

# Mountain Plover

## (*Charadrius montanus*)

April 2004

Fish and Wildlife Habitat Management Leaflet

Number 22



F. L. Knopf

### General Information

The mountain plover (*Charadrius montanus*) is an upland shorebird native to the shortgrass prairies of the Great Plains and arid rangelands of North America. These habitats consist of gently rolling hills and flat plains dominated by low-growing native grasses, primarily blue grama and buffalograss. Also called the prairie plover or upland plover, the mountain plover is adapted to sparsely vegetated and bare ground areas associated with various disturbances (heavy grazing, fire, prairie dog colonies, etc.) or alkaline soils. While the essential habitat feature is bare ground, plovers will tolerate up to 70 percent short vegetation ground cover.

Grassland bird populations, which include the mountain plover, are declining at faster rates than any other group of North American birds. During

the 30-year period between 1965 and 1995, mountain plover populations declined overall by 63 percent. Habitat loss due to conversion of shortgrass prairie to agricultural uses and declining prairie dog populations were major factors contributing to this decline. Other threats include loss of eggs and chicks to predation and introduction of tall woody species in preferred grassland habitats.

Prior to 1900, the mountain plover was a widely distributed, heavily hunted gamebird of the shortgrass prairie. Historical accounts of mountain plover populations indicate that although uncommon overall, individuals were common in suitable habitats. Recent population estimates range from 8,000–12,000 birds. However, accurate counts are difficult to obtain because the birds are well camouflaged.

Already extirpated from its former range in North Dakota and South Dakota, in 1999 the mountain plover was proposed to be listed as a federally threatened or endangered species by the U.S. Fish and Wildlife Service. The Partners in Flight conservation rating system considers this species as an “extremely high priority.” Existing populations are isolated due to habitat loss and other factors. Conservation efforts are focused on maintaining and improving habitat in areas currently occupied by breeding mountain plovers.

This leaflet provides an introduction to the habitat requirements of the mountain plover and is intended to assist landowners and managers develop mountain plover management plans. The success of any species-specific management plan depends on targeting the needs of the desired

Physical Features and Habits

**Description:** Similar in appearance to killdeer (*Charadrius vociferus*), but no breast rings; light brown back, sandy-buff breast; during breeding season has black forecrown with white forehead and white eyestripe; loses white face pattern in the fall; thin white wing stripe that shows in flight and black tailband with white border.

**Size:** Medium body size, 20–24 cm (8–9.5 in.).

**Wing spread:** 44.5–49.5 cm (17.5–19.5 in.).

**Voice:** Low, variable whistle.

**Displays:** “Falling leaf” and “butterfly” aerial displays performed during breeding season; also distraction displays; bows and calls.

**Comments:** Sexes similar in size and appearance; polyandrous (one female mates with more than one male, but each male mates with only one female), which is rare and observed mostly in shorebirds; often runs rather than flying when disturbed.

species and analyzing existing habitat conditions to ensure that all required habitat elements are present. This leaflet provides a number of practical habitat management practices that can be used to improve and manage mountain plover habitat. Landowners and managers are encouraged to enlist the expertise of wildlife and natural resource

professionals to help identify additional habitat management needs and actions.

**Range**

As short distance migrants, mountain plovers arrive at breeding grounds in March and wintering grounds from late July through October. Breeding range is currently restricted to portions of Montana, Wyoming, eastern Colorado, eastern New Mexico, southwestern Nebraska, the western panhandle of Oklahoma, western Kansas, and scattered breeding pairs in northeast Utah.

In Nebraska, the most recent sightings of mountain plovers were in Kimball and Box Butte counties. Adults exhibiting nesting behavior were observed in Morton County and three other counties in southwest Kansas in or close to the Cimarron National Grassland. Most of the remaining breeding birds can be found in eastern Colorado.

Grasslands of the Intermountain Flyway and the central plains and playa regions of the Central Flyway are used by migrating plovers. Winter range includes short growth grassland, arid plains, and agricultural land found mostly in central and coastal California (Sacramento, San Joaquin, and Imperial Valleys). A few plovers also winter in southern Arizona, central and coastal Texas, and northern Mexico.

**Status of the Mountain Plover in the U.S. and Canada**

**Federal Status, U.S.**

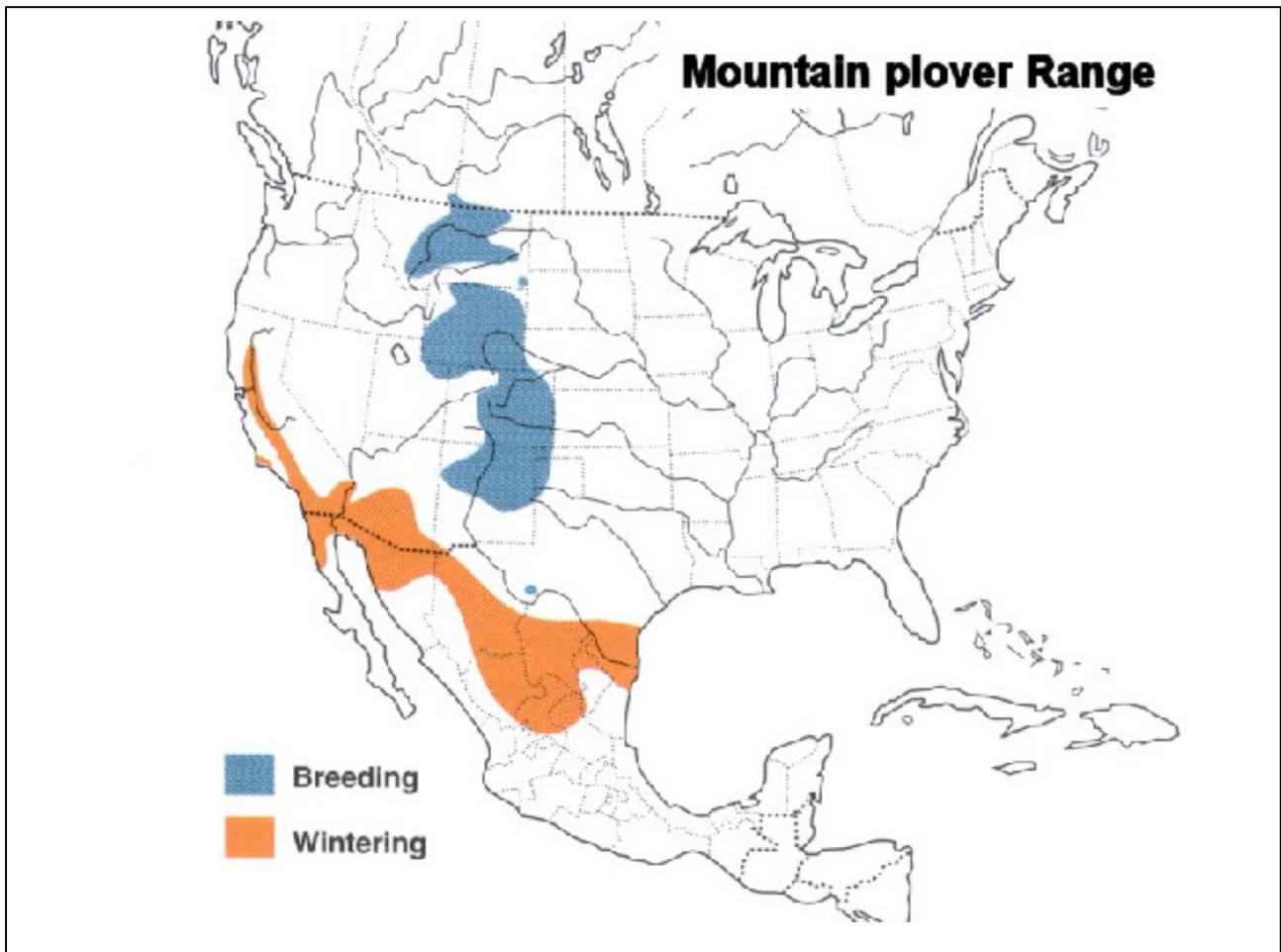
The U.S. Fish and Wildlife Service has proposed listing the mountain plover as a threatened or endangered species throughout its range.

**State status**

- ◆ Montana—Protected
- ◆ Oklahoma—Species of Interest or Concern
- ◆ California—Species of Special Concern
- ◆ Kansas—on Watch List
- ◆ Nebraska—Threatened
- ◆ North Dakota—Extirpated
- ◆ South Dakota—Extirpated
- ◆ Utah—Species of Special Concern

**Canada**

- ◆ Endangered



## Habitat Requirements

### General

The mountain plover is widely distributed throughout its range. However, it is considered rare or uncommon even in areas with high quality habitat. Suitable mountain plover habitat has several unifying, distinctive features:

- ✓ Bare ground on non-sandy soils; plovers will tolerate up to 70 percent coverage of short, sparse vegetation; vegetation height <4 inches, on average <2.4 inches.
- ✓ Moderate elevations; generally found lower than 6,500 feet above sea level.
- ✓ Level or nearly level topography; usually found in areas with 0–5 percent slope, but on average <2 percent slope.

Mountain plovers are often associated with disturbed sites where the vegetation is very short or lacking, there is at least 30 percent bare ground, and the terrain is level. Favored habitats include prairie dog towns, areas heavily grazed by domestic livestock or wild herbivores, bare ground areas near artificial watering structures, recently burned or



F. L. Knopf

*Mountain plovers require bare ground or short grass habitats.*

### Nest, Eggs, and Young

**Nest:** Shallow, hollow scrape; may be unlined or lined with bits of plant material.

**Eggs:** Average 3 eggs, but can have 1–4; oval-shaped; drab light olive to olive-buff; rarely pinkish-buff; finely speckled or scrawled with black or gray marks.

**Egg size:** 37x28 mm (1 1/2 x 1 1/8 in.).

**Number of clutches:** One or two; female may lay two clutches, each in a different nest with the same or different males.

**Incubation:** Eggs laid at one- or two-day intervals; incubation lasts 28–31 days; male often takes over incubation duties; males and females both incubate eggs, but in separate nests. Females may be polyandrous.

**Young:** Precocial and downy; can find own food; down is whitish below, pale yellowish-buff on flanks and back; collar around hind-neck and forehead unmarked; rest of body heavily spotted/mottled with black spots which are heaviest on the hind-crown; pale eyestripe.

**Fledging date:** 33–34 days.

**Predators:** Mammalian predators include coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and ground squirrels (*Citellus* spp.) and other small mammals; avian predators include common raven (*Corvus corax*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*) and others.

mowed areas, and recently fallowed or tilled crop fields. In Montana, the largest mountain plover population is associated with the state's largest prairie dog colony.

Mountain plovers are adaptable to a variety of plant communities and terrain, as long as the vegetation structure and topography are similar to that described above. Blue grama and buffalograss communities often provide suitable plover habitat. Forbs such as fleabane and tufted milkvetch, sedges, and other grasses are also part of these grass communities. Scattered small shrubs and cacti may also be present. Nuttall's saltbush, fringed sagebrush, prostrate sagebrush, and big sagebrush are shrub species that may be associated with some mountain plover habitats. Plains prickly pear cactus is also found in some areas inhabited by plovers.

### Food

The diet of the mountain plover consists of grasshoppers and crickets, beetles, ants, flies, and other insects and invertebrates. Bare ground associated with extremely short vegetation and artificial watering structures attract insects and consequently foraging mountain plovers. The precocial young also feed on insects and other invertebrates. Less than one percent of the diet is seeds and other plant matter.

### Breeding and nesting habitat

Mountain plovers exhibit nesting site fidelity to areas used the previous year. Breeding habitat characteristics are similar to those described for general habitat: nearly level bare ground, possibly interspersed with short grass or shrubs. Males defend territories used during the previous breeding season, and both males and females perform falling leaf aerial displays on breeding grounds.

Male mountain plovers make several scrapes (shallow depressions in the soil) before females



F. L. Knopf

Mountain plovers sometimes make nesting scrapes next to conspicuous objects like cow patties or small shrubs.

**Table 1. Summary of mountain plover habitat requirements.**

Habitat component	Habitat requirements
Food-- Young	Insects--mostly ants, grasshoppers, and other ground-dwelling insects and invertebrates.
Food-- Adults	Insects--mostly ants, grasshoppers, and ground-dwelling insects; also an occasional scorpion or other invertebrate; less than one percent of total diet is seeds/vegetation.
Breeding and nesting habitat	Bare ground (at least 30 percent) and short, sparse vegetation (usually <3 inches tall) on nearly level ground (usually between 0-5 percent slope); favored sites include prairie dog towns, heavily grazed pasture and rangeland, and recently burned or mowed areas; low-growing scattered shrubs such as Nuttall's saltbush, fringed sagebrush, big sagebrush, and plains prickly pear cactus may be present.
Winter habitat	Same as breeding habitat; plovers most often observed in crop fields or other disturbed sites.
Water	Obtain water from food items; sometimes observed near livestock watering structures but probably attracted to bare ground and high insect numbers.
Minimum habitat size	At least 70 acres for brood-rearing; 25-50 acres at other times of the year.

choose one as the nest site. Scrapes may be lined with chunks of earth or bits of vegetation. Sometimes nests are placed next to cow chips or other conspicuous objects. Female mountain plovers may start incubating a second clutch after the male starts incubating the first clutch. This behavior may help ensure nesting success since many eggs and chicks are lost to a variety of causes. Hot summer sun can quickly kill eggs and chicks if the parent bird is not present to provide shade. A wide variety of predators also take a heavy toll on mountain plover eggs and chicks. After hatching, parent birds may move young more than a mile to better foraging areas.



F. L. Knopf

*Heavily grazed areas are commonly used by nesting and foraging mountain plovers.*

***Wintering habitat***

Wintering grounds in central and coastal California and portions of Arizona, Texas, and northern Mexico have habitat features similar to breeding

**Table 2. Factors that can limit habitat quality/quantity for mountain plovers.**

Habitat Component	Availability/Quality			
	High	Medium	Low	Absent
Food				
Breeding, nesting, and brood-rearing cover				
Winter habitat				
Minimum habitat size				

and nesting grounds. Mountain plovers may gather in wintering flocks. Wintering sites include dry alkali lakes, coastal prairies, fallow fields, and semidesert habitats.

**Water**

The water content of food items fulfills mountain plover water requirements. Mountain plovers have been observed near artificial watering structures designed for livestock and wildlife, but are probably attracted to the heavily grazed areas around watering structures and the insects found there.

**Minimum habitat area**

Minimum breeding habitat area depends on habitat quality to some degree. In general, the mountain plover needs at least 25–50 acres of suitable habitat for foraging. Studies in Colorado found that mountain plovers need at least 70 acres to raise a brood, although sometimes the boundaries of brooding areas overlap.

**Limiting Factors**

Table 1 provides a summary of mountain plover habitat requirements. For planning purposes, use Table 2 to subjectively rate the availability and quality of mountain plover habitat within a



**Table 3. Management options for increasing habitat quality or availability for mountain plovers.**

<b>Habitat component</b>	<b>Management options for increasing habitat quality or availability</b>	<b>Conservation practices &amp; assistance programs*</b>
<b>Food</b>	Maintain bare ground; up to 70 percent short, sparse vegetation (no tall vegetation) with 0-5 percent slope to encourage insect populations such as beetles, grasshoppers, and crickets.	338, 528A, 645 WHIP, PFW
	Limit pesticide use on potential mountain plover habitat (both breeding and wintering habitat).	
	Use mechanical treatments to control woody species; can use prescribed grazing system for domestic livestock or allow foraging by prairie dogs and grazing by wild ungulates such as bison and pronghorn antelope.	338, 528A, 645, 647 PFW, WHIP, EQIP
<b>Breeding, nesting, brood-rearing, and winter habitat</b>	Maintain bare ground; up to 70 percent short, sparse vegetation (no tall vegetation) with 0-5 percent slope with occasional prescribed burning or controlled grazing when and where appropriate.	338, 528A, 645 PFW, WHIP, EQIP
	If restoring croplands with native grasses, allow intensive grazing to encourage shortgrasses and keep them from being shaded out by exotic and taller vegetation.	327, 528A WHIP, EQIP, PFW, CRP
	Avoid or eliminate pesticide application during the nesting season and minimize use during the rest of the year.	
<b>Minimum habitat size</b>	Ensure at least 70 acres are available for breeding habitat, and at least 50 acres for wintering habitat. At least 25-50 acres are required for suitable foraging habitat at all times of the year.	

\* See Table 4 for a description of assistance programs.

planning area, based on habitat requirement descriptions listed in Table 1. Habitat communities and components that are absent or given a low rating are likely limiting mountain plover habitat quality. Management actions should be taken to address these limiting factors. Land uses on adjacent properties may need to be considered to accurately rate the quality of a habitat management area for mountain plovers.

### **Habitat Management Recommendations**

Many breeding populations of mountain plovers are isolated from others. Habitat management focused on improving potential habitat around existing breeding populations could increase viability and reproductive success. Management

### **NRCS Conservation Practices that may be useful in undertaking the above management actions.**

<b>Conservation Practice</b>	<b>Code</b>
Conservation Cover	327
Prescribed Burning	338
Prescribed Grazing	528A
Upland Wildlife Management	645
Early Successional Habitat Development	647

**Table 4. Programs that provide technical and financial assistance to develop fish and wildlife habitat on private lands.**

Program	Land eligibility	Type of assistance	Contact
Conservation Reserve Program (CRP)	Highly erodible land, wetland and certain other lands with cropping history. Streamside areas in pastureland.	50% cost-share for establishing permanent cover and conservation practices, and annual rental payments for land enrolled in 10- to 15-year contracts. Additional financial incentives available for some practices.	NRCS or FSA state or local office
Environmental Quality Incentives Program (EQIP)	Cropland, range, grazing land and other agricultural land in need of treatment.	Up to 75% cost-share for conservation practices in accordance with 5- to 10-year contracts. Incentive payments for certain management practices.	NRCS state or local office
Partners for Fish and Wildlife Program (PFW)	Most degraded fish and/ or wildlife habitat.	Up to 100% financial and technical assistance to restore wildlife habitat under minimum 10-year cooperative agreements.	Local office of the U.S. Fish and Wildlife Service
Waterways for Wildlife	Private lands.	Technical and program development assistance to coalesce habitat efforts of corporations and private landowners to meet common watershed level goals.	Wildlife Habitat Council
Wildlife at Work	Corporate lands.	Technical assistance on developing habitat projects into programs that allow companies to involve employees and the community.	Wildlife Habitat Council
Wildlife Habitat Incentives Program (WHIP)	High-priority fish and wildlife habitats.	Up to 75% cost-share for conservation practices under 5- to 10-year contracts.	NRCS state or local office

*State fish and wildlife agencies as well as private groups may have additional assistance programs.*

practices that conserve or enhance mountain plover habitat focus on maintaining blocks of habitat (at least 50 acres in size) consisting of bare ground and up to 70 percent short, sparse vegetation on nearly level terrain. All mechanical land treatment practices including mowing, burning, and tilling should be avoided during the nesting season (from March through August) to help reduce egg and chick mortality. Whenever possible, landowners and managers should preserve tracts of natural, continuous shortgrass prairie habitat preferred by mountain plovers. Management options are summarized in Table 3.



Victor Love, IBM Boulder, Colorado

*Mountain plovers prefer the habitat conditions created by black-tailed prairie dog colonies. The disturbed soils, patches of bare ground, and short vegetation provide good foraging habitat and attract insects. Other wildlife such as burrowing owls and endangered black-footed ferrets require habitat characteristics associated with prairie dog towns.*

reducing vegetation height. Intensive domestic livestock grazing (cattle, horses, llamas) has been effective in providing habitat on ranches. Heavy spot grazing by livestock can simulate wild herbivore grazing patterns and create patches of bare ground.

Heavy spot grazing best benefits breeding habitat in the late winter and early spring. Sites with vegetation taller than four inches, or previously grazed sites left ungrazed for a few years, will be abandoned or left uninhabited. The potential use of mixed-grass prairies by mountain plovers can increase with a combination of heavy spot grazing, preserving prairie dog towns, and management practices like mowing and prescribed burning. Prescribed burns conducted in late summer or early fall can be used to reduce vegetation height, help control woody species, and increase the interspersed of bare ground and vegetation.

Prescribed burns should be conducted under the supervision of trained natural resource professionals. These professionals can also help develop a burn plan that accomplishes the wildlife management and economic goals of the landowner or manager, and may be able to provide equipment and technical or financial assistance. Mowing can also be used to reduce the height of grasses, and dead plant material can be burned or grazed. Landowners should avoid seeding exotic or taller grasses that can crowd out native shortgrass prairie plants.

Prairie dog colonies provide a combination of bare ground and short vegetation that is favored by breeding mountain plovers, and the insects attracted to these sites supply a rich food source for plovers and other grassland birds. Prairie dog colonies also provide certain habitat conditions required by species such as meadowlarks, grasshopper sparrows, burrowing owls, black-footed ferrets, and other wildlife. Conservation measures intended to preserve active prairie dog towns will greatly benefit mountain plovers and other species of shortgrass prairie ecosystems.

## Landowner Assistance Programs

Technical and financial assistance is available to landowners through a variety of government agencies and other organizations (Table 4). Landowners and managers should enroll the expertise of state and local natural resource professionals to help assess habitat quality and management practices for sustaining mountain plover populations and enhancing plover habitat quality.

## References

### *On-line sources*

- Dechant, J. A., M. L. Sondreal, D. H. Johnson, L. D. Igl, C. M. Goldade, M. P. Nenneman, and B. R. Euliss. 2001. Effects of management practices on grassland birds: Mountain plover. USGS Northern Prairie Wildlife Research Center, Jamestown, North Dakota, USA. <http://www.npwrc.usgs.gov/resource/literatr/grasbird/mtnplove/mtnplove.htm> (Version 17FEB2000).
- Knopf, F. L. and W. Iko. Ecology of the mountain plover. USGS Midcontinent Ecological Science Center. <http://www.mesc.usgs.gov/projects/ecology%5Fmtn%5Fplover.html>. May 1, 2001.
- Skagen, S. K., P. B. Sharpe, R. G. Waltermire, and M. B. Dillon. Biographical profiles of shorebird migration in midcontinental North America. USGS Biological Resources Division, Midcontinental Ecological Science Center. Fort Collins, Colorado. <http://www.mesc.usgs.gov/shorebirds>. April 4, 2001.
- The mountain plover: A threatened and endangered species. Nebraska Game and Parks. <http://ngp.ngpc.state.ne.us/wildlife/plover.html>. March 30, 2001.

**Printed sources**

- Andrews, R. and R. Righter. 1992. Colorado Birds. Denver Museum of Natural History, Denver, Colorado, USA.
- Baicich, P. J. and C. J. O. Harrison. 1997. A guide to the nests, eggs, and nestlings of North American birds, second edition. Natural World Academic Press, New York, New York, USA.
- Cable, T. T., S. Seltman, and K. J. Cook. 1996. Birds of Cimarron National Grassland. General Technical Report RM-GTR-281. U.S. Forest Service. Fort Collins, Colorado, USA.
- DeGraaf, R. M., V. E. Scott, R. H. Hamre, L. Ernst, and S. H. Anderson. 1991. Forest and rangeland birds of the United States: Natural history and habitat use. U. S. Department of Agriculture, Forest Service, Agricultural Handbook 688.
- Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. The birder's handbook. Simon & Schuster, New York, New York, USA.
- Gillihan, S. W. and S. W. Hutchings. Best management practices for shortgrass prairie birds: A landowner's guide. Colorado Bird Observatory, Brighton, Colorado, USA.
- Graul, W. D. 1975. Breeding biology of the mountain plover. Wilson Bulletin 87:6–31.
- Knopf, F. L. 1994. Avian assemblages on altered grasslands. Studies in Avian Biology 15:247–257.
- Knopf, F. L. 1996. Mountain plover (*Charadrius montanus*) in The Birds of North America, No. 211 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, Pennsylvania, USA.
- Knowles, C. J. and P. R. Knowles. 1998. The historic and current status of the mountain plover in Montana. FaunaWest Wildlife Consultants. Bureau of Land Management, Billings, Montana, USA.
- Knowles, C. J. and P. R. Knowles. 1999. The historic and current status of the mountain plover in Montana. FaunaWest Wildlife Consultants. Bureau of Land Management, Billings, Montana, USA.
- Knowles, C. J., C. J. Stoner, and S. P. Gieb. 1982. Selective use of black-tailed prairie dog towns by mountain plovers. Condor 84:71–74.
- May, H. L. In press. Managing rangelands for fish and wildlife. USDA Natural Resources Conservation Service and Wildlife Habitat Council Fish and Wildlife Habitat Management Leaflet, No. 19.
- Pashley, D. N., C. J. Beardmore, J. A. Fitzgerald, R. P. Ford, W. C. Hunter, M. S. Morrison, and K. V. Rosenberg. 2000. Partners in Flight: Conservation of land birds in the United States. American Bird Conservancy, The Plains, Virginia, USA.
- Peterson, R. T. 1990. A field guide to western birds. Third edition. Houghton Mifflin, New York, New York, USA.
- Schwilling, M. D. 1994. Wildlife investigations in western Kansas—January 1, 1993–January 1, 1994. Chickadee Checkoff Nongame Contract No. 238. Kansas Department of Wildlife and Parks.
- Terres, J. K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York, New York, USA.

**Wildlife Habitat Management Institute**

100 Webster Circle, Suite 3  
Madison, Mississippi 39110  
(601) 607-3131

In cooperation with partners, the mission of the Wildlife Habitat Management Institute is to develop and disseminate scientifically based technical materials that will assist NRCS field staffs and others to promote conservation stewardship of fish and wildlife, and deliver sound habitat management principles and practices to America's land users.



[www.whmi.nrcs.usda.gov](http://www.whmi.nrcs.usda.gov)

**Wildlife Habitat Council**

8737 Colesville Road, Suite 800  
Silver Spring, Maryland 20910  
(301) 588-8994

The mission of the Wildlife Habitat Council is to increase the amount of quality wildlife habitat on corporate, private, and public land. WHC engages corporations, public agencies, and private, non-profit organizations on a voluntary basis as one team for the recovery, development, and preservation of wildlife habitat worldwide.



[www.wildlifehc.org](http://www.wildlifehc.org)

Primary author: Holly L. May, Wildlife Habitat Council. Drafts were reviewed by Fritz L. Knopf, USGS Fort Collins Science Center; Sam Fitton, Bureau of Land Management; and Kevin Hunting, Bureau of Land Management. Edited by Charlie Rewa, NRCS Wildlife Habitat Management Institute.

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternate means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.