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Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule To List the Mountain Plover as Threatened; Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R6–ES–2010–0038; MO 92210–0–0008–B2]

RIN 1018–AX26

Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule To List the Mountain Plover as Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; withdrawal.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce our decision to withdraw the proposed listing of the mountain plover (*Charadrius montanus*) as a threatened species under the authority of the Endangered Species Act of 1973, as amended (Act). After a thorough review of all available scientific and commercial information, we have determined that the species is not endangered or threatened throughout all or a significant portion of its range. We make this determination because threats to the species as identified in the proposed rule are not as significant as earlier believed and currently available data do not indicate that the threats to the species and its habitat, as analyzed under the five listing factors described in section 4(a)(1) of the Act, are likely to endanger the species in the foreseeable future throughout all or a significant portion of its range.

DATES: The December 5, 2002 (67 FR 72396), proposal to list the mountain plover as a threatened species is withdrawn as of May 12, 2011.

ADDRESSES: This finding is available for viewing on the Internet at *http://www.regulations.gov* (see Docket No. FWS–R6–ES–2010–0038) and *http://www.fws.gov/mountain-prairie/species/birds/mountainplover* and also by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Colorado Ecological Services Office, 134 Union Boulevard, Suite 670, Lakewood, CO 80225; telephone 303–236–4773; facsimile 303–236–4005. Please submit any new information, materials, comments or questions concerning this finding to the Colorado Ecological Services Field Office at P.O. Box 25486, DFC (MS 65412), Denver, Colorado 80225.

FOR FURTHER INFORMATION CONTACT: Susan Linner, Field Supervisor, U.S. Fish and Wildlife Service, Colorado Ecological Services Field Office (see **ADDRESSES**). If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Background

Previous Federal Actions

For a detailed description of Federal actions concerning the mountain plover, please refer to the February 16, 1999, proposed rule to list the species (64 FR 7587); the December 5, 2002, proposed rule to list the species with a special rule under section 4(d) of the Act (16 U.S.C. 1531 *et seq.*) (67 FR 72396); and the September 9, 2003, withdrawal of the proposed rule to list the species (68 FR 53083).

The document we published on September 9, 2003 (68 FR 53083), withdrew the entire proposed rule we published on December 5, 2002 (67 FR 72396), including our proposal to list the mountain plover as a threatened species and our proposed special 4(d) rule. The September 9, 2003, document also addressed comments we received on both the 1999 and 2002 proposals to list the mountain plover and summarized threat factors affecting the species. The withdrawal of the proposed rule was based on our conclusion that the threats to the mountain plover identified in the proposed rule were not as significant as previously believed and that currently available data did not indicate that threats to the species and its habitat, as analyzed under the five listing factors described in section 4(a)(1) of the Act, were likely to endanger the species in the foreseeable future throughout all or a significant portion of its range.

On November 16, 2006, Forest Guardians (now WildEarth Guardians) and the Biological Conservation Alliance filed a complaint in the District Court for the Southern District of California challenging the September 9, 2003, withdrawal of the proposal to list the mountain plover (68 FR 53083). We entered into a settlement agreement with the plaintiffs, which was filed by the court on August 28, 2009. As part of the settlement agreement, we agreed to reconsider our decision to withdraw the proposed listing of the mountain plover and to submit to the **Federal Register** by July 31, 2010, a document reopening the December 5, 2002, proposal to list the mountain plover (67 FR 72396) that would also request public comments. We agreed to vacate our 2003 withdrawal of the proposed rule upon publication of the **Federal Register** notice reopening public comment on the December 5, 2002, proposal to list the mountain plover (67 FR 72396). We further agreed to submit a final listing determination for the mountain plover to the **Federal Register** no later than May 1, 2011.

On June 29, 2010, we published a document in the **Federal Register** notifying the public that we were reinstating that portion of our December 5, 2002, proposed rule to list the mountain plover as threatened under the Act (75 FR 37353). We did not reinstate that portion of the December 5, 2002, proposed rule regarding a proposed special rule under section 4(d) of the Act. The proposed special rule was designed to allow researchers to complete field research and analyze data for an ongoing study, and addressed agricultural activities only through December 31, 2004. To ensure that our review of the species' status was complete and based on the best available scientific and commercial information, we requested comments on the proposal to list the mountain plover as a threatened species, including all information related to the species' status and the proposed listing. We invited public comments on the proposed listing, new information relevant to our consideration of the status of the mountain plover, and comments and information regarding threats to the species and its habitat.

Species Information

Our February 16, 1999, and December 5, 2002, proposed rules (64 FR 7587 and 67 FR 72396, respectively), and our September 9, 2003, withdrawal of our 2002 proposal to list the mountain plover (68 FR 53083) described the species' life history, ecology, and habitat use. For additional background on the natural history of the mountain plover, see the account of the species in *The Birds of North America* (Knopf and Wunder 2006).

While the majority of relevant information directly pertaining to the mountain plover that has become available since our December 5, 2002, proposal to list (67 FR 72396) and September 9, 2003, withdrawal of that proposal (68 FR 53083) has resulted from local or Statewide studies on the mountain plover's breeding range; two recent documents provide extensive review of current knowledge regarding the mountain plover:

(1) Mountain Plover (*Charadrius montanus*) in *Birds of North America* (Knopf and Wunder 2006); and

(2) Conservation Plan for the Mountain Plover (*Charadrius montanus*), Version 1.0 (Andres and Stone 2009).

Numerous other recent documents are summarized in our June 29, 2010, notification reinstating our December 5, 2002, proposed rule to list the mountain plover as threatened under the Act (75 FR 37353). These include over twenty peer-reviewed journal articles, and many other reports and summaries relevant to the status of the mountain plover that have become available since 2002.

The following sections highlight and update information on the mountain plover with emphasis on information developed since 2002.

Taxonomy and Species Description

The mountain plover (*Charadius montanus*) is a small bird in the order Charadriiformes, family Charadriidae. No subspecies are recognized. It is a migratory, terrestrial shorebird averaging 8 inches (21 centimeters) in body length. Mountain plover are light brown above and white below, but lack the contrasting dark breast band characteristic of several other plovers such as the more common killdeer (*C. vociferus*). Sexes are similar in appearance.

Feeding Habits

Mountain plover feed on ground-dwelling invertebrates and flying invertebrates found on the ground, primarily beetles, crickets, and ants. They forage with a series of short runs and stops, feeding opportunistically as they encounter prey (Knopf and Wunder 2006, unpaginated).

Breeding

Mountain plover return north to their breeding sites in the western Great Plains and Rocky Mountain States in spring. They arrive at their breeding grounds in northeastern Colorado in late March (Graul 1975, p. 6). Arrival is earlier farther south and later in Montana and at higher elevations in South Park, Colorado (Knopf and Wunder 2006). Mountain plover are territorial during the breeding season, with males defending territories shortly after arrival (Knopf and Wunder 2006). Mountain plover are generally monogamous; they form pairs and begin courtship on arrival at their breeding grounds. Nests consist of a simple ground scrape. Egg laying in northeastern Colorado begins in late April and extends through mid-June (Graul 1975, p. 7). Graul (1973, p. 84) described mountain plover nesting as a “rapid multi-clutch system.” The female normally produces two clutches, typically three eggs each, at different nest sites; the male incubates the first nest site while the female incubates the second. If the first nest or brood is lost early in the breeding season, the adult may renest, so each pair can potentially make four attempts per year to raise a brood. This breeding system may increase breeding success given predation that occurs on mountain plover nests or broods. This breeding system, rare among bird species, may result in greater reproductive potential than in other shorebirds (Knopf and Wunder 2006). It may have developed in response to food fluctuations that typically occur in the shortgrass prairie, where insect populations likely fluctuate in response to annual, seasonal, and local fluctuations in precipitation (Graul 1973, p. 85).

Average incubation period is 29 days (Graul 1975, p. 19). Chicks leave the nest within hours of hatching and obtain their own food. Only one adult normally tends each nest and brood. The minimum habitat requirement for mountain plover broods in Montana was 70 acres (ac) (28 hectares (ha)) (Knopf and Rupert 1996, p. 33), and brood home ranges averaged 143 ac (57 ha) on rangeland in Colorado (Knopf and Rupert 1996, p. 31). Brood home ranges appeared similar for three Colorado landscapes (Dreitz and Knopf 2007, p. 129). Parents stay with chicks until they fledge, which occurs at about 33 to 34 days (Graul 1975, p. 25). Mountain plover breed their first spring and every year thereafter (Knopf and Wunder 2006).

Habitat and Range

Although often thought of as a grassland species, the mountain plover may best be described as a species of disturbed prairie or semi-desert habitat (Knopf and Miller 1994, p. 505). They are found on open, flat lands including xeric (extremely dry) shrublands, shortgrass prairie, barren agricultural fields, and other sparsely vegetated areas. On grasslands, they often inhabit areas with a history of disturbance by burrowing rodents such as prairie dogs (*Cynomys* spp.), native herbivores, or domestic livestock.

Mountain plover breed from Canada (extreme southern Alberta and Saskatchewan) to northern Mexico (Figure 1) with greatest apparent numbers in Colorado and Wyoming, and substantial numbers in Montana, New Mexico, and Nebraska. In Mexico, breeding populations are suspected in the States of Chihuahua, Cohuila, and Nuevo Leon (Andres and Stone 2009, p. 9).

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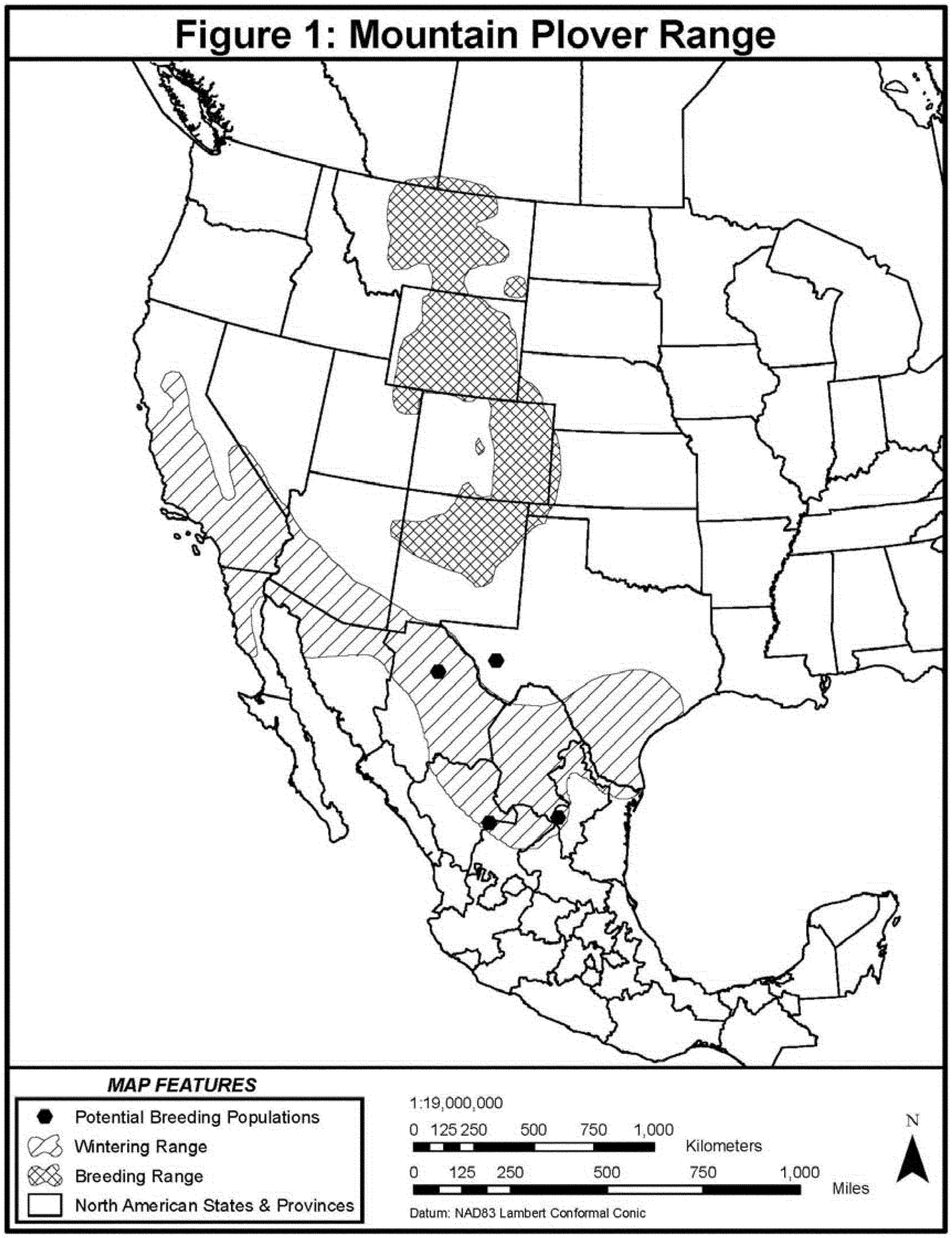

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Mountain plover winter in similar habitat, many in California, but also in southern portions of Arizona, Nevada, New Mexico, Texas, and in northern Mexico. While California's Sacramento, San Joaquin, and Imperial Valleys support the greatest documented concentrations of wintering mountain plover, relatively little is known about wintering numbers or distribution in other areas.

Breeding Habitat

Common elements of mountain plover breeding habitat include short vegetation, bare ground, and flat topography. The mountain plover historically nested in a region impacted by a variety of herbivores, including prairie dogs, bison (*Bison bison*), and pronghorn antelope (*Antilocapra americana*), because these heavily grazed or similarly disturbed landscapes support reduced height and density of vegetation, creating favorable breeding habitat for mountain plover. While the mountain plover is categorized as a shorebird, it is seldom found near margins of freshwater or marine estuaries. Dinsmore (2003, pp. 14–17) described four types of breeding habitat: Short- and mixed-grass prairie, prairie dog colonies, agricultural lands, and semi-desert.

On the plains, the mountain plover is generally considered an associate of the shortgrass prairie, dominated by blue grama (*Bouteloua gracilis*) and buffalo grass (*Buchloe dactyloides*) (Knopf and Miller 1994, p. 504). In the Pawnee National Grasslands (PNG) in northern Weld County, Colorado, an area that formerly supported the greatest known concentration of breeding mountain plover, breeding habitat was described as restricted to flat, heavily grazed areas (Graul 1973, p. 69). Native prairie grasslands formerly presented a diverse ecosystem, shaped by low precipitation, grazing, and fire. Today, prairie landscapes often consist of grassland fragments where current cattle grazing practices tend to create relatively uniform grass coverage and height, which is not beneficial to mountain plover (Knopf 2008, pp. 55–57). Typical range management practices such as rotational grazing, limited grazing, and improving soil moisture are designed to promote taller grasses that limit mountain plover use. Within these landscapes, areas of cattle concentration (loafing areas and near water), disturbance caused by prairie dogs, and plowed or fallow (unseeded for one or more seasons) agricultural fields create conditions favorable for mountain plover nesting (Knopf and Wunder 2006). Mountain plover are also attracted to burned areas in their breeding grounds, and burning may be valuable as a habitat management tool (Knopf 2008, pp. 25–26, 57–58, 61; Andres and Stone 2009, p. 34).

Prairie dog colonies create important habitat for mountain plover, and are especially important to maintaining mountain plover populations in the northern portions of their range (Dinsmore *et al.* 2003, pp. 1024–1025; Dinsmore *et al.* 2005, p. 1552; Augustine *et al.* 2008, unpaginated; Childers and Dinsmore 2008, p. 705; Tipton *et al.* 2009, pp. 496–497; Dreitz 2009, pp. 875–877). Active prairie dog colonies provide exposed soils around burrows and, because prairie dogs keep surrounding vegetation clipped, an area of low-growing, perennial vegetation that is suitable as mountain plover breeding and brood-rearing habitat. In addition, prairie dogs give alarm calls in response to the approach of predators and may alert mountain plover to predator presence. The density of mountain plover was found to be much greater on black-tailed prairie dog (*C. ludovicianus*) colonies than on other habitats in Montana (Childers and Dinsmore 2008, pp. 705–706). In north-central Montana, the size of the adult mountain plover population closely tracked annual changes in the area occupied by black-tailed prairie dogs (Dinsmore *et al.* 2003, p. 1024). Both prairie dog and mountain plover numbers declined sharply in the mid-1990s in response to an outbreak of sylvatic plague, which caused deaths of prairie dogs and resultant loss of favored mountain plover habitat. Mountain plover later increased in concert with subsequent increases in prairie dogs (Dinsmore *et al.* 2005, pp. 1550–1552).

In the Colorado shortgrass prairie ecosystem, mountain plover densities observed on black-tailed prairie dog colonies were higher than those on dryland agriculture and much higher than those on grasslands without prairie dogs (Dreitz *et al.* 2006, p. 702; Tipton *et al.* 2009, p. 496). Mountain plover were significantly more abundant on black-tailed prairie dog colonies than on other rangeland within a bison pasture in northeastern New Mexico (Groguen 2010, pers. comm.). Prairie dog colonies occupied by mountain plover were, on average, larger in size than colonies with no mountain plover. In Utah, mountain plover nested in proximity to white-tailed prairie dog (*C. leucurus*) colonies (Manning and White 2001, p. 226). In northeastern Mexico, breeding mountain plover were associated with Mexican prairie dog (*C. mexicanus*) colonies (Gonzales-Rojas *et al.* 2006, p. 82).

Mountain plover have been found to regularly use fallow or plowed agricultural fields for nesting (Shackford *et al.* 1999, entire; Dreitz and Knopf 2007, pp. 684–685; Bly *et al.* 2008, p. 127; McConnell *et al.* 2009, pp. 30–33). Where mountain plover have an opportunity to choose between agriculture and prairie, they may use both equally (Knopf and Rupert 1999, p. 84). Shackford *et al.* (1999, entire) found mountain plover nesting on cultivated fields in Colorado, Oklahoma, Kansas, and Wyoming. Fifty percent of all nests they encountered during their research were on fallow or bare fields. While many nests were destroyed by farm machinery, they concluded that mountain plover were using cultivated fields successfully for nesting, especially in southern portions of the species' range (Shackford *et al.* 1999, p. 117).

Recent studies addressed the mountain plover's nesting ecology, and attempted to identify the extent of breeding distribution and population size in Nebraska (Bly *et al.* 2008). They encountered 272 nests on agricultural fields of cultivated wheat and millet (Bly *et al.* 2008, p.123). Studies in Oklahoma encountered mountain plover on bare agricultural fields (90 percent of observations), with few (5 percent of observations) associated with prairie dog towns (McConnell *et al.* 2009, pp. 31–32).

It remains unknown whether Texas or Mexico crop fields support mountain plover breeding (Andres and Stone 2009, p. 24). Holliday (2010) reported that breeding season sightings of mountain plover from the Texas Panhandle tended to be in cultivated fields as in adjacent Oklahoma, although previously reported nesting in West Texas was in grazed, short-grass habitat.

Knopf and Wunder (2006) described mountain plover as breeding "more predictably" at semi-desert locations west of the shortgrass prairie in Colorado, Wyoming, and Montana. Beauvais and Smith (2003, entire) developed a model of mountain plover breeding habitat in shrub-steppe habitat of western Wyoming. They related favored patches of mountain plover breeding habitat to poor soils, low precipitation, and wind scour, features they predicted would persist over time, especially on public lands. In such habitats, mountain plover are less dependent on prairie dog colonies to create breeding habitat. A Wyoming study located 55 mountain plover nests in grassland or desert scrub habitat in six counties (Plumb *et al.* 2005a, p. 225). All nest sites were grazed by ungulates with prairie dogs present at only 36 percent of nest sites, mostly in grassland (Plumb *et al.* 2005a, pp. 226–227). In Montana, Childers and Dinsmore (2008, p. 107) noted that sparsely vegetated, hardpan clay flats provided nesting habitat.

In summary, mountain plover require short vegetation with some bare ground on their breeding sites. In grasslands, this usually requires disturbance, such as that provided by prairie dogs, cattle grazing, fire, or farming. In semi-desert environments, breeding habitat may persist without these forms of disturbance.

Migration and Wintering Habitat

Southbound migration of mountain plover is prolonged, with post-breeding flocks numbering in the hundreds forming in late June with some remaining on breeding areas until September or October (Bly *et al.* 2008, p. 123; Andres and Stone 2009, p. 10). Mountain plover migrate southward across the southern Great Plains in late summer and early fall to Texas, New Mexico, and Mexico, with many then traveling west to California (Knopf and Wunder 2006). During spring migration, mountain plover move from their wintering sites in early March and proceed quickly to breeding sites in eastern Colorado by mid-March and in Montana by mid-April (Knopf and Wunder 2006). Mountain plover are generally thought to use habitats similar to those on the breeding and wintering grounds during migration. During migration, they have also been reported using alkaline or mud soils, and sod farms (Knopf and Wunder 2006). Few studies have been conducted on stopover habitat, and little is known about stopover ecology or food resources exploited (Andres and Stone 2009, pp. 14, 21, 37).

In winter, mountain plover use habitats similar to those on their breeding grounds. Mountain plover are found wintering in California mostly on fallow and cultivated agricultural fields, but also on grasslands and grazed pastures (Hunting *et al.* 2001, p. 39; Knopf and Wunder 2006).

Throughout the Central Valley of California, the field types used by mountain plover vary seasonally, from uncultivated lands in October and November, shifting toward cultivated lands over the winter (Hunting and Edson 2008, pp. 183–184). Mountain plover wintering in the San Joaquin Valley of California used tilled fields, grazed pastures, alkali flats, and burned fields, but they preferred native valley sink scrub (low vegetation dominated by alkali-tolerant shrubs) and nonnative grazed or burned grasslands over any of the more common cultivated land types (Knopf and Rupert 1995, pp. 747–749). Winter habitat availability in California's Carrizo Plain seems linked to a combination of livestock grazing and precipitation, with heavy grazing and dry conditions creating conditions most favorable to the mountain plover. Giant kangaroo rat (*Dipodomys ingens*) precincts (colonies) are also used, especially when wet years produce tall vegetation elsewhere (Sharum 2010, pers. comm.).

Mountain plover exclusively used cultivated sites in the Imperial Valley of California (Wunder and Knopf 2003, pp. 74–75). While cultivated lands are abundant throughout the Imperial Valley, not all provide suitable feeding habitat. Mountain plover were found to favor irrigated farmland, including burned bermudagrass (*Cynodan dactylon*); harvested, grazed, or sprouting alfalfa (*Medicago spp.*) fields; and newly cultivated fields (Wunder and Knopf 2003, pp. 75–76; AMEC Earth and Environment 2003, p. 12). Fallow fields were used mostly for roosting, and melon and vegetable fields were rarely or never used (Wunder and Knopf 2003, pp. 75–76). Insect availability, furrow depth, size of dirt clods, and the vegetation on contiguous land parcels were all believed to influence the suitability of agricultural fields to mountain plover.

In California, annual climatic variability, especially abundant rainfall, influences field conditions and can reduce mountain plover use of traditionally occupied wintering sites. For example, mountain plover became virtually absent from cultivated fields in the Imperial Valley during the rainy winter of 2004–2005 (Knopf and Wunder 2006). Movement patterns of wintering mountain plover in California are shown to be highly variable, with birds on several occasions moving more than 34 miles (mi) (55 kilometers (km)) in a week (Knopf and Wunder 2006).

In Arizona, mountain plover winter on sod farms and grazed pastures, and are observed using the same sites yearly. Their use of farm fields and other potential habitats is generally unknown, and these areas are rarely surveyed (Robertson 2010, p. 1). A few mountain plover have wintered in recent years on mowed grasses at Gila Bend Air Force Auxiliary Field (Mendelsohn 2010).

In Texas, winter reports of mountain plover were correlated with barren fields and grazed pastures (Holliday 2010). In Williamson and Bell Counties, Texas, mountain plover winter only on large, flat, plowed fields, especially those with some corn or sorghum stubble (Fennel 2002, p. 29). In the Texas coastal bend area (Nueces and San Patricio Counties), wintering plover are largely limited to plowed fields rather than grasslands or fallow fields, with mountain plover often following tractors while feeding (Cobb 2009, pers. comm.). Wintering mountain plover in Texas have also been reported using burned fields (Knopf and Wunder 2006), sod farms (Cobb 2011, pers. comm.), coastal prairies, and alkaline flats (Andres and Stone 2009, p. 12).

In Mexico, mountain plover are found wintering in grassland areas with high densities of prairie dogs (both black-tailed and Mexican) and on heavily grazed pastures (Andres and Stone 2009, p. 12; Macias-Duarte and Panjabi 2010, pp. 5, 7). Consistent with other areas, open habitat with low grass cover and sparse or no shrub cover are elements common to areas used by mountain plover in Mexico. However, significant mountain plover use of crop fields in Mexico has not been reported (Macias-Duarte and Punjabi 2010, p. 7).

Wunder (2007) studied geographic population structure in mountain plover through color-banding and stable isotope concentrations in feathers. He concluded that there is widespread mixing of mountain plover populations in winter and that birds may use alternate wintering sites in different years (Wunder 2007, p. 118). While mountain plover appear annually at some favored wintering sites, site fidelity by individual birds appears low. Mountain plover can move long distances and use various sites even within a given winter.

Survival, Lifespan, and Site Fidelity

A long-term study on mountain plover breeding grounds in Phillips County, Montana, provides much of what is known regarding population dynamics of the species. The annual survival rate of adult mountain plover of both sexes in Phillips County ranged from 0.74 to 0.96 yearly (Dinsmore 2008, p. 50). The annual survival rate for juvenile mountain plover (survival to 1 year of age) was 0.06 at hatching, but for those chicks that reached fledging age was 0.62 (Dinsmore 2008, p. 51). Survival estimates did not account for permanent emigration (birds surviving but returning in subsequent years to sites outside of the study area), so the actual annual survival may have been higher.

Previous estimates of survival rates and of estimated mean lifespan of 1.92 years (Dinsmore *et al.* 2003, pp. 1020–1021) supported our December 5, 2002, conclusion that the mountain plover had a shorter lifespan than other plovers (*Charadriidae*) (67 FR 72397) and that this might impact its opportunity to reproduce. These conclusions underestimated adult mountain plover survival. The longer study of the same population over years with varying weather and habitat conditions modified the earlier conclusions regarding the mountain plover's longevity. Mountain plover of 5 to 7 years of age were frequently encountered, and a longevity record over 10 years was established (Dinsmore 2008, p. 52). Based on this additional research, survival rates for mountain plover appear comparable to those reported for other plovers, and the mountain plover is now considered a relatively long-lived species (Dinsmore *et al.* 2010, unpaginated). We no longer believe that the mountain plover's lifespan is a liability that could contribute to the negative impact of natural or manmade events affecting the species.

Mountain plover have a high nest survival rate compared to other ground-nesting species (Dinsmore *et al.* 2010), but nest success in mountain plover has varied greatly from study to study. Successful hatching (of at least one egg) ranged from 26 percent (Knopf and

Rupert 1996, pp. 29–30) to 65 percent (Graul 1975, p. 18). Dinsmore *et al.* (2002, pp. 3485–3486) found differences in nest success between nests incubated by males (49 percent) and females (33 percent). Dreitz and Knopf (2007, p. 684) found nest success of 37 percent with no appreciable difference between nests on agricultural fields and on native rangeland.

There have been relatively few studies of chick survival (hatching to fledging) and results vary greatly. Dreitz (2009, p. 6) estimated that 30-day survival of chicks of mountain plover from prairie dog colony nesting habitat was 75 percent, and that 30-day survival on other grasslands and on agricultural fields was less than 25 percent. Following similar methodology, research on crop fields in Nebraska found 95 percent survival of chicks accompanying 31 adult mountain plover that were radio-tracked for the 36 days after eggs hatched (Blakesley and Jorgensen 2010). Radio contact was lost with other adults (due to birds leaving the area or transmitter failure), but even if assuming all chicks associated with these adults perished, chick survival was at least 58 percent (Blakesley and Jorgensen 2010). Dreitz *et al.* (2010) studied post-hatching chick survival (hatching to fledging) via radio-tracking in Colorado and Montana. The study targeted factors affecting survival, including landscape characteristics, with an objective of informing conservation and management efforts. Field studies in 2010 were hampered by unusually cold and wet weather. Of 93 chicks radio-tracked over three habitat types in Colorado, only 9 were confirmed to survive to 30 days (Dreitz *et al.* 2010, p. 3). Thirty-eight confirmed mortalities included 13 from avian predators, 8 from mammalian predators, and 17 from unknown predation, weather, and undetermined factors. Contact with other chicks was lost, and their fates were unknown. Results did not reflect higher chick survival on prairie dog towns than on other grasslands or agricultural fields. In Montana, only 1 of 39 chicks monitored on black-tailed prairie dog colonies was confirmed to survive to 30 days. Nineteen mortalities were documented, with 13 from heavy rains (Dreitz *et al.* 2010, p. 4). Sources of mortality differed among habitats in Colorado, with avian predation higher at black-tailed prairie dog towns (Dreitz *et al.* 2010, p. 6). However, results of the study are considered preliminary, and future work is planned.

Few studies have estimated seasonal adult survival rates. Dreitz (2010, unpaginated) found 89 percent survival of adults with broods for the 30 days after hatching. A study of overwintering mountain plover in California showed nearly 95 percent survival of wintering birds from November 1 to March 15 (Knopf and Rupert 1995, p. 746). Since survival of adults during stationary periods is believed to be relatively high, and there is no estimate for adult survival during spring and fall migration, there is potential that losses of adults during migration may be significant and efforts to increase adult survival might be focused on migration periods (Dinsmore *et al.* 2003, p. 1023; Andres and Stone 2009, p. 1; Dinsmore *et al.* 2010). However, there is no scientific information available to indicate that high mortality during migration is occurring.

A life stage-specific model based on data from three breeding areas, two in Colorado and one in Montana, found that mean adult survival was the parameter that most influenced modeled population growth (Dinsmore *et al.* 2010). The importance of adult survival was characterized as typical of long-lived bird species, for which repeated reproductive attempts throughout life are less important to population growth, as evidenced by low chick survival, than adult survival (Dinsmore *et al.* 2010). Nest survival was comparable to, or higher than, other ground-nesting shorebirds and was less important to population growth than survival of chicks, juveniles, and adults. Large variation in estimates of chick survival led to the conclusion that to improve population viability on breeding areas, management to increase chick survival should be a priority. The authors believed such management should be emphasized over past efforts to decrease nest losses and increase hatching success (Dinsmore *et al.* 2010). However, the authors conceded that management to improve chick survival is more difficult than improving hatching success and might require large-scale habitat improvement.

Mountain plover were thought to have high site fidelity to nesting locations, returning to same area where they hatched each year (Graul 1973, p. 71). Skrade and Dinsmore (2010, p. 672) quantified mountain plover dispersal on breeding sites in Montana and reported juvenile (natal) dispersal (hatching year to return at age 1) averaged 8.1 mi (13.0 km) for males and 6.3 mi (10.2 km) for females. Only 4 of 38 banded chicks returning as adults arrived back at the same black-tailed prairie dog colony where they were banded. Knopf and Wunder (2006) noted a chick that had dispersed over 30 mi (50 km) in Colorado.

The previous year's nesting success influences adult dispersal; unsuccessful adults disperse farther than successfully breeding adults (Skrade and Dinsmore 2010, p. 671). While adults rarely move far from the area where they nested the previous year, evidence of potential for year-to-year dispersal in adults is exemplified by an adult mountain plover banded on a breeding area in Colorado in 2009, that was found nesting approximately 25 mi (40 km) away in Nebraska in 2010 (Bly 2010b, pers. comm.).

Results from genetic studies suggest that gene flow among breeding areas is sufficient to offset genetic effects of small populations and reported adult fidelity to breeding areas (Oyler-McCance *et al.* 2008, pp. 496–497).

Population Size and Trends

Mountain plover are difficult to detect because they are cryptically colored and in general are widely distributed at low densities (Knopf and Wunder 2006). Based on historical observations of mountain plover and extensive habitat changes, there is general agreement that the mountain plover is currently greatly reduced in numbers and range compared to their numbers and range prior to European settlement (Graul and Webster 1976, p. 265; Knopf and Wunder 2006). The mountain plover's historical breeding range is believed to have differed from that currently occupied primarily in its eastern extent, which may have encompassed the western thirds of North Dakota, South Dakota, and Nebraska, and more of western Kansas and the Texas Panhandle than is currently occupied (Graul and Webster 1976, p. 265, Knopf and Wunder 2008).

Population estimates for the species, both historical and recent, appear imprecise. Graul and Webster (1976, p. 266) estimated that mountain plover populations in Montana, Wyoming, eastern Colorado, and New Mexico then totaled 214,200 to 319,220 birds, with 20,820 in the population stronghold of Weld County, Colorado. However, Knopf and Wunder (2008) cited Graul (pers. comm.) as saying that the estimates may have been off (*i.e.,* high) by an order of magnitude (a factor of 10).

Knopf (1996, p. 12) estimated the total population of mountain plover to be about 8,000 to 10,000, based on a 1994 wintering survey in California and on assumptions regarding proportion of the wintering population observed (*i.e.,* that only half of birds wintering in California had been counted and that 1,000 to 3,000 birds wintered in Texas and other areas). We cited this estimate in our

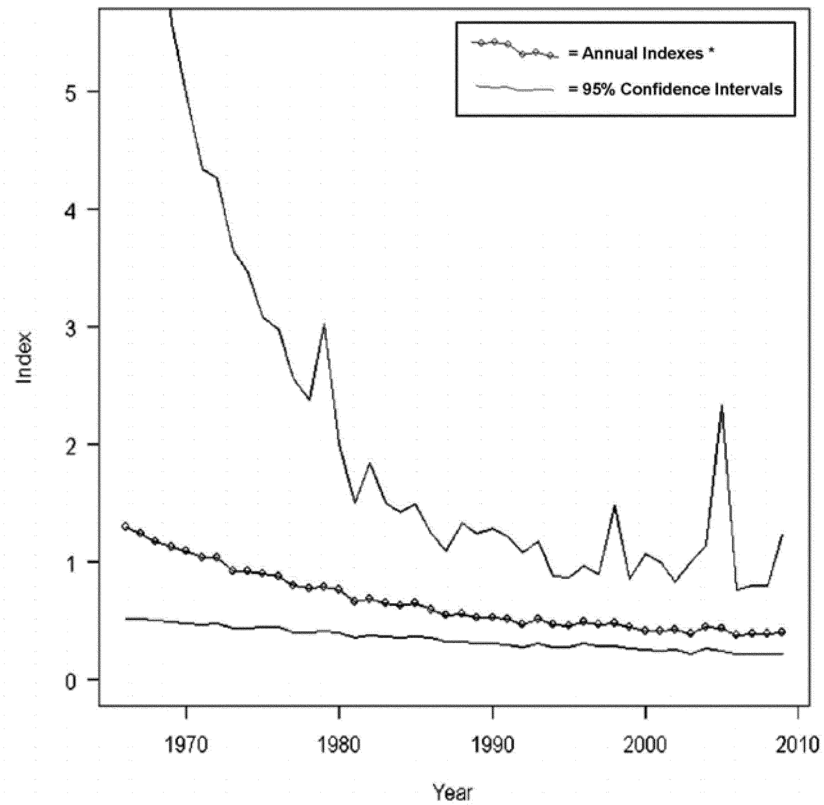
December 5, 2002, proposed rule (67 FR 72396). In our September 9, 2003, withdrawal of our proposed listing (68 FR 53083), we again cited the Knopf estimate above and, using similar assumptions and newer California winter survey data (1998–2002), provided a rangewide estimate of 5,000 to 11,000 mountain plover. More recent studies, which estimated populations present on specific portions of the breeding range, have resulted in a higher rangewide estimate of the mountain plover breeding population. After investigating Wyoming populations, Plumb *et al.* (2005b, p. 15) estimated a minimum of 3,393 mountain plover in Wyoming (up from previous estimates of 500 to 1,500) and estimated a rangewide total of 11,000 to 14,000 mountain plover. Based on newer information, including an upward revision of estimated mountain plover numbers on the eastern Colorado plains (a conservative estimate of 8,577 birds), Tipton *et al.* (2009, p. 497) provided a rangewide estimate of 15,000 to 20,000 mountain plover. Andres and Stone (2009, p. 8) reviewed available data and provided a coarse, minimum rangewide estimate of 18,000 breeding mountain plover. Knopf and Dreitz (*in press*) concluded that the continental breeding population is "certainly larger" than the 17,500 birds estimated in Montana, Wyoming, and Colorado, citing small populations in contiguous States, a potentially significant population in New Mexico, and an unknown population in Mexico. Based on our review of recent data, including those from Nebraska (Van der Berg *et al.* 2010) and New Mexico (see Breeding Range below), we estimate that the current rangewide mountain plover breeding population exceeds 20,000 birds. This was supported by Knopf (2009, pers. comm.). We have no information to indicate that this estimate reflects an actual increase in rangewide mountain plover numbers over previous, lower estimates. Instead, it likely reflects the limitations of those earlier rangewide estimates (based on mountain plover wintering in California that largely discounted birds wintering elsewhere) and more accurate recent estimates of breeding populations.

Accurate trend information for mountain plover numbers is generally lacking. Interpreting trends from the two long standing surveys, the Breeding Bird Survey (BBS) and the National Audubon Society's Christmas Bird Count (CBC), suffer from a variety of problems, including the inherent difficulties associated with using a survey of only a small portion of a total population to infer rangewide trends (Knopf and Wunder 2004, p. 1).

The BBS is a large-scale survey of North American birds that began in 1966, and is conducted during the breeding season by observers driving along roads over established routes. Knopf (1996, p. 12) cited BBS data from 1966 through 1993 as indicative of a steep decline in mountain plover numbers across their breeding range (3.7 percent per year, a decline of approximately two-thirds over the period). However, Knopf and Wunder (2004, p. 1) suggested that the timing of surveys (which occur mostly in June when mountain plover are less conspicuous) and the low densities at which mountain plover occur prevent reliable trend estimates.

Based on recent BBS data analysis (Sauer 2010a), the mountain plover has declined rangewide at an estimated rate of 2.6 percent per year for the period from 1966 to 2009 (95 percent confidence interval (CI) −6.7 to +0.6). However, for the period from 1999 through 2009, the estimated rate of decline decreased to 1.1 percent per year (95 percent CI −5.8, +9.6) (Figure 2). While neither estimate varies statistically from a stable population (at a 95 percent CI), the probability that the estimated long-term trend (1966 through 2009) is less than or equal to zero is 95 percent. The probability that the estimated short-term trend (1999 through 2009) is less than or equal to zero is 68 percent. The estimated long-term decline is consistent with the generally accepted conclusion that the mountain plover's rangewide population is currently smaller than it was in the 1960s. The more recent (1999 through 2009) estimated decline and associated CI lead us to conclude that most or all of the long-term decrease took place before 1999, that any recent declines are modest, and that the mountain plover population may be near stable.

Figure 2: Rangewide Population Index for the Mountain Plover



Based on rangewide Breeding Bird Survey Data (Sauer 2010a)

* Annual indexes are modeled composite population estimates scaled to the population level of a typical breeding bird survey route.

Sauer (2011, pers. comm.) concluded that limited regional data from the BBS (*i.e.,* the low numbers of routes reporting the species and low numbers of mountain plover observed) resulted in imprecise trend estimates within individual States and for the time periods of interest. He also concluded that BBS data only provide an imprecise summary of mountain plover population dynamics, and the limited sample size likely reflects the limitations of the roadside sampling frame in sampling mountain plover breeding populations.

We conclude that, while the BBS is the only long-term trend information available for the mountain plover on its breeding range, it is an imprecise indicator of mountain plover population trends. Given the wide confidence interval and the conclusion by Sauer (2011, pers. comm.) above, the data provide limited support for any recent (1999 through 2009) trend in mountain plover numbers. Even so, we acknowledge that this is the best available information on trends for this species and BBS survey results suggest a recent (1999 through 2009) moderated rate of decline (Figure 2). We provide long-term and recent BBS trend estimates for three States where the sample size allowed for analysis (see Conservation Status and Local Populations below), but with the same reservations regarding precision.

The CBC is an annual count performed around the end of December in which volunteers observe birds in 15-mi (24-km) radius count circles. While CBCs can be used to infer species population trends, spatial coverage is limited (Knopf and Wunder 2004, p. 1) and established count circles commonly coincide with populated areas where volunteers are available. The CBC data estimated an annual decrease of 2.8 percent in mountain plover observed from 1966 through 2007, but reliability was described as low (Butcher and Niven 2007, Appendix 1).

The vast majority of mountain plover reported in CBCs come from California and, within California, from the South Salton Sea count. Pandolfino (2009, unpaginated) submitted his analysis of CBC data for California and recognized the data's limitations, but concluded that the data reflected long-term and recent declines in mountain plover numbers wintering in California. The CBC data on mountain plover numbers is highly variable from year to year. The Salton Sea South CBC, the only CBC in the Imperial Valley, is limited in scope and does not include portions of the valley where most mountain plover have been seen (Wunder and Knopf 2003, p. 76). Inherent limitations in data collection methods (volunteers surveying small areas relative to total winter range) and lack of sufficient detections of mountain plover in California count circles (Hunting *et al.* 2001, p. 40) render trend analysis uncertain. CBC data from other States and Mexico is even less representative of wintering populations and provides no insight into possible trends for the mountain plover.

We conclude, based on observations across the mountain plover's range and BBS trend data, that a historical decline of the mountain plover has occurred since the 1960s. However, we agree with the conclusion of Andres and Stone (2009, p. 3) that precise and accurate information on recent trends in mountain plover numbers is lacking. The recent (1999 through 2009) decline estimate from BBS data is modest (1.1 percent per year) and any difference from a stable population estimate (slope of 0.0) is statistically insignificant. However, we acknowledge that the BBS data is the best available information on trends for the mountain plover and that BBS results suggest a recent (1999 through 2009) moderated rate of decline (Figure 2). The CBC wintering data are highly variable and come mostly from California, but also suggest a long-term decline. No comprehensive trend data across the mountain plover's wintering range are available. The discussion below provides information on populations and trends within States, Canada, and Mexico, where available.

Conservation Status and Local Populations

The mountain plover is listed as endangered in Canada, as a sensitive species in Alberta, and as a threatened species in Mexico (Andres and Stone 2009, p. 13; Gober 2010). The mountain plover is identified by the Service as a Bird of Conservation Concern (Service 2008), is considered "highly imperiled" in the U.S. Shorebird Conservation Plan (2004, p. 2), a category assigned to species listed as threatened or endangered nationally, and all species with significant population declines and either low populations or some other high risk factor. It is also identified as "G3-vulnerable" by NatureServe (2010). The species is listed as a sensitive species by the U.S. Forest Service (USFS) (2010) and by the Bureau of Land Management (BLM) (2000a, 2006, 2010a). It is identified as a species of global conservation concern in the American Bird Conservancy and National Audubon Watchlist, and it is listed as "near threatened" by the International Union for the Conservation of Nature (IUCN) (BirdLife International 2010). The designations discussed above may, in part, reflect population estimates at the time those designations were established. The IUCN previously (from 2004 to 2007) listed the species as "vulnerable," a higher level of concern than "near threatened," but changed its rating as higher rangewide population estimates emerged. The U.S. Shorebird Conservation Plan provided a rangewide estimate of 9,000 mountain plover until 2006, when the estimate was revised upward to 12,500 (Morrison *et al.* 2006, p. 69).

All States within the range of the mountain plover have included the species in their Comprehensive Wildlife Conservation Strategy or Wildlife Action Plans or both (State Plans) (Arizona Game and Fish Department 2006; University of California 2005; Colorado Division of Wildlife 2006; Wasson *et al.* 2005; Montana Fish, Wildlife and Parks 2005; Schneider *et al.* 2005; New Mexico Department of Game and Fish 2006; Oklahoma Department of Wildlife Conservation 2005; Texas Parks and Wildlife 2005; Wyoming Game and Fish Department 2005) as either "Species of concern" or "Species of greatest conservation need." Each State categorizes species under these designations based on available information about the status, distribution, and trend of the species in their State. They are not regulatory classifications, but rather are intended to guide resource managers in making proactive decisions regarding species conservation and data collection priorities. The State Plans are not intended to be specific action plans for any species. These designations do not result in any protection for the species. However, the mountain plover is identified as threatened in the State of Nebraska, the only State where the species is listed as endangered or threatened.

Breeding Range

Colorado

In Eastern Colorado, the shortgrass prairie ecosystem provides flat, dry breeding habitat for the mountain plover. The species occupies grasslands within prairie dog colonies, grasslands without prairie dog colonies, and dry land agricultural fields (Dreitz *et al.* 2005, pp. 129–130; Tipton *et al.* 2009, p. 496).

Knopf and Miller (1994, p. 504) noted the PNG, Weld County, Colorado, as a breeding stronghold for the species, but in the mid-1990s the population fell dramatically. The PNG now supports relatively few breeding mountain plover. In 2009, Knopf provided an overview of mountain plover studies on the PNG from 1986 through 2007. He suggested that mountain plover numbers on the PNG had been in decline since the late 1930s and early 1940s, and that the dramatic decline in the mid-1990s was the abrupt endpoint of a process of deteriorating habitat, exacerbated by other factors such as wet spring weather, increased predation, and the relocation of breeding mountain plover to better habitats elsewhere (Knopf 2008, p. 61).

Despite the virtual loss of the PNG population, over half of all mountain plover are thought to breed in Colorado (Andres and Stone 2009, p. 15). A recent study reported a conservative estimate of 8,577 breeding mountain plover in eastern Colorado (95 percent CI 7,511 to 35,130) (Tipton *et al.* 2009, p. 497). A separate, higher elevation population in South Park, Park County, Colorado, was estimated at 2,310 adults (Wunder *et al.* 2003, p. 661). Surveys through 2006 suggested a stable population in South Park, with any variation largely attributable to wet years and dry years affecting breeding conditions (Wunder 2010a). Small numbers of mountain plover also occur in Colorado's San Luis Valley (Hicks-Anderson and VerCauteren 2006, entire). Andres and Stone (2009, p. 8) provided population estimates for the United States, Canadian provinces, and Mexican States based on their review of all available information. Their estimate of 11,000 mountain plover breeding in Colorado appears appropriate given information available.

The BBS data from Colorado, 1966 through 2009 (−0.9 percent decline annually, 95 percent CI (−7.0 to 3.5)) and 1999 through 2009 (0.3 percent increase annually, 95 percent CI (−5.5 to 14.7)) (Sauer 2010a), suggest little long-term or recent change in breeding numbers in Colorado. Based on these data, we conclude that the current breeding population in Colorado, which likely supports half or more of all breeding mountain plover, is relatively stable.

Wyoming

Wyoming has the highest estimated number of breeding mountain plover outside of Colorado. The mountain plover is locally common and has been detected in every county of Wyoming (Smith and Keinath 2004, p. 3). A projected 20.5 million ac (8.3 million ha) of mountain plover habitat exists in Wyoming, with 59 percent occurring on public lands (Wyoming Natural Diversity Database (WYNDD) 2010; Emmerich 2010).

Nesting of mountain plover in Wyoming occurs in both grassland, mostly in the eastern part of the State, and desert-shrub (Plumb *et al.* 2005b, p. 20). Mountain plover densities were comparable across habitat types with overall density only slightly higher in grassland than in desert-shrub (Plumb *et* *al.* 2005b, p. 20). Mountain plover appear to have less association with prairie dog habitat in Wyoming than elsewhere (Plumb *et al.* 2005a, p. 226). Little of the mountain plover breeding range in Wyoming (approximately 12 percent) is on cropland Knopf and Rupert 1999, p. 85).

Plumb *et al.* (2005b, pp. 19–20) estimated a minimum population of 3,393 mountain plover in Wyoming in 2002 and 2003. Andres and Stone (2009, p. 8) provide an estimate of 3,400 mountain plover breeding in Wyoming. This number is based on Plumb *et al.'*s estimate and, like that estimate, it reflects the minimum number likely present. Given that Plumb *et al.* (2005b, pp. 19–20) provided a conservative estimate, the actual breeding population is likely larger; however, we have no basis to provide a more accurate estimate.

The BBS data from Wyoming (Sauer 2010a), 1966 through 2009 (−1.2 percent decline annually, 95 percent CI (−5.7 to 3.3)) and 1999 through 2009 (−2.3 percent decline annually, 95 percent CI −13.9 to 4.5)), suggest that both long-term and recent declines in breeding mountain plover numbers in Wyoming may have occurred.

Montana

Primary breeding habitat for mountain plover in Montana is in the north-central portion of the State where mountain plover are highly dependent on black-tailed prairie dog colonies for habitat. Montana Fish, Wildlife and Parks modeled suitable mountain plover habitat in the State. Mapping indicated that the greatest area of highly suitable habitat occurs in Phillips, Blain, Valley, and Fergus Counties with patchy distribution though the central and southeast portions of the State. The total area of suitable habitat estimated was 18.5 million ac (7.5 million ha) (McDonald 2010).

Childers and Dinsmore (2008, p. 706) reported an estimate of 1,028 mountain plover in Phillips and Valley Counties in 2004 (95 percent CI (903 to 1,153)). In 2010, standardized census areas in southwest, central, and northeast Montana produced fewer sightings than previous surveys (1992–2000, 2004); however, McDonald (2010) stated that results were negatively influenced by above average rainfall, increased vegetation height, and limited private land access; therefore, results cannot be relied upon. Other than apparent confirmation of a previously documented decline in the southwest census area (FaunaWest Wildlife Consultants 2004, pp. 4–5), no trends could be inferred from the 2010 survey.

Andres and Stone (2009, p. 8) used the above estimate by Childers and Dinsmore (2008, p. 706) and previous estimates of about 600 mountain plover elsewhere in Montana and provided a Statewide estimate of approximately 1,600 mountain plover. BBS observations of mountain plover on routes in Montana were insufficient to provide estimates of population trend.

New Mexico

Most breeding season reports of mountain plover in New Mexico have come from the northeast and western counties. Sager (1996, pp. 8–9) found 152 presumed breeding adults at 35 sites in 11 counties in northern New Mexico. Marguilies *et al.* (2004, p. 3) estimated 200 mountain plover in Union County alone throughout the summer and located 46 nests. In a limited effort, they also found 22 mountain plover and six nests on public lands in Taos and Colfax Counties.

At BLM's North Unit, Taos County, point counts in 2005 through 2007 estimated 176 mountain plover on 8,400 ac (3,400 ha) of the 50,000-ac (20,000-ha) unit considered to be favorable mountain plover breeding habitat, based on past observation of mountain plover (Hawks Aloft 2007, pp. 9–11). If the entire unit was occupied at the same density, an estimated 1,000 mountain plover might have been present on the North Unit. Manderson (2010, pers. comm.) inspected habitat away from survey routes in 2010, and suggested that, based on habitat quality, 500 or more mountain plover could be present on the entire unit. Mountain plover numbers seen on the same survey routes in 2010 were comparable to those in earlier (2005 through 2007) surveys (Hawks Aloft 2010, p. 13), suggesting this population may be stable.

Goguen (2010, pers. comm.) estimated a minimum of 40 to 50 breeding mountain plover on the Vermejo Ranch, Colfax and Taos Counties. Mountain plover were also recently reported present in El Malpais National Conservation Area, Cibola County (Hawks Aloft 2008, entire).

We found no Statewide breeding surveys or estimates of Statewide breeding populations for mountain plover in New Mexico, other than Andres and Stone's (2009, p. 8) conservative estimate of 500. Given the above data from Union County, the BLM's North Unit in Taos County, the Vermejo Ranch in Colfax and Taos Counties, and likely mountain plover occurrence in several other counties, we believe that at least 1,000 and potentially significantly more mountain plover breed in New Mexico.

BBS data from New Mexico (Sauer 2010a), 1966 through 2009 (−5.0 percent decline annually, 95 percent CI (−8.6 to −1.2)) and 1999 through 2009 (−4.8 decline annually, 95 percent CI (−12.1 to 2.7)), demonstrate a long-term decline and also suggest a short-term decline in breeding mountain plover numbers in New Mexico. New Mexico is the only State for which the long-term BBS trend statistically differs from zero.

Nebraska

In our December 5, 2002, proposal to list the mountain plover we estimated 200 mountain plover in Nebraska (67 FR 72399). Recent studies attempted to identify the extent of breeding distribution and population size in Nebraska (Bly *et al.* 2008, entire). Most nests were found on agricultural fields in Kimball County, in extreme southwestern Nebraska, but mountain plover were also found in nearby Cheyenne and Blain Counties. The minimum breeding population was estimated to be 80 adults in 2007, based on nests found, and the total estimate of breeding birds ranged upward to 360 (Bly *et al.* 2008, p. 127). Van der Burg *et al.* (2010, pp. 50–53) reported on monitoring in the same three counties (Kimball, Cheyenne, and Blain) in southwestern Nebraska and estimated that mountain plover breeding numbers of 1,650, 1,617, and 1,558 over 3 years of the study (2005, 2006, and 2007, respectively). The authors attributed past low estimates in Nebraska to: (1) Low detection probabilities; (2) clumped spatial distribution of mountain plover, which their estimation methodology corrected for; and (3) "chronic undersampling." Given the above estimates from Van der Burg *et al.* (2010, pp. 50–53), an estimate by Andres and Stone (2009, p. 8) of 500 breeding mountain plover in Nebraska appears low.

Nebraska is the only State that has regulatory mechanisms in place to conserve the mountain plover and its habitat, which likely protect relatively few individuals. The Nebraska Game and Parks Commission lists the mountain plover as a "threatened" species. Listing of endangered and threatened species identifies those animals and plants whose continued existence in Nebraska is in jeopardy. Efforts can then be made to restore the species or to prevent extirpation or extinction. Once a species is listed, a State law, titled the Nebraska Nongame and Endangered Species Conservation Act, automatically prohibits take, exportation, and possession, and imposes severe penalties on violators (Nebraska Game and Parks Commission

2011). Proposed projects that would be authorized, funded, or carried out by Nebraska State agencies are reviewed as part of a mandatory consultation process designed to prevent a State action from jeopardizing the existence of an endangered or threatened species. Recovery plans for endangered or threatened species are developed; these recovery plans identify, describe, and schedule the actions necessary to restore populations of these animals and plants to a more secure status. Given that most mountain plover in Nebraska occur on private agricultural lands, there are not many State projects that are reviewed under the law. It is generally implemented only 4 or 5 times per year, primarily on transportation, transmission, and energy development projects (Lackey 2011, pers. comm.). While this law may provide protection for some individual mountain plover in Nebraska, we believe that it would only have minimal positive effects on the entire population in Nebraska, or on the rangewide population.

Oklahoma

Recent studies to determine the breeding distribution and population size in Oklahoma detected mountain plover in Cimarron and Texas Counties in the Oklahoma panhandle, mostly on fallow or barren agricultural fields (McConnell *et al.* 2009, pp. 30–33). Randomized point counts were used to derive a Statewide population estimate of 68 to 91 birds (McConnell *et al.* 2009, pp. 32–33). Andres and Stone (2009, p. 8) estimated 200 mountain plover breeding in Oklahoma. Given results of McConnell *et al.* (2009, pp. 32–33), we believe that Andres and Stone's (2009, p. 8) estimate may be slightly high. The range of the mountain plover in Oklahoma was described as stable over the past 100 years, with the suggestion that populations may have changed little (Hatcher 2010).

Kansas

The Kansas Department of Wildlife and Parks (2005) stated that mountain plover breed only on dry upland in the shortgrass prairie of western Kansas. While conversion to agriculture has left little native breeding habitat, Cable and Seltman (2010, pp. 50–51) reported mountain plover are an uncommon but regular breeding species in western Kansas and that they also use idle cropland. Morton County may also serve as a staging area for migration in late summer (Cable and Seltman 2010, p. 51). Andres and Stone (2009, p. 8) estimated 200 breeding mountain plover in Kansas. No comprehensive surveys of breeding mountain plover in Kansas have been attempted; however, given their apparent use of both prairie and cropland, and a substantial population in nearby Colorado, the estimate may be appropriate.

Texas

The mountain plover likely breeds in Texas, but there are no confirmed reports of breeding since 1993 (Andres and Stone 2009, p. 16). Holliday (2010) described breeding season sight reports of mountain plover from the Texas Panhandle near known Oklahoma breeding sites. Holliday (2004) also mapped potential breeding habitat, much of it on private land that has not been surveyed. Andres and Stone (2010) did not provide an estimate of breeding mountain plover in Texas. We believe that at least minimal numbers of mountain plover breed in Texas.

Arizona

The only known mountain plover nesting in Arizona is in Apache County in east-central portion of the State, with at maximum perhaps a dozen breeding birds (Gardner 2010, pers. comm.). Breeding has occurred on grasslands where cattle were concentrated and at Gunnison prairie dog (*C. gunnisoni*) colonies (Corman 2005, pp. 591–591; Gardner 2010). However, hundreds of square miles of potential breeding habitat in northern and western Arizona have never been surveyed, and there are reports of potential breeding mountain plover on Tribal lands in Navajo County (Corman 2005, pp. 591–591; Gardner 2010, pers. comm.). Andres and Stone (2009, p. 8) estimated 100 breeding mountain plover in Arizona. This estimate acknowledges potential for a more substantial breeding population than limited observations have documented.

Utah

The mountain plover has been a historically rare breeder in shrub-steppe habitat in the Uinta Basin of northeastern Utah. Manning and White (2001, p. 225) described a small breeding population that averaged about 15 adults yearly. Mountain plover breeding in the area subsequently declined, and no birds have been found during surveys of the area since 2003 (Maxfield 2010, pers. comm.). Andres and Stone (2009, p. 8) estimated fewer than 50 breeding mountain plover in Utah. Based on no recent records of breeding mountain plover, this estimate may be optimistic.

North Dakota and South Dakota

The mountain plover once bred in these States, with higher numbers present in South Dakota, but there are no recent breeding records in either North Dakota or South Dakota (North Dakota Game and Fish Department 2010; South Dakota Game, Fish and Parks 2010).

Canada

A review of breeding records for Canada (Knapton *et al.* 2006, p. 33) concluded that the mountain plover is a peripheral species in Canada with no evidence that it was ever a common or regular breeder. The first breeding record was documented in 1979 and the most recent in 2007 (Knapton *et al.* 2006, pp. 32–33; Holroyd 2010, pers. comm.). Most sightings and breeding records come from extreme southeastern Alberta, with at least one incidence of confirmed breeding in Saskatchewan. Holroyd (2010, pers. comm.) provided updated records of sightings through 2009, mostly from Alberta. Andres and Stone (2009, p. 8) estimated fewer than 100 mountain plover breeding in Canada. We are not aware of any attempts to systematically survey all potential breeding areas in the Canadian range. However, given the low number and limited distribution of reported recent sightings (Holroyd 2010, pers. comm.), we believe that actual breeding numbers are fewer than 100.

Mexico

Breeding records of mountain plover in Mexico have been documented in southeastern Coahuila and Nuevo Leon, following a history of breeding season observations in Mexican prairie dog colonies (Desmond and Chavez-Ramirez 2002 entire; Gonzalez-Rojas 2006, pp. 81–84). Nesting is suspected in San Luis Potosi, 130 mi (200 km) south of the above records (Luevano *et al.* 2010, p. 123).

The extent of mountain plover breeding in Mexico is largely unknown. Andres and Stone (2009, pp. 8, 15) estimated fewer than 300 mountain plover breeding in Mexico (fewer than: 50 in Chihuahua, 100 in Cohuila, 100 in Nuevo Leon, and 50 in San Luis Potosi), but suspect that if there are major concentrations of breeding mountain plover not yet discovered anywhere in their range, they are likely in Mexico. The estimate of fewer than 300 birds is at best a guess, but is appropriately conservative given the lack of knowledge regarding breeding mountain plover occurrence and distribution in Mexico.

In summary, we believe that the rangewide breeding population of mountain plover likely exceeds 20,000, with largest populations in Colorado, conservatively 11,000; Wyoming, conservatively 3,400; Montana 1,600; Nebraska 1,600; New Mexico, at least 1,000 and potentially many more; and smaller populations elsewhere (Kansas, Oklahoma, Texas, Utah, Canada, and Mexico).

Wintering Range

California

Mountain plover are found from north-central California to the Mexico border, mostly from September to mid-March, with peak numbers from December through February (Knopf and Wunder 2006; Hunting and Edson 2008, p. 181). Mountain plover were historically common on the coastal plain in southern California (coastal prairie, alkaline flats, agricultural fields) before being displaced by human development (Hunting and Edson 2008, p. 182; Wunder and Knopf 2003, p. 78). Historically, much of the mountain plover habitat in the Central Valley grasslands was lost following the decline of grazing elk (*Cervus canadensis*), pronghorn antelope, burrowing kangaroo rats, ground squirrels (*Spermophilus* spp.), and other mammals. The combined activities of these herbivores maintained suitable habitat conditions for mountain plover, conditions closely resembling habitat characteristics found on breeding habitats (Knopf and Rupert 1995, p. 750). Farther south in California, desert scrub in the Imperial Valley was converted to agriculture beginning in the 1940s, creating important wintering habitat for the mountain plover. See Hunting and Edson (2008, p. 181) for details of the mountain plover's historical range and abundance in California.

Mountain plover currently occur in the greatest numbers in two general areas in California: (1) The western Central Valley from southern Colusa and Yolo Counties in the north to Kern County in the south (especially the western San Joaquin Valley, the name by which the southern Central Valley is known); and (2) the Imperial Valley in Imperial County (Hunting and Edson 2008, p. 182). The Carrizo Plain, separated from the San Joaquin Valley by the Temblor Range, and the Panoche Valley are also regularly occupied wintering areas.

Populations and trends in the Central Valley are difficult to determine due to the abundance of potential habitat, flock movements, and lack of systematic surveys (Knopf and Rupert 1995, p. 749; Edson and Hunting 1999, p. 17). In our December 5, 2002, proposal to list the mountain plover (67 FR 72396), we included Edson and Hunting's 1999 (p. 27) comment that mountain plover were "rare and local, exceedingly rare, or accidental" within individual counties in the San Joaquin Valley. Wunder and Knopf (2003, p. 78) suggested that, as a result of habitat loss, many mountain plover had shifted from the Central Valley to the Imperial Valley. Hunting and Edson (2008, p. 182) considered reports of 200 to 300 birds in the San Joaquin Valley in winter of 2004–2005, 100 to 200 in Madera County in 2005–2006, 645 in Tulare County in December 2005, and about 300 in western Kings County in January 2006 to be "exceptional." They also found noteworthy a survey total of 381 mountain plover at the Carrizo Plain in 2006 (Hunting and Edson 2008, p. 182). However, recent reports from the Central Valley also include 645 birds in Madera County in 2006 (McCaski and Garrett 2006, p. 283), 426 in Tulare County in 2007 (McCaski and Garrett 2007, p. 326), 230 in San Joaquin County in 2008 (eBird 2010), 230 in Solano County in 2008 (Central Valley Bird Club 2010), and 223 in Kern County in 2010 (eBird 2010). These reports suggest that significant numbers of mountain plover continue to use widespread areas of the Central Valley annually. Nearby, a recent high count for the Carrizo Plain National Monument was 540 birds in 2009 (Sharum 2010).

In the Imperial Valley, coordinated surveys by 26 observers over 2 days in December 1999 sighted 3,758 mountain plover (Shuford *et al.* 2004, p. 7). A survey of mountain plover and their use of cultivated fields in the Imperial Valley of California in 2001 found 4,037 birds (Wunder and Knopf 2003, p. 75), and 3,476 were counted from January 29 through February 6, 2002, by four observers, with the largest flock consisting of 410 birds (AMEC Earth and Environment 2003, p. 9–10). Mountain plover wintering in the Imperial Valley were surveyed in 2003 and 2004, in an attempt to develop a statistically reliable estimate of numbers (Knopf and Wunder 2004, entire). Flocking behavior, mobility, and weather were among factors found to limit the reliability of Imperial Valley estimates (Knopf and Wunder 2004, pp. 9–12). Results of more recent survey estimates in the Imperial Valley include more than 4,500 mountain plover seen in January 2007, approximately 3,000 seen in January 2008, and 827 seen in January 2011 (Kelsey 2011, pers. comm.).

Hunting *et al.* (2001 p. 40), Wunder and Knopf (2003, p. 76), and Hunting and Edson (2008, pp. 181–183) all suggested a significant decline in numbers of mountain plover wintering in California over previous decades. However, we found little evidence available to establish any trend in more recent (2000 to present) wintering numbers in California. The 4,500 mountain plover recorded in the Imperial Valley survey in 2007 (Kelsey 2011, pers. comm.) exceeded mountain plover observed in Statewide surveys from 1994, and 1998 through 2002 (Knopf 1996, p. 12; 68 FR 53083). Most recently, a Statewide survey over 5 days in January 2011 found 1,235 mountain plover (Kelsey 2011, pers. comm.), considerably fewer than found in previous Statewide surveys or recent Imperial Valley surveys. However, it is not apparent how unusually wet weather or other factors contributed to the relatively low number of mountain plover reported in the 2011 survey. California experienced heavy rains in late 2010. December 2010 was the City of Los Angeles' wettest December in 121 years (Southern California Weather Notes 2010).

While California remains the best documented wintering area for the mountain plover, it may winter less than 50 percent of the estimated breeding population (Andres and Stone, p. 9). Knopf (1996, p. 12) estimated 7,000 mountain plover wintering in California and 1,000 to 3,000 wintering elsewhere. In our December 5, 2002, proposed rule to list the mountain plover as threatened, we suggested that few mountain plover wintered in Texas, Arizona, and Mexico (67 FR 72397). We do not know the actual number of mountain plover wintering in California or how the number varies from year to year; however, given no recent evidence that wintering birds in California number more than the 7,000 estimate above (Knopf 1996, p. 12), and our current rangewide estimate of at least 20,000 breeding mountain plover, the previous contention that California winters the majority of all mountain plover appears incorrect. The fewer mountain plover that are wintering in California, on average or in any given winter, the more important that wintering areas outside California become. Unfortunately, we have little information to pinpoint where the majority of mountain plover are wintering.

Texas

Holiday (2010), based on an examination of LandSat (satellite) photos, found that winter records of mountain plover in Texas correlated to the distribution of barren fields and grazed pastures. He also suggested that the northern limit of the wintering range in Texas is related to the average number of frost-free days, which influences insect availability. Collins (2006, pp. 27–31) summarized mountain plover wintering status in Texas (with much of the compiled records and maps attributable to Holliday). Populations in Hondo County and Medina County areas were described as potentially the largest; Williamson County was characterized as a well-known wintering area, but with populations potentially small compared to other less known areas. Mountain plover were also present around Wharton, Wharton County, and surrounding counties, and the Corpus Christi area was said to potentially hold more mountain plover than reports indicate (Collins 2006, p. 30). Estimates by knowledgeable local birders of wintering mountain plover in the coastal bend area (Nueces and San Patricio Counties) ranged from 200 up to 2,000 to 3,000 birds (Cobb 2009, pers. comm.). The higher numbers were characterized as speculative because the vast amount of available habitat where access is generally limited makes it difficult to draw any conclusions. Andres and Stone (2009, p. 20) provided an estimate of 1,500 mountain plover wintering in Texas, with a note that abundance could be much greater.

Arizona

Approximately 500 mountain plover are believed to winter in agricultural areas of southern and western Arizona, but numbers could be higher because private and Tribal lands are largely unsurveyed (Gardner 2010). Wintering numbers in La Paz and Pinal Counties appeared stable; numbers in Cochise County have significantly decreased in the last 10 to 15 years due to urban expansion; and Yuma County populations were characterized as increasing, with 150 to 300 birds annually (Gardner 2010; Robertson 2010, pp. 3–4). Wintering mountain plover are also reported from the Sulphur Springs Valley in Cochise County (Robertson 2010, p. 2). Andres and Stone (2009, p. 20) provided an estimate of 200 mountain plover wintering in Arizona. Given limited coverage of potential wintering habitat, we consider the above estimate of 500 birds wintering in Arizona the likely minimum.

Nevada

Wintering mountain plover are rarely reported from Nevada, with the most recent reports of up to 17 mountain plover coming from the Armagosa Valley near the Nevada-California border northwest of Las Vegas (eBird 2010).

New Mexico

While some mountain plover likely winter in southern New Mexico, we have no information regarding locations or numbers.

Mexico

Mountain plover's winter distribution in Mexico has not been well studied, but the species is believed to winter from along the United States-Mexico border south into the border States of Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas, and beyond into Durango, Zacatecas, and San Luis Potosi (Gonzales-Rojas *et al.* 2006, p. 81; Knopf and Wuder 2006; Macias-Duarte and Punjabi 2010, p. 4). While the Mexicali Valley, Baja California, located just south of the Imperial Valley, seems to have suitable wintering habitat (200,000 ac (80,000 ha) of farmland), mountain plover have rarely been reported from the area (Macias-Duarte and Punjabi 2010, p. 3).

Two primary concentration areas within the Chihuahuan Desert are believed to be most important for wintering mountain plover: (1) The Janos area in northwestern Chihuahua; and (2) the El Tokio grasslands in southern Coahuila, Nuevo Leon, northeastern Zacatecas, and northern San Luis Potosi (Macias-Duatre and Punjabi 2010, pp. 3–6). Mountain plover are most abundant in the La Soledad region of the El Tokio grasslands. The highest estimated density in Llano de la Soledad (based on data from the winter of 2005–2006) extrapolated over the area suggests that over 2,000 mountain plover were present. Extrapolation from Llano de la Soledad to all prairie dog colonies in the entire El Tokio region provided an estimate of 6,800 mountain plover (Macias-Duarte and Punjabi 2010, p. 6). While this estimate is crude and may be optimistically high, it is not inconsistent with reports of mountain plover flocks in the area totaling 1,600 to 3,500 birds reported by Andres and Stone (2009, p. 18). In the winter of 2005–2006, surveys in Janos estimated 1,435 birds (Salinas 2006, p. 43).

The reported sightings and the estimates presented above are maximums reported, and the numbers can vary greatly from year to year. However, these reports suggest that a substantial number of mountain plover may winter in Mexico. Andres and Stone (2009, p. 20) provided an estimate of 5,000 birds wintering in Mexico. Changes in sampling methodology, annual variability in mountain plover numbers, and the short duration covered by recent systematic surveys prevent any conclusions regarding trends (Macias-Duarte and Punjabi 2010, pp. 5–6, 16, 17).

Summary of Comments and Recommendations

We requested written comments from the public on the proposed listing of the mountain plover during the June 29, 2010, through August 30, 2010, comment period that followed our June 29, 2010, document (75 FR 37353) vacating our September 9, 2003, withdrawal (68 FR 53083) and reinstating our December 5, 2002, proposal to list the mountain plover (67 FR 72396). We contacted appropriate Federal, State, and local agencies; scientific organizations; and other interested parties, and invited them to comment on the proposed rule and supporting documents. Following an initial draft of our final determination we contacted 5 peer reviewers and asked them to review selected portions of the draft.

We received 53 comments in response to the December 5, 2002, proposed rule (67 FR 72396) during the June 29, 2010, to August 30, 2010, comment period. These included comments from 3 Federal entities, 10 States, 3 local governments, 28 organizations or groups (business, industry, environmental), and 8 private parties. WildEarth Guardians also forwarded us 302 similar comments from individuals, and the Colorado Farm Bureau forwarded us 8 similar comments from individuals. We received no requests for public hearings. We also reviewed comments received after our February 16, 1999, and December 5, 2002, proposals to list the mountain plover (64 FR 7587 and 67 FR 72396, respectively) for relevant issues not addressed in more recent comments. All substantive comments have either been incorporated into this final determination or are addressed below.

Peer Review

In accordance with our policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), we solicited expert opinions from five knowledgeable individuals with scientific expertise that included familiarity with the mountain plover, with other shorebird species, the geographic region and habitats in which the mountain plover occurs, and conservation biology principles. We provided reviewers with a partial draft of this document. We received responses from all five of the peer reviewers that we contacted. The peer reviewers generally agreed that we accurately described the species and its habitat requirements; that we provided accurate review and analysis of factors affecting the species; that our assumptions and definitions of suitable habitat were logical and adequate; that there were few oversights, omissions, or inconsistencies in out draft document; and that we used pertinent literature to support our assumptions and conclusions. One reviewer was generally critical of the synthesis of information regarding threats to mountain plover habitat, especially our assessment of wintering habitat in the Imperial Valley. One reviewer limited comments primarily to population trends. The peer reviewers provided suggestions to improve this final document. Recommended editorial revisions, clarifications, and other changes have been incorporated into the final document as appropriate. We respond to all substantive comments below or through changes to the final document.

Comments From Peer Reviewers

(1) *Comment:* Three reviewers questioned specific details of our range map.

Our Response: Figure 1, depicting the mountain plover's range, was developed based on those in Knopf and Wunder 2006, and Andres and Stone 2009, with modifications based on our review of recent information. Our map depicts generalized areas believed to support breeding and wintering mountain plover, and does not depict localized areas of presence or absence. We made some revisions to our range map based on reviewer comments.

(2) *Comment:* One reviewer pointed out that while mountain plover are attracted to burned areas on their breeding ground, there is little evidence as to whether such burned areas benefit breeding mountain plover (for example, through higher nest success or fledging success) compared to habitats they may otherwise use.

Our Response: Reduced vegetative cover resulting from burning appears more attractive to mountain plover than similar habitat left unburned. However, we agree that studies have not documented the specific relationship of burning to successful mountain plover nesting.

(3) *Comment:* One reviewer stated that estimates of annual survival should be considered minimum estimates, because studies do not control for permanent migration of mountain plover (*i.e.,* they assume birds not accounted for have died rather than moved away from the study area).

Our Response: We agree and have acknowledged this in the text. Studies in Montana have produced the most complete information on juvenile (first year of life) and adult mountain plover annual survival rates, but the extent to which these studies underestimate survival rates due to emigration is not known.

(4) *Comment:* One reviewer asserted that recent literature clearly identified adult survival as a vital importance to productivity and survival of shorebird populations.

Our Response: We agree. In the limited studies that have estimated adult survival of mountain plover, adult mountain plover survival appears relatively high. The suggestion that management efforts to increase mountain plover populations might best be targeted at increased chick survival (hatching to fledging) result, in part, from data showing relatively low and highly variable survival of mountain plover chicks (see Survival, Lifespan, and Site Fidelity above).

(5) *Comment:* Two reviewers noted that while the mountain plover may have a long lifespan compared to many other shorebirds, some shorebirds do live longer and other bird families, such as seabirds, live much longer.

Our Response: Mountain plover in the wild have been known to live to over 10 years. We have qualified our description of the mountain plover as a "relatively" long-lived species.

(6) *Comment:* One reviewer suggested that mountain plover fidelity to breeding sites is more regional than site-specific and that differences in habitat across the mountain plover breeding range may influence site fidelity.

Our Response: Both may be correct. Lack of genetic differentiation found by Oyler-McCance *et al.* (2005, p. 359; 2008, pp. 496–497) suggest that mixing of mountain plover across regions is also occurring.

(7) *Comment:* One reviewer suggested that we discuss spatial and temporal variation in long-term and recent BBS trend data for the mountain plover and cited a long-term (1966 through 2009), negative New Mexico trend as the only statistically significant population trend among the rangewide or Statewide BBS trend estimates we provide.

Our Response: We have included data pertinent to spatial and temporal (by State and long-term versus short-term) trends in mountain plover populations in this document when available (see Conservation Status and Local Populations above). These statistics are based on fewer data and generally appear less reliable than rangewide trends. The long-term trend estimate in New Mexico is unique among those we cite, in that it reflects a statistically significant indication of at least some decline.

(8) *Comment:* One peer reviewer stated that there is insufficient information about the distribution and status of the mountain plover in Mexico to evaluate whether past, present, or future loss of prairie dogs and the ecosystem they support in Mexico is a significant threat to the mountain plover.

Our Response: We agree that information on the distribution and status of the mountain plover in Mexico is limited. Based on the information available, past loss of prairie dogs colonies in Mexico has decreased available mountain plover habitat and may have had some adverse impact on the mountain plover. Recent Mexican and international attention to conservation of prairie dogs and grassland complexes in Mexico improves prospects for maintaining existing mountain plover wintering habitat (see *Factor A* below). While future losses of prairie dog colonies in Mexico may occur, we do not believe that associated impacts to mountain plover's habitat present a significant threat to the mountain plover over its wintering range.

(9) *Comment:* One reviewer stated that discussion of habitat loss to land use modification would be greatly improved by including specifics of how these losses fall within the precise breeding and wintering habitats of the mountain plover. Two reviewers contended that the relative threat posed by agricultural conversion (of grasslands) was difficult to assess unless analyzed at a fine spatial scale.

Our Response: The mountain plover's breeding and wintering ranges extend across a large area and encompass a variety of habitat types. We have addressed habitats supporting the mountain plover, habitat losses, and threats to mountain plover habitat on a rangewide and regional level, and in some cases on a State or local level as well.

(10) *Comment:* One reviewer offered that uncertainties regarding future agricultural practices on private lands emphasized the importance of managing for the mountain plover on State and Federal lands.

Our Response: A great degree of uncertainty exists regarding future agricultural practices on private lands, but we believe that changes in agriculture are not likely to significantly threaten the mountain plover in the foreseeable future. Across the range of the mountain plover there are currently many initiatives, on both public and private lands, to manage habitat for wildlife including the mountain plover, bird species using similar habitats, and prairie dogs (see *Factor A* discussion below). The mountain plover has been designated a bird of conservation concern by the Service (2008) and has special conservation status in many States (see Conservation Status and Local Populations above and *Factor A* discussion below). We anticipate and support continued emphasis on mountain plover conservation and management by our Federal and State partners.

(11) *Comment:* One reviewer noted that, without synthesis of exactly what agricultural lands mountain plover require on their wintering areas and how those specific fields are threatened (for example, fallowing of crop fields in California's Imperial Valley), our conclusion that threats impacting only a small portion of agricultural lands would not affect mountain plover was problematic.

Our Response: In Migration and Wintering Habitat above, we describe wintering habitats favored by the mountain plover. In *Factor A* below we discuss threats that may impact these habitats, including threats to certain crop types favored by the mountain plover. The level of analysis we provide is sufficient to evaluate threats to the mountain plover from changes on agricultural lands that provide wintering habitat and utilizes the best available information we have regarding this topic. Without specific information to suggest otherwise, we conclude that threats would not disproportionately impact those particular fields that presently receive, or in the future would receive, most use by the mountain plover.

(12) *Comment:* One reviewer noted that the Imperial Valley, California, an area supporting significant numbers of wintering mountain plover, is one of the fastest growing areas of the United States.

Our Response: From 1984 to 2008, urban area in the Imperial Valley increased by 6,000 ac (2,400 ha) (CDC 2010), much of it outside of croplands favored by the wintering mountain plover. About 381,000 ac (154,000 ha) of field crops are present in the Imperial Valley (Imperial Irrigation District (IID) 2009a). We concluded that population growth and urban expansion is having a modest impact on Imperial Valley croplands, but does not rise to the level of a threat to the species (see *Factor A* discussion below).

(13) *Comment:* One reviewer stated that, over the wintering range of the mountain plover, increase in human population, associated land use changes, and reductions in available water for agriculture would impact areas currently used by mountain plover. The reviewer concluded that because there was "lack of suitable habitat to move to," this would be detrimental to mountain plover.

Our Response: Human development and changes in agriculture, including changes brought on by future water availability, are likely to impact some of the areas currently used by wintering mountain plover in California, in southern Arizona, and elsewhere in their wintering range. Based on the likely magnitude of such changes and the extensive wintering range of the mountain plover, we conclude that loss of wintering habitat is not likely to be a significant threat to the mountain plover in the foreseeable future (see our discussion in *Factor A* below).

(14) *Comment:* One reviewer questioned whether mountain plover are impacted by pesticides and herbicides used on sod farms where they are often seen during migration or in winter.

Our Response: We have found no documentation of effects to mountain plover from exposure to pesticides on sod farms. However, in the past, the use of diazinon, an organo-phosphate pesticide, on sod farms may have impacted the mountain plover. In 1988, after documented large die-offs of birds of other species, the U.S. Environmental Protection Agency (EPA) cancelled the registration of diazinon for use on golf courses and sod farms (EPA 2006, p. vii). We have no information regarding significant harm of any bird species since 1988 that is attributable to use of pesticides on sod farms.

(15) *Comment:* One reviewer suggested more discussion on invasive grasses and their impact on mountain plover.

Our Response: Invasive plants, including nonnative grasses planted as forage for cattle, are widespread across the western United States. Many invasive plants grow to a density or height that can make habitat unsuitable for mountain plover. While perceived by some as a potential threat, the effects of nonnative grasses and invasive plants on the mountain plover have not been well documented. Within the ecosystems it inhabits, the mountain plover is best supported where native or domestic herbivores, fire, dry conditions, soil conditions, or disturbance create low, sparse vegetation. In general, this is true whether the vegetative community consists only of native vegetation or also supports a component of nonnative or invasive plants.

Public Comments

Process Issues

(16) *Comment:* One commenter stated that e-mails, personal communications, and letters that the Service referenced in support of the December 5, 2002, listing proposal (67 FR 72396) do not meet the best information available standard as described in Service policy (59 FR 34271, July 1, 1994).

Our Response: Our policy, as cited above, requires that we evaluate all scientific and other information available, which includes both published and unpublished materials, in the development of a listing action. We review the information regardless of origin, and determine whether it is reliable, is credible, and represents the best information available regarding the species under review. We document our evaluation of any information we use in making our decision, whether it supports the decision or not.

(17) *Comment:* Commenters believed that our analysis in our February 16, 1999, and December 5, 2002, proposals to list the mountain plover (64 FR 7587 and 67 FR 72396, respectively) used "selective science" to defend our position, while ignoring information contrary to our conclusion.

Our Response: We base our determinations on review of all pertinent information available. This final determination is further based on substantial new and additional information available since our previous actions.

(18) *Comment:* One commenter stated that in the 1999 and 2002 proposals to list the mountain plover (64 FR 7587 and 67 FR 72396, respectively) the Service did not identify or quantify actual threats, and therefore the Service has not shown that mountain plover have declined or are at risk.

Our Response: In this final determination, we have evaluated the relative security of the species from present and foreseeable threats across its breeding, migratory, and wintering range. Where available information has allowed, we have identified and quantified actual threats to the mountain plover in this evaluation. While threats, especially future threats, may be difficult to quantify, we evaluate threats based on analysis of the best scientific and commercial information available.

(19) *Comment:* One commenter stated that e-mails and faxes should be accepted as comment on the proposed listing.

Our Response: Our policy requires submission of written comments through the Internet (via the Federal eRulemaking Portal at *http://www.regulations.gov*), or by U.S. mail or hand-delivery, and we believe this provides the means for all interested parties to provide comments, information, and recommendations.

(20) *Comment:* Various commenters suggested that there are either more or fewer reasons for listing the mountain plover now compared to 2003 when our proposed listing was withdrawn (68 FR 53083, September 9, 2003).

Our Response: Our 2003 decision was vacated by the Court and is not relevant to this final determination regarding the mountain plover. We have based our determination on the current status of the mountain plover and current and future threats to the species, based on the best scientific and commercial information available to us at this time.

Issues Regarding Range, Numbers, and Populations Trends

(21) *Comment:* One commenter questioned our emphasis on the PNG in Colorado and Charles M. Russell National Wildlife Refuge (NWR) in Montana in our proposals to list the mountain plover, as relatively few mountain plover breed in either site.

Our Response: We agree that neither site currently supports a large percentage of the total mountain plover population. Both sites are Federally controlled and have supported mountain plover research and management efforts. The PNG once likely supported the highest density of mountain plover in the species' breeding range. The dramatic loss of this sizable population has relevance to the rangewide population trend and may provide insight to current and future threats to the mountain plover. Charles M. Russell NWR provides management opportunities on a Montana site representative of those where mountain plover is largely dependent on the black-tailed prairie dogs to create desirable habitat conditions.

(22) *Comment:* One commenter stated that breeding habitat on public and private lands in the mountain plover's range has not been adequately surveyed and suggested that additional surveys will consistently find more mountain plover.

Our Response: Knowledge of mountain plover populations varies greatly across the breeding range. Surveys vary in methodology and scope. In some cases, lack of access to conduct surveys on private lands limits the accuracy of population estimates. Based on information available since 2002, estimates of mountain plover breeding numbers in certain States and throughout the range have been modified. Former rangewide population estimates were based on surveys of mountain plover in California, where the vast majority of birds were thought to winter. Our current rangewide population estimate is based on minimum breeding range population estimates. However, no estimate currently exists that provides a precise estimate of rangewide numbers.

(23) *Comment:* One commenter dismissed population estimates as "just a guess."

Our Response: We believe that some structured studies on the breeding range have produced population estimates that approximate the actual numbers of mountain plover that are present. In other cases, estimates may be limited to the minimum number of individuals known, or may suggest the likely population size based on limited data. While we summarize population estimates and seek to understand population trends, numbers alone are not the basis for listing determinations under the Act. Listing determinations are based on whether there are threats present or likely to occur that would result in the species being in danger of extinction or likely to become so within the foreseeable future.

(24) *Comment:* Several commenters cited increased rangewide population estimates as a reason why the mountain plover does not merit listing. One commenter cited the recent status change by the IUCN (downlisting from "vulnerable" to "nearly threatened") as evidence of reduced threat to the species.

Our Response: While greater abundance suggests less vulnerability, we have no basis to suggest that the increased estimate of mountain plover numbers reflects an actual, rangewide increase. The number of individuals of a species present is only one factor considered when assessing vulnerability to extinction. Current and future threats may be of greater significance. Downlisting by the IUCN was based on revised population estimates alone, and not on changed interpretation of threats present.

(25) *Comment:* One commenter noted that all wintering areas in the United States and Mexico have not been located and opined that further searching is likely to yield more wintering sites.

Our Response: While more information overall has been gathered since our 2002 proposal (67 FR 72396, December 5, 2002), much is still unknown regarding wintering habitat. Rangewide breeding population estimates and wintering estimates from California suggest that a substantial percentage of mountain plover winter elsewhere. Because the large flock sizes observed in California are not regularly encountered elsewhere, mountain plover numbers may occur at lower densities in other parts of their wintering range.

(26) *Comment:* One commenter stated that the former estimate of 20,000 breeding mountain plover at the PNG in the 1970s may have been off by an order of magnitude.

Our Response: While the actual number present in the 1970s is unknown, it is well established that mountain plover populations on the PNG have greatly decreased since that time, with relatively few breeding mountain plover present since the mid-1990s.

(27) *Comment:* One commenter questioned our estimates of up to 10,000 mountain plover at Kern NWR in California during the 1960s.

Our Response: Many mountain plover used Kern NWR in winter during the 1960s, but the 10,000 estimate is by far the largest recorded (Engler 1992). We believe estimates at Kern NWR approximate mountain plover numbers attracted to the refuge by favorable habitat conditions previously present.

(28) *Comment:* Multiple commenters mentioned continued, significant declines across the breeding and wintering range of the mountain plover, as cited by researchers, as indicative of the species' imperiled status.

Our Response: Documentation of historical range contraction and apparent decline in mountain plover populations is reflected in long-term BBS and CBC trends. Despite more intensive study in recent years, it is not clear if, or to what extent, any declines in mountain plover populations continue. See our discussion of Population Size and Trends above.

(29) *Comment:* A few commenters stated that BBS and CBC data and trends regarding mountain plover are unreliable. Others state that these data are a reason for concern.

Our Response: The BBS is the best available long-term trend information for the mountain plover on its breeding range. It is an imprecise indicator of mountain plover population trends. These data appear to confirm a decline over the period 1966 through 2009, but results suggest that the rate of any continued (1999 through 2009) decline has moderated. The CBC data are more restricted in geographic scope than are the BBS data, but these data also suggest a long-term decline. Few CBC count circles regularly report mountain plover, and numbers are highly variable, likely reflecting mobility of wintering flocks.

See our discussion of Population Size and Trends above.

(30) *Comment:* We received a comment that insufficient data are available to predict any trend toward extinction.

Our Response: We agree that current trend data are limited and that the ability to project future population trends is difficult. However, we have reviewed the best population and trend data available as part of our analysis of the mountain plover's status. In making our final listing determination, we not only looked at population trends, but we have also evaluated the best available information on current and future threats to the species.

(31) *Comment:* One commenter suggested that population trends at the PNG, where the birds have been closely studied, are indicative of the overall population trend for the mountain plover.

Our Response: Knopf (2008, p. 61) summarized mountain plover studies on the PNG in Weld County, Colorado, and suggested reasons for that population's former abundance and more recent decline, including long-term changes in habitat since abandonment of agricultural fields following the "Dust Bowl" of the 1930s. We believe that this represents a unique history because long-term BBS data (Sauer 2010a) suggest a relatively stable population in Colorado despite the dramatic drop in numbers on the PNG. In 2008, Knopf expressed the opinion that similar numbers of mountain plover were breeding in Weld County as in 1990, just not on the PNG (Knopf 2008, p. 54). We have no scientific information that would point to the precipitous decline in mountain plover historically at the PNG as indicative of the overall mountain plover population trend.

(32) *Comment:* One commenter suggested that mountain plover numbers are dynamic, and that their current abundance is within the range of normal fluctuation due to annual variation in weather patterns.

Our Response: Breeding numbers and nest success can vary locally based on a number of factors including weather. However, the historical reduction in rangewide mountain plover numbers seems well substantiated. Interpretation of recent trends is made more difficult by short-term variability in population numbers that may reflect annual weather variation. The effect of all factors, natural and human-caused, that may contribute to the survival of the mountain plover is considered in this determination, including variation in weather patterns and longer-term changes in climate.

Species Vulnerability

(33) *Comment:* One commenter referenced the mountain plover's relatively short lifespan as contributing to the vulnerability of populations to extirpation if one or more years of unfavorable habitat on their breeding grounds prevent successful nesting.

Our Response: As discussed above in our discussion of Population Size and Trends, and under *Factor E* below, our former conclusion that the lifespan of mountain plover contributed to its vulnerability has been refuted based on more recent information. The mountain plover is now considered a relatively long-lived species, with one individual documented living for 10 years (Dinsmore 2008, p. 52). We do not believe that mountain plover lifespan substantially influences the vulnerability of mountain plover to extinction.

(34) *Comment:* One commenter stated that breeding mountain plover populations are often discontinuous, in part because of habitat fragmentation, and stated that local, isolated mountain plover populations have an increased vulnerability to random natural and human-caused events.

Our Response: It is generally true that small and isolated populations are less secure than larger populations. While the mountain plover is a migratory, highly mobile species, it generally returns to the same breeding sites, which isolates local populations to a degree. Small mountain plover populations are vulnerable to "blinking out" if events destroy or degrade habitat. This vulnerability may be offset by the species' ability to colonize new habitat as it becomes available. Recent studies describe mountain plover dispersal from natal sites or former breeding sites, and suggest that the mountain plover has been able to disperse and exploit habitat nearby if former habitat is destroyed.

Prairie Dog Issues

(35) *Comment:* We received numerous comments regarding mountain plover and prairie dogs. They included comments regarding the mountain plover's dependence on prairie dogs, and the distribution, abundance, and trends in prairie dog populations. One commenter contended that if the black-tailed prairie dog does not merit listing, then the mountain plover does not either.

Our Response: It is well established that in parts of its range, Montana in particular, the mountain plover is largely dependent during breeding on the habitat that prairie dogs create and maintain. Elsewhere, mountain plover also breed in a variety of habitats, including prairie, semi-desert, and cropland. See our discussion regarding the status and threats to the black-tailed prairie dog and potential effect on the mountain plover in *Factor A* below. We recently determined that the black-tailed prairie dog does not warrant listing under the Act (74 FR 63343, December 3, 2009), but it does not follow that this would automatically lead to a similar conclusion for the mountain plover since the species could be subject to a variety of threats unrelated to the status of prairie dogs.

(36) *Comment:* We received a comment that the Service in 1999 and 2002 underestimated the presence of prairie dogs and therefore their habitat and the number of mountain plover that prairie dog colonies supported.

Our Response: Our current analysis includes information developed since 2002. Under *Factor A* below, we discuss current estimates of prairie dog abundance and implications of prairie dog numbers to mountain plover.

(37) *Comment:* Some commenters stated that black-tailed prairie dogs lack protection, are often poisoned or shot, and are often affected by sylvatic plague; therefore, prairie dog colonies and the mountain plover they support remain vulnerable.

Our Response: We agree that there are few protections for the black-tailed prairie dog. However, despite the above factors, the black-tailed prairie dog has increased in number throughout all States in its range in the United States since the 1960s. In the United States, we do not foresee any significant decreases in black-tailed prairie dog populations or the habitats they create. On December 3, 2009, the Service published a 12-month finding that the black-tailed prairie dog is not threatened with extinction and is not likely to become so in the foreseeable future (74 FR 63343). In Mexico, both the black-tailed prairie dog and the Mexican prairie dog continue to be reduced in number and distribution, and this likely impacts mountain plover habitat. See our discussion under *Factor A* below.

(38) *Comment:* Other commenters cited conservation efforts that target prairie dogs, as well as efforts to conserve greater sage-grouse (*Centrocercus urophasianus*), lesser prairie-chicken (*Tympanuchus pallidicinctus*), and black-footed ferret (*Mustela nigripes*), and concluded that these existing efforts make mountain plover conservation efforts unnecessary.

Our Response: Efforts to conserve these species are in response to declines in numbers and threats to their future existence. While the mountain plover will benefit from conservation of prairie dogs, some other species require habitats unlike those favored by the mountain plover. To the extent that mountain plover benefit from conservation efforts for other species, these are addressed under *Factor A,* below.

(39) *Comment:* One commenter contended that the presence of prairie dogs was only one of several factors that create mountain plover breeding habitat and that soil type, soil moisture, cattle grazing, fire, and incidence of drought all play a role in supplying suitable mountain plover breeding habitat.

Our Response: While the literature on the mountain plover is replete with the association of mountain plover and prairie dog colonies, we agree that other factors, singly or in combination, can shape mountain plover breeding habitat, and we have taken this into consideration in this final listing determination.

Grassland Conversion and Agricultural Issues

(40) *Comment:* Multiple commenters state that grassland conversion to cropland is a significant threat.

Our Response: While grassland conversion contributed to past contraction in the mountain plover's range and reduction of the mountain plover's numbers, much of this took place on the eastern Great Plains where conversion to crops such as corn and soybeans was feasible. The rate of grassland conversion is now much reduced. We do not believe that the current or anticipated future conversion of grasslands to other uses is a significant threat. Dryland agriculture, found in the southern portions of the mountain plover's breeding range, supports significant numbers of breeding mountain plover. The extent to which the use of dryland agricultural habitat is beneficial to the mountain plover is largely undetermined. See our discussion under *Factor A* below.

(41) *Comment:* One commenter contended that current farming practices benefit breeding mountain plover, that mountain plover are an adaptable species that have shifted from grasslands to cultivated lands on both their breeding and wintering areas, and that cultivated lands are now the most important habitat for the mountain plover. Other commenters raised the question of whether the choice to nest in cropland is detrimental to mountain plover.

Our Response: Research findings from Colorado present a complex picture. Hatching success on some croplands is similar to that found on grasslands with or without prairie dogs. Chick survival appears to be lower on crop fields, but results of some studies differ, perhaps depending on variables such as annual weather conditions and site-specific levels of predation. The influence of the agricultural landscape on mountain plover recruitment has not been fully determined. Wintering mountain plover favor crop fields at times, but habitat preference seems to vary greatly by region. Mountain plover use of crop fields in winter may reflect the loss of preferred native habitats.

(42) *Comment:* One commenter stated that farming practices on the prairie have not changed in 50 years and questioned why they could suddenly be a threat.

Our Response: Dryland farming practices in eastern Colorado and adjacent States have remained relatively stable, although market factors may favor one crop over another. Historically, conversion of prairies to crop fields likely contributed to the decline of mountain plover, especially in the eastern portion of its range. Farm operations can directly impact nesting, but the current relationship between dryland crop fields and breeding mountain plover is complex. However, the best available information indicates that current agricultural practices have remained largely unchanged in recent years and have not been shown to pose a threat to the mountain plover (see *Factor A* discussion below).

(43) *Comment:* Several commenters stated that the Conservation Reserve Program is beneficial to the mountain plover, while other commenters thought the program was detrimental to the mountain plover.

Our Response: The U.S. Department of Agriculture (USDA) administers the Conservation Reserve Program, which allows producers to retire agricultural lands for a 10-year period, thereby benefitting wildlife and other resources. Most of these lands are planted with nonnative grasses that support other wildlife species but often do not create mountain plover habitat. The program likely has little effect on overall mountain plover habitat because a relatively small portion of agricultural fields are retired at any one time and retired lands provide minimal benefit to mountain plover.

(44) *Comment:* Commenters expressed concern that anticipated human population growth in South Park, Park County, Colorado, and the fragmentation of existing habitat there, will impact a significant mountain plover population.

Our Response: We agree that buildout of private lands in South Park would adversely affect the mountain plover breeding population that is currently present. However, based on information from Park County, population growth is much slower than once predicted, and we do not anticipate substantial human development will occur in the area in the foreseeable future. See our discussion under *Factor A* below.

Livestock/Grazing/Range Management

(45) *Comment:* One commenter stated that range management has contributed to the past decline of mountain plover and is a current threat, as practices vary little from those used previously.

Our Response: Range management is often designed to maximize forage and diminish excessive disturbance to grass and soil. Such management, when employed, does not benefit the mountain plover. However, we do not see range management as representing a current or future threat to the mountain plover, as there is no information to suggest that current range management practices and the habitat conditions now present are likely to change substantially in the future.

(46) *Comment:* One commenter cited recommendations by Knopf and Wunder (2006) to prioritize research regarding varied livestock grazing practices and their effects on mountain plover.

Our Response: Research is ongoing as to how range management affects mountain plover and a variety of other grassland species. We have a basic understanding of how livestock grazing can enhance mountain plover habitat (Dechant *et al.* 2003, entire).

(47) *Comment:* Commenters cited the decline in sheep (*Ovis aries*) numbers in the mountain plover's breeding range as detrimental to mountain plover.

Our Response: Sheep grazing helps maintain low vegetation structure favored by the mountain plover. The U.S. sheep industry has been in decline since the 1940s. Past declines in sheep may have contributed to losses in mountain plover breeding habitat. The future of the sheep industry in the United States is difficult to predict. See our discussion under *Factor A* below.

(48) *Comment:* One commenter stated that cattle do not replace the role of bison in the ecosystem, and that the role of cattle grazing as it relates to insect availability has not been adequately evaluated.

Our Response: The historical loss of bison resulted in a number of changes to the prairie ecosystem. Current mountain plover numbers and distribution, and our evaluation of threats to the species, are based on an ecosystem largely devoid of bison.

Insect numbers and availability to mountain plover under various grazing regimes may be worthy of investigation.

Mineral Extraction/Energy Development

(49) *Comment:* We received many comments on the threat to the mountain plover posed by oil and gas field development, and wind energy development. Commenters stated that effects of energy development on the mountain plover are largely unknown and that the mountain plover's response to oil, gas, and wind energy development should be investigated.

Our Response: We discuss the potential impact of energy development on mountain plover under *Factor A* below. Wells, turbines, roadways, and related development constitute potential threats. While far from definitive, recent studies suggest mountain plover may be little affected by oil and gas development. Thus far, we have no data on the effect of wind energy development on wintering mountain plover.

(50) *Comment:* One commenter recounted the history of mountain plover presence at the Antelope Coal Mine in Wyoming and suggested that mountain plover are tolerant of both ground disturbance and nearby industrial activity.

Our Response: We agree that results of monitoring at this site confirm the mountain plover's preference for open ground created by disturbance and a general tolerance of human activity. While mining activity displaces mountain plover, reclamation following mining may restore habitat.

(51) *Comment:* One commenter described new wind energy projects under development in southern Texas areas where mountain plover winter and thought that the species would be affected by the presence of turbines.

Our Response: As stated earlier, thus far, we have no data on the effect of wind energy development on wintering mountain plover. The response of mountain plover to turbines on their breeding areas (which indicates some degree of tolerance) may not provide insight into how flocks respond in winter.

(52) *Comment:* One commenter noted conservation efforts to limit energy development on State-designated greater sage-grouse Core Breeding Areas in Wyoming, which include 36 percent of likely mountain plover breeding habitat in the State. The commenter suggested that this will provide a significant measure of protection for the mountain plover.

Our Response: While limitations on energy development in these areas may reduce potential for any associated adverse impacts on the mountain plover, there is uncertainty as to whether such measures will persist into the future. Designated greater sage-grouse Core Breeding Areas are broad and encompass habitats that support mountain plover, but from a habitat perspective, the needs of the two species differ. Measures to manage for the greater sage-grouse may not benefit the mountain plover.

(53) *Comment:* One commenter suggested that the Service should base its analysis of the energy development threats on what is known regarding the impact of roads, habitat conversion, and fragmentation. Others raised the issue of roads and structures resulting in increases in mammalian and avian predators of mountain plover, which in turn could lead to higher mortality of mountain plover chicks and adults.

Our Response: In general, while some other species have been shown to be adversely impacted by energy development, we have little evidence of similar impacts on the mountain plover. Changes in habitat brought on by energy development, including the potential that roads and structures may facilitate increased predation on the mountain plover, are addressed under *Factor A* and *Factor C* below. Some adverse impacts are likely, but there may also be offsetting benefits resulting from the increase in bare ground preferred by the mountain plover.

(54) *Comment:* One commenter noted that the Western Governors Association, States, and the wind industry have been addressing concerns regarding construction of wind energy projects on sensitive wildlife areas.

Our Response: The Service is engaged with the wind industry and other partners on issues regarding a range of wildlife including the endangered whooping crane (*Grus americana*), and candidates including the greater sage-grouse, lesser prairie chicken, and Sprague's pipit (*Anthus spragueii*), as well as the mountain plover. We anticipate that current emphasis on renewable energy projects will be accompanied by cooperative initiatives to minimize impacts to species of concern.

(55) *Comment:* One commenter was concerned that mountain plover populations could decrease significantly while studies on impacts from energy development were ongoing and that precautionary measures should be enacted to preclude potential impacts.

Our Response: The USFS and BLM have designated the mountain plover a sensitive species within portions of the range (see discussion under *Factor D* below). These agencies address potential impacts to the species when reviewing energy development. However, we will continue to work with these and other Federal agencies, States, and other partners to monitor the status of the mountain plover.

Wintering Habitat

(56) *Comment:* We received many comments on actual or potential loss of wintering habitat in California and how this could affect rangewide populations of mountain plover. Commenters stated that the historical and ongoing conversion of grasslands in California is a threat to the mountain plover. Some commenters cited Andres and Stone (2009, p. 1), describing crucial threats facing the mountain plover, including "* * * the inability to manage agricultural lands in the Imperial Valley, California, to provide consistent winter habitat, and the loss or inadequate management of other known wintering areas in California."

Our Response: Much of the native grassland that the mountain plover formerly used for wintering in California has been lost. While the mountain plover has shown a preference for native and nonnative grasslands in California, especially when heavily grazed, the mountain plover has successfully switched to using crop fields. Additional conversion of grasslands to various other lands uses may increase mountain plover dependence on these crop fields. Any resulting adverse effects of this change are largely speculative.

Based on a variety of existing and projected trends in land use, the further reduction of grassland and crop fields used by mountain plover for wintering in California seems likely. However, as of 2007, California supported over 25 million ac (10 million ha) of land in farms, including 9.5 million ac (3.8 million ha) of cropland, 5.5 million cattle, and 600,000 sheep (USDA 2010). The mountain plover is a highly mobile species that uses habitat opportunistically in winter. The mountain plover's preference for certain agricultural lands above others is well documented. However, the pervasive expanse of agriculture throughout the Central Valley and Imperial Valley suggests to us that, while current and foreseeable future changes may reduce favored wintering habitat, the quantity and variety of agricultural habitat remaining in California will continue to provide sufficient wintering areas for the mountain plover.

(57) *Comment:* One commenter noted that in the Imperial Valley, an important wintering area for mountain plover, the

area of bermudagrass and alfalfa (crops favored by the mountain plover) has declined.

Our Response: Both bermudagrass and alfalfa show recent declines in area from 2005 to 2009 (Imperial Irrigation District (IID) 2010). While area devoted to all hay (including bermudagrass and alfalfa) in the Imperial County varies yearly, 233,000 ac (90,000 ha) were present in both the 1997 and the 2007 (USDA Census of Agriculture (USDA) 2010). We do not have evidence indicating the likelihood of long-term future declines in acreage devoted to these two crops.

(58) *Comment:* One commenter noted that the wintering range of the mountain plover in Texas is not well described and that the species' occurrence in Texas is variable. There was concern that habitat needs were not understood and that Texas populations were not receiving the attention they merited.

Our Response: We agree that knowledge of mountain plover wintering in Texas has been scant (as described in Conservation Status and Local Populations above). Distribution is largely limited to private lands where land use has varied little and where few threats are known. New efforts to survey abundance and habitat use of mountain plover in Texas are currently under way.

Pesticides

(59) *Comment:* Some commenters expressed concern that use of pesticides to control grasshoppers (family Acrididae) and the Mormon cricket (*Anabrus simplex*) reduces foods that sustain breeding mountain plover, especially chicks, in the mountain plover's breeding range.

Our Response: Efforts to control grasshoppers and Mormon crickets are generally limited to suppressing populations in years and in areas where infestations occur, and have the goal of reducing densities to limit economic impacts. While at times local mountain plover populations could be affected by these activities, we do not believe that grasshopper and Mormon cricket control represents a significant threat to mountain plover populations. See our further discussion under *Factor E* below.

Climate

(60) *Comment:* Some commenters suggested that climate change could bring warmer and drier conditions that may benefit mountain plover breeding.

Our Response: Mountain plover breeding numbers and breeding success can vary greatly based on a number of factors, including annual weather variation. Anticipated changes in climate will alter annual norms of temperature and precipitation, but those changes will likely vary across the mountain plover's breeding and wintering range (see discussion under *Factor E* below). Overall, we believe it is speculative to conclude that these effects will be beneficial to the mountain plover.

Conservation Efforts and Effects of Listing

(61) *Comment:* Several commenters noted that conservation partnerships between State agencies, landowners, and conservation groups have promoted conservation of mountain plover and that listing would negate some gains in cooperation.

Our Response: We agree that partnerships are important to the conservation of the mountain plover, especially in those States where mountain plover occur mostly on private lands. The concern that such partnerships could be affected by listing is legitimate, but is not a factor evaluated when determining whether a species warrants listing under the Act.

(62) *Comment:* One commenter suggested that traditional land uses on private land would continue even if listing occurred. Another commenter suggested listing under the Act would decrease the ability to effectively manage habitat, slowing management response to changing science and conditions on the ground. A third commenter suggested listing would provide impetus for needed research.

Our Response: We agree that listing under the Act could lead to multiple outcomes, including those above. We considered all available scientific and commercial information in making our determination as to whether the mountain plover is currently, or may in the foreseeable future become, in danger of extinction.

(63) *Comment:* Several commenters emphasized the importance of developing a special rule under section 4(d) of the Act to exempt certain activities from the take provisions of the Act should the mountain plover be listed.

Our Response: In our June 29, 2010, document (75 FR 37353) we addressed the possible development of a special 4(d) rule if the mountain plover were listed as threatened. The intent was to develop a mechanism by which agricultural practices that might result in take, but were believed to have no net adverse impact on the mountain plover, could continue. Development of such a rule would allay some concerns associated with listing and would contribute to continued cooperation efforts with private landowners. Were we to determine that the mountain plover met the definition of a threatened species, we would consider developing a special rule under section 4(d) of the Act. However, because we determined that the species does not warrant listing, the consideration of a special 4(d) rule is not necessary.

Summary of Information Pertaining to Five Factors

Section 4 of the Act (16 U.S.C. 1533) and implementing regulations (50 CFR 424) set forth procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, a species may be determined to be endangered or threatened based on any of the following five factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

The February 16, 1999 (64 FR 7587), proposed listing rule provided a description of threats affecting the mountain plover under the five listing factors identified in section 4(a)(1) of the Act. The December 5, 2002, proposal (67 FR 72396), which was described as a "supplemental proposal," provided pertinent new information. Both of the proposed rules concluded that the mountain plover was likely to become an endangered species in the foreseeable future unless measures were taken to reverse its decline. Conservation measures to reverse the decline were discussed in both of the proposals.

In our February 16, 1999, proposed rule to list the species (64 FR 7587) and our December 5, 2002, proposed rule to list the species (67 FR 72396) we described a number of potential threats to the mountain plover. We cited historical decline in the black-tailed prairie dog (98 percent range wide) and its effect on mountain plover habitat. We described effects of past rangeland loss to agricultural conversion (30 percent of the Great Plains) and more recent conversion at specific mountain plover breeding sites. We addressed residential expansion into a mountain plover breeding area in South Park, Colorado, and stated that buildout of private lands would be detrimental. We hypothesized that cultivated areas used for breeding by mountain plover may act as a "population sink" and that this could impact population viability. We expressed concern over the rising trend in oil, gas, and mineral exploration in mountain plover breeding habitat and, while we suggested habitat changes might not be detrimental, we cautioned that roads and human disturbance could impact mountain plover breeding. We cited potential impacts of both historical loss of grasslands and changing agricultural practices on mountain plover wintering areas in California. With the Imperial Valley growing in importance to wintering mountain plover, we suggested that water conservation, water transfer projects, burning restrictions, urbanization, and resulting modification of agricultural practices in the Imperial Valley could be detrimental to mountain plover populations. In our 1999 and 2002 proposals we also expressed concerns regarding the mountain plover's average life span and breeding site fidelity as factors potentially impacting persistence of local breeding populations. We described a short average life span as limiting opportunities for mountain plover to reproduce. We also suggested that high site fidelity and the specific breeding habitat that mountain plover required limited opportunities to disperse to new breeding sites should former breeding areas turn inhospitable. We addressed concerns over mountain plover exposure to pesticides; however, we documented no deleterious effects.

In the nine years since our 2002 proposal, substantial new information has been developed regarding the mountain plover and potential threats to its existence. Our December 3, 2009, 12-month finding on a petition to list the black-tailed prairie dog summarized new information on the species and provided a basis for us to assess whether threats to black-tailed prairie dog may, in turn, affect the mountain plover (74 FR 63343). We now believe that the black-tailed prairie dog is a resilient species and that, overall, populations in the mountain plover breeding range are not likely to decline. Recent data confirms that rangeland conversion to agriculture remains insignificant across the mountain plover's breeding range. Of the States where we previously documented rangeland declines, none have experienced significant decline in rangeland in recent years. Expanded human development of mountain plover breeding habitat in South Park, Colorado, did not proceed as previously anticipated, and is not expected to do so in the foreseeable future. Mountain plover use of cultivated lands has been further investigated, providing insight into the value of crop lands to breeding mountain plover. It now appears that perhaps one quarter of the rangewide mountain plover population breeds in crop fields and little evidence has surfaced to suggest that is problematic. Energy production in mountain plover habitat continues to expand, including increased development of oil and gas, and wind energy projects. Studies to date have not documented adverse impacts of oil and gas development, or wind energy projects. Effects of such projects on mountain plover merit continued study, largely because of their potential future scope. In California, land use changes continue in the Imperial Valley and elsewhere. However, based on current rangewide mountain plover population estimates (over 20,000 breeding birds) we now believe that the majority of mountain plover winter in areas other than California. We conclude that even with reduction of California wintering habitat, sufficient area of wintering habitat will remain, in California and elsewhere, to support current populations. Life span, site fidelity, and dispersal of both adult and juvenile mountain plovers have been further investigated. Contrary to our previous belief, the mountain plover is now considered a relatively long-lived species. Results of genetic research provide evidence that mixing among mountain plover breeding populations is occurring. Dispersal, especially by returning one year old mountain plover, appears significant. Site fidelity and the mountain plover's ability to seek out alternative sites for breeding are no longer of concern. While substantially more information has been developed regarding exposure of mountain plover to pesticides, no evidence of actual impacts to individuals, or suggestions that pesticides are having local or rangewide impacts to the species have surfaced.

The following summary builds on scientific and commercial information presented in our 1999 and 2002 proposals and provides our current analysis based on all information currently available.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

Recent summaries of the mountain plover's status (Dinsmore 2003; Knopf and Wunder 2006; Andres and Stone 2009) have highlighted the loss or degradation of mountain plover habitat as the greatest threat to the species. The primary issues that have been raised are potential loss of prairie dog populations and the mountain plover habitat they create; loss of native prairie and rangeland habitats; cropland breeding habitat as a potential reproductive sink; oil, gas, and mineral development; wind and solar energy development; loss and changes to wintering habitat in California; livestock grazing practices; and urbanization. We address these below.

Threats to Prairie Dogs and Associated Loss of Habitat

Much of the mountain plover breeding range described above follows the range of the black-tailed prairie dog on grasslands of the Great Plains from Canada to Mexico. To a lesser extent, mountain plover also breed within the ranges of the white-tailed, Gunnison's, and Mexican prairie dogs. Mountain plover often nest in black-tailed prairie dog colonies at densities greater than in other habitats (Childers and Dinsmore 2008, p. 707; Tipton *et al.* 2009, p. 496), and mountain plover numbers have been shown to track changes in prairie dog abundance brought on by sylvatic plague (Dinsmore *et al.* 2005, pp. 1550–1551; Augustine *et al.* 2008, unpaginated; Dinsmore and Smith 2010, pp. 42–44). A common recommendation regarding conservation of the mountain plover is to assure the maintenance or expansion of black-tailed prairie dog populations and the landscapes they create (Dinsmore *et al.* 2005, p. 1552; Augustine *et al.* 2008; Knopf 2008, p. 61; Andres and Stone 2009, p. 35; Dinsmore *et al.* 2010). Current and future threats to the distribution and abundance of prairie dogs, especially the black-tailed prairie dog, may in turn be threats to the mountain plover.

On December 3, 2009, the Service published a 12-month finding on a petition to list the black-tailed prairie dog as endangered or threatened under the Act (74 FR 63343). We found listing to be not warranted. Here, we rely heavily on the analysis and results of that finding to assess the potential threat to the mountain plover from current or future loss of breeding habitat in the United States that is created and maintained by the black-tailed prairie dog.

In our December 5, 2002, proposal to list the mountain plover we discussed historical reduction of the black-tailed prairie dog numbers, but not current populations or recent population trends (67 FR 72402). In our 2009 finding regarding the black-tailed prairie dog, we estimated that 2.4 million ac (1 million ha) of occupied black-tailed prairie dog habitat exists in a shifting mosaic over time, throughout an estimated 283 million ac (115 million ha) of suitable habitat. We evaluated recent trends in occupied habitat and considered occupied habitat an appropriate surrogate for the status of the species. Rangewide, we estimated historical occupied area of black-tailed prairie dog colonies to be between 80 million ac and 104 million ac (32 to 42 million ha), almost all in the United States. Occupied area in the United States had decreased to a low of 364,000 ac (147,000 ha) by 1961 (largely because of eradication efforts), and subsequently increased to the 2.4 million ac (1 million ha) cited above. Throughout the United States, this represents a 600 percent increase in estimated black-tailed prairie dog numbers from 1961. See our December 3, 2009, finding (74 FR 63343) for the methods used to arrive at these estimates and cautions regarding their accuracy.

The following evaluation of black-tailed prairie dog status highlights the three States, Colorado, Montana, and Wyoming, which have the greatest number of breeding mountain plover associated with black-tailed prairie dog colonies. In Colorado, occupied black-tailed prairie dog habitat historically existed in the eastern half of the State, east of the Front Range Mountains (Hall and Kelson 1959, p. 365). Currently, the distribution of the black-tailed prairie dog is scattered in remnant populations throughout at least 75 percent of the historical range (Van Pelt 2009, p. 14). The most recent estimate of occupied habitat is 788,657 ac (319,158 ha) (Odell *et al.* 2008, p. 1311). This is approximately one-third of all currently occupied black-tailed prairie dog habitat in the United States, and is an eight-fold increase over occupied habitat thought to be present in Colorado in 1961.

The Conservation Plan for Grassland Species in Colorado (Conservation Plan) (Colorado Division of Wildlife 2003, p. 1) has a goal "to ensure, at a minimum, the viability of the black-tailed prairie dog and associated species (mountain plover, burrowing owl, swift fox, and ferruginous hawk (*Buteo regalis*)) and provide mechanisms to manage for populations beyond minimum levels, where possible, while addressing the interests and rights of private landowners." The Conservation Plan includes a species account for mountain plover, but does not provide any regulatory protections for the species or its habitat.

In Montana, where mountain plover are strongly associated with prairie dog colonies (Childers and Dinsmore 2008, p. 701), black-tailed prairie dog occupied habitat historically existed in the eastern two-thirds of the State, with the exception of the northeastern corner of the State (Hall and Kelson 1959, p. 365). Current prairie dog distribution is scattered in remnant populations over 90 percent of the historical range (Van Pelt 2009, p. 20). Currently, 193,862 ac (78,453 ha) of occupied habitat are estimated to occur in Montana (Hanauska-Brown 2009). This represents nearly a seven-fold increase over occupied habitat thought to be present in Montana in 1961.

In Wyoming, the black-tailed prairie dog historically occupied habitat in the eastern half of the State, east of the Rocky Mountains (Hall and Kelson 1959, p. 365). Currently, distribution is scattered in remnant populations throughout at least 75 percent of the historical range (Van Pelt 2009, p. 40). A 2006 study estimated the amount of occupied habitat to be 229,607 ac (92,919 ha) (Grenier *et al.* 2007, p. 125) and these results suggested that black-tailed prairie dog populations in Wyoming remain stable (Emmerich 2010, pers. comm.). This represents nearly a five-fold increase over occupied habitat thought to be present in Wyoming since in 1961.

In the past, the conversion of native prairie habitat or rangeland to cropland reduced black-tailed prairie dog colonies, and thereby impacted the mountain plover's most productive breeding habitat in the grassland ecosystem. Conversion of native prairie to cropland historically progressed across the Great Plains from east to west. The most intensive farming activity remains in the east, in portions of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas, where higher rainfall amounts and generally better soils result in greater agricultural production, and the land supports crops such as corn and soybeans. This land conversion resulted in the historical reduction in black-tailed prairie dog populations; as well as reductions in mountain plover populations in Nebraska, Kansas, Oklahoma, and Texas; it also resulted in the extirpation of the mountain plover populations in North Dakota and South Dakota. Land with the highest potential for traditional farming uses was converted many years ago. The threat of future destruction of both prairie dog and mountain plover habitat through cropland conversion is minimal, much less than in the early days of agricultural development in the Great Plains (see Loss of Breeding Habitat to Land Conversion and Development, below).

The present or threatened alteration of habitat due to oil, gas, coalbed methane, and mineral extraction, and wind energy development, affects portions of black-tailed prairie dog occupied habitat; however, we have no information regarding the extent of potential impacts. Nevertheless, prairie dog occupancy has apparently increased within oil and gas development areas in Wyoming (Sorensen *et al.* 2009, pp. 5–6). We have no evidence that present or threatened curtailment of habitat due to oil, gas, coalbed methane, and mineral extraction, and wind energy development, is a limiting factor for the black-tailed prairie dog in Wyoming or elsewhere throughout its range.

Approximately 110 million ac (45 million ha) of cropland and 283 million ac (115 million ha) of rangeland occur within the black-tailed prairie dog's range at present (Ernst 2008, pp. 10–19). In our December 3, 2009, finding for the black-tailed prairie dog (74 FR 63343), we contrasted the 2.4 million ac (1 million ha) of currently occupied habitat with the 283 million ac (115 million ha) of rangeland and concluded that sufficient potential habitat still occurs within the range of the species in the United States to accommodate large expansions of prairie dog populations (which in turn would benefit the mountain plover) if the landowners and public sentiment allow. We concluded that the present or threatened destruction, modification, or curtailment of habitat or range is not a limiting factor for the black-tailed prairie dog and that we do not anticipate that impacts from habitat loss are likely to negatively impact the status of the species in the foreseeable future. Because of the association between the mountain plover and the black-tailed prairie dog, we believe that appropriate habitat to support prairie dog colonies is not a limiting factor within the breeding range of the mountain plover.

Sylvatic plague is an exotic disease foreign to the evolutionary history of North American prairie dogs. It is caused by the bacterium *Yersinia pestis.* Black-tailed prairie dogs are very sensitive to sylvatic plague, and mortality in colonies affected frequently reaches 100 percent. Sylvatic plague has expanded its range to all States within the range of the black-tailed prairie dog in recent years and has caused local population declines at several sites. These declines are typically followed by partial or complete recovery. Rangewide and Statewide estimates of prairie dog occupied area did not include unoccupied prairie dog colonies where sylvatic plague (or poisoning) had at least temporarily eliminated prairie dogs. Over all prairie dog colonies, unoccupied area was found to total 12 percent in Colorado, 15 percent in Montana, and 13 percent in Wyoming. The BLM mapped prairie dog colonies in Phillips County, Montana in 2004 and 2005, and returned to 50 randomly selected prairie dog colonies in 2010. Of the 50 colonies selected for sampling, 48 were still active in 2010 (McDonald 2010). In the changing mosaic, colonies lost or temporarily inactive may be offset by colonies reoccupied or newly established.

We documented in our 12-month finding on a petition to list the black-tailed prairie dog that, since the early 1960s, occupied black-tailed prairie dog habitat has increased in every State, even in those States where sylvatic plague has been present for over 50 years (74 FR 63355–63356). This increase has occurred despite continued impacts from sylvatic plague and other threats. In our 2009 finding, we concluded that the status of the black-tailed prairie dog, as indicated by increased occupied habitat since the early 1960s, indicates that sylvatic plague is not a limiting factor for the species (74 FR 63357).

Similarly, the increase in black-tailed prairie dog numbers in the United States has occurred despite conflicting Federal and State regulations and policies that encourage conservation of prairie dogs through development of State and rangewide management plans, yet in many cases continue to allow shooting and poisoning of prairie dogs. Nevertheless, affected Federal and State agencies are engaged in black-tailed prairie dog management and monitoring to a much greater extent than they were 10 years ago.

Efforts to conserve the black-tailed prairie dog will likely be beneficial to the mountain plover. Our December 3, 2009, finding for the black-tailed prairie dog (74 FR 63343) described the 1998 establishment of the Black-tailed Prairie Dog Conservation Team, with representatives from each State within the historical range of the species, and the development of "The Black-tailed Prairie Dog Conservation Assessment and Strategy" (Van Pelt 1999, entire), which initiated development of "A Multi-State Conservation Plan for the Black-tailed Prairie Dog, *Cynomys ludovicianus,* in the United States" (Multi-State Plan) (Luce 2002). The purpose of the Multi-State Plan was to provide adaptive management goals for future prairie dog management in the 11 States within the species' range. The plan identified 10-year target objectives including maintaining and increasing occupied acreage of black-tailed prairie dog habitat, and increasing the number of large prairie dog complexes. The States also agreed to draft Statewide management plans for the black-tailed prairie dog. The States approve their own Statewide management plans. Colorado and Wyoming have finalized grassland conservation plans that support and meet the objectives of the Multi-State Plan. However, Montana is among the States that have finalized management plans that do not support or meet all of the objectives of the Multi-State Plan. These and other efforts give promise that the trend of increasing black-tailed prairie dogs populations since 1961 can be sustained.

Climate change will likely affect black-tailed prairie dogs and their habitat; however, at this time we have no information on the direct relationship between climate change and black-tailed prairie dog population trends, and we cannot quantify the potential magnitude or extent of impact that climate change may have on the species. While climate change may potentially impact the species in future decades, particularly through its effects on sylvatic plague, it is not apparent that a net loss in occupied habitat will result. The current status of the black-tailed prairie dog does not suggest that the combined effects of sylvatic plague and climate change are currently limiting factors for the species or that they will become so within the foreseeable future, and we do not believe climate change will result in significant population-level impacts to the black-tailed prairie dog.

In summary, we believe that the black-tailed prairie dog is a resilient species and that overall United States populations are not expected to be significantly affected by habitat loss due to conversion to cropland, sylvatic plague, shooting, poisoning, or climate change (74 FR 63364, December 3, 2009).

Mountain plover populations in Montana, and to a lesser extent other breeding areas, are dependent on the prairie dog for breeding habitat. Given our conclusion that habitat created or enhanced by black-tailed prairie dogs is unlikely to decrease, we conclude that threats to the black-tailed prairie dog in the United States do not represent a threat to the continued existence of the mountain plover.

Potential dependence of both wintering and breeding mountain plover populations on remaining prairie dog colonies in Mexico is of concern (Macias-Duarte and Panjabi 2010, pp. 9–10). In Mexico, decline of native grasslands supporting the black-tailed prairie dog and the Federally endangered Mexican prairie dog have been extensive, despite some environmental regulations designed to protect prairie dogs and their habitats. The large black-tailed prairie dog complex at Janos has been reduced by 73 percent since 1988, to approximately 38,000 ac (16,000 ha), while Mexican prairie dog colonies within the El Tokio region have also been reduced to approximately 79,000 ac (32,000 ha) (Andres and Stone 2009, p. 28; Ceballos *et al.* 2010, pp, 7–8; Macias-Duarte and Punjabi 2010, p. 9–10). Both areas, at least in some years, support significant numbers of wintering mountain plover (see Conservation Status and Local Populations above). Destruction and fragmentation of prairie dog colonies has occurred through poisoning and shooting of prairie dogs, conversion to cattle ranching or farming, overgrazing, and drought. Mexico experienced a prolonged drought in the Janos area in recent years, which resulted in dramatic loss of vegetation, followed by a reduction in black-tailed prairie dog occupied habitat (Larson 2008, p. 87).

These losses in prairie dog habitat in Mexico have degraded or eliminated the extent of wintering plover habitat in these areas. Recent efforts to protect prairie dogs and grasslands also benefit wintering mountain plover and may help stop or reverse recent trends. Government designation of protected areas in Chihuahua and Nuevo Leon, and efforts by Pronatura Noreste, The Nature Conservancy, and other institutions, hold promise (Andres and Stone 2009, pp. 33, 40; Macias-Duarte and Punjabi 2010, p. 10). In 2009, the 1.3-million-ac (526,000-ha) Janos Biosphere Reserve was established to protect some of the best remaining shortgrass prairie in Mexico and thereby benefit the black-tailed prairie dog. This conservation initiative is led by Mexico's National Protected Areas Commission and the Chihuahuan State government (The Nature Conservancy 2010). The Llano de la Soledad, which encompasses the major Mexican prairie dog complexes of the El Tokio area, a 26,000-ac (10,500-ha) area, has been designated a State Natural Area for Ecological Conservation administered by the Agency of Environmental Protection and Natural Resources of Nuevo Leon. Neotropical migratory bird grants from the Service have supported efforts led by Pronatura Noreste to protect and manage key lands through purchase and easement. While past habitat loss for the mountain plover at Janos and El Tokio has been significant, international attention to these and to other important grassland complexes in Mexico improves prospects for future conservation and maintenance of mountain plover wintering habitat.

Knowledge of mountain plover breeding on prairie dog colonies in Mexico is limited. The primary known value of black-tailed and Mexican prairie dog colonies to the mountain plover is as wintering habitat; yet use varies greatly from year to year. Mountain plover use of croplands and rangelands present in Mexico for wintering is largely unstudied. For example, agricultural areas in northern Baja California, the coastal plains of Sonora and Sinaloa, and throughout the northern Chihuahuan Desert States may potentially support substantial wintering populations (Macias-Duarte and Punjabi 2010, p. 10). The net effect of reduction in prairie dog colonies in Mexico to mountain plover is largely unknown. However, given that mountain plover winter extensively in cropland habitats in California and Texas, we believe that cropland habitats in Mexico are likely available as alternative wintering habitat. There is no available information to indicate that the past, current, or potential future loss of black-tailed and Mexican prairie dog colonies and the ecosystems they support in Mexico is a significant threat to the mountain plover.

Despite the ongoing effects of habitat conversion, sylvatic plague, shooting and poisoning, and lack of regulatory mechanisms that provide protection, black-tailed prairie dog habitats have increased in the United States over the last 50 years (74 FR 63343, December 3, 2009). Although there is significant concern about the status of black-tailed and Mexican prairie dogs and their habitats in Mexico, there is no information available to indicate that further reductions in prairie dogs in Mexico are threatening the mountain plover. At this time, the best available scientific information does not indicate that the loss of prairie dog habitat is likely to threaten the mountain plover now or in the foreseeable future.

Loss of Breeding Habitat to Land Conversion and Development

As described above, losses of native grasslands in the Great Plains have been severe since European settlement. Losses of these native grasslands have been greatest in the eastern Great Plains and have impacted the mountain plover mainly from conversion of prairie grasslands to crop fields incompatible with mountain plover breeding, including those planted to corn and soybeans. These losses are likely the reason why the mountain plover no longer breeds in the Dakotas, has a limited range in Nebraska, and is now a rare breeder in Kansas (Graul and Webster 1976, p. 266; Knopf and Wunder 2006). Land conversion to agriculture continues, primarily in the northern Great Plains, but at a much slower rate. Over the 15-year period from 1982 to 1997, in Montana, Wyoming, and Colorado, there were no decreases in the amount of rangeland or pastureland present (USDA 2010). Conversion to cropland may be locally affecting mountain plover in some areas of Montana. Approximately 47,000 ac (19,000 ha) of native grassland was converted to agriculture in Montana from 2005 to 2009 (Ducks Unlimited, *cited in* McDonald 2010). Statewide, the amount of cropland in Montana increased by about 3 percent from 1997 to 2007 (USDA 2010). In the four Montana counties with the most mountain plover habitat (Blain, Fergus, Phillips, and Valley Counties), cropland increased over the same period by about 6 percent, with most of the increase attributable to Valley County (USDA 2010). However, the cited conversion from 2005 to 2009 represents less than 0.2 percent of the 30 million ac (12 million ha) of "grassland/herbaceous" cover present in Montana in 2001 (USGS 2001). Cropland is used by breeding mountain plover elsewhere, but its potential for use in Montana is unknown. Conversion of grasslands to cropland in Montana may locally impact mountain plover; however, we believe this low rate of conversion would have negligible rangewide effect.

The best information available does not allow us to estimate the specific amount of occupied grassland breeding habitat for mountain plover that has been converted to other uses in recent years. However, given the apparent low rate of grassland conversion in Montana and rangewide, and the mountain plover's ability to use grassland that has been converted to other uses such as certain agricultural crops including wheat, sorghum, and millet, we believe that grassland conversion does not pose a substantial threat to the mountain plover in Montana, or elsewhere in its breeding range, now or in the foreseeable future.

In our 1999 and 2002 proposals to list the mountain plover as a threatened species (64 FR 7587 and 67 FR 72396, respectively), we also addressed the concern that grassland breeding habitat may be lost to human development. Since the mountain plover's breeding range is extensive, there are undoubtedly instances where human development is and will locally displace the mountain plover. We agree with the conclusion of Andres and Stone (2009, p. 22) that habitat in the mountain plover breeding range is subject to little overall threat from residential and commercial development, because human development is not expected to be very extensive in the largely rural areas of the species' breeding habitat.

An area that generated past concern in our 1999 and 2002 proposals is South Park, Park County, Colorado, an approximately 480,000 ac (200,000 ha) grassland basin where the mountain plover breeding population is estimated to be about 2,300 birds. Much of the mountain plover habitat in South Park is privately owned, and 32 percent of this area has been subdivided (Granau and Wunder 2001, pp. 8–9). Substantial build-out of those properties currently subdivided would be detrimental to mountain plover; however, human population growth in South Park is modest (Nichols 2010, pers. comm.). Many of the subdivisions occurred in the 1960s and 1970s, and have not been developed. Earlier forecasts suggested South Park would have a human population of 10,000 by 2010, but the current human population stands at approximately 3,500 (Nichols 2010, pers. comm.). Issuance of building permits countywide have decreased steadily in recent years, from 297 in 2002 to 70 in 2009 (Carrington 2010, pers. comm.). In addition, land protection and conservation efforts by the BLM, Park County, Colorado Open Lands, and The Nature Conservancy are ongoing in South Park. The BLM (2009a, p. 2) amended their Royal Gorge Resource Area Management Plan for the South Park Subregion in light of new resource goals, including the protection of mountain plover breeding habitat. Their Land Tenure Designation Plan for South Park was modified to keep a greater portion of the BLM's approximately 63,000 ac (26,000 ha) of South Park lands in Federal ownership and make less sensitive BLM lands available for exchange to consolidate Federal lands of highest resource value. Primary goals of Park County's Master Plan include protection of environmentally sensitive areas, and managing the location and pace of residential growth (Park County 2001, p. 13). In addition, Colorado Open Lands and their partners have preserved approximately 17,000 ac (7,000 ha) of lands in South Park to minimize development in and around significant conservation areas (Colorado Open Lands 2011).

The current level of residential development in South Park is not currently a threat to the mountain plover and, given recent development trends and conservation initiatives, we do not consider residential development in South Park to be a threat in the foreseeable future. Elsewhere, threats from human development are largely limited to wintering habitat.

In summary, we do not believe that conversion of the mountain plover's grassland breeding habitat to cropland, or to human residential and commercial development, represents a threat to the mountain plover now or in the foreseeable future.

Range Management

Breeding mountain plover in grasslands are strongly associated with heavy grazing and soil disturbance (Knopf and Wunder 2006). In the absence of prairie dogs, activities such as heavy cattle grazing, the concentration of cattle at loafing areas and at water, and burning of rangeland provide habitat for mountain plover. However, typical range management practices such as fencing, rotational grazing, decreased stocking rates, and planting nonnative grasses to improve soil moisture promote uniform vegetative cover and taller grasses, which are less beneficial to breeding mountain plover. In addition, human efforts to suppress wildfire are generally detrimental to mountain plover.

Specific range management options for mountain plover are somewhat limited. Cattle grazing provides benefits to mountain plover, but this is especially true when it maintains low vegetation and patches of bare ground. Heavy cattle grazing may not be a financially justifiable option for ranchers and can create conditions unfavorable to many other species of wildlife. Aside from grazing, specific range management options for mountain plover are somewhat limited. Mountain plover use burned areas for breeding, and prescribed burning can be used as a habitat management tool (Knopf 2008, p. 61; Andres and Stone 2009, p. 29). Ongoing USFS burning programs on the PNG and the Comanche National Grasslands in Colorado to attract breeding mountain plover have had some success (Augustine 2010a, pers. comm.). However, primary benefits of burning a site are generally of short duration, *i.e.,* 1 or 2 years (Augustine 2010b, pers. comm.). The value of burning is dependent on the extent and the frequency of burns. Augustine and Malchunas (2009, p. 89) suggested that late winter shortgrass burns may have neutral or positive consequences for livestock, but burning is not a management practice generally employed within the mountain plover's breeding range.

Even without rangeland management that specifically benefits the mountain plover, soil type, site history, or drought may create habitat conditions that are beneficial to breeding mountain plover. Rocky or clay pan substrate may suppress vegetation and provide breeding habitat (Knopf and Wunder 2006). In years of low precipitation, grazing at relatively low intensity has a greater impact on grassland vegetation and can produce habitat conditions favorable for mountain plover breeding.

Knopf (2008, entire) provided an historical account of mountain plover populations on the PNG, Weld County, Colorado, and discussed the future of mountain plover in the area. He suggested that mountain plover numbers in the area had been in decline since the post-dust bowl days of the late 1930s and early 1940s, and that the dramatic decline in the mid-1990s was the abrupt end point of a process of deteriorating mountain plover habitat (recovery of grassland habitat), which was exacerbated by other factors such as wet spring weather and predation (Knopf 2008, p. 60). Given current range management practices, Knopf suggested that short-term benefits from prescribed burning and, more significantly, the maintenance of prairie dog colonies were the only viable means to enhance mountain plover habitat on the PNG.

Sheep grazing can maintain the low vegetation structure that is beneficial to breeding mountain plover. However, the current level of sheep grazing does not maintain significant amounts of mountain plover breeding habitat rangewide. The sheep industry in the United States has been in decline for more than 60 years and now supports about one-tenth of the number of sheep present in the 1940s. Decreases in sheep grazing may have been a contributing factor to loss of favorable grassland breeding habitat for the mountain plover in the past. The future of the industry is uncertain; continued declines in the industry are likely in some areas, but changes in the industry also present opportunities for its growth (National Academy of Sciences 2008, p. 4). For the foreseeable future, it appears likely that sheep grazing will remain a minor rangewide contributor to maintenance of favorable mountain plover breeding habitat, but that potential for any further decline in breeding habitat due to additional loss of acreage grazed by sheep is minimal.

A number of conservation efforts target the conservation of grasslands, prairie ecosystems, and prairie birds: The Great Plains Landscape Conservation Cooperative (a public/private initiative to proactively conserve declining habitats on private lands); The Nature Conservancy's ecoregional plan for the Central Shortgrass Prairie; the Colorado Division of Wildlife's Conservation Plan for Grassland Species and similar efforts in other States; Natural Resources Conservation Service conservation efforts under the Farm Bill; preservation of grasslands via conservation easements, including more than 350,000 ac (140,000 ha) in easements reported by the Colorado Cattleman's Agricultural Land Trust (2010); the Rocky Mountain Bird Observatory's Prairie Partners; and The Nature Conservancy's "Prairie Wings" effort. Many of these initiatives include conservation of the mountain plover, the black-tailed prairie dog, and other species supported by the prairie dog ecosystem.

In summary, the extent to which mountain plover are benefitted by cattle grazing on any given site is determined by the range management practices employed. While some current management practices result in habitat conditions that are not optimal for mountain plover breeding, a large number of mountain plover nest on rangeland. We do not anticipate future changes to the current pattern of range management across the breeding range of the mountain plover that would prove detrimental to the mountain plover and its habitat. The extent to which range management practices could benefit the mountain plover in the future is dependent on conservation of black-tailed prairie dog colonies and, to a lesser extent, on willingness to employ prescribed burning as a range management tool. Grazing by sheep can create favorable breeding habitat for mountain plover. The sheep industry in the western United States has declined over time, but we do not anticipate that future changes in the sheep industry will have a net negative impact on existing mountain plover habitat or be a threat to existing mountain plover habitat in the future.

Cultivated Areas in the Mountain Plover Breeding Range Acting as a Potential Population Sink

Agricultural practices can destroy mountain plover nests and eggs from mechanical treatment (tilling, planting, application of fertilizers and pesticides), and crops growing beyond a certain height may cause nest abandonment (Knopf and Rupert 1999, p. 85; Dinsmore 2003, p. 27). In our 1999 and 2002 proposals to list the mountain plover as a threatened species (64 FR 7587 and 67 FR 72396, respectively), we raised the concern that these activities could create a reproductive "sink," or in other words a situation in which mountain plover are drawn to crop fields for nesting but do not produce viable young at a rate that would sustain the population.

Knopf and Rupert (1999, p. 84) suggested that breeding mountain plover having the opportunity to nest on either agricultural or prairie areas chose both equally. In the eastern Colorado shortgrass prairie ecosystem, mountain plover breeding densities on crop fields were twice as high as the densities found on grasslands without prairie dogs, although only one-fifth as high as the densities found on prairie dog colonies (Tipton *et al.* 2009, p. 496). Based on the area of habitats surveyed and densities of mountain plover estimated, approximately 40 percent of mountain plover may use crop fields for nesting in eastern Colorado. Nebraska studies (Van der Burg *et al.* 2010, pp. 48, 50) suggested a similar percentage of the mountain plover in Nebraska utilize crop fields for nesting. The small, seemingly stable, breeding mountain plover population in Oklahoma was primarily found in plowed or fallow fields, although again the potential of a reproductive sink was raised (MacConnell *et al.* 2009, pp. 31–33). Based on estimates of mountain plover using crop fields in Colorado and Nebraska, together with known use of crop fields in Wyoming, Oklahoma, and Kansas, we conclude that up to one quarter of all mountain plover may utilize crop fields for breeding. Given the significance of crop fields to breeding mountain plover and questions regarding a possible reproductive sink, research is ongoing to better understand the role that crop fields play in support of breeding mountain plover populations (Dreitz *et al.* 2010).

In Colorado, mountain plover hatching success was found to be similar in native grasslands and crop fields, although causes of nest mortality differed between the two habitats (Dreitz and Knopf 2007, pp. 684–685). Use of crop fields was not determined to be detrimental to mountain plover hatching success. However, a subsequent eastern Colorado study found chick survival to be similar on crop fields (23 percent) to shortgrass habitat without prairie dogs (24 percent), but lower than chick survival on shortgrass habitat occupied by black-tailed prairie dogs (75 percent), and the author again suggested that crop fields may represent a reproductive sink or "ecological trap" (Dreitz 2009, pp. 875–877). Given the study results, the same concern could be raised regarding shortgrass habitat lacking prairie dogs. In contrast to the study above, recent research on crop fields in Nebraska found 95 percent survival of chicks of adult mountain plover tracked for 35 days (Blakesley and Jorgensen 2010, pers. comm.), although loss of contact with other adult mountain plover suggests that actual chick survival was somewhat lower (Blakesley 2010, pers. comm.). Preliminary data from studies of radio-tracked chicks in Montana and Colorado in 2010 (Dreitz *et al.* 2010) did not show chick survival in crop fields to be lower than in other habitats. While results reported by Dreitz (2009, pp. 875–877) above come from the most comprehensive study of chick survival in crop fields, other studies indicate that mountain plover chick survival rates on crop fields and among other prairie habitats vary greatly in time and place.

Shackford *et al.* (1999, p. 119) suggested that decreasing nest loss from mechanical treatment of fields would benefit mountain plover. Nest marking efforts that allow farmers to avoid nests and reduce nest mortality from agricultural operations have been conducted with cooperating farmers in Colorado and Nebraska (Dreitz and Knopf 2007, p. 685; Lock and VerCauteren 2008, entire; Bly 2010a). The Colorado Division of Wildlife and the Nebraska Game and Parks Commission, along with the Rocky Mountain Bird Observatory, initiated nest marking programs. In Nebraska, a reported 80 percent of 246 nests marked in crop fields over 3 years successfully hatched young (Bly 2010a). As a comparison, an experiment using dummy nests suggested a 35 percent success rate was likely in crop fields if nests were not marked (Bly 2010a).

While recent analysis of mountain plover populations suggests that efforts targeting chick survival may hold more conservation value than those efforts to enhance nest success, management techniques to achieve higher chick survival may be difficult to employ. In addition, nest marking programs have helped establish ties between the agricultural community and wildlife managers (Dreitz and Knopf 2007, pp. 685–686; VerCauteren 2010). Outreach efforts to farmers continue, including education regarding mountain plover and transition from nest marking to landowners' taking the lead in finding and avoiding mountain plover nests in the course of their field operations. Community efforts, such as the annual Mountain Plover Festival sponsored by the Karval Community Alliance in Lincoln County, Colorado, promote stewardship of the mountain plover and other wildlife as an integral part of both farming and ranching practices.

Studies documenting numbers and reproductive success of mountain plover breeding on crop fields in eastern Colorado and Nebraska do not entirely resolve the issue of the relative value of this habitat to the mountain plover. However, in studies from eastern Colorado, nest success in crop fields (Dreitz and Knopf 2007, pp. 684–685) and chick survival in crop fields (Dreitz 2009, pp. 875–877; Dreitz *et al.* 2010) appear similar to nest success and chick survival in native shortgrass without prairie dogs. We conclude that crop fields support breeding mountain plover as well as shortgrass without prairie dogs, although likely not as well as shortgrass with prairie dogs. If the crop fields in eastern Colorado that are regularly occupied by breeding mountain plover are a reproductive sink, their continued occupancy by mountain plover is dependent on a net influx of birds dispersing from other breeding habitats. We have no evidence to suggest whether or not this is occurring. Further, unless mountain plover prefer and choose crop fields for breeding over available (unoccupied) habitat where reproductive success is higher, breeding in crop fields, even if less successful, would not seem detrimental. We conclude that, based on the information available, the mountain plover's use of crop fields for breeding does not represent a threat to the species.

Another concern is the potential that change in current agricultural practices will result in future loss of the types of crop fields that currently provide breeding habitat for mountain plover. Dryland agriculture is the type of agriculture that most frequently supports breeding mountain plover, and it is dominated by wheat, but also includes crops of sorghum, millet, and sunflowers. Annual variation in the use of dryland agriculture fields is dictated by a number of factors including weather, government programs, crop prices, and preferences of individual farmers. It is not known whether any significant future changes to dryland agriculture that the mountain plover uses for breeding are likely to occur or how they would affect mountain plover (Andres and Stone 2009, p. 23).

In recent years, ethanol production from corn has expanded in the United States; however, most corn is cultivated east of the range of the mountain plover (Westcott 2007, pp. 1–3). Additionally, the increase in corn production largely occurs by adjusting crop rotations between corn and soybeans (Westcott 2007, p. 7); neither crop regularly supports mountain plover. We do not anticipate that increased ethanol production will result in a substantial loss in the species' occupied or potential habitat because the majority of this activity lies outside the range of the mountain plover.

In conclusion, we believe that approximately one quarter of the rangewide mountain plover population breeds in crop fields in Colorado, Nebraska, or elsewhere, but there is no evidence that this represents a reproductive sink detrimental to the rangewide population. Dryland agriculture has changed little over recent decades, and we have little evidence to suggest that crop fields now, or in the future, represent a significant threat to the mountain plover.

Energy and Mineral Development

Development targeting oil and gas, coal bed methane, wind energy, and other mineral resources is extensive within the breeding range of the mountain plover. Energy development is a national priority as mandated by Executive Orders 13212 (Actions to Expedite Energy-Related Projects) (66 FR 28357, May 22, 2001) and 13514 (Federal Leadership in Environmental, Energy, and Economic Performance) (74 FR 52117, October 8, 2009), and the Energy Independence and Security Act of 2007 (42 U.S.C. 17001 *et seq.*). Current permitting and construction of new energy projects on Federal and non-Federal lands reflects this priority. The development of energy resources requires construction at well or wind turbine sites, as well as access roads, pipelines, power lines, and other support facilities. These projects could have an immediate effect on breeding mountain plover due to disturbance and habitat conversion, and secondary effects associated with operation and maintenance.

The magnitude of the issue is best exemplified by energy development in Wyoming, where the Wyoming Natural Diversity Database (WYNDD) (2010) has used habitat mapping and mountain plover observation records to map the probability of mountain plover presence. In Wyoming, WYNDD (2010) predicts a high probability of mountain plover occurrence over about 7 million ac (3 million ha) and a medium probability of occurrence over about 14 million ac (6 million ha). We evaluated overlap between predicted mountain plover presence and energy development (Lindstom 2010).

As of February 2010, 5,043 wells, approximately 12 percent of operating oil and gas wells in Wyoming (Wyoming Oil and Gas Commission 2010), occurred in areas of high probability of mountain plover occurrence, while 13,266 wells, about 32 percent of wells, occurred in areas with medium probability of mountain plover occurrence. While wells are clustered in well fields, this would equate to one well per about 1,400 ac (560 ha) in areas of high probability of mountain plover occurrence and one well per 1,080 ac (430 ha) in areas medium probability of occurrence. We believe that this represents a relatively low overall potential impact to mountain plover habitat.

Of 13 million ac (6 million ha) of authorized (both developed and undeveloped) BLM oil and gas leases in Wyoming (BLM 2009b), we estimated that 52 percent were in areas of high or medium probability of mountain plover occurrence (or about one-third of all areas of high or medium probability of mountain plover occurrence were under BLM lease).

Areas in Wyoming of wind classes 4 through 7 (a measure of wind resource potential) account for about 6 million ac (2.4 million ha), or about 30 percent, of those areas of high or medium probability of mountain plover occurrence (National Renewable Energy Laboratory 2002). Since additional factors determine development potential, only a portion of these areas would likely see future wind energy development.

Future energy development will depend on whether oil and gas resources are actually present, the location of wind resources relative to consumers, future demand, economic considerations, and environmental regulations. Therefore, it is uncertain to what degree energy projects will be developed in mountain plover breeding habitat in Wyoming, or other portions of the range, in the foreseeable future. However, given our evaluation above, we believe that current and future energy development in mountain plover habitat may be substantial in Wyoming. Existing and proposed oil and gas development and wind energy projects also occur in mountain plover habitat in Montana and the plains of Colorado, as well as in other States within the mountain plover's breeding, migratory, and wintering range. The cumulative total of current and future energy development elsewhere in the mountain plover's breeding range may not approach that likely to occur in Wyoming, but energy development is likely to occur within many breeding areas used by the species. For example, oil and gas development continues in Weld County, Colorado, and renewed exploration is occurring on and near the PNG (Philbrook 2010, pers. comm.), formerly an important breeding area for the mountain plover.

Concerns over impacts of oil and gas development to landscapes and to various wildlife species have prompted environmental review standards (BLM 2010c), and may lead to more widespread use of development practices that minimize impacts. For example, directional drilling, where feasible, has the potential to decrease habitat impacts. Increased piping, product storage in central locations, and remote sensing of wells may reduce vehicular traffic and the impact of roads.

Despite the prevalence of energy development activities throughout the range of the mountain plover, there is little evidence as to whether, or to what extent, the overall effects of energy development are detrimental to mountain plover (Andres and Stone 2009, p. 25). Although oil and gas field development modifies and fragments nesting, brood rearing, and foraging habitats, mountain plover continue to use these areas (Smith and Keinath 2004, p. 36; Carr, in review). For many wildlife species, the principal impact of energy development is fragmentation rather than habitat loss. Energy development, even when extensive, may directly impact only a small percentage of an area. In a study of the Big Piney-LaBarge oil and gas field in the Upper Green River Valley of Wyoming, where well density averaged about one well per 64 ac (26 ha), 97 percent of the landscape was within 0.25 mile (0.40 kilometer) of infrastructure (roads, pipelines, well pads, waste pits), but only 4 percent of the area was directly impacted by oil and gas infrastructure (Morton *et al.* 2004, pp. 10–11). Carr (in review) found that mountain plover located nests in relation to habitat available, rather than avoiding locations of energy development. We have no data to suggest that the mountain plover is impacted by habitat fragmentation, as opposed to habitat loss.

Because the mountain plover generally favors disturbance that reduces vegetative cover and exposes bare ground (*e.g.,* prairie dogs, grazing, fire), it may tolerate surface disturbance from energy development (Andres and Stone 2009, p. 25; Carr, in review). In Utah, disturbed areas around oil well pads reportedly created open habitat with bare ground suitable for the mountain plover (Day 1994, pp. 298–299). Manning and White (2001, p. 226) found all mountain plover nests in Utah to be situated near roadways or oil well pads, and saw adults and chicks using these areas for foraging both day and night. However, they suggested that while mountain plover tended to choose nest sites near surface disturbance, the overall impact of oil and gas expansion could be negative (Manning and White 2001, p. 226). This small, apparently isolated Utah population subsequently declined, and no birds have been found during surveys of the area since 2003 (Maxfield 2010, pers. comm.). Decline of the population occurred subsequent to oil and gas development, but no direct tie was established. Severe drought and cessation of sheep grazing that provided mountain plover breeding habitat may have been more significant to the apparent loss of this local population (Maxfield 2010, pers. comm.).

Carr (in review) provides the only targeted study of mountain plover response to oil and gas development. The USGS study evaluated the effects of oil and gas development on mountain plover population density and nesting success in mixed desert shrublands in Wyoming. Results suggested that the presence of wells, roads, and associated infrastructure at densities studied (up to 8 wells per square mile (3 per square kilometer)) did not have detectable negative effects on breeding mountain plover (Carr, in review). Carr (in review) concluded that energy development at low to moderate levels may be compatible with nesting mountain plover, although the author suggested the need for additional studies of potential effects of energy development on chick survival and potential for impacts at higher well densities.

Tolerance to disturbance from energy development by mountain plover could result in nesting or foraging in areas where continued human disturbance and vehicular traffic could pose threats to adults and chicks. Carr (in review) cautioned that human activities at well sites might keep mountain plover from their nests, subjecting eggs to possible overheating. In Oklahoma, mountain plover appeared unaffected by the presence of roads (MacConnell *et al.* 2009, p. 33). Manning and White (2001, p. 226) indicated that vehicular traffic did not influence incubation or foraging behavior, and, while vehicular collisions with mountain plover might be a concern, no such mortalities were noted. Andres and Stone (2009, pp. 26, 27) noted that mountain plover are tolerant of vehicles, and while there is potential that vehicles could kill adult or juvenile birds, such mortality would not likely have a population-level impact. In addition, collisions with stationary structures such as power lines have been discounted as not likely a significant cause of mortality (Knopf and Wunder 2006; Andres and Stone 2009, p. 26).

Other impacts of energy development on the mountain plover and its habitat could occur. These include a potential for increase in predators, increased opportunity for spread of invasive plants, and potential changes in human land use such as cessation of grazing. Despite these concerns, to date, impacts of oil and gas development at levels typically seen in mountain plover breeding habitat have not been shown to decrease mountain plover populations.

Coalbed methane extraction is a process in which: (1) Wells are drilled into the coal seam; (2) the seam is dewatered; and (3) the methane is then extracted from the seam, compressed, and piped to market. In Wyoming, some water from coalbed methane operations is used for surface or subsurface irrigation of agriculture fields and rangeland. There is concern that plover habitat, including prairie dog colonies, have been and could be lost to these practices, thereby altering or eliminating important mountain plover habitat (Rogers 2010, pers. comm.). In the Powder River Basin, about 2,000 ac (800 ha) of such irrigation is occurring and more than 7,000 ac (3,000 ha) is permitted (Fischer 2010, pers. comm.). We have no information as to whether or not mountain plover have been displaced. While changes in habitat caused by this irrigation may alter habitat and cause a local impact to mountain plover, we do not believe that the relatively small area involved represents a threat to overall mountain plover populations in this region.

Like oil and gas development, wind energy development presents a range of habitat changes and disturbance factors that could affect the mountain plover. In addition, there is concern that the mountain plover's use of areas may decline during and after construction due to avoidance of wind turbines or increased mortality attributable to collisions, primarily with moving rotor blades. Lock (2010) highlighted the potential for wind energy projects to displace breeding mountain plover, but described the potential threat of mortality from collisions as being of "low certainty."

The most comprehensive study conducted on potential effects of wind power development on the mountain plover came from the facility on Foote Creek Rim in Carbon County, Wyoming, where mountain plover were studied from 1994 (prior to construction) through 2007 (Young *et al.* 2007, entire). The authors suggested that mountain plover habituated over time to the presence of turbines, as evidenced by nesting within 60 feet (ft) (20 meters (m)) of the base of a tower in one instance (Young *et al.* 2007, p. 18).

Wind towers, rotors, and associated meteorological towers pose an added risk that mountain plover may be struck by blades or fly into stationary structures. However, carcass searches at Foote Creek Rim documented no mountain plover mortalities attributable to collisions over the 3 years the studies were conducted. On breeding grounds, mountain plover fly at low heights. In a common courtship display, a male flies only to a height of approximately 16 to 33 ft (5 to 10 m) (Knopf and Wunder 2006). The lowest point of rotor sweep on the Foote Creek Rim site (57 ft (17 m)) was above the typical heights flown by mountain plover during courtship and breeding (Young *et al.* 2007, p. 18). Research at the Judith Gap Wind Farm in Montana found no evidence of mountain plover displacement or fatalities (MacDonald 2010). However, recently we became aware of two mountain plover mortalities from searches of Wyoming wind energy projects (Sweanor 2010, pers. comm.). Because sources of mortality could not be confirmed for either carcass, we do not know whether the birds were struck by rotor blades, collided with towers, or died from other causes. Rotor sweep was 126 ft (41 m) above the ground in both cases, well above heights that breeding mountain plover are thought to regularly fly. At Glenrock Rolling Hills, one of the two sites reporting a mortality, no mountain plover were observed prior to construction of the wind energy project, but nesting occurred after construction, suggesting that nesting habitat may have been created through project disturbance (Sweanor 2010, pers. comm.).

Wind energy development could present a greater potential issue for post-breeding congregations of mountain plover, because hundreds of birds may flock in a single area. However, we have no information regarding behavior of post-breeding flocks that could be applied to the potential threat of bird strikes from wind turbines. Little is known regarding their potential to strike moving blades or stationary structures, although based on mortality studies, shorebirds (plovers, sandpipers, and similar species) do not seem to be at great risk of colliding with turbines or communication towers (Kerlinger 2011, pers. comm.). Wind energy projects have reportedly been constructed and are proposed in South Texas agricultural fields that may overlap with areas used by wintering mountain plover (Cobb 2010, pers. comm.). The potential for mountain plover displacement or collisions in Texas is unknown. In California, wind energy development projects tend to be located on mountain ridges where wind speeds are greater and, therefore, are less likely to impact wintering mountain plover.

One exception is in Antelope Valley, Kern County (California), an area where mountain plover are known to winter. Several wind energy projects have been permitted on a mosaic of desert and agricultural lands. Overall, evidence available does not suggest that wind energy development is likely to displace mountain plover from breeding or wintering areas, or cause direct mortality through collisions to the extent that it would pose a threat to the species.

Surface mining for coal and other minerals can displace mountain plover within the footprint of the work for the duration of the active mining. Whether or not this would result in permanent displacement is dependent on whether and how restoration occurs. We have little site-specific data on impacts of surface mining to nearby mountain plover. Surveys over 28 years at Cloud Peak Energy's Antelope Mine in Campbell and Converse Counties, Wyoming, documented mountain plover's use of the mine permit area and adjacent lands (Green 2010). Mountain plover numbers declined as mining and the footprint of surface disturbance progressed, but in general they showed tolerance to mining activities nearby (Green 2010). In 2010, adult mountain plover and chicks were, for the first time, seen using a reclaimed mine area at the Antelope Mine (Green 2010). Mountain plover can be directly affected by surface mining through temporary or permanent loss of their habitat. However, we do not believe that surface mining, currently or in the future, will impact a significant amount of the mountain plover's breeding range or represent a threat to the species.

The BLM considers the mountain plover, among other species, when evaluating the impacts of energy development on the environment. The BLM, through its Special Status Species program, has developed various management scenarios for the protection of the mountain plover throughout its range. In 2005, the BLM analyzed the potential effects to the mountain plover from management actions approved in Resource Management Plans for the various BLM field offices in Wyoming (BLM 2005). At the time, we concluded that BLM's proactive conservation measures should aid in protecting the species from further decline (Kelly 2007). The conservation measures committed to by the BLM included habitat screening (determining whether habitat might support the mountain plover) and, as appropriate, subsequent surveys for the possible presence of mountain plover prior to approval of ground-disturbing activities; designation of a 0.25-mi (0.40-km) buffer around occupied nests during the nesting season, with restrictions on activities to protect nesting plover; and continued research and census activities targeting the mountain plover on BLM-administered land in Wyoming (BLM 2005). A number of best management practices were also provided, to be considered on a case-by-case basis, to help protect the mountain plover and expand suitable nesting habitat. While these measures are not binding, and on-the-ground conservation efforts likely vary by BLM field office, a proactive cooperative approach between the BLM and the Service in Wyoming has heightened recognition of mountain plover conservation on BLM-administered lands and provides a basis for future cooperation to safeguard the species.

Solar energy projects are likely to displace mountain plover when situated in breeding or wintering habitat. Unlike oil and gas wells or wind turbines, solar collectors are placed so close together that they effectively eliminate the ability of mountain plover to use the habitat. Solar energy development potential is greatest in southwestern States and California and, except for Colorado's San Luis Valley and Northern New Mexico, occurs in areas used mostly by wintering rather than breeding mountain plover. See Changes in Land Use in Mountain Plover Wintering Range below for a discussion of solar energy development.

In summary, potential effects to the mountain plover from energy and mineral development are largely uncertain. Ground disturbance from oil and gas development and wind energy development may, in some cases, enhance or create mountain plover habitat, but whether the net effect of such activity is beneficial or detrimental has not been determined. The risk of significant mortality through mountain plover being struck by rotors of wind turbines appears low. Whether, or to what extent, construction of wind energy projects displaces breeding or wintering mountain plover has not been clearly established. Surface mining displaces mountain plover, at least until an area is restored, and development of solar fields likely results in habitat loss. Overall, more information regarding possible impacts of energy and mineral development to mountain plover is needed. However, the information currently available does not indicate that energy and mineral development threatens the mountain plover now or is likely to do so within the foreseeable future.

Changes in Land Use in Mountain Plover Wintering Range

In our December 5, 2002, proposal to list the mountain plover (67 FR 72396), we emphasized the potential impact to mountain plover populations from changes to wintering habitat in California, including changes stemming from human population growth, changes in agriculture, water availability, and burning restrictions. It now appears that the proportion of the rangewide population of mountain plover that winter in California is far less than previously believed (see Conservation Status and Local Populations above). However, the importance of mountain plover wintering habitat in California has been a continued topic of investigation and interest (Kopft and Rupert 1995; Hunting *et al.* 2001; Wunder and Knopf 2003; Hunting and Edson 2008). Knopf and Rupert (1995, p. 750) cited a high overwinter survival rate of mountain plover in California and their use of agricultural fields, and concluded that long-term population declines were likely attributable to processes on their breeding grounds. Dinsmore *et al.* (2010) concluded that adult survival in winter was high and suggested that conservation and management efforts be directed toward chick survival on breeding grounds and habitat during migration. In contrast, Hunting and Edson (2008, p. 184) attributed both past declines and potential future declines in rangewide plover populations to loss of traditional wintering sites in California. Andres and Stone (2009, pp. 21, 22) stated that effects to the mountain plover from changes to wintering habitat in California's Central Valley were unknown, but also expressed concerns regarding maintenance of quality wintering habitat in the Imperial Valley, where a majority of mountain plover in California are now thought to winter. Below we address current trends and potential changes to the future extent and quality of mountain plover wintering habitat in California.

Concern continues to center on land use trends, conversion of agricultural lands to other uses, and changes in agriculture (Andres and Stone 2009, pp. 22–24; Hunting and Edson 2008, p. 184). Due to population growth in California, more rural and agricultural land is being urbanized. Between 1982 and 2007, approximately 8 percent of California's croplands, 11 percent of the State's pasturelands, and 6 percent of State's rangelands were lost (USDA 2010). However, as of 2007, California still supported approximately 9.5 million ac (3.8 million ha) of cropland, 1.1 million ac (0.4 million ha) of pastureland, and 17.5 million ac (7.0 million ha) of rangeland (USDA 2010).

The dynamic, market-driven nature of agricultural production and changes in cultivation practices in California could affect the availability and quality of wintering habitat for the mountain plover. Another issue is the dependence of California agriculture on irrigation water, some of which is imported from other areas, and its future availability. Future changes in the availability of irrigation water might result from competition with other water uses, the effects of global climate change (see discussion under *Factor E* below), and changes in the characteristics of agricultural lands as a result of improved or more broadly implemented water conservation techniques.

Development of energy projects, especially solar energy, in mountain plover wintering habitat is also a concern in California. California's electric utility companies were required by California statute (Chapter 464, Statutes of 2006) to use renewable energy to produce 20 percent of their power by 2010. Governor Schwarzenegger's Executive Order of November 2008 (#S–13–08) set a higher, more ambitious goal of 33 percent by 2020 (California Energy Commission 2010). On April 12, 2011, Governor Jerry Brown signed Senate Bill 2X into law, requiring that 33 percent of the State's electric generation come from renewable sources by 2020 (Los Angeles Times 2011). A main source of renewable power will be solar energy. A Statewide list of solar energy projects includes over 400 proposals (Brickley 2011, pers. comm.). Many large solar energy projects are being proposed on BLM land, often in desert areas. The BLM, along with the Department of Energy (DOE), is currently in the process of developing a Programmatic Environmental Impact Statement (PEIS) for solar energy development in six southwestern States, including California. The document assesses development of a new solar energy program for siting utility-scale solar energy projects on BLM lands. Any program adopted will have implications for solar energy project siting in mountain plover wintering habitat. A draft of the PEIS was made available for public comment December 17, 2010 (75 FR 78980). Mountain plover are not specifically addressed in the PEIS, but potential impacts to wildlife and appropriate mitigation measures are provided (DOE 2010, pp. 5–73 to 5–96).

As described in Conservation Status and Local Populations above, the California winter range of the mountain plover is primarily in the Central Valley (including the Sacramento and San Joaquin valleys) and the Imperial Valley. The Carrizo Plain in San Luis Obispo County is also recognized as an important wintering site. Other areas where mountain plover are regularly observed include the Panoche and Antelope valleys.

The Central Valley (Sacramento Valley and San Joaquin Valley), Carrizo Plain, Panoche Valley, and Antelope Valley

In the Central Valley, human population growth over the last 20 years has resulted in a declining trend in agricultural area, with a smaller, but corresponding, trend of conversion to urban uses (California Department of Conservation (CDC) 2010). The rate of land conversion to urban uses in the Central Valley increased beginning in 1990. With the exception of Solano County, the human populations of Central Valley counties within the wintering range of the mountain plover all grew faster than the Statewide average between 2000 and 2009 (U.S. Census Bureau 2010).

In the Sacramento Valley, urbanization in Yolo and Solano Counties, the two principal counties supporting wintering mountain plover, has not adversely impacted the mountain plover to date, because known wintering locations are located outside city planning boundaries. However, continued population growth beyond the current planning horizon could potentially threaten individual wintering localities that are close to urban areas, particularly those in areas most proximate to Sacramento.

In the San Joaquin Valley, human population growth has been approximately 17 percent over the period from 1997 through 2010. To date, most of the resulting urban growth has occurred adjacent to, and in the general vicinity of, the towns, such as Modesto, Fresno, and Bakersfield, that developed along Highway 99 in the eastern portion of the San Joaquin Valley (Teitz *et al.* 2005, p. 27). These urban areas are located to the east and outside of the mountain plover's wintering range. To date, urbanization in the western San Joaquin Valley is restricted to the Interstate 5 corridor, which supports few mountain plover. Therefore, we expect it to have little effect on wintering mountain plover. Scenarios developed to gauge effects of future population growth and urbanization suggest that the San Joaquin Valley will experience significant urban growth within the next 35 years; increasing populations will result in scattered urbanization within the plover's wintering range, but the pattern of development will depend on land use planning goals, and potential development of high speed rail (Teitz *et al.* 2005, pp. 45–67).

In the San Joaquin Valley counties (Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, Tulare), cropland declined by about 3 percent from 1997 to 2007, to about 5.2 million ac (2.1 million ha) (USDA 2010). Crop fields in alfalfa and other hay, favored by mountain plover, were relatively stable and accounted for about one-third of all cropland in the San Joaquin Valley in 2007 (USDA 2010).

While relatively little agricultural land is being lost, conversion from annual agricultural crops to permanent crops that do not provide mountain plover with habitat is significant within the San Joaquin Valley. For example, in the San Luis Unit of the Central Valley Project (CVP), in Fresno, Kings, and Merced Counties, agricultural acreage has increasingly been converted to permanent crops of orchards or vineyards. We estimate the percentage of land in permanent crops at somewhere between 16 percent and 24 percent of the San Luis Unit, compared with 10 percent in 2000. General field observations and land value reports (California Society of Farm Managers and Rural Appraisers 2009, pp. 31–64) suggest that this is a continuing trend, with new orchards displacing cotton and tomato crops in many areas of the Central Valley. In Madera County, some locations formerly utilized by wintering mountain plover have been converted from rangeland to annual crops or to permanent crops such as pistachio trees (Woods 2009, pers. comm.).

Outside of the Central Valley, orchard land in San Luis Obispo County, which includes the Carrizo Plain, a known mountain plover wintering area, rose from 29,000 ac (12,000 ha) to 54,000 ac (22,000 ha) from 2007 to 2009, to about 18 percent of cropland in the county. Conversion to orchard crops in the nearby Maricopa and Cuyama valleys near the Carrizo Plain area have resulted in loss of wintering mountain plover habitat (Sharum 2010). Overall, conversion of annual cropping systems to permanent crops is expected to continue and poses an additional, but unquantified, source of habitat loss for the mountain plover.

As a result of the large-scale irrigation efforts in the western San Joaquin Valley, approximately 1,750,000 ac (710,000 ha) of agricultural lands with shallow groundwater tables have become impaired due to accumulated concentrations of naturally occurring toxic elements, including selenium.

With the passage of the Central Valley Project Improvement Act (CVPIA) in 1992, Federal and State acquisition programs enabled owners to stop farming, or "retire" their privately owned, drainage-impaired agricultural lands as a strategy to reduce drainage problems and address selenium accumulations (Service 1998; USDI 2005). Lands targeted for retirement lie primarily within the San Luis Unit of the CVP along the west side of the San Joaquin Valley where approximately 379,000 ac (152,000 ha) of agricultural land have been identified as contributing to poor water quality. Of these lands, nearly 200,000 ac (80,000 ha) have been proposed for land retirement (USBR 2007), and, to date, more than 100,000 ac (40,000 ha) of agricultural land have been retired within the San Luis Unit. We have no estimate of what proportion of this area may have supported acceptable wintering habitat for the mountain plover or the extent to which it was used by the mountain plover.

A portion of the lands proposed for retirement are expected to be used for drainage reclamation; between 1,280 and 3,300 ac (5,170 and 1,340 ha) of existing irrigated cropland will be converted to treatment facilities and evaporation basins, while 12,500 ac (5,100 ha) of either existing or fallowed cropland will be converted to reuse areas in which crops will be irrigated with selenium-contaminated, agricultural drainwater in order to reduce selenium loads in the agricultural run-off (Service 2006). These areas might threaten some mountain plover with selenium toxicity, as described below in the discussion under *Factor E.* Numerous retired parcels are characterized by dense weedy growth (Cypher *et al.* 2007, p. 28; Service 2006), and are not expected to provide suitable habitat for the plover. Substantial retired acreage has been converted to permanent crops utilizing alternate sources of water. Other retired lands that support grazing or farming may remain suitable for wintering mountain plover.

Due to the historical importance of agriculture in the Central Valley, the valley has the highest percentage of privately owned land in the State. Only 4 percent of Sacramento Valley land and 7 percent of San Joaquin Valley land is public open space. In the Central Valley, a variety of conservation and restoration projects have been implemented to protect natural resources, although 57 percent of such conservation projects report a focus on riparian habitat enhancement (Great Valley Center 2005, p. 30). Twenty-three local and regional land trusts operate in the Central Valley to protect valley wildlife, farmland, habitat, rivers, and native vegetation (Great Valley Center 2005, pp. 30–31). The Service does not have information on the area of specific habitat types that have been protected within the range of the mountain plover or whether these efforts have produced substantial benefits to the species.

In the Sacramento Valley, we have found no planned solar energy development likely to threaten the mountain plover's habitat. However, the legislation cited above (Chapter 464, Statutes of 2006, and Governor Schwarzenegger's Executive Order of November 2008 *(*#S–13–08)) has initiated a significant increase in the planning for solar development in and adjacent to the San Joaquin Valley. Solar developments proposed thus far vary greatly in size: small projects of 100 to 200 ac (40 to 80 ha), to projects of potentially to 30,000 ac (12,000 ha) in size. The Service does not have specific information on mountain plover use of many of these sites, but we conclude that sites will be unsuitable for mountain plover after development.

To date, small projects are proposed for scattered locations across the southern San Joaquin Valley, while large projects have been proposed both within the San Joaquin Valley, and in the Carrizo Plain and Panoche Valley areas. The solar projects proposed on the valley floor are typically situated on active or recently cultivated agricultural lands and several larger projects have been proposed for lands that have been used for livestock grazing.

The Service is currently aware of up to six small solar projects, each approximately 200 ac (80 ha) in size, which are expected within the mountain plover's general wintering range in the southern San Joaquin Valley. The projects will be constructed by Pacific Gas and Electric, a major California utility company. In the San Joaquin Valley, the solar projects proposed on the valley floor are typically situated on active or recently cultivated agricultural lands and several larger projects have been proposed for lands that have been used for livestock grazing. The Service concludes that sites will be unsuitable for mountain plover after development.

Several large proposals are located within the mountain plover's general wintering range. A large 32,000-ac (13,000-ha) park, the Westlands Solar Park, has been proposed for western Fresno and Kings Counties, with an initial phase of approximately 10,000 ac (4,000 ha). It will be constructed on agricultural land that the Westlands Water District has slated for land retirement (Woody 2010). We expect that additional proposals for retired farmland are likely due to the general perception that such lands have few environmental issues.

The Maricopa Sun Solar Complex (approximately 9,000 ac (3,600 ha)) is proposed for agricultural lands in western Kern County near the edge of the plover's winter range. We do not know whether the mountain plover uses the site. Development of the project includes cancellation of a contract to preserve agricultural land. The Draft Environmental Impact Report identifies mountain plover as a potential winter migrant (Kern County Planning and Community Development Department 2010, pp. 1, 4.4–8).

In the Carrizo Plain, San Luis Obispo County, two solar projects have been proposed, including the 4,000-ac (1,619-ha) California Valley Solar Ranch (CVSR) and the 4,500-ac (1,800-ha) Topaz Solar Farm. Both facilities would be located approximately 6 miles north of the Carrizo Plains National Monument, an important natural area for the plover, on a mixture of natural lands, grazing lands, and cropped lands (Aspen Environmental Group 2010, pp. C3–2–C3–3, C6–4). Suitable foraging and roosting habitat for the mountain plover occurs on sites under consideration (Aspen Environmental Group 2010, pp. C6–4–C6–5, C6–11). Mountain plover have been observed on the CVSR site but likely occur sporadically and in low numbers (Boroski 2011, pers. comm.).

The Panoche Valley, an area of about 12,000 ac (5,000 ha) in San Benito County, receives annual use by wintering mountain plovers. A solar project is currently proposed on 3,200 ac (1,300 ha) of potential mountain plover wintering habitat, or about one-third of the potential mountain plover habitat present in the Panoche Valley. Proposed mitigation would preserve and manage other nearby habitat.

The Antelope Valley, an area of approximately 900,000 ac (360,000 ha) in Los Angeles and Kern Counties, supports wintering mountain plover annually, with numbers estimated in the low 100s using crop fields and grasslands (eBird 2010). How much of the valley's area is mountain plover habitat is unclear. The valley is primarily privately owned land, and its proximity to human population centers has generated high interest in renewable energy (solar and wind) development that could reduce mountain plover wintering habitat.

Solar energy projects currently planned in the San Joaquin Valley, the adjacent Carrizo Plain, and the Panoche and Antelope valleys are likely, over time, to reduce existing mountain plover wintering habitat. A variety of siting considerations, including presence of other wildlife species of concern, and potential mitigation requirements, will dictate the extent to which mountain plover are affected. The Sacramento Valley and Imperial Valley lands used by the mountain plover are less likely to be developed for solar projects. We know of no solar projects are currently planned for agricultural lands known to support mountain plover in the Imperial Valley, discussed below.

As future solar projects are proposed and implemented, we conclude that they will cause some continued loss of mountain plover wintering habitat in California. While cumulative impacts of these projects, and other factors such as urbanization and changes in agriculture, are likely to reduce the total area of wintering habitat available, substantial acreage of appropriate wintering habitat will persist in the Central Valley, Carrizo Plain, Panoche Valley, and Antelope Valley.

The Imperial Valley

As of 2009, about 381,000 ac (154,000 ha) of field crops existed in the Imperial Valley (Imperial Irrigation District (IID) 2009a). The Imperial County has witnessed a decline in annual area used for agricultural purposes from 1984 through 2008 of about 21,000 ac (8,000 ha) or 4 percent (CDC 2010), while the county saw an increase in area used for urban areas in the same period of about 6,000 ac (2,400 ha) or 29 percent (CDC 2010). Urban expansion has accounted for only a relatively small portion of the 4 percent decline in agricultural lands over a period of 24 years. At this rate, conversion of agricultural lands to urban lands in Imperial County has a modest impact.

Habitat in the Imperial Valley believed most important for mountain plover includes alfalfa fields, especially those harvested then grazed by sheep, and bermudagrass fields burned following harvest (Wunder and Knopf 2002, pp. 75–76). Both alfalfa and bermudagrass acreages have declined in recent years (2005–2009) (IID 2009a). However, in 2009, these crops occupied 195,000 ac (79,000 ha) or approximately 51 percent of total field crop acreage in the Imperial Valley (IID 2009a). Area devoted to all hay (including alfalfa and bermudagrass), 233,000 ac (90,000 ha), was the same in Imperial County in both 1997 and the 2007 (USDA 2010). Data available also suggest the number of sheep in the Imperial Valley have declined recently as well but that numbers fluctuate over time. It is not known whether these short-term declines are indicative of future trends.

The continued success of agricultural habitats used by the mountain plover in the Imperial Valley depends on a reliable water supply. The Imperial Valley depends on Colorado River water to irrigate its crops, but there has been increasing pressure for more water to be diverted to urban areas. In 2003, the State of California and water agencies across the State signed the Quantification Settlement Agreement (QSA) to dictate distribution of water from the Colorado River. The settlement allocated 370,000 acre-feet (ac-ft) (456 million cubic meters (cu-m)) of water to urban areas in Southern California and Tribal areas (IID 2010a, p. 2). Most of the 370,000 ac-ft (456 million cu-m) will come from improvements in on-farm water efficiency and improved irrigation technology (IID 2010a, p. 2; Delfino 2006, p. 161).

Under the QSA, Imperial County must also fallow agricultural land, some of which will be transferred to the San Diego Water Authority, and some of which will go to mitigation to restore the Salton Sea (IID 2010a, p. 1). The area of land fallowed depends on the intensity of water use, not farm size (IID 2010b, p. 1). Fallowing will be conducted on a sliding scale. The program began in 2003 with lands fallowed that had been irrigated by under 10,000 ac-ft (1.2 million cu-m) of water, and peaked in 2010 to lands fallowed that had been irrigated by over 80,000 ac-ft (9.9 million cu-m) of water. The program will slowly decline before agricultural fallowing ends in 2017 (IID 2009b). The area of land fallowed in 2009–2010 was about 10,500 ac (4,300 ha) or about 2 percent of agricultural land in the valley. Overall, lands fallowed will reduce the area of crop fields in the Imperial Valley but we have no specific information as to extent to which those fields fallowed provide wintering habitat to the mountain plover.

The future of the QSA is in question. On January 13, 2010, the Superior Court of California found that funding provisions of the QSA were unconstitutional, and officially invalidated the QSA on January 19, 2010 (*QSA Coordinated Cases,* Case No.: JC4353). IID asked for, and received, a stay that temporarily allowed the terms of the QSA to remain in effect (Case No.: JC4353). As of April 2011, a ruling was anticipated before the end of the year (Imperial Valley Press 2011, p. 1). It is unclear what effect the cancellation of the QSA will have on water use and fallowing, given the extreme contention and difficulty in negotiating the 2003 settlement. If the stay does not remain in place, the IID may halt fallowing, as it has been strongly opposed to fallowing as a conservation measure (IID 2010c, p. 1). If the fallowing program remains in place, it could continue as an immediate, but relatively insignificant, threat to mountain plover habitat, as it would only affect a small portion of agricultural fields, with no definitive data indicating if (or how much) fallowing will occur on those croplands that mountain plover frequent.

The yield from alfalfa crops is related to the amount of irrigation the land receives (Hanson *et al.* 2007, p. 1). Alfalfa could thus be more significantly impacted by water use restrictions. In California, revenue for alfalfa is expected to decrease slightly by 2050, decreasing 11 percent Statewide (Howitt *et al.* 2008, p. 11). These statistics take water use into consideration (California Department of Finance 2007, p. 5). In contrast, Bermudagrass is drought-tolerant, and one study showed little decrease in crop yield under drought conditions (Kneebone 1966, p. 96; George *et al.* 1992, pp. 23–24).

Yield and acreage of bermudagrass could be affected by restrictions on burning in the Imperial Valley due to pollution concerns. To comply with California's air pollution restrictions (California Code of Regulations 2001, pp. 80100–80170), the Imperial County Air Pollution Control District (ICAPCD) has set forth rules and regulations (ICAPCD 2010b, pp. 701.1–702.1) governing implementation of a smoke management program (ICAPCD 2010a, pp. 1–37) for agricultural burning. These rules and regulations allow for agricultural burning after the ICAPCD has analyzed several factors: (1) Quantitative and qualitative analysis of meteorological conditions; (2) current smoke complaints; (3) source/receptor consideration; and (4) current air quality levels (ICAPCD 2010b, p. 8). The number of burn days permissible in the areas of Imperial County has declined (California Air Resources Board 2010) since 2003, but the amount of bermudagrass acreage burned in the same period (2003 to 2009) shows little trend and averages about 18,000 ac (7,000 ha) (Lancero, pers. comm.; Cavazos 2010, pers. comm.). Any concern that current burning restrictions limit bermudagrass cultivation appears unsupported by these data.

Future trends in alfalfa and Bermudagrass may largely determine the extent and quality of mountain plover wintering habitat available in the Imperial Valley. While no predictions of future area devoted to these two crops is available, we do not have any information that would lead us to conclude that their occurrence will significantly decline. Therefore, we anticipate that in the future substantial areas of alfalfa and Bermudagrass fields will remain available to support wintering mountain plover in the Imperial Valley.

Currently, there is no habitat conservation plan (HCP) implemented in the Imperial County. The Imperial Irrigation District is currently working on an HCP, but they have not yet finalized the plan or been issued a section 10(a)(1)(b) permit under the Act (Roberts 2010, pers. comm.); however, in the current draft of the HCP, mountain plover is a covered species.

Individually, urbanization, water restrictions, and trends in agriculture do not appear to pose significant threats to the acreage or quality of wintering habitat available or to the mountain plover's use of the Imperial Valley. However, in the foreseeable future, their combined effects, along with climate change, could appreciably reduce habitat available to mountain plover and potentially affect the nature or extent of wintering mountain plover use of the Imperial Valley.

Mountain plover winter over a large range and in diverse habitats. In our February 16, 1999, proposed rule to list the species we cited sources suggesting that most mountain plover, an estimated 7,000 of a rangewide population of 8,000 to 10,000 birds, wintered in California (64 FR 7587). However, we now believe that less than half of the rangewide population, estimated at over 20,000 birds, winter in California (see Population Size and Trends above). As of 2007, over 18 million ac (7 million ha) in California (about 18 percent of the State) supported cropland, pastureland, or rangeland (USDA 2010). While only a portion of this area provides habitat for the mountain plover in any given winter, the total includes 1.7 million ac (0.7 million ha) of alfalfa, Bemudagrass, and other hay crops that the mountain plover utilizes, including 230,000 ac (90,000 ha) in Imperial County alone. The total also includes 1.1 million ac (0.4 million ha) of pastureland, often used by mountain plover. To exploit these and other wintering habitats, mountain plover are able to move long distances and use various sites as conditions become favorable within a given winter (Knopf and Wunder 2006). Mountain plover appear annually at some favored wintering sites, but site fidelity by individual birds appears low. Birds may also alternate between wintering areas in California and elsewhere in different years. Cumulatively, the potential changes in land uses in California described above will likely result in a reduction of mountain plover wintering habitat in the State. However, given the available agricultural acreage cited above, it is not apparent that even a reduction in California wintering habitat substantially larger than that which we anticipate would significantly affect California's ability to support mountain plover numbers currently wintering in the State. We conclude that any likely reduction of mountain plover wintering habitat in California will not threaten the mountain plover plover's ability to maintain a wintering population in California or threaten the species range wide in the foreseeable future.

Wintering Outside of California

Elsewhere, in the Phoenix area, Maricopa County, and some other wintering sites in southern Arizona, mountain plover have been displaced by growth of human populations (Gardner 2010; Robertson 2010, pers. comm.). Declines are likely to occur in the Tucson area, Pinal County, and perhaps in Yuma County as well, due to increased human populations and, more directly, due to an accompanying reduction in agriculture. Wintering mountain plover populations in Cochise County, where there is less urban development and where the amount of cropland increased from 1997 to 2007 (USDA 2010), will likely remain more stable. Solar energy development is occurring in areas of southern Arizona, but the extent to which projects may overlap mountain plover wintering habitat has not yet been determined.

Both increases in human population and expansion of agriculture are occurring in areas of southern Arizona (Council for Agricultural Science and Technology 2009, pp. 8–12). Rather than the total area urbanized, the extent and nature of future agriculture that is present in southern Arizona and available for mountain plover use will likely dictate the future value of this area to wintering mountain plover. However, water resources are limited, and urban uses may compete with agriculture for available water. Southern Arizona is thought to winter a relatively small portion of the rangewide mountain plover population. We believe that any net future decreases in agricultural lands in southern Arizona will be limited and that these potential future decreases in agricultural lands in southern Arizona will not markedly affect the ability of the area to support these wintering mountain plover.

Other than potential impacts from wind energy development described in Energy and Mineral Development above, we have no information regarding threats to wintering mountain plover from habitat changes in Texas.

Outside of the trends in wintering areas in Mexico described in Threats to Prairie Dogs and Associated Loss of Habitat above, we have little information regarding threats to the mountain plover from wintering habitat changes in Mexico. Based on their wintering habitat preferences in the United States, significant numbers of mountain plover may winter in agricultural areas in Mexico. Possible areas of concentration and the types of agriculture utilized remain undocumented.

Summary of Factor A

The mountain plover occupies a wide geographic range across the breeding, migration, and wintering seasons. The extensive and diverse habitats it utilizes are subject to a number of changes that represent potential threats.

Black-tailed prairie dogs create favorable breeding habitat for the mountain plover in States including Colorado, Montana, and Wyoming. Black-tailed prairie dog numbers have increased by a factor of six since 1981 in States where they are present, and associated mountain plover habitat has likewise increased. We do not anticipate loss of black-tailed prairie dog numbers or the mountain plover habitat they maintain in the foreseeable future.

Current conversion of prairie and grasslands to other land uses within mountain plover breeding habitat appears negligible when viewed from a rangewide perspective. Formerly expressed concerns regarding human development in South Park, Colorado, where a high density of mountain plover breeds, now seem unfounded.

Cattle grazing generally benefits mountain plover breeding habitat, but some range management practices do not create favorable conditions for mountain plover breeding. Specific range management to benefit mountain plover could be employed, but overall we expect current cattle grazing to continue relatively unchanged in the foreseeable future.

Suggestions that cropland use by breeding mountain plover may be detrimental to populations have not been substantiated.

Energy and mineral development alters landscapes, and some activities can adversely impact mountain plover habitat, at least locally and temporally. The mountain plover often benefits from ground disturbance and may tolerate or benefit from certain development activities. Mountain plover collisions with wind turbines are likely to occur infrequently. Overall, oil and gas extraction, wind power projects, and mineral extraction have not been shown to have significant adverse impacts to the mountain plover.

Wintering mountain plover are wide-ranging, and seek out a variety of grassland, rangeland, crop field, and semi-desert landscapes, from the Gulf Coast to the Pacific Ocean, to meet their needs. Habitat in California and across the mountain plover's wintering range is dynamic, based on yearly weather patterns, grazing levels, crops present, and timing of planting or harvest. Currently available wintering habitat can not be easily quantified, nor can its projected quantity and quality in the foreseeable future be easily predicted. A future net loss of wintering habitat in California appears likely, based on solar development projects and other factors described above, but given the expanse of wintering habitat currently present, it is not apparent that this will have any affect on the number of wintering mountain plover California will support.

Dinsmore *et al.* (2010) assessed factors affecting population growth in the mountain plover in order to target conservation and management efforts. They cited mountain plover adult survival as high in winter and suggested conservation efforts should target increased chick survival on breeding grounds. This is consistent with Knopf and Rupert (1995, p. 750), who concluded that past declines in the mountain plover were attributable to events taking place on the breeding grounds not during winter. We believe that rather than changes in wintering habitat, future changes on the mountain plover's breeding grounds that influence reproductive success will dictate rangewide mountain plover numbers and population trends. The quantity and quality of breeding habitat, and the ability of the mountain plover to successfully reproduce will depend largely on future human land uses, rangeland and cropland management practices, the potential effects of energy development, and the abundance and distribution of prairie dogs. We have no credible evidence to show that future changes in the extent and quality of mountain plover rangewide wintering habitat, of the magnitude likely to occur, would significantly influence their total population or population trend, or that they endanger the species now or would be likely to endanger the species in the foreseeable future.

We conclude that the best information available indicates that the mountain plover is not now, or in the foreseeable future, threatened by the present or threatened destruction, modification, or curtailment of its habitat or range to the extent that listing under the Act as an endangered or threatened species is warranted at this time.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Mountain plover were historically hunted for human consumption on the Great Plains (Knopf and Wunder 2006). Under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–712), mountain plover are not legally hunted in the United States, Canada, or Mexico, although Andres and Stone (2009, p. 27) note that some illegal shooting may occur in some areas of Mexico. The extent or significance of any such activity is unknown, but, because we have no information that such illegal hunting activity is widespread, we believe it is unlikely to be a significant threat to the mountain plover's continued existence.

Birders (bird watchers) may seek out mountain plover for viewing. This activity is most likely to occur on a few publicized sites and often takes place from, on, or near roadways. Mountain plover are relatively tolerant of disturbance and often ignore humans in vehicles. If approached on foot they quickly retreat (Knopf and Wunder 2006). We believe that observation by birders does not represent a threat to the mountain plover because it is limited in extent and most birders attempt to minimize disturbance to birds as they pursue their activities.

Most research conducted on mountain plover relies on passive sampling (*e.g.,* point counts) rather than active handling. Passive sampling is not likely to substantially affect the mountain plover. The studies that involve handling of adults, chicks, and eggs may impact individuals, but these studies are small enough in scale that they are not likely to affect populations as a whole. Knopf and Wunder (2006) cautioned mountain plover eggs could become overheated if exposed to direct sun on hot days. However, we do not have any information to indicate that this has caused decreased nest success in areas where research occurs.

Summary of Factor B

We do not have any evidence of risks to mountain plover from overutilization for commercial, recreational, scientific, or educational purposes, and we have no reason to believe that that this factor will become a threat to the species in the foreseeable future. We conclude that the best scientific and commercial information available indicates that the mountain plover is not now, nor in the foreseeable future, threatened by overutilization for commercial, recreational, scientific, or educational purposes.

Factor C. Disease or Predation

Disease

We are not aware of any diseases or parasites that pose a threat to the mountain plover at this time. West Nile virus, which has been documented to cause deaths in many bird species, has not been found in mountain plover (Andres and Stone 2009, p. 29). Since 2007, 4,888 dead birds have been identified throughout California as deaths attributed to the West Nile virus (California Department of Public Health (CDPH) 2010). Within this time span, West Nile virus has been reported from a number of Central Valley counties, but to date no mountain plover deaths have been attributed to the virus (CDPH 2010). Over the same time period, there have been no bird deaths associated with West Nile virus in Imperial County.

Dreitz *et al.* (2010) investigated causes of mortality in mountain plover chicks and reported preliminary analysis of blood samples from chicks in Colorado and Montana. Blood parasitism was low in Colorado, and none was detected in Montana.

The Intergovernmental Panel on Climate Change (IPCC) (2007, p. 51) suggests that the distribution of some disease vectors may change as a result of climate change. However, we have no information to suggest any specific disease may become problematic to the mountain plover as a result of climate change.

Predation

The list of predators on mountain plover, their nests, and young is extensive, and includes the American badger (*Taxidea taxus*), skunks (*Spilogale* spp. and *Mephitis* spp.), ground squirrels, swift fox (*Vulpes velox*), coyote (*Canis latrans*), bullsnake (*Pituophis catenifer*), Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), common raven (*Corvus corax*), great-horned owl (*Bubo virginianus*), burrowing owl (*Athene cunicularia*), and loggerhead shrike (*Lanius ludovicianus*) (Smith and Keinath 2004, p. 20; Andres and Stone 2009, p. 28).

Survival rates of adult mountain plover are thought to be quite high on both breeding and wintering grounds, and it is unlikely that predation of adult mountain plover constitutes a significant concern to mountain plover populations overall (Smith and Keinath 2006, p. 19). Emphasis has been largely placed on predation of nests and chicks (Kopf and Wunder 2006; Andres and Stone 2009, p. 28; Dreitz *et al.* 2010, entire). Survival of nests to hatching is similar to or greater than that found in other ground-nesting prairie shorebirds in the Great Plains, and nest success does not appear to be a limiting factor to population growth of the species (Dinsmore *et al.* 2010). Survival of chicks from hatching to fledging has been highlighted as a potentially important life stage that could be targeted for management to support the conservation and expansion of mountain plover populations, for example, from habitat improvements that may reduce predation rate (Dinsmore *et al.* 2010).

Knopf (2008, p. 50) cited the swift fox as the major predator on eggs and the primary predator on chicks on the PNG in Colorado, and suggested that reduced predator control and subsequent increase in predators was a contributing factor in the dramatic decline in mountain plover the area experienced. Thirteen-lined ground squirrels (*Spermophilus tridecemlineatus*) have been the greatest source of nest predation in South Park, Colorado (Wunder 2010b, pers. comm.). Chick monitoring in Colorado in 2010 confirmed 38 mortalities, including 13 from avian predation (most on less than 16-day old chicks by burrowing owls) and 8 by mammalian predators including swift fox and American badger (Dreitz *et al.* 2010, pp. 3–4). Predation by unknown species was suspected in some other deaths (Dreitz *et al.* 2010, pp. 3–4). Similar research in Montana in 2010 implicated black-billed magpies (*Pica hudsonia*) as a possible cause of disappearances of chicks whose fate was not confirmed.

Knopf and Wunder (2006) suggested mountain plover nest visits by researchers could lead to predation by ravens (*Corvus* spp.). Similarly, nest marking to avoid nest destruction during agricultural operations may alert predators to nest locations.

We do not believe that natural levels of predation present a threat to the mountain plover, although the risk could be increased through human development and habitat fragmentation. This may result where predators concentrate their foraging activities and movements along habitat edges. However, Mettenbrink *et al.* (2006, p. 195) looked at mountain plover nesting in a prairie landscape fragmented by crop fields and found little relationship between nest predation and distance to habitat edges. The authors concluded that predators of mountain plover in the shortgrass prairie apparently do not hunt selectively along anthropogenic (human-created) edges. Roads may serve as travel routes for predators (Pitman *et al.* 2005, p. 1267), and natural gas development has been shown to increase the occupancy of the common raven, a potential predator of mountain plover nests and chicks, in sage brush habitat (Bui *et al.* 2010, pp. 73–74). Increases in roads and structures associated with energy development could result in increased predation on mountain plover nests or chicks. However, Carr (in review) found no relationship between mountain plover nest success and road or well density.

While predation accounts for a major portion of chick mortality, we have no information that would lead us to conclude that predation on mountain plover chicks differs from levels experienced by other upland nesting shorebirds or that, across the range of the mountain plover, it is a current or future threat to the survival of the species.

Summary of Factor C

We do not find evidence that disease is currently impacting the mountain plover, nor do we have information to indicate that disease outbreaks will increase in the future. While the level of predation on mountain plover nests and chicks is high, it is not inconsistent with that found in other ground-nesting bird species. Fragmentation of habitats, including that associated with energy development, could increase predation, but evidence to date does not suggest any increase is occurring. We do not have information at this time to indicate that predation is impacting the mountain plover at a level that threatens the species. We conclude that the best scientific and commercial information available indicates that the mountain plover is not now, or in the foreseeable future, threatened by disease or predation to the extent that listing under the Act as an endangered or threatened species is warranted at this time.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

Under this factor, we examine whether existing regulatory mechanisms are inadequate to address the threats to the mountain plover discussed in *Factors A, B, C and E.* The Service considers regulatory mechanisms to mean all mechanisms that are related to a comprehensive regime designed to maintain a conserved wildlife population. In addition to the five factors that section 4(a)(1) of the Act directs the Service to consider, section 4(b)(1)(A) of the Act requires the Service to take into account, "those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect such species. * * *" We consider these efforts when developing our threat analyses under all five factors and in particular under *Factor D.* Therefore, under *Factor D* we consider not only laws and regulations, but other mechanisms that are part of a regulatory process such as management plans and agreements, conservation practices, and so forth.

In analyzing whether the existing regulatory mechanisms are inadequate, the Service reviews relevant Federal, State, and Tribal laws, plans, regulations, Memoranda of Understandings (MOUs), Cooperative Agreements, and other such mechanisms that influence conservation. We give strongest weight to statutes and their implementing regulations, and management direction that stems from those laws and regulations. An example would be the terms and conditions attached to a grazing permit that describe how a permittee will manage livestock on a BLM allotment. They are non-discretionary and enforceable, and are considered a regulatory mechanism under this analysis. Other examples include State governmental actions enforced under a State statute or constitution, or Federal action under statute. Some other agreements (MOUs and others) are more voluntary in nature; in those cases we analyze the specific facts for that mechanism to determine the extent to which it can be relied on in the future. We consider all pertinent information, including the efforts and conservation practices of State governments, whether or not these are enforceable by law. Regulatory mechanisms, if they exist, may preclude the need for listing if such mechanisms are judged to adequately address the threat to the species such that listing is not warranted.

Conversely, threats on the landscape are not ameliorated when not addressed by existing applicable regulatory mechanisms, or when the existing mechanisms are not adequate (or not adequately implemented or enforced). We cannot predict when or how State and Federal laws, regulations, and policies will change; however, most Federal land use plans are valid for at least 20 years. In this section, we review actions undertaken by State and Federal entities designed to reduce or remove threats to mountain plover and its habitat.

Federal Laws and Regulations

The mountain plover is covered under the provisions of the Migratory Bird Treaty Act (MBTA), which provides regulatory protection for mountain plover by prohibiting actions causing direct mortality and destruction of nests. In addition, the mountain plover is listed as a Bird of Conservation Concern by the Service in all 12 Bird Conservation Regions encompassing the species' breeding and wintering ranges. Birds of Conservation Concern represent the highest conservation priorities under the MBTA for the Service's Migratory Bird Program (Service 2008, p. iii). The goals of the Service's Migratory Bird Program include the protection, restoration, and management of migratory bird populations to ensure long-term ecological sustainability (Service 2011). The Service's goal is to prevent or remove the need for additional bird listings under the Act by implementing proactive management and conservation actions. The list is to be used to develop research, monitoring, and conservation actions to stimulate coordinated and collaborative proactive conservation actions among Federal, State, Tribal, and private partners (Service 2008, p. iii). However, the designation as a Bird of Conservation Concern does not in and of itself provide any extra protections for the mountain plover or its habitat.

The BLM and the USFS are the primary Federal agencies that manage lands that provide breeding or wintering habitat for the mountain plover. The BLM's lands and USFS-managed National Grasslands provide important breeding habitat in Montana, Wyoming, Colorado, and New Mexico. The BLM's lands in California and southern Arizona may provide habitat for wintering mountain plover.

The Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1701 *et seq.*) is the primary Federal law governing most land uses on BLM-administered lands. Section 102(a)(8) of FLPMA (43 U.S.C. 1701(a)(8)) specifically recognizes wildlife and fish resources as being among the uses for which these lands are to be managed. Regulations pursuant to FLPMA and the Mineral Leasing Act (30 U.S.C. 181 *et seq.*) that address wildlife habitat protection on BLM-administered land include 43 CFR 3162.3–1 (Drilling applications and plans) and 43 CFR 3162.5–1 (Environmental obligations); subpart 4120 (Grazing Management) of Title 43 of the Code of Federal Regulations (CFR); and subpart 4180 (Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration) of Title 43 of the CFR.

Mountain plover have been designated as a BLM Sensitive Species in Colorado (BLM 2000a), California (BLM 2006), and Wyoming (BLM 2010a). The management guidance afforded sensitive species under BLM Manual 6840—Special Status Species Management (BLM 2008, entire) states that "Bureau sensitive species will be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the [Act]" (BLM 2008, p. 05V). The BLM Manual 6840 further requires that Resource Management Plans (RMPs) should address sensitive species, and that implementation "should consider all site-specific methods and procedures needed to bring species and their habitats to the condition under which management under the Bureau sensitive species policies would no longer be necessary" (BLM 2008, p. 2A1). See our discussion above under *Factor A,* Energy and Mineral Development, for more on measures the BLM has taken in Wyoming to conserve the mountain plover as a sensitive species.

The BLM in Montana has designated a Mountain Plover Area of Critical Environmental Concern (ACEC), which contains 24,730 ac (9,892 ha) of habitat suitable for breeding mountain plover (BLM 2000b, p.1). Management prescriptions apply within the ACEC to protect breeding mountain plover during its nesting period. All construction activity and surface disturbance are prohibited from April 1 to July 31, road construction is minimized within the ACEC, and seasonal restrictions also apply to off-highway travel (BLM 2000b, pp. 8–9). While the ACEC is a focus of BLM's efforts to conserve the mountain plover, the area covers only a small fraction of all mountain plover habitat in Montana.

As a designated sensitive species under BLM Manual 6840, mountain plover conservation must be addressed in the development and implementation of RMPs on BLM lands. RMPs are the basis for all actions and authorizations involving BLM-administered lands and resources. They establish allowable resource uses, resource condition goals and objectives to be attained, program constraints and general management practices needed to attain the goals and objectives, general implementation sequences, and intervals and standards for monitoring and evaluating the plan to determine effectiveness and the need for amendment or revision (43 CFR 1601.0–5(n)). The RMPs provide a framework and programmatic guidance for activity plans, which are site-specific plans written to implement decisions made in an RMP. Examples include Allotment Management Plans that address livestock grazing, oil and gas field development, travel management (motorized and mechanized road and trail use), and wildlife habitat management. Activity plan decisions normally require additional planning and National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*) analysis. If an RMP contains specific direction regarding mountain plover habitat, conservation, or management, it represents an enforceable regulatory mechanism to ensure that the species and its habitats are considered during permitting and other decision-making on BLM lands.

The BLM has regulatory authority for oil and gas leasing on Federal lands and on private lands with a severed Federal mineral estate, as provided at subpart 3100 (Onshore Oil and Gas Leasing; General) of Title 43 of the CFR, and they are authorized to require stipulations as a condition of issuing a lease. They can condition "Application for Permit to Drill" authorizations, conducted under a lease that does not contain specific mountain plover conservation stipulations, but utilization of conditions is discretionary, and we are uncertain as to how this authority is applied.

Management of National Forest System lands is guided principally by the National Forest Management Act (NFMA) (16 U.S.C. 1600–1614, August 17, 1974, as amended). The NFMA specifies that all National Forests must have a Land and Resource Management Plan (LRMP) (16 U.S.C. 1604) to guide and set standards for all natural resource management activities on each National Forest or National Grassland. The NFMA requires USFS to incorporate standards and guidelines into LRMPs (16 U.S.C. 1604(c)). The USFS conducts NEPA analyses on its LRMPs, which include provisions to manage plant and animal communities for diversity, based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives. The USFS planning process is similar to that of the BLM. The mountain plover is a USFS sensitive species in Region 2, which includes all of Colorado and portions of Wyoming and Nebraska.

The USFS policy provides direction to analyze potential impacts of proposed management activities to sensitive species in a biological evaluation. The LRMPs for grassland units within USFS Region 2 (PNG, Nebraska National Forest, and Thunder Basin National Grassland in Wyoming) contain management direction for the mountain plover (USFS 2001). Some examples of the LRMP standards (required measures) for the three areas include: (1) Prohibiting development of new facilities within 0.25 mi (0.40 km) of known mountain plover nests or nesting areas; (2) limiting vehicle speeds in occupied mountain plover habitat to 25 miles per hour (mph) (40 kilometers per hour (kph)) on resource roads and 35 mph (56 kph) on local roads; (3) designing vegetation management projects in suitable mountain plover habitat to maintain or improve mountain plover habitat; and (4) maintaining occupied nesting and brooding habitat on black-tailed prairie dog colonies by limiting new oil and gas development to one well per 80 ac (32 ha) within occupied habitat. Cumulatively, structure and facility development will not occur on more than 2 percent of the occupied mountain plover nesting habitat in each prairie dog colony on the Thunder Basin National Grasslands (USFS 2001). As described above in the discussion under *Factor A,* the PNG has been conducting prescribed burning for many years to improve breeding habitat for mountain plover (Knopf 2008, pp. 25–26). Numerous research projects on mountain plover have also been conducted on the PNG and the adjacent USDA Research Area (Augustine 2010a, pers. comm.; Augustine 2010b, pers. comm.).

In Colorado and Wyoming, a multi-agency team, consisting of biologists from the Service, BLM, USFS, and National Park Service, developed a non-regulatory screening tool to allow for proactive and consistent management and conservation of the mountain plover on public lands and to provide a tool for streamlining agency review and implementation of activities (BLM 2004). The screening tool allows agency personnel to evaluate the impacts of projects (such as energy development, rangeland management, and recreation) that would occur within or adjacent to mountain plover habitat to determine whether the project would result in an impact to the species at the local or rangewide scale. Use of the screening tool would not stop any projects from occurring, but rather would alert agency personnel to possible project impacts so that the project could be modified if possible. While the screening tool provides a good non-regulatory mechanism for Federal biologists in Colorado and Wyoming to evaluate the effects of their proposed actions, it does not require that projects ultimately have no effect on mountain plover. However, this screening tool provides for advanced notice of actions and facilitates coordination between the multi-state agency team.

The Federal laws, regulations, and actions cited above are designed to reduce or remove threats to the mountain plover and its habitat. There is no information available to indicate that the species is threatened by the inadequacy of existing Federal laws and regulations.

State and International Laws and Regulations

The Nebraska Game and Parks Commission lists the mountain plover as "threatened." But, this regulatory mechanism likely protects relatively few individuals (see Conservation Status and Local Populations above). While some States, such as Colorado, have specific management plans that address mountain plover conservation, and all States within the range of the species include it within their State Wildlife Conservation Strategies (see Conservation Status and Local Populations above), there is no rangewide or intrastate coordinated management effort and no requirement to implement specific management actions. However, there is no information available to indicate that the species is threatened by the inadequacy of existing State regulatory mechanisms.

Canada

The mountain plover has been listed as endangered in Canada since 1987. Knapton *et al.* (2006, p. i) noted that listing was in part due to a perceived decline from 1980 to 1986. The Species At Risk Act (SARA), passed December 12, 2002, is a commitment by the Canadian government to prevent the extinction of wildlife and provide the necessary actions for the recovery of species deemed endangered. These at-risk wildlife species are provided with legal protection under SARA, and their biological diversity is thereby conserved (Environment Canada 2010). As noted in the Background section above, the mountain plover population in Canada is very small, and efforts there to improve habitat will not likely have a significant impact on this species' conservation rangewide. There is no information available to indicate that the species is threatened by the inadequacy of existing regulatory mechanisms in Canada.

Mexico

In 2001, Mexico established a list of species classified as endangered, threatened, under special protection, or probably extinct in the wild (Commission for Environmental Cooperation (CEC) 2011). The mountain plover was listed as threatened (Andres and Stone 2009, p. 14). Under the General Wildlife Law, the use of at-risk species may be authorized only for the collection and capture for restoration, repopulation, and reintroduction activities (CEC 2011). However, regulatory powers and wildlife management prerogatives reside largely with the Federal government with States taking a more minor role. Shifting Federal agency responsibility and lack of agency funding results in inadequate protection and management of wildlife resources (Valdez *et al.* 2006, p. 277). Although regulatory mechanisms in Mexico appear to be minimal or are not adequately enforced, Mexico constitutes a small portion of the overall species' breeding range. Mountain plover appear to winter in significant numbers in Mexico, but at that time of year, they are highly mobile and less vulnerable to human activity than when nesting, and they therefore may require few regulatory protections. There is no information available to indicate that the species is threatened by the inadequacy of existing regulatory mechanisms in Mexico.

Summary

While mountain plover conservation has been addressed in some State, Federal, and international plans, laws, regulations, and policies, none of these have applicability throughout the range of the mountain plover sufficient to provide effective population-level conservation. However, we have found in the analysis of the other four factors (A, B, C, and E) that there are no activities that currently rise to the level of a significant threat to the mountain plover. Therefore, we conclude that the best scientific and commercial information available indicates that the mountain plover is not now, and is not expected to become within the foreseeable future, threatened by the inadequacy of existing regulatory mechanisms to the extent that listing under the Act as an endangered or threatened species is warranted at this time.

Factor E. Other Natural or Manmade Factors Affecting the Species' Continued Existence

Genetic Diversity

The loss of local populations may impact a species because local populations may possess unique genetic characteristics that are important to the species' genetic diversity and its ability to adapt to future environmental changes. However, for mountain plover, genetic studies using nuclear microsatellites have concluded that mountain plover across sampled breeding locations in Colorado and Montana comprise a single, relatively homogenous gene pool (Oyler-McCance 2005, p. 359; Oyler-McCance *et al.* 2008, pp. 496–497). These results suggest that there is sufficient gene flow among breeding areas to offset reported adult fidelity to breeding areas and genetic effects of small populations (genetic drift, loss of genetic diversity) (Oyler-McCance *et al.* 2005, p. 360; Oyler-McCance *et al.* 2008, pp. 496–497). While this seems unusual for a species with relatively high reported site fidelity, it suggests pair formation in mixed winter flocks from different breeding areas. Widespread mixing of mountain plover populations in winter has been documented (Wunder 2007, p. 118). From a genetic perspective, this information suggests that no single breeding population requires special conservation or protection (Oyler-McCance *et al.* 2005, p. 360). However, not all populations have received genetic analysis, including potentially non-migratory breeding populations in Mexico. We conclude that there is no known restriction of gene flow within the species, and that the loss of any given local population will not substantially impact the genetic diversity of the mountain plover or the species' ability to adapt to future stressors.

Longevity, Site Fidelity, and Sex Ratio

In our December 5, 2002, proposed listing rule (67 FR 72396), we stated, "* * * that because the average lifespan of a mountain plover is less than 2 years, and breeding does not occur until 1 year of age, an individual mountain plover will likely have only one breeding season to contribute to population recruitment." Previous study results underestimated adult survival and, more importantly, our proposed rule erroneously concluded that average lifespan reflected typical adult survival. In the best available estimate of adult mountain plover survival, the annual survival rate of adult mountain plover of both sexes in Phillips County, Montana, ranged from 0.74 to 0.96 yearly (Dinsmore 2008, p. 50). Based on this study, a mountain plover returning to its breeding ground would likely return multiple additional years. Dinsmore *et al.* (2010) characterized the mountain plover as typical of relatively long-lived bird species, documented to live over 10 years, where repeated reproductive attempts throughout life are less important to population growth than adult survival. On the basis of our review of the best available information, we now believe that a short average lifespan and resulting limited reproductive opportunities, as suggested in our 2002 proposal, do not constitute a threat to the mountain plover.

In our February 16, 1999 (64 FR 7587), and December 5, 2002 (67 FR 72396), proposals to list the mountain plover as a threatened species, we considered the plover to have high fidelity to breeding sites. In patchy habitat, when nesting habitat is destroyed or unavailable, it may be difficult for the mountain plover to find a new place to breed, thus resulting in the decline of populations. Dispersal ability may be important to the use of available habitat and conservation of the mountain plover given the patchiness of desirable breeding habitat. Altered or fragmented landscapes may force mountain plover to disperse greater distances. For example, in Montana, where the mountain plover is highly dependent on black-tailed prairie dog colonies for breeding habitat, sylvatic plague outbreaks often make previously used breeding habitat undesirable. As discussed above, Skrade and Dinsmore (2010, pp. 671–672) demonstrated the mountain plover's ability to disperse at least locally to exploit favorable breeding habitats nearby, and in at least one instance, an adult mountain plover returned to breed at a site about 25 mi (40 km) from a site where it was banded during the previous season. We conclude that while the mountain plover generally exhibits fidelity to breeding sites, it is capable, at least locally, of seeking out and exploiting new habitat through both juvenile dispersal and through adult birds returning to different breeding sites in subsequent years. On a local scale (several mi/km), loss or fragmentation of breeding habitat is unlikely to have an inordinate effect on mountain plover survival and reproduction (*i.e.,* effects are likely to be proportional to, but not in excess of the amount of habitat loss).

Previously, concern arose as to whether a preponderance of male mountain plover among those birds handled by researchers in California suggested a skewed sex ratio (more males than females) range wide and whether this might adversely affect reproductive potential. Knopf (2003, pers. comm.) speculated that a slightly unbalanced sex ratio in California might result from slightly higher overall mortality in females or from differential wintering, with females wintering further south, in Mexico. Rangewide sex ratios for mountain plover are still unknown (Knopf and Wunder 2006) and we have no evidence that relative number of males and females in mountain plover populations represents a threat to the species.

Exposure to Pesticides

Potential exposure of mountain plover to pesticides and agrochemicals on wintering areas in California, and resulting impacts to mountain plover health and reproduction, have been cited as a potential threat (Knopf and Wunder 2006). Exposure of mountain plover to direct pesticide application is likely minimized because most pesticide application occurs on growing crops, and less frequently on harvested and fallow fields, or grazed pastures that mountain plover frequent.

The organochlorine agricultural pesticide DDT, and its byproduct DDE, can cause thinning of eggshells and decreased reproductive success in birds (Longcore *et al.* 1971, pp. 486, 489). DDT has not been in use in California since the 1970s, and in many cases, DDE levels that remain in the environment will decrease slowly over several decades (Thomas *et al.* 2008, pp. 55, 65). Organochloride levels in mountain plover collected from three California counties (Imperial, San Luis Obispo, and Tulare) in 1991–1992 ranged from 1.0 to 10.0 parts per million (ppm) (dry weight); although these levels are considered high for an upland bird, no subsequent issues with bird behavior or eggshell thickness in mountain plover were noted (Knopf and Wunder 2006). Levels of DDE of 43 ppm (wet weight) were found in eggs collected from abandoned mountain plover nests in Park County, Colorado, in 2001 (Knopf and Wunder 2006). No effects on eggs, chicks, or adult mountain plover were established.

Historically, soils in the Imperial Valley are known to be high in DDE (California Department of Food and Agriculture (CDFA) 1985, p. 27). Studies have shown unchanging levels of the chemical in the past decades; this suggests a persistent, local source of the chemical (Gervais and Catlin 2004, pp. 509–510). The Imperial Valley is the suspected source for high DDE concentrations and decreased reproductive success in white-faced ibises (*Plegadis chihi*) (Yates *et al.* 2010, p. 159). Levels of DDE in resident burrowing owls are suspected to act as a stressor, but reproductive effects have not been documented (Gervais and Anthony 2003, p. 1259).

Service biologists recently collected and analyzed mountain plover eggs, soils, and soil invertebrates from breeding areas in Colorado, Wyoming, and Montana, and soils and soil invertebrates from wintering areas in the Imperial Valley (Zeeman 2011, pers. comm.). Chemical analyses of eggs showed measurable, and in some cases high, levels of persistent organic pollutants, most notably DDE. Much lower concentrations of polychlorinated biphenyls (PPBs), hexachlorobenzene, tetrachlorobenzenes, alpha chlordane, oxychlordane (chlordane metabolite), heptachlor epoxide, and dieldrin were found. Contaminants detected in mountain plover eggs were also detected in soil and invertebrate samples from fields in Imperial Valley, but no measurable levels were found in soil and invertebrates at the breeding grounds.

The upper concentrations of DDE detected, 50 ppm (wet weight) in two eggs, was within the range of values (which can range from as low as 3 ppm in sensitive species to 30 ppm in less sensitive species) associated with eggshell thinning and reproductive impairments in wild birds (Blus 1996). Conspicuous signs of impacts associated with DDE exposure, such as eggshell cracking and embryo malformation, were not detected in mountain plover (Zeeman 2011, pers. comm.). Based on concentrations found in eggs, DDE from wintering areas, including the Imperial Valley, could potentially affect mountain plover (Zeeman 2011, pers. comm.). The potential for the other contaminants detected in eggs, both individually or in combination, to affect the mountain plover is being evaluated by the Service (Zeeman 2011, pers. comm.). The results cited above suggest that exposure varies by individual and that few mountain plover have DDE levels that raise a concern. In addition, no effects of DDE to adult mountain plover, their eggs, or chicks have been established. At this time, we believe that if an effect occurs, it would probably be localized, and would affect individual birds or eggs and not have an effect at a population or species level.

Certain organophosphate insecticides are still used to control insect pests on crops in California's Central Valley within the range of the mountain plover. Iko *et al.* (2003, p. 119) measured cholinesterase levels in mountain plover, a measure of exposure to organophosphorus and carbamate insecticides, and found that they varied widely between mountain plover collected in California from the Central Valley where pesticide use is widespread and from the Carrizo Plain where there is minimal pesticide use, but no differences were observed in mountain plover body condition.

The Central Valley is one of the State's primary growing regions for alfalfa. Sixty percent of the State's hay crop is grown here, with over 600,000 ac (240,000 ha) planted to alfalfa within the Central Valley (Godfrey 2002, p. 4). Insecticides used on alfalfa pests include chlorpyrifos, malathion, and pyrethroids. Insecticide applications in alfalfa usually occur once insects reach damaging levels, typically in March or later in the growing season (Godfrey 2002, pp. 4–10), suggesting that exposure of wintering mountain plover to treatments would be limited, if any. Because early spring insecticide treatments in alfalfa have been found to largely eliminate nontarget insect species complexes (Godfrey 2002, pp. 4–6), an unknown but potential residual effect to mountain plover prey availability may exist in specific areas the following winter. If present, such an effect could locally reduce desirability of certain alfalfa fields to wintering mountain plover, but would not have a rangewide impact to the species.

Malathion, a broad-spectrum organophosphate insecticide, has been used to control the beet leaf-hopper (*Circulifer tenellus*) in rangeland habitat, fallow fields, oil fields, and cultivated areas on both public and private lands in the San Joaquin Valley (BLM 2002, pp. 1–2; CDFA 2007, p. 8; CDFA 2008, pp. 1–4). The beet leaf-hopper is a vector for curly top virus, which negatively affects crops. In the western and southern portions of the San Joaquin Valley, aerial spraying may occur fall through spring, and may include treatment of approximately 200,000 ac (80,000 ha) in years with high beet leaf-hopper populations. Treatment usually results in a target population decline of over 90 percent (CDFA 2008, pp. 1–4). Potential impacts to the mountain plover from the control treatments could result from both direct exposure and indirectly from the reduction of insect prey (CDFA 2007, p. 79).

Although beet leaf-hopper control is potentially immense in scale, in the 10 years up to 2002, an average of only about 4,400 ac (1,800 ha) per year were treated in the bird's wintering range within the San Joaquin Valley, primarily in sloped terrain that is not thought to be desired by the mountain plover (CDFA 2007, p. 79). The limited area and quality of mountain plover habitat treated, coupled with the species' large wintering range in California, led the CDFA to determine that the curly top treatment program would not be likely to significantly impact the mountain plover (CDFA 2007, p. 80). On public lands managed by the BLM, prescribed usage avoids malathion spraying on wintering mountain plover areas when the plover is present (BLM 2002, p. 1).

Chemical exposure in Mexico where regulations and enforcement may be less stringent could be of concern (Andres and Stone 2009, p. 30). DDE levels in mountain plover eggs reported by Zeeman (2011, pers. comm.) may have resulted from exposure in Mexico, where DDT is still used. While we believe that crop fields in Mexico have potential to support large numbers of wintering mountain plover, significant mountain plover use of crop fields in Mexico has not been reported (Macias-Duarte and Punjabi 2010, pp. 3, 7), nor have specific issues regarding pesticide use and impact to mountain plover been identified. While changing agricultural practices regarding pesticide application or evolution of new chemicals for use in the United States or Mexico could prove a future threat, we have no basis for predicting the potential of such an occurrence.

We have no evidence that pesticides are significantly impacting mountain plover populations either locally or rangewide. However, given the information summarized above, additional evaluation of any possible effects to mountain plover from former and ongoing pesticide use within the mountain plover's range appears prudent.

Selenium Toxicity

Within the western San Joaquin Valley, selenium is present in the soil and has the potential to occur in ponded irrigation water in fields and drainages. Irrigation with drainwater used to flood wetlands has resulted in biological accumulation of selenium sufficient to harm reproduction of shorebirds and other wildlife (Ohlendorf *et al.* 1987, pp. 169–171, 174–181). Potential effects of selenium poisoning on birds can include gross embryo deformities, winter stress syndrome, depressed resistance to disease due to depressed immune system function, reduced reproductive success, reduced juvenile growth and survival rates, mass wasting, loss of feathers (alopecia), embryo death, altered enzyme function, and mortality (Ohlendorf 1996, pp. 131–139; O'Toole and Raisbeck 1998, pp. 361–380). Species exposed to multiple stressors can become more vulnerable to exposure to selenium.

Because the mountain plover is an upland bird feeding primarily on terrestrial insects, its habits may limit its exposure to selenium. Still, selenium bioaccumulation in the food chain could create a contaminant hazard for mountain plover feeding on insects in alkaline flats, grazed pastures, and plowed fields in this area. Specific exposure of the mountain plover to selenium, or any adverse effects of such exposure have not been documented.

In summary, it has been documented that mountain plover have been exposed to various levels of potentially harmful pesticides and chemical toxins in various portions of its range. However, we have no information to indicate that the mountain plover is responding negatively to this exposure or that it is likely to respond negatively in the future. Exposure levels that elicit negative responses in other bird species do not appear to elicit a similar negative response in mountain plover. Therefore, we do not believe that mountain plover are threatened by exposure to pesticides and chemical toxins.

Grasshopper and Cricket Control

Efforts to control grasshoppers and Mormon crickets, especially Federal control programs on BLM lands, have been cited as potentially detrimental to breeding mountain plover. Grasshoppers occur throughout the breeding range of the mountain plover and can reach population levels considered to be a threat to agriculture. The USDA's Animal and Plant Health Inspection Service (APHIS) conducts rangeland grasshopper and Mormon cricket control, including areas occupied by breeding mountain plover. Logically, a significant reduction in these mountain plover foods could affect mountain plover fecundity and survival. However, efforts to control grasshoppers and Mormon crickets on Federal lands are generally limited to suppressing populations in years and areas where infestations occur, and do not have the goal of eradication, but rather the goal of reducing densities to levels that limit economic impacts (BLM 2010b). Numbers of these insects present after treatment may remain greater than those present in a normal year. The BLM currently is pursuing a strategy of "reduced area and agent treatments," with the majority of treatments through aerial spraying of a pesticide (diflubenzuron, a chiton inhibitor) with limited impacts to non-target species (BLM 2010b). Broad spectrum insecticides (carbaryl and in limited cases malathion) are used more sparingly, and as a secondary treatment.

Control on private lands can be undertaken by State or local government agencies, or private landowners without participation or oversight by APHIS. Treatment on private lands likely varies depending on resources available and the economic implications of infestations. Where treatment occurs, it likely has the similar goal of reducing insect densities to acceptable levels. Grasshopper and cricket control can have an impact on mountain plover prey and could, in some years and at some locations, adversely affect mountain plover breeding. However, since the scope and impact of these control efforts appear minimal relative to the mountain plover breeding range, we conclude that grasshopper and Morman cricket control does not represent a significant threat to rangewide mountain plover populations.

Weather

Annual weather variation influences mountain plover habitat and breeding success. Inclement weather may hinder egg laying (Knopf and Wunder 2006). Cold, rain, and hail can result in loss of nests and decreased chick survival. Dreitz *et al.* (2010, pp. 3–4) identified weather as a significant cause of chick mortality. Mammalian predators of mountain plover eggs and chicks are scent-driven, and wet conditions enhance predation (Knopf and Wunder 2006; Wunder 2007, p. 121).

Wunder (2007, pp. 119–121) presented evidence that recruitment may be linked to regional patterns of weather, with highest recruitment coming from breeding areas with low precipitation and a subsequent 1- to 2-year lag observed in increased populations of adults (Wunder 2007, pp. 119–121). Productivity may be influenced by drought cycles, with dry years reducing predation from mammals and suppressing vegetative growth, thus providing increased accessibility to insects. Annual survival of mountain plover in Montana proved higher during periods of drought, although prolonged drought eventually decreases abundance of insect foods (Dinsmore 2008, p. 52). Weather variation affects mountain plover productivity across its breeding range, but we have no evidence that normal weather fluctuations represent a threat to the mountain plover.

Climate Change

There is no information available on the direct relationship between the environmental changes associated with climate change and mountain plover population trends. However, climate change could potentially impact the species. According to the IPCC (2007, p. 6), "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level." Average Northern Hemisphere temperatures during the second half of the 20th century were very likely higher than during any other 50-year period in the last 500 years and likely the highest in at least the past 1,300 years (IPCC 2007, p. 30). It is very likely that over the past 50 years cold days, cold nights, and frosts have become less frequent over most land areas, and hot days and hot nights have become more frequent (IPCC 2007, p. 6). It is likely that heat waves have become more frequent over most land areas, and the frequency of heavy precipitation events has increased over most areas (IPCC 2007, p. 30).

Changes in the global climate system during the 21st century are likely to be larger than those observed during the 20th century (IPCC 2007, p. 19). For the next 2 decades, a warming of about 0.2 degrees Celsius (°C) (0.4 degrees Fahrenheit (°F)) per decade is projected (IPCC 2007, p. 19). Afterward, temperature projections increasingly depend on specific emission scenarios (IPCC 2007, p. 19). Various emissions scenarios suggest that by the end of the 21st century, average global temperatures are expected to increase 0.6 to 4.0 °C (1.1 to 7.2 °F), with the greatest warming expected over land and at most high northern latitudes (IPCC 2007, p. 46).

The IPCC (2007, p. 48) predicts that the resiliency of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change associated disturbances (*e.g.,* flooding, drought, wildfire, and insects), and other global drivers. Current climate change predictions for terrestrial areas in the Northern Hemisphere indicate intense precipitation events, warmer air temperatures, and increased summer continental winds (Field *et al.* 1999, pp. 5–10; Cayan *et al.* 2005, pp. 6–28). With medium confidence, IPCC predicts that approximately 20 to 30 percent of plant and animal species assessed so far are likely to be at an increased risk of extinction if increases in global average temperature exceed 1.5 to 2.5 °C (3 to 5 °F).

The mountain plover is primarily a species of grasslands and semi-desert. Grasslands in the Great Plains of the United States and southern Canada are predicted to get warmer and drier with climate change (North American Bird

Conservation Initiative 2010, p.18). Southwestern grasslands are expected to become drier because of declining precipitation and higher temperatures, especially the Chihuahuan Desert grasslands of the southwestern United States and northern Mexico, which are critical wintering areas for many grassland birds, including the mountain plover (North American Bird Conservation Initiative 2010, p.18). In northern grasslands, additional precipitation is expected, but they will still become drier because warmer temperatures will cause increased evaporation (North American Bird Conservation Initiative 2010, p. 18). Variability in precipitation is also expected to increase; droughts, flooding, and extreme storms (such as hailstorms) are all expected to become more common (North American Bird Conservation Initiative 2010, p.18). Increased atmospheric carbon dioxide will probably contribute to invasions of woody shrubs into grasslands (North American Bird Conservation Initiative 2010, p. 18), which could make certain habitats unusable for the mountain plover.

Climate Wizard (TNC 2007) predicts an average temperature increase of approximately 4 to 6 °F by the 2050s for the majority of mountain plover breeding and wintering habitat within the United States. Precipitation is projected to decline slightly in the southwest portion of the range, and to increase by 10 to 15 percent in the more northern portions of the range in the same time period. However, as stated above, warmer temperatures and evaporation may offset any gains in precipitation. By the 2080s, temperatures are predicted to increase by as much as 7.5 °F within the species' breeding range, and precipitation to decline from 2050s levels throughout the range (TNC 2007). Weather data in the Imperial Valley recorded by the Desert Research Institute of the Western Regional Climate Center (WRCC) between 1927 and 2010 show an increasing trend in average temperature during the months of September through March, when mountain plover are present in the area (WRCC 2010a, Figure 1). Projected temperature change for the Imperial Valley was obtained through the Climate Wizard, in which an average of all models was used to display change in temperature. These data indicate a 3.9 °F increase in temperature for the 2050s and a 5.7 °F increase for the 2080s (TNC 2007). The WRCC also documented in Imperial, California, a slight increasing trend in average precipitation (inches) from 1925–2010 (WRCC 2010b). Projected change in precipitation values for the Imperial Valley was also obtained through the Climate Wizard in which an average of all models was used to display percent change in precipitation. These data indicate a 1.1 percent increase in precipitation for the 2050s and an increase of 0.3 percent by the 2080s (TNC 2007).

Change in plant phenology (timing of life cycle events such as vegetative growth and reproduction) may be one of the earliest observed responses to rapid global climate change and could potentially have serious consequences both for plants and animals that depend on periodically available resources (Moza and Batnegar 2005, p. 243). A change in the timing of availability of insects that mountain plover and their chicks rely on as a food source could occur as a result in changes in plant phenology.

Because they are often highly competitive, invasive plant species are altering the plant composition of ecosystems and changing their structure and function over large landscape areas. Addition of fine fuels from these species often increases fire frequency, which can lead to increased dominance by invasive species and further habitat degradation. Climate change is exacerbating these changes by altering the amount and seasonal distribution of precipitation and seasonal temperature patterns in ways that often favor the invasive species (Tausch 2008). This could potentially result in changes in the amount of ground cover in mountain plover habitat, which could discourage mountain plover nesting. Nonnative wildlife species that could compete with the mountain plover for resources or prey on the species could potentially move into their habitats.

Although the mountain plover was not included in "The State of the Birds—2010 Report on Climate Change" (North American Bird Conservation Initiative), it was assessed using the sensitivity traits analysis used in that report (Sauer 2010b, pers. comm.). The threat of climate change impacts to the plover was considered low, as it was only considered sensitive to one of the five main traits (it was considered a breeding obligate to a single habitat type) (Sauer 2010b, pers. comm.). Species that occupy only a single habitat for breeding are vulnerable should climate change reduce or eliminate that habitat. While the mountain plover has been often described as a grassland obligate (*i.e.,* is dependent on grasslands for breeding), it also breeds in agricultural fields, and in semi-desert habitat. As such, we believe it is less likely to be threatened by climate change impacting grassland, or any one of its favored breeding habitats, than is suggested by its classification as a breeding obligate to a single habitat type. The mountain plover was not considered sensitive to potential climate change impacts based on the other four traits (its migratory habits, dispersal ability, niche specificity, and reproductive potential) (Sauer 2010b, pers. comm.). In general, the mountain plover seems to possess characteristics that would allow it to adapt to changing environmental and climate conditions. See the North American Bird Conservation Initiative (2010, p. 28) for definitions of these traits.

Specific information on mountain plover suggests that the species might be adapted to drought, and that climate change predictions of the Great Plains becoming warmer and drier might benefit the species (Dinsmore 2008, p. 52). Andres and Stone (2009, p. 31) predicted increased summer temperatures and decreased precipitation could benefit mountain plover breeding. Recruitment of juvenile mountain plover into the population appears linked to regional patterns of precipitation, with highest recruitment coming from areas with lowest precipitation every year, and a subsequent increase in populations of adults observed from the same areas after a 1- to 2-year lag (Wunder 2007, pp. 119–121). Annual survival of mountain plover in Montana proved higher during periods of drought, despite potential reduction in insect foods (Dinsmore 2008, p. 52). Peterson (2003, pp. 291–292) concluded that there have been subtle shifts northward in ranges of grassland birds, including mountain plover, potentially due to climate change.

Climate change predictions are based on models with assumptions, and there are uncertainties regarding the magnitude of associated climate change parameters, such as the amount and timing of precipitation and seasonal temperature changes. There is also uncertainty as to the magnitude of effects of predicted climate parameters. The mountain plover, along with its habitat, will likely be affected in some manner by climate change. A shift in the species' geographic range may occur due to an increase in temperature and drought, although climate change would likely not pose as great a risk to mountain plover habitat as it may to species in polar, coastal, or montane ecosystems. Nonnative and invasive species, both plants and animals, could move into plover habitat as a result of changes in temperature or precipitation patterns and degrade nesting habitat or compete with the mountain plover for resources. A change in the timing of availability of insects that mountain plover and their chicks rely on as a food source could occur as a result of changes in plant phenology. There is no information available to suggest that any of these factors are impacting mountain plover now or that they will likely impact the species in the foreseeable future.

Based on all the potential climate change factors, a shift in range of the species could be possible, but there is no information available to suggest that a net loss in occupied breeding habitat or a significant impact to the status of the species will result. Although currently difficult to quantify, changes in climate, including higher temperatures, increasing stochastic precipitation events, high winds, and increasing soil dryness, will likely lead to a loss of agricultural production in the Imperial Valley; however, wintering habitat seems adequate to support the species. The species is adaptable to a wide array of climes, as evidenced by a geographic range that includes 12 States, Canada, and Mexico. Based on the best available information on climate change projections modeled over the next 40 to 70 years, we do not consider climate change to be a significant threat to the mountain plover at this time.

Human Disturbance

Knopf and Wunder (2006) stated that mountain plover on nests are extremely tolerant of human disturbance from vehicles, tractors, and aircraft, but quickly moved away when approached by a human on foot. While adult mountain plover would not likely be affected by humans on foot, eggs left unprotected for a period of time could become overheated if exposed to direct sun on hot days.

It seems likely that heavy construction activities nearby could impact nesting mountain plover. Such activities are limited in scope across mountain plover breeding habitat at any one time. In addition, timing stipulations that restrict construction related to oil and gas development, wind-power development, and some other activities in the vicinity of mountain plover during the nesting season exist for some Federal lands (Knopf and Wunder 2006).

Mountain plover are only one of a number of breeding bird species found in the habitats and locations where they nest. While prohibitions under the MBTA govern direct mortality and the destruction of mountain plover nests, general awareness of MBTA protections and of efforts to protect nesting birds, their nests, and their eggs may help limit human disturbance to nesting mountain plover.

Andres and Stone (2009, p. 27) suggested population-level effects from human disturbance were unlikely. We conclude that while human-caused disturbance may impact mountain plover, such impacts are generally of limited scope, and human disturbance is not likely a significant threat to the species.

Cumulative Impacts

Some of the threats discussed in this finding could work in concert with one another to cumulatively create situations that potentially impact the mountain plover beyond the scope of each individual threat. For example, as discussed under *Factor C,* habitat fragmentation, including energy development that both alters habitat and provides structure on which predators could perch, could lead to increase in predation on the mountain plover. We have no data to determine if, or to what extent, such a scenario is likely to occur. We conclude, at this time, that it does not present a threat to the future existence of the mountain plover.

Similarly, under *Factor A,* we alluded to the potential that in the Imperial Valley and other areas of California, human development, solar development, changing agricultural practices, water availability, and climate change could interact to heighten potential loss of mountain plover wintering habitat. In the future, warming climate may necessitate use of more irrigation water for crops at the same time that water availability decreases due to expansion of human population and related water demand. In our best judgment, agriculture in the Imperial Valley, and in other areas of California that support the mountain plover, are likely to be affected by some variation of the above scenario. However, specific changes in agriculture are uncertain. Seasonal change in timing of crops, potential change toward those crops needing less water, and changes in irrigation practices may or may not detract from available wintering habitat for mountain plover. While cumulatively, these factors will likely reduce the total area of wintering habitat available, we believe that sufficient area of appropriate agricultural habitat will persist to support wintering mountain plover.

We have not identified other likely scenarios where the potential threats discussed in the five factors above have potential to work in concert to synergistically produce threats to the mountain plover above those which we have analyzed. We conclude that, at this time, there are no identifiable cumulative impacts likely to threaten the existence of the mountain plover in the foreseeable future.

Summary of Factor E

We conclude that the best scientific and commercial information available indicates that the mountain plover is not now, or likely in the future, threatened by genetic stochasticity, its typical lifespan, its site fidelity, exposure to pesticides, selenium toxicity, grasshopper and cricket control, weather, climate change, or human disturbance, or cumulative impacts of potential threats such that the species is in danger of extinction or likely to become so within the foreseeable future.

Finding

As required by the Act, we considered the five factors in assessing whether the mountain plover is endangered or threatened throughout all, or a significant portion of its range. We have carefully examined the best scientific and commercial information available regarding the status and past and present and future threats faced by the mountain plover. We reviewed information in our files, other available published and unpublished information, and information provided by interested parties following our February 16, 1999, and December 5, 2002, proposals to list the mountain plover (64 FR 7587 and 67 FR 72396, respectively), and following our June 29, 2010, document (75 FR 37353) vacating our September 9, 2003, withdrawal (68 FR 53083) and reinstating our 2002 proposal. We also consulted with Federal and State land managers.

There have been historical impacts to the mountain plover, in particular the loss of much of the native prairie ecosystem, including bison, prairie dog colonies, other native grazers, and wildfires that produced extensive mountain plover habitat on the Great Plains. However, past concerns regarding continuing and future loss of breeding habitat provided by black-tailed prairie dog colonies appears unfounded. Conversion to agriculture remains insignificant across the mountain plover's breeding range. Human development and resultant impact to mountain plover breeding habitat in South Park, Colorado, has not occurred as previously anticipated, and is not expected to do so in the foreseeable future. Little evidence has surfaced to suggest that the mountain plover's substantial use of cultivated lands for breeding is problematic. The potential for future energy development to adversely affect mountain plover and their habitat on their breeding or wintering ranges is not fully known and requires continued research. However, studies to date do not lead us to conclude that these activities currently pose substantial threats to the mountain plover or will in the foreseeable future. Climate change may impact the mountain plover, positively or negatively, in ways not yet envisioned.

In the past, we were concerned that mountain plover life span was short compared to other plovers and that this, in combination with high breeding site fidelity, presented a threat to breeding populations. Contrary to our previous belief, the mountain plover is now considered a relatively long-lived species. Site fidelity and ability to seek out alternative sites for breeding does not appear to be a concern. Based on new information regarding life span, site fidelity, and dispersal, we no longer believe that these aspects of the mountain plover's life history represent any threat to the species. Lastly, recent information confirms that some mountain plover are exposed to pesticides, but no evidence of impacts to individuals, local populations, or rangewide impacts to the species have been demonstrated.

The current status of the mountain plover does not suggest that future habitat changes, or the combination of climate change and habitat changes will result in significant population-level impacts in the foreseeable future. Their geographically widespread breeding and wintering locations, and ability to use a variety of habitats, contribute to their security. During breeding, they utilize short- and mixed-grass prairie, prairie dog colonies, agricultural lands, and semi-desert (Dinsmore 2003, pp. 14–17). The variety of habitats in which they successfully breed suggests that threats affecting one habitat type would not greatly increase the mountain plover's vulnerability to extinction. Mountain plover have proven to be adaptable to many human activities, such as using crop fields for breeding and wintering, and benefitting from some cattle grazing practices. Over time, the extent of wintering habitat in California is likely to decline, but wintering mountain plover exploit a variety of grassland, rangeland, crop fields, and semi-desert landscapes from the Gulf Coast to the Pacific Ocean. We conclude that any foreseeable future declines in wintering habitat, in California or elsewhere, are unlikely to imperil the mountain plover.

We estimate the current rangewide mountain plover breeding population to be over 20,000 birds. This is more than double the estimate of 8,000 to 10,000 mountain plover that we cited in our December 5, 2002, proposal to list the mountain plover as a threatened species (67 FR 72396). While we have no evidence that an actual population increase has occurred, a larger known population provides added security from current and future potential influences and threats.

Based on our review of the best available scientific and commercial information pertaining to the five factors, we find that the threats, alone or cumulatively, are not of sufficient imminence, severity, or magnitude to indicate that the mountain plover is in danger of extinction, or likely to become endangered within the foreseeable future, throughout all or a significant portion of it range. The mountain plover has experienced historical losses of native habitat resulting in a significant decline in the rangewide population. However, BBS survey results suggest that the recent (1999 through 2009) rate of decline has moderated (see Population Size and Trends above). We have no evidence that potential threats (as discussed in Factors A, B, C, D, and E) are acting on the species or its habitat in a way that would reverse this positive trend or result in an increased rate of population decline within the foreseeable future. The currently estimated rangewide mountain plover population, more than 20,000 breeding birds, is more than double that estimated in 2002, providing the species with added security should increased threats to its wellbeing arise. As stated above, the mountain plover's geographically widespread breeding and wintering ranges, and ability to exploit a variety of habitats, contribute to its security. According to the Act, the term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range; the term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. We conclude that the mountain plover does not meet the definition of endangered, because there is an apparent trend toward stability of the species' rangewide population, it remains widespread over both its breeding and wintering ranges, and it can exploit a variety of habitats including areas of human disturbance. In addition, we have found no threats acting on the mountain plover in a way that would drive the species towards being endangered in the foreseeable future; therefore, the species does not meet the definition of threatened. Therefore, we find that listing the mountain plover as an endangered or threatened species is not warranted throughout all or a significant portion of its range at this time (see the Significant Portion of the Range discussion below). As such, we withdraw our December 5, 2002, proposed rule (67 FR 72396) to list the mountain plover as a threatened species.

Distinct Vertebrate Population Segments/Significant Portion of the Range

After assessing whether the species is endangered or threatened throughout its range, we next consider whether a distinct vertebrate population segment (DPS) or whether any significant portion of the mountain plover range meets the definition of endangered or is likely to become endangered in the foreseeable future (threatened).

Distinct Vertebrate Population Segment

Under the Service's Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act (61 FR 4722, February 7, 1996), three elements are considered in the decision concerning the establishment and classification of a possible DPS. These are applied similarly for additions to or removal from the Federal List of Endangered and Threatened Wildlife. These elements include:

(1) The discreteness of a population in relation to the remainder of the species to which it belongs;

(2) The significance of the population segment to the species to which it belongs; and

(3) The population segment's conservation status in relation to the Act's standards for listing, delisting, or reclassification (*i.e.,* is the population segment endangered or threatened).

Discreteness

Under the DPS policy a population segment of a vertebrate taxon may be considered discrete if it satisfies either one of the following conditions:

(1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation.

(2) It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation

status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

We do not consider any population segment of mountain plover to be markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Mountain plover are naturally distributed across a large landscape in a discontinuous fashion. Available breeding and wintering habitats exist in a constantly shifting mosaic of suitable habitat throughout the western Great Plains and Rocky Mountain States from Canada to Mexico. As an avian species, mountain plover are able to move long distances during migration, and to return to different geographical areas for breeding or wintering.

Although there is some evidence that mountain plover exhibit some site fidelity to their breeding areas (Graul 1973, p. 71; Skrade and Dinsmore 2010, p. 672), other studies have shown that the species can disperse over relatively long distances (Knopf and Wunder 2006; Bly 2010b, pers. comm.). There are no known barriers to movement throughout the geographic range of the species. Wunder (2007, p. 118) concluded that there is widespread mixing of mountain plover populations in winter and that birds may use alternate wintering sites in different years. A genetic study using nuclear microsatellites concluded that mountain plover across sampled breeding locations in Colorado and Montana comprised a single, relatively homogenous gene pool (Oyler-McCance *et al.* 2008, pp. 496–497). Results suggested that there was sufficient gene flow among breeding areas to offset genetic effects of small populations and reported adult fidelity to breeding areas (Oyler-McCance *et al.* 2008, pp. 496–497).

The mountain plover spans international boundaries between the United States, Canada, and Mexico; however, the vast majority of occupied breeding habitat occurs in the United States with few breeding records in Canada and Mexico. Mexico likely winters a substantial number of mountain plover that breed in the United States. The known relative distribution of mountain plover between the three countries has remained fairly constant in recent years. Additionally, we are not aware of any differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms that exist in Canada or Mexico that are significant in light of section 4(a)(1)(D) of the Act (the inadequacy of existing regulatory mechanisms). Therefore, we do not believe that international boundaries provide evidence of discrete mountain plover populations.

We determine, based on a review of the best available information, that no mountain plover population segments meet the discreteness conditions of the 1996 DPS policy. Therefore, no mountain plover population segment qualifies as a DPS under our policy, and no DPS is a listable entity under the Act.

The DPS policy is clear that significance is analyzed only when a population segment has been identified as discrete. Because we found that no mountain plover populations meet the discreteness element and, therefore, do not qualify as a DPS under the Service's DPS policy, we will not conduct an evaluation of significance.

Significant Portion of the Range

The Act defines an endangered species as one "in danger of extinction throughout all or a significant portion of its range," and a threatened species as one "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The term "significant portion of its range" is not defined by the statute. For the purposes of this finding, a significant portion of a species' range is an area that is important to the conservation of the species because it contributes meaningfully to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a significant decrease in the viability of the species.

If an analysis of whether a species is endangered or threatened in a significant portion of its range is appropriate, we engage in a systematic process that begins with identifying any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose in analyzing portions of the range that are not reasonably likely to be significant and endangered or threatened. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that (i) the portions may be significant and (ii) the species may be in danger of extinction there or likely to become so within the foreseeable future. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the range that are unimportant to the viability of the species, such portions will not warrant further consideration.

We next address whether any portions of the mountain plover's range warrant further consideration. On the basis of our review, we found no geographic concentration of threats on breeding or wintering habitat such that the subspecies may be in danger of extinction in that portion. Although the mountain plover's wintering habitat in California is likely to decrease in the future because of changes in land use and agriculture, we have determined that the likely extent of change will not result in a significant threat to the species' ability to maintain a wintering population in California. Similarly, we found that there is no area within the breeding range of the mountain plover where the potential threat of changes to habitat are concentrated or may be substantially greater than in other portions of the range. The factors affecting the species are essentially uniform throughout its range, indicating that no portion of the mountain plover's range warrants further consideration of possible endangered or threatened status.

We request that you submit any new information concerning the status of, or threats to, the mountain plover to our Colorado Ecological Services Office (see **ADDRESSES**) whenever it becomes available. New information will help us monitor the mountain plover and encourage its conservation. If an emergency situation develops for the mountain plover or any other species, we will act to provide immediate protection.

References Cited

A complete list of references cited is available on the Internet at *http://www.regulations.gov* and upon request from the Colorado Ecological Services Office (see **ADDRESSES**).

Authors

The primary authors of this document are the staff members of the Colorado Ecological Services Office (see **ADDRESSES**).

Authority

The authority for this section is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: April 29, 2011.

Rowan W. Gould,

Acting Director, Fish and Wildlife Service.

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