Mountain Plover
(Charadrius montanus)

Legal Status

State: Species of Special Concern
Federal: U.S. Fish and Wildlife Service Bird of Conservation Concern,
Bureau of Land Management Sensitive
Critical Habitat: N/A
Recovery Planning: N/A
Notes: Proposed listing as threatened species withdrawn on May 12, 2011 (76 FR 27756–27799).

Taxonomy

Mountain plover (Charadrius montanus) is a bird in the order
Charadriiformes and the Charadriidae family. This species was
formerly placed in a monotypic genus (Eupoda) (Garrett, pers. comm. 2012). There are no recognized subspecies of mountain plover (76 FR 27756–27799). The closest relatives to the mountain plover appear to be the Asiatic species Charadrius asiaticus (Caspian plover) and C. veredus (Oriental plover) (Garrett, pers. comm. 2012).

Distribution

General

Mountain plover occurs from Canada (AB, SK) south through the
United States (AZ, CA, CO, KS, MT, ND (extirpated), NE, NM, NN, OK, SD
(extirpated), TX, UT, and WY) and into Mexico. In California, where
most birds winter, the mountain plover is known in the following
counties: Riverside, Orange, Santa Barbara, Madera, Mono, San
Bernardino, San Diego, San Joaquin, Humboldt, Kings, Monterey,
Colusa, Fresno, Imperial, Kern, Los Angeles, Merced, San Benito, San
Luis Obispo, Solano, Stanislaus, Tulare, Ventura, and Yolo
Distribution and Occurrences within the Plan Area

**Historical**

In California, the historical wintering range for mountain plover included low elevation interior valleys and plains. The range extended from the southern Sacramento Valley and the inner San Francisco Bay area south to the southern coastal slope and east to the Imperial Valley. According to sources from 1944 and 1957, in the southern deserts, mountain plover historically occurred near Indio in Riverside County, at Brawley and Pilot Hill in Imperial County, and Needles in San Bernardino County (Hunting and Edson 2008).

There are 11 historical (i.e., pre-1990) occurrence records for mountain plover in the Plan Area (CDFW 2013; Dudek 2013). The majority of these occurrences are located east of Lancaster and north of Palmdale, in the southwest corner of Edwards Air Force Base, in the Harper Lake area, and at the southern end of the Salton Sea (Figure SP-B11).

**Recent**

In California, mountain plovers continue to occupy the same broad regions in which they have historically occurred, although they no longer winter on the Channel Islands or the eastern fringes of the San Francisco Bay area (Hunting and Edson 2008). In the southern desert region, mountain plovers winter in the Antelope Valley; western Mojave Desert, near Harper Dry Lake; the Imperial Valley; and near Blythe in the lower Colorado River Valley (Hunting and Edson 2008).

Within the Plan Area, there are 61 recent (i.e., since 1990) documented occurrences south of or along the eastern edge of the Salton Sea, near Palmdale, west of Lancaster, and in the Harper Lake area (Figure SP-B11) (CDFW 2013; Dudek 2013).

**Natural History**

**Habitat Requirements**

Although mountain plover is categorized as a shorebird, it is not actually associated with margins of freshwater or marine estuaries,
and despite its name, mountain plovers do not actually nest in the mountains (Table 1; 76 FR 27756–27799; McGaugh 2006). In California, mountain plovers primarily winter on fallow and cultivated agricultural fields, but also use grasslands and grazed pastures (76 FR 27756–27799). Audubon (2011) observed wintering mountain plovers in five habitat types: grassland, alfalfa, lettuce, beach, and in bare dirt or recently plowed fields. Alkali playa is an important habitat type in composition, structure, and location (County of Riverside 2003). In the Imperial Valley, where there is the largest known concentration of wintering plovers, preferred foraging habitats include harvested alfalfa and Bermuda grass fields that have been grazed by domestic sheep and Bermuda grass fields, wheat, and other grass fields that have been burned post-harvest (Knopf and Wunder 2006; Molina 2011; Molina 2012). Molina (2011, 2012) also demonstrates the importance of bare plowed or furrowed agricultural fields in the Imperial Valley for mountain plovers. During migration, mountain plovers likely use habitats similar to their breeding and wintering habitats (76 FR 27756–27799). Mountain plover also appear in very small numbers in coastal estuaries in Fall migration, even though they do not winter in such habitats (Garrett, pers. comm. 2012). Mountain plovers prefer areas with heavy, saline/alkaline, clay soils (BLM 2002, p. N-8; see Table 1).

**Table 1. Habitat Associations for Mountain Plover**

<table>
<thead>
<tr>
<th>Land Cover Type</th>
<th>Land Cover Use</th>
<th>Habitat Designation</th>
<th>Habitat Parameters</th>
<th>Supporting Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fallow and cultivated agricultural fields, burned grass fields, grasslands, alkali playa, and grazed pastures</td>
<td>Winter</td>
<td>Wintering</td>
<td>Short vegetation with some bare ground</td>
<td>76 FR 27756–27799; McGaugh 2006; County of Riverside 2003</td>
</tr>
</tbody>
</table>

Mountain plover breeding habitats are similar to those used for wintering. Suitable breeding habitat for mountain plover includes disturbed prairie or semidesert habitats at high elevations, from 2,000 to 8,500 feet (76 FR 27756–27799; McGaugh 2006; Knopf and Wunder 2006). This species occupies open, flat lands or sparsely
vegetated areas, including xeric shrublands, short-grass prairie, and barren agricultural fields. Grassland habitats where mountain plover is found often have a history of disturbance by burrowing rodents, such as prairie dogs (*Cynomys* spp.), native herbivores, or domestic livestock (76 FR 27756–27799).

Mountain plover breeding sites require short vegetation with some bare ground. Breeding habitats for mountain plover include short- and mixed-grass prairie, prairie dog colonies, agricultural lands, and semidesert areas (76 FR 27756–27799). Typical disturbances in grasslands include disturbances from prairie dogs, cattle grazing, fire, or farming. Although these forms of disturbance are usually required in grassland habitats, breeding sites in semidesert environments may persist without these forms of disturbance (76 FR 27756–27799).

**Foraging Requirements**

Mountain plovers feed on ground-dwelling or flying invertebrates found on the ground (76 FR 27756–27799). Their diet primarily consists of beetles, crickets, and ants, though mountain plover diets are diverse and differ greatly by location (76 FR 27756–27799; McGaugh 2006). Mountain plovers feed opportunistically as they encounter prey (76 FR 27756–27799). Foraging behavior consists of short runs and stops in which prey are captured with a lunge at the end of a short, quick run (76 FR 27756–27799; McGaugh 2006). On wintering grounds, mountain plovers also forage by probing into cracks of dried loamy soils (Knopf and Wunder 2006).

Mountain plovers forage in large areas of dry, disturbed ground or areas of short (less than 2 centimeters [0.79 inch]) vegetation with patches of bare ground. Prey is more abundant on prairie dog towns than adjoining habitats (Knopf and Wunder 2006).

**Reproduction**

Mountain plovers return north to their breeding sites in the western Great Plains and Rocky Mountain states in spring. Males defend territories shortly after arrival at the breeding grounds (76 FR 27756–27799). Generally monogamous, mountain plovers form pairs and begin courtship on arrival at the breeding grounds as well. In
Colorado, mountain plovers lay eggs between late April and mid-June in a simple ground scrape nest (Table 2; 76 FR 27756–27799).

Mountain plovers nest using what has been described as the “rapid multiclutch system,” which may increase their breeding success in the face of predation. Typically, the female produces two clutches with three eggs each at different nest sites. The male incubates one nest site and the female incubates the other. They may renest if nests or broods are lost early in the breeding season (76 FR 27756–27799). Each pair can make up to four attempts per year to raise a brood, but only one brood is raised per adult each season (76 FR 27756–27799; Knopf and Wunder 2006).

Mountain plovers incubate for 29 days on average, and young fledge at approximately 33 to 34 days (76 FR 27756–27799; Knopf and Wunder 2006). Mountain plovers can breed their first spring (76 FR 27756–27799).

**Table 2. Key Seasonal Periods for Mountain Plover**

<table>
<thead>
<tr>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breeding</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Migration</td>
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<td>Wintering</td>
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</tbody>
</table>

**Source:** 76 FR 27756–27799; Knopf and Wunder 2006

**Spatial Behavior**

In late summer and early fall, mountain plovers migrate south across the southern Great Plains to Texas, New Mexico, and Mexico. Several then travel west to California (Table 3). In California, fall migrants generally arrive in the north by mid-September and in the south by mid-October (Knopf and Wunder 2006). Patten et al. (2003) indicate that the earliest date for migrating mountain plovers to arrive at the Salton Sea is August 24 but that the majority of the birds return to this area in late September. Most birds depart this area in March, with the last birds leaving by March 31. In the Antelope Valley, peak numbers of this species occur from late October to early March while peak
numbers of this species occur from late October to mid-March in the western Mojave Desert in Los Angeles County (Garrett, pers. comm. 2012). During spring migration in early March, mountain plovers travel quickly from their wintering sites to their breeding sites, arriving in eastern Colorado by mid-March and in Montana by mid-April (76 FR 27756–27799). In California, wintering mountain plover movement patterns are highly variable with some birds moving more than 34 miles in one week (76 FR 27756–27799).

Table 3. Spatial Behavior by Mountain Plover

<table>
<thead>
<tr>
<th>Type</th>
<th>Distance/Area</th>
<th>Location of Study</th>
<th>Supporting Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brood home range</td>
<td>143 acres</td>
<td>Colorado</td>
<td>76 FR 27756–27799</td>
</tr>
<tr>
<td>Dispersal</td>
<td>8.1 miles for males and 6.3 miles for females</td>
<td>Montana</td>
<td>76 FR 27756–27799</td>
</tr>
</tbody>
</table>

Ecological Relationships

Most egg and chick losses are to predators (County of Riverside 2003). Birds, mammals, and reptiles, including prairie falcon (*Falco mexicanus*) and kit fox (*Vulpes macrotis*), are known to predate mountain plover eggs and/or chicks (McGaugh 2006).

Historically, winter areas in California supported tule elk (*Cervus elaphus nannodes*), pronghorn (*Antilocapra americana*), and kangaroo rat (*Dipodomys* spp.) (McGaugh 2006). In the Carrizo Plain, winter habitat availability is currently correlated with livestock grazing and precipitation; mountain plovers prefer dry areas that are heavily grazed. Annual climatic variability and abundant rainfall, in particular, alter field conditions, which can reduce mountain plover use of traditionally occupied wintering sites. In the Imperial Valley, mountain plover became virtually absent from cultivated fields during the rainy winter of 2004 to 2005 (76 FR 27756–27799).

Mountain plovers favor plowed or recently harvested agricultural fields and habitats that have been burned because these disturbances create the necessary sparse conditions (BLM 2002, p. N-8; 76 FR 27756–27799).
Mountain plovers prefer areas with abundant mammalian burrows (BLM 2002, p. N-8). They tend to be associated with giant kangaroo rat (Dipodomys ingens) colonies, especially when wet years produce tall vegetation elsewhere (76 FR 27756–27799).

**Population Status and Trends**

**Global:** Increasing (76 FR 27756–27799)

**State:** Same as above

**Within Plan Area:** Same as above

From 2004 to 2007, the International Union for the Conservation of Nature (IUCN) listed mountain plover as “vulnerable,” a higher level of concern than “near threatened.” However, higher rangewide population estimates have emerged prompting IUCN to change its rating accordingly.

From 1966 to 1993, Breeding Bird Survey (BBS) data indicate a decline rate of 3.7% per year. Although the BBS survey routes are not distributed evenly within the species’ habitat, the decline rate indicates reduction in the population during that 25-year period by approximately two-thirds (Knopf and Wunder 2006). Until 2006, a rangewide mountain plover population estimate provided by the U.S. Shorebird Conservation Plan was increased from 9,000 to 12,500 (76 FR 27756–27799).

Although wintering mountain plover populations in California appear to have experienced a significant decline over previous decades, more recent wintering numbers, from 2000 onward, have not shown a similar trend. In 2007, 4,500 mountain plover were recorded in the Imperial Valley, which exceeded statewide survey counts of mountain plover from 1994, and 1998 through 2002. A statewide survey over 5 days in January 2011 recorded 1,235 mountain plover, which is considerably fewer than found in previous statewide surveys or recent Imperial Valley surveys. In late 2010, unusually wet conditions due to heavy rains may have influenced the relatively low number of mountain plover in California (76 FR 27756–27799).
Mountain Plover (Charadrius montanus)

Threats and Environmental Stressors

Mountain plovers are threatened by loss and degradation of breeding and wintering habitat, predation, severe weather conditions during nesting/fledging, and direct persecution by humans (McGaugh 2006).

Habitat loss and degradation appear to be the main factors contributing to mountain plover population declines (Hunting and Edson 2008). The reduction of short-grass prairie by conversion to agriculture and the elimination of important grazers, such as bison (Bison bison), which kept the habitat sparsely vegetated, began in the 1800s (McGaugh 2006). Currently, loss of traditional wintering sites on grasslands and suitable agricultural cropland to urban development, vineyards, or other incompatible land uses could continue to reduce suitable wintering habitat for mountain plover (Hunting and Edson 2008). In addition to allowing higher vegetation structure that is unsuitable for mountain plover, incompatible agricultural practices can directly kill plovers from farm equipment or expose plovers to pesticides (McGaugh 2006). Grain fields, which have become more popular in the last 25 years, remain fallow until early May, after most mountain plovers have started nesting, and farm equipment destroys many nests when fields are planted in May (Knopf and Wunder 2006). However, plovers will successfully renest on tilled fields, and although the transition to more grain crops was originally thought to have a substantial impact on mountain plover reproduction, this factor has since been dismissed as having an additive impact beyond normal nest-predation rates (Knopf and Wunder 2006). High levels of organochlorine residues were found in birds collected from California’s Imperial, San Luis Obispo, and Tulare Counties in 1991–1992 (Knopf and Wunder 2006). However, there is no evidence that mountain plover reproductive success or survival is affected by pesticide use (McGaugh 2006).

Predation is the main source of egg and chick loss. Mountain plovers are susceptible to a variety of predators, such as birds, mammals, and reptiles (County of Riverside 2003; McGaugh 2006). Reduced populations of fossorial mammals could impact mountain plover populations since they attract invertebrates used for forage (Hunting and Edson 2008).
Mountain plover is also susceptible to extreme weather conditions. At the Pawnee National Grassland in Colorado, hail and flooding caused almost complete reproductive failure (McGaugh 2006). Climatic conditions also influence vegetation structure with wetter years possibly supporting fewer wintering mountain plover (76 FR 27756–27799).

Because mountain plovers tend to be unwary and form tight flocks, they have historically been susceptible to hunters (e.g., in the late 1800s) (McGaugh 2006; Knopf and Wunder 2006). However, shootings in more recent years have not been documented, and hunting is not a current conservation concern (Knopf and Wunder 2006). Although very tolerant of machinery, such as off-road vehicles, tractors, and military aircraft, mountain plovers will flee nest sites or roost areas when approached by humans on foot, leaving eggs susceptible to overheating due to solar radiation (Knopf and Wunder 2006).

**Conservation and Management Activities**

Mountain plover is not the subject of a documented recovery plan, and there do not appear to be any active state or local programs focused on its conservation and management. However, it is a Covered Species in several approved habitat conservation plans and natural community conservation plans. Several of these are not related to the Plan Area, but the mountain plover is also a Covered Species under the Bureau of Land Management’s (BLM’s) West Mojave Plan, which proposes possible management actions such as subsidizing alfalfa farmers, establishing agricultural preserves, and encouraging land-use practices that benefit mountain plovers. These might include periodically disking and/or burning fields or controlling the use of pesticides (McGaugh 2006).

**Data Characterization**

Both breeding and wintering mountain plover populations should be monitored more carefully. Monitoring of wintering populations in California should focus on traditional wintering sites and high-quality habitat in the Imperial Valley, Carrizo Plain, Panoche Valley, and Central Valley. Standardized methods should be used that sample in order to estimate a statewide wintering population if possible. Other data collected should include land-use changes, habitat suitability, and annual habitat availability. Mountain plover life history and
distributional characteristics should be considered to enable the development of population estimates at 3- to 5-year intervals (Hunting and Edson 2008).

Additional research could focus on determining the potential effects of mountain plover chronic exposure to agrochemicals in the Central and Imperial Valleys and to determine whether there is a relationship between agrochemical use and winter plover distribution in response to changes in prey selection, availability, and abundance (Hunting and Edson 2008).

Research can also focus on documenting the differential seasonal use by plovers of native and non-native grasslands as opposed to cultivated lands and determine what factors drive the shifts between habitats. The correlations between the availability and suitability of habitat and winter survival, movement patterns, and foraging strategies can also be explored (Hunting and Edson 2008).

Management and Monitoring Considerations

Management should focus on protecting traditional wintering sites and high-quality wintering habitat from urban development and conversion to other incompatible land uses. This can be achieved by securing conservation easements and property acquisition as part of regional conservation planning efforts (Hunting and Edson 2008). Furthermore, the subsidization of alfalfa farmers, establishment of agricultural preserves, and encouragement of land-use practices that benefit mountain plovers can also help preserve suitable habitat for this species (McGaugh 2006).

Habitat quality for mountain plover can be maintained by management of grasslands at low stature and density (Hunting and Edson 2008). Periodic disking and/or burning fields or controlling the use of pesticides can also maintain habitat for the species (McGaugh 2006).

Species Modeled Habitat Distribution

This section provides the results of habitat modeling for mountain plover, using available spatial information and occurrence information, as appropriate. For this reason, the term “modeled
suitable habitat” is used in this section to distinguish modeled habitat from the habitat information provided in Habitat Requirements, which may include additional habitat and/or microhabitat factors that are important for species occupation, but for which information is not available for habitat modeling.

There are 718,451 acres of modeled suitable habitat for mountain plover in the Plan Area. Appendix C includes a figure showing the modeled suitable habitat in the Plan Area.

**Literature Cited**


Garrett, K. Unpublished information contained in comments from K. Garrett (Natural History Museum of Los Angeles County) on draft species profile for mountain plover.


Molina, K. C. 2011. Results of the 2011 Mountain Plover Survey in the Imperial Valley, Imperial County, California. Summary report to Audubon California, 765 University Avenue, Sacramento, California 95825.

Molina, K. C. 2012. Results of the 2012 Mountain Plover Survey in the Imperial Valley, Imperial County, California. Summary report to Audubon California, 765 University Avenue, Sacramento, California 95825.


FIGURE SP-B09
Mountain Plover Occurrences in the Plan Area

Sources: ESRI (2014); DRECP Species Occurrence Database (2013), CWHR (2008)