

to Texas (Coues 1878, Knight 1902, McCafferty 1930, Bailey and Neidrach 1965). Knopf (1996b) estimated the North American mountain plover population to be between 8,000 to 10,000 birds. His estimate is based on a 1994 count of mountain plovers on their winter habitat in California. Applying the same assumptions using the more recent 1998–2002 winter counts ranging from 1,372 to 4,037 individuals would yield an estimate ranging from 5,000 to 11,000 (Hunting *et al.*, 2001; Shuford *et al.* 2000; Wunder and Knopf 2003, S. Myers, pers. comm. 2002). The search efforts among years are not comparable, but represent the best available information. We believe the estimates provided are a reasonable approximation of mountain plover total abundance, given recent survey efforts directed at mountain plovers on their winter habitat, the dedicated efforts to locate them in California's Central and Imperial valleys, and their winter flocking behavior that enhances detection.

As discussed by Knopf (1996b), the continental breeding range of the mountain plover has been reduced from its historical extent, especially in the eastern portion of the range. The mountain plover was formerly common in western and central Kansas (Goss 1891), and reported as numerous between Fort Supply, Oklahoma, and Dodge City, Kansas (McCauley 1877). The species was historically numerous in Colorado (Bailey and Niedrach 1965) and Wyoming (Knight 1902). Lower numbers of mountain plovers formerly occupied western South Dakota (South Dakota Ornithologist's Union 1991) and Nebraska (Knopf 1996b), and there is one known breeding reference from North Dakota (Roosevelt 1885). There was a single report of breeding mountain plovers in northern Mexico in 1901 (Sanford *et al.* 1924), and breeding was confirmed in the State of Nuevo Leon in 1999 (Desmond and Ramirez 2002).

Colorado—The Colorado Bird Atlas Partnership estimated a population of 7,200 (range from 3,652 to 12,168) mountain plovers in Colorado, with perhaps 22 percent of these in Weld County (H. Kingery, in litt. 1997; Kingery 1998). However, this population estimate should be considered a "first approximation" and used with caution (Kingery 1998). A more recent effort to estimate mountain plover abundance is the Rocky Mountain Bird Observatory's estimate of 4,850 individual mountain plovers in eastern Colorado (S. Gillihan, in litt. 2003).

Mountain plovers have been studied intensively in Weld County, Colorado, from the late 1960s to the present. Graul and Webster (1976) considered Weld County in northeastern Colorado the breeding stronghold for the mountain plover, a conclusion widely referenced by subsequent authors (*e.g.*, Knopf and Rupert 1996). However, inventories completed by the Colorado Bird Atlas Partnership from 1987 through 1995 found mountain plovers more widely distributed than previously known in many other eastern Colorado counties (Kingery 1998). Based on their inventories, the Bird Atlas Partnership concluded that 75 percent of Colorado's mountain plovers occurred south of Weld County (H. Kingery, Colorado Bird Atlas Partnership, pers. comm. 1994, in litt. 1998).

Breeding mountain plovers also have been reported from southeastern Colorado by others (Chase and Loeffler 1978; Nelson 1993; R. Estelle, Colorado Bird Observatory, in litt. 1994; M. Scott, BLM, in litt. 2000; K. Giesen, Colorado Division of Wildlife (CDOW), in litt. 2001). During a 1996 inventory, Carter *et al.* (1996) concluded that mountain plovers occur at very low densities in 10 eastern Colorado counties, and are most numerous in Kiowa and Park Counties. Mountain plovers also have been seen in Moffat County in northwestern Colorado (Behrends and Atkinson 2000). The Colorado Natural Heritage Program conducted mountain plover surveys in Park County in central Colorado from 1994 through 2002, and currently estimate 2,300 mountain plovers at this location (Pague and Pague 1994, Sherman *et al.* 1996, Hanson 1997, Granau and Wunder 2001, Wunder *et al.* in prep.). South Park appears to currently be the most productive breeding location in Colorado, and probably throughout the entire breeding range. This is clearly the largest breeding population of mountain plovers in Colorado, and perhaps throughout the breeding range.

In Weld County, 60 to 70 percent of the mountain plover habitat occurs on the Pawnee National Grassland, a historically recognized breeding stronghold (F. Knopf, in litt. 1991). Today, nearly all mountain plovers have abandoned the Pawnee National Grassland. During the late 1960s, Graul and Webster (1976) estimated about 69,000 hectares (171,000 acres) of good habitat on the Pawnee National Grassland, with mountain plover densities of at least 10/kilometer² (26/mile²). Based on these estimates, we calculate that at least 7,000 mountain plovers likely occupied the Pawnee in the early 1970s. Knopf (in litt. 1991)

estimated about 1,280 individuals in 1991, while presently the Grassland population is about 78 individuals (F. Knopf, pers. comm. 2002).

Graul (1973) hypothesized that mountain plover productivity on the Pawnee is influenced by drought and its corresponding effects on food supply. In 1995, the Pawnee received above-average spring rainfall resulting in lush vegetation growth not suitable as mountain plover nesting habitat. As a result, few birds were found there during the breeding season; conditions continued through 1996 and 1997, with few adult birds and very little reproduction observed through 2002 (Knopf 1996; F. Knopf, in litt. 2003).

Although mountain plovers nest on cultivated fields in southeast Colorado and adjacent States, 1 study (Shackford *et al.* 1999) found that of 46 nests monitored on cultivated fields, 31 nests failed and the fate of the remaining 15 nests was unknown. Of the 31 failed nests, 22 nests (48 percent of total nests) were destroyed by farm machinery. Giesen (in litt. 2000) reported a higher nest success on agricultural fields than on native rangeland. As a result of these conflicting findings, research was initiated in five eastern Colorado counties to better describe nest success and productivity, and the implications of cultivated field nesting to mountain plover population recruitment (T. McCoy, Colorado Natural Heritage Program, in litt. 2001). In 2001 and 2002 within the study area, nests on croplands numbered 45 and 85, respectively, with the increase due to a 40 percent increase in area surveyed (V. Dreitz, in litt. 2002). Nest success on cropland and rangeland was equal in 2001, but was about 10 percent higher on range in 2002 (V. Dreitz, in litt. 2002). Predation was the major cause of nest failure on rangelands in 2001 and 2002. Predation and tillage losses were the cause of nest failure on cropland, but the combined losses on cropland were fewer than predation losses on rangeland in either year.

Based on the data presented above, we estimate over 7,000 breeding mountain plovers in Colorado.

Montana—The largest known number of breeding mountain plovers in Montana is found on a large complex of black-tailed prairie dog colonies in the contiguous Phillips and Blaine Counties (Knowles and Knowles 2001, Dinsmore 2001). In Phillips County, nearly all mountain plovers are found on active prairie dog colonies that also are grazed by cattle (Dinsmore 2001).

Although Phillips and Blaine Counties contain a major breeding concentration for the species (Knopf and