

abundance on the BBS, which shows a statistically significant decline from 1966 to 2002 only in the extreme southern portion of the breeding range where plover abundance is low and the number of routes detecting the species are few (BBS, <http://www.mbr-pwrc.usgs.gov/bbs/bbs.html>).

Several range management practices conducted throughout the range of the mountain plover enhance the development of taller vegetation, thereby eliminating nesting opportunities (Graul and Webster 1976, Knowles and Knowles 1993). Examples of these practices include "pitting" to increase moisture retention in the soil, introduction of exotic grass species such as crested wheatgrass, watershed improvement projects to retain water, and, in Montana, fire suppression (Graul 1980, FaunaWest 1991, Knowles and Knowles 1993).

Localized range management activities on private and public lands also destroy mountain plover habitat. In 2001, for example, two known mountain plover breeding sites were destroyed in Valley County, Montana, by the construction of stock tanks in an area designated by the BLM as an Area of Critical Environmental Concern for mountain plover (C. Knowles, in litt. 2001).

Although range management activities may adversely affect some habitat for the mountain plover in specific instances, the complete absence of grazing causes mountain plover habitat to deteriorate. Therefore, we see grazing as necessary for the species, and not a threat to the species throughout its range.

#### Effects of the Decline of Burrowing Mammals on Mountain Plover Habitat

The historic decline in abundance and distribution of prairie dogs likely contributed to the historic decline of the mountain plover (Knowles *et al.* 1982; S. Fitton, in litt. 1992; Knopf 1994). The mountain plover nests on active prairie dog colonies, principally those of the black-tailed prairie dog (*Cynomys ludovicianus*), throughout its breeding range, as prairie dogs maintain their preferred nesting habitat of low vegetation structure and a high percent of bare ground. Preliminary findings from Colorado suggest that mountain plover nesting success is higher on black-tailed prairie dog colonies than sites without prairie dogs (V. Dreitz and F. Knopf, in litt. 2002). Prairie dogs were widespread and numerous throughout the mountain plover's historic breeding range (Service 2002). Mountain plovers presently occupy prairie dog colonies in Colorado,

Montana, Wyoming, Oklahoma, and New Mexico (Shackford 1991; Godbey 1992; Nelson 1993; Hawks Aloft 2001b; M. Edwards, in litt. 1994; T. Thompson, in litt. 2003; Dinsmore 2001). Montana, Wyoming, and Colorado likely comprised most of the core mountain plover breeding areas historically, and currently there are more mountain plovers associated with prairie dogs in those States. The suitability of prairie dog colonies as mountain plover habitat appears to be influenced by the individual colony size and prairie dog density (Knowles *et al.* 1982, Olson-Edge and Edge 1987, Dinsmore 2001). Therefore, total prairie dog acres is not a measure of total suitable mountain plover habitat available.

Black-tailed prairie dogs have been reported to currently occupy about 256,000 ha (631,000 ac) in Colorado (Pusateri, CDOW, in litt. 2002), 36,000 ha (90,000 ac) in Montana, and an estimated 50,000 ha (125,000 ac) in Wyoming (Luce 2003). In Phillips County, Montana, 99 percent of the mountain plover nests found on survey transects were located on active prairie dog colonies (Dinsmore 2001). The largest population of mountain plovers in Montana (about 700 individuals) occurs on black-tailed prairie dog colonies in Phillips County, and mountain plover and prairie dog abundance are closely related there (Dinsmore 2001). Mountain plovers seem closely tied to active prairie dog colonies in Wyoming in the Powder River Basin, including Thunder Basin, particularly the Thunder Basin National Grassland. Mountain plovers are associated with black-tailed prairie dog colonies on the Pawnee National Grassland in northern Colorado (Nelson 1993; F. Knopf, in litt. 1999), in the Arkansas River Valley, and on the Comanche National Grassland in southeastern Colorado (K. Geisen, CDOW, in litt. 2001). A large population of mountain plovers nest in montane grasslands without prairie dogs in South Park in central Colorado (Wunder *et al.* in prep.). About 50 percent of the black-tailed prairie dog colonies in Colorado occur in nine southeastern counties, which also report numerous mountain plover sightings (Kingery 1998; L. Nelson, CDOW, in litt. 2002).

Mountain plovers sometimes nest on white-tailed prairie dog colonies in Colorado, Wyoming, and Montana (P. Deibert, pers. comm. 2003). Gunnison's prairie dogs occur at the periphery of the mountain plover breeding range in northern New Mexico and southern Colorado, and mountain plovers have been documented to nest on their colonies (5 out of 19 confirmed breeding

sites on BLM lands in Taos County were on Gunnison prairie dog colonies (Hawks Aloft 2001b)). The geographic extent of mountain plover use of Gunnison colonies appears to be small, and limited information suggests no close dependence.

Because mountain plovers have no ability to modify their environment to create suitable nesting conditions, the decline of prairie dogs can result in the loss of suitable nesting characteristics in only a few weeks (Dinsmore 2001).

Outbreaks of sylvatic plague occur frequently throughout Montana, Wyoming, and Colorado on prairie dog colonies in the breeding range of the mountain plover. Sylvatic plague is an exotic disease to which prairie dogs have almost no immunity, although recent laboratory research indicates some isolated resistance to plague in black-tailed prairie dogs (Rocke, USGS, pers. comm. 2002). However, recently available population data across a majority of the species' range, that include many smaller populations (which represents the majority of all occupied habitat), indicate that occupied prairie dog habitat is more abundant and more stable than previously thought. The majority of black-tailed prairie dog populations occur in small, isolated complexes where the dynamics of disease appear to be fundamentally different than in larger populations. The reproductive and dispersal capabilities of the species, as indicated by the distribution, abundance, and trends data for the species, may be sufficient to counteract, at least partially, the impacts of a disease that occurs only sporadically in time and space (Service 2002).

Prairie dog control, principally by poisoning, continues to occur on private and public lands throughout the mountain plover's breeding range, although the likelihood of control on public lands is minimized by Federal agency policies (Service 2002). Black-tailed prairie dog populations are capable of recovering rapidly from chemical control efforts that temporarily reduce their numbers (or from other depressant factors such as disease (Knowles 1986) or drought (Hoogland 1995)).

Mountain plovers may vacate prairie dog colonies following plague or poisoning because of the rapid deterioration of habitat conditions (Dinsmore 2001), but we consider plague or prairie dog control to be a temporary impact on mountain plovers. For example, between 1992 and 1996, prairie dog occupation of colonies in Montana's area of greatest prairie dog abundance was reduced by as much as