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Wildlife Information Leaflet

HABITAT MANAGEMENT FOR UPLAND GAME BIRDS ON EASTERN COLORADO SANDHILL RANGELAND

Sandhill rangelands occur south of the South Platte River in portions of Sedgwick, Logan, Phillips, Washington, Morgan, Weld, and especially Yuma County in addition to extensive areas in Baca, Prowers, and Kiowa counties in eastern Colorado (Fig. 1). Unless irrigated, these areas are seldom farmed and are dominated by mixtures of native grasses (primarily midgrasses), sand sagebrush (*Artemisia filifolia*), and forbs. Most sandhill areas are privately owned and managed for cattle grazing, however, numerous tracts are owned and/or managed by State and Federal agencies including the U.S. Forest Service, the Colorado State Board of Land Commissioners, and the Colorado Division of Wildlife. Publicly-owned rangelands have high potential to be managed for wildlife, especially birds, either in replacement of, or in addition to, use by livestock. Greater prairie-chickens (*Tympanuchus cupido*), lesser prairie-chickens (*T. pallidicinctus jamesi*), plains sharp-tailed grouse (*T. phasianellus*), (all listed as threatened or endangered in Colorado), and mourning doves (*Zenaida macroura*), scaled quail (*Callipepla squamata*), northern bobwhite (*Colinus virginianus*), and ring-necked pheasants (*Phasianus colchicus*) are breeding residents in the sandhills. Densities of these species are low but there is potential to increase their abundance as well as other nongame and neotropical migrant species through habitat management.

Sources of adequate food are often a major limitation to upland game birds and other avifauna in rangeland habitats. Many forbs provide high-energy seeds and also attract insects that are a nutritious food source for many birds. However, perennial and annual forbs typically comprise <10% of the total vegetation. Less than 5% of the plant

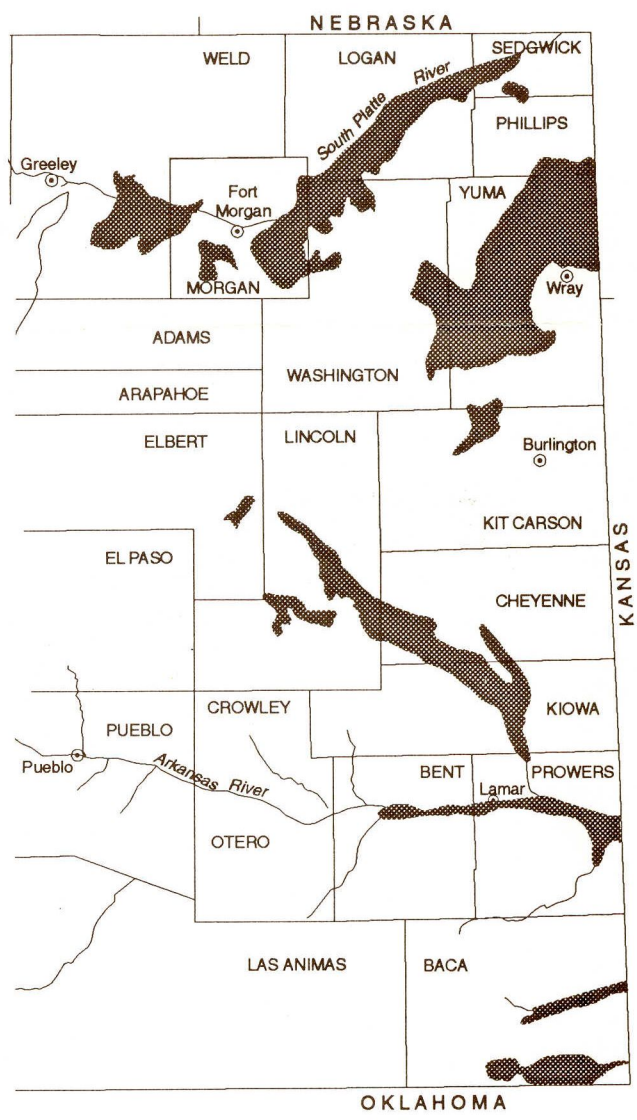


Fig. 1. Distribution of sandsage rangelands in eastern Colorado.

composition is food-producing forbs and livestock grazing may reduce their seed production to insignificant levels for avian species. Unless extensively interspersed with croplands or other disturbed areas, eastern Colorado rangelands are relatively sterile with respect to food production for resident upland birds.

MANAGEMENT RECOMMENDATIONS WHERE GRAZING CAN BE EXCLUDED

Rangeland managed to enhance prairie grouse and other upland birds should be retained in vigorous subclimax condition; it should not be left idle and unmanaged (Kirsch et al. 1973). For Division of Wildlife properties, fire, tillage, and partial revegetation are recommended to produce moderate densities of game birds.

Prescribed burns can be used in eastern Colorado sandhills from late April to mid May, after greenup of cool season grasses, to enhance dominance of tall, warm-season species such as blue-stems (*Andropogon* spp.), switchgrass (*Panicum virgatum*), prairie sandreed (*Calamovilfa longifolia*) assuming they are already common in the grass composition. If a site is dominated by shortgrass and midgrass species such as blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), and needle-and-thread (*Stipa comata*), fire will do little to change the composition or increase the height and density of residual vegetation. Fire is most effective in increasing height and density of grasses during years of above average rainfall. Because of possible wind erosion, fire should be used primarily in mid to late spring when adequate soil moisture will ensure rapid regrowth. At least 0.75 m (2.5 ft) of soil moisture should be available based on soil probe samples. Fire used in late April to mid-May will remove excess litter and enhance growth of tallgrass species, but will neither enhance the abundance of forbs nor thin dense stands of sand sagebrush. Fire in early spring (Mar to mid-Apr) will enhance forb growth but will increase the threat of erosion. Therefore, tillage is usually recommended in preference to burning to promote forbs. Prescribed burns should not be repeated more than once every 5 to 10 years where tall, warm-season grasses dominate. Since sand sagebrush is valuable for concealment and nesting cover but does not regrow quickly after fire, several separate tracts approximating 16 ha (40 a) should be burned rather than one large block so that sand

sagebrush remains well distributed throughout (Fig. 2). A few areas up to 4 ha (10 a) that contain moderate stands of sand sagebrush should remain unburned for longer intervals (15-25 yr) to retain old stands of sand sagebrush.



Fig. 2. Sand sagebrush and grasses in combination provide important cover for nesting, loafing, and other wildlife uses in rangelands.

Tillage of linear strips, is recommended to provide fire guards, promote annual and perennial forbs, and convert sites dominated by shortgrasses to warm-season tallgrasses, perennial legumes, or annual crops (Fig. 3). Strip widths can range from 3 to 4 m for fireguards up to 33-50 m for revegetated plots. Disking or undercutting to retain plant residue on the surface is recommended. One objective of tillage is to create mosaics of vegetation in early to late successional stages and to separate burned tracts in differing stages of recovery to provide year-long needs of prairie grouse and other species.

The primary objective of tillage is production of food. Wild sunflower (*Helianthus annuus*) planted in tilled sites provides seeds and insects for food and cover for broods, winter escape, survival, and hunting cover (Fig. 4). Native annuals such as Rocky Mountain beflower (*Celome serrulata*) and Texas croton (*Croton texensis*) may be planted or may occur naturally. Growth of native perennial forbs such as western ragweed (*Ambrosia psilostachya*) and sweet pea (*Lathyrus polymorphus*) can be enhanced by shallow tillage. Native legumes and dryland varieties of alfalfa (ladak and ranger) provide green succulents for prairie grouse. Water



Fig 3. Tillage destruction of existing vegetation in small strips or patches should precede revegetation to tall, warm-season grasses or food plantings for wildlife.

from windmills, distributed by drip irrigation to patches of legumes, promotes green vegetation into fall and winter. Annual rye and winter triticale provide green vegetation throughout winter. Grain sorghum, sorghum-sudan hybrids, forage sorghums, and other sorghum varieties are adapted to sandy soils and provide food and cover from summer through winter. Patches 1 ha (2.5 a) or larger are recommended to ensure that rodents and other wildlife do not deplete or markedly reduced their value for target bird species. These patches should be placed in low areas with good soil using reduced-till or no-till methods.

In rangeland where short- and midgrasses dominate, patches up to 1 ha (2.5 ac) should be disked to remove shallow-rooted perennials and reseeded to mixtures of tall, warm-season grasses in early spring (Snyder 1990). Mixtures of switchgrass, yellow Indiangrass (*Sorghastrum nutans*), and

native bluestems provide excellent standing residual growth of desirable height and density and are adapted to subsequent management using fire. Interseeding or direct seeding into sod is not recommended. Sites dominated by indigenous prairie sandreed, sand bluestem (*A. halli*), and other deep-rooted vegetation should be renovated using a prescribed burn followed by shallow tillage (<10 cm [4 in.]) to remove competing shallow-rooted species.

Aerial application of liquid herbicides is not recommended to thin dense stands of sand sagebrush because airplanes can not safely fly low enough in hilly terrain and increased drift can affect much wider strips than intended. I recommend using a tractor-mounted sprayer to treat 10-to 30-m wide strips to create mosaics of openings that impact from 10 to 25% of the site. Partial thinning is preferable to complete kills.



Fig. 4. Wild sunflowers.

MANAGEMENT ASSOCIATED WITH GRAZED LANDS

The described management procedures, if used intensively, are not compatible with livestock grazing. However, livestock grazing can not be completely curtailed on most private and many public lands.

Grazing on Private and Public Lands. -- Restoration grazing methods are often used on private and public lands in eastern Colorado. Modern electric fencing makes pasture rotation feasible. In

most rotations, 100% of the land is grazed each year, which is detrimental to prairie grouse. When managing for prairie grouse, complete rest of some range each year (at least 20%) is desirable. Pastured tracts should not be grazed intensively. The optimum for prairie grouse is to graze 20-25% of the area each year leaving 75-80% ungrazed which dictates a 4 or 5-year rotation. Grazed areas should be no larger than 40-50 ha (100-125 a).

Revegetation of small tracts to tall, warm-season grasses should be used in sites dominated by blue grama and other short- and midgrasses. Fencing, either permanent or electric, can be used to exclude livestock.

Food Production Enhancement Within Grazed Ranges. -- Moderate winter grazing to remove and trample old residual and disturb the soil while not impacting plant vigor is preferred to summer grazing. Winter grazing allows greater forb-seed production and increased height and density of standing residual vegetation. Disturbed sites around windmills and corrals produce crotons, beflower, sunflowers, and other forbs of high seed value if used by livestock in winter rather than during the growing season. Weedy sites also provide excellent summer brood habitat for grouse, quail, and pheasants. Windmills should be left running through summer so that overflow water can enhance plant growth and also provide water for mourning doves and other wildlife.

Increasing the quantity and distribution of legumes and other perennial and annual forbs in grazed rangeland will benefit wildlife but may not be readily or economically achieved. Direct seeding of legumes and forbs, like seeding of grasses, into undisturbed grass is not practical since new seedlings cannot compete well with established plants. Interseeding, using an interseeder that creates a wide furrow, may be feasible, especially if grazing is deferred for 1 or more years. Disking narrow strips to destroy most shallow-rooted grasses before planting is the most practical approach.

Fencing small tracts (≤ 0.4 ha [1 a]) to exclude livestock in pasture corners, near windmills, blowouts, or other sites can be used in grazed rangelands. Disking or other disturbance tillage of narrow strips within these tracts promotes growth of wild or tame annuals for quail and doves. Addition of plum thickets, brush shelters, or other resting cover allows quail and other birds to become year-long residents (Snyder 1970, 1983). Occupied

or vacant building sites usually are associated with shrub plantings, windbreaks, and corrals which make them attractive to mourning doves, scaled quail, northern bobwhite, and pheasants. Sagebrush, in sandhills, helps reduce snow depth in woody plantings increasing survival of quail through winter.

Prairie grouse often move several kilometers to obtain winter food and fly 2-3 km on a regular basis to feed in irrigated corn and alfalfa fields (northeastern Colorado) and dryland sorghum fields (southeastern Colorado). However, if grouse must move 6-10 km or more to obtain food in late winter and early spring, supplemental food patches should be considered. Increased flock size, movements, and daily flights increase probabilities for predation and reduce opportunities for lek (display ground) establishment in locations distant from food.

There is considerable potential to manage rangeland in eastern Colorado for prairie grouse, quail, mourning doves, and other upland birds. Management to increase food abundance, to convert short- and midgrass to tallgrass, and to increase the height and density of residual cover is best achieved using prescribed burns, tillage, and revegetation techniques where livestock grazing can be excluded. Within grazed rangeland, use of rest-rotation, seasonal winter grazing, reduced grazing intensity, and fencing can be used to improve habitats for upland game birds.

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