# APPENDIX D

## Analysis for NLAA Species and CH

This appendix is referenced in the USFWS Concurrence letter and in Section 1.2 of the Statewide Restoration Programmatic Biological Opinion (PBO), and provides additional supporting information for our concurrence with the Action Agencies on several ESA-listed species and designated critical habitats. The USFWS concurs with the Action Agencies that the Proposed Statewide Restoration Effort may affect, but is unlikely to adversely affect the following species and critical habitats:

1. Howell's spineflower;
2. Palmate-bracted bird's-beak;
3. Pedate checker-mallow;
4. San Bernardino kangaroo rat;
5. Santa Ana River woolly-star;
6. Slender-horned spineflower;
7. Soft bird's-beak and its critical habitat;
8. Sonoma alopecurus;
9. Southwestern willow flycatcher and its critical habitat;
10. Suisun thistle and its critical habitat; and
11. Yellow-billed cuckoo – Western DPS and its critical habitat.

The following sections provide a brief description of the above ESA-listed species and/or their critical habitat, the proposed conservation measures for each species, and the USFWS' additional rationale beyond that contained in Section 1.2 for our concurrence. Any restoration action that is determined to likely adversely affect any of above species or their critical habitat is not covered by the PBO, and must go through an individual section 7 consultation.

## 1. Howell's spineflower (*Chorizanthe howellii*)

## 1.1. Background

### 1.1.1. Listing Status

The Service listed the Howell's spineflower (*Chorizanthe howellii*) as endangered on June 22, 1992 (57 FR 27848-27859). Critical habitat was not designated for this species. The Service issued a recovery plan in 1998 (Service 1998) and 5-year reviews in 2007 (Service 2007), 2011 (Service 2011) and 2019 (Service 2019). The species is listed by the state of California as threatened, and has a California Rare Plant Rank of 1B.2.

### 1.1.2. Life History and Habitat

Howell's spineflower is a small herbaceous annual member of the buckwheat family (Polygonaceae). The species typically blooms from May through July and occurs in semi-stabilized soil in sand dunes, coastal bluffs and coastal prairies. The plants are low growing, typically less than one decimeter (four inches) tall, and approximately one to five decimeters (3.9 – 20 inches) across (Baldwin 2012). What appears to be a spiny flower is in fact mostly the

involucre that surrounds the flower, tipped with six brown, straight spines (awns). The distinguishing morphological feature of Howell's spineflower from other species in this genus is its straight (not hooked) awns (Baldwin 2012).

Howell's spineflower is an annual species, completing its life cycle within one year. Dispersal of seeds is facilitated by the spines (on the involucres) which attach the seed to passing animals. The preference of this species for vegetation gaps or sparsely vegetated areas on sandy substrate allows seedlings to establish in areas that are relatively free from other competing native species. It seldom occurs or persists in dune areas of dense European beachgrass (*Ammophila arenaria*) cover, dense native vegetation cover, or bare, highly mobile sand. It is unknown whether this species forms a dormant soil seed bank. The species occurs in areas of relatively mild maritime climate, characterized by fog and winter rains. The fog helps keep summer temperatures cool and winter temperatures relatively warm and provides moisture in addition to the winter rains.

Howell's spineflower occurs in coastal dunes and adjacent sandy soils of coastal prairies at elevations ranging from sea level to 37 meters (120 feet). In coastal dunes, it is associated with sand verbena (*Abronia latifolia*) and Menzies' wallflower (*Erysimum menziesii*). In coastal prairie habitat, associated plants include two non-native grasses, sweet vernal grass (*Anthoxanthum odoratum*), and velvet grass (*Holcus lanatus*), and two species of special concern, Mendocino coast paintbrush (*Castilleja mendocinensis*) and northcoast phacelia (*Phacelia insularis var. continentis*).

### 1.1.3. Population Status

The species occurs in coastal Mendocino County from southernmost Fort Bragg, California north to the mouth of the Ten Mile River. Historical occurrences are documented from the Fort Bragg headlands north of the Noyo River and the headlands in the vicinity of Jug Handle Creek (approximately 3.5 miles south of Fort Bragg). Most of the current distribution of the species occurs within MacKerricher State Park. The remainder of known populations occur on private ownership along Ward Avenue.

At the time of the recovery plan (1998) Howell's spineflower was estimated to occur on approximately 51 hectares (125 acres) and have an estimated total of 23,700 individuals. The California Department of Parks and Recreation (CDPR) conducted a more precise mapping effort using Global Positioning Systems in 2011 and mapped approximately 5.7 hectares (14 acres) of occupied habitat (Maslach 2011a). They also conducted a population estimate in the same year that resulted in an estimate of 1.04 million plants (95% confidence interval 0.88 –1.20 million) (Maslach, pers. comm. 2011b). We updated mapping for the current distribution on MacKerricher State Park in April 2018 and at that time occupied habitat had increased to approximately 6.3 hectares (15.5 acres). In 2019, we conducted a population estimate using the area mapped in 2018 and yielded an estimated abundance of 2,025,768 plants (95% confidence interval of 1.58 – 2.52 million) (Service 2019).

Howell's spineflower is threatened by development, recreational activities, vehicles, and loss of habitat due to encroachment of invasive, non-native plants.

### 1.1.4. Critical Habitat

No critical habitat has been designated for Howell's spineflower.

### 1.1.5. Recovery Plan Information

The downlisting criteria listed in the recovery plan (Service 1998) include:

1. Habitat occupied by the species that is needed to allow delisting has been secured, with long-term commitments and, if possible, endowments to fund conservation of the native vegetation.
2. Management measures are being implemented to address the threats of invasive species, pedestrians, and off-road vehicles at some sites.
3. Monitoring reveals that management actions are successful in reducing threats of invasive non-native species.
4. Additional restored habitat has been secured, with evidence of either natural or artificial long-term establishment of additional populations, and long-term commitments (and endowments where possible) to fund conservation of the native vegetation.

The general delisting criterion states that full recovery will be achieved when the dune system Howell's spineflower inhabits is secure, with experience to demonstrate that exotic (invasive) plants and other threats (recreational use, off-road vehicles, etc.) are controlled and managers have demonstrated their ability to keep the threats under control. The taxon needs to be secure in the presently occupied range, and opportunities should be taken to introduce these plants to restored habitat in or near its historic range. To be counted toward recovery, (re)introduced populations should be naturally reproducing in vegetation that also appears to be persisting without excessive maintenance. The determination that delisting is possible must be based on at least 15 years of monitoring, to include wet and drought years. Aspects of demography and population biology must be understood to be assured that populations are likely to persist. The species can be considered for delisting when sites are secure from habitat modification (development), occupied habitat is stable or improving, and free of weed invasion.

The specific delisting criterion requires that restoration of habitat at MacKerricher State Park and the vicinity (Ten Mile Dunes), including eradication of European beachgrass and expansion of populations into restored habitat, has been accomplished. Monitoring and history studies should, by then, demonstrate that the area occupied by the plant is increasing and that populations are not being lost to recreational activity.

### 1.1.6. Environmental Baseline

Howell's spineflower only exists within the Action Area (California). As such the information above serves as the environmental baseline for this species.

## 1.2. Analysis

### 1.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Howell's spineflower faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non- native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

## 1.3. Conservation/Protection Measures

The risk of the adverse effects described above to Howell's Spineflower from the proposed action is minimal due to the general and specific plant protective measures described below. The General Plant Protection Measures (PLANT-1 through PLANT-8) described in the PBA include habitat assessments and surveys, exclusion buffers, seasonal avoidance measures, biological monitoring and herbicide restrictions will minimize the potential for these negative effects. The following protective measures are intended to avoid any impacts to the species:

> ***PLANT3, Exceptions to Work Restrictions in the Exclusion Buffer.*** If a USFWS-Approved Biologist determines that some work activities can take place within the exclusion buffer described in Measure PLANT3 without causing any adverse direct or indirect impacts to Covered plants identified for avoidance, those approved work activities may be conducted within the exclusion buffer. Covered vernal pool plants will be clearly marked by a USFWS-Approved Biologist prior to worker entry into the exclusion buffer. Workers may only enter the exclusion buffer when accompanied by a Qualified Biologist, and all work within the exclusion buffer will be monitored by a Qualified Biologist. Based on the results of the botanical surveys, complete avoidance of populations onsite during their respective blooming periods will be applied for the following four Covered plant species with limited populations: Ben Lomond spineflower, soft bird's-beak, Suisun thistle, and Howell's spineflower.
>
> ***PLANT-4, Additional Seasonal Avoidance of Vernal Pool Plant Species and Other Covered Annual and Perennial Species Beyond the Exclusion Buffer.***
>
> > ***For Other Covered Annual Species****:* To avoid impacts to other Covered annual plant species, work will be timed to occur after plants have set seed and senesced, avoid soil disturbance, and avoid actions that have the potential to reduce habitat quality. This measure is not applicable to Menzies' wallflower (a monocarpic perennial), which can live many years as a small rosette before flowering. Optimal work windows are August 1 through October 31 for Howell's spineflower. Known occupied habitat, as it is displayed in CNDDB for Howell's spineflower, will be avoided. If a project would occur in known occupied habitat of Howell's spineflower species, then the Project Proponent should consult with the appropriate USFWS FWO individually for a potential "Likely to Adversely" LAA determination.

## 1.4. Conclusion

Howell's spineflower has a very limited distribution and the above conservation measures ensure that any restoration project will not cause adverse effects to Howell's spineflower. All potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect Howell's spineflower.

## 1.5. Literature Cited

Baldwin, B.G., D.H. Goldsman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (Eds.). 2012. The Jepson manual: vascular plants of California, second edition. University of California Press, Berkeley.

Maslach, B. 2011a. GIS shapefiles showing Chorizanthe howellii occupied polygons within MacKerricher State Park. California Department of Parks and Recreation, Mendocino.

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--------. 2019. Howell's spineflower 5-Year Review: Summary and Evaluation. Arcata Fish and Wildlife Office. Arcata, California.

# 2. Palmate-bracted bird's beak (*Chloropyron palmatum*)

## 2.1. Background

### 2.1.2. Listing Status

The Service listed this species as endangered on July 1, 1986, California/Nevada (Region 8) (USFWS, 2015).

### 2.1.3. Life History and Habitat

This species is an annual herb in the broomrape family (Orobanchaceae) (Olmstead et al. 2001). The plants are 4-12 inches tall and highly branched. The stems and leaves are grayish green and sometimes are covered with salt crystals excreted by glandular hairs. Small pale whitish flowers, up to 1-inch long, are arranged in dense clusters (spikes) and are densely surrounded by herbaceous leaf-like bracts. The petals are divided into two lips. The upper one is shaped like a bird's beak, leading to the common name of the genus. (USFWS, 2009).

Tank et al. (2009) moved four species of Cordylanthus (*maritimus, mollis, palmatus,* and *tecopensis*) to Chloropyron. (NatureServe, 2015).

Bumblebees (*Bombus californicus*, *B. occidentalis*, and *B. vosnesenskii*) were the primary pollinators of palmate-bracted bird's beak at the Springtown Alkali Sink in 1993 (USFWS, 1998).

This species flowers from May until October (Skinner and Pavlik 1994). Seasonal overland flooding may disperse seeds and promote seed germination by diluting the saline soils (Coats et al. 1993). Both self- and cross-pollination can contribute to seed-set (Center for Conservation Biology 1993j), and individual plants can produce up to 1,000 seeds in a single growing season (Center for Conservation Biology 1991).

Palmate-bracted bird's beak is restricted to seasonally-flooded, saline-alkali soils in lowland plains and basins at elevations of less than 155 meters (500 feet). It occurs in a mosaic pattern of small and isolated patches. Within these areas, palmate-bracted bird's beak grows primarily along the edges of channels and drainages, with a few individuals scattered in seasonally-wet depressions, alkali scalds (barren areas with a surface crust of salts), and grassy areas. Suitability of microhabitats for palmate-bracted bird's beak depends primarily on soil pH and to a lesser extent on soil layering, salinity, and moisture. This species occurs on neutral to alkaline soils (pH 7.2 to 9.5) under natural conditions (USFWS, 1998 and USFWS, 2009).

Historically, the species is known from scattered locations in the Sacramento and San Joaquin Valleys (Bittman 1985, 1986; Center for Conservation Biology 1991, 1992, 1993, 1994) (USFWS,2009). The species ranges from the northern Sacramento Valley south to the San Joaquin Valley (USFWS, 2009).

### 2.1.4. Population Status

The palmate-bracted bird's beak has declined significantly over the past century. Several palmate-bracted bird's beak species experts have suggested that (a) except, perhaps, for Sacramento National Wildlife Refuge Complex there are fewer palmate-bracted bird's beak today than when the species was originally listed and (b) population trends are down. Of the eight known occurrences (up to 10 populations reported historically), five are located on public lands and are protected from development. The constrained dispersal abilities of *C. palmatus* can limit its ability to withstand changes in climate. (USFWS, 2009)

### 2.1.5. Critical Habitat

No critical habitat has been designated for Palmate-bracted bird's beak.

### 2.1.6. Recovery Plan Information

The reclassification and delisting criteria for this species (USFWS, 2009) include the following:

*Reclassification Criteria:*

1. Protection of occupied habitat A) 95 percent of occupied habitat on public lands is secured and protected, and B) 75 percent or more of the population at Springtown Alkali Sink and 75 percent or more of the occupied area and upland habitat for pollinators within 300 meters (984 feet) of the population margins is secured and protected, and C) Two or more populations are secured and protected in the San Joaquin Valley.
2. A management plan that includes the survival of palmate-bracted bird's-beak as an objective has been approved and implemented for all protected areas identified as important to continued survival.
3. The populations are stable or increasing through a precipitation cycle.

*Delisting Criteria:*

1. Eight or more distinct populations, including two or more in the San Joaquin Valley are secured and protected.
2. 95 percent or more of the occupied habitat [under Service ownership] of Colusa National Wildlife Refuge, Delevan National Wildlife Refuge, and Sacramento National Wildlife Refuge is secured and protected.
3. 95 percent or more of the occupied habitat [under CDFG ownership] of the Alkali Sink Ecological Reserve-Mendota Wildlife Area (San Joaquin Valley) is secured and protected.
4. 260 hectares (640 acres) or more of any occupied habitat [under any ownership] elsewhere in the San Joaquin Valley, including western Madera County, is secured and protected.
5. 90 percent or more of the plants and occupied habitat [under ownership by City of Livermore, Federal Communications Commission, or private] of the Springtown Alkali Sink is secured and protected.
6. Two or more distinct populations each about 260 hectares (640 acres) [under any ownership] in the Sacramento Valley are protected.
7. A management plan has been approved and implemented for all protected areas identified as important to the continued survival of the species.
8. There is no decline after downlisting. If the population is declining, then the Service should determine the cause and reverse the trend.

### 2.1.7. Environmental Baseline

Palmate-bracted bird's beak only exists within the Action Area (California). As such the information above serves as the environmental baseline for this species.

## 2.2. Analysis

### 2.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Palmate-bracted bird's beak faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non- native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 2.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to palmate-bracted bird's beak from the proposed action is avoided by the general and specific plant protective measures. The General Plant Protection Measures (PLANT-1 through PLANT-6) described in the PBO and PBA include habitat assessments and surveys, exclusion buffers, seasonal avoidance measures, biological monitoring and herbicide restrictions. These measures or alternate measures proposed by the Project Proponent must be used to avoid adverse effects. If adverse effects cannot be avoided, separate consultation with the USFWS is necessary.

## 2.3. Conclusion

Palmate-bracted bird's beak has a very limited distribution and the above conservation measures ensure that any restoration project will not cause adverse effects to palmate-bracted bird's beak. All potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect palmate-bracted bird's beak.

## 2.4. Literature Cited

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USFWS. 2015. Environmental Conservation Online System (ECOS) – Species Profile. http://ecos.fws.gov/speciesProfile/. Accessed April 2016.

USFWS 2009. Palmate-bracted bird's-beak (*Cordylanthus palmatus* = *Chloropyron palmatum*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office Sacramento, California

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USFWS. 1998. Recovery Plan for Upland Species of the San Joaquin Valley, California. Region 1 U.S. Fish and Wildlife Service Portland, Oregon

USFWS. 2009. Palmate-bracted bird's-beak (*Cordylanthus palmatus = Chloropyron palmatum*) 5- Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office Sacramento, California

# 3. Pedate checker-mallow (*Sidalcea pedata*)

## 3.1. Background

### 3.1.2. Listing Status

Pedate checker-mallow was federally listed as endangered on August 31, 1984, because over 85 percent of the historic meadowland habitat for this plant has been eliminated by dam construction and urban and commercial development and most of the remaining habitat in its limited range was subject to development and/or adverse modification (49 FR 34497).

### 3.1.3. Life History and Habitat

Pedate checker-mallow is a multi-stemmed perennial herb in the Malvaceae (mallow family) that is restricted to the moist alkaline meadows of the Big Bear Valley of San Bernardino County, California. Pedate checker-mallow is gynodioecious, meaning there are plants with both female and hermaphrodite flowers and plants with female flowers only. The most common visitors to pedate checker-mallow appear to be generalist bees, predominantly in the genus *Osmia*. Pedate checker-mallow also attracts one specialist pollinator, the female of the bee species *Diadasia nigrifrons* (Anthrohoridae). Pedate checker-mallow seeds are small, and dispersal appears to be limited to the area surrounding the parent plant (Service 2011).

Pedate checker-mallow is found towards the drier edges of moist meadows, or drier sparsely vegetated meadows dominated by *Artemisia rothrockii* (basin sagebrush). These preferred areas are characterized by annual saturation of the soil but not to the extent that denser, more water tolerant vegetation intrude. However, pedate checker-mallow is an obligate wetlands indicator (i.e., it almost always occurs under natural conditions in wetlands) (Service 2011).

### 3.1.4. Population Status

At the time of listing, there were 19 known extant occurrences of pedate checker-mallow at three locations, including near Bluff Lake, Baldwin Lake, and the south shore of Big Bear Lake. Currently, there are 25 occurrences of pedate checker-mallow. Nine are extant, seven are presumed extant, one is possibly extirpated, and eight are extirpated (Service 2021).

Development remains a concern for pedate checker-mallow, but we don't have recent reports of impacts due to this threat. In addition, acquisitions of land at Metcalf Meadow and Little Metcalf

Meadow have reduced this threat. Altered hydrology, off-highway vehicle use, nonnative plants, and climate change continue to be threats (Service 2021).

### 3.1.5. Critical Habitat

No critical habitat has been designated for Pedate checker-mallow.

### 3.1.6. Recovery Plan Information

The Service completed a recovery plan for pedate checker-mallow on July 31, 1998 (USFWS 1998). The delisting criteria include the following:

> 1. Any necessary protection, restoration and enhancement recommended as a result of prescribed research or management contingency plans are successfully completed.
>
> 2. Current and potential threats to populations of pedate checker-mallow at all sites with high or moderate protection priorities have been eliminated.
>
> 3. Natural populations of pedate checker-mallow at all protected sites show positive trends for establishment and recruitment for a minimum of five consecutive generations (at least 15 consecutive years).
>
> 4. Populations of pedate checker-mallow are representative of the current genetic and geographical range of each species and occur in habitats that collectively represent the full range of parameters observed during prescribed research and monitoring efforts.

### 3.1.7. Environmental Baseline

Pedate checker-mallow only exists within the Action Area (California). As such the information above serves as the environmental baseline for this species.

## 3.2. Analysis

### 3.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Pedate checker-mallow faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non- native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 3.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to pedate checker-mallow from the proposed action is avoided by the general and specific plant protective measures. The General Plant Protection Measures (PLANT-1 through PLANT-6) described in the PBO and PBA include habitat assessments and surveys, exclusion buffers, seasonal avoidance measures, biological monitoring

and herbicide restrictions. These measures or alternate measures proposed by the Project Proponent must be used to avoid adverse effects. If adverse effects cannot be avoided, separate consultation with the USFWS is necessary.

## 3.3. Conclusion

Pedate checker-mallow has a very limited distribution and the above conservation measures ensure that any restoration project will not cause adverse effects to pedate checker-mallow. All potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect pedate checker-mallow.

## 3.4. Literature Cited

Service [U.S. Fish and Wildlife Service]. 1998. Recovery plan for the pedate checkermallow (*Sidalcea pedata*) and the slender-petaled mustard (*Thelypodium stenopetalum*). U.S. Fish and Wildlife Service, Portland, Oregon. 62 pp.+Appendices.

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Service [U.S. Fish and Wildlife Service]. 2021. 5-year review *Sidalcea pedata* (pedate checker-mallow). 21 pp.

# 4. San Bernardino kangaroo rat (*Dipodomys merriami parvus*)

## 4.1. Background

### 4.1.2. Listing Status

The San Bernardino kangaroo rat was federally listed as endangered on September 24, 1998, primarily due to habitat loss associated with agricultural, urban, and industrial development and small population size (63 FR 51005). Critical habitat was designated on October 17, 2008 (73 FR 61936).

### 4.1.3. Life History and Habitat

San Bernardino kangaroo rats reside in burrow systems, which appear to be occupied by a single adult. The burrow systems of adults are often clustered, and individuals typically emerge from their burrows after sunset. Typical of kangaroo rats, kangaroo rats are primarily granivorous and often store large quantities of seeds (Service 2009). Although seeds are the primary food source, green vegetation and insects appear to be important seasonal food and water sources. Seed caching may enable them to endure temporary shortages of food, as has been documented for other species of *Dipodomys* (Service 2009).

Although reproductive activities peak in June and July, San Bernardino kangaroo rats appear to have a prolonged breeding season. Pregnant or lactating females have been captured between January and November while males in reproductive condition have been captured between January and August. Females are capable of having more than one litter per year, and litter sizes probably average between two and three young. Kangaroo rat populations typically exhibit large fluctuations in density in response to temporal variability in plant productivity (Service 2009).

The areas which the San Bernardino kangaroo rats occupy are subjected to periodic flooding and hence, the dominant vegetation type (alluvial fan sage scrub) is described in general terms as having three successional phases: pioneer, intermediate, and mature, as determined by elevation and distance from the main channel and time since previous flooding (Service 2009). Thus, flood activity also affects population persistence and temporal changes in abundance. When major floods occur, the actions of moving water and sediment scour out vegetation and rework the sediment deposition patterns within the floodplain. During these events, burrows within the flow path are destroyed, likely drowning animals within them. Hence, local survival of the San Bernardino kangaroo rat is dependent upon the presence of animals in nearby occupied habitat (a 'refugia' population) that is not scoured out during storms. This refugia population typically occurs within alluvial terraces or benches in areas elevated above the main channel and supporting a vegetation community comprised to a large degree of shrubs and short-lived perennial plant species (Service 2009).

### 4.1.4. Population Status

In the final listing rule, we considered that the current range likely encompassed 9,797 acres of habitat with the appropriate soils and vegetative cover to be occupied to some degree by the subspecies as follows: 3,861 acres in the Santa Ana River; 5,161 acres in Lytle and Cajon Creeks; and 775 acres in the San Jacinto River (Service 2009). In the revised critical habitat for the San Bernardino kangaroo rat, we determined that the current range of the species encompasses at least 10,696 acres. While these acres do not encompass all habitat occupied by or suitable for the San Bernardino kangaroo rat, we believe that they do represent much of the remaining occupied habitat (Service 2009).

As identified in the final listing rule, habitat for the San Bernardino kangaroo rat has been severely reduced and fragmented by development, aggregate mining, and related activities in the San Bernardino and San Jacinto valleys (Service 2009). As a result of listing, the Service is working cooperatively with other Federal agencies and local aggregate mining operators to conserve and manage habitat for the San Bernardino kangaroo rat. Thus, the direct threats posed to San Bernardino kangaroo rat from aggregate mining are being addressed. Development within floodplain habitat will continue to increase as a result of population growth within western San Bernardino County and the demand for a larger water supply in southern California. An overall reduction in the amount of habitat available to the San Bernardino kangaroo rat and greater habitat fragmentation will continue to occur. Because of the high level of habitat loss (habitat already reduced by 96% by the time the San Bernardino kangaroo rat was emergency listed), the Service's conservation and recovery strategy is to conserve as much remaining habitat as possible. Management and coordination with Federal, State, and local government agencies and

mining operations will be needed to protect San Bernardino kangaroo rat from habitat fragmentation and loss due to urban development, off-highway vehicle use, trash dumping, aggregate mining, and an increase in predators such as domestic and feral cats associated with urban development (Service 2009).

### 4.1.5. Critical Habitat

Four units of critical habitat were designated in Riverside and San Bernardino counties including the Santa Ana River, Lytle and Cajon Creek, San Jacinto River-Bautista Creek, and the Etiwanda Alluvial Fan and Wash units (73 FR 61936). A determination of likely to adversely affect San Bernardino kangaroo rat was made on the Statewide Restoration Effort. More information on critical habitat can be found in the PBO and Appendix C.

### 4.1.6. Recovery Plan Information

No recovery plan has been developed for this species.

### 4.1.7. Environmental Baseline

Since the San Bernardino kangaroo rat and its designated critical habitat occur entirely within California, the status description above also serves as the baseline for this consultation.

## 4.2. Analysis

### 4.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Upland habitat restoration is not the focus of the restoration activities in this PBO, but adjacent upland areas to aquatic and riparian habitat can experience adverse effects associated with a restoration project. Thus, the San Bernardino kangaroo rat faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non- native vegetation techniques used for establishment, restoration, and enhancement of stream and riparian habitat and upslope watershed sites. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 4.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to San Bernardino kangaroo rat from the proposed action is avoided by the species-specific protective measures described in the PBO and PBA and inserted below. These measures include habitat assessments and surveys, exclusion buffers, and avoidance measures. These measures or alternate measures proposed by the Project Proponent must be used to avoid adverse effects. If adverse effects cannot be avoided, separate consultation with the USFWS is necessary.

***KRAT-1*, *Conduct Habitat Assessment*.** Prior to beginning project activities, a Qualified Biologist will conduct a habitat assessment in potentially suitable habitat in the project footprint to determine presence of kangaroo rat burrows or their sign (e.g., scat, tail drags and tracks, or skeletal remains in owl pellets). The habitat assessment surveys will be conducted within 60 days, and at least 14 days prior to the start of ground-disturbing activities. If no burrows or sign of kangaroo rats are detected, no further measures will be required.

***KRAT-2, Habitat Buffer.*** An exclusionary buffer will be established between noise-generating project activities and occupied, or presumed occupied, habitat. The buffer distance will be determined by the USFWS-Approved Biologist in coordination with the respective USFWS ES Field Office/S7 Delegated Authority Program. A Project Proponent may choose to submit in their ESA Section 7(a)(2) Review Form with their own analysis and buffer recommendations for the USFWS' consideration.

***KRAT-3, Avoidance Areas.*** Based on the results of the habitat assessment and if the exclusionary buffer established by KRAT-2, Habitat Buffer is not sufficient to include the distances described in 3a-3f, in areas where kangaroo rats are present or assumed present,[1] nondisturbance zones will be established prior to ground-disturbing activities.

a. Environmentally Sensitive Areas and/or Wildlife Exclusion (GPM-7) will be done in coordination with a USFWS-Approved Biologist around potentially suitable habitat within the project site boundaries, so that the potentially suitable habitat can be avoided during ground-disturbing activities. Barriers used will not involve trenching.

b. The contractor will maintain the avoidance zones around active burrows identified by a USFWS-Approved Biologist, with a minimum radius of 50 feet measured outward from the burrow entrance or cluster of entrances.

c. Actions in avoidance zones will be limited to essential vehicle and equipment operation on existing authorized roads and foot traffic. Actions in avoidance zones will be confined to daylight hours unless, at the discretion of the Service, operations at other times of day would be beneficial to kangaroo rats.

d. The avoidance zone radius may be altered in consultation with the USFWS, based on publication of new guidance, sensitivity of the site, proximity of existing disturbance, or other factors.

e. If project activities will take place within 50 feet of existing burrow entrances and, in the judgment of the USFWS-Approved Biologist, the combination of soil hardness and activity impact is not expected to collapse those burrows, then those project activities may take place under the supervision of the USFWS-Approved Biologist.

[1] The Project Proponent will assume a species is present in an area when suitable habitat is present within the current range of the species and their absence has not been determined by a negative finding using protocol level surveys.

f. Activities authorized by the USFWS-Approved Biologist within 50 feet of burrow entrances will be documented and reported to USFWS.

***KRAT-4, Minimizing Suitable Habitat Adverse Effects.*** No permanent or temporary loss of San Bernardino kangaroo rat occupied or presumed occupied habitat will occur unless take can be avoided and effects to the habitat are determined to be insignificant at the project level.

***KRAT-5, Minimizing and Avoiding Critical Habitat Adverse Effects.*** No permanent loss of designated critical habitat will occur, unless determined to be insignificant at the project level.

## 4.3. Conclusion

Given the limited distribution of San Bernardino kangaroo rat, all the protective measures to avoid adverse effects to San Bernardino kangaroo rat by the proposed action, the eligibility criteria and prohibited acts, and the anticipated long-term benefits from each project to native habitats and listed species in the long-term, all potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect San Bernardino kangaroo rat.

Please see the PBO regarding San Bernardino kangaroo rat critical habitat.

## 4.4. Literature Cited

Service. (U.S. Fish and Wildlife Service). 2009. San Bernardino kangaroo rat (*Dipodomys merriami parvus*) 5-year Status Review: Summary and evaluation. Carlsbad Fish and Wildlife Office, Department of the Interior. 31 pp.

# 5. Santa Ana River wooly-star (*Eriastrum densifolium* subsp. *sanctorum*)

## 5.1. Background

### 5.1.2. Listing Status

Santa Ana River woolly-star was federally listed as endangered on September 28, 1987, due to encroaching developments within the floodplain, sand and gravel mining, grazing by domestic animals, and competition from exotic plants (52 FR 36265).

### 5.1.3. Life History and Habitat

Santa Ana River woolly-star is a subshrub occasionally reaching 3.3 feet high. They have an average lifespan of five years, with some living 10 years. This subspecies flowers between May

and August, but most heavily in June. Fruiting can extend from mid-July to mid-October (Service 2010). The primary pollinators include the solitary digger bee (*Micranthophora flavocincta*), giant flower-loving fly (*Rhaphiomidas acton* subspecies *acton*), California bumblebee (*Bombus californicus*), white-lined sphinx moth (*Hyles lineata*), black-chinned hummingbird (*Arhilochus alexandri*), and Anna's hummingbird (*Calypte anna*). The relative importance of these pollinators appears to vary with location (USFWS 2010).

Dispersal of seed is limited in the absence of flooding. Most seeds fall within one foot of the parent plant and the wetted seed coat forms a mucilaginous mass that readily attaches the seed to the surrounding soil particles. Those seeds not immediately shed from the fruits are retained within capsules that may remain on the plant for several seasons. In times of flooding, seeds or capsules may be transported down the floodplain for some distance, thereby facilitating some gene flow between populations (Service 2010).

### 5.1.4. Population Status

Santa Ana River woolly-star is endemic to the Santa Ana River drainage of southern California. This subspecies was formerly a conspicuous shrub in the alluvial fan sage scrub community on the higher floodplain terraces of the Santa Ana River and its tributaries in Orange, Riverside, and San Bernardino counties. At listing, there were 11 extant occurrences known, all within San Bernardino County. Since listing, 12 new occurrences were detected, and Santa Ana River woolly-star was also rediscovered within Riverside County just downstream of the border with San Bernardino County. After listing, two occurrences were extirpated by construction. Currently, there are 23 occurrences of Santa Ana River woolly-star. The number of plants in each occurrence varies widely, from two plants to over 5,000 (Service 2010).

At listing, Santa Ana River woolly-star was threatened by habitat loss from encroaching development within the floodplain, and sand and gravel mining. Additional threats impacting occupied habitat include aggregate mining and off-highway vehicle use. Threats identified since listing include hybridization and climate change. Nearly all the historical occurrences (10 of 11 occurrences) have persisted, and 11 of the 12 occurrences identified since listing are extant. Though additional occurrences have been identified since listing, there are few plants at most occurrences, and impacts from development and altered hydrology in the Santa Ana River mainstem and its tributaries have reduced the amount of suitable habitat necessary for the establishment of seedlings. Impacts at some occurrences in Riverside County are protected by the Western Riverside County Multiple Species Habitat Conservation Plan; 3 of the extant occurrences are afforded protection by the plan (Service 2010).

### 5.1.5. Critical Habitat

No critical habitat has been designated for this species.

### 5.1.6. Recovery Plan Information

No recovery plan has been developed for this species.

### 5.1.7. Environmental Baseline

Since the known occurrences of Santa Ana River woolly-star occur entirely within California, the status description above also serves as the baseline for this consultation.

## 5.2. Analysis

### 5.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Santa Ana River wooly-star faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non- native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 5.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to Santa Ana River wooly-star from the proposed action is avoided by the general and specific plant protective measures. The General Plant Protection Measures (PLANT-1 through PLANT-6) described in the PBO and PBA include habitat assessments and surveys, exclusion buffers, seasonal avoidance measures, biological monitoring and herbicide restrictions. These measures or alternate measures proposed by the Project Proponent must be used to avoid adverse effects. If adverse effects cannot be avoided, separate consultation with the USFWS is necessary.

## 5.3. Conclusion

Given the limited distribution of Santa Ana River wooly-star, all the protective measures to avoid adverse effects to Santa Ana River wooly-star by the proposed action, the eligibility criteria and prohibited acts, and the anticipated long-term benefits from each project to native habitats and listed species in the long-term, all potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect Santa Ana River wooly-star.

## 5.4. Literature Cited

Service (U.S. Fish and Wildlife Service). 2010. *Eriastrum densifolium* subsp. *sanctorum* (Santa Ana River woolly-star) 5-year review: summary and evaluation. 30 pp.

# 6. Slender-horned spineflower (*Dodecahema leptoceras*)

## 6.1. Background

### 6.1.2. Listing Status

Slender-horned spineflower was federally listed as endangered on September 28, 1987, due to developments within the floodplain, sand and gravel mining, grazing by domestic animals, and competition from exotic plants (52 FR 36265).

### 6.1.3. Life History and Habitat

Slender-horned spineflower is an annual plant in the Polygonaceae (buckwheat family). Slender-horned spineflower is found in drought-prone habitats where germination is likely related to rainfall. Individual plants are difficult to detect because they are small and occur in relatively small, isolated patches across often extensive floodplain habitat. Additionally, plant densities may be low during drought conditions.

There is no correlation between the numbers of seeds dispersed to the soil and the number of flowering plants the next year, indicating the likely presence of a seed bank. Both demographic and genetic diversity studies indicate that the seed bank is long-lived, although the length of time that individual seeds can remain viable in the ground is unknown. Some level of surface disturbance (e.g., sheet flows or soil disturbances during and following fire) may enhance germination in years following the disturbance (Service 2010).

### 6.1.4. Population Status

At the time it was listed, slender-horned spineflower was reported to be extant at five localities, representing six occurrences, each associated with a separate watershed. The localities included Cajon Creek and the Santa Ana River near Highland in San Bernardino County and near the San Jacinto River, Temescal Creek, and Bautista Creek in Riverside County. The extent of occupied habitat was estimated at less than 10 acres. There are currently 20 known extant occurrences distributed among Los Angeles, San Bernardino, and Riverside counties. Since listing, one occurrence has been extirpated. Additional surveys have detected two occurrences of the species previously thought to have been extirpated and detected 13 previously unknown occurrences. Due to the annual nature of slender-horned spineflower, abundance estimates may be misleading (Service 2010).

While the number of known occurrences has increased since listing, the known extant occurrences are scattered in the watersheds, support different numbers of plants from year to year, and the majority have not been surveyed recently. The primary threats noted in the listing rule, development and mining activities, threaten a smaller proportion of the known occurrences because of the detection of several previously unknown occurrences that are not exposed to these threats. The threat from altered hydrology is essentially rangewide. Regardless, because of the

increase in range and number of extant occurrences since listing, the magnitude of threats to the species is reduced (Service 2010).

### 6.1.5. Critical Habitat

No critical habitat has been designated for this species.

### 6.1.6. Recovery Plan Information

No recovery plan is available for this species.

### 6.1.7. Environmental Baseline

Since the known occurrences of slender-horned spineflower occur entirely within California, the status description above also serves as the baseline for this consultation.

## 6.2. Analysis

### 6.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Slender-horned spineflower faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non-native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 6.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to slender-horned spineflower from the proposed action is avoided by the general and specific plant protective measures. The General Plant Protection Measures (PLANT-1 through PLANT-6) described in the PBO and PBA include habitat assessments and surveys, exclusion buffers, seasonal avoidance measures, biological monitoring and herbicide restrictions. These measures or alternate measures proposed by the Project Proponent must be used to avoid adverse effects. If adverse effects cannot be avoided, separate consultation with the USFWS is necessary.

## 6.3. Conclusion

The slender-horned spineflower has a very limited distribution and the above conservation measures ensure that any restoration project will not cause adverse effects to this species. All potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect slender-horned spineflower.

## 6.4. Literature Cited

Service (U.S. Fish and Wildlife Service). 2010. *Dodecahema leptoceras* (slender-horned spineflower) five-year review: summary and evaluation. 37 pp.

# 7. Soft bird's-beak and Critical Habitat

## 7.1. Background

### 7.1.2. Listing Status

Soft bird's-beak (*Chloropyron molle* subsp. *molle*) was listed as endangered on November 20, 1997, due to threats to habitat loss (Service 1997). The Service designated a critical habitat for the soft bird's-beak on April 12, 2007 (Service 2007).

### 7.1.3. Life History and Habitat

The principal habitat of the soft bird's-beak is the high marsh zone or upper-middle marsh zone of brackish marshes with a full tidal range (Peinado *et al.* 1994). It is rarely found in non-tidal conditions. Abundance is usually greatest in or near the upper-marsh upland ecotone (Chuang and Heckard 1973; Ruygt 1994). Large, dense patches are sometimes found along the margins of emergent salt pans or scalds (Ruygt 1994).

The soft bird's-beak is an annual plant that regenerates from a persistent dormant seed bank. The longevity of the seed bank is unknown. However, some colonies have been observed to fail to emerge for several years and then reappear. Population densities vary from isolated individuals (less than 0.5 per square meter to more than 450 per square meter), with typical densities of 100 to 200 per square meter (Ruygt 1994).

Branching and flower development begin as early as May (Ruygt 1994) and continues throughout the summer. Flower production correlates with branching and plant size (Ruygt 1994; Grewell 2004). Fruits and seeds mature from July to November. However, flowering has been known to occur as late as November, indicating a significant overlap between flowering and fruiting (seed production) time. Some fruits begin to mature around early July.

### 7.1.4. Population Status

There are currently 11 populations with documented occurrences in nine general areas: Rush Ranch, Hill Slough, Joice Island, Benicia State Recreation Area, Point Pinole, Concord Naval Weapons Station, Fagan Slough, McAvoy Boat Harbor, and Denverton. Our understanding of the soft bird's-beak is based on limited and opportunistic survey data. No recent comprehensive range-wide status survey has been conducted for the soft bird's-beak. Today's largest populations are located primarily on old relict tidal marshes in Suisun Marsh. The most recent near-comprehensive census was conducted in 2000 (Service 2013). The census covered Hill Slough

marsh and Rush Ranch, both in Suisun Marsh, Solano County. The largest population was found at Hill Slough Wildlife Area and covered approximately 2 hectares (4.7 acres) (Service 2013). Since then, experimental reintroductions at Rush Ranch have occurred.

Population size and distribution are highly variable among years for this species. Each soft bird's-beak population comprises many shifting colonies or subpopulations. Because colonies may fail to emerge in some years, it can be difficult to determine with confidence when a population has become extirpated.

The Service's 2009 Five-year Review for the soft bird's-beak recommended the soft bird's-beak remain listed as endangered due to the continuation of threats from muting (damping) of tides and salinity, invasive non-native plants, seed predation, sea-level rise predicted to result from global climate change, mosquito abatement, oil spills, and (for these small populations) random events (Service 2009).

### 7.1.5. Critical Habitat

The Service designated critical habitat for soft bird's-beak on April 12, 2007 (Service 2007). The PCEs for the soft bird's-beak were derived from its biological needs. Based on the current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PCEs essential to the conservation of the soft bird's-beak are:

1. Persistent emergent, intertidal, estuarine wetland at or above the mean high-water line (as extended directly across any intersecting channels);
2. Rarity or absence of plants that naturally die in late spring (winter annuals); and
3. Partially open spring canopy cover (approximately 790 nMol/$m^2$/s) at ground level, with many small openings to facilitate seedling germination.

Five units have been designated as critical habitat for soft bird's-beak in Contra Costa, Napa, and Solano Counties, California. Contra Costa, Napa, and Solano Counties have approximately 22 acres, 384 acres, and 1,870 acres of critical habitat, respectively. Common threats that may require special management considerations or protections of the PCEs for soft bird's-beak in all five units include:

1. Mosquito abatement activities (ditching, dredging, and chemical spray operations), which may damage the plants directly by trampling and soil disturbance, and indirectly by altering hydrologic processes and by providing relatively dry ground for additional foot and vehicular traffic.
2. General foot and off-road vehicle traffic through soft bird's-beak populations that could result in their damage and loss in impacted areas.
3. Increases in the proliferation of nonnative invasive plants from human-induced soil disturbances leading to the invasives outcompeting soft bird's-beak.
4. Control or removal of nonnative invasive plants, especially *Lepidium latifolium,* which, if not carefully managed, can damage soft bird's-beak populations through the injudicious application of herbicides by direct trampling, or through the accidental transport of invasive plant seeds to new areas.

5. Presence of *Lipographis fenestrella* (a moth) larvae that could reduce the reproductive potential of soft bird's-beak through flower, fruit, and seed predation.

### 7.1.6. Recovery Plan Information

The Service published the Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California in 2013 (Service 2013). Recovery strategies for *Chloropyron molle* ssp. *molle* includes both long and short-term elements. Immediate steps are needed to protect and maintain the remaining populations and habitat of the species. In the long-term, significant re-expansion of the range and population of the species, with an increase in the extent and quality of its habitat, will foster recovery. Large-scale habitat restoration is needed to allow natural fluctuations in population size and distribution with minimal risk of extinction. However, developing adequate tidal marsh habitat through natural processes will probably take several decades. In the interim, short-term recovery actions are necessary to ensure the species' survival while habitat restoration is underway. Short-term recovery actions should be implemented concurrently with long-term habitat restoration and focus on protecting and managing existing populations and habitats. Recovery strategies include:

- Suppression of invasive non-native plant species,
- Protection and management of nearby native bee and wasp habitats,
- Management of grazing and control of feral pigs to reduce trampling and disturbance,
- Management of vehicle access and recreation,
- Management of urban runoff,
- Restoration of normal tidal range and salinity,
- Seed banking of *C. Molle* ssp. *molle*,
- Monitoring of populations and habitat, and
- Research aspects of the life history of the species.

### 7.1.7. Environmental Baseline

Soft bird's-beak and its critical habitat only exist within the Action Area (California). As such the information above serves as the environmental baseline for this species.

## 7.2. Analysis

### 7.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Soft bird's-beak and its critical habitat faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non-native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 7.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to soft bird's-beak from the proposed action is minimal due to the general and specific plant protective measures described below. The General Plant Protection Measures (PLANT-1 through PLANT-8) described in the PBA include habitat assessments and surveys, exclusion buffers, seasonal avoidance measures, biological monitoring and herbicide restrictions that will minimize the potential for these negative effects. The following protective measure is intended to avoid any impacts to the species:

> ***PLANT-3, Exceptions to Work Restrictions in the Exclusion Buffer.*** If a USFWS-Approved Biologist determines that some work activities can take place within the exclusion buffer described in Measure PLANT-3 without causing any adverse direct or indirect impacts to Covered plants identified for avoidance, those approved work activities may be conducted within the exclusion buffer. Covered vernal pool plants will be clearly marked by a USFWS-Approved Biologist prior to worker entry into the exclusion buffer. Workers may only enter the exclusion buffer when accompanied by a Qualified Biologist, and all work within the exclusion buffer will be monitored by a Qualified Biologist. Based on the results of the botanical surveys, complete avoidance of populations onsite during their respective blooming periods will be applied for the following four Covered plant species with limited populations: Ben Lomond spineflower, soft bird's-beak, Suisun thistle, and Howell's spineflower.

## 7.3. Conclusion

*Species*

Soft bird's-beak has a limited distribution and the above conservation measures, including the complete avoidance of populations onsite during their blooming period, ensure that any restoration project will not cause adverse effects to soft bird's-beak. All potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect soft bird's-beak.

*Critical Habitat*

Impacts to soft bird's-beak critical habitat will be minimized through the combination of the eligibility requirements, prohibited actions, and protective measures. The following prohibited acts minimize impacts to soft bird's-beak critical habitat function: 1) Projects that would result in a net loss of aquatic resource functions and/or services; and 2) Restoration projects that would result in a net loss of designated critical habitat function for any federally listed species. Loss of function is considered in the context of the physical and biological features as described in the respective critical habitat designation and includes abiotic and biotic resources and conditions necessary to support one or more life processes of the species. The USFWS will provide technical assistance to the project proponent to ensure that any potential adverse effects to soft bird's-beak critical habitat will be insignificant or discountable.

## 7.4. Literature Cited


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[Service] U.S. Fish and Wildlife Service. 2013. Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California. U.S. Fish and Wildlife Service, Sacramento, California. xviii + 605 pp. https://ecos.fws.gov/docs/recovery_plan/TMRP/20130923_TMRP_Books_Signed_FINAL.pdf

# 8. Sonoma alopecurus

## 8.1. Background

### 8.1.2. Listing Status

Sonoma Alopecurus was listed as endangered on November 21, 1997 because of habitat destruction and modification due to urbanization, land-use changes, and alterations in hydrology. In addition, at the time of listing, the species was threatened by competition from invasive plant species, trampling and grazing by cattle, and low reproductive success (Service 2011). No critical habitat has been designated for the Sonoma alopecurus (*Alopecurus aequalis var. sonomensis*).

### 8.1.3. Life History and Habitat

*Alopecurus aequalis var. sonomensis* is a tufted perennial in the Poaceae (grass family). The plant occurs in freshwater marshes, swamps, and riparian scrub within Marin and Sonoma Counties, California (Service 2011). Five of six known populations are clustered within a 12-square kilometer (4.6-square mile) area on the Point Reyes Peninsula in Marin County. The only known extant population in Sonoma County is located at Annadel State Park. While the reproductive mechanisms of this species have not been studied, A*lopecurus aequalis var. sonomensis* appears to reproduce both sexually (assumed via wind pollination) and vegetatively (via rhizomes) (Gennet 2004). Flowering begins in mid-May and lasts through August (Gennet 2004).

### 8.1.4. Population Status

*Alopecurus aequalis var. sonomensis* was known from 16 populations in Marin and Sonoma Counties. When the final listing rule was written, *A. aequalis var. sonomensis* was known from eight natural populations. Three of the populations in Sonoma County were privately owned, four were on Federal land within Point Reyes National Seashore (PRNS) in Marin County, California, and one was on a private inholding within the PRNS (Service 1997). Historically, the number of individuals in populations of this taxon has significantly varied between years; for instance, the largest recorded was 600 plants in 1995, and in 1996 there were only 100 (Service 1997). This fluctuation may be attributable to annual habitat characteristics, weather patterns, water level, changing land-use patterns, or inconsistent monitoring and inventory methods (Gennet 2004).

The primary threats to *Alopecurus aequalis var. sonomensis* are habitat destruction and modification due to urbanization, land-use changes, and alterations in hydrology. Most of the historical populations of *Alopecurus aequalis var. sonomensis* experienced dramatic human-influenced land-use changes before their decline or extirpation. Wetland areas had been drained or altered in preparation for constructing structures or buildings; others were fenced and intensively grazed (USFWS, 2011).

In addition, the species is threatened by competition from invasive plant species, trampling and grazing by cattle, and low reproductive success. The invasive emergent wetland species, *Juncus* spp. (rushes) and *Cyperus* spp. (nutsedges) currently impacts and threatens the species (USFWS, 2011).

### 8.1.5. Critical Habitat

No critical habitat has been designated for the Sonoma alopecurus (*Alopecurus aequalis var. sonomensis*).

### 8.1.6. Recovery Plan Information

No recovery plan is available for this species.

### 8.1.7. Environmental Baseline

Sonoma alopecurus only exist within the Action Area (California). As such the information above serves as the environmental baseline for this species.

## 8.2. Analysis

### 8.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Sonoma alopercurus faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non- native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 8.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to Sonoma alopercurus from the proposed action is avoided by the general and specific plant protective measures. The General Plant Protection Measures (PLANT-1 through PLANT-6) described in the PBO and PBA include habitat assessments and surveys, exclusion buffers, seasonal avoidance measures, biological monitoring and herbicide restrictions. These measures or alternate measures proposed by the Project Proponent must be used to avoid adverse effects. If adverse effects cannot be avoided, separate consultation with the USFWS is necessary.

## 8.3. Conclusion

Given the very limited distribution of Sonoma alopercurus, all the protective measures to avoid adverse effects to Sonoma alopercurus by the proposed action, the eligibility criteria and prohibited acts, and the anticipated long-term benefits from each project to native habitats and listed species in the long-term, all potential negative effects from the proposed restoration

program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect Sonoma alopercurus.

## 8.4. Literature Cited

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# 9. Southwestern willow flycatcher and Critical Habitat

## 9.1. Background

### 9.1.2. Listing Status

The southwestern willow flycatcher was federally listed as endangered on February 27, 1995, due to loss of habitat, brood parasitism, and lack of adequate protective regulations (60 FR 10695). Critical habitat was designated on January 3, 2013 (78 FR 344).

### 9.1.3. Life History and Habitat

The southwestern willow flycatcher is a small, neotropical migrant bird. It eats a variety of invertebrate prey including insects of terrestrial and aquatic origins. The southwestern willow flycatcher occurs in riparian woodlands along streams and rivers with mature, dense stands of willows, cottonwoods, or smaller spring-fed areas with willows or alders (*Alnus* species). Riparian habitat provides both breeding and foraging habitat. The southwestern willow flycatcher is a diurnally active subspecies that begins singing at a predawn hour while within the territory. The southwestern willow flycatcher is an insectivore that forages within and above dense riparian vegetation, taking insects on the wing or gleaning them from foliage. This subspecies also forages in areas adjacent to nest sites, which may be more open (60 FR 10695).

The breeding range of the southwestern willow flycatcher includes southern California, southern Nevada, Arizona, New Mexico, and western Texas. The species may also breed in southwestern Colorado. Records of breeding in Mexico are few and confined to extreme northern Baja California and Sonora (60 FR 10695).

### 9.1.4. Population Status

Since listing of the southwestern willow flycatcher in 1995, the overall known status of the subspecies has improved due to increased surveys and conservation efforts, as detailed below under the *Recovery Plan* section. Threats to the southwestern willow flycatcher include the destruction, modification, or curtailment of habitat and nest parasitism by the brown-headed cowbird (*Molothrus ater*) (60 FR 10695). Changes in riparian plant communities have resulted in the degradation and elimination of nesting habitat for the southwestern willow flycatcher, which has reduced the range, distribution, and population size of this subspecies (60 FR 10695). Loss and modification of southwestern riparian habitats has occurred from urban and agricultural development, water diversion and impoundment, channelization, livestock grazing, off-road vehicle and other recreational uses, and hydrological changes resulting from these and other land uses. Cowbird parasitism of southwestern willow flycatchers can occur frequently. A relatively recent threat is the introduction and spread of the tamarisk leaf beetle. Tamarisk is an important habitat component used by the flycatcher, occurring in just over 50 percent of their known territories and providing shelter and food at migration stop-over areas (Service 2014).

### 9.1.5. Critical Habitat

Revised critical habitat was designated for the southwestern willow flycatcher on January 3, 2013 (78 FR 343), including 1,227 stream miles within the 100-year floodplain of waters in California, Arizona, Nevada, Utah, Colorado, and New Mexico, encompassing a total area of approximately 208,973 acres. These critical habitat areas are designed to provide sufficient riparian habitat for breeding, non-breeding, territorial, dispersing and migrating southwestern willow flycatchers and to flycatchers throughout their range, and provide those habitat components essential for conservation of the subspecies. The physical and biological features of designated critical habitat for the southwestern willow flycatcher include:

1. Riparian habitat in a dynamic river or lakeside, natural or manmade successional environment (for nesting, foraging, migration, dispersal, and shelter) that is comprised of trees and shrubs that can include Gooddings willow (*Salix gooddingii*), coyote willow (*Salix exigua*), Geyers willow (*Salix geyeriana*), arroyo willow (*Salix lasiolepsis*), red willow (*Salix laevigata*), yewleaf willow (*Salix taxifolia*), pacific willow (*Salix lasiandra*) , boxelder (*Acer negundo*), tamarisk, Russian olive (*Elaeagnus angustifolia*), buttonbush (*Cephalanthus occidentalis*), cottonwood, stinging nettle (*Urtica dioica*), alder (*Alnus rhombifolia*, *Alnus oblongifolia*, *Alnus tenuifolia*), velvet ash (*Fraxinus velutina*), poison hemlock (*Conium maculatum*), blackberry (*Rubus ursinus*), seep willow (*Baccharis salicifolia*), oak (*Quercus agrifolia*), rose (*Rosa californica*, *Rosa arizonica*, *Rosa multiflora*), sycamore (*Platanus wrightii*), false indigo (*Amorpha californica*), Pacific poison ivy (*Toxicodendron diversilobum*), grape (*Vitis arizonica*), Virginia creeper (*Parthenocissus quinquefolia*), Siberian elm (*Ulmus pumila*), and walnut (*Juglans hindsii*) and some combination of:

(a) Dense riparian vegetation with thickets of trees and shrubs that can range in height from about 6 to 98 feet. Lower-stature thickets (6 to 13 feet tall) are found at higher elevation riparian forests and tall-stature thickets are found at middle and lower-elevation riparian forests; and/or
(b) areas of dense riparian foliage at least from the ground level up to approximately 13 feet above ground or dense foliage only at the shrub or tree level as a low, dense canopy; and/or
(c) sites for nesting that contain a dense (about 50 percent to 100 percent) tree or shrub (or both) canopy (the amount of cover provided by tree and shrub branches measured from the ground); and/or
(d) dense patches of riparian forests that are interspersed with small openings of open water or marsh or areas with shorter and sparser vegetation that creates a variety of habitat that is not uniformly dense. Patch size may be as small as 0.25 acre or as large as 175 acres; and

2. a variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, which can include: flying ants, wasps, and bees (Hymenoptera); dragonflies (Odonata); flies (Diptera); true bugs (Hemiptera); beetles (Coleoptera); butterflies, moths, and caterpillars (Lepidoptera); and spittlebugs (Homoptera).

### 9.1.6. Recovery Plan Information

A recovery plan was completed on August 30, 2002 (Service 2002). Since listing and the completion of the recovery plan, there has been an overall increase in the distribution and numbers of flycatcher sites and territories. When the 2002 recovery plan was completed, 225 breeding sites and an estimated 1,000 flycatcher territories were recorded. The most recent 2007 rangewide assessment described a modest increase to 288 breeding sites with an estimated 1,299 territories (Service 2014).

Still, as a measurable objective, the overall increase in flycatcher territories (to an estimated 1,299 territories) and their current distribution does not yet meet the numerical and geographical downlisting or delisting goals established in the recovery plan. As identified in the recovery plan, Criterion A requires a flycatcher population of at least 1,950 territories, with each Management Unit reaching 80 percent of its goal and each Recovery Unit 100 percent of its goal (for at least 5 years). Criterion B requires a population of 1,500 territories, with each Management Unit reaching 50 percent and each Recovery Unit 75 percent of the numeric goal (for at least three years). The reduced numbers associated with Criterion B are countered with an increased requirement of long-term protection of these habitats through conservation management agreements (Service 2014).

### 9.1.7. Environmental Baseline

#### *Species*

There are three recovery units that occur at least partially in California: the Coastal California Recovery Unit, the Basin and Mojave Recovery Unit, and the Lower Colorado Recovery Unit.

The Coastal California Recovery Unit has experienced the overall largest proportion of decline in the number of known flycatcher territories since 2002. When the Recovery Plan was completed, there were 186 known territories, but they were estimated at 120 in 2008 (Service 2014). The decline of 66 territories is about 35 percent of the 2002 total, and numbers have been reduced in all the four coastal management units. It may be that the lack of recent survey information to determine whether flycatchers still occur at breeding sites combined with the known decline of territories at some key breeding sites (i.e., Camp Pendleton – Santa Margarita River, Prado Basin – Santa Ana River) has contributed to the change. In addition, populations in the Coastal California Recovery Unit, including at the lower San Luis Rey River, Santa Margarita River, and Kern River, have recently experienced steep declines or have been extirpated (Howell and Kus 2021). The detected declines at known sites have no obvious cause. The Basin and Mohave and the Lower Colorado River recovery units are the farthest from reaching their numerical reclassification goals, with both approximately 75 percent short. In 2002, the Basin and Mohave Recovery Unit had 69 known territories and now has 51; the Lower Colorado Recovery Unit had 146 territories (Service 2014). However, much of the Lower Colorado Recovery Unit occurs outside California (Service 2014).

#### *Critical Habitat*

Designated critical habitat in California includes 477 acres in the Inyo Management Unit; 4,556 acres in the Kern Management Unit; 3,419 acres in the Los Angeles Management Unit, 1,472 acres in the Riverside Management Unit; 9,005 acres in the San Bernardino Management Unit; 5,369 acres in the San Diego Management Unit; 3,790 acres in the Santa Barbara Management Unit; and 11,032 acres in the Ventura Management Unit.

## 9.2. Analysis

### 9.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Southwestern willow flycatcher and its critical habitat faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non-native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 9.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to southwestern willow flycatcher from the proposed action is minimal due to the general protective measures described in the PBA and PBO and the species-specific protection measures described below. These protective measures provide specific requirements to avoid adverse effects.

> ***SWWF-YBC1, Habitat Assessment.*** A habitat assessment will be conducted by a Qualified Biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for the flycatcher or cuckoo occurs in the Action Area. If suitable habitat

for these species is identified in the Action Area and the proposed project may affect suitable habitat that is not known to be occupied, the respective USFWS ES Field Office/S7 Delegated Authority Program will be contacted regarding the need for surveys according to USFWS protocol (USFWS 2001; Sogge et al. 2010; and Halterman et al. 2015) and those surveys will be conducted, as appropriate. Otherwise, if the respective USFWS ES Field Office/S7 Delegated Authority Program agrees based on other biological data or reasoning, subsequent avoidance and minimization measures for these species will be implemented.

***SWWF-YBC2, Habitat Buffer.*** A noise disturbance buffer of 500 feet will be maintained between noise-generating project activities and occupied or assumed occupied Southwestern willow flycatcher or yellow-bill cuckoo habitat. Noise buffer distances may be modified in coordination with the USFWS ES field office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for the USFWS' consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, which are not covered under this consultation.

***SWWF-YBC3, Minimizing Suitable Habitat Adverse Effects.*** No permanent or temporary loss of native flycatcher or cuckoo occupied or presumed occupied habitat, or nonnative vegetation that supports essential breeding, feeding, and sheltering behaviors (e.g., tamarisk that supports willow flycatcher nesting), will occur (within or outside of the breeding season), unless determined to be insignificant at the project level.

***SWWF-YBC-4, Minimizing and Avoiding Critical Habitat Adverse Effects.*** No permanent loss of designated critical habitat will occur, unless determined to be insignificant at the project level.

## 9.3. Conclusion

### *Species*

Southwestern willow flycatcher has a limited distribution and the above conservation measures, ensure that any restoration project will not cause adverse effects to southwestern willow flycatcher. All potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect southwestern willow flycatcher.

### *Critical Habitat*

Impacts to southwestern willow flycatcher critical habitat will be minimized through the combination of the eligibility requirements, prohibited actions, and protective measures. The following prohibited acts minimize impacts to southwestern willow flycatcher critical habitat

function: 1) Projects that would result in a net loss of aquatic resource functions and/or services; and 2) Restoration projects that would result in a net loss of designated critical habitat function for any federally listed species. Loss of function is considered in the context of the physical and biological features as described in the respective critical habitat designation and includes abiotic and biotic resources and conditions necessary to support one or more life processes of the species. The USFWS will provide technical assistance to the project proponent to ensure that any potential adverse effects to flycatcher critical habitat will be insignificant or discountable.

## 9.4. Literature Cited

Howell, S.L., and Kus, B.E. 2021. Distribution and abundance of southwestern willow flycatchers (*Empidonax traillii extimus*) on the upper San Luis Rey River, San Diego County, California-2020 data summary: U.S. Geological Survey Data Series 1140, 11 p.

Service [U.S. Fish and Wildlife Service]. 2002. Southwestern willow flycatcher recovery plan. Albuquerque, New Mexico. i-ix. + 210p., Appendices A-O.

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# 10. Suisun thistle and Critical Habitat

## 10.1. Background

### 10.1.2. Listing Status

The Suisun thistle was listed as endangered in its entire range on November 20, 1997, due to habitat loss (Service 1997). The Service designated critical habitat on April 12, 2007 (Service 2007).

### 10.1.3. Life History and Habitat

Suisun thistle is associated with the upper intertidal marsh plain along the steep, peaty banks of natural, mature, small tidal creeks, banks, ditches, and marsh edges that are very infrequently flooded but generally not along gently sloping terrestrial edges (Service 2013). All Suisun thistle populations today occur in peaty organic marsh soils, old bay muds of fine estuarine sediments (silty clays) with relatively high organic content in the upper horizons and increasing mineral content with depth (Joice series soils). Suisun thistle is known to be restricted to freshwater-influenced brackish marshes. It is absent in the freshwater tidal marshes of the West Delta and the tidal marshes of central San Pablo Bay to the west.

Suisun thistle is an annual plant, dying after one year of seed reproduction. Its vegetative period is usually one year (biennial). Still, if a small vegetative plant size or unfavorable environmental conditions delay flowering, it may regenerate from the central root crown for more than one

year. Flowering occurs throughout the summer in most years and continues through the production of ripe seedheads (Service 2013).

The status of the Suisun thistle and information about its biology and ecology are available in the *Recovery Plan for the Tidal Marsh Ecosystems of Northern and Central California*, available at: https://ecos.fws.gov/docs/recovery_plan/TMRP/20130923_TMRP_Books_Signed_FINAL.pdf (Service 2013).

### 10.1.4. Population Status

There is scarce information on the historical distribution of the Suisun thistle. Since the time of listing and in the absence of recent surveys, the species is thought to be present at the two sites known prior to the listing (Peytonia Slough Ecological Reserve and Rush Ranch), plus upper Hill Slough and the Joice Island portion of Grizzly Island Wildlife Area, all in Suisun Marsh; however, the colonies at Rush Ranch and the colonies at Joice Island, which are at the eastern end of Rush Ranch have generally been interpreted as one population, for a total of three populations (Service 2013). Potential habitat exists on private land directly adjacent to the three known populations on California Department of Fish and Wildlife and Solano Land Trust properties. The status of the species on private land is unknown.

The Service's 2009 and 2021 Five-year Reviews for the Suisun thistle recommended the Suisun thistle remain listed as endangered due to the continuation of threats from muting (damping) of tides and salinity, invasive non-native plants, seed predation, sea level rise predicted to result from global climate change, mosquito abatement, oil spills, and (for these small populations) random events (Service 2009, 2021).

### 10.1.5. Critical Habitat

The Service designated critical habitat for Suisun thistle on April 12, 2007 (Service 2007). The PCEs defined for Suisun thistle were derived from its biological needs. Based on current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PCEs essential to the conservation of the Suisun thistle are:

1. Persistent emergent, intertidal, estuarine wetland at or above the mean high-water line (as extended directly across any intersecting channels);
2. Open channels that periodically contain moving water with ocean derived salts in excess of 0.5%; and
3. Gaps in surrounding vegetation to allow for seed germination and growth.

The three units designated as critical habitat for Suisun thistle comprise 2,052 acres of Solano County. Common threats that may require special management considerations or protections of the PCEs for Suisun thistle in all three units include: (1) alterations to channel water salinity and tidal regimes from the operation of the Suisun Marsh Salinity Control Gates that could affect the depth, duration, and frequency of tidal events and the degree of salinity in the channel water column; (2) mosquito abatement activities (dredging, and chemical spray operations), which may

damage the plants directly by trampling and soil disturbance, and indirectly by altering hydrologic processes and by providing relatively dry ground for additional foot and vehicular traffic; (3) rooting, wallowing, trampling, and grazing impacts from livestock and feral pigs that could result in damage or loss to C. *hydrophilum* var. *hydrophilum* colonies, or in soil disturbance and compaction, leading to a disruption in natural marsh ecosystem processes; (4) the proliferation of nonnative invasive plants, especially *Lepidium latifolium,* leading to the invasives outcompeting C. *hydrophilum* var. *hydrophilum;* and (5) programs for the control or removal of non-native invasive plants, which, if not conducted carefully, can damage C. *hydrophilum* var. *hydrophilum* populations through the injudicious application of herbicides, by direct trampling, or through the accidental transport of invasive plant seeds to new areas. An additional threat that may require special management considerations or protection of the PCEs in Units 1 and 2 includes urban or residential encroachment from Suisun City to the north that could increase stormwater and wastewater runoff into these Units.

### 10.1.6. Recovery Plan Information

The Service published the Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California in 2013 (Service 2013). Since habitat loss is the primary reason for the decline of *Cirsium hydrophilum* var. *hydrophilum*, restoration of extensive areas of tidal brackish marsh habitat in areas contiguous with currently occupied habitat is necessary for recovery of the species. However, it may take decades to achieve this long-term goal of favorable tidal marsh soil and hydrologic conditions. In the meantime, it will be important to protect existing populations from further decline and possible extinction. Short-term recovery actions should be implemented concurrently with long-term habitat restoration and should focus on protecting and managing existing populations and habitats. Recovery strategies include:

- Suppression of invasive non-native plant species,
- Protection and management of nearby native bee and wasp habitats,
- Control of *Cirsium vulgare*, if research indicates necessity,
- Restoration of normal tidal range and salinity,
- Seed banking of *Cirsium hydrophilum* var. *hydrophilum*,
- Monitoring of populations and habitat, and
- Research aspects of life history, population ecology, and seed predation of *C. hydrophilum* var. *hydrophilum*.

### 10.1.7. Environmental Baseline

Suisun thistle only exists within the Action Area (California). As such the information above serves as the environmental baseline for this species.

## 10.2. Analysis

### 10.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Suisun thistle and its critical habitat faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions,

etc.) and the control or removal of invasive and non- native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

It is worth noting that several marsh restoration projects are in various stages of implementation in the north and south San Francisco Bay and in Suisun Marsh. The eligible project types covered in this PBO include various marsh restoration activities. However, due to other existing programmatic consultations in the San Francisco Bay area, including Suisun Bay, it is unclear how often this PBO may be used for such activities within Suisun thistle habitat.

### 10.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to Suisun thistle from the proposed action is minimal due to the general and specific plant protective measures described below. The General Plant Protection Measures (PLANT-1 through PLANT-8) described in the PBA include habitat assessments and surveys, exclusion buffers, seasonal avoidance measures, biological monitoring and herbicide restrictions will minimize the potential for these negative effects. The following protective measure is intended to avoid any impacts to the species:

> ***PLANT-3, Exceptions to Work Restrictions in the Exclusion Buffer.*** If a USFWS-Approved Biologist determines that some work activities can take place within the exclusion buffer described in Measure PLANT-3 without causing any adverse direct or indirect impacts to Covered plants identified for avoidance, those approved work activities may be conducted within the exclusion buffer. Covered vernal pool plants will be clearly marked by a USFWS-Approved Biologist prior to worker entry into the exclusion buffer. Workers may only enter the exclusion buffer when accompanied by a Qualified Biologist, and all work within the exclusion buffer will be monitored by a Qualified Biologist. Based on the results of the botanical surveys, complete avoidance of populations onsite during their respective blooming periods will be applied for the following four Covered plant species with limited populations: Ben Lomond spineflower, soft bird's-beak, Suisun thistle, and Howell's spineflower.

## 10.3. Conclusion

*Species*

Suisun thistle has a limited distribution and the above conservation measures, including the complete avoidance of populations onsite during their blooming period, ensure that any restoration project will not cause adverse effects to Suisun thistle. All potential adverse effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect Suisun thistle.

### *Critical Habitat*

Impacts to Suisun thistle critical habitat will be minimized through the combination of the eligibility requirements, prohibited actions, and protective measures. The following prohibited acts minimize impacts to Suisun thistle critical habitat function: 1) Projects that would result in a net loss of aquatic resource functions and/or services; and 2) Restoration projects that would result in a net loss of designated critical habitat function for any federally listed species. Loss of function is considered in the context of the physical and biological features as described in the respective critical habitat designation and includes abiotic and biotic resources and conditions necessary to support one or more life processes of the species. The USFWS will provide technical assistance to the project proponent to ensure that any potential adverse effects to Suisun thistle critical habitat will be insignificant or discountable.

## 10.4. Literature Cited


[Service] U.S. Fish and Wildlife Service. 1997. Endangered and threatened wildlife and plants; Determination of Endangered Satus for Two Tidal Marsh Plants—Cirsium hydrophilum va. hydrophilum (Suisun Thistle) and Cordylanthus mollis ssp. Mollis (Soft Bird's-Beak) from San Francisco Bay Area of California. Federal Register 62(224): 61916-61925. https://www.govinfo.gov/content/pkg/FR-1997-11-20/pdf/97-30552.pdf#page=1

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# 11. Western yellow-billed cuckoo

## 11.1. Background

### 11.1.2. Listing Status

The western yellow-billed cuckoo distinct population segment was federally listed as threatened on October 3, 2014, due to habitat loss associated with manmade features that alter watercourse hydrology so that the natural processes that sustained riparian habitat in western North America are greatly diminished (79 FR 59992). Critical habitat was designated on April 21, 2021 (86 FR 20798).

### 11.1.3. Life History and Habitat

The yellow-billed cuckoo is a member of the avian family Cuculidae and is a Neotropical migrant bird that winters in South America and breeds in North America. Yellow-billed cuckoos arrive in the southwest United States and northwestern Mexico in late May/early June with some as late as early July. They move about their breeding range in search of a riparian habitat block of sufficient size that has an abundance of prey. Breeding occurs when prey is sufficiently abundant to feed and fledge their precocial chicks. Breeding can occur from June through August with most cuckoos migrating south by mid-September. Nesting activity typically occurs between late June and late July and nest clutch size is typically between two and four eggs (Service 2019).

### 11.1.4. Population Status

The available surveys and literature support the conclusion that the population of the western yellow-billed cuckoo has declined by several orders of magnitude over the past 100 years, and that this decline is continuing. Recent declines over the past 15 years have shown both a loss of breeding western yellow-billed cuckoos in smaller isolated sites and declines in numbers at core breeding areas. The current breeding population is low, with 350 to 495 pairs north of the Mexican border and another 330 to 530 pairs in Mexico for a total of 680 to 1,025 breeding pairs. The breeding population may be lower than these estimates, as some of these pairs may be counted twice since yellow-billed cuckoos apparently move into southern Sonora and Sinaloa during the rainy season in late July and August after they have previously bred farther north. Therefore, we conclude that the western yellow-billed cuckoo has a small and declining population (78 FR 61622).

The primary factors threatening the western distinct population segment of the yellow-billed cuckoo are the loss and degradation of habitat for the species from altered watercourse hydrology and natural stream processes, livestock overgrazing, encroachment from agriculture, and conversion of native habitat to predominantly nonnative vegetation. Additional threats to the species include the effects of climate change, pesticides, wildfire, and small and widely separated habitat patches (79 FR 59992).

### 11.1.5. Critical Habitat

Designated critical habitat occurs in 63 units in Arizona, California, Colorado, Idaho, New Mexico, Texas, and Utah over about 298,845 acres. The physical and biological features of designated critical habitat include:

1. Drainages with varying combinations of riparian, xeroriparian, and/or nonriparian trees and large shrubs. This physical or biological feature includes breeding habitat found throughout the distinct population segment range as well as additional breeding habitat characteristics unique to the southwest. a) Rangewide breeding habitat is composed of riparian woodlands within floodplains or in upland areas or terraces often greater than 325 feet in width and 200 acres or more in extent with an overstory and understory vegetation component in contiguous or nearly contiguous patches adjacent to intermittent or perennial watercourses. The slope of the watercourses is generally less than three percent but may be greater in some instances. Nesting sites within the habitat have an above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats. Rangewide breeding habitat is composed of varying combinations of riparian species including the following nest trees: Cottonwood, willow, ash, sycamore, boxelder, alder, and walnut. b) Southwestern breeding habitat, found primarily in Arizona and New Mexico, is more variable than rangewide breeding habitat. Southwestern breeding habitat occurs within or along perennial, intermittent, and ephemeral drainages in montane canyons, foothills, desert floodplains, and arroyos. It may include woody side drainages, terraces, and hillsides immediately adjacent to the main drainage bottom. Drainages intersect a variety of habitat types including, but not limited to, desert scrub, desert grassland, and Madrean evergreen woodlands (presence of oak). Southwestern breeding habitat is composed of varying combinations of riparian, xeroriparian, and/or nonriparian tree and large shrub species including, but not limited to, the following nest trees: Cottonwood, willow, mesquite, ash, hackberry, sycamore, walnut, desert willow, soapberry, tamarisk, Russian olive, juniper, acacia, and/or oak. In perennial and intermittent drainages, southwestern riparian breeding habitat is often narrower, patchier, and/or sparser than rangewide riparian breeding habitat and may contain a greater proportion of xeroriparian trees and large shrub species. Although some cottonwood and willow may be present in southwestern riparian habitat, xeroriparian species may be more prevalent. Mesquite woodland may be present within the riparian floodplain, flanking the outer edges of wetter riparian habitat, or scattered on the adjacent hillsides. The more arid the drainage, the greater the likelihood that it will be dominated by xeroriparian and nonriparian nest tree species. Arid ephemeral drainages in southeastern Arizona receive summer humidity and rainfall from the North American monsoon (physical and biological feature 3), with a pronounced green-up of grasses and forbs. These arid ephemeral drainages often contain xeroriparian species like hackberry or nonriparian species associated with the adjacent habitat type like oak, mesquite, acacia, mimosa,

greythorn, and juniper. In southeastern Arizona mountains, breeding habitat is typically below pine woodlands (~6,000 feet).

2. Presence of prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies, moth larvae, spiders), lizards, and frogs for adults and young in breeding areas during the nesting season and in postbreeding dispersal areas.

3. The movement of water and sediment in natural or altered systems that maintains and regenerates breeding habitat. This physical or biological feature includes hydrologic processes found in rangewide breeding habitat as well as additional hydrologic processes unique to the Southwest in southwestern breeding habitat: a) Hydrologic processes (either natural or managed) in river and reservoir systems that encourage sediment movement and deposits and promote riparian tree seedling germination and plant growth, maintenance, health, and vigor (e.g., lower-gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). In some areas where habitat is being restored, such as on terraced slopes above the floodplain, this may include managed irrigated systems that may not naturally flood due to their elevation above the floodplain. b) In southwestern breeding habitat, elevated summer humidity and runoff resulting from seasonal water management practices or weather patterns and precipitation (typically from North American monsoon or other tropical weather events) provide suitable conditions for prey species production and vegetation regeneration and growth. Elevated humidity is especially important in southeastern Arizona, where western yellow-billed cuckoos breed in intermittent and ephemeral drainages.

### 11.1.6. Recovery Plan Information

A recovery plan is not available for this species.

### 11.1.7. Environmental Baseline

#### *Species*

There are about 40-50 territories within California (Service 2019). While California historically hosted a large portion of the breeding population and the species nested at numerous sites primarily in coastal areas from San Diego to Sonoma County, the Central Valley from Kern County to Shasta County, and the lower Colorado River, the California population has decreased to less than 1 percent of its estimated historical size (Service 2019). Today, there are only three regions in California with confirmed breeding populations: the Sacramento River between Red Bluff and Colusa, the Kern River immediately upstream of Lake Isabella, and the Lower Colorado River along the border between Arizona and California (Service 2019). The Lower Colorado River breeding population is relatively stable. The Kern River population is experiencing a drastic decline, and the area may not currently support a viable breeding

population. While cuckoo still occupy the Sacramento River Valley, the population has declined by at least 80 percent over the last 40 years, with a major continuing decline in the most recent 10 years. In 2013, the Sacramento River Valley population was found to be between 27 and 28 breeding pairs (Service 2019).

#### *Critical Habitat*

Designated critical habitat includes 34,330 acres in the Sacramento River Unit and 2,377 acres in the South Fork Kern River Valley Unit.

## 11.2. Analysis

### 11.2.2. Risk of Adverse Effects from Statewide Restoration Effort

Western yellow-billed cuckoo and its critical habitat faces risk of impact from ground disturbing activities (e.g., installation of structures and facilities, soil stabilization, grading, tilling, and habitat conversions, etc.) and the control or removal of invasive and non-native vegetation. However, long-term beneficial effects are expected by addressing threats to listed species, such as degraded ecosystem processes, and plant competition with non-native and invasive plant species.

### 11.2.3. Conservation/Protection Measures

The risk of the adverse effects described above to western yellow-billed cuckoo from the proposed action is minimal due to the general protective measures described in the PBA and PBO and the species-specific protection measures described below. These protective measures provide specific requirements to avoid adverse effects.

> ***SWWF-YBC1, Habitat Assessment.*** A habitat assessment will be conducted by a Qualified Biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for the flycatcher or cuckoo occurs in the Action Area. If suitable habitat for these species is identified in the Action Area and the proposed project may affect suitable habitat that is not known to be occupied, the respective USFWS ES Field Office/S7 Delegated Authority Program will be contacted regarding the need for surveys according to USFWS protocol (USFWS 2001; Sogge et al. 2010; and Halterman et al. 2015) and those surveys will be conducted, as appropriate. Otherwise, if the respective USFWS ES Field Office/S7 Delegated Authority Program agrees based on other biological data or reasoning, subsequent avoidance and minimization measures for these species will be implemented.

> ***SWWF-YBC2, Habitat Buffer.*** A noise disturbance buffer of 500 feet will be maintained between noise-generating project activities and occupied or assumed occupied Southwestern willow flycatcher or yellow-bill cuckoo habitat. Noise buffer distances may be modified in coordination with the USFWS ES field office based on project specific

characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for the USFWS' consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, which are not covered under this consultation.

***SWWF-YBC3, Minimizing Suitable Habitat Adverse Effects.*** No permanent or temporary loss of native flycatcher or cuckoo occupied or presumed occupied habitat, or nonnative vegetation that supports essential breeding, feeding, and sheltering behaviors (e.g., tamarisk that supports willow flycatcher nesting), will occur (within or outside of the breeding season), unless determined to be insignificant at the project level.

***SWWF-YBC-4, Minimizing and Avoiding Critical Habitat Adverse Effects.*** No permanent loss of designated critical habitat will occur, unless determined to be insignificant at the project level.

## 11.3. Conclusion

### *Species*

Western yellow-billed cuckoo has a limited distribution and the above conservation measures, ensure that any restoration project will not cause adverse effects to western yellow-billed cuckoo. All potential negative effects from the proposed restoration program will be insignificant or discountable, if not avoided entirely. Therefore, the Service concurs the proposed action is not likely to adversely affect western yellow-billed cuckoo.

### *Critical Habitat*

Impacts to western yellow-billed cuckoo critical habitat will be minimized through the combination of the eligibility requirements, prohibited actions, and protective measures. The following prohibited acts minimize impacts to yellow-billed cuckoo critical habitat function: 1) Projects that would result in a net loss of aquatic resource functions and/or services; and 2) Restoration projects that would result in a net loss of designated critical habitat function for any federally listed species. Loss of function is considered in the context of the physical and biological features as described in the respective critical habitat designation and includes abiotic and biotic resources and conditions necessary to support one or more life processes of the species. The USFWS will provide technical assistance to the project proponent to ensure that any potential adverse effects to cuckoo critical habitat will be insignificant or discountable.

## 11.4. Literature Cited

Service (U.S. Fish and Wildlife Service). 2019. Biological opinion for reinitiation of consultation on long-term operations of the Central Valley Project and State Water Project. October 21, 2019. 406 pp.