 plants were counted on the two transects in 2008. These plants are reestablishing themselves in the reclaimed areas from the original seed bank. Hughes (2009, p. 14) counted 50 and 32 plants on these sites in 2009. In 2011, Hughes (2012, p. 7) completed transect surveys on the same reclaimed sites as he did in 2008 and 2009, and counted 67 plants on one rehabilitated site and 1 plant on the other rehabilitated site. Data from surveys conducted in 2012 indicate a slight increase in the population of Gierisch mallow on both reclaimed sites (Hughes 2012b). Hughes (2012b) also indicates that 2012 precipitation levels were very low in the winter and spring, while summer precipitation was above average. We do not have any information to indicate why there was a substantial decrease in plant numbers at these reclaimed areas for 3 years, especially since 2010 and 2011 were significant moisture years (Hughes 2011, p. 1; Hughes 2012c, p.1). Because the Gierisch mallow is only found in gypsiferous soils, it is possible that they are declining due to disruption of the original soil composition in these reclaimed soils. Outside of the reclaimed areas, some populations of the Gierisch mallow appear to be fluctuating annually according to data provided by Hughes (2011, pp. 4–7). Some populations appear to be decreasing, others have shown slight increases, and some populations have remained stable (Hughes 2011, pp. 4–7; Hughes 2012b, pp. 2–4).

## Summary of Comments and Recommendations

Due to the nature of the proposed rule, we received combined comments from the public on the listing action and the critical habitat designation. We have separated those comments accordingly and are only addressing the comments related to the listing of the Gierisch mallow in this rule. Comments related the designation of critical habitat for the Gierisch mallow can be found in the final rule designating critical habitat published elsewhere in today's **Federal Register**.

We requested written comments from the public on the proposed listing for the Gierisch mallow during two comment periods. The first comment period, which was associated with the publication of the proposed rule (77 FR 49894), opened on August 17, 2012, and closed on October 16, 2012. The second comment period opened on March 28, 2013 (78 FR 18943), and closed on April 29, 2013. We also contacted appropriate Federal, State, and local agencies; scientific organizations; peer reviewers, and other interested parties and invited them to comment on the proposed rule during these comment periods. Newspaper notices inviting general public comment were published in the Kingman Daily Miner on September 12, 2012, and in the Saint George Spectrum on September 13, 2012. Additionally, letters were sent to stakeholders and special interest groups on September 12, 2012. We received no request for a public hearing.

During the first comment period, we received 19 comment letters directly addressing the proposed listing and critical habitat designation for the Gierisch mallow. During the second comment period, we received one comment letter addressing the proposed listing. All substantive information provided during comment periods has either been incorporated directly into this final determination or is addressed below.

*Peer Review*

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinions from four knowledgeable individuals outside the Service with scientific expertise to review our technical assumptions, interpretations of biology, and use of ecological principles with respect to the Gierisch mallow. We received responses from three of the four peer reviewers.

We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding threats to Gierisch mallow. The peer reviewers generally concurred with our methods and conclusions and provided additional information, clarifications, and suggestions to improve the final rule. Peer reviewer comments are addressed in the following summary and incorporated into the final rule as appropriate.

*Peer Reviewer Comments*

(1) *Comment:* Only 16 percent of occupied habitat is planned for mining, which is not enough to cause Gierisch mallow to go extinct.

*Our Response:* We agree that the amount of occupied habitat for the Gierisch mallow is small in the mining areas; however, approximately 46 percent of the known plants will be lost in these habitat areas. Please see the Summary of Factors Affecting the Species section of this rule.

*Public Comments*

(2) *Comment:* We received several comments that revenue and jobs would be lost and that gypsum mining operations may be negatively impacted as a result of listing the Gierisch mallow under the Act.

*Our Response:* The Act requires decisions to be based on the best available science at the time of the listing. In addition, we base our decisions to list a species on the five threat factors discussed in the proposed rule (77 FR 49894; August 17, 2012) and in this final rule. Please refer to the Summary of Factors Affecting the Species section in this final rule. Additionally, the economic analysis did not support this claim. The economic analysis includes the analysis of two future consultations on mining activity on BLM-managed land and assumes that these consultations will not result in changes to the level of mining activity. The Service expects the most likely outcome of these consultations to include conservation measures such as land reclamation.

(3) *Comment:* The occurrence of Gierisch mallow on steep slopes may indicate a refugia from grazing, and the species could be more widely distributed in absence of grazing.

*Our Response:* We have no information to support this observation regarding steep slopes acting as refugia. We are aware that Gierisch mallow grows in other areas besides steep slopes and have addressed this in this listing rule. We acknowledge that grazing is a threat to the species; however, we have determined that it is not a significant threat to the Gierisch mallow. Please refer to the Summary of Factors Affecting the Species section in this final rule.

(4) *Comment:* One commenter questions if Gierisch mallow is a separate species because no genetic testing has been completed.

*Our Response:* The best available science indicates that Gierisch mallow is a valid taxon. Genetic analysis is not needed to differentiate species. See the *Species Information* section for a complete description of the biology and taxonomy of the species.

(5) *Comment:* In preparing this final listing determination, we used the best available scientific and commercial data as required under section 4(b)(1)(A) of the Act. We received several comments stating that we did not use the best science because we did not consult geologists and botanists regarding the soil layers associated with the Harrisburg Member and other similar gypsum deposits and that we did not thoroughly survey the widely ranging Harrisburg Member for the Gierisch mallow.

*Our Response:* All gypsum deposits and available habitat in the Harrisburg Member were surveyed for the Gierisch mallow. It is common practice for botanists to work with local geologists to determine where appropriate soils layers are. We consulted with local botanists to gather data for our determination; therefore, we used the best science available.

(6) *Comment:* We received several comments stating that there is no proof that the Gierisch mallow is threatened, that we are missing data to support our threats analysis, and that more years of study are needed to gather the necessary data to support our analysis.

*Our Response:* As stated previously, section 4(b)(1) of the Act requires that decisions be based on the best available science at the time of listing. The commenters did not provide any additional data contradicting the threats analysis. We based our decision on the best available science at the time of listing, as required by the Act. Regarding whether we should undertake additional years of study to gather additional data, the Act requires that we finalize or withdraw a proposed rule within 1 year. Based on the currently available data, we believe it is appropriate to finalize the decision at this time. We will continue to work cooperatively with partners to conserve and work towards recovery of the species.

(7) *Comment:* We received several comments stating that it is not known if Hill 4 will be mined.

*Our Response:* We based our analysis on current, available information, and, according to the mining company, Hill 4 is still currently included in the mine expansion area.

(8) *Comment:* We received several comments stating that Gierisch mallow should only be listed after cooperative conservation efforts are demonstrated ineffective and that Gierisch mallow is better protected through existing mechanisms.

*Our Response:* The Act sets forth a requirement that a final rule be issued no later than 1 year after a proposal or the proposal be withdrawn. As we are not withdrawing our proposal to list Gierisch mallow, we must publish the final rule to list the species within 1 year of the proposed rule. Listing a species under the Act does not preclude working cooperatively with partners to conserve and work towards recovery of a species. We are currently working with partners to conserve the Gierisch mallow and will continue to work with partners in the future. Additionally, we reviewed the existing conservation measures and concluded they are not sufficient to ameliorate the threats. We do not know if enough seeds can be collected to reestablish pre-mining population numbers in reclaimed areas. Furthermore, preliminary data from seed germination studies indicate that reestablishing populations from collected seeds may be difficult. Refer to our Summary of Factors Affecting the Species section for a thorough review of the threats.

(9) *Comment:* The Gierisch mallow was observed blooming twice in 2012 (spring and fall) and producing seed with each bloom cycle.

*Our Response:* We acknowledge that the plant had two bloom cycles in 2012, and produced seed each time. As was acknowledged by the commenter, this was likely to due to an abundance of rainfall in 2012. We have no other data to suggest that this is a regular occurrence that contributes to the long-term viability of the species.

(10) *Comment:* The Service does not have data to support that off-highway vehicle (OHV) use and illegal dumping impact the species.

*Our Response:* Service biologists and plant ecologists have observed the effects of unauthorized OHV use and illegal dumping in Gierisch mallow habitat. We have documentation that these are ongoing activities that occur in habitat and that they are disrupting the soil crusts as well as contributing to the alteration of vegetation composition, thereby impacting the species. Refer to the Summary of Factors Affecting the Species section for a complete discussion on the effects of OHV use and illegal dumping.

(11) *Comment:* The commenter questions if the Gierisch mallow came into existence because of the mines.

*Our Response:* Gierisch mallow is a recently described species that is closely associated with gypsum soil types. Gierisch mallow also occurs on gypsum soil deposits that are not being mined. Gierisch mallow is not dependent on the mines, nor did it come into existence because of the mines.

(12) *Comment:* We received several comments regarding livestock grazing operations helping the Gierisch mallow or improving its habitat.

*Our Response:* No information was provided to substantiate these observations.

(13) *Comment:* One commenter stated that the Gierisch mallow can be grown from seed and, therefore, is not endangered.

*Our Response:* Under the Act, a species is considered endangered if it is

in danger of extinction throughout all or a significant portion of its range. The purpose of the Act is to protect both the species and the ecosystem upon which it depends. Therefore, preservation of the species and its habitat is essential for the conservation and recovery of the species. Although Gierisch mallow has been demonstrated to be grown from seed with limited success, this alone does not conserve the ecosystem, including the pollinators that are necessary for the species to reproduce. As we discuss in the Summary of Factors Affecting the Species section of this final rule, the threats to the Gierisch mallow and its habitat are significant, and, therefore, the species warrants protection under the Act.

(14) *Comment:* We received several comments related to the lack of sufficient BLM grazing and OHV use policies and standards, including monitoring protocols, to protect the Gierisch mallow.

*Our Response:* As detailed below in our discussion of the threats to the species, grazing and OHV use are not threats that have significant impacts to the species rangewide. We have no oversight regarding the creation and implementation of BLM policies and standards.

(15) *Comment:* We received several comments stating that not enough notice was given or that individuals were not notified at all regarding the proposed listing and comment period.

*Our Response:* Per the Act as well as Service policy and practices, legal notices indicating the publication of the proposed rule and inviting general public comment for the 60-day public comment period were published in the Kingman Daily Miner on September 12, 2012, and in the Saint George Spectrum on September 13, 2012. Additionally, letters were sent to stakeholders and special interest groups on September 12, 2012. The document making available the draft environmental assessment and draft economic analysis, and opening a 30-day public comment period on these draft documents as well as the proposed rule, was published on March 29, 2013, in the **Federal Register**.

(16) *Comment:* One commenter provided information regarding ecological site guide descriptions to demonstrate the proportion of forbs, including globemallow, which would be expected in Historic Climax Plant Community. This information was provided to demonstrate that Gierisch mallow should be found in low numbers in the appropriate soil types.

*Our Response:* Ecological site guide descriptions predict the annual production (pounds per acre) of plant groups (grass/grass-like, forbs, shrub/vine, and trees). They further break down plant species composition within the plant groups, also by annual production. A forb species may be more numerous at a site while providing less annual production than fewer numbers of shrubs and perennial grasses. Therefore, although an ecological site description will include expected composition by weight of a species or group of species, it does not indicate the expected numbers or densities of these plants at a particular site.

(17) *Comment:* One commenter suggested that Gierisch mallow is supposed to occur in low density on the mining rehabilitation sites where top soil was replaced after mining. The commenter further suggested that other large shrubs are more abundant in these areas and that, according to the ecological site descriptions, shrubs should be more abundant than Gierisch mallow.

*Our Response:* As previously described, ecological site descriptions provide the expected annual production in pounds per acre rather than abundance or density of plant species. Further, an ecological site description provides a plant community description for an undisturbed site and its historic condition. It is reasonable to assume that plants with soil-specific requirements and tolerances, such as Gierisch mallow, would be low in both quantity and density after the original soil composition and structure has been altered. Likewise, we find it reasonable to assume that more common shrubs without soil-specific requirements such as *Larrea tridentata* (creosote bush) or *Atriplex canescens* (four-wing saltbush) would be more abundant in these disturbed areas. We do not know what the capabilities of Gierisch mallow are to reestablish to pre-disturbance population levels.

## Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we may list a species based on any of the following five factors: (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; and (E) other natural or manmade factors affecting its continued existence. Listing actions may be warranted based on any of the above threat factors, singly or in combination. Each of these factors is discussed below.

### *A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range*

Because the Gierisch mallow has a limited range and distribution, including being found in a specific soil composition (gypsum outcrops), it is highly susceptible to habitat destruction and modification. Specifically, habitat destruction or modification resulting from mining operations, recreational activities, and wildfires associated with the spread of nonnative grass species are threats to the Gierisch mallow.

#### Mining

Gypsum mining is an ongoing source of habitat modification for the Gierisch mallow in Arizona. Gypsum is used in construction (including the manufacturing of drywall) and for a variety of agricultural purposes. Gypsum deposits are found at various depths within the Harrisburg Member. Many of the most valuable gypsum deposits are not at ground level. This means that surface materials need to be removed and stockpiled, while the subsurface gypsum is mined. The stockpiled surface material is then used to reclaim the area after the gypsum has been removed. Because all the topsoil is temporarily removed, gypsum mining temporarily removes the plant's habitat and any plants growing in the affected area. Although the topsoil is replaced, the original structure of the gypsum soil and its composition is altered; therefore, the reclaimed soils do not contain the original gypsum soil structure and composition with which the plants are associated.

There is an existing gypsum mining operation (Black Rock Gypsum Mine) on BLM land affecting the Hill 4 population, the largest population in Arizona (Hughes 2009, p. 13). The plants in the Hill 4 area are not restricted to one hill, but are scattered among several smaller hills that all contain gypsum outcrops. One of the larger deposits is currently being mined. A large amount of soil has been removed, but we cannot quantify how much of the habitat this comprises at this site, as we do not have access to ASLD lands due to ASLD access policies. Based on prior monitoring before access was limited (Hughes 2008, p. 13), there are other small hills within the footprint of the mining claim that support the Gierisch mallow; therefore, we assume the Gierisch mallow occupied the disturbed area. Western

Mining and Minerals, Inc., the mine operator, has inquired about expanding the current operation (Service 2008a, p. 1). The area they propose to expand into currently supports the largest portion of the Hill 4 population, estimated to be between 5,000 and 9,000 plants (Hughes 2008, p. 14), which comprises approximately 35 percent of the entire population rangewide and approximately 39 percent of the population in Arizona. The proposed expansion would remove the entire population and its habitat on Hill 4. An environmental assessment (under the National Environmental Policy Act, 42 U.S.C. 4321 *et seq.*) for expansion of the quarrying activities within the Black Rock Gypsum Mine has been completed, and the Mining Plan of Operation has been approved (BLM 2008a). Because the demand for gypsum has declined along with the decrease in the housing market, mining activity has not yet reached the expansion area (Cox 2011a, pers. comm.). Recent discussions with the BLM indicate that the expansion could happen as soon as 3 years from now or may take up to 10 years, depending on the housing market, but BLM staff believes the expansion is very likely to happen (Cox 2011a, pers. comm.).

There is another gypsum mine, located near Hill 5, supporting another large Arizona population (approximately 2,000 to 3,000 plants). This mine, operated by Georgia-Pacific, is on ASLD lands and encompasses 178 ha (440 ac). Service biologists did not receive permission to enter the site in February 2008, but, through the site boundary fence, did notice at least one pile of spoils near the population, indicating some recent surface-modifying activity prior to the Service biologists' visit. The lease was first issued in 2006, but Georgia-Pacific has not mined anything, due to the slowing of the economy. The surface-modifying activity observed in February 2008 was likely a result of moving topsoil in preparation to begin mining activities (Dixon 2011, p. 1). Because the lease is for 20 years, we expect that mining operations will begin at some point within the next 13 years, or when the housing market improves. We presume that habitat for the species would be affected by the operation because the technique for gypsum mining necessarily involves removal of the topsoil, eliminating, at least temporarily, the species' ability to survive there. There are no known protection measures for Gierisch mallow or its habitat within the lease on State trust lands.

In addition to the Georgia-Pacific mine, there are several ASLD-issued exploration permits in the area on ASLD lands surrounding Hill 5. These are all relatively new claims, and no significant work has been done on them, yet some drilling was completed, but no other exploration or mining work has occurred. With the depressed housing market, the ASLD does not anticipate any gypsum mining will occur until the housing market improves (Dixon 2011, p. 1).

Gypsum mining is a threat to this species and its habitat. The mining operation removes plants and habitat for the duration of the mining activities, and, post-mining, the reclaimed areas may or may not be capable of supporting the plants. A few Gierisch mallow plants were seen on reclaimed areas near Hill 4, but no information on the density of plants before the disturbance exists. Plants continue to be observed in two reclaimed areas near Hill 4; however, the numbers are relatively low (Hughes 2012, pp. 6–7). Furthermore, it is unknown if restored areas will support the plants sufficiently to restore populations to pre-mining levels. Restoration efforts with this species are currently being planned within the Black Rock Mine to assess the feasibility of seeding reclaimed areas with Gierisch mallow (Service 2008b, p. 1), although preliminary data indicate that germination rates from collected seeds are low (Reisor 2012, pers. comm.). Observations during the early stages of restoration efforts also suggest that the reclaimed areas have different vegetation composition and cover than nearby undisturbed areas (Reisor 2012, pers. comm.).

We conclude that the ongoing and future gypsum mining activities, as authorized by the BLM and the ASLD, are a significant threat to this species. Although there has been no mining activity on ASLD lands since 2007, the Service concludes this inactivity is temporary and that mining will resume when the housing market improves in the future. There will be a significant reduction in the number of individuals of the species when the Western Mining and Minerals Inc., operation (Black Rock Gypsum Mine) expands, and when mining activities resume at the Georgia-Pacific mine on lands managed by the ASLD. Although Hills 4 and 5 comprise only 2 of the 18 populations, approximately 46 percent of all the known Gierisch mallow plants rangewide are in these two areas. That would leave the other Arizona locations and the one Utah population, and those areas support fewer plants. The loss of suitable habitat at Hills 4 and 5 would result in the loss of approximately 46 percent of the known plants rangewide. This substantial loss of the total population would result in a compromise to the long-term viability of the species, due to reduced reproductive potential and fragmentation. The limited distribution of this species, the small number of populations, the limited amount of habitat, and the species' occurrence only in areas that support high-quality gypsum deposits lead us to conclude that mining is a threat that has significant impacts to the species.

Grazing

In general, grazing practices can change vegetation composition and abundance, cause soil erosion and compaction, reduce water infiltration rates, and increase runoff (Klemmedson 1956, p. 137; Ellison 1960, p. 24; Arndt and Rose 1966, p. 170; Gifford and Hawkins 1978, p. 305; Robinson and Bolen 1989, p. 186; Waser and Price 1981, p. 407; Holechek *et al.* 1998, pp. 191–195, 216; and Loftin *et al.* 2000, pp. 57–58), leaving less water available for plant production (Dadkah and Gifford 1980, p. 979). Fleischner (1994, pp. 630–631) summarized the ecological impacts of grazing in three categories: (1) Alteration of species composition of communities, including decreases in density and biomass of individual species, reduction of species richness, and changing community organization; (2) disruption of ecosystem functioning, including interference in nutrient cycling and ecological succession; and (3) alteration of ecosystem structure, including changing vegetation stratification, contributing to soil erosion, and decreasing availability of water to biotic communities.

Grazing occurs in most populations of the Gierisch mallow in Arizona and Utah on BLM, ASLD, and SITLA lands. Grazing is excluded from both the Black Rock Gypsum Mine on BLM land and the Georgia-Pacific Mine on ASLD land, although grazing occurs on the reclaimed areas. Gierisch mallow populations occur on three BLM grazing allotments in Arizona and one allotment in Utah. In Arizona, the Black Rock, Lambing-Starvation, and Purgatory allotments all contain populations of Gierisch mallow. The Black Rock Allotment encompasses 15,250 ha (37,685 ac) that are grazed year-round, but this allotment is on a deferred grazing system, which means that pasture use is rotated so that each pasture receives a set amount of rest (non-use) every year. As previously stated, there are an additional 1,152 ha (2,846 ac) in this allotment that are

unavailable for grazing because of the Black Rock Gypsum Mine, but heavy grazing has been documented on the reclaimed sites (Reisor 2012, pers. comm.; Hughes 2011, p. 8). Gierisch mallow occurs in both the ''Lizard 1'' and ''Lizard 2'' pastures within this allotment, and both pastures are typically used in the spring to allow the livestock to utilize cheatgrass when it is still green. These two pastures are typically rotated, that is used every other year so that one pasture receives a full year of rest.

The Lambing-Starvation Allotment encompasses 5,446 ha (13,457 ac) that are grazed from November 16 through May 15 every season and is also on a deferred system. Gierisch mallow occurs in two of the three pastures in this allotment, the North Freeway and South Freeway pastures. These two pastures are also used in the spring, as the third pasture is along the Virgin River and contains critical habitat for the endangered southwestern willow flycatcher (*Empidonax traillii extimus*). Because the third pasture contains critical habitat for the southwestern willow flycatcher, its use is restricted seasonally, causing livestock to spend more time in the two pastures containing Gierisch mallow, including during the spring growing season for the Gierisch mallow. The Lambing-Starvation Allotment also contains ASLD lands with a grazing lease; however, the BLM oversees the management of this allotment. The Purgatory Allotment encompasses 1,985 ha (4,905 ac) in a single pasture that is grazed from December 1 through May 31 every season. Only a small portion of a Gierisch mallow population occurs within this allotment. Information from the BLM indicates that many of the Gierisch mallow populations occur on hillsides or steep slopes, and livestock do not typically go up to these areas looking for forage unless it is a dry year (Roaque 2012a, p. 2); however, DeFalco (2012, pers. comm.) has observed livestock climbing rocky hillsides and steep slopes while conducting extensive research in the northeast Mojave Desert. Additionally, livestock have been documented consuming Gierisch mallow in populations that occur on lesser- or flat slopes. Livestock consumption of Gierisch mallow has more of an impact to the species during the flowering period, when the plants are reproducing. Failure to flower and, therefore, produce seeds can have adverse effects on the ability of Gierisch mallow to reproduce. According to Reisor (2012, pers. comm.), entire flowering stalks were removed and reproduction did not occur in several areas, including on steep slopes, in 2010 and 2012.

In Utah, grazing occurs in the one allotment that contains Gierisch mallow and its habitat. The Curly Hollow Allotment is comprised of approximately 9,105 ha (22,500 ac) of BLM land and 2,226 ha (5,500 ac) of SITLA land. SITLA lands contain approximately 68 ha (167 ac) of Gierisch mallow habitat that is grazed within the Curly Hollow Allotment. This is a four-pasture allotment that is managed for intensive grazing and a rest rotation system similar to those described above. Gierisch mallow only occurs in the River Pasture, which is usually grazed from November 1 through February 28 of each season. Recent wildfires had burned much of the upper three pastures; therefore, the River Pasture has been grazed beyond February 28 for several years to alleviate pressure on the three upper pastures while the vegetation recovered from the wildfire in the absence of livestock grazing (Douglas 2012a, p. 1). The three upper pastures are now considered rehabilitated, and grazing in the River Pasture should resume with its normal season of use from November 1 through February 28. The general condition of the range in the River Pasture is fair to good (moderate cheatgrass spread); however, portions near Sun River, and the *Astragalus holmgreniorum* (Holmgren milkvetch) (an endangered plant) habitat, have been disturbed in the past, resulting in a more significant spread of cheatgrass and *Malcolmia africana* (African mustard). Livestock utilization on Gierisch mallow has not been monitored by BLM's St. George Field Office, but conditions are expected to be similar to livestock utilization described above in Arizona (Douglas 2012a, p. 1).

In addition to consumption, livestock are known to trample plants. As noted, livestock do not typically go up into Gierisch mallow habitat on the BLM allotments in Arizona and Utah due to the steeper hillsides and slopes that this plant is known to inhabit (Roaque 2012a, p. 2; Douglas 2012a, p. 1). Given the grazing management described above and the observations of how infrequently livestock are in Gierisch mallow habitat, trampling of plants does not likely significantly impact the overall viability of these populations.

Habitat degradation in the Mojave Desert, through loss of microbiotic soil crusts (soils containing algae, lichen, fungi, etc.) due to livestock grazing, is a great concern (Floyd *et al.* 2003, p. 1704). Grazing can disturb soil crusts and other fundamental physical factors in landscapes. For example, climatologists and ecologists have attributed increasing soil surface temperatures and surface reflectivity in the Sonoran Desert to grazing-related land degradation (Balling *et al.* 1998 in Floyd *et al.* 2003, p. 1704). Biological soil crusts provide fixed carbon on sparsely vegetated soils. Carbon contributed by these organisms helps keep plant interspaces fertile and aids in supporting other microbial populations (Beymer and Klopatek 1991 in Floyd *et al.* 2003, p. 1704). In desert shrub and grassland communities that support few nitrogen-fixing plants, biotic crusts can be the dominant source of nitrogen (Rychert *et al.* 1978 and others in Floyd *et al.* 2003, p. 1704). Additionally, soil crusts stabilize soils, help to retain moisture, and provide seed-germination sites. Soil crusts are effective in capturing wind-borne dust deposits, and have been documented contributing to a 2- to 13-fold increase in nutrients in southeastern Utah (Reynolds *et al.* 2001 in Floyd *et al.* 2003, p. 1704). The presence of soil crusts generally increases the amount and depth of rainfall infiltration (Loope and Gifford 1972 and others in Floyd *et al.* 2003, p. 1704).

In addition to loss of soil crusts, grazing often leads to soil compaction, which reduces water infiltration and can lead to elevated soil temperatures (Fleischner 1994, p. 634; Floyd *et al.* 2003, p. 1704). All of these soil disturbances can increase erosion by both wind and water (Neff *et al.* 2005, p. 87). Because Gierisch mallow only occurs in gypsum soil outcrops, this loss of soil crust, increased soil compaction, and potential increase in erosion may lead to reduced fitness of individual plants as nutrients decrease when livestock enter and concentrate in these areas during dry years. Additionally, it is possible that individual plants, especially seedlings, are not able to take root in any unstable soils that result from loss of soil crusts due to livestock grazing. Increased erosion and decreased water infiltration from loss of soil crusts can lead to depletion of gypsum and other specific soil features that the Gierisch mallow requires. These effects may be significant to Gierisch mallow populations because grazing occurs at some level throughout all populations. Reduced fitness of individual plants may lead to reduced overall reproduction, which may lead to decreases in the overall population.

Grazing can also lead to changes in vegetation structure, including the proliferation of nonnative, invasive species such as cheatgrass and red brome. Livestock have been implicated

in the spread of weeds (Brooks 2009, p. 105), and both abundance and diversity of native plants and animals is lower in grazed areas as compared to ungrazed habitat in the Mojave Desert (Brooks 2000, p. 105). We do not know the current density of these two nonnative grass species within the Gierisch mallow populations; however, we do know that both of these nonnative species are prevalent in high densities throughout the Mojave Desert in northwest Arizona and southwest Utah, including throughout all three allotments in Arizona and the allotment in Utah (Roaque 2012a, pp. 1–2; Douglas 2012, p. 1). While cheatgrass and red brome appear not to favor gypsiferous soils under normal (dry) conditions, they can be abundant in Gierisch mallow habitat during wet years, as was recently observed (Roaque 2102b, p. 1). Red brome has also been documented in high density in similar gypsiferous soils near Gierisch mallow populations after wet years (Roth 2012, entire). The proliferation of cheatgrass and red brome can lead to competition with Gierisch mallow for both water and nutrients, which can lead to decreased reproduction and fitness in individual Gierisch mallow plants.

In addition to decreased reproduction and fitness in established plants, the spread of these two species can also make the habitat less suitable for establishment of new plants. If cheatgrass and red brome reach high densities throughout all of the Gierisch mallow populations, this can lead to a significant reduction in the proper functioning of the habitat, which in turn would lead to a reduction in fitness and reproduction population-wide and an overall population decline. Given the limited distribution of Gierisch mallow and the known abundance of cheatgrass and red brome in its habitat, continued proliferation of these two species into Gierisch mallow habitat is likely to have significant effects to the species and its habitat. The number of populations may be reduced and their current limited distribution may become even more limited. Additionally, the overall resiliency of the species may be significantly reduced, especially if the spread of these nonnative grasses leads to other stochastic events, such as wildfire. Although grazing can help promote the spread of nonnative weeds such as cheatgrass and red brome, and their spread is a threat to the Gierisch mallow and its habitat, we do not know how much livestock contribute to their spread. The threat of wildfire resulting from the spread of nonnative species will be discussed in more detail in ''Nonnative, Invasive Species'' below.

In summary, livestock grazing can have many effects on Gierisch mallow and its habitat, and on desert ecosystems in general, particularly on soils. However, livestock do not typically spend much time in Gierisch mallow habitat, due to the steeper hillsides and slopes that this plant inhabits, unless drought conditions cause livestock to search for forage on the steeper hillsides and slopes. When livestock do enter Gierisch mallow habitat, some limited soil disturbance may occur, and individual plants may be affected, although we do not anticipate population-level effects to the Gierisch mallow unless heavy grazing occurs in the large populations during the flowering and reproductive period. Livestock have been implicated as a mechanism for the spread of cheatgrass and red brome. Although we do not know the extent to which livestock spread these two nonnative grasses, the spread of these grasses does pose a threat to the Gierisch mallow. Because of these potential effects from livestock grazing, we consider grazing to be a threat to the species that has a moderate level of impact to populations, especially during drought years and during the reproductive season in the spring.

Recreation Activities

There is evidence of off-road vehicle (OHV) activity in Utah. Several of the smaller hills were crisscrossed with OHV tracks (Service 2008, p. 1), and these areas are closed to OHV use off of designated roads and trails (Douglas 2012b, p. 1); therefore, this is considered unauthorized OHV use. Washington County is projected to be one of the fastest growing counties in Utah, with a growth rate of 3.9 percent. The population of St. George has grown from 64,201 (2005) to 88,001 (2010), and is expected to increase to 136,376 by 2020 (St. George Area Chamber 2010, pp. 2–3). The surrounding open spaces around St. George are popular for OHV use because of the relatively flat terrain and ease of access.

Vollmer *et al.* (1976, p. 121) demonstrated that shrubs exposed to repeated driving (continued use of the same tracks) were severely damaged. Both live and dead stems were broken and pressed to the ground. Stems still standing exhibited broken twigs or shoots and leaves were dislodged. Damage to about 30 percent of all shrubs examined in tire tracks were scored at 100 percent damage. Vollmer *et al.* (1976, p. 121) go on to state that approximately 54 percent of the shrubs in the tracks sustained 90 percent or greater damage. The numbers of annual shrubs growing in regularly driven ruts were lower than in other areas (Vollmer *et al.* 1976, p. 124). These data indicate that individual Gierisch mallow plants may be susceptible to the effects of OHV use in this area. Plants may be damaged to the point that they are no longer viable and able to produce seed. Seedlings may not be able to reach maturity and reproduce if they are crushed to point of significant damage. As unauthorized OHV use increases in these areas and associated unauthorized trails proliferate, this population of Gierisch mallow may experience an overall reduction in fitness.

In addition to the direct effects to vegetation, unauthorized OHV use can have the same indirect effects that were previously described by livestock grazing, including soil compaction, loss of soil crusts, erosion, and the promotion and spread of nonnative, invasive species. Refer to the livestock grazing discussion above for a complete description of the effects to soil composition and how those effects impact Gierisch mallow and its habitat.

In summary, we consider continued unauthorized OHV use (off of designated roads) to be a threat that has a potential future impact to this species and its habitat in Utah. Continued unauthorized OHV use can have a significant effect on the long-term viability of the Utah population of the Gierisch mallow because habitat degradation can be severe enough to prevent reestablishment of new plants, as well as removing mature, reproducing plants from the population. As stated above, Hughes (2009, p. 14) estimated this population to be between 5,000 and 8,000 individuals in 2009. While this is only one of 18 known populations, this is the second largest population of the plant and this population includes almost half of the total population, rangewide. This population is important to the long-term viability of the species. Given that this large population only encompasses 1.01 ha (2.5 ac) and is easily accessible, these activities may lead to enough Gierisch mallow plants being crushed to reduce the overall fitness of the population. Therefore, we conclude that this activity is threat to the species that has moderate impacts to this population in Utah.

Other Human Effects

The same areas in Utah that are subjected to unauthorized OHV use are also used for target shooting and trash dumping. Evidence of both of these activities was present in Utah during the February 2008 visit. There was one large

appliance, which had obviously been used for target practice, dumped near the population (Service 2008a, p. 1). People engaging in target shooting near the population degrade habitat by trampling the soil and plants, and by driving vehicles on the habitat to access areas for target shooting. The unauthorized use of BLM lands for these activities can contribute to the degradation of habitat for the Gierisch mallow by causing the same direct and indirect effects described above for OHV use. It is also possible that trash dumping can lead to soil contamination, which would most likely not be beneficial to the species. The full extent of damage to soils may not be evident until years or even decades after the original disturbance (Vollmer *et al.* 1976, p. 115). We did not observe these activities near the Arizona populations. Similar to the effects of unauthorized OHV use, we consider illegal trash dumping and impacts associated with target shooting to be a threat to the species that has moderate impacts to this population in Utah.

Nonnative, Invasive Species

The spread of nonnative, invasive species is considered the second largest threat to imperiled plants in the United States (Wilcove *et al.* 1998, p. 608). Invasive plants—specifically exotic annuals—negatively affect native vegetation, including rare plants. One of the most substantial effects is the change in vegetation fuel properties that, in turn, alter fire frequency, intensity, extent, type, and seasonality (Menakis *et al.* 2003, pp. 282–283; Brooks *et al.* 2004, p. 677; McKenzie *et al.* 2004, p. 898). Shortened fire return intervals make it difficult for native plants to reestablish or compete with invasive plants (D'Antonio and Vitousek 1992, p. 73).

Invasive plants can exclude native plants and alter pollinator behaviors (D'Antonio and Vitousek 1992, pp. 74–75; DiTomaso 2000, p. 257; Mooney and Cleland 2001, p. 5449; Levine *et al.* 2003, p. 776; Traveset and Richardson 2006, pp. 211–213). For example, cheatgrass and red brome outcompete native species for soil nutrients and water (Melgoza *et al.* 1990, pp. 9–10; Aguirre and Johnson 1991, pp. 352–353; Brooks 2000, p. 92), as well as modify the activity of pollinators by producing different nectar from native species (Levine *et al.* 2003, p. 776) or introducing nonnative pollinators (Traveset and Richardson 2006, pp. 208–209). Introduction of nonnative pollinators or production of different nectar can lead to disruption of normal pollinator interactions for the Gierisch mallow.

Cheatgrass and red brome are particularly problematic nonnative, invasive annual grasses in the intermountain west. If already present in the vegetative community, cheatgrass and red brome increase in abundance after a wildfire, increasing the chance for more frequent fires (D'Antonio and Vitousek 1992, pp. 74–75; Brooks 2000, p. 92). In addition, cheatgrass invades areas in response to surface disturbances (Hobbs 1989, pp. 389, 393, 395, 398; Rejmanek 1989, pp. 381–383; Hobbs and Huenneke 1992, pp. 324–325, 329, 330; Evans *et al.* 2001, p. 1308). Cheatgrass and red brome are likely to increase due to climate change (see ''Climate Change and Drought'' discussion, below, under Factor E) because invasive annuals increase biomass and seed production at elevated levels of carbon dioxide (Mayeux *et al.* 1994, p. 98; Smith *et al.* 2000, pp. 80–81; Ziska *et al. 2*005, p. 1328).

Although cheatgrass and red brome both occur in close proximity to Gierisch mallow habitat, red brome is more prevalent (Roaque 2012b, p. 1). As previously described above, both cheatgrass and red brome tend to not grow well in gypsum outcrops in normal (dry) rainfall years; however, they can be abundant in the Gierisch mallow habitat during wet years. Red brome has also been documented in similar gypsiferous soils near the Gierisch mallow populations after wet years and can provide enough fuel continuity to aid in the spread of fire across the landscape in these areas (Roth 2012, entire). As we stated above, we do not anticipate a high degree of surface disturbances in the Gierisch mallow habitats in the near future from livestock grazing except during drought years; however, increased mining in Arizona and unauthorized OHV use, target shooting, and trash dumping in the Utah population of the Gierisch mallow may lead to significant amounts of surface disturbance, providing conditions that allow red brome to expand into and increase in density within Gierisch mallow habitat.

Invasions of annual, nonnative species, such as cheatgrass, are well documented to contribute to increased fire frequencies (Brooks and Pyke 2002, p. 5; Grace *et al.* 2002, p. 43; Brooks *et al.* 2003, pp. 4, 13, 15). The disturbance caused by increased fire frequencies creates favorable conditions for increased invasion by cheatgrass. The end result is a downward spiral where an increase in invasive species results in more fires, more fires create more disturbances, and more disturbances lead to increased densities of invasive species. The risk of fire is expected to increase from 46 to 100 percent when the cover of cheatgrass increases from 12 to 45 percent or more (Link *et al.* 2006, p. 116). The invasion of red brome, another nonnative grass, into the Mojave Desert of the Intermountain West poses similar threats to fire regimes, native plants, and other federally protected species (Brooks *et al.* 2004, pp. 677–678). Brooks (1999, p. 16) also found that high interspace biomass of red brome and cheatgrass resulted in greater fire danger in the Mojave Desert. Brooks (1999, p. 18) goes on to state that the ecological effects of cheatgrass- and red brome-driven fires are significant because of their intensity and consumption of perennial shrubs.

In the absence of cheatgrass and red brome, the Gierisch mallow grows in sparsely vegetated communities unlikely to carry fires (see *Biology, Habitat, and the Current Range* section, above). Thus, this species is unlikely to be adapted to survive high frequency fires. As described in the *Biology, Habitat, and the Current Range* section, the total range of this species covers approximately 186 ha (460 ac), and each of the 18 populations occupies a relatively small area, ranging between 0.003 ha (0.01 ac) and 38.12 ha (94.36 ac). A range fire could easily impact or eliminate one or all populations and degrade Gierisch mallow habitat to the point that it will no longer be suitable for the plant. The loss of one population and associated suitable habitat would be a significant loss to the species. Therefore, the potential expansion of invasive species and associated increase in fire frequency and intensity is a significant threat to the species, especially when considering the limited distribution of the species and the high potential of the Gierisch mallow population extinctions.

In summary, invasive species can impact plant communities by increasing fire frequencies, outcompeting native species, and altering pollinator behaviors. Although invasive species do not occur in high densities in Gierisch mallow habitat during normal (dry) rainfall years, nonnative, invasive species, especially red brome, can be very abundant in wet rainfall years. Given the ubiquitous nature of cheatgrass and red brome in the Intermountain West and their ability to rapidly invade dryland ecosystems (Mack 1981, p. 145; Mack and Pyke, 1983, p. 88; Thill *et al.* 1984, p. 10), we expect these nonnative species to increase in the future in response to surface disturbances from increased mining activities, recreation activities,

and global climate change (see ''Climate Change and Drought,'' below). An increase in cheatgrass and red brome is expected to increase the frequency of fires in Gierisch mallow habitat, and the species is unlikely to survive increased wildfires due to its small population sizes and the anticipated habitat degradation. Therefore, we determine that nonnative, invasive species and associated wildfires constitute a threat to Gierisch mallow and its habitat that may have a significant population-level effect on the species.

Summary of Factor A

Based on our evaluation of the best available scientific information, we conclude that the present and future destruction and modification of the habitat for the Gierisch mallow is a threat that has significant impacts to the speceis. Destruction and modification of habitat for the Gierisch mallow are anticipated to result in a significant decrease in both the range of the species and the size of the population of the species.

Mining activities impacted Gierisch mallow habitat in the past and will continue to be a threat in the future to the species' habitat throughout its range. All of the populations and most of the habitat are located on BLM and ASLD lands, which have an extensive history of, and recent successful exploration activities for, gypsum mining. A small amount of Gierisch mallow habitat (approximately 68 ha (167 ac)) occurs on SITLA managed lands; however no mining is proposed on these lands. Two of the 18 populations are located in the immediate vicinity of gypsum mining, including the Black Rock Gypsum Mine, which has an approved Mining Plan of Operation to expand into the largest Gierisch mallow population. Gypsum mining is expected to continue and expand in the near future (Cox 2011b, p. 1; Dixon 2012, p. 1). Considering the small area of occupied habitat immediately adjacent to existing gypsum mines, anticipated future mining will result in the loss of habitat for these populations in the future, and these two populations comprise approximately 46 percent of the entire species' distribution.

Although livestock do not typically eat Gierisch mallow, livestock grazing can affect Gierisch mallow habitat more significantly during drought years, as livestock move into the Gierisch mallow habitat searching for forage. The consumption of Gierisch mallow that has been documented increases the significance of the effects of livestock grazing when grazing occurs during the reproductive period for the pant in the spring. Additionally, livestock have been implicated in spreading nonnative, invasive species, such as red brome and cheatgrass, although we do not know the extent to which livestock contribute to the spread of these two nonnative grasses.

Red brome and cheatgrass are documented to occur in all 18 populations of the Gierisch mallow, although mostly after wet years. The threat of fire caused by annual invasions of nonnative species is exacerbated by mining activities, livestock grazing, and recreation activities. Therefore, we conclude that Gierisch mallow and its habitat face significant threats as a result of habitat loss and modification.

*B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

The Gierisch mallow is not typically a plant of horticultural interest; however, we do have information regarding possible seed collection from wild plants on BLM and ASLD department lands for commercial sale (Roth 2011, p. 1; Frates 2012, pers. comm.). Collection of seeds from both BLM and ASLD is prohibited, and only the BLM offers a special research permit to collect seeds of listed species, as long as the seed collection does not violate the Act. Each respective land management agency referred the matter to its law enforcement branches. Because collection is restricted, and collection permits are only issued for scientific research or educational purposes by the Arizona Department of Agriculture (Austin 2012, p. 1), we do not expect collection to be a regular occurrence. See Factor D discussion, below, for a complete description of when permits are issued for collection of the Gierisch mallow. We are not aware of any other instances when the Gierisch mallow has been collected from the wild other than as a voucher specimen (specimen collected for an herbarium) (Atwood and Welsh 2002, p. 161). Therefore, we conclude that overutilization for commercial, recreational, scientific, or educational purposes is not a threat to the Gierisch mallow now, and we have no information to indicate that it will become a threat in the future.

*C. Disease or Predation*

The flowering stalks of the Gierisch mallow are eaten by livestock. All of the Gierisch mallow populations on BLM lands are within grazing allotments. Herbivory has been documented by a BLM ecologist (Service 2008a, p. 1) and Atwood (2008, p. 1). Hughes has found that the mallow is eaten during drought years, when other forage is reduced or unavailable. The plant is also grazed during non-drought times, but not as heavily. The Gierisch mallow plants located near water sources (stock tanks and drinkers) are also heavily browsed (Hughes 2008b, p. 1) because livestock tend to congregate near sources of water. When Atwood (2008, p. 1) was surveying the populations to collect fruit of the Gierisch mallow during drought years, Atwood was unable to locate any fruit because all of the flowering stalks had been consumed by livestock. The effect of sporadic grazing of plants is unknown, but persistent grazing can reduce the reproductive output of the plants, potentially reducing the size of the smaller populations, especially during drought years and during the reproductive period in the spring. Livestock herbivory during the reproductive period can lead to the flowering stalks being eaten, thus preventing adult Gierisch mallow plants from reproducing. As previously described under Factor A, livestock do not typically spend significant amounts of time in Gierisch mallow habitat, due to the hillsides and steep slopes that the Gierisch mallow typically inhabits, although livestock will enter into Gierisch mallow habitat during drought periods and have been documented on steep slopes in similar habitats (DeFalco 2012, pers. comm.).

Herbivory from livestock is not a threat that has significant impacts because of the steepness of the terrain on which the plant is typically located and because the herbivory that does occur is mostly limited to drought years when the plant is not overly abundant. Although herbivory is likely to continue to some degree, especially during drought years, recruitment from the seed bank has been documented in recent years, indicating that herbivory by livestock is not likely to diminish the overall fitness and reproductive ability of the larger Gierisch mallow populations. Smaller populations of the Gierisch mallow are likely to be more susceptible to the effects of herbivory during drought years or during the reproductive period, especially when the flowering stalks are consumed during the reproductive period.

We have no information that disease is affecting the plants. Therefore, based on the best available information, we conclude that disease is not a threat to the Gierisch mallow and that predation (herbivory, along with some related trampling) is a threat that has moderate impacts only during drought years or during the reproductive period.

*D. The Inadequacy of Existing Regulatory Mechanisms*

Under this factor, we examine whether existing regulatory mechanisms are inadequate to address or alleviate the threats to the species discussed under the other factors. Section 4(b)(1)(A) of the Act requires the Service to take into account ''those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect such species. . . .'' In relation to Factor D under the Act, we interpret this language to require the Service to consider relevant Federal, State, and tribal laws, plans, regulations, and other such mechanisms that may minimize any of the threats we describe in threat analyses under the other four factors, or otherwise enhance conservation of the species. We give strongest weight to statutes and their implementing regulations and to management direction that stems from those laws and regulations. An example would be State governmental actions enforced under a State statute or constitution, or Federal action under statute.

Having evaluated the significance of the threat as mitigated by any such conservation efforts, we analyze under Factor D the extent to which existing regulatory mechanisms are inadequate to address the specific threats to the species. Regulatory mechanisms, if they exist, may reduce or eliminate the impacts from one or more identified threats. In this section, we review existing State and Federal regulatory mechanisms to determine whether they effectively reduce or remove threats to the Gierisch mallow.

State Regulations

Approximately 13 percent of known populations are located on ASLD lands in Arizona mining claims. There are no laws protecting the Gierisch mallow's habitat on State or private lands in Arizona. This species is currently protected by the Arizona Native Plant Act (ANPA). Since it became a candidate species in 2008, Arizona protects the Gierisch mallow as ''Highly Safeguarded.'' Plants in the ''Highly Safeguarded'' category under the ANPA include, ''plants resident to this State and listed as endangered, threatened, or category 1 in the Federal endangered species act of 1973'' (ANPA 1997, p. 4). The ANPA controls collecting, and limited scientific collection of ''Highly Safeguarded'' species is allowed for research and educational purposes (Austin 2012, p. 1), but the ANPA provides no protection for plant habitat. Private landowners are required to obtain a salvage permit to remove plants protected by the ANPA; however, there are no known private lands containing the Gierisch mallow. Furthermore, seed collection on ASLD lands is prohibited, as described above under Factor B, although there are no ASLD regulations protecting habitat for the Gierisch mallow. While the ANPA may be effectively protecting the species from direct threats, it is not designed to protect the species' habitat.

No Gierisch mallow populations are known to occur on the approximately 68 ha (167 ac) of SITLA lands that contain habitat for the species; however, there are no laws protecting plants or their habitat on SITLA lands in Utah.

In addition to the Black Rock Gypsum Mine on BLM lands in Arizona, discussed below, the Georgia-Pacific Mine on ASLD land is in close proximity to a large Gierisch mallow population. The ASLD has strict reclamation provisions and bonding requirements when they approve a Mining Plan of Operation; however, any decision that the ASLD makes on whether or not to lease land is based strictly on the benefit of the State Trust. The ASLD would not deny a mine, or any other project, based on the presence of an endangered or threatened species; however, they can have stipulations written into the ASLD lease or the mining company's reclamation plan that would require the mining company to make allowances for federally listed species (Dixon 2012, p. 1). With listed plants, these stipulations can include seed collection or transplanting plants from the footprint of the mine; however, because the Gierisch mallow is not currently listed, the ASLD does not currently have to include these stipulations in reclamation plans. Because the ASLD does not have to require mitigation stipulations to protect the Gierisch mallow or its habitat, we conclude that this regulatory mechanism is insufficient to protect the Gierisch mallow from threats to its habitat associated with mining on ASLD lands.

Federal Regulations

Mining Activities on BLM Lands

We have previously identified habitat loss associated with gypsum mining as a potential threat to the species. On BLM-managed lands, this mining occurs pursuant to the Mining Law of 1872 (30 U.S.C. 21 *et seq.*), which was enacted to promote exploration and development of domestic mineral resources, as well as the settlement of the western United States. It permits U.S. citizens and businesses to freely prospect hardrock (locatable) minerals and, if a valuable deposit is found, file a claim giving them the right to use the land for mining activities and sell the minerals extracted, without having to pay the Federal Government any holding fees or royalties (GAO 1989, p. 2). Gypsum is frequently mined as a locatable mineral, and gypsum mining is, therefore, subject to the Mining Law of 1872. The BLM implements the Mining Law through Federal regulations at 43 CFR 3800.

The operators of mining claims on BLM lands must reclaim disturbed areas (Cox 2012, p. 1). The BLM's regulations also require the mitigation of mining operations so that operations do not cause unnecessary or undue degradation of public lands. Unnecessary or undue degradation is generally referred to as ''harm to the environment that is either unnecessary to a given project or violates specified environmental protection statutes'' (USLegal, 2012, p. 1). Furthermore, it is unclear what specific activities would constitute unnecessary or undue degradation in relation to the Gierisch mallow and its habitat.

The Gierisch mallow is listed as a BLM sensitive species in both Arizona and Utah. Sensitive species designation on BLM lands is afforded through the Special Status Species Management Policy Manual #6840 (BLM 2008B, entire), which states that on BLM-administered lands, the BLM shall manage Bureau sensitive species and their habitats to minimize or eliminate threats affecting the status of the species, or to improve the condition of the species' habitat (BLM 2008B, pp. 37–38).

The BLM's regulations do not prevent the Black Rock Gypsum Mine's expansion into Gierisch mallow habitat, but the BLM could require mitigation measures to prevent unnecessary or undue degradation from mining operations. For example, the BLM required seed collection of the Gierisch mallow by the mine operators to aid in reestablishing the species in reclaimed areas of the Black Rock Gypsum Mine in the recently approved expansion of the Black Rock Gypsum Mine.

The BLM has required seed collection as a result of these operations; however, we do not know if enough seeds can be collected to reestablish pre-mining population numbers in reclaimed areas. The ability to reestablish healthy populations in reclaimed areas is uncertain because the number of plants observed growing from the seed bank in reclaimed soils has decreased since they were first observed. Furthermore, we do not know the long-term viability of these plants or any plants grown from

collected seeds. Therefore, we find that the BLM's Federal regulatory measures are not adequate to address the loss of habitat caused by gypsum mining.

*E. Other Natural or Manmade Factors Affecting Its Continued Existence*

Small Population Size

As previously described (see the *Biology, Habitat, and the Current Range* section, above), the entire range of the Gierisch mallow is located in an area of less than 186 ha (460 ac) throughout Arizona and Utah. Within this range, each of the 18 individual populations' habitat areas is very small, ranging from 0.003 ha (0.01 ac) to 38.12 ha (94.36 ac). The Gierisch mallow can be dominant in small areas of suitable habitat, containing thousands of individuals. However, the small areas of occupation and the narrow overall range of the species make it highly susceptible to stochastic events that may lead to local extirpations.

Mining, or a single random event such as a wildfire (see Factor A), could extirpate an entire or substantial portion of a population given the small area of occupied habitat. Species with limited ranges and restricted habitat requirements also are more vulnerable to the effects of global climate change (see the ''Climate Change and Drought'' section, below; IPCC 2002, p. 22; Jump and Penuelas 2005, p. 1016; Maschinski *et al.* 2006, p. 226; Krause 2010, p. 79).

Overall, we consider small population size and restricted range intrinsic vulnerabilities to the Gierisch mallow that may not rise to the level of a threat on their own. However, the small population sizes and restricted range of this species increase the risk of extinction to the Gierisch mallow populations in conjunction with the effects of global climate change (see below) and the potential for stochastic extinction events such as mining and invasive species (Factor A). Therefore, we consider the small, localized population size to exacerbate the threats of mining, invasive species, and climate change to the species.

Climate Change and Drought

Our analyses under the Act include consideration of ongoing and projected changes in climate. The terms ''climate'' and ''climate change'' are defined by the Intergovernmental Panel on Climate Change (IPCC). ''Climate'' refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term ''climate change'' thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative, and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

Annual mean precipitation levels are expected to decrease in western North America and especially the southwestern States by mid-century (IPCC 2007, p. 8; Seager *et al.* 2007, p. 1181). Throughout the Gierisch mallow's range, precipitation is predicted to increase 10 to 15 percent in the winter, decrease 5 to 15 percent in spring and summer, and remain unchanged in the fall under the highest emissions scenario (Karl *et al.* 2009, p. 29). The levels of aridity of recent drought conditions and perhaps those of the 1950s drought years will become the new climatology for the southwestern United States (Seager *et al.* 2007, p. 1181). Much of the Southwest remains in a 10-year drought, which is considered the most severe western drought of the last 110 years (Karl *et al.* 2009, p. 130). Although droughts occur more frequently in areas with minimal precipitation, even a slight reduction from normal precipitation may lead to severe reductions in plant production (Herbel *et al.* 1972, p. 1084). Therefore, the smallest change in environmental factors, especially precipitation, plays a decisive role in plant survival in arid regions (Herbel *et al.* 1972, p. 1084).

As discussed above, the Gierisch mallow has a limited distribution, and populations are localized and small. In addition, these populations are restricted to very specific soil types. Global climate change exacerbates the risk of extinction for species that are already vulnerable due to low population numbers and restricted habitat requirements. Predicted changes in climatic conditions include increases in temperature, decreases in rainfall, and increases in atmospheric carbon dioxide in the American Southwest (Walther *et al.* 2002, p. 389; IPCC 2007, p. 48; Karl *et al.* 2009, p. 129). Although we have no information on how the Gierisch mallow will respond to effects related to climate change, persistent or prolonged drought conditions are likely to reduce the frequency and duration of flowering and germination events, lower the recruitment of individual plants, compromise the viability of populations, and impact pollinator availability as pollinators have been documented to become locally extinct during periods of drought (Tilman and El Haddi 1992, p. 263; Harrison 2001, p. 64). The smallest change in environmental factors, especially precipitation, plays a decisive role in plant survival in arid regions (Herbel *et al.* 1972, p. 1084).

Drought conditions led to a noticeable decline in survival, vigor, and reproductive output of other rare and endangered plants in the Southwest during the drought years of 2001 through 2004 (Anderton 2002, p. 1; Van Buren and Harper 2002, p. 3; Van Buren and Harper 2004, entire; Hughes 2005, entire; Clark and Clark 2007, p. 6; Roth 2008a, entire; Roth 2008b, pp. 3–4). Similar responses are anticipated to adversely affect the long-term persistence of the Gierisch mallow. Periods of prolonged drought, especially with decreased winter rains essential to the survival and persistence of the Gierisch mallow, are likely to decrease the ability of this plant to produce viable seeds. Additionally, prolonged drought will likely diminish the ability of seeds currently in the seed bank to produce viable plants and for seedlings to survive to maturity.

Climate change is expected to increase levels of carbon dioxide (Walther *et al.* 2002, p. 389; IPCC 2007, p. 48; Karl *et al.* 2009, p. 129). Elevated levels of carbon dioxide lead to increased invasive annual plant biomass, invasive seed production, and pest outbreaks (Smith *et al.* 2000, pp. 80–81; IPCC 2002, pp. 18, 32; Ziska *et al.* 2005, p. 1328), and will put additional stressors on rare plants already suffering from the effects of elevated temperatures and drought. This is important to note with regards to the Gierisch mallow because increases in nonnative, invasive plants, including increased seed production, are anticipated to increase both the frequency and intensity of wildfires as described above in ''Nonnative, Invasive Species'' under Factor A. Further, these additional stressors associated with increased carbon dioxide are likely to increase the competition for resources between the Gierisch mallow and nonnative, invasive plant species.

The actual extent to which climate change itself will impact the Gierisch

mallow is unclear, mostly because we do not have long-term demographic information that would allow us to predict the species' responses to changes in environmental conditions, including prolonged drought. Any predictions at this point on how climate change would affect this species would be speculative. However, as previously described, mining and recreation activities are threats (see ''Mining'' and ''Recreation Activities'' sections under Factor A, above), which will likely result in the loss of large numbers of individuals and maybe even entire populations. Increased surface disturbances associated with mining and recreation activities also will likely increase the extent and densities of nonnative, invasive species and with it the frequencies of fires (see *''*Nonnative, Invasive Species'' section under Factor A, above). Given the cumulative effects of the potential population reduction and habitat loss (of already small populations) associated with mining, recreation, invasive species, and fire, we are concerned about the impacts of future climate change to the Gierisch mallow.

In summary, the future effects of global climate change and drought on the Gierisch mallow are unclear. However, because of the threats of mining, grazing during drought years, recreation, and nonnative species, the cumulative effects of climate change and drought may be of concern for this species in the future. At this time, we believe that the state of knowledge concerning the localized effects of climate change and drought is too speculative to determine whether climate change and drought are a threat to these species in the future. However, we will continue to assess the potential threats of climate change and drought as additional scientific information becomes available.

Summary of Factor E

We assessed the potential risks of small population size to the Gierisch mallow. The Gierisch mallow has a highly restricted distribution and exists in 18 populations scattered over an area that covers approximately 460 ac (186 ha). Individual populations occupy very small areas with large densities of plants. We conclude that stochastic events could impact a significant portion of a population. Small populations that are restricted by habitat requirements also are more vulnerable to the effects of climate change, such as prolonged droughts and increased fire frequencies. Although small population size and climate change make the species intrinsically more vulnerable, we are uncertain whether they would rise to the level of threat by themselves. However, when combined with the threats listed under Factor A (mining operations; livestock grazing; recreation activities; and nonnative, invasive species), and the lack of existing regulatory mechanisms to alleviate those threats, the small population size and restricted range of the Gierisch mallow are likely to significantly increase the level of the above-mentioned threats.

**Determination**

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Gierisch mallow. We find that the species is in danger of extinction due to the current and ongoing modification and destruction of its habitat and range (Factor A) from the ongoing and future gypsum mining operations, livestock grazing, recreation activities, and nonnative, invasive species. The most significant threat to the Gierisch mallow is the ongoing and future gypsum mining that is likely to remove approximately 46 percent of the total population of the Gierisch mallow. We did not find any significant threats to the species under Factor B. We found that predation (herbivory) during drought years and during the reproductive period to be a moderate threat (Factor C). We also found that existing regulatory mechanisms that could provide protection to the Gierisch mallow through mining operations management by the BLM and ASLD are inadequate to protect the species (Factor D) from existing and future threats. Finally, the small population size and restricted range of this species also puts it at a heightened risk of extinction (Factor E), due to the threats that have significant impacts described above in Factors A, C, and D.

The threats acting upon the populations of Gierisch mallow are intensified because of the species' small population size and limited range, resulting in a high likelihood of extinction for this species. The Gierisch mallow is a narrow endemic species with a very restricted range; the small areas of occupied habitat combined with the species' strong association with gypsum soils makes the species highly vulnerable to habitat destruction or modification through mining-related and recreation activities, as well as livestock grazing during drought and random extinction events, including invasive species (and the inherent risk of increased fires) and the potential future effects of global climate change (Factor A). Furthermore, two of the largest populations of the Gierisch mallow and its habitat will be completely removed by mining operations. Both of the mines have approved Mining Plans of Operations and permits from the respective land management agencies (BLM and ASLD); thus mining can occur at any time. Even though these mining operations are not currently active, when they begin operation there will be no requirement for notification of land-disturbing activities that would impact or completely remove these populations. As previously stated, operation and expansion of these two mines is anticipated to extirpate approximately 46 percent of known Gierisch mallow plants, which are located in two populations in Arizona. The existing regulatory mechanisms are inadequate to protect the Gierisch mallow from the primary threat of mining, particularly because the BLM has approved mining operations with mitigation that we consider ineffective at reducing threats. Furthermore, the ASLD does not consider the presence of a listed species when approving a Mining Plan of Operation; however, they can have stipulations written into the ASLD lease or the mining company's reclamation plan that would require the mining company to make allowances for federally listed species (Dixon 2012, p. 1). The ASLD has the ability to require mitigation for the presence of a federally listed species; however, there is no current requirement because the Gierisch mallow is not federally listed. We consider this regulatory mechanism to be inadequate as well. The inadequacy of regulatory mechanisms (Factor D), combined with the expected turnaround of the housing market (gypsum is an important component of sheet rock for housing construction), poses a serious threat to the continued existence of the Gierisch mallow. The small, reduced range (Factor E) of the Gierisch mallow also puts it at a heightened risk of extinction.

The elevated risk of extinction of the Gierisch mallow is a result of the cumulative stressors on the species and its habitat. For example, gypsum mining is anticipated to extirpate more than half of the known population of the Gierisch mallow, especially since the existing regulations cannot sufficiently mitigate the effects of gypsum mining in Gierisch mallow habitat. Livestock grazing throughout the range of the Gierisch mallow may affect the population viability of the remaining populations if periods of drought continue and livestock continue to

consume the Gierisch mallow, including seedlings, during drought periods. Additionally, the risk of increased wildfire frequency and intensity resulting from increased nonnative, invasive species has the potential to extirpate several populations and, possibly, contribute to the extinction of the species. Climate change is anticipated to increase the drought periods and contribute to the spread of nonnative, invasive species as well. All of these factors combined heighten the risk of extinction and lead to our finding that the Gierisch mallow is in danger of extinction and warrants listing as an endangered species.

The Act defines an endangered species as any species that is ''in danger of extinction throughout all or a significant portion of its range'' and a threatened species as any species ''that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.'' The identified threats are currently impacting the species, and will continue to do so, or increase, into the foreseeable future. Therefore, the Gierisch mallow does not meet the definition of a threatened species under the Act. We find that the Gierisch mallow is presently in danger of extinction throughout its entire range, based on the immediacy, severity, and scope of the threats described above. Therefore, on the basis of the best available scientific and commercial information, we finalize the listing of the Gierisch mallow as endangered species in accordance with sections 3(6) and 4(a)(1) of the Act.

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. The Gierisch mallow being listed in this rule is highly restricted in its range and the threats occur throughout its range. Therefore, we assessed the status of the species throughout its entire range. The threats to the survival of the species occur throughout the species' range and are not restricted to any particular significant portion of that range. Accordingly, our assessment and determination applies to the species throughout its entire range.

Listing the Gierisch mallow as a threatened species is not the appropriate determination because the ongoing threats described above are severe enough to increase the immediate risk of extinction. The gypsum mining operations are anticipated to resume full operations and expansions in as few as 3 to 10 years, although the mining operations could occur sooner. Grazing is ongoing throughout the range of the Gierisch mallow, and climate change is anticipated to cause more periods of drought, when livestock graze more heavily on the Gierisch mallow. Additionally, red brome and cheatgrass are abundant throughout the area, and while they are typically more abundant in the Gierisch mallow habitat after wet years, recent wet years have left an abundant crop of red brome in Gierisch mallow habitat. Wildfires could occur at any time as a result of the proliferation of these invasive species. All of these factors combined lead us to conclude that the threat of extinction is high and immediate, thus warranting a determination of an endangered species rather than a threatened species for the Gierisch mallow.

**Available Conservation Measures**

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness and conservation by Federal, State, Tribal, and local agencies; private organizations; and individuals. The Act encourages cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act requires the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed, preparation of a draft and final recovery plan, and revisions to the plan as significant new information becomes available. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. The recovery plan identifies site-specific management actions that will achieve recovery of the species, measurable criteria that determine when a species may be downlisted or delisted, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (comprised of species experts, Federal and State agencies, nongovernment organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan would be available on our Web site (*http://www.fws.gov/endangered*), or from our Arizona Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribal, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

Once this species is listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, under section 6 of the Act, the States of Arizona and Utah would be eligible for Federal funds to implement management actions that promote the protection and recovery of the Gierisch mallow. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants.*

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to

jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal agency actions within the species' habitat that may require conference or consultation or both, as described in the preceding paragraph, include management and any other landscape-altering activities on Federal lands administered by the BLM, such as mining operations, livestock grazing, and issuing special use permits.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to endangered plants. All prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61, apply. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to import or export, transport in interstate or foreign commerce in the course of a commercial activity, sell or offer for sale in interstate or foreign commerce, or remove and reduce the species to possession from areas under Federal jurisdiction. In addition, for plants listed as endangered, the Act prohibits the malicious damage or destruction on areas under Federal jurisdiction and the removal, cutting, digging up, or damaging or destroying of such plants in knowing violation of any State law or regulation, including State criminal trespass law. Certain exceptions to the prohibitions apply to agents of the Service and State conservation agencies.

This species is currently protected by the Arizona Native Plant Act (ANPA). Since it became a candidate species in 2008, Arizona protects the Gierisch mallow as ''Highly Safeguarded.'' Plants in the ''Highly Safeguarded'' category under the ANPA include ''plants resident to this State and listed as endangered, threatened, or category 1 in the Federal endangered species act of 1973'' (ANPA 1997, p. 4). The ANPA controls collecting, and limited scientific collection of ''Highly Safeguarded'' species is allowed (Austin 2012, p. 1), but the ANPA provides no protection for plant habitat. Protection under the Act as an endangered species will, therefore, offer additional protections to this species.

We may issue permits to carry out otherwise prohibited activities involving endangered and threatened plant species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.62 for endangered plants, and at 17.72 for threatened plants. With regard to endangered plants, a permit must be issued for the following purposes: for scientific purposes or for enhancement of propagation or survival of the species.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a listing on proposed and ongoing activities within the range of species being listed. The following activities could potentially result in a violation of section 9 of the Act; this list is not comprehensive: Unauthorized collecting, handling, possessing, selling, delivering, carrying, or transporting of the species, including import or export across State lines and international boundaries, except for properly documented antique specimens of these taxa at least 100 years old, as defined by section 10(h)(1) of the Act.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Arizona Ecological Services Office (see **ADDRESSES**). Requests for copies of the regulations concerning listed plants and general inquiries regarding prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Endangered Species Permits, Southwest Regional Office, P.O. Box 1306, Albuquerque, NM, 87103–1306; telephone (505) 248–6911; facsimile (505) 248–6915.

## Required Determinations

*National Environmental Policy Act*

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*), need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

## References Cited

A complete list of all references cited in this rule is available on the Internet at *http://www.regulations.gov* at Docket No. FWS–R2–ES–2012–0049 or upon request from the Field Supervisor, Arizona Ecological Services Office (see **ADDRESSES** section).

## Authors

The primary authors of this document are staff of the Arizona Ecological Services Office (see **ADDRESSES**).

## List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

## Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as follows:

## PART 17—[AMENDED]

■ 1. The authority citation for part 17 continues to read as follows:

**Authority:** 16 U.S.C. 1361–1407; 1531–1544; 4201–4245, unless otherwise noted.

■ 2. Amend § 17.12(h) by adding an entry for ''*Sphaeralcea gierischii*'', in alphabetical order under ''FLOWERING PLANTS'', to the List of Endangered and Threatened Plants, to read as follows:

**§ 17.12 Endangered and threatened plants.**

* * * * *

(h) * * *

| Species | | Historic range | Family | Status | When listed | Critical habitat | Special rules |
|---|---|---|---|---|---|---|---|
| Scientific name | Common name | | | | | | |
| FLOWERING PLANTS | | | | | | | |
| * | * * * | * | * | * | * | * | |
| *Sphaeralcea gierischii* ..... | Gierisch mallow ..... | U.S.A (AZ, UT) | Malvaceae ... | E | 813 | 17.96(a) | NA |
| * | * * * | * | * | * | * | * | |

* * * * *

Dated: July 29, 2013.

**Stephen Guertin,**

*Acting Director, U.S. Fish and Wildlife Service.*

[FR Doc. 2013–19386 Filed 8–12–13; 8:45 am]

**BILLING CODE 4310–55–P**

## DEPARTMENT OF THE INTERIOR

## Fish and Wildlife Service

## 50 CFR Part 17

**[Docket No. FWS–R2–ES–2013–0018; 4500030113]**

**RIN 1018–AZ46**

## Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Sphaeralcea gierischii (Gierisch Mallow)

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service, designate critical habitat for *Sphaeralcea gierischii* (Gierisch mallow) under the Endangered Species Act of 1973, as amended (Act). The effect of this regulation is to designate critical habitat for Gierisch mallow under the Act. This final rule implements the Federal protections provided by the Act for this species.

**DATES:** This rule is effective on September 12, 2013.

**ADDRESSES:** This final rule, final economic analysis, and final environmental assessment are available on the Internet at *http://www.regulations.gov* and at *http://www.fws.gov/southwest/es/arizona/.* Comments and materials received, as well as supporting documentation used in preparing this final rule are available for public inspection at *http://www.regulations.gov.* All of the comments, materials, and documentation that we considered in this rulemaking are available by appointment, during normal business hours, at U.S. Fish and Wildlife Service, Arizona Ecological Services Office, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ, 85021; by telephone (602) 242–0210; or by facsimile (602) 242–2513.

The coordinates, or plot points, or both from which the critical habitat maps are generated are included in the administrative record for this rulemaking and are available at *http://www.fws.gov/southwest/es/arizona/,* and at *http://www.regulations.gov* at Docket No. FWS–R2–ES–2013–0018, and at the Arizona Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**). Any additional tools or supporting information that we may develop for this rulemaking will also be available at the Fish and Wildlife Service Web site and Field Office set out above, and may also be included in the preamble and/or at *http://www.regulations.gov.*

**FOR FURTHER INFORMATION CONTACT:** Steve Spangle, Field Supervisor, U.S. Fish and Wildlife Service, Arizona Ecological Services Office, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ 85021; by telephone (602) 242–0210; or by facsimile (602) 242–2513. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

**SUPPLEMENTARY INFORMATION:**

### Executive Summary

In this final rule, we refer to *Sphaeralcea gierischii* as Gierisch mallow.

Why we need to publish a rule. This is a final rule to designate critical habitat for the Gierisch mallow. Under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), any species that is determined to be an endangered or threatened species requires critical habitat to be designated, to the maximum extent prudent and determinable. Designations and revisions of critical habitat can only be completed by issuing a rule.

Elsewhere in today's **Federal Register**, we list the Gierisch mallow as an endangered species. On August 17, 2012, we published in the **Federal Register** a proposed critical habitat designation for Gierisch mallow (77 FR 49894). Section 4(b)(2) of the Act states that the Secretary shall designate critical habitat on the basis of the best scientific data available after taking into consideration the economic impact, the impact on national security, and any other relevant impact of specifying any particular area as critical habitat.

The critical habitat areas we are designating in this rule constitute our current best assessment of the areas that meet the definition of critical habitat for Gierisch mallow. We are designating approximately 5,189 hectares (ha) (12,822 acres (ac)) as critical habitat in two units in both Mohave County, Arizona, and Washington County, Utah, as follows:

TABLE 1—DESIGNATED CRITICAL HABITAT UNITS FOR GIERISCH MALLOW

| Critical habitat unit | Federal | | State | | Totals |
|---|---|---|---|---|---|
| | Arizona | Utah | Arizona | Utah | |
| Unit 1. Starvation Point | 220 ha (544 ac) | 802 ha (1,982 ac) | 249 ha (615 ac) | 68 ha (167 ac) | 1,339 ha (3,309 ac) |
| Unit 2. Black Knolls | 3,586 ha (8,862 ac). | 0 | 263 ha (651 ac) | 0 | 3,850 ha (9,513 ac) |
| Totals | 3,806 ha (9,406 ac). | 802 ha (1,982 ac) | 512 ha (1,266 ac) | 68 ha (167 ac) | 5,189 ha (12,822 ac) |

We have prepared an economic analysis of the designation of critical habitat. In order to consider economic impacts, we have prepared an analysis of the economic impacts of the critical habitat designations and related factors. We announced the availability of the draft economic analysis (DEA) in the **Federal Register** on March 28, 2013 (78 FR 18943), allowing the public to provide comments on our analysis. We have incorporated the comments and have completed the final economic analysis (FEA) concurrently with this final designation.

We have prepared an environmental assessment of the designation of critical habitat. In order to consider environmental impacts, we have prepared an assessment of the environmental impacts of the critical habitat designations and related factors. We announced the availability of the draft environmental assessment in the **Federal Register** on March 28, 2013 (78 FR 18943), allowing the public to provide comments on our assessment.