

**NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATIONS**

UPLAND WILDLIFE HABITAT MANAGEMENT

1. Scope

Upland Wildlife Habitat Management will be carried out on lands where game and non-game wildlife are the primary or secondary objective of the landowner or project purpose. This specification provides details and other information that shall be used in the planning and implement process, where appropriate, to improve upland habitat management.

Habitat Diversity. Interspersion or 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 and quail. Potential negative wildlife population effects should be considered before converting native plant communities to other types of vegetation. Habitat fragmentation can adversely affect some wildlife species such as neotropical migrants and grassland birds. In Kansas, prairie chickens require large blocks of native grass for survival.

Habitat Linkages. Habitat linkages or cover types with corridors may greatly increase the use of an area by wildlife. Corridors particularly can provide travel access but also may offer food, cover, and water for wildlife. Priority habitats for linking with wildlife corridors are riparian areas, wetlands, native prairies, and native woodlands. Fencerows, windbreaks, waterways, and contour and crosswind grass strips are examples of linking. There is no minimum or maximum width as long as the width is adequate to meet the species needs. Vegetation for corridors can include perennial grass, annual or perennial forbs, 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), the Private Lands Wildlife Management (PLWM) publication from Kansas State University (KSU) Extension, and other approved wildlife habitat assessment guides, and when recommended by Kansas Wildlife and Parks (KDWP), Natural Resources Conservation Service (NRCS), and U.S. Fish and Wildlife Service (USFWS) wildlife biologists.

Home Range. Wildlife species occur in a home range or a geographic area. Individual species life requirements must be present in sufficient quantity and quality. Structure and composition of habitat must be available for the daily and seasonal needs of the species. Habitat assessments provided with this specification identify home range for prairie chicken, bobwhite quail, and ring-necked pheasants. For other species, refer to PLWM publication, species specific leaflets, or recommendations from wildlife biologists.

Limiting Factor. Habitat assessments are used to identify limiting factors. Some conditions will limit populations within the home range of each animal. If that condition is removed or improved, species population 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. These elements impose limits through food supply, protection, and reproduction.

(2) Those which are difficult or cannot be influenced, such as climate or topography.

Plant Communities. Many wildlife species prosper at the 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.

Comparison Sites. The use of comparison sites 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, interspersed 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

Herbaceous Cover Establishment. Native or introduced non-invasive 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. Use Form KS-ECS-4, Grass Seeding, in planning an herbaceous seeding mix. Where upland bird brood-rearing habitat development is the primary objective and erosion remains within tolerable limits (T) after treatment, a reduced grass seeding rate and a higher forb component will provide for a more "open" stand and allow for other annual plant growth. Some species like bobwhite quail require 25-50 percent bare ground.

See Conservation Practices 550, Range Planting, or 512, Pasture and Hay Planting for seeding methods and establishment procedures. Optimum statewide seeding dates for native species are March 15 to May 15. Maximum seeding dates are December 1 to May 15. Seeding dates for introduced plants can include August 15 to September 30. The responsible technician may extend the seeding dates two weeks where justified by climatic conditions.

Native plants should be used in seeding and plantings to imitate native plant communities. Non-invasive introduced species can be used for wildlife seeding and planting where introduced plants are needed to meet wildlife or landowner objectives.

Refer to species requirements in the NRCS Fish and Wildlife Habitat Management (FWHM) leaflets and the KSU 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.

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

Inter-Seeding. Inter-seeding of legumes and forbs into existing grass stands can provide a needed food source and add plant diversity to attract beneficial insects necessary for brood habitat. Existing stands of native or introduced grasses may be inter-seeded with one or more forbs/legumes to increase plant diversity for improved wildlife habitat. Drilling is the preferred method of seeding for native species, but broadcast seeding is allowed at the higher seeding rate for introduced species. The forb/legume component drill seeding rate will be from 0.5 to one pure live seed, pound per acre (PLS lb/ac). If broadcast seeding is used for introduced species, the rates will be doubled. The following methods are acceptable for inter-seeding:

- **Drilling or Broadcasting Following a Prescribed Burn.** The area proposed for inter-seeding would be burned by March 31, 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.

- **Mechanical Tillage Followed by Drilling or Broadcast Seeding.** The area proposed for inter-seeding would receive mechanical tillage sufficient to prepare the seedbed and also to suppress the existing vegetation. The amount of tillage and degree of disturbance will depend on the planned

seeding method. Tillage should be used with caution in any known areas of noxious weeds or highly erodible soils. Surface disturbance may result in noxious weed growth which will require control or excessive non-noxious weed growth, which might require control if the weed competition is detrimental to species establishment.

- **Herbicide Application Followed by Direct Seeding.** The area proposed for inter-seeding would receive a non-selective herbicide (such as glyphosate) application followed by direct seeding. Herbicides are applied to temporarily reduce the vigor of existing vegetation to allow for more vigorous growth of inter-seeded species. It may be necessary to manage the existing cover (burning, mowing, etc.) to allow for proper drilling. Read and follow herbicide label directions. If this method is used to convert cool-season grass to warm-season native grass, rates should be sufficient to eradicate the cool-season species. It is likely that at least two applications will be required to eradicate cool-season species such as smooth brome or fescue.

- **Mowing, Haying, or Grazing Followed by Drilling.** The existing cover is reduced by such methods as mowing, haying, or grazing, followed by drilling directly into the residue. The drill must be properly equipped to allow proper seed placement through the existing cover

- **Frost Seeding.** Frost seeding is limited to the eastern seeding zone. The area proposed for inter-seeding would be over seeded (broadcast) with the forb/legume component. This would be done between November 1 and December 31 to allow natural processes of freezing, thawing, and precipitation to incorporate the seed.

- **No-till Seeding into Existing Cover.** The area proposed for inter-seeding is seeded by drilling directly into existing cover with no seedbed preparation. This is the least preferred method. Seeding should be completed with a no-till drill. Management actions including burning, mowing, or grazing may be required after the seeding.

Note: Hydro-seeding may be used in place of drilling or broadcasting in any of the above methods if proper equipment is available.

3. Herbaceous Cover Management

Used alone or in combination, the following techniques may be used to manipulate successional stages of grassland habitat. If the field size is large (greater than 80 acres), it is usually best to treat only one-half of a field to allow some residual cover.

Prescribed Burning. Use Conservation Practice 338, Prescribed Burning, to remove excess litter and improve wildlife habitat. Burning at the right time can open the stand to allow for bird movement, encourage forb growth to increase diversity and attract insects, and control unwanted woody encroachment. Allowable dates are August 15 to April 15. Generally, burning between February 1 and March 15 is the preferred window for opening up the stand and encouraging forb growth, however, other dates can be used for specific management purposes.

Rotational Burning. Burning is the method preferred for the maintenance of native grass of wildlife management. Rotational burned pastures should only be burned once every three to four years, or as designed, 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.

Patch Burning. Kansas Biology Technical Note 34, Patch Burn Grazing (PBG), is defined as an application of prescribed fire to focus livestock grazing on a portion of a grazing unit where the objective

is to increase the diversity and structure of vegetation to benefit wildlife and maintain livestock production. This is especially valuable to prairie chickens in large grassland areas. By burning different parts of a pasture on a rotational basis, livestock grazing pressure and hoof action can be shifted. This creates a mosaic of habitats that provide nesting cover and brood rearing cover within the same pasture while maintaining livestock performance.

A written burn plan will be prepared by certified individuals. All patch burns will follow Conservation Practice 338, Prescribed Burning. Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets (Form KS-ECS-22), technical notes, and narrative statements in the conservation plan, or other acceptable documentation. All necessary permits must be obtained before implementation of the practice.

As a minimum, a Prescribed Burn Plan will include:

- Map indicating the location of the burn.
- Resource management objectives and timing of the burn.
- Pre-burn vegetative description of the area
- Acceptable conditions for prescribed burn.
- Description of pre-burn preparation.
- Description of the firing technique to be used.
- Equipment /personnel/safety requirements.

Light Disking. Disking of established grass stands (more than 4 years old) like the Conservation Reserve Program (CRP) may be necessary to open the stand, create bare ground, and encourage forb growth. Bobwhite quail requires 25-50 percent bare ground. Disk between October 1 and April 15. The best forb response is usually created if disked prior to February 28. In high residue, multiple passes may be needed. This practice is prohibited in unbroken native prairie.

Prescribed Grazing. Use Conservation Practice 528, Prescribed Grazing, to manipulate plant succession and encourage desirable forb growth. Livestock can be beneficial to maintaining the quality of herbaceous cover and controlling undesirable plants when managed in accordance with a grazing plan with wildlife management as a primary objective.

Controlling Tree Invasion. Tree invasion is a serious threat to native rangeland and established grassland such as CRP. Prairie chickens and bobwhite quail have declined or disappeared from many extensive areas of grasslands because of tree invasion. Even a few scattered trees can make an area unsuitable for prairie chickens. Use Conservation Practice 314, Brush Management, when applying tree control methods. Aerial spraying should be used only as a last resort. For consultation, contact the NRCS area biologist or the KDWP district wildlife biologist.

Even when tree removal is warranted, 10-30 percent of the area may remain in shrubs for wildlife depending on species requirements. See the Conservation Practice Specification 314, Brush Management.

The list of plant species having negative impacts, although not all inclusive, includes honey locust, eastern red cedar, Siberian elm, Russian olive, Osage orange, black locust, mulberry, and cottonwood. Refer to Conservation Practice 314, Brush Management, when identifying brush species and control methods.

4. Woody Cover Establishment

Species recommendations will be based on landowner objectives and site potential. Planting trees and shrubs has the potential to adversely affect non-target species. Where wildlife is a primary objective of the landowner, trees should generally not be planted in or adjacent to native prairie or other large grassland blocks. Shrub plantings may be acceptable in some circumstances.

Woody plantings will follow the criteria and guidelines in Conservation Practices 612, Tree/Shrub Establishment, and 380, Windbreak/Shelterbelt Establishment. These practices provide guidelines for planting design and establishment. Specific recommendations may be found in the wildlife leaflets produced by the Wildlife Habitat Institute, PLWM, or by consulting KDWP biologists. Native species are preferred.

Shrub plantings are particularly valuable for edge associated upland birds like pheasants and quail. Where quail covey headquarters are desired, shrub plantings from 0.1 to 0.25 acres should be planted for each 5 to 40 acre tract. Shrubs may be planted in rows 8 to 12 feet apart and 4 to 6 feet between plants in row. The use of weed/moisture barrier is optional, but encouraged to increase survival the first three years. A companion component to reinforce covey headquarters is the downed tree structure. A few trees with their crowns dropped together will create excellent woody cover at ground level similar to a shrub thicket. The practice of half cutting maintains live growth in the downed tree branches.

For woody plantings, refer to Section II of the eFOTG for plant species selection and use Form KS-ECS-5, Tree/Shrub Planting, to design the plan. For species-specific information, see Wild Turkey and Managing Forest for Fish and Wildlife leaflets. These leaflets are located on the NRCS and Wildlife Habitat Council Web site and can be located at <http://www.whmi.nrcs.usda.gov/technical/leaflet.htm>.

5. Woody Cover Management

Manipulation of woody tree and shrub stands to achieve early successional plant composition encourages re-growth and regeneration of palatable and nutritious vegetation beneficial to deer. Browse management also increases plant diversity, which supports a variety of other species. Browse management can be accomplished by mechanical (shearing, hand cutting, mowing, etc.) or prescribed burning.

Where covey headquarters is a limiting factor for bobwhite quail, one covey headquarters for every 15 acres is recommended. Covey headquarters are woody shrubs, vines, down tree structures, and feathered edge where woody stems and shoots are managed between three and eight feet in height. Minimum recommended size on tree rows is 30 feet wide by 50 feet long or a minimum of 1500 square feet. This habitat can be established through shrub planting or through tree cutting (coppicing or cutting of trees with the ability to re-sprout). Trees can be cut, treated, monitored, and managed to achieve the structure and height desired. Trees will need re-cutting to achieve the height requirements. Shrubs will provide covey headquarters with lower maintenance costs. Priority areas for covey headquarters habitat development include tree rows, windbreaks, and wildlife areas that are in need of renovation.

Forest openings are beneficial habitat for some species. Conservation Practice 666, Forest Stand Improvement, will be used for recommendations on thinning extent and techniques.

Conservation Practice 382, Fencing, can be used to protect desirable woody vegetation from livestock, especially in riparian areas.

6. Crop Field Management

Crop fields make up over half of the Kansas landscape. These habitats are important to wildlife. Many conservation practices can provide high quality habitat components in crop fields through altering cover types and adding diversity.

Buffers. Adding strips of permanent cover adjacent to or in critical areas of crop fields greatly improves habitat for edge-associated species such as pheasants and quail. Buffers increase diversity and cover for nesting, brood-rearing, and escape cover when the crop field is harvested, tilled, or chemically treated. Use Conservation Practices such as 393, Filter Strip; 391, Riparian Forest Buffer; 589C, Cross Wind Trap

Strip; 412, Grassed Waterway; 332, Contour Buffer Strip; 386, Field Border; and 380, Windbreak/Shelterbelt Establishment. Seeding will follow appropriate specifications. In center-pivot irrigation areas there is often little undisturbed cover available during critical times of the year. Planting permanent cover (native grass and forbs) on dry land corners adjacent to a center pivot irrigation system greatly enhances upland bird habitat.

Wet Areas. Marginally profitable small wet areas including playa lakes should be managed for optimum wetland functions and values. Grass buffers can enhance the habitat values of a wetland. These areas are valuable to a variety of migratory species and provide other environmental benefits to include water quality and aquifer recharge.

Brood Strips. Brood strips are narrow bands (10 to 30 feet) of crops where annual weeds are permitted to grow within the crop or crop stubble. **Wheat:** Brood strips in green wheat and other similar crops should not be sprayed using herbicides with residual activity for control of cool season weeds. Broadleaf herbicides that have no long-term residual activity are acceptable. After harvest, brood strips cannot be sprayed or tilled until March 31 of the following year. **Row crop:** No herbicides (including pre-emergent herbicides) should be applied to brood strips prior or during the growing season. Brood strips must remain intact from harvest until March 31. Brood strips are most valuable for providing insects necessary for upland birds during the first six weeks of their life.

Residue Management/Tillage. Farming methods such as No-Till that leave maximum residue on the surface usually provide better wildlife potential than conventional tillage, especially when done in conjunction with buffers or other practices that provide adjacent permanent habitat. Crop stubble should be left as tall as possible to provide upland birds with overhead protection from avian predators. Upland bird use and survival increases significantly when wheat stubble is left taller than 15 inches. Row crop stubble should also be maximized. The wheat/fallow cropping sequence termed "delayed minimum till" provides both wildlife and crop production benefits. Under this scenario, wheat is cut no lower than 12 inches, no weed control is done after harvest, and the first, and sometimes second, treatment in the spring is done with herbicides. Information on this practice is available from a KDWP publication "New life for wheat fallow."

Crop Rotations/Field Size. Pheasants, quail, and other edge species require high habitat diversity (a mix of different habitat types in an area). Reducing field size or breaking crop rotations at convenient places within a field (along contours or terraces) can accomplish this. Additional diversity and edge can be provided by practices like buffers and brood strips.

Harvest/Haying Patterns. Significant wildlife losses can occur during cutting hay during the nesting or brood rearing season. This damage can be reduced by using a harvesting pattern that starts through the middle of the field and proceeds outward, thereby forcing wildlife to the edge of the field where they may find adjacent cover. When harvesting starts around the edges of a field, wildlife are forced toward the center where they are repeatedly exposed to the harvesting operation and left far from cover at harvest completion. Other helpful practices include harvesting one half of a field at a time or leaving a strip of unharvested hay around the perimeter of the field. Leaving a strip of corn, grain sorghum, wheat, or other crops unharvested along the perimeter or other field break will provide a food source with overhead cover especially valuable in winter.

7. Edge Habitat Management

Edge habitat is important for upland birds including pheasants and quail. Most upland bird activity takes place within 100 feet of the field edge. High quality edge habitat consists of multiple cover types with a gradual change from one to the other (shrubs to grass to crops, for example). Edge habitat should be a minimum of 30 feet in width. In addition to the edge habitat practices discussed in the crop field management section, the following should be considered:

- Root plowing can be used to prevent encroachment of woody plants into the farm field. Root pruning on a three to five year basis prevents crop yield reduction.
- A cutback border can be used to create a woodland edge. Tall trees are removed in favor of shrubs and herbaceous vegetation. The re-growth will provide benefits for five to ten years before treatment is needed again. A modification of this practice includes half-cutting trees on the outer edge, creating canopy on the ground for a more shrub-like effect.
- To create an edge-feathering effect, shrubs may be planted along a woodland edge and herbaceous vegetation along the shrub edge. If quail are the target species, bare ground should also be provided.
- Where no trees or shrubs are present, shrubs should be planted on field edges to provide covey headquarters areas where bobwhite quail are desired.
- Conservation Practice 650, Windbreak/Shelterbelt Renovation, may be done to improve habitat on windbreaks that no longer provide desired habitat due to age, damage, or management objective.

8. Food Plots

Many wildlife species depend on and prefer native weed seeds and wild fruits for winter food. However, additional high quality food can be provided in the form of green browse or standing grain crops. Typically, crop fields have an abundance of waste grain, but it may become less accessible due to insufficient overhead cover for protection or during times of snow cover. Locate food plots next to other cover such as grass or low growing woody cover. Planting should be done in a manner to control erosion at least to the (T) level. Large areas of re-established grassland like CRP often benefit from food plots. Food plots are not recommended in unbroken native rangeland.

Almost all grain crops are adequate for food plots (corn, grain sorghum, wheat, etc.). For ease of management, food plots may be planted to the same crop as an adjacent field. A combination of grain sorghum and forage sorghum can provide food and cover through selective lodging. Food plots should be planted using standard agronomic practices to produce a moderate yield. A lower yielding food plot with some weed presence is acceptable if wildlife habitat objectives are met for the target species. Food plots should be planted in a timely manner to expect maturation before frost in a normal year. Food plots may also be planted to perennial or biennial crops of green browse such as alfalfa or clover. Annual food plots can be managed on a paired plot design with one half planted each year and the other half allowed to grow annual plants. Food plots should be large enough and numerous enough to provide food to the target species through the critical period (normally winter). Placed around a portion of, or the entire perimeter of a CRP field, food plots can serve a second role acting as a firebreak.

For bobwhite quail habitat, winter food items include grain, forb seeds, legumes, nuts, mast, and berries. Where food is a limiting factor, plots of one acre for every 15 acres of bobwhite quail home range can benefit bobwhite quail. Food plots need to be designed to fit the landowner's equipment such as 40 feet by 1100 feet or 60 feet by 726 feet. Leaving unharvested grain along the edge of a field as mentioned in the cropland section above is an easy way to provide wildlife food.

Considerations. This practice does not attempt to list all possible habitat development and management practices. An NRCS biologist, conservationist, technician, or KDWP biologist may recommend other practices for application. Many land uses provide habitat for wildlife, but there is great variability in the quality (condition) of the land to support wildlife. A land use may provide one or more benefits if the habitat elements necessary for a particular species are present during specific seasons of the year. Vegetative management changes can improve habitat while still maintaining a high level of soil conservation. Consider that the manipulations of habitat may impact more than the target species. These possible effects should be evaluated and taken into consideration during the planning process.

Plans and Specifications. Plans and specifications for this practice shall be prepared for each site. They shall be recorded using approved specification sheet, job sheet, technical notes, or narrative documentation in the conservation plan or other acceptable documentation. NRCS planners are encouraged to work closely with the NRCS and KDWP biologists in developing site specific plans. All documents developed are to specify the requirements for installing the practice such as kind, amount or quantity of materials to be used, and the timing or sequence of activities.

Operation and Maintenance. The purpose of operation, maintenance, and management is to ensure that the practice functions as intended over time. A plan for operation and maintenance of upland wildlife habitat at a minimum shall include monitoring and management of structural and vegetative measures. Actions will be carried out to ensure the practice functions as intended throughout its expected life.

TABLE 1 - HERBACEOUS WILDLIFE PLANTING GUIDE.

The planting mix must contain at least 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. Introduced cool season grasses that may be used in wildlife plantings include: creeping foxtail, orchard grass, timothy, redtop, tall wheatgrass, and intermediate wheatgrass. All seed must comply with state law requirements. Consult the Kansas NRCSEcological Site Descriptions for additional plant species suitable for a particular site.

The following mixes are recommended.

WESTERN SEEDING ZONE

Species	pls/lbs/ac 1	Loamy Site		Sandy Site		Lowland Site	
		optimu m mix percent	pls/ac	optimu m mix percent	pls/ac	optimum mix percent	pls/ac
Grasses							
Little Bluestem	4	40	1.6	40	1.6	40	1.6
Switchgrass	3	20	0.6	25	0.8	15	0.5
Blue Grama	2	10	0.2	5	0.1	10	0.2
Indiangrass	6	15	0.9	10	0.6	15	0.9
Big Bluestem ²	6	5	0.3	10	0.6	10	0.6
Sideoats Grama	6	5	0.3	5	0.3	10	0.6
Western Wheatgrass	10	5	0.5				0.0
Sand Lovegrass	2			5	0.1		

Forbs/Legumes (Include 0.5 to 2.0 pls/lbs/ac in addition to grass mixture) See Table 2.

1. Pls/lbs/ac is based on full seeding rate for species involved.
2. Sand Bluestem recommended on sandy sites.

CENTRAL SEEDING ZONE

Species	pls/ lbs/ac ¹	Loamy Site		Sandy Site		Lowland Site	
		optimu m mix percent	pls/ac	optimu m mix percent	pls/ac	optimu m mix percent	pls/ac
Grasses							
Little Bluestem	4	40	1.6	40	1.6	40	1.6
Switchgrass	3	20	0.6	25	0.8	15	0.5
Blue Grama	2	5	0.1		0.0	10	0.2
Indiangrass	6	10	0.6	10	0.6	10	0.6
Big Bluestem ²	6	15	0.9	15	0.9	15	0.9
Sideoats Grama	6	5	0.3	5	0.3	10	0.6
Western Wheatgrass	10	5	0.5				0.0
Sand Lovegrass	2			5	0.1		

Forbs/Legumes - (Include 0.5 to 2.0 pls/lbs/ac in addition to grass mixture) See Table 2

1. Pls/lbs/ac is based on full seeding rate for species involved.
2. Sand Bluestem recommended on sandy sites.

EASTERN SEEDING ZONE

Species	pls lbs/ac ¹	Loamy Site		Sandy Site		Lowland Site	
		optimu m mix percent	pls/ac	optimu m mix percent	pls/ac	optimu m mix percent	pls/ac
Grasses							
Little Bluestem	4	45	1.8	45	1.8	45	1.8
Switchgrass	3	10	0.3	15	0.5	10	0.3
Blue Grama	2					10	0.2
Indiangrass	6	10	0.6	15	0.9	5	0.3
Big Bluestem ²	6	10	0.6	10	0.6	5	0.3
Sideoats Grama	6	25	1.5	10	0.6	25	1.5
Sand Lovegrass	2			5	0.1		

Forbs/Legumes (Include 0.5 to 2.0 pls/lbs/ac in addition to grass mixture See Table 2)

1. Pls/lbs/ac is based on full seeding rate for species involved.
2. Sand Bluestem recommended on sandy sites.

TABLE 2 - LIST OF NATIVE AND INTRODUCED FORBS/LEGUMES

Forbs and legumes are a necessary component in herbaceous plantings for wildlife. Each mix should have 0.5 to 2.0 pls/lbs/ac of native or non-invasive introduced forbs and/or legumes.

Native forbs/legumes	West	Central	East
Arkansas Rose		X	X
Blacksampson	X	X	X
Black-eyed susan		X	X
Blanketflower		X	X
Butterfly milkweed		X	X
Canada milkvetch			X
Catsclaw sensitivebriar			X
Clasping coneflower		X	X
Compassplant		X	X
Cudweed sagewort		X	X
Dotted gayfeather	X	X	X
Engelmann's daisy	X	X	X
False sunflower/Smooth oxeye		X	X
Fringed sagewort		X	X
Grayhead coneflower		X	X
Hairy goldaster		X	X
Illinois bundleflower	X	X	X
Indian blanket		X	X
Lance-leaf coreopsis			X
Leadplant	X	X	X
Manyflower scurfpea	X		
Maximilian sunflower	X	X	X
Missouri goldenrod		X	X
Missouri Primrose			X
New England aster			X
Pale purple coneflower			X
Pitcher sage	X	X	X
Plains coreopsis		X	X
Prairie aster			X
Prairie sunflower			
Purple coneflower			X
Purple prairieclover	X	X	X
Roundhead lespedeza		X	X
Scarlet globemallow		X	X
Shell leaf penstemon/large beardtongue		X	X
Showy partridgepea		X	X
Silktop dalea	X		
Slimflower scurfpea	X		
Stiff goldenrod		X	X
Stiff sunflower		X	X
Swamp milkweed		X	X
Texas croton	X		
Thickspike gayfeather			X
Upright coneflower	X	X	X
Virinia tephrosia (goat's rue)	X		
White aster		X	X
White prairieclover		X	X
Wild bergamot			X
Introduced legumes			
Alfalfa	X	X	X
Birdsfoot Trefoil			X
Crownvetch		X	X
Ladino Clover		X	X
Red Clover		X	X
Yellow or White Sweetclover	X	X	X
ean lespedeza			X

X = Species adapted to these areas