

From 1982 to 1997, rangeland decreased in Colorado by 217,200 ha (536,700 ac), in Kansas by 14,852 ha (36,700 ac), in Nebraska by 14,326 ha (35,400 ac), in Oklahoma by 16,512 ha (40,800 ac), in Montana by 59,894 ha (148,000 ac), and in Wyoming by 18,090 ha (44,700 ac). More acres were converted prior to 1992 in all States except Nebraska and Montana, where acres converted after 1992 were about the same or more than doubled, respectively. The total lands converted are a small fraction of the total rangeland. While the best information available does not allow us to quantify the acres of occupied mountain plover habitat converted, using the rate of rangeland conversion, we believe native grassland conversion is small and does not pose a substantial threat to mountain plovers.

The Montana Fish, Wildlife and Parks expressed concern over conversion of native habitat in Montana (P. Graham, Montana Fish, Wildlife and Parks, in litt. 1999). For example, Knowles and Knowles (2001) reported that a total of 13 percent of the land area in their central Montana study area has been converted from native grass from 1991 to 1999, and that mountain plovers have abandoned all but one of the sites that were converted. Mountain plovers in the central Montana study area declined from more than 100 in 1992 to about 70 individuals in 2000, as a result of grassland conversion (Knowles and Knowles 2001; C. Knowles, pers. comm. 2003).

Mountain plovers nest successfully on croplands in Colorado and perhaps contiguous States (V. Dreitz and F. Knopf, in litt. 2003; Shackford *et al.* 1999). While the findings are preliminary and represent a small percentage of total croplands in eastern Colorado, they suggest that existing croplands and grasslands in the southern portion of the breeding range may be of equivalent value to nesting mountain plovers (V. Dreitz and F. Knopf, in litt. 2002). In Montana and northern Wyoming, nesting on cultivated land has not been observed (Knowles and Knowles 2001; Shackford *et al.* 1999). However, since the amount of rangeland converted is small (NRCS 1998), we conclude that the impact to mountain plovers in Montana and northern Wyoming is comparably small, regardless of how cultivated land is used by mountain plovers in those states.

In some areas in the mountain plover breeding range, grasslands are being converted to housing subdivisions. Of some concern is development of nesting habitat in South Park, Park County,

Colorado, where the mountain plover population is now estimated to be about 2,300 individuals, which is the largest known remaining concentration of mountain plovers in the breeding range (Wunder *et al.* in prep.). The known breeding sites in South Park are vulnerable to ongoing and proposed future residential development. Full build-out of those sites currently subdivided would be detrimental to mountain plovers (Sherman *et al.* 1996, Granau and Wunder 2001). However, it is unknown how extensive future development will actually be or how fast it will proceed, such that while it is a potential threat we have no reason to believe that it means the species is likely to be in danger of extinction in the foreseeable future. It also is likely that private conservation efforts ongoing in South Park will preserve important mountain plover habitat.

Cultivated Areas in Breeding Range as Potential Population Sinks

In the 1999 proposed rule, we stated that we believed cultivated lands in the southern portion of the breeding range created population sinks for the mountain plover, contributing to species decline. In an effort to better define the implications to mountain plover survival, research was initiated on cultivated fields and rangelands in five counties in eastern Colorado in 2001 (T. McCoy, in litt. 2001). Preliminary data analysis indicates that nest success is comparable between cropland and rangeland (V. Dreitz and F. Knopf, in litt. 2003). Nest failure was attributed principally to tillage and predation on cropland, and to predation on rangeland (V. Dreitz and F. Knopf, in litt. 2002). However, while hatching success on croplands and grasslands is similar in the southern portion of the breeding range, comparable data on juvenile survivorship are not available so mountain plover reproductive success on cropland relative to grasslands is not fully known (V. Dreitz and F. Knopf, in litt. 2002; Knopf, in litt. 2003).

Historical Conversion of Grassland in Wintering Range

Historically, mountain plover habitat in the Central Valley was lost following the decline of grazing elk, pronghorn, burrowing kangaroo rats, ground squirrels, and other mammals. The combined activities of these herbivores maintained suitable habitat conditions for mountain plovers, closely mimicking habitat characteristics found on breeding habitats (Knopf and Rupert 1995). Elk are now extirpated from the Central Valley, and pronghorns, once extirpated, have recently been

reintroduced into the Carrizo Plains (BLM *et al.* 1995). The federally-listed giant kangaroo rat (*Dipodomys ingens*) and Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) have declined to about 2 percent and 1 percent of their former range, respectively, due primarily to conversion of grassland habitat to agriculture and urbanization, and secondarily due to other incidental human activities and control of California ground squirrels (W. White, Service, in litt. 2001a; 52 FR 283; S. Jones, Service, pers. comm. 2003). The occupied range of each of these species in the San Joaquin Valley overlaps the described wintering range of the mountain plover. Currently, it is estimated that giant kangaroo rats may occupy about 11,145 ha (27,540 ac) and the Tipton kangaroo rat may occupy about 25,000 ha (63,000 ac) (Service 1998). While we cannot measure the degree of impact to mountain plovers resulting from the loss of these mammals, we believe any further loss would be detrimental to the species by further reducing natural habitats.

Native grasslands in the San Joaquin Valley have been nearly eliminated. Of nearly 1,800,000 ha (4,400,000 ac) of native grasslands present prior to extensive settlement, no more than 600 ha (1,500 ac) remained in 1972 (Moore *et al.* 1990). This loss of grasslands has been paralleled by a loss of other natural habitats, with the total of all uncultivated lands in the San Joaquin Valley now occupying less than 61,000 ha (150,000 ac) (Service 1998).

Mountain plovers wintering in the San Joaquin Valley prefer native Valley sink scrub and nonnative grasslands over any of the more commonly cultivated land types (Anderson *et al.* 1991; Knopf and Rupert 1995) when the grasslands are grazed or burned (Knopf and Rupert 1995). These preferred habitats occupy less than 26,000 ha (66,000 ac) of the San Joaquin Valley (Anderson *et al.* 1991). Mountain plovers in the San Joaquin Valley depend on these core areas of uncultivated lands in October and November (Engler, in litt. 1992; Knopf and Rupert 1995), and further loss of these areas would be detrimental to the species (Knopf and Rupert 1995).

Mountain plovers use cultivated croplands in the Imperial Valley of California, where in recent years (except the winter of 2002–03 when excessive rain prevented it) greater than 50 percent of all individuals of the species wintered (Wunder and Knopf 2003). Until agricultural development began in the 1940s, this historically desert region was not known to support the species. Here, 37 percent of the mountain