

Astragalus lentiginosus var. *coachellae*
(Coachella Valley milk-vetch)

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



Astragalus lentiginosus var. *coachellae*, photo by Jon Avery (Service)

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

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5-YEAR REVIEW

Astragalus lentiginosus var. *coachellae* (Coachella Valley milk-vetch)

GENERAL INFORMATION

Species: *Astragalus lentiginosus* var. *coachellae* (Coachella Valley milk-vetch), a plant variety

Date listed under the Endangered Species Act: October 6, 1998

Federal Register listing citation: Service 1998 (63 FR 53596)

Classification: Endangered

Recovery Plan: There is no recovery plan for this variety.

Recovery Priority Number: 12C

Critical Habitat Designation: Service 2013 (78 FR 10449)

BACKGROUND

Under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 et seq.), the U.S. Fish and Wildlife Service (Service), referred to as “we” in this document, maintain lists of endangered and threatened wildlife and plant species (referred to as the List) in the Code of Federal Regulations (CFR) at 50 CFR 17.11 (for wildlife) and 17.12 (for plants). Section 4(c)(2)(A) of the Act requires us to review each listed species' status at least once every 5 years.

Most recent status review: Service. 2009. *Astragalus lentiginosus* var. *coachellae* (Coachella Valley milk-vetch) 5-Year Review: Summary and Evaluation. Prepared by the Carlsbad Fish and Wildlife Office, Carlsbad, California. 29 pp.

We initiated a status review for Coachella Valley milk-vetch in 2006 (Service 2006). The review was finalized on September 1, 2009, and recommended no change in listing status.

Federal Register notice announcing this status review: On May 20, 2021, we published a *Federal Register* notice announcing initiation of the 5-year review of this species, and the opening of a 60-day comment period to receive information (Service 2021). We received no information about Coachella Valley milk-vetch.

Species Overview and Habitat: *Astragalus lentiginosus* var. *coachellae*, a member of the Fabaceae (pea family), is an annual or short-lived perennial endemic to the Coachella Valley, Riverside County in the southern California portion of the western Sonoran Desert. *Astragalus lentiginosus* var. *coachellae* is strongly affiliated with active, stabilized, and shielded sandy substrates (Sanders and Thomas Olsen Associates 1996, pp. 3 and 4). This taxon is primarily found on loose aeolian (wind transported) or alluvial (water transported) sands that are located on dunes or flats and along disturbed margins of sandy washes (Service 2005, p. 75124).

ASSESSMENT

Information acquired since the last status review

This 5-year review was conducted by the Service’s Carlsbad Fish and Wildlife Office. Data for this review were solicited from the public and interested parties through a *Federal Register* notice announcing this review on May 20, 2021 (Service 2021). We also contacted State and Federal partners and species experts to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files.

We received additional survey reports/monitoring reports from the Coachella Valley Conservation Commission (CVCC) (CVCC 2023, pp. 32–36; Sweet et al. 2022, entire). The results indicate the species is still present in previously known populations and the species distribution remains the same as described in our 2009 5-year review. This information does not alter our understanding of the species’ current distribution or status of occurrences.

SUMMARY OF NEW INFORMATION SINCE 2009

Distribution

The last status review (2009) explained the spatial distribution of the Coachella Valley milk-vetch had not changed since listing in 1998, and there is no evidence the species range has changed since the last review (Figure 1; Table 1). As noted in the last status review additional observation locations had been detected within the range of the taxon since listing, however “...it is likely that these occurrences existed at the time of listing, and we are aware of them now because of increased survey efforts.” Therefore, while we are aware of new observation locations within the species range since the last review, we do not believe these reflect increased spatial distribution.

Abundance and Occurrence Status

As explained in the last status review (Service 2009):

- Historical abundances of Coachella Valley milk-vetch plants in occurrences have not been estimated.
- Detecting changes in numbers of individuals over time is difficult because annual germination rates vary widely.
- A portion of the population is a seed bank that can remain dormant for up to 8 years.
- Differences in reporting/defining “occurrences” among databases (Figure 1) make it difficult to discern changes in the number of Coachella Valley milk-vetch occurrences over time.

There is evidence of small-scale shifts in Coachella Valley milk-vetch abundance that may affect population footprints. Coachella Valley Conservation Commission 2022 annual report (CVCC 2022, pp. 35 and 36) discusses a shift in Coachella Valley milk-vetch densities from cluster a cluster near Tipton Road (code “ESF 19-24;” San Gorgonio River/Snow Creek System Occurrence; Figure 1) to another near Gene Autry Trail (“ESF 7-12;” Whitewater River System Occurrence; Figure 1) in east Palm Springs. That is, densities dropped significantly in ESF 19-24

from 2005 to 2022, while they increased significantly in ESF 7-12. ESF 19-24 receives sand from the Windy Point region, dependent on the San Gorgonio Wash sand source, while ESF 7-12 receives its sand from the Whitewater River sand source. Areas along the San Gorgonio Wash have been considerably developed in the last decade and it is unclear if future floods will transport new sands to this area. These density trends indicate compromised sand transport through the San Gorgonio Wash sand corridor (CVCC 2022, p 36) for the San Gorgonio River/Snow Creek System Occurrence.

Though it is difficult to estimate how Coachella Valley milk-vetch abundance has changed since the last review, we do not believe any changes were significant and the distribution remains similar to the previous 5-year review.

Gene Flow

Bees in the family Megachilidae are known to visit *Astragalus lentiginosus* spp. flowers (Hurd 1979, pp. 2022 and 2040); but the primary modern pollinator of Coachella Valley milk-vetch may be nonnative *Apis mellifera* (honeybees) (Meinke et al. 2007, p. 36). Megachilid bee foraging distances are relatively limited, ranging from 197 to 1,970 feet (ft) (60 to 600 meters (m)) on average (Gathmann and Tschardt 2002, pp. 757 and 760; Hofmann et al. 2020, p. 112). Although honeybees are known to forage over 6 miles (9 kilometers) (Beekman and Ratnieks, 2000, p. 490), Coachella Valley milk-vetch usually flowers late winter into April (Meinke et al. 2007, p. 6) when honeybee foraging distances have been recorded averaging less than 0.6 mi (1 km), 5 to >10 times shorter than summer maximums (Beekman and Ratnieks 2000, p. 1; Couvillon et al. 2014, p. 1). Therefore, historical genetic mixing was likely local over relatively short distances (< 1,969 ft (<600 m)), however current mixing via nonnative pollinators may be up to 3,280 ft (1000 m).

Population/Occurrence Definitions

Because the last review in 2009 did not clearly define occurrences, we reviewed existing literature for possible ways to assign putative populations (“occurrence”) membership to mapped observation and collection locations. As populations are defined by frequency of genetic mixing among individuals, we started by reviewing literature on *Astragalus* spp. seed dispersal mechanisms and distances, and pollinator foraging distances.

The Coachella Valley milk-vetch critical habitat rule (Service 2013, pp. 10458 and 10459) grouped occupied habitat areas into essential habitat units by connected fluvial and aeolian sand transport systems. Given the influence of prevailing wind direction (east) and water flow (within creek, wash, and alluvial systems) on seed dispersal, and limited native bee foraging/pollen movement distances, this seemed like a logical way to define historical population distributions/occurrences for the purpose of this status review. System-based occurrences identified in this status review include: San Gorgonia River/Snow Creek System; Whitewater River System; Mission Creek/Morongo Wash System; Thousand Palms System; Painted Canyon Wash System; Tahquitz Canyon Wash System; and Whitewater River South System (Figure 1; Table 1). Occurrence definitions and names correspond with critical habitat units of the same name, where there was no corresponding unit, occurrences were named for the associated fluvial and aeolian sand transport system as in the critical habitat rule.

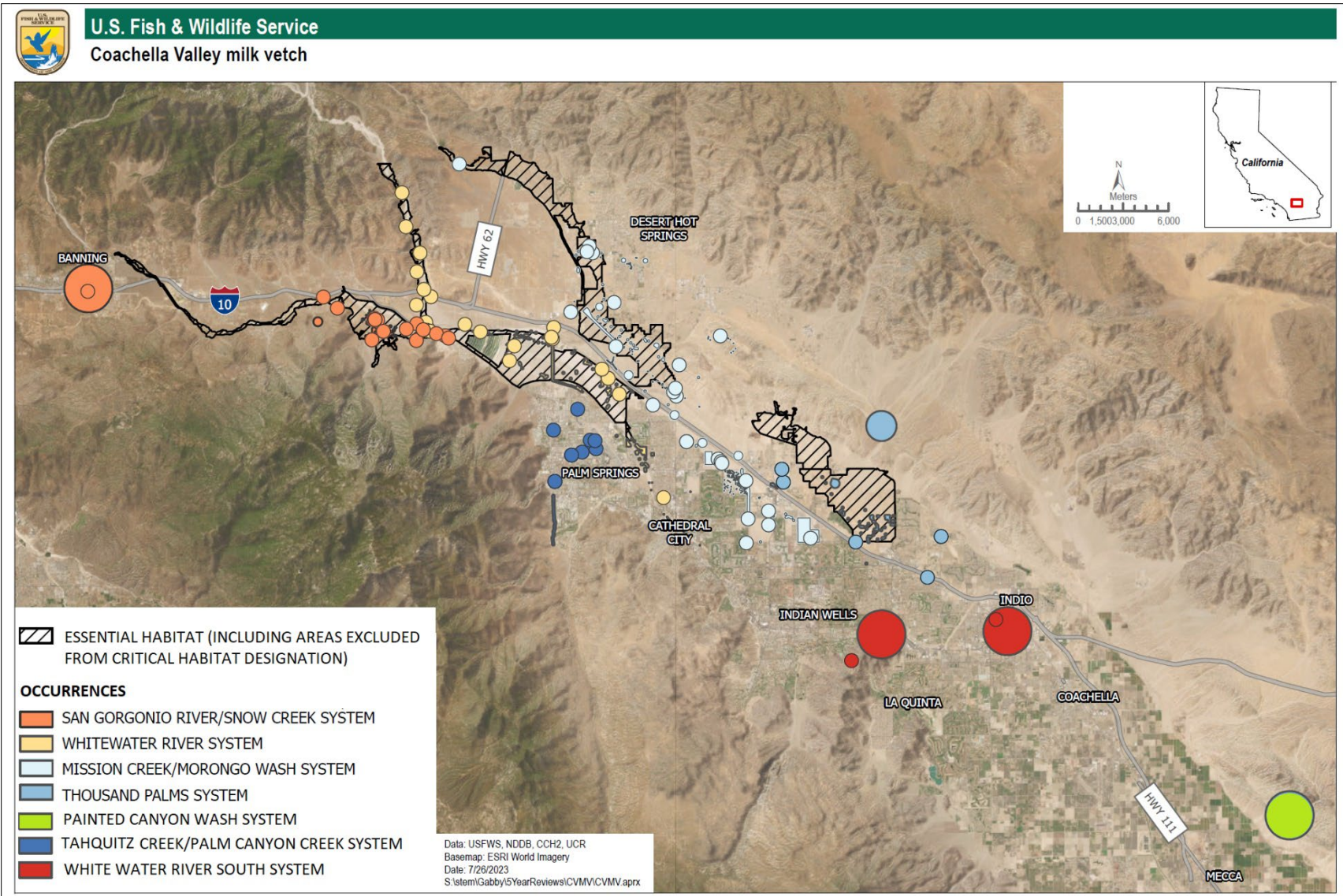


Figure 1. Coachella Valley milk-vetch occurrence and essential habitat. Observation locations are represented differently by California Natural Diversity Database and the California Consortium of Herbaria databases and include redundant records that do not always overlap geographically. Larger circles represent lower geographic accuracy.

Table 1. Coachella Valley milk-vetch occurrence information.

Occurrence ¹	Partially Included in 2013 Critical Habitat Unit	Last Recorded Observation or Collection	2023 Status ²	2009 Status ³	Threats ⁴
San Gorgonio River/Snow Creek System	Unit 1: San Gorgonio River/Snow Creek System	2022	Extant	Extant	ASF, NPI, OHV
Whitewater River System	Unit 2: Whitewater River System	2022	Extant	Extant	OHV, NPI, D, ASF
Mission Creek/Morongo Wash System	Unit 3: Mission Creek/Morongo Wash System	2022	Extant	Extant	OHV, NPI, D, ASF
Thousand Palms System	Unit 4: Thousand Palms System	2020	Extant	Extant	OHV, NPI, D, ST
Tahquitz Creek/Palm Canyon Creek System	None	1978	Extirpated	Extirpated	NA
Whitewater River South System	None	1929	Extirpated	Extirpated	NA
Painted Canyon Wash System ⁵	None	1927	Possibly Extirpated	Possibly Extirpated	OHV

¹ Putative population distributions based on systems used to define critical habitat units.

² Estimated based on state of associated habitat in 2006 imagery. Painted Canyon Wash System Occurrence locations were not mapped.

³ “Extant” are observations within past 8 years; “Possibly Extant” within past 16 years; “Possibly Extirpated” are older than 16 years with sufficient remaining habitat; and “Extirpated” are associated with developed/stabilized habitat. Surveys of locations within Tahquitz Creek/Palm Canyon Creek System Occurrence in 2022 were negative.

⁴ From 2013 critical habitat rule recommended management measures: ASF is altered stream flow; NPI is nonnative plant invasion; OHV is off highway vehicle use; D is development; ST is reduced sand transport.

⁵ CNDDDB database says it needs fieldwork, no known negative surveys.

Threats

Threats to the Coachella Valley milk-vetch have not changed significantly since the last review. Ongoing development in the City of Desert Hot Springs impacts occupied habitat at two of the four main alluvial sand sources (Mission Creek and Morongo Wash). Previously approved development in the Coachella Valley has altered the sand transport system which results in the continued degradation of Coachella Valley milk-vetch habitat. The continued loss and degradation of habitat, disturbance, fragmentation of populations, and loss or degradation of sand sources and sand transport corridors necessary to sustain remaining habitat and populations of Coachella Valley milk-vetch are essentially rangewide. Stability of landscapes associated with urbanization is contrary to the required dynamic and transitory nature of habitat needed for the variety. Recreational off highway vehicle (OHV) use continues to directly impact Coachella Valley milk-vetch plants by directly destroying them and spreading nonnative invasive plant seeds.

The latest Coachella Valley Multiple Species Habitat Conservation Plan monitoring report also identified nonnative plant species invasion as a threat (Sweet et al. 2022, p. 2), primarily *Brassica tournefortii* (Sahara mustard), but also *Salsola tragus* (Russian thistle), and *Schismus sp.* (Mediterranean grass) (Sweet et al. 2022, p. 8).

Conservation

Coachella Valley Multiple Species Habitat Conservation Plan

The Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP) permits take of covered species for certain covered activities, while conserving covered species and natural communities within the plan boundaries. The overall goal of the CVMSHCP is to “enhance and maintain biological diversity and ecosystem processes while allowing future economic growth” (CVAG 2016, pp. 1–2). The CVCC was established to oversee CVMSHCP implementation.

Our 2009 5-year review discussed the CVMSHCP in detail (Service 2009, pp. 9–21). Under the CVMSHCP, permittees are required to manage and protect 7,176 ac (2,904 ha) of Coachella Valley milk-vetch habitat in exchange for the maximum potential loss of 15,706 ac (6,356 ha) of Coachella Valley milk-vetch habitat. Conserved habitat is being assembled from a reserve system of 21 conservation areas (CVAG 2016, p. 4.1). Conservation areas provide core and other conserved habitat for covered species and conserve natural communities, ecological processes, and biological corridors (CVAG 2016, p. 4.1). Coachella Valley milk-vetch has been recorded in 10 of the 21 conservation areas, and the majority of remaining viable occurrence distributions habitat falls within them (Figure 2).

The CVMSHCP was amended in 2016 to include the City of Desert Hot Springs and Mission Springs Water District as permittees and to analyze additional take of covered species. The amendment resulted in a 3 ac (1.2 ha) loss of modeled habitat for Coachella Valley milk-vetch in the Willow Hole Conservation Area, from 3,039 ac to 3,036 ac (Service 2015b, p. 42). The amendment also added 2 ac (0.8 ha) of additional Coachella Valley milk-vetch habitat in the Upper Mission Creek/Big Morongo Canyon Conservation Area. Within the amendment action area, there are 2,266 ac (917 ha) of designated critical habitat, and approximately 222 ac (89.8

ha) (10 percent) potentially would be lost (Service 2015b, p. 43). The 222 ac (89.8 ha) are located at the edge of Unit 3 in an area surrounded by disturbance; therefore, the loss is not expected to appreciably reduce the ecological function and value of the critical habitat. Our 2015 biological opinion concluded impacts associated with the amendment would not likely jeopardize the continued existence of Coachella Valley milk-vetch or appreciably diminish the value of the physical and biological features essential to the conservation of milk-vetch in the amendment action area (Service 2015b, p. 42–43).

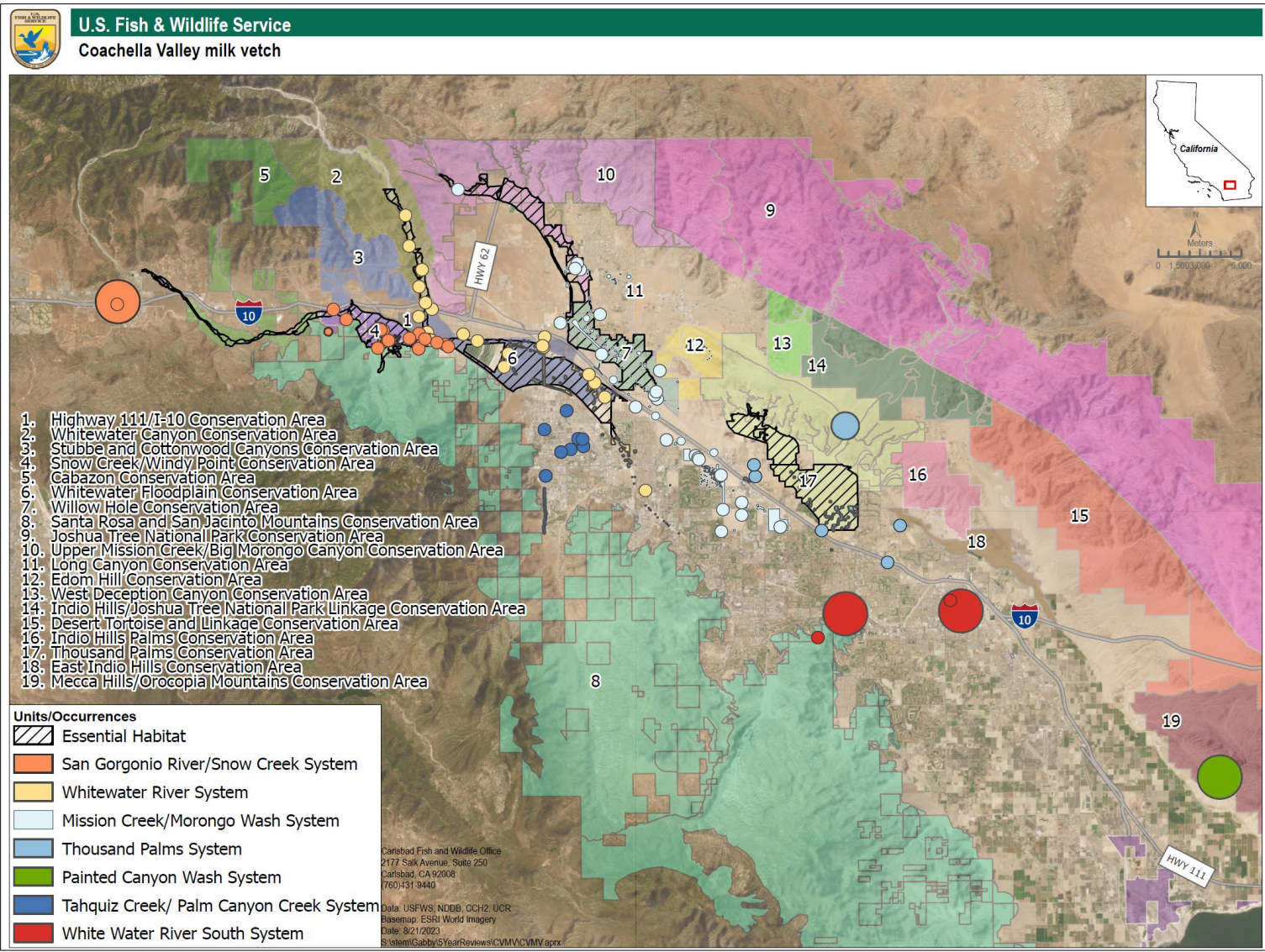


Figure 2. Coachella Valley milk-vetch occurrences, essential habitat, and Coachella Valley Multiple Species Habitat Conservation Plan Conservation Areas.

CONCLUSION

After reviewing the best available scientific information, we conclude that Coachella Valley milk-vetch remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis of the status of the species in our 2009 5-year Review remains an accurate reflection of the species current status.

The new information and updated occurrence statuses do not substantially alter the species' status or the results of our five-factor analysis in the 2009 5-year review. Therefore, we conclude that the Coachella Valley milk-vetch remains a federally endangered variety and recommend no change in listing status.

RECOMMENDATIONS FOR FUTURE ACTIONS

These actions focus on protecting remaining habitat and avoiding future habitat loss, which has always been the primary threat to the Coachella Valley milk-vetch. Based on our synthesis of new information in this 5-year review, recommendations for future actions are listed below.

1. Continue to acquire land to conserve Coachella Valley milk-vetch habitat and protect sand transport systems.
 - a. Support Reserve System assembly to meet CVMSHCP goals and objectives. Conserve additional areas to directly protect occupied habitat, minimize fragmentation and edge effects, create or maintain linkages, and protect ecological processes.
 - b. Identify opportunities for complementary land acquisition outside of conservation areas to maintain or restore habitat connectivity and ecological processes.
 - c. Work with local, State, and Federal partners to identify and leverage funding (i.e., section 6) to acquire occupied and potential habitat including necessary ecological processes to maintain Coachella Valley milk-vetch habitat.
2. Manage Coachella Valley milk-vetch habitat to maintain or restore habitat quality.
 - a. Treat Sahara mustard within and adjacent to Coachella Valley milk-vetch habitat. Manage other nonnative species as needed.
 - b. Plan and implement further dune restoration as needed to maintain habitat and sand source/transport systems.
3. Conduct detailed annual monitoring and investigation of impacts to Coachella Valley milk-vetch due to possible reduced sand transport from San Gorgonio Wash.
 - a. Monitor sand transport through the corridor and deposition in Coachella Valley milk-vetch habitats.
 - b. Monitor Coachella Valley milk-vetch abundance in habitats dependent on the sand corridor.

- c. Monitor measures of suitability in habitats dependent on the sand corridor.
4. Determine if Painted Canyon Wash System Occurrence is extirpated.
- a. Survey for Coachella Valley milk-vetch.
 - b. Assess habitat suitability, in particular sufficient sand transport.

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