

NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATIONS
UPLAND WILDLIFE HABITAT MANAGEMENT

1. Scope

Procedures, technical details, and other information listed below provide additional guidance for carrying out selected components of the practice. This material is referenced from the conservation practice standard and supplements the requirements and considerations listed therein.

Habitat diversity: The interspersing or the intermixing of the various wildlife habitat components is habitat diversity. Numerous habitat types in small units provide a maximum amount of diversity or edge and benefit certain species such as pheasants. However, this could result in habitat fragmentation and adversely affect some wildlife species such as neotropical migrants. In Kansas, conversion from native plant communities to other types of vegetation should be considered for potential negative wildlife population effects in the planning process. Smaller blocks of cover and increased edge have the potential to lead to increased predation and parasitism. See the "Comparison Sites" section below for assistance with this issue.

Habitat linkages: Linking fragmented habitats or cover types with corridors may greatly increase the use of an area by wildlife. Corridors can provide food, cover, water, and travel access for wildlife. Priority habitats for linking with wildlife corridors are riparian areas, wetlands, native prairies, and native woodlands. Fence rows, windbreaks, waterways, and contour and crosswind grass strips can link habitats. There is no minimum or maximum width as long as the width is adequate to meet the species needs. Examples of types of vegetation for corridors are perennial grass, trees, shrubs, or a combination of vegetation types. Wildlife planners will identify vegetative components, configuration, and shape of corridors by use of the Kansas Wildlife Habitat Assessment Guide (KWHAG) and the Private Lands Wildlife Management (PLWM) publication.

Daily and season ranges: Wildlife species occur in a home range or a geographic area. Food must be present in sufficient quantity and quality, and have the structure and composition to be usable for the daily and seasonal needs of the species.

Limiting factor: Some conditions will limit population growth within the home range of each animal. If that condition is removed or improved, numbers will increase to the point where another condition sets the limit. These conditions can be grouped into two categories: (1) those which can be influenced or changed, such as the vegetative elements of habitat which impose limits through food supply, protection, and reproduction, and (2) those which are difficult or cannot be influenced, such as climate or topography.

Plant communities: Many wildlife species prosper at some early plant successional stage. Others are dependent on climax communities. Knowledge of the local plant communities, the plant species in the successional stages, and the associated animals is essential for providing accurate wildlife management assistance.

Where wildlife management is an objective, the food and cover value of the planting can be enhanced by using an approved habitat evaluation procedure to aid in selecting plant species and providing for other habitat requirements necessary to achieve the objective.

Comparison sites: This is another tool available to assist in habitat development. A planner can use resource information such as soils, plant species, and wildlife species from a comparison site(s) to optimize a wildlife development plan. Areas that provide all of the necessary components (food, cover, and water) for stable wildlife populations provide a wealth of information, such as preferred foods,

distance to water, disturbance, plant species, interspersions, den trees, and other habitat information. Plantings, seedings, water development and management should be used to meet the intended objective. Where program or regulatory issues apply, comparison sites will be sampled according to agency policy.

2. Habitat Development

Native or introduced grasses, forbs, and woody plants can be established and managed to meet landowner objectives or program objectives for upland wildlife habitat management. For herbaceous seedings, use Table 1, which is a seeding matrix entitled "Herbaceous Wildlife Planting Guide." Use Form KS-ECS-4 in planning a herbaceous seeding mix. For woody plantings, refer to Section II of the electronic Field Office Technical Guide (eFOTG) for plant species selection and use Form KS-ECS-5 to design the plan.

Native plants should be used in seeding and plantings to imitate native plant communities. Introduced species can be used for wildlife seeding and planting where introduced plants are needed to meet wildlife or landowner objectives. Introduced species are listed at the end of Table 1.

Refer to species requirements in the Fish and Wildlife Habitat Management (FVHM) leaflets and the PLWM publication for the size, configuration, location, and management of the planting or seeding area. These elements will vary widely due to the target species requirements.

Configuration: Where possible, establish habitat in blocks or linear plantings as required to benefit target species or groups.

Location: For optimum wildlife benefit, locate habitat development sites near existing food, cover, or water where the lack of the critical habitat component is a limiting factor in the environment.

Management: Protect the new plantings and seedings from mowing, burning, and grazing unless these management tools are needed to benefit the habitat and the target wildlife species.

3. Food Plots

Food plots can be established to benefit target wildlife species and to meet landowner objectives in wildlife management. Food plots are designed to provide a food source for wildlife during severe winters or in areas where food may be limited such as big Conservation Reserve Program (CRP) fields that are isolated from cropland. Typically, food plots are planted to grain sorghum, or ideally, a mixture of grain and forage sorghum to provide food and cover due to selective lodging. Food plots may be planted to any grain or a green crop such as clover or alfalfa. Ideally, a crop rotation is recommended, such as wheat/sorghum/fallow or a sorghum and legume rotation. Having paired food plots allows rotation while providing a sorghum food source each year. Livestock and traffic control will be provided if necessary.

4. Food Plot Planting and Management

Site preparation, planting schedule, planting method, and seeding rate shall be in accordance with accepted agronomic practices for the selected food crop and soil type as listed on the field sheets. Seedbed preparation should be carried out to minimize negative environmental impacts. Seed must be of a quality that provides the desired food plot yield. Legumes should be correctly inoculated. Fertilizers should be applied according to a nutrient management plan for moderate yield. Pesticides should be used sparingly since it may not be necessary to maximize yield. Often a moderate yielding field with some additional weedy cover provides the best food and cover combination. If necessary, irrigation may be applied during the development of the food crop according to the conservation plan.

5. Chemicals (For Food Plot Establishment and Growth/Noxious Weed Control)

All pesticides used in performing this practice shall be registered by federal, state, and local government and shall be applied strictly in accordance with authorized and registered uses, directions on the label,

and other federal or state policies and requirements. Annual plant communities and associated insect life should be recognized as valuable for certain wildlife. Wildlife will be considered before applying pesticides. Follow label directions.

6. Location (For Food Plots)

Food plots can be located where soil conditions are suitable to grow the desired wildlife food plants and where erosion is controlled to the "T" or tolerable level. The primary considerations for locating food plots are the need of the target species and the objectives of the landowner. Location options include, but are not limited to, the desire for a viewable area by a home owner in farmsteads or suburban developments, the attraction of upland game for hunting purposes, and the providing of food for wildlife to stabilize or enhance target wildlife species. Consider the effects of predation and human impacts.

7. Timing (For Food Plots)

The crop from seed-producing food plots can be timed to be available for wildlife use at the critical time when food supplies may limit wildlife survival.

8. Size (Of Food Plots)

Some of the seed in food plots will be consumed before the winter months. Wildlife food plots should be large enough or numerous enough to supply food through the critical period. Local knowledge, landowner objectives, size and number of animals in the wildlife population that use the food plot, and the geographic home range of the target wildlife species are considerations in planning the food plot size. Refer to FWHM leaflets and Section IV of the PLWM for the specific needs of a species. Programs that provide assistance, incentives, and cost sharing for establishment of food plots may dictate the size of food plots. Special consideration will be taken to meet the program requirements for maximum and minimum allowable size of food plots for wildlife.

9. Environmental Disturbance for Wildlife Benefit

Disturbance in natural ecosystems can produce valuable vegetative habitat components by creating vegetative diversity, by changing the vegetative seral stages, and by increasing biological production. Use KWHAG and the input of the area biologist when planning these practices. Additional eFOTG practices that can be valuable to wildlife are the Kansas Conservation Practice Standards: 338, Prescribed Burning; 528A, Prescribed Grazing; and 666, Woodland Improvement. Various mechanical activities that are not described in the eFOTG can also be valuable in avoiding the disturbance of wildlife.

Disked strips for wildlife: Disking can be used to create diversity on established grass fields where the objective is to promote forbs and other plants that benefit ring-necked pheasants, bobwhite quail, and other species that need early successional vegetation. Annual broadleaf plants such as sunflower and kochia stimulate insect growth for wildlife food and provide food, cover, and water for some species. Disking at a depth of up to three inches is recommended. The objective is to leave an average of 25 percent of the grass stand alive. The total disked area will be no more than 15 percent of the field. Where a landowner is using conservation program incentives, follow program guidelines for the total recommended disked area.

Light disking should be avoided in areas where erosion is a problem and in areas with historic or existing noxious weed problems. Placing strips on field contours or perpendicular to the prevailing wind may reduce potential erosion problems. Erosion will be controlled according to eFOTG recommendations. Size and width of strips should be chosen to benefit target species. Disking must be done after native grass dormancy in the fall and completed prior to April 15. It should be avoided during the primary nesting season. A single disking may provide beneficial effects for more than one year. Additional areas can be disked in future years as needed.

Controlled burning: Burning is the method preferred for the maintenance of native grass for wildlife management. Burning should be done every three to four years to reduce litter and improve plant health. Burning for wildlife purposes should be done as early as possible (March 15 through April 15) to encourage broadleaf plant growth and to avoid negative wildlife impacts during the primary nesting season. When possible, burning should be done on a rotational basis to preserve critical nesting cover for target species each year. Food plots can be used on field perimeters to serve a dual purpose of wildlife food and fire control. Strip disking can also be used for a firebreak.

Interseeding native and introduced species into existing vegetative stands: Existing stands of introduced grasses may be interseeded with one or more introduced grasses and or forb/legumes to increase plant diversity for improved wildlife habitat. However, existing stands of introduced grasses may not be interseeded with one or more native grasses and/or native forb/legumes. If introduced grasses are to be used in the interseeding, the drill seeding rate will be 1/3 of the full seeding rate for that particular species. The forb/legume component drill seeding rate will be one pure live seed, pound per acre (PLS lb./ac). If broadcast seeding is used, the rates will be doubled. Broadcast seeding is an option for use with introduced legumes only. All grasses must be drill seeded.

For example, a producer has an existing stand comprised of smooth brome. He desires to interseed that stand with intermediate wheatgrass, orchardgrass, and alfalfa. The drill seeding rate for intermediate wheatgrass would be 4 PLS/lbs./ac. ($12 \times 1/3 = 4$), for orchardgrass 1 PLS/lb./ac. ($3 \times 1/3 = 1$), and for alfalfa 1 PLS/lb./ac.

Options for Interseeding Introduced Grasses and/or Introduced Forbs/Legumes

Mechanical tillage followed by drilling or broadcast seeding: The area proposed for interseeding would receive light mechanical tillage to prepare the seedbed and also to suppress the existing vegetation. The amount of tillage and degree of disturbance would depend on the planned seeding method. If broadcast seeding, a one or two pass tillage operation with shallow soil disturbance (1-2 inch depth) would be desirable. If drilling is planned, more tillage may be required to prepare a proper seedbed. It is highly recommended that following the tillage operation, a harrow operation be performed to smooth the surface of the field. Drilling is the preferred method of seeding, but broadcast seeding is allowed at the higher seeding rate. Following broadcasting, the area should be cultipacked or rolled to help incorporate the seed and improve seed to soil contact. Caution: Tillage should not be used in any known areas of noxious weeds. Any surface disturbance may result in excessive weed growth, which may require control if the weed competition is detrimental to species establishment.

Prescribed burn followed by drilling or broadcast seeding: The area proposed for interseeding would be burned winter or early spring (February to mid-March) followed by drilling or broadcast seeding of the forb/legume component and/or grass species. Burning is not approved for soils in Wind Erosion Groups (WEG) greater than 86, unless specifically approved by the state resource conservationist. Drilling is the preferred method of seeding, but broadcast seeding is allowed at the higher seeding rate. Following broadcasting, the area should be cultipacked or rolled to help incorporate the seed and improve seed to soil contact.

Frost seeding: Frost seeding is limited to the eastern seeding zone. The area proposed for interseeding would be overseeded (broadcast) with the forb/legume component and/or grass species. The preferred situation would be the overseeding into a bunchgrass stand such as tall fescue or a thin/marginal stand of a sodforming species such as brome.

If grasses are to be added to the stand, drilling would be the preferred method as there has been limited success with the frost seeding (broadcast) method. Of the cool season grasses, fescue and orchard grass may be overseeded, but brome should be drilled. The overseeding would be completed in February to mid-March. Although it is not considered necessary, disturbing the soil slightly in the fall before seeding may help establishment.

Chemical burndown followed by direct seeding: The area proposed for interseeding would receive a burndown herbicide (such as glyphosate) application followed by direct seeding. This method involves killing or burning down existing vegetation (as compared to broadcast spraying) to allow for more vigorous growth of interseeded species. It may be necessary to manage the existing cover (burning, mowing) to allow for proper drilling. Read and follow herbicide label directions.

Mowing, haying, or grazing followed by drilling: The existing cover is removed by such methods as mowing, haying, or grazing, followed by drilling directly into the stubble. The drill must be properly equipped to allow proper seed placement through the existing cover.

No-till seeding into existing cover: The area proposed for interseeding would be seeded by drilling directly into existing cover with no seedbed preparation. It may be necessary to manage the existing cover (burning, mowing) to allow for proper drilling. The drill must be properly equipped to allow proper seed placement through the existing cover.

Interseeding into existing vegetative stands comprised of native grasses: Existing stands of native grasses may be interseeded with one or more native grasses and/or native or introduced forb/legumes to increase plant diversity for improved wildlife habitat.

If native grasses are to be interseeded, the drill seeding rate will be 50 percent of the full seeding rate for that particular species. The forb/legume component drill seeding rate will be 1 PLS/lb./ac. If broadcast seeding is used, the rate will be doubled. Broadcast seeding is an option for use with introduced legumes only, not for native grasses or native forbs/legumes. All native species must be drill seeded.

For example, a producer has an existing stand comprised of switchgrass, little bluestem, sideoats grama, and big bluestem. He desires to interseed Indiangrass and a mixture of native forb/legumes into the existing stand. The drill seeding rate for Indiangrass would be 3 PLS/lbs./ac. ($6 \times 50\% = 3$) and 1 PLS/lb./ac. for the native forbs/legumes.

Options for Interseeding Native Grasses and/or Native or Introduced Forbs/Legumes

Mechanical tillage followed by drilling or broadcast seeding: The area proposed for interseeding would receive light mechanical tillage to prepare the seedbed and also to suppress the existing vegetation followed by drilling or broadcast seeding. The amount of tillage and degree of disturbance would depend on the planned seeding method. If broadcast seeding, a one or two pass tillage operation with shallow soil disturbance (1/2-1 inch depth optimum) would be desirable. If drilling is planned, more tillage may be required to prepare a proper seedbed. It is highly recommended that following the tillage operation, a harrow operation be performed to smooth the surface of the field. Drilling is the preferred method of seeding, but broadcast seeding is allowed at the higher seeding rate. Following broadcasting, the area should be cultipacked or rolled to help incorporate the seed and improve seed to soil contact.

Caution: Tillage should not be used in any known areas of noxious weeds. Any surface disturbance may result in excessive weed growth, which may require control if the weed competition is detrimental to species establishment.

Prescribed burn followed by drilling or broadcast seeding: The area proposed for interseeding would be spring burned two to three weeks prior to the normal burning date, followed by drilling or broadcast seeding. Spring burning is not approved for soils in WEG greater than 86, unless specifically approved by the state resource conservationist. Drilling is the preferred method of seeding, but broadcast seeding is allowed at the higher seeding rate. Following broadcasting, the area should be cultipacked or rolled to help incorporate the seed and improve seed to soil contact.

Mowing, haying, or grazing followed by drilling: The existing cover is mowed, hayed, or grazed followed by drilling directly into the stubble. The drill must be properly equipped to allow proper seed placement through the existing cover.

No-till seeding into existing cover: The area proposed for interseeding would be seeded by drilling directly into existing cover with no seedbed preparation. It may be necessary to manage the existing cover (burning, mowing) to allow for proper drilling. The drill must be properly equipped to allow proper seed placement through the existing cover.

10. Den trees

Den trees in an ecosystem will be assessed, if applicable, according to the KWHAG. For cavity nesting species, den trees may need to be protected from fire, wood cutting, and human clean-up activities in order to provide needed food and nesting habitat.

11. Fencing

Vegetation can be managed and improved through fencing to exclude livestock. Riparian areas, wetlands, and ponds are priority habitats for this practice.

Odd areas: Many small areas not normally used for agriculture production may provide excellent wildlife habitat. Fence rows, homesteads, field corners, and roadsides are examples of areas where undisturbed vegetation can be an excellent habitat.

Center-pivot irrigation corners: In intensively cropped areas where center-pivot irrigation is common, there may be little undisturbed upland cover available during critical times of the year. Planting permanent cover on the corners of fields greatly enhances the habitat for upland species. Even leaving tall wheat stubble on the corners is an improvement, as stated below.

Wheat stubble management: Winter wheat stubble that remains 12 inches tall and is left standing undisturbed through winter provides excellent wildlife habitat. Moisture lost to weed growth in the summer and fall period is usually exceeded by moisture gained from having the additional cover present during winter.

Woody cover: Some special requirements are necessary to get maximum wildlife benefits from woody cover. A minimum of five rows is needed for snow protection. At least two rows of shrubs should be planted on the south or east sides to provide overhead protection, wind protection, and shade. A windbreak should be designed with a trip row of shrubs on the north and west to break the snow 50 to 100 feet before getting to the main tree row. Tree species should be selected according to landowner objectives and requirements of the target wildlife species. A weed and moisture barrier is recommended for all tree and shrub wildlife plantings.

Shrub plots are particularly valuable for upland birds. They provide overhead cover, protection from wind, sun, and food. Shrub plots of 1/4 acre (100 feet by 100 feet) are recommended, but any size and configuration of plantings are valuable.

12. Plans and Specifications

Plans and specifications shall be prepared in accordance with the criteria of the standard and shall describe the requirements for applying the practice to achieve its intended use. Plans and specifications shall be developed for the specific field site. For plant species, varieties, and adaptation information, refer to Kansas Plant Materials Technical Note No. 1 (Rev. 6). Plans and specifications may include engineering plans, specific Kansas forms, technical guides, or narrative statements in conservation plans. Other applicable practice standards should be used when appropriate, such as Conservation Cover, Brush Management, or Tree Planting, to meet identified habitat deficiencies.

13. Operation and Maintenance

Actions will be carried out to ensure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation) such as prescribed burning or mowing, and repair and upkeep of the practice (maintenance). An example would be the replacement of dead trees or shrubs. This practice will be inspected periodically and restored as needed to maintain the stated purpose. Additional operation and maintenance requirements will be developed on a site-specific basis to ensure performance of the practice as intended.

Table 1 - Herbaceous Wildlife Planting Guide

X = Plant species are recommended for this site

O = Not recommended

The planting mix must contain four species including two grasses, at least one forb or legume, and no more than 50 percent of any one species. Native species should be used where possible to meet wildlife objectives although introduced species can be beneficial for wildlife populations and are listed separately. All mixes will comprise 100 percent of the seeding mix. All seed must comply with state law requirements.

Adapted plants are listed by the Kansas Range Site name. Sites like Blue Shale and Chalk Flats are not listed but add diversity and are usually not considered adapted sites for revegetation. Handle these on a case-by-case basis with biology input from the area or state biologists.

Sandy, Sands, Choppy Sands, and Sandy Lowland Sites

Native Grass Species				
	PLS/lbs./ac. ^{1/}	West	Central	East
Big Bluestem	6	X	X	X
Sand Bluestem	6	X	X	X
Little Bluestem	4	X	X	X
Indiangrass	6	X	X	X
Switchgrass	3	X	X	X
Sideoats Grama	6	X	X	X
Blue Grama	2	X	X	O
Sand Lovegrass	2	X	X	X
Prairie Sandreed	4	X	X	O
Giant Sandreed	4	X	X	O

Native legumes - Include 0.1 to 1.0 PLS/lbs./ac. ^{1/} in addition to native grass (optional)				
	West	Central	East	
Purple Prairieclover	X	X	X	
Showy Partridgepea	X	X	X	
Roundhead Lespedeza	O	X	X	

Forbs - Adapted forbs may be used to replace or can be planted in addition to native legumes. Include 0.1 to 1.0 PLS/lbs./ac. ^{1/} in addition to the desired mixture (optional)				
	West	Central	East	
Maximilian Sunflower	X	X	X	
False Sunflower	O	X	X	
Prairie Coneflower	X	X	X	

^{1/} PLS/lbs./ac. is based on a full seeding rate for the species involved.

A variation of 10 percent above or below the planned rate for each species is allowable. For planning purposes, the rates shown will be used.

**Loamy, Limy, Clay Upland and Lowland, Claypan, Clay Terrace, Clay Upland,
and Eroded Red Clay Prairie Sites**

Native Grass Species				
	PLS/lbs./ac. ^{1/}	West	Central	East
Big Bluestem	6	X	X	X
Sand Bluestem	6	X	X	X
Little Bluestem	4	X	X	X
Indiangrass	6	X	X	X
Switchgrass	3	X	X	X
Sideoats Grama	6	X	X	X
Blue Grama	2	X	X	X
Buffalo Grass	5	X	X	X
Western Wheatgrass	10	X	X	O
Eastern Gamagrass	8	O	X	X

Native legumes - Include 0.1 to 1.0 PLS/lbs./ac. ^{1/} in addition to the desired mixture (optional)				
	West	Central	East	
Purple Prairieclover	X	X	X	
Showy Partridgepea	X	X	X	
Illinois Bundleflower	X	X	X	
Roundhead Lespedeza	O	X	X	
Leadplant	X	X	X	

Forbs - Adapted forbs may be used to meet wildlife objectives. Include 0.01 to 1.0 PLS/lbs./ac. ^{1/} in addition to the desired mixture (optional)				
	West	Central	East	
Maximillian Sunflower	X	X	X	
Pitcher Sage	X	X	X	
Thickspike Gayfeather	O	O	X	
False Sunflower	O	X	X	
Prairie Coneflower	X	X	X	
Grayhead Prairie Coneflower	O	O	X	
Engelman's Daisy	X	X	X	

^{1/} PLS/lbs./ac. is based on a full seeding rate for the species involved. A variation of 10 percent above or below the planned rate for each species is allowable. For planning purposes, the rates shown will be used.

Saline Lowland and Saline Subirrigated Sites

Native Grass Species				
	PLS/lbs./ac. ^{1/}	West	Central	East
Indiangrass	6	X	X	X
Switchgrass	3	X	X	X
Sideoats Grama	6	X	X	X
Blue Grama	2	X	X	X
Buffalograss	5	X	X	X
Western Wheatgrass	10	X	X	X
Tall Wheatgrass	12	X	X	O
Alkali Sacaton	1	X	X	O

Native legumes - Include 0.1 to 1.0 PLS/lbs./ac. ^{1/} in addition to mixture (optional)			
	West	Central	East
Showy Partridgepea	X	X	X

Forbs - Adapted forbs may be used to replace or can be planted in addition to native legumes. Include 0.1 to 1.0 PLS/lbs./ac. ^{1/} in addition to the desired mixture (optional)			
	West	Central	East
Maximilian Sunflower	X	X	X
False Sunflower	O	X	X
Purple Prairieclover	O	X	X
Thickspike Gayfeather	O	X	X

^{1/} PLS/lbs./ac. is based on a full seeding rate for the species involved.
 A variation of 10 percent above or below the planned rate for each species is allowable.
 For planning purposes, the rates shown will be used.

Introduced Plants (Check Adaptability on a Site Basis)

Plant the following recommended rates ^{1/} where native plant seed is not available or where the cost of native seed limits the development of habitats that meet the planned wildlife objective. Introduced plant seed will not be planted where programs require native plantings or where native habitat restoration is the primary and/or secondary resource conservation objective.

Cool Season	
	PLS/lbs./ac. ^{1/}
Creeping Foxtail	4
Meadow Bromegrass	16
Orchardgrass	4

Legumes	
	PLS/lbs./ac. ^{1/}
Alfalfa	8
Birdsfoot Trefoil	6
Crownvetch	10
Ladino Clover	3
Red Clover	7
Yellow Sweetclover	8

^{1/} PLS/lbs./ac. is based on a full seeding rate for the species involved.

A variation of 10 percent above or below the planned rate for each species is allowable. For planning purposes, the rates shown will be used.