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Effects of Management Practices on Grassland Birds: McCown's Longspur

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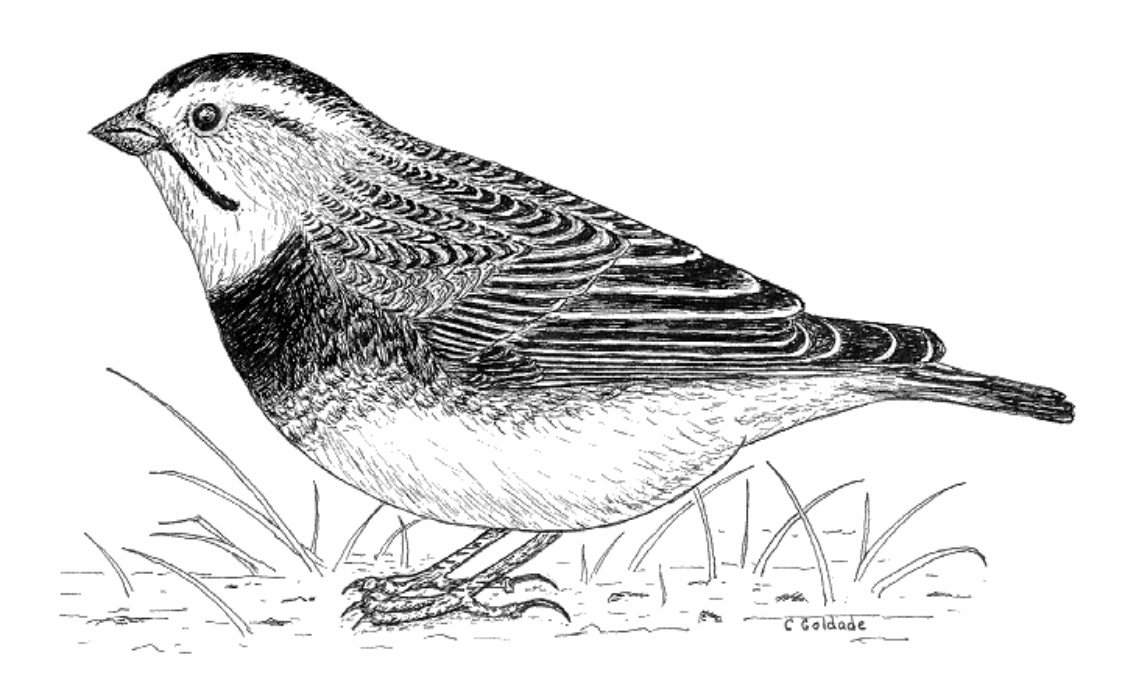
EFFECTS OF MANAGEMENT PRACTICES ON GRASSLAND BIRDS:

McCOWN'S LONGSPUR



Grasslands Ecosystem Initiative
Northern Prairie Wildlife Research Center
U.S. Geological Survey
Jamestown, North Dakota 58401

This report is one in a series of literature syntheses on North American grassland birds. The need for these reports was identified by the Prairie Pothole Joint Venture (PPJV), a part of the North American Waterfowl Management Plan. The PPJV recently adopted a new goal, to stabilize or increase populations of declining grassland- and wetland-associated wildlife species in the Prairie Pothole Region. To further that objective, it is essential to understand the habitat needs of birds other than waterfowl, and how management practices affect their habitats. The focus of these reports is on management of breeding habitat, particularly in the northern Great Plains.

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Species for which syntheses are available or are in preparation:

American Bittern
Mountain Plover
Marbled Godwit
Long-billed Curlew
Willet
Wilson's Phalarope
Upland Sandpiper
Greater Prairie-Chicken
Lesser Prairie-Chicken
Northern Harrier
Swainson's Hawk
Ferruginous Hawk
Short-eared Owl
Burrowing Owl
Horned Lark
Sedge Wren
Loggerhead Shrike
Sprague's Pipit
Grasshopper Sparrow
Baird's Sparrow
Henslow's Sparrow
Le Conte's Sparrow
Nelson's Sharp-tailed Sparrow
Vesper Sparrow
Savannah Sparrow
Lark Sparrow
Field Sparrow
Clay-colored Sparrow
Chestnut-collared Longspur
McCown's Longspur
Dickcissel
Lark Bunting
Bobolink
Eastern Meadowlark
Western Meadowlark
Brown-headed Cowbird

EFFECTS OF MANAGEMENT PRACTICES ON GRASSLAND BIRDS:

MCCOWN'S LONGSPUR

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January 1999
(revised January 2002)

ORGANIZATION AND FEATURES OF THIS SPECIES ACCOUNT

Information on the habitat requirements and effects of habitat management on grassland birds were summarized from information in more than 4,000 published and unpublished papers. A ***range map*** is provided to indicate the relative densities of the species in North America, based on Breeding Bird Survey (BBS) data. Although birds frequently are observed outside the breeding range indicated, the maps are intended to show areas where managers might concentrate their attention. It may be ineffectual to manage habitat at a site for a species that rarely occurs in an area. The species account begins with a brief ***capsule statement***, which provides the fundamental components or keys to management for the species. A section on ***breeding range*** outlines the current breeding distribution of the species in North America, including areas that could not be mapped using BBS data. The ***suitable habitat*** section describes the breeding habitat and occasionally microhabitat characteristics of the species, especially those habitats that occur in the Great Plains. Details on habitat and microhabitat requirements often provide clues to how a species will respond to a particular management practice. A ***table*** near the end of the account complements the section on suitable habitat, and lists the specific habitat characteristics for the species by individual studies. A special section on ***prey habitat*** is included for those predatory species that have more specific prey requirements. The ***area requirements*** section provides details on territory and home range sizes, minimum area requirements, and the effects of patch size, edges, and other landscape and habitat features on abundance and productivity. It may be futile to manage a small block of suitable habitat for a species that has minimum area requirements that are larger than the area being managed. The Brown-headed Cowbird (*Molothrus ater*) is an obligate brood parasite of many grassland birds. The section on ***cowbird brood parasitism*** summarizes rates of cowbird parasitism, host responses to parasitism, and factors that influence parasitism, such as nest concealment and host density. The impact of management depends, in part, upon a species' nesting phenology and biology. The section on ***breeding-season phenology and site fidelity*** includes details on spring arrival and fall departure for migratory populations in the Great Plains, peak breeding periods, the tendency to renest after nest failure or success, and the propensity to return to a previous breeding site. The duration and timing of breeding varies among regions and years. ***Species' response to management*** summarizes the current knowledge and major findings in the literature on the effects of different management practices on the species. The section on ***management recommendations*** complements the previous section and summarizes specific recommendations for habitat management provided in the literature. If management recommendations differ in different portions of the species' breeding range, recommendations are given separately by region. The ***literature cited*** contains references to published and unpublished literature on the management effects and habitat requirements of the species. This section is not meant to be a complete bibliography; a searchable, annotated bibliography of published and unpublished papers dealing with habitat needs of grassland birds and their responses to habitat management is posted at the Web site mentioned below.

This report has been downloaded from the Northern Prairie Wildlife Research Center World-Wide Web site, www.npwrc.usgs.gov/resource/literatr/grasbird/grasbird.htm. Please direct comments and suggestions to Douglas H. Johnson, Northern Prairie Wildlife Research Center, U.S. Geological Survey, 8711 37th Street SE, Jamestown, North Dakota 58401; telephone: 701-253-5539; fax: 701-253-5553; e-mail: Douglas_H_Johnson@usgs.gov.

McCOWN'S LONGSPUR
(*Calcarius mccownii*)

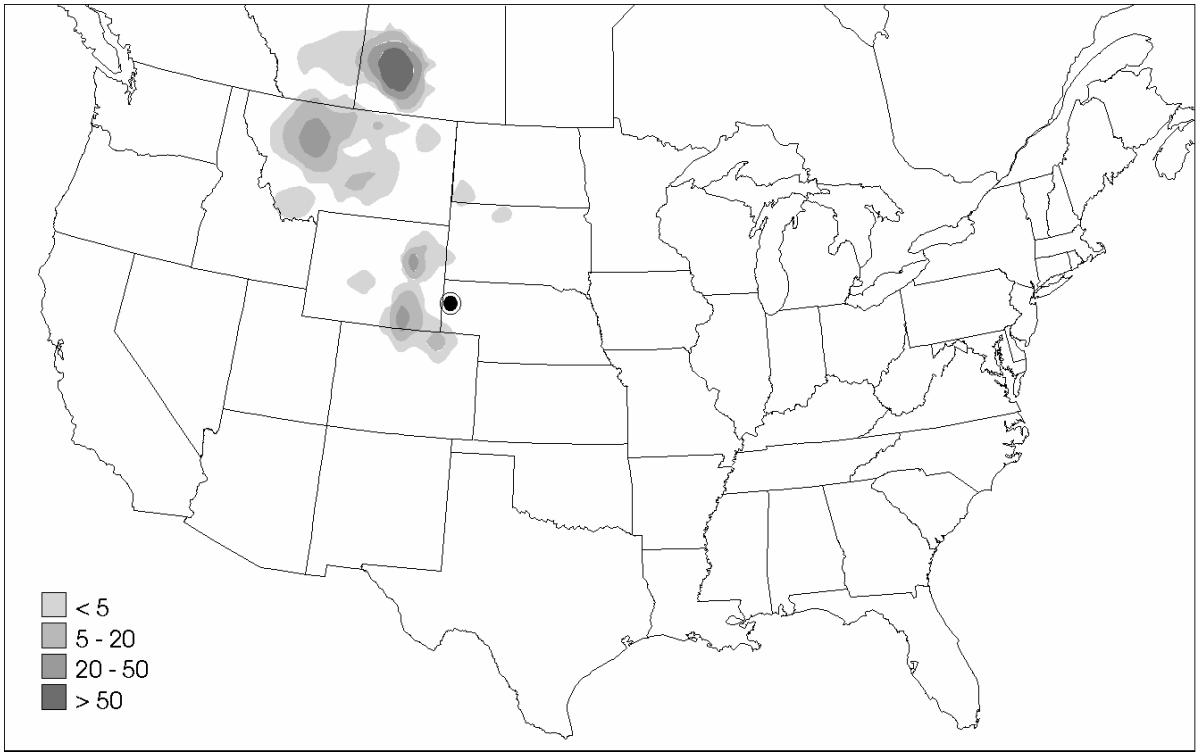

Figure. Breeding distribution of the McCown's Longspur in the United States and southern Canada, based on Breeding Bird Survey data, 1985-1991. Scale represents average number of individuals detected per route per year. Map from Price, J., S. Droege, and A. Price. 1995. The summer atlas of North American birds. Academic Press, London, England. 364 pages. The black circle indicates locations with known populations of McCown's Longspurs, based on Kantrud, H. A. 1982. Maps of distribution and abundance of selected species of birds on uncultivated native upland grasslands and shrubsteppe in the Northern Great Plains. U.S. Department of the Interior, Fish and Wildlife Service, FWS/OBS-82/31. Jamestown, ND: Northern Prairie Wildlife Research Center home page http://www.npwrc.usgs.gov/resource/distr/birds/plainmap/plainmap.htm (Version 16JUL97).

Keys to management include providing short, sparsely vegetated native grasslands of adequate size. Mixed-grass areas can be made suitable for breeding McCown's Longspurs by implementing moderate to heavy, or season-long grazing.

Breeding range:

McCown's Longspurs breed from southern Alberta and southern Saskatchewan, south through Montana, eastern and central Wyoming, and northcentral Colorado, and east to western Nebraska, northcentral South Dakota and southwestern North Dakota (National Geographic Society 1987). (See figure for the relative densities of McCown's Longspur in the United States and southern Canada, based on Breeding Bird Survey data.)

Suitable habitat:

McCown's Longspurs use grasslands with little litter (Felske 1971) and low vegetation cover (DuBois 1935, Creighton 1974), such as that provided by shortgrass or heavily grazed mixed-grass prairie (Saunders 1914; Finzel 1964; Wiens 1970; Maher 1973, 1974; Creighton

1974; Oberholser 1974; Porter and Ryder 1974; Stewart 1975; With 1994*a*; Prescott and Wagner 1996). Cultivated lands also may be utilized, including small-grain stubble fields, minimum- and conventional-tilled land, and summer fallow fields (Felske 1971, Stewart 1975, Martin and Forsyth 2003), although, historically, agricultural lands were avoided (DuBois 1935, Mickey 1943). Early-season abundance of McCown's Longspurs nesting in cropland fields in southcentral Alberta showed a positive correlation with percent bare ground, and productivity appeared to be negatively correlated with the vertical density of forbs (Martin and Forsyth 2003). McCown's Longspurs often breed on high, barren hillsides with southern exposures (Giezentanner 1970*a*,*b*; Felske 1971; Creighton 1974). Blue grama (*Bouteloua gracilis*) and buffalo grass (*Buchloe dactyloides*) are dominant plants in nesting areas (DuBois 1935, Cassel 1952, Creighton 1974).

McCown's Longspur nests tend to be oriented to the north (With and Webb 1993), and about one-third to one-half of nests are placed near clumps of grass, shrubs, plains prickly pear (*Opuntia polyacantha*), or cowpies (DuBois 1935, Mickey 1943, Greer 1988**,** With 1994*b*). However, shrubs and prickly pear near the nest may facilitate depredation by providing protective cover to predators: in northcentral Colorado, 75-80% of nests placed near shrubs or prickly pear were depredated (With 1994*b*). Nests depredated during incubation had six times more shrub cover within 1 m of the nest than did successful nests. In northcentral Colorado, nests were exposed completely to solar radiation at midday and had 45% total exposure per day (With and Webb 1993). High exposure to solar radiation may ameliorate cold stresses associated with an early breeding season. Nests constructed later in the season were more likely to be constructed near vegetative cover than those constructed earlier in the season (With and Webb 1993). In southeastern Wyoming, preferential placement of territories on areas with a high percent of bare ground was attributed to microclimate effects such as early warming and drying of nest sites (Greer 1988). Percent vegetation coverage within 5 cm of the ground was higher in occupied territories than in unoccupied territories (Greer 1988, Greer and Anderson 1989). Occupied territories also had fewer cowpies, less lichen, and lower forb coverage than unoccupied areas. A table near the end of the account lists the specific habitat characteristics for McCown's Longspurs by study.

Area requirements:

Territorial area requirements of McCown's Longspurs vary by region. Reported territory sizes were 0.6 ha in southeastern Wyoming (Greer 1988, Greer and Anderson 1989), 0.5-1.0 ha in Saskatchewan (Felske 1971), and 1-1.5 ha in central Colorado (Wiens 1970, 1971; With 1994*a*). In southeastern Wyoming, an increase in density of breeding pairs between years did not cause territory size to decrease, suggesting that there is an optimal limit to territory size (Greer 1988). Pairs often nest near each other (Mickey 1943, Felske 1971). For McCown's Longspur, no studies have investigated a relationship between patch size and nest success or patch size and rates of brood parasitism by Brown-headed Cowbirds (*Molothrus ater*).

Brown-headed Cowbird brood parasitism:

The status of McCown's Longspur as a host of the Brown-headed Cowbird is not well-known (Friedmann 1963, Maher 1973). In Saskatchewan, Maher (1973) reported that none of 74 nests were parasitized. Friedmann (1963) reported that 2 of 3 nests in North Dakota were parasitized.

Breeding-season phenology and site fidelity:

The breeding season extends from about mid-March through mid-October (Mickey 1943, Giezentanner and Ryder 1969, Felske 1971, Creighton 1974, Salt and Salt 1976, Greer 1988, With 1994*a*), but in some locations McCown's Longspurs may remain on the breeding grounds as late as mid-November (Johnsgard 1980). Second broods were reported in northcentral Colorado, in Montana, and in southeastern Wyoming (DuBois 1935, Strong 1971, Greer 1988). Second broods may be initiated as soon as 3 wk after fledging of the initial brood, but may be limited by female energy reserves (Felske 1971, With 1994*a*).

Species' response to management:

Little is known about the short- or long-term effects of burning on McCown's Longspur populations. Some authors have suggested that prairie fire suppression has contributed to the population decline of the species (Krause 1968, Oberholser 1974, With 1994*a*).

In areas where grass is too tall or thick for McCown's Longspurs, grazing can improve habitat by providing shorter, sparser vegetation (Giezentanner 1970*a*, Stewart 1975, Kantrud and Kologiski 1982, Bock et al. 1993). Heavily grazed areas with aridic boroll soils and moderately grazed areas with aridic ustoll soils appeared to be ideal nesting habitat in portions of North Dakota, Montana, Wyoming, Colorado, and Nebraska (Kantrud and Kologiski 1982). In Alberta, McCown's Longspurs preferred continuously grazed (season-long) native pastures, and were fairly common in native pastures grazed in early summer (Prescott et al. 1993, Prescott and Wagner 1996). They infrequently occupied spring-grazed (late April to mid-June) pastures of crested wheatgrass (*Agropyron cristatum*), and they avoided deferred-grazed (grazed after 15 July) native pastures. In northcentral Alberta, McCown's Longspur used moderately to heavily grazed grasslands on drier, sandier sites than those used by Chestnut-collared Longspurs (Wershler et al. 1991). McCown's Longspurs nesting in Alberta and Saskatchewan were found to favor season-long grazed native pasture over areas managed with complementary grazing (early-season grazing on crested wheatgrass with cattle rotated through several native-grassland paddocks for the remainder of the summer) (Dale and McKeating 1996). McCown's Longspurs did not breed on idle mixed-grass in Saskatchewan, and preferred heavily grazed pastures over lightly or moderately grazed pastures (Felske 1971). Summer-grazed areas were preferred over winter-grazed areas in Colorado shortgrass prairie (Giezentanner and Ryder 1969; Giezentanner 1970*a*,*b*; Wiens 1970). However, overgrazing may be detrimental (Oberholser 1974), particularly in arid, sparse shortgrass (Ryder 1980). In southern Saskatchewan, McCown's Longspurs were found in equal abundances in tame and native pastures (Davis et al. 1997).

Use of cultivated lands has included small-grain stubble fields, minimum- and conventional-tilled land, and summer fallow fields (Felske 1971, Stewart 1975, Martin and Forsyth 2003). In Alberta and Saskatchewan, McCown's Longspurs were more abundant in cropland than in Permanent Cover Program (PCP) grasslands (McMaster and Davis 1998). PCP was a Canadian program that paid farmers to seed highly erodible land to perennial grassland cover; it differed from CRP in the United States in that haying and grazing were allowed annually in PCP.

At the Pawnee National Grassland in Colorado, malathion and toxaphene were applied at rates of 0.6 kg/ha and 1.1 kg/ha, respectively (McEwen and Ells 1975). Densities of McCown's Longspurs were highest in grasslands treated with malathion or toxaphene than in untreated grasslands. However, nestlings were killed by toxaphene applications.

Management Recommendations:

Provide areas of adequate size to support multiple McCown's Longspur territories (0.5-1.5 ha per territory, depending on geographic location), as pairs often nest near each other (Mickey 1943, Wiens 1970, Felske 1971, Greer 1988**,** Greer and Anderson 1989, With 1994*a*).

Protect McCown's Longspur habitat from agricultural and urban development (Oberholser 1974, With 1994*a*).

Provide areas with little litter and short, sparse vegetation with low forb cover (DuBois 1935; Felske 1971; Maher 1973,1974; Stewart 1975; With 1994*a*; Martin and Forsyth 2003).

Prescribed prairie burns have been suggested for historically burned areas where fire has been suppressed (Krause 1968, Oberholser 1974, With 1994*a*).

Protect vegetation that is already sparse and short from overgrazing (Oberholser 1974), especially in areas of low precipitation (Ryder 1980).

Graze areas where grass is too tall or thick for breeding McCown's Longspurs (Giezentanner 1970*a*,*b*; Stewart 1975; Kantrud and Kologiski 1982). McCown's Longspurs did not breed on idle mixed-grass in Saskatchewan, and preferred heavily grazed pastures over lightly or moderately grazed pastures (Felske 1971).

Table. McCown's Longspur habitat characteristics.

Author(s)	**Location(s)**	**Habitat(s) Studied***	**Species-specific Habitat Characteristics**
Cassel 1952	Colorado	Montane meadow, shortgrass pasture, shrubsteppe, woodland	Occurred in high abundances in blue grama (*Bouteloua gracilis*)
Creighton 1974	Colorado	Mixed-grass pasture, shortgrass pasture	Used shortgrass areas with bare ground and sparse vegetation, particularly hilltops; buffalo grass (*Buchloe dactyloides*) and blue grama were often the dominant vegetation at nesting sites; mean vegetation values for occupied areas were 66% shortgrass cover, 1% mid-grass cover, 3% sedge (*Carex*) cover, 2% forb cover, 2% cactus cover, 0.9% shrub cover, 23% bare ground, and 2% rock; mean vegetation height of occupied areas was 5.2 cm
Dale and McKeating 1996	Alberta, Manitoba, Saskatchewan	Cropland, dense nesting cover: idle mixed-grass, idle tame; hayland; mixed-grass pasture; tame pasture	More abundant on season-long grazed native pasture than areas managed with complementary grazing (early-season grazing on crested wheatgrass [*Agropyron cristatum*] with cattle rotated through several native-grassland paddocks for the remainder of the summer)
Davis et al. 1997	Saskatchewan	Cropland, hayland, mixed-grass pasture, tame pasture	Found in equal abundances in native and tame areas
DuBois 1935	Montana	Cropland, idle shortgrass, shortgrass pasture	Nested within dry, sparse areas of prairie dominated by buffalo grass; did not nest in cultivated areas; nests were often placed near a clump of grass

Felske 1971	Saskatchewan	Burned mixed-grass, cropland, idle mixed-grass, mixed-grass pasture	Preferred heavily grazed, barren grassland with little standing dead vegetation; also territorial on cultivated land; often nested on southern/southwestern exposure of hills; did not nest in idle mixed-grass
Finzel 1964	Wyoming	Mixed-grass pasture, shortgrass pasture**,** woodland	Used mixed-grass and shortgrass pastures
Giezentanner 1970*a*,*b*; Giezentanner and Ryder 1969	Colorado	Idle, cropland, hayland, shortgrass pasture	Were most abundant on heavily grazed hilltops with sparse (60% of plant growth removed annually) vegetation of uniform height
Greer 1988, Greer and Anderson 1989	Wyoming	Mixed-grass pasture	Percent lichen cover was higher in occupied territories than in unoccupied areas; mean microhabitat values in occupied territories were: 1.52 total vertical vegetation contacts, 26.5% vegetation cover 0-5 cm, 38.1% bare ground cover, 1.4% cowpie cover, 14.1% lichen cover, 1.0% cactus cover, 7.4% forb cover, 14.8% litter cover, 6.7% shrub cover, 22.9% shortgrass (blue grama) cover, 27.1% mid-grass (needle-and-thread [*Stipa comata*], western wheatgrass [*Pascopyrum smithii*], Junegrass [*Koeleria pyramidata*], Indian ricegrass [*Oryzopsis hymenoides*], bluegrass [*Poa* spp.]) cover
Kantrud and Kologiski 1982	Colorado, Montana, Nebraska, North Dakota, South Dakota, Wyoming	Mixed-grass pasture, shortgrass pasture, shrubsteppe	Used heavily grazed areas with aridic boroll soils, and moderately grazed areas with aridic ustoll soils
Maher 1973	Saskatchewan	Burned mixed-grass, idle mixed-	Were more abundant in grazed than in ungrazed prairie, and bred within grazed prairie

		grass, mixed-grass hayland, mixed-grass pasture	
Maher 1974	Saskatchewan	Cropland, idle mixed-grass, mixed-grass pasture, tame hayland, woodland	Were common in grazed prairie; bred only in grazed prairie
Martin and Forsyth 2003	Alberta	Cropland, idle	Early-season abundance was positively correlated to percent bare ground; productivity was negatively related to vertical density of forbs
McMaster and Davis 1998	Alberta, Manitoba, Saskatchewan	Cropland, Permanent Cover Program (PCP; idle tame, tame hayland, tame pasture)	Were more abundant in cropland than in PCP fields
Mickey 1943	Wyoming	Idle shortgrass	Nested in uncultivated areas; most nests were near grass clumps or brush
Porter and Ryder 1974	Colorado	Shortgrass pasture	Preferred heavily grazed pastures over moderately or lightly grazed pastures for nesting
Prescott and Wagner 1996	Alberta	Mixed-grass pasture, tame pasture	Preferred continuously grazed pastures; were fairly common in native pastures grazed in early summer, infrequently occupied tame pastures of crested wheatgrass grazed in spring from late April to mid-June, and avoided deferred-grazed (grazed after 15 July) native pastures
Saunders 1914	Montana	Idle shortgrass, woodland	Used shortgrass prairie benches (level areas near water)

Stewart 1975	North Dakota	Cropland, idle, idle mixed-grass, idle shortgrass, mixed-grass hayland, mixed-grass pasture	Preferred shortgrass prairie and heavily grazed, xeric mixed-grass prairie; often nested on dry soils; used small-grain stubble fields, newly cultivated areas, and fallow fields
Wershler et al. 1991	Alberta	Cropland, idle mixed-grass, idle tame, mixed-grass pasture, parkland, wet meadow	Preferred moderately or heavily grazed grassland on drier, sandier sites
Wiens 1970	Colorado	Shortgrass pasture	Absent from heavily winter-grazed pasture; nested in heavily summer-grazed pastures characterized by 79% mean grass cover, 0% forb cover, 0% woody plant cover, 3% cactus cover, 19% bare ground cover, 1% rock cover, 0.18 cm average litter depth, 16.8% litter cover, 0.4 cm effective height of vegetation, 1.84 contacts/10 cm interval vertical density at 0-10 cm
With 1994*a*	Rangewide	Idle shortgrass, shortgrass pasture	Used open, sparsely vegetated shortgrass habitat or heavily grazed pastures with similar structure
With 1994*b*	Colorado	Shortgrass pasture	About one-half of nests were built near plains prickly pear (*Opuntia polyacantha*), shrubs, or cowpies; rates of depredation were high (75-80%) for nests placed near shrubs or prickly pear; nests depredated during incubation had six times more shrub cover within 1 m of the nest than did successful nests
With and Webb 1993	Colorado	Shortgrass pasture	Nests experienced complete solar exposure at midday and 45% total exposure per day; placement near prickly pear or shrubs increased in frequency later in the breeding season

*In an effort to standardize terminology among studies, various descriptors were used to denote the management or type of habitat. “Idle” used as a modifier (e.g., idle tallgrass) denotes undisturbed or unmanaged (e.g., not burned, mowed, or grazed) areas. “Idle” by itself denotes unmanaged areas in which the plant species were not mentioned. Examples of “idle” habitats include weedy or fallow areas (e.g., oldfields), fencerows, grassed waterways, terraces, ditches, and road rights-of-way. “Tame” denotes introduced plant species (e.g., smooth brome [*Bromus inermis*]) that are not native to North American prairies. “Hayland” refers to any habitat that was mowed, regardless of whether the resulting cut vegetation was removed. “Burned” includes habitats that were burned intentionally or accidentally or those burned by natural forces (e.g., lightning). In situations where there are two or more descriptors (e.g., idle tame hayland), the first descriptor modifies the following descriptors. For example, idle tame hayland is habitat that is usually mowed annually but happened to be undisturbed during the year of the study.

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