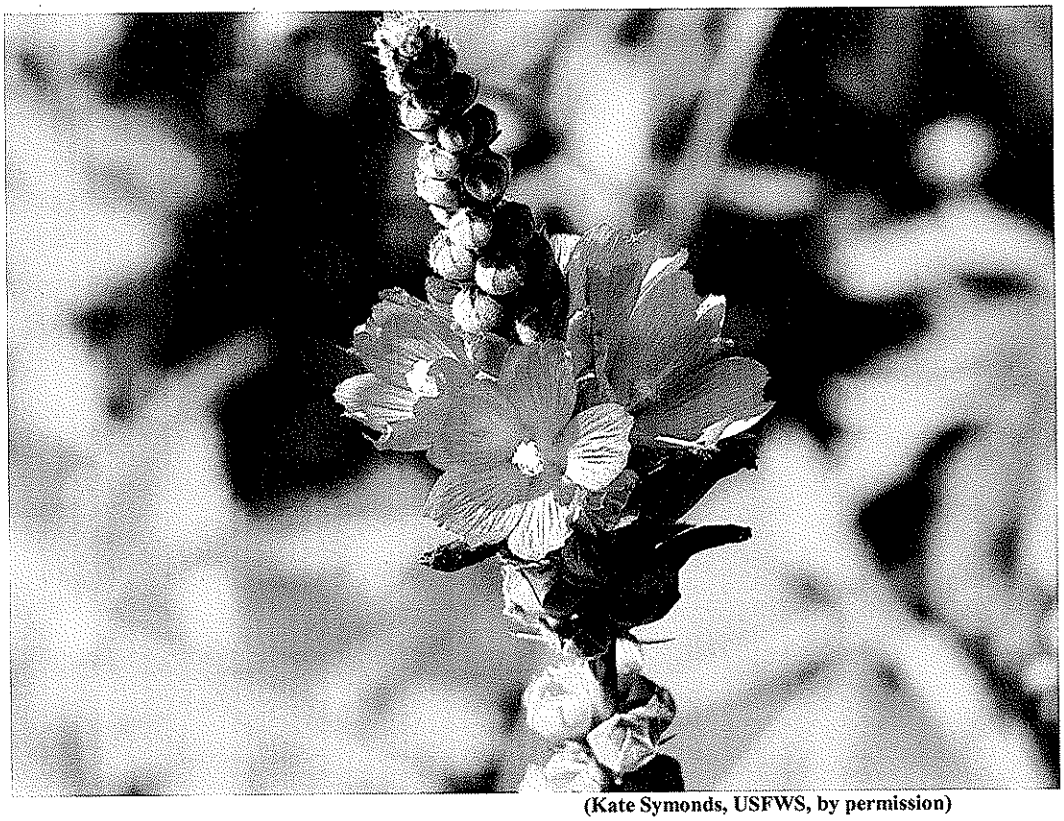
Sidalcea oregana ssp. *valida*
(Kenwood Marsh checkermallow)

5-Year Review:
Summary and Evaluation



(Kate Symonds, USFWS, by permission)

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

June 2009

5-YEAR REVIEW

Sidalcea oregana ssp. *valida* (Kenwood Marsh checkermallow)

I. GENERAL INFORMATION

Purpose of 5-Year Reviews:

The U.S. Fish and Wildlife Service (Service) is required by section 4(c)(2) of the Endangered Species Act (Act) to conduct a status review of each listed species at least once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species, be changed in status from endangered to threatened, or be changed in status from threatened to endangered. Our original listing of a species as endangered or threatened is based on the existence of threats attributable to one or more of the five threat factors described in section 4(a)(1) of the Act, and we must consider these same five factors in any subsequent consideration of reclassification or delisting of a species. In the 5-year review, we consider the best available scientific and commercial data on the species, and focus on new information available since the species was listed or last reviewed. If we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process defined in the Act that includes public review and comment.

Species Overview:

Sidalcea oregana ssp. *valida* is a perennial herb in the Malvaceae (mallow family) and is referred to in this document as a species for ease of reference. The plant inhabits freshwater marshes approximately 150 meters (490 feet) in elevation, at Kenwood Marsh and Knight's Valley, Sonoma County, California. The two sites are located approximately 29 kilometers (18 miles) apart. Both occurrences occupy a small area with few plants. The Knight's Valley population covers less than 0.1 hectare (0.25 acre). The most recent surveys for the species found 47 plants at Knight's Valley in 1998 (California Natural Diversity Database 2008) and approximately 24 plants in 2008 at Kenwood Marsh (K. Symonds, U.S. Fish and Wildlife Service, pers. comm., 2008). The plants are 0.9 to 1.2 meters (3 to 4 feet) tall with rounded leaves. Lower leaves are shallowly lobed and toothed; upper leaves become increasingly deeply and narrowly lobed. Uppermost leaves are generally smaller and divided into three to five long, narrow segments. Flowers appear from late June to September. The inflorescence consists of densely-flowered, spike-like stems that are 2 to 5 centimeters (0.8 to 2 inches) long. The petals are approximately 1.25 centimeters (0.5 inch) long, notched at the tip, and are deep rose-pink.

Methodology Used to Complete This Review:

This review was prepared by the Sacramento Fish and Wildlife Office (SFWO), following the Region 8 guidance issued in March 2008. We used information from survey data collected by experts who have been monitoring the two localities of this species, and from the California Natural Diversity Database (CNDDB) maintained by the California Department of Fish and Game. Personal communications with experts were our primary sources of information used to

update the species' status and threats. We received one letter from the public in response to our Federal Notice initiating this 5-year review. This 5-year review contains updated information on the species' biology and threats, and an assessment of that information compared to that known at the time of listing or since the last 5-year review. We focus on current threats to the species that are attributable to the Act's five listing factors. The review synthesizes all this information to evaluate the listing status of the species and provide an indication of its progress towards recovery. Finally, based on this synthesis and the threats identified in the five-factor analysis, we recommend a prioritized list of conservation actions to be completed or initiated within the next 5 years.

Contact Information:

Lead Regional Office: Diane Elam, Deputy Division Chief for Listing, Recovery, and Habitat Conservation Planning, and Jenness McBride, Fish and Wildlife Biologist, Region 8, Pacific Southwest Region; (916) 414-6464.

Lead Field Office: Kirsten Tarp, Recovery Branch, Fish and Wildlife Biologist, Sacramento Fish and Wildlife Office, Region 8, California and Nevada; (916) 414-6600

Federal Register (FR) Notice Citation Announcing Initiation of This Review: A notice announcing initiation of the 5-year review of this taxon and the opening of a 60-day period to receive information from the public was published in the Federal Register on March 5, 2008 [73 FR 11945]. One comment letter was received from the Attorney General, Department of Justice, State of California (E. Ochoa and J. Potter, Deputy Attorney General, State of California, *in litt.* 2008), recommending that we fully explore and evaluate the impact of global warming on *Sidalcea oregana* ssp. *valida*. The Attorney General's comments have been addressed in this 5-year review.

Listing History:

Original Listing
FR Notice: 62 FR 55791
Date of Final Listing Rule: October 22, 1997
Entity Listed: *Sidalcea oregana* ssp. *valida,* a plant subspecies
Classification: Endangered

State Listing *Sidalcea oregana* ssp. *valida* was listed by the State of California as endangered in 1982

Associated Rulemakings:

Review History: No previous reviews including 12-month status reviews or other 5-year reviews have been completed for this species.

Species' Recovery Priority Number at Start of 5-Year Review: The recovery priority number for *Sidalcea oregana* ssp. *valida* is 3C according to the Service's 2007 Recovery Data Call for

the Sacramento Fish and Wildlife Office, based on a 1-18 ranking system where 1 is the highest-ranked recovery priority and 18 is the lowest (Endangered and Threatened Species Listing and Recovery Priority Guidelines, 48 FR 43098, September 21, 1983). This number indicates that the taxon is a subspecies that faces a high degree of threat and has a high potential for recovery. The "C" indicates conflict with construction or other development projects or other forms of economic activity.

II. REVIEW ANALYSIS

Application of the 1996 Distinct Population Segment (DPS) Policy

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

Information on the Species and its Status

Species Biology and Life History

Spatial Distribution Only two occurrences of *Sidalcea oregana* ssp. *valida*, one each at Kenwood Marsh and at Knight's Valley, both in Sonoma County, have ever been reported. The Kenwood Marsh occurrence consists of three colonies (T. Moore, National Resources Conservation Service, *in litt.* 2004; CNDDB 2008). The two colonies located on Deerfield Ranch Winery property are still extant (T. Moore, *in litt.* 2004; K. Symonds, U.S. Fish and Wildlife Service, *in litt.*, 2008). The third colony, located on an adjacent property, has not been visited in at least 10 years and its current status is unknown. The Knight's Valley occurrence has not been visited since 1998 but without additional surveys it is considered still extant. Therefore, no changes are known to have occurred in the distribution of the species since the time of listing.

Abundance At the time of listing, the Knight's Valley occurrence of *Sidalcea oregana* ssp. *valida* covered less than 0.1 hectare (0.25 acre) and was reported to have fewer than 100 plants in 1979 and 60 plants in 1993. The only survey conducted at this site since the time of listing found 47 plants in 1998 (CNDDB 2008). Prior to the listing, the Kenwood Marsh occurrence contained approximately 130 plants in 1987, 550 plants in 1988, 225 plants in 1989, and 700 plants in 1993 (CNDDB 2008, L. Parsons, pers. comm. 2008). Since the time of listing in 1997, three surveys are known to have been conducted at Kenwood Marsh; 40 plants were found in 1998 (CNDDB 2008), 33 plants were found in 2007 and approximately 24 plants were found in 2008 (K. Symonds, pers. comm., 2008). The trend at both locations has been one of gradual decline. No information on demographic features, such as age structure or seed production, is available.

Habitat or Ecosystem At the time of listing, the species was only known from freshwater marshes at 150 meters (492 feet) in elevation. No additional occurrences have been found since

that time. The species co-occurs at the Kenwood Marsh colonies with *Carex barbarae*, a native sedge, and several nonnative plants including *Rubus discolor* (Himalayan blackberry) and *Holcus lanatus* (velvet grass). No additional information is known about the species' habitat.

Table 1: *Sidalcea oregana* ssp. *valida* occurrences, status 2008; prepared for 5-year review, 2008.

OCCURRENCE (1)	**KNOWN AT LISTING (2)**	**CURRENT THREATS (3)**	**CURRENT CONSERVATION (4)**
Kenwood Marsh EO 1	Kenwood Marsh, south of Kenwood.	Factor A: Changes to hydrology of Kenwood Marsh from water diversion and watershed conversion. Factor C: Herbivory by invertebrates, deer, and small mammals. Factor D: Ability of regulatory mechanisms to protect wetlands is inadequate. Factor E: Invasive plants, climate change, drought, and small population size.	Landowner is working with NRCS, USFWS and CDFG on habitat enhancement/plant propagation. No permanent conservation easement in place.
Knights Valley EO 2	Bavarian Lion Ranch, Knights Valley.	Unknown	Unknown.
Abbreviations: EO = CNDDB Element Occurrence. Plant taxa, animal taxa, and natural communities in the CNDDB are referred to as "elements." An "element occurrence" (EO) is a location record for a site which contains an individual, population, nest site, den, or stand of a special status element. Populations, individuals, or colonies located within 1/4 mile of each other generally constitute a single occurrence, sometimes with multiple "parts."			
Identifications are based on CNDDB names, previous USFWS determinations, location information, and ownership boundaries.			
1. Name of occurrence and CNDDB EO number if assigned.			
2. Information about occurrence as known at listing.			
3. Current threats to the occurrence segregated by listing factor.			
4. Current conservation measures for each occurrence.			

Changes in Taxonomic Classification or Nomenclature No changes to taxonomic classification or nomenclature have occurred since listing.

Genetics No information on genetic variation within the species, *Sidalcea oregana* subsp. *valida,* or among populations is available. However, two studies on the systematics and evolutionary development of the genus *Sidalcea* have been published since the listing (Andreasen and Baldwin 2003 and Andreasen 2005). The results of the studies indicate that the species which consist of *S. oregana* ssp. *spicata, hydrophila,* and *valida* are well supported as a taxonomic group and that their evolution from a common ancestor was recent. Previously it was thought that the genus spread northward from Mexico along two major routes (through the Rocky Mountains and the Sierra Nevada foothills); however, this theory was not supported by their results (Andreasen and Baldwin 2003). Instead, their results indicate that *S. neomexicana,* the most widely-distributed species of *Sidalcea,* originated in California and subsequently became established in southwestern North America and northern Mexico (Andreasen and Baldwin 2003).

Species-specific Research and/or Grant-supported Activities Since 2002, the Natural Resource Conservation Service (NRCS) has been working with the owner of the Deerfield Ranch Winery to implement wetland restoration enhancements (Service, *in litt.* 2007). This project is funded under the Wetlands Reserve Program 10-year Restoration Agreement option. Additionally, the landowner entered into a 10-year Wildlife Extension Agreement with the Service in July 2007 (Service, *in litt.* 2007) as part of the Service's Partners for Fish and Wildlife Program. The Partners Program is providing funding for habitat management and enhancement on the 5.27-hectare (13-acre) portion of the Deerfield Ranch Winery that supports the *Sidalcea oregana* ssp. *valida.* The Partners Program is coordinating with NRCS and CDFG on management and enhancement activities.

Five-Factor Analysis

The following five-factor analysis describes and evaluates the threats attributable to one or more of the five listing factors outlined in section 4(a)(1) of the Act.

FACTOR A: Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

At the time of listing, one of the two occurrences of the species was threatened by permitted and unauthorized water diversions of a stream that flows through Kenwood Marsh. This stream is a tributary to Sonoma Creek. Water diversions had previously removed all water from the stream channel, eliminating a source of water to the marsh (A. Howald, consulting biologist, pers. comm. 2008). In the mid-1800s, Kenwood Marsh was part of a much larger marsh, possibly 400 acres in area (A. Dawson, Sonoma Ecology Center, pers. comm., 2008). Current aerial photographs reveal that much of the contributing watershed to the stream has been converted to vineyards or reservoirs. These changes to the watershed may have ongoing effects to percolation rates and ground water recharge; therefore, dewatering or hydrologic alteration of the Kenwood Marsh site is still considered a threat to the species.

Two of the three colonies of *Sidalcea oregana* ssp. *valida* at Kenwood Marsh are located on Deerfield Ranch Winery property, which is privately-owned. The Deerfield Ranch Winery has been the subject of a section 7 consultation between the U.S. Army Corps of Engineers and the Service for development of an access road and culvert to serve a winery being built on this property (Service, *in litt.* 2004). Due to conservation measures proposed by the landowner (T. Moore, Biologist, NRCS, *in litt.* 2004), the Service determined that the project, which was proposed to fill 0.14 acre of seasonal wetland, was not likely to adversely affect the *S. oregana* ssp. *valida* colonies on the site (Service, *in litt.* 2004). The site has not yet been protected by a permanent conservation easement; however, a wetland restoration and enhancement project at the Deerfield Ranch Winery was begun in 2002. The restoration and enhancement project is funded under the Wetlands Reserve Program 10-year Restoration Agreement option. The NRCS, working in coordination with USFWS and CDFG, is attempting to enhance the marsh hydrology and native plant community, including the habitat for *S. oregana* ssp. *valida* (T. Moore, Biologist, NRCS, *in litt.* 2004; K. Symonds, *in litt.* 2008;). Since 2007, the habitat of the marsh has been improved by the removal of the majority of *Rubus discolor* (Himalayan blackberry).

Additionally, the landowner entered into a 10-year Wildlife Extension Agreement with the Service in July 2007 (Service, *in litt.* 2007) as part of the Service's Partners for Fish and Wildlife Program. The Partners Program is providing funding for habitat management and enhancement on the 13-acre portion of the Deerfield Ranch Winery that supports the *Sidalcea oregana* ssp. *valida*. The Partners Program is coordinating with National Resource Conservation Service and the California Department of Fish and Game on activities such as surveying the colonies, collection of *Sidalcea oregana* ssp. *valida* seed for propagation at the U.C. Berkeley Botanic Garden, and determining future invasive vegetation management actions.

Seed of *Sidalcea oregana* ssp. *valida* has been collected at various times since the listing. Seed collected in 2001 has been accessioned at Rancho Santa Ana Botanic Garden (Rancho Santa Ana Botanic Garden 2008). Seeds have been collected by NRCS and stored at their seed propagation facility near Dixon, California (K. Symonds, *in litt.* 2008). Approximately 4000 seeds were collected in 2007 by staff from the Service and CDFG, from the two colonies at the Kenwood Marsh occurrence. A portion of the 2007 seed has been germinated at the University of California Berkeley Botanic Garden for reintroduction to the Kenwood Marsh site (K. Symonds, in litt. 2008).

FACTOR B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Overutilization for commercial purposes was not known to be a factor in the 1997 final listing rule (Service 1997). Overutilization for any purpose does not appear to be a threat at this time.

FACTOR C: Disease or Predation

At the time of listing, the amount of seed set at both occurrences of the species was potentially threatened by cattle grazing and trampling. Grazing was discontinued on the Deerfield Ranch

Winery portion of Kenwood Marsh in 2000. Since that time, the *Sidalcea oregana* ssp. *valida* at Kenwood Marsh has competed with nonnative plants, particularly *Rubus discolor* and *Holcus lanatus* (velvet grass), and with the native sedge *Carex barbarae*. Although the site is no longer grazed by cattle, herbivory is still occurring and is considered a threat. The two colonies of *Sidalcea oregana* ssp. *valida* at the Deerfield Ranch Winery site have been fenced by the landowner to exclude cattle since 2000; however, damage to the plants within the exclosures by deer (*Odocoileus* sp.), slugs (several genera in the Phylum Mollusca), snails (*Helix aspersa*), spittle bugs (Family Cercopidae), and small rodents, possibly California voles (*Microtus californica*), was observed in 2008 (K. Symonds, pers. comm., 2008). The cattle exclosures may inadvertently provide a refugia for rodents due to the heavy growth of *Carex barbarae* within the exclosures (K. Symonds, pers. comm. 2008; K. Symonds, *in litt.* 2008). *Sidalcea oregana* ssp. *valida* plants that germinated in 2007 outside of the cattle exclosures were marked with pinflags in 2007 but the plants did not reappear in 2008, possibly from being eaten by herbivores or being overgrown by *Carex barbarae* (K. Symonds, pers. comm. 2008; K. Symonds, *in litt.* 2008).

FACTOR D: Inadequacy of Existing Regulatory Mechanisms

At the time of listing, regulatory mechanisms thought to provide inadequate protection for *Sidalcea oregano* ssp. *valida* included: (1) listing under the California Endangered Species Act (CESA); (2) the California Environmental Quality Act (CEQA); (3) the California Native Plant Protection Act; and (4) the Clean Water Act;. The listing rule (Service 1997) provides an analysis of the level of protection that was anticipated from those regulatory mechanisms. This analysis appears to remain currently valid for those laws with the exception of the Clean Water Act. At the time of listing, California Department of Fish and Game proposed to purchase a 37-acre site supporting the species; however, this acquisition did not take place.

Federal Laws and Regulations

Endangered Species Act: The Endangered Species Act of 1973, as amended (Act), is the primary Federal law that provides protection for *Sidalcea oregano* ssp. *valida*. 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, the take prohibition does not apply to plants. 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, or in the course of any violation of a state criminal trespass law. 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. Federally listed plants may be incidentally protected in areas where they co-occur with federally listed wildlife species. In some cases, federally listed plants are included as covered species in habitat conservation plans (HCPs) prepared by non-Federal applicants as part of the terms and conditions for issuance of an incidental take permit for federally listed wildlife under section 10(a)(1)(B).

Clean Water Act: Under section 404, the U.S. Army Corps of Engineers (Corps or USACE) regulates the discharge of fill material into waters of the United States, which include navigable and isolated waters, headwaters, and adjacent wetlands (33 U.S.C. 1344). In general, the term "wetland" refers to areas meeting the Corps's criteria of hydric soils, hydrology (either sufficient annual flooding or water on the soil surface), and hydrophytic vegetation (plants specifically adapted for growing in wetlands). Any action with the potential to impact waters of the United States must be reviewed under the Clean Water Act, National Environmental Policy Act, and Endangered Species Act. These reviews require consideration of impacts to listed species and their habitats, and recommendations for mitigation of significant impacts.

The Corps interprets "the waters of the United States" expansively to include not only traditional navigable waters and wetlands, but also other defined waters that are adjacent or hydrologically connected to traditional navigable waters. However, recent Supreme Court rulings have called into question this definition. On June 19, 2006, the U.S. Supreme Court vacated two district court judgments that upheld this interpretation as it applied to two cases involving "isolated" wetlands. Currently, Corps regulatory oversight of such wetlands (e.g., vernal pools) is in doubt because of their "isolated" nature. In response to the Supreme Court decision, the Corps and the U.S. Environmental Protection Agency (USEPA) have recently released a memorandum providing guidelines for determining jurisdiction under the Clean Water Act. The guidelines provide for a case-by-case determination of a "significant nexus" standard that may protect some, but not all, isolated wetland habitat (USEPA and USACE 2007). The overall effect of the new permit guidelines on loss of isolated wetlands, such as vernal pool habitat, is not known at this time.

Nationwide permit No. 26, under section 404 of the Clean Water Act, was established by the U.S. Army Corps of Engineers (Corps) to facilitate issuance of permits for discharge of fill into wetlands. Under the regulations at the time of listing, these nationwide permits could be issued for fill of up to 1.2 hectare (3 acres) of wetlands. For wetland fill of less than 0.13 hectare (0.33 acre) only an after-the-fact report was required to be submitted to the Corps. Thus for *Sidalcea oregano* ssp. *valida*, which occupies wetlands less than 1.3 hectare (0.33 acre) in size, the *post facto* reporting was considered inadequate to prevent extinction of the species. In 2000; however, Nationwide Permit No. 26 expired and new replacement Nationwide Permits were issued. Nationwide permit No. 29 covers residential developments and Nationwide permit No. 39 covers commercial and institutional developments (USACE 2008).

State Law and Regulations

California Endangered Species Act (CESA) and Native Plant Protection Act (NPPA): The CESA (California Fish and Game Code, section 2080 *et seq.*) prohibits the unauthorized take of State-listed threatened or endangered species. The NPPA (Division 2, Chapter 10, section 1908) prohibits the unauthorized take of State-listed threatened or endangered plant species. The CESA requires State agencies to consult with the California Department of Fish and Game on activities that may affect a State-listed species and mitigate for any adverse impacts to the species or its habitat. Pursuant to CESA, it is unlawful to import or export, take, possess, purchase, or sell any species or part or product of any species listed as endangered or threatened.

The State may authorize permits for scientific, educational, or management purposes, and to allow take that is incidental to otherwise lawful activities. *Sidalcea oregana* ssp. *valida* is State-listed as endangered.

Furthermore, with regard to prohibitions of unauthorized take under NPPA, landowners are exempt from this prohibition for plants to be taken in the process of habitat modification. Where landowners have been notified by the State that a rare or endangered plant is growing on their land, the landowners are required to notify the California Department of Fish and Game 10 days in advance of changing land use in order to allow salvage of listed plants. It is unknown whether salvage of *Sidalcea oregana* ssp. *valida* is likely to be successful.

California Environmental Quality Act (CEQA): The CEQA requires review of any project that is undertaken, funded, or permitted by the State or a local governmental agency. If significant effects are identified, the lead agency has the option of requiring mitigation through changes in the project or to decide that overriding considerations make mitigation infeasible (CEQA section 21002). Protection of listed species through CEQA is, therefore, dependent upon the discretion of the lead agency involved.

FACTOR E: Other Natural or Manmade Factors Affecting Its Continued Existence

At the time of listing, threats to *Sidalcea oregana* ssp. *valida* under Factor E were loss of both occurrences from natural events because of small population size exacerbated by drought and water diversions. Small population size was identified as a threat due to increased susceptibility to extirpation from random events and increased genetic drift and inbreeding leading to a loss of fitness (genetic contribution to future generations). Reduced genetic variation in small populations may make any species less able to successfully adapt to future environmental changes (Ellstrand and Elam 1993). In addition, the occurrences were being encroached upon by invasive weeds, including *Centaurea solstitialis* (yellow star-thistle) and *Rubus* sp. (blackberry). One colony was damaged by an off-road vehicle during maintenance of a local aqueduct.

The threat to the species from natural events because of small population size exacerbated by drought is unchanged. The number of occurrences of the species remains unchanged (two occurrences) and the numbers of plants in the Kenwood Marsh occurrence have remained low since the listing. As discussed previously, the most recent survey results report that approximately 47 plants were found at Knight's Valley in 1998 and 33 plants were found in 2007 and approximately 24 plants found in 2008 at Kenwood Marsh. The threat from encroachment and competition with invasive plants also remains unchanged. *Centaurea solstitialis* does not appear to be a dominant species at Kenwood Marsh. However *Rubus discolor*, although it has been reduced as previously discussed, will likely require continuous maintenance. Additional plant species also threaten *S. oregana* ssp. *valida* including *Carex barbarae* and *Holcus lanatus*.

An additional threat to the species noted since the listing is climate change. Impacts to the species under predicted future climate change are unclear. A trend of warming in the mountains of western North America is expected to decrease snowpack, hasten spring runoff, and reduce summer stream flows (IPCC 2007). Increased summer heat may increase the frequency and

intensity of wildfires (IPCC 2007). While it appears reasonable to assume that the species may be affected, we lack sufficient certainty on knowing how and how soon climate change will affect the species, the extent of average temperature increases in California/Nevada, or potential changes to the level of threat posed by drought or fire. The most recent literature on climate change includes predictions of hydrological changes, higher temperatures, and expansion of drought areas, resulting in a northward and/or upward elevation shift in range for many species (IPCC 2007); higher elevation habitat could be important to the future conservation of this species. Rapid climate change may place native species with long generation times at a disadvantage because they cannot quickly move into newly suitable habitat. However, invasive plants that are capable of rapid dispersal and are tolerant of a wide range of climates will be at an advantage as they will be able to shift ranges quickly (Dukes and Mooney 1999). In addition, invasive species, such as *Bromus tectorum* (cheatgrass), *Pueraria lobata* (kudzu), and *Lonicera japonica* (Japanese honeysuckle) have been shown to respond positively to increased carbon dioxide concentration when grown under controlled conditions (Dukes and Mooney 1999). It is difficult to predict which species now co-occurring with *Sidalcea oregana* ssp. *valida* may become invasive and which invasive species may become more severe. Currently several invasive nonnative plants (discussed in Factor C.) are established in Kenwood Marsh and are already invading the habitat of *S. oregana* ssp. *valida.* These nonnative plants may respond positively to further drying of the marsh and increased atmospheric carbon dioxide concentration. We have no knowledge of more detailed climate change information specifically for this species' range.

III. RECOVERY CRITERIA

No approved final or draft recovery plan for *Sidalcea oregana* ssp. *valida* has been completed or is in preparation.

IV. SYNTHESIS

At the time of listing in 1997, two occurrences of *Sidalcea oregana* ssp. *valida* were known to exist in Sonoma County with a total of 130 plants according to 1993 surveys. Currently the two occurrences are still considered extant and no additional occurrences have been found. The Kenwood Marsh occurrence had approximately 24 plants in 2008. The Knight's Valley occurrence has not been visited or surveyed since 1998 when 47 plants were found. Without further information, the Knight's Valley occurrence is presumed extant; however its condition and current threats are unknown. The small number of populations, small number of plants, and potential effects from drought and climate change continue to threaten the species. The Kenwood Marsh occurrence remains threatened by invasive, competitive plant species, herbivory by mammals and invertebrates, and lack of reproductive success in the field among other threats. The Kenwood Marsh occurrence is the subject of enhancement and management efforts by NRCS, CDFG, the Service and the landowner. Even with the efforts of the agencies and the landowner, control of the competitive plants will likely be a continuous, on-going effort. The status of the species remains endangered due the low numbers of individuals, low numbers of occurrences, and lack of information since 1998 about one of the two known occurrences of the

species. Therefore, we believe *Sidalcea oregana* ssp. *valida* still meets the definition of endangered, and recommend no status change at this time.

V. RESULTS

Recommended Listing Action:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist (indicate reason for delisting according to 50 CFR 424.11):
    ____ *Extinction*
    ____ *Recovery*
    ____ *Original data for classification in error*
__X__ No Change

New Recovery Priority Number and Brief Rationale: No change is recommended.

VI. RECOMMENDATIONS FOR ACTIONS OVER THE NEXT 5 YEARS

1. The Service, NRCS, CDFG, and the landowner should continue to manage the Deerfield Ranch Winery site for control of invasive plants, including *Rubus discolor*, *Carex barbarae* and *Holcus lanatus*. The following are highest priority management and restoration actions:

    a. Collect and propagate *Sidalcea oregana* ssp. *valida* seeds for outplanting into the Deerfield Ranch Winery site. Specifically, the plants should be planted into the area currently supporting *Juncus* sp. (rush), downgradient from the *Sidalcea oregana* ssp. *valida* occurrence.

    b. Collect and propagate *Sidalcea oregana* ssp. *valida* seeds for outplanting into the Deerfield Ranch Winery site in suitable locations north of the old railroad grade.

    c. Cut back willows (*Salix* sp.) to allow expansion of potential *Sidalcea oregana* ssp. *valida* habitat.

    d. Control invasive plants, including *Holcus lanatus* (velvet grass), *Phalaris aquatica* (Harding grass), and *Festuca arundinacea* (tall fescue), in the general Deerfield Ranch Winery site and at outplanting sites. At a minimum, cut *H. lanatus* in late spring to prevent seed production and dispersal.

2. A perpetual conservation easement with an endowment for management in perpetuity should be placed on the 13-acre Deerfield Ranch Winery site that is the subject of agreements with NRCS and the Service.

3. The third colony at the Kenwood Marsh site should be surveyed. If the landowner is willing, a management plan should be developed and implemented by the Service, CDFG, and NRCS.

4. The Knights Valley occurrence should be visited and surveyed by CDFG and or the Service. If the landowner is willing, a management plan should be developed and implemented by the Service, CDFG, and NRCS

VII. REFERENCES CITED

References Cited

Andreasen, K. 2005. Implications of molecular systematic analyses on the conservation of rare and threatened taxa: Contrasting examples from Malvaceae. Conservation Genetics. 6: 399-412.

Andreasen, K. and B. Baldwin. 2003. Reexamination of relationships, habital evolution, and phylogeography of checkermallows (*Sidalceae*;Malvaceae) based on molecular phylogenetic data. American Journal of Botany. 90(3): 436-444.

[CNDDB] California Natural Diversity Database. 2008. Natural Heritage Division. California Department of Fish and Game, State of California. Element Occurrence Reports for *Sidalcea oregana* ssp. *valida*. Unpublished cumulative data current to 2008.

Dukes, J. S. and H. A. Mooney. 1999. Does global change increase the success of biological invaders? Trends in Ecology and Evolution. 14(4): 135-139.

Ellstrand, N. C. and D. R. Elam. 1993. Population genetic consequences of small population size: Implications for plant conservation. Annual Review of Ecology and Systematics 24: 217-242.

[IPCC] Intergovernmental Panel on Climate Change. 2007. Climate change 2007: the physical science basis. Summary for policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC Secretariat, World Meteorological Organization and United Nations Environment Programme, Geneva, Switzerland.

Rancho Santa Ana Botanic Garden. 2008. http://www.rsabg.org/content/view/29/52/ Accessed June 12, 2008.

[USACE] U.S. Army Corps of Engineers. 2008. http://www/spk.usace.army.mil//organizations/cespk-co/regulatory/nwp.html. Accessed December 9, 2008.

[USEPA and USACE] U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. 2007. Memorandum: Clean Water Act jurisdiction following the U.S. Supreme Court's decision in Rapanos v. United States and Carabell v. United States. June 5, 2007.

[Service] U.S. Fish and Wildlife Service. 1997. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Nine Plants from the Grasslands or Mesic Areas of the Central Coast of California. Federal Register 62: 55791-55808.

In Litteris

Moore, Thomas. 2004. Bay Delta Cluster Biologist, Natural Resource Conservation Service. Letter to Dan Buford, Chief, Coast Bay Delta Branch, Sacramento Fish and Wildlife Office. August 13, 2004.

Ochoa, Ed and James Potter. 2008. Deputy Attorney General, State of California. Letter to Field Supervisor of Sacramento Fish and Wildlife Office. May 5. Subject: Comments on 5-Year Reviews - Global Warming Impacts.

Symonds, Kate. 2008. Biologist, U.S. Fish and Wildlife Service. Notes from February 26, 2008, site visit to Deerfield Ranch Winery by land manager, Martin Rex, and staff from the Service, NRCS, and CDFG; various electronic messages to Betty Warne, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office.

[Service] U.S. Fish and Wildlife Service. 2004. Informal Section 7 Consultation for Deerfield Ranch Winery Project in the Town of Kenwood, in Sonoma County California (Service file no. 1-1-03-I-3513).

[Service] U.S. Fish and Wildlife Service 2007. Wildlife Extension Agreement. Kenwood Marsh Restoration at Deerfield Ranch Winery. July 1, 2007 between Robert Rex and the U.S. Fish and Wildlife Service.

Personal Communications

Dawson, Arthur. 2008. Sonoma Ecology Center.

Howald, Ann. 2008. Consulting biologist.

Parsons, Liz. 2008. California Native Plant Society and Kenwood resident.

Symonds, Kate. 2008. Conservation Partnerships Program, U.S. Fish and Wildlife Service.

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW

***Sidalcea oregana* ssp. *valida* (Kenwood Marsh checkermallow)**

Current Classification: Endangered

Recommendation Resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
_X_ No change needed

Review Conducted By: SFWO staff

FIELD OFFICE APPROVAL:

Lead Field Supervisor, U.S. Fish and Wildlife Service

Approve _____ Date 15 June 2009