

Keck's Checkermallow
(Sidalcea keckii)

**5-Year Review:
Summary and Evaluation**



**U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
Sacramento, California**

December 2007

5-YEAR REVIEW
Keck's Checkermallow (*Sidalcea keckii*)

I. GENERAL INFORMATION

I.A. Methodology used to complete the review:

This review was conducted by a staff biologist within the Sacramento Fish and Wildlife Office (Service), based on the California Natural Diversity Database (CNDDDB); peer-reviewed journal articles; personal communications with California Department of Fish and Game and Bureau of Reclamation personnel; our database that tracks section 7 consultations and other projects; and our files.

I.B. Contacts

Lead Regional or Headquarters Office – Contact name(s) and phone numbers:

Region 8 (California and Nevada), Diane Elam, Deputy Division Chief for Listing, Recovery, and Habitat Conservation Planning, and Jenness McBride, Fish and Wildlife Biologist; 916-414-6464.

Lead Field Office – Contact name(s) and phone numbers: Sacramento Fish and Wildlife Office, Kirsten Tarp, Senior Biologist, Recovery Branch, 916-414-6600.

I.C. Background

I.C.1. FR Notice citation announcing initiation of this review: On July 7, 2005, we announced initiation of the 5-year review for *Sidalcea keckii* and asked for information from the public regarding the species' status (70 FR 39327). We published a second notice announcing the 5-year review and extending the request for information on November 3, 2005 (70 FR 66842). We received no response to the request for information.

I.C.2. Listing history

Original Listing

FR notice: 65 FR 7757

Date listed: February 16, 2000

Entity listed: Species – *Sidalcea keckii*

Classification: Endangered

I.C.3. Associated rulemakings:

Critical habitat for *Sidalcea keckii* was proposed on June 19, 2002 (67 FR 41669 and finalized on March 18, 2003 (FR 68:12863).

I.C.4. Review History: No status reviews have been conducted since *Sidalcea keckii* was listed in 2000.

I.C.5. Species' Recovery Priority Number at start of review: The recovery priority of this species is 8, indicating that it is a full species with moderate threats and a high recovery potential.

I.C.6. Recovery Plan or Outline

Name of plan: *Draft Recovery Plan for Fifteen Plants from Southern Sierra Foothills, California* (in development)

II. REVIEW ANALYSIS

Species Overview

Sidalcea keckii is an annual herb of the mallow family (Malvaceae) that can remain dormant as seeds for long periods. *Sidalcea keckii* is endemic to California and grows in relatively open areas on grassy slopes of the Sierra foothills. Botanists first collected *S. keckii* from a site near White River in Tulare County in the 1930s (Wiggins 1940; California Natural Diversity Database [CNDDDB] 2006). Historically, *S. keckii* was known from three occurrences, two from Tulare County and one from Fresno County. After having been collected in the 1930s, it was not collected or seen by botanists again for over 50 years. *Sidalcea keckii* was presumed extinct until it was rediscovered in 1992 at a site near Mine Hill in Tulare County (Mine Hill population)(Stebbins 1992). *Sidalcea keckii* is threatened by urban development, competition from non-native grasses, agricultural land conversion, and random events (U.S. Fish and Wildlife Service 2000; S. Hill, Illinois Natural History Survey, pers. comm. 2002; C. Peck, *in litt.*, 2002).

II.A. Application of the 1996 Distinct Population Segment (DPS) policy

II.A.1. Is the species under review listed as a DPS?

Yes
 No

The Endangered Species Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This definition limits listing as distinct population segments (DPS) to vertebrate species of fish and wildlife. Because the species under review is a plant and the DPS policy is not applicable, the application of the DPS policy to the species listing is not addressed further in this review.

II.B. Recovery Criteria

II.B.1. Does the species have a final, approved recovery plan containing objective, measurable criteria?

Yes

No. The draft plan is currently under development.

II.C. Updated Information and Current Species Status

II.C.1. Biology and Habitat –

II.C.1.a. Abundance, population trends, demographic features, or demographic trends:

At the time of listing in 2000, *Sidalcea keckii* was extremely localized, with one extended population at Mine Hill in Tulare County (Mine Hill population) and another population at Tivy Mountain near the community of Piedra, in southern Fresno County (Piedra population), (California Natural Diversity Data Base [CNDDDB]1997; S. Carter, Bureau of Land Management, *in litt.* 1998). The Mine Hill population had a total of 60 plants in 1992 (Woodward and Clyde Consultants 1992). The Piedra population was discovered on a mixture of private and public lands in Fresno County in 1998 and, at the time of listing, consisted of 216 plants (S. Carter, *in litt.* 1998).

Currently, the occurrence of *Sidalcea keckii* at Mine Hill in Tulare County is thought to be extirpated (Stebbins 2004) and the habitat highly modified since the species was last seen there in the early 1990s. *Sidalcea keckii* was not observed during the spring 2002, 2003, 2004 or 2005 field surveys for it at Mine Hill (Stebbins 2004; CNDDDB 2006; J. Stebbins, pers. comm. 2006).

Subsequent surveys for *Sidalcea keckii* conducted in 2000 and 2001 by the Sierra Foothill Conservancy at the Piedra population found 500 to 1,000 plants. (J. Stebbins, Environmental Consultant, pers. comm. 2004, 2006). The trend of the one remaining population is uncertain because changes in population size may well be due to variations in annual rainfall rather than any inherent problems, but have not been observed long enough to be sure.

The population at the White River in Tulare County may be extant, but the species was not found during appropriately-timed visits in 2002, 2003, or 2004 (J. Stebbins, pers. comm. 2004). The last time *Sidalcea keckii* was reported from this site was in 1939 (CNDDDB 2006). Other suitable habitat exists within the species' range but has not yet been surveyed (J. Stebbins, pers. comm. 2006).

Currently, only the Piedra population of *Sidalcea keckii* is known to be extant. Most of this population is on the Sierra Foothill Conservancy's Tivy Mountain Preserve (U.S. Fish and Wildlife Service 2003), with small portions on land administered by the U.S. Bureau of Reclamation (Cypher 1998; R. Faubion,

Bureau of Reclamation, pers. comm. 2001) and on private land (Bureau of Land Management 1998; J. Stebbins, pers. comm. 2001).

II.C.1.b. Spatial distribution, trends in spatial distribution, or historic range:

At the time of listing, the Mine Hill population covered an area measuring 30 meters by 100 meters (100 feet by 320 feet). The population occurred on a privately owned, 280-hectare (700-acre) parcel of land that was used for livestock grazing. As mentioned in II.C.1.a., the occurrence of *Sidalcea keckii* at Mine Hill in Tulare County is thought to be extirpated

Surveys for *Sidalcea keckii* conducted in 2000 and 2001 by the Sierra Foothill Conservancy at the Piedra population found 500 to 1,000 plants in 8 separate patches within 83 hectares (205 acres). Additionally, as properties adjacent to the known habitat have been surveyed, the boundaries of the Piedra population have been extended (J. Stebbins, Environmental Consultant, pers. comm. 2004, 2006), but are still within critical habitat.

Overall, *Sidalcea keckii* has decreased in distribution since it was listed because of the extirpation of the known Mine Hill population (California Natural Diversity Database 2006).

II.C.1.d. Habitat or ecosystem conditions:

Sidalcea keckii is associated with serpentine and other soils that tend to restrict competing vegetation (Kirkpatrick 1992; Cypher 1998; U.S. Fish and Wildlife Service 2003). Serpentine soils are unusually low in primary plant nutrients, nitrogen, phosphorus, and potassium; and high in heavy metals. These soil properties tend to restrict the growth of many competing plants (Brooks 1987). As with many serpentine species, *S. keckii* appears to compete poorly with densely growing non-native annual grasses (Stebbins 1992; Weiss 1999).

At the Piedra population, *Sidalcea keckii* grows on both Fancher and Cibo soils (Cypher 1998; C. Peck, Sierra Foothill Conservancy, *in litt.*, 2002; U.S. Fish and Wildlife Service 2003). The plants occur between 183 and 305 meters (600 and 1,000 feet) in elevation (C. Peck, Sierra Foothill Conservancy, *in litt.*, 2002). Associated plants at this site include *Bromus hordeaceus* (soft chess), *Dichelostemma capitatum* (blue dicks), *Gilia tricolor* (bird's eye gilia), *Triteleia ixioides* (pretty face), *Triteleia laxa* (Ithuriel's spear), *Asclepias* sp. (milkweed), and *Madia* sp. (tarweed) (Cypher 1998; Chuck Peck, pers. comm, Sierra Foothill Conservancy, 2006).

The Mine Hill population occurred on 20- to 40-percent slopes of red or white-colored clay in sparsely-vegetated annual grasslands. The clay soils are thought to be derived from serpentine parent materials that are high in magnesium, low in calcium, and laden with heavy metals.

II.C.1.d. Genetics, genetic variation, or trends in genetic variation and taxonomic classification or changes in nomenclature:

Recent genetic analyses have confirmed that *Sidalcea keckii* is a distinct taxon. The analysis of results from a DNA analysis concluded that *S. keckii* is most closely related to *S. diploscypha* and that *S. keckii* has a significant number of unique mutations (Andreasen and Baldwin 2001, 2003; Andreasen 2005).

II.C.2. Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

II.C.2.a. Present or threatened destruction, modification or curtailment of its habitat or range:

At the time of listing, the primary threats to the species were urban development, agricultural land conversion, and grazing (65FR 7757). Currently, *Sidalcea keckii* remains threatened by agricultural conversion and potential development.

The exact location where *Sidalcea keckii* was found in 1992 at Mine Hill in Tulare County has been altered significantly during the last few years. A citrus orchard has been planted and a reservoir has been constructed on a part of the habitat that previously supported the species (CNDDDB 20006). In addition, a gravel quarry has been constructed immediately south of the 1992 population site. A small portion of the original habitat from the 1992 population site has not been directly altered, but the habitat quality has been degraded and the species was not observed despite the intensive field surveys by experienced researchers (Stebbins 2004; J. Stebbins, pers. comm. 2006) and is thought to have been extirpated (Stebbins 2004; CNDDDB 2006).

Approximately 20 percent of the critical habitat at Mine Hill has also been destroyed. Nearly 40 percent of the critical habitat was surveyed for *Sidalcea keckii* during surveys conducted from 2002 to 2006 (J. Stebbins pers. comm. 2006). Although the highest quality habitat was destroyed, potential habitat in the Mine Hill Critical Habitat Unit still exists that has not yet been surveyed due to lack of access (J. Stebbins pers. comm. 2006). It is possible that plants or a seed bank of this species could occur in the unsurveyed portion of the Mine Hill critical habitat. If so, it could be subject to the same threats that are thought to have extirpated the known standing population of *S. keckii*, as discussed above.

The Sierra Foothill Conservancy has used a combination of private and Federal funding sources to purchase land and conservation easements. The Sierra Foothill Conservancy purchased the first 40 acres in 1999. The most significant source of Federal funds is the Central Valley Project Conservation Program (CVPCP, administered by the Bureau of Reclamation and the U.S Fish and Wildlife Service (J. Thomson, Bureau of Reclamation, pers. comm. 2006.).

Most of the habitat for *Sidalcea keckii* at the Piedra population on Tivy Mountain is protected. There is, however, an unprotected parcel within the Piedra population that could potentially be developed (Stebbins 2004); however, there are no imminent development plans.

II.C.2.b. Overutilization for commercial, recreational, scientific, or educational purposes:

As mentioned in the final rule, *Sidalcea keckii* is an attractive, showy plant, and the genus is prized as a source of horticultural plants. Simply listing a species can precipitate commercial or scientific interest, both legal and illegal, which can threaten the species through unauthorized and uncontrolled collection.

Unrestricted collecting for scientific or horticultural purposes, and impacts from excessive visits by individuals interested in seeing rare plants could result in a reduction of plant numbers and seed production. To date there is no evidence of this occurring for this species.

II.C.2.c. Disease or predation:

At the time of listing, cattle grazing was discussed as a potential threat to the species; there has been no known change since the final listing. Cattle grazing at the current level does not appear to be detrimental, and may reduce encroachment by non-native grasses (C. Peck, *in litt.*, 2002; Weiss 1999). Cattle have been observed to cause some damage to *Sidalcea keckii* by eating or trampling it, although the damage was barely noticeable a week later (Cypher 1998).

However, unmanaged increases in grazing during months of flowering, seed-set, or seed maturation at the unprotected parcel on Tivy Mountain could potentially reduce local population viability and thereby affect long-term conservation.

II.C.2.d. Inadequacy of existing regulatory mechanisms:

At the time of listing we discussed the inadequacies of the California Environmental Quality Act (CEQA).

California State Laws: The State's authority to conserve plants is comprised of four pieces of legislation: The California Endangered Species Act (CESA), the Native Plant Protection Act (NPPA), the CEQA, and the Natural Community Conservation Planning Act (NCCPA).

Sidalcea keckii is neither listed under the CESA (California Fish and Game Code, section 2080 *et seq.*) nor the NPPA (Division 2, Chapter 10, section 1908). The California Environmental Quality Act (CEQA) (chapter 2, section 21050 *et seq.* of the California Public Resources Code) requires government agencies to consider and disclose environmental impacts of projects and to avoid or mitigate them where possible. Under CEQA, public agencies must prepare environmental documents to disclose environmental impacts of a project and to identify

conservation measures and project alternatives. Through this process, the public can review proposed project plans and influence the process through public comment. However, CEQA does not guarantee that such conservation measures will be implemented.

The Federal Endangered Species Act: The Endangered Species Act of 1973, as amended (Act), is the primary Federal law that provides protection for *Sidalcea keckii*. Section 7(a)(2) requires Federal agencies to consult with the Service to ensure any project they fund, authorize, or carry out does not jeopardize a listed species. Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the “take” of federally endangered wildlife, however, plants are not protected against take. Instead, plants are protected from harm in two particular circumstances. Section 9 prohibits (1) the removal and reduction to possession (*i.e.* collection) of endangered plants from lands under Federal jurisdiction, and (2) the removal, cutting digging, damage, or destruction of endangered plants on any other area in knowing violation of a state law or regulation. Section 9 also makes illegal the international and interstate transport, import export and sale or offer for sale of endangered plants and animals. The protection of Section 9 afforded to endangered species is extended to threatened wildlife and plants by regulation. The Act affords protection to federally-listed plants if they co-occur with federally-listed wildlife species.

Currently there are no completed regional or county-wide Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) in Tulare or Fresno Counties, thereby leaving populations on private land without protection pursuant to the Endangered Species Act of 1973, as amended (Act) or the Natural Community Conservation Planning Act.

II.C.2.e. Other natural or manmade factors affecting its continued existence:

Other natural or manmade threats cited in the 2000 final listing rule include small population size, extirpation due to random events including fire, inbreeding depression, and loss of genetic variability, additionally competition of non-native grasses so currently threatens *Sidalcea keckii*.

Small population size increases the susceptibility of a population to extirpation from random demographic, environmental, and/or genetic events, affecting survival and reproduction of individuals (Shaffer 1981, 1987; Lande 1988; Groom *et al.* 2006). Species such as *Sidalcea keckii* are vulnerable to random environmental events such as extreme weather, disease, fire, or insect infestations (Shaffer 1981, 1987; Menges 1991; Groom *et al.* 2006). For example, if a fire should occur before the plants bloom or as they are blooming, the fire could destroy the individual plants as well as deplete the seed bank. The threat from random natural events has increased since *S. keckii* was listed because the plant now is found only at one location.

The isolation of the single known extant of population of *Sidalcea keckii* exacerbates these vulnerabilities by reducing the likelihood of recolonization of extirpated populations. Inbreeding depression and loss of genetic variability may also be causes for concern in such small isolated populations (Ellstrand and Elam 1993).

The absence of *Sidalcea keckii* from dense grasslands, even those on serpentine clay soils, suggests that it is a poor competitor (Stebbins 1992; J. Stebbins, pers. comm. 2001). Thus, aggressive, nonnative grasses such as *Bromus madritensis* ssp. *rubens*, and *Bromus hordeaceus* that are present at the extant site could potentially outcompete *S. keckii* if conditions changed to favor grasses. Conditions that could favor the grasses include soil disturbance and increased availability of soil nutrients. The nonnative grasses also create fuel that could carry fires (E. Cypher, California Department of Fish and Game, pers. comm. 2006).

II.D. Synthesis -

The primary threats to *Sidalcea kecki* which led to the listing of the species continue to be destruction and modification of habitat and the threat from catastrophic events. One population has been extirpated at Mine Hill in Tulare County and approximately 20 percent of the designated critical habitat at this site has been destroyed. Additional lands have been protected since the time of the listing. The Piedra population is mostly protected and is being managed with grazing, although the unprotected parcel within the Piedra population could be subject to threats from either inappropriate grazing or development.

Due to past and threatened destruction or modification of its habitat, the inadequacy of existing regulatory mechanisms, and other natural or manmade factors affecting its continued existence, we conclude that *Sidalcea keckii* continues to meet the definition of endangered.

III. RESULTS

III.A. Recommended Classification:

Downlist to Threatened

Uplist to Endangered

Delist (Indicate reasons for delisting per 50 CFR 424.11):

Extinction

Recovery

Original data for classification in error

No change is needed

III.B. New Recovery Priority Number 8 (no change)

IV. RECOMMENDATIONS FOR FUTURE ACTIONS -

1. Continue to protect property with suitable habitat for *Sidalcea keckii*. Acquisition of additional habitat through fee title or conservation easements is needed for the recovery of the species.
2. Survey additional serpentine and gabbro soil areas in Tulare and Fresno Counties to try to find additional populations of *Sidalcea keckii*.
3. If additional populations of *Sidalcea keckii* can not be found through systematic surveys, the species should be reintroduced into protected land either at Mine Hill or at the White River critical habitat unit.
4. Complete and publish the draft recovery plan, and approve a final recovery plan.
5. Monitor the species status and trend of *Sidalcea keckii* in order to estimate current population sizes, the number and distribution of populations, and whether the species is stable, increasing, or declining.

V. REFERENCES -

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Personal Communications

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In litteris

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**U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Keck's checkermallow (*Sidalcea keckii*)**

Current Classification Endangered

Recommendation resulting from the 5-Year Review

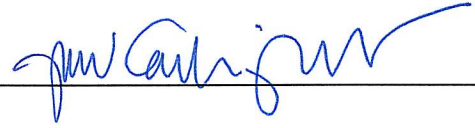
- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change is needed

Review Conducted By Sacramento Fish and Wildlife Office staff

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

ACTING

Approve  Date 1-8-08

REGIONAL OFFICE APPROVAL:

Regional Director, Fish and Wildlife Service

Approve  Date 1/10/08