

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD AND SPECIFICATIONS**

UPLAND WILDLIFE HABITAT MANAGEMENT

(acre)

Code 645

DEFINITION

Provide and manage upland habitats and connectivity within the landscape for wildlife.

PURPOSE

Treating upland wildlife habitat concerns identified during the conservation planning process that enable movement, or provide shelter, cover, and food in proper amounts, locations and times to sustain wild animals that inhabit uplands during a portion of their life cycle.

CONDITIONS WHERE PRACTICE APPLIES

Land where the decision maker has identified an objective for conserving a wild animal species, guild, suite, or ecosystem.

Land within the range of targeted wildlife species and capable of supporting the desired habitat.

CRITERIA

General Criteria Applicable to all Purposes

Habitat development/management, necessary to achieve the purpose(s), shall be based on use of the Wildlife Habitat Appraisal Guides (WHAG) – Community Models or the individual species guidesheets depending upon the needs and objectives of the landowner. The appraisal is used to determine an index for individual fields/evaluation units, or an evaluation for the entire property or operating unit (farm).

WHAG evaluations must result in an index of at least 0.5 for the field, habitat community, evaluation unit, or farm.

Recommendations selected by the producer for development and management should achieve this minimum level of scoring on the appropriate model. If the “home range” Missouri Bobwhite Quail (BWQ) Habitat Appraisal Guide is used no limiting factor rating score will be less than 50% of the optimum within a home range no larger than 40 acres.

Application of this practice shall remove or reduce limiting factor(s) in their order of significance as indicated by results of the habitat evaluation. For the desired natural community or selected wildlife species, identify the types, amount, and distribution of habitat elements and management actions necessary to achieve the management objectives and detail them in a management plan.

Plant materials shall include only high quality and adapted species. See VEGETATION ESTABLISHMENT HERBACEOUS SEEDING (723) and Native Grass Cultivars/Selections Information Sheet (IS-MO723).

Native plant materials adapted to soil and site conditions will be used whenever possible. The use of native species will avoid problems associated with non-adapted and undesirable plants.

Site preparation, planting dates, and planting methods shall optimize vegetation survival and growth.

This is a draft standard for review and comment purposes only. To obtain the current version of this standard, contact the Natural Resources Conservation Service or download the standard from the electronic Field Office Technical Guide for Missouri. (Italic text indicates state additions to the national standard and blue text indicates a change from current standard)

Equipment travel, grazing, haying and other disturbance to habitat shall be restricted during critical periods such as nesting, brood rearing, fawning, etc. Exceptions may be made during the period of establishment and for management activities to maintain the health of the plant community and to control noxious and undesirable plants.

Control of regulated noxious weeds and other undesirable plants shall be specified on a "spot" basis where practical to protect forbs and legumes that benefit native pollinators and other wildlife and provide insect food sources.

Any habitat management technique will ensure that soil loss is within acceptable limits.

Permanent Vegetative Cover (Grasses, Legumes, Forbs – borders/cover strips/block plantings) –

Development

High quality nest and brood cover for grassland wildlife species are critically needed cover types for upland wildlife in Missouri. Native plants and communities are encouraged since they are well-adapted to sites, less invasive, and likely to provide quality habitat without long term maintenance. However, due to cost, availability, and landscape position, native plants may not be feasible in all situations.

VEGETATION ESTABLISHMENT HERBACEOUS SEEDING (723), RESTORATION and MNGT. of RARE or DECLINING HABITATS (643), or Table 1 of this standard will be used to develop **food and cover** for wildlife (new seeding or interseeding) – wildlife borders, cover strips, or block habitat. Planting rates and mixes will be based on the landowner's wildlife species of interest and desired vegetation composition after establishment.

Erosion rates must remain within acceptable limits after treatment. Concentrated flow erosion must also be controlled by proper treatment. If vegetation establishment alone will treat areas of concentrated flow,

then increase recommended base seeding rate to critical area rate (**base rate times 2**) – see VEGETATION ESTABLISHMENT HERBACEOUS SEEDING (723). Use wildlife friendly species with good to excellent erosion/wildlife ratings (Table 1 – (723)), such as redtop, in the wildlife mix in order to achieve critical area seeding rates for treatment of concentrated flow areas. If mechanical treatment is needed for concentrated flow areas see GRASSED WATERWAY (412) or FILTER STRIP (393).

If **VEGETATION ESTABLISHMENT, HERBACEOUS SEEDING (723)** is used for wildlife seeding the following applies: Base rate (**rate equals 100%**) applies and mixtures will be used that will contain multiple species (at least 3) with 60% or more of the seeding rate (PLS) based on perennial grasses having a good to excellent wildlife rating (Table 1 – VEGETATION ESTABLISHMENT, HERBACEOUS SEEDING (723)). Seed mix will not contain species with a poor wildlife habitat rating. If seedings are planned for wildlife species requiring open herbaceous stands, Big Bluestem, Indiangrass, and Switchgrass will be limited to no more than 5% PLS each of the base rate in Table 1 – VEGETATION ESTABLISHMENT, HERBACEOUS SEEDING (723). If cultivars/selections are to be used in seeding, see Table 2 – VEGETATION ESTABLISHMENT, HERBACEOUS SEEDING (723) and Native Grass Cultivars/Selections Information Sheet (IS-MO723).

When native forbs are added to a wildlife mixture to increase plant diversity and structure the following adjustment will be made **to the 723: add 3 pounds/acre of pure live seed (PLS)** of native forbs/legume mix to a grass seed mix and reduce grass seed rate in the entire mixture by 15 percent. Ensure that after adjustments the **PLS** seeding rate of the final mix still has at least **60% of the seeding rate based on perennial grasses where herbaceous wildlife habitat development will occur on highly erodible lands (HEL) that do have an active or potential erosion problem or 45% of the**

seeding rate based on perennial grasses where herbaceous wildlife habitat development will occur on lands that **do not** have an active or potential erosion problem (NHEL) but only the flattest portions of the NHEL fields of the seeding rate based on perennial grasses. The native forb/legume mix to be included in a seed mixture will contain a minimum of 10 species in the mix and no single species to exceed **10 percent or less than 1 percent of the mix**. The forb and legume mix shall have no more than **10 percent** annuals and biennials combined. Refer to Table 2 - RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) for a listing of approved native forbs and legumes. **NOTE:** Seed for native species of grasses, forbs, or legumes used for wildlife plantings:

1) will be grown in (origin) and should be source identified (source) from Missouri or adjacent states, and/or

2) will be acceptable cultivars from Table 2 of the VEGETATION ESTABLISHMENT, HERBACEOUS SEEDING (723).

See Table 1 of this practice standard for seeding recommendations for Bobwhite Quail and related wildlife species and native pollinators. RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) and Native Forbs Information Sheet (IS-MO643F) also provide seeding recommendations for several natural community habitats. Also see JS-BIOL-32 - Glade, Prairie, and Savanna establishment Job Sheet or JS-AGRON-25 (seedrate) for additional information.

The VEGETATION ESTABLISHMENT HERBACEOUS SEEDING (723) will be used for interseeding for wildlife habitat, site preparation, planting method, and planting date recommendations for establishment of all herbaceous habitats. Also see the Native Forbs Information Sheet (IS-MO643F) for additional information.

Diverse herbaceous stands with a mix of annual and perennial vegetation provide niches for many wildlife species. Increased

fertility can lead to a more rapid closing of both ground and canopy cover. **Soil tests and fertility/nutrient additions are not required by this practice for seeding or interseeding on sites where (after vegetation establishment) soil loss is within acceptable limits. Evaluate the site conditions to determine if soil test and fertility/nutrient addition are needed.** Erosion concerns in wildlife field borders can often be addressed by increasing the border width or selecting more erosion resistant species for planting. Some sites may require fertility to provide an adequate vegetative stand to provide both habitat and control erosion.

Where herbaceous wildlife habitat development will occur on lands (other than wildlife field borders) that do not have an active or potential erosion problem (flattest parts of the NHEL fields), seeding rates in VEGETATION ESTABLISHMENT HERBACEOUS SEEDING (723) may be multiplied by a factor of 0.75. This reduced rate will provide for a more diverse stand and allow for other annual plant growth.

It is recommended to consider the eradication of undesirable plant species. This eradication is often necessary to provide suitable conditions for grassland development. When 25% of the canopy coverage is undesirable vegetation then control will be initiated. Recommendations are found in PEST MANAGEMENT (595), or JS-BIOL-30 Controlling Undesirable Species Job Sheet. This would include any species rated poor for wildlife in Table 1 in the VEGETATION ESTABLISHMENT HERBACEOUS SEEDING (723).

Existing herbaceous borders will require renovating if the percentage of species rated poor exceeds 25% of the plant community.

Interseeding of legumes and forbs into existing grass stands can provide a needed food source and add plant diversity to attract beneficial insect populations. Interseeding is best accomplished after a disturbance practice in an existing vegetation stand.

VEGETATION ESTABLISHMENT HERBACEOUS SEEDING (723), RESTORATION and MNGT. of DECLINING HABITATS (643), or JS-BIOL-20 Native Forb and Non-Native Legume Interseeding Job Sheet and [Native Forb Information Sheet \(IS-MO643F\)](#) will be used for appropriate seeding mixtures/techniques.

Where wildlife habitat development will occur on lands that do not have an erosion problem (NHEL), an effective herbaceous stand for wildlife borders, cover strips or block habitat development can be established by natural regeneration. This process is slower than establishment by planting and the land user has less control over plant species selection. Natural regeneration will encourage a greater diversity of annual and perennial plants and better structural cover for wildlife. There is often an adequate seedbank in the soil for good "weedy" wildlife food and cover to develop. There is no requirement for adjacent permanent vegetation. This technique should only be attempted when noxious weeds and undesirable/invasive plants do not exist in the seedbank.

Management

Used alone or in combination with other techniques, mechanical methods can successfully manipulate successional stages of habitat. See EARLY SUCCESSIONAL HABITAT DEVELOPMENT/MANAGEMENT (647) or RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) for additional information.

Mowing is not an acceptable method for maintaining permanent wildlife habitat since it greatly decreases plant diversity, and reduces residual cover available for the following nesting season.

Mowing is only allowed in conjunction with other management methods/practices or to aid in vegetation establishment. Mowing is only allowed immediately prior to the application of the management method/practice and is limited to the acres on which the management method/practice

is applied or as specified for stand establishment.

When desired a light disking (4 to 6" deep resulting in 30 to 70% bare ground) of existing stands may be necessary to increase the amount of open ground and encourage a diverse plant community of annual and perennial plants. Disk July 16 to March 31. Late summer/fall disking tends to favor broadleaves; spring disking tends to favor weedy grasses. Avoid disking in areas where concentrated flow is a concern. Alternate disked strips (less than or equal to 75' wide) with buffer strips (2 times the disked width) across the field on the contour/cross-slope. Rotate the disked strips across the field. Other disking patterns can be used (within soil erosion limits) and will be limited to not more than one-third (preferred) to one-half of the acreage treated in a year (fields 20.0 acres or less may be treated in their entirety in a given year), based upon the recommendation of a NRCS Biologist/Wildlife Conservationist or MDC Biologist. See JS-BIOL-24 Light Disking Job Sheet.

Use PRESCRIBED GRAZING (528) to manipulate plant succession, reduce ground litter, and provide dusting areas. 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 habitat management as the primary objective.* This technique requires close management supervision to assure that wildlife habitat objectives are met as the primary concern. Haying (applied according to wildlife management plan) can also be conducted to maintain or improve vegetation structure and composition so as to improve the desired wildlife habitat. Also see JS-BIOL-31 Managing Native Hay Prairies.

Timing of haying and grazing will avoid peak periods of wildlife nesting (May 1 to July 15) and allow the establishment, development, and management of vegetation for the intended wildlife purpose. [Haying and grazing will be limited to not more than one-](#)

third (preferred) to one-half of the acreage burned in a year (fields 20.0 acres or less may be burned in their entirety in a given year), based upon the recommendation of a NRCS Biologist/Wildlife Conservationist or MDC Biologist.

Use PRESCRIBED BURNING (338) to remove excess litter and manipulate plant communities. Controlled fire can allow germination of seed bearing annuals, increase plant species diversity, control unwanted woody cover, and remove litter to rejuvenate the stand. Burns should be managed with consideration for wildlife needs such as nesting and feeding cover. Fields should be burned on a 3 year rotation and will be limited to not more than one-third (preferred) to one-half of the acreage burned in a year (fields 20.0 acres or less may be burned in their entirety in a given year), based upon the recommendation of a NRCS Biologist/Wildlife Conservationist or MDC Biologist. Rotate the burned areas each year. See JS-BIOL-15 Prescribed Burning for Wildlife Job Sheet, Patch Burn Grazing Information Sheet, or Prescribed Burning Information Sheet.

For greatest wildlife benefit native warm season grasses should only be burned July 16 to March 15. Prescribed burning beyond March 15 for wildlife management purposes will be based on recommendation of a NRCS Biologist/Wildlife Conservationist or MDC Biologist. Late summer or early fall burns in native warm season grass encourage the forb component of herbaceous stands resulting in better and more diverse habitat.

Cool season grasses may be burned March 15 to April 30. Prescribed burning beyond March 15 for wildlife management purposes will be based on recommendation of a NRCS Biologist/Wildlife Conservationist or MDC Biologist.

Use selected herbicides to manipulate plant succession and improve habitat diversity. Careful planning and care in application are required in the use of chemicals to improve existing habitat. Native warm season grasses may be sprayed May 1 to

September 15. Cool-season grasses may be sprayed March 15 to May 15 or October 1 to December 1. To be effective herbicides must be applied when grasses are actively growing, which may result in a narrowing of these dates based on annual weather conditions. Application in strips totaling not more than one-third (preferred) to one-half of the acreage treated in a year (fields 20.0 acres or less may be treated in their entirety in a given year), based upon the recommendation of a NRCS Biologist/Wildlife Conservationist or MDC Biologist. Other spraying patterns can be used (within soil erosion limits) and will be limited to not more than one-third (preferred) to one-half of the acreage treated in a year (fields 20.0 acres or less may be treated in their entirety in a given year), based upon the recommendation of a NRCS Biologist/Wildlife Conservationist or MDC Biologist. Selection of a product should be based on several factors including product effectiveness, non-target species impacts, toxicological risks, and off-site movement of chemicals. See EARLY SUCCESSIONAL HABITAT DEVELOPMENT (647), PEST MANAGEMENT (595), and JS-BIOL-26 Strip Herbicide Application Job Sheet. [Follow herbicide label directions.](#)

Permanent Vegetative Cover (Trees and Shrubs) –

Development

Species recommendations will be based on landowner objectives and site potential. Planting trees and shrubs has the potential of adversely affecting non-target species. Careful consideration is to be given when planting trees and taller shrubs in the historic prairie region of the state. Soils and site potential should guide the plant species selected. Refer to FOTG - Section II G.1 Native Vegetation List for Missouri Soils.

Woody plantings will follow the criteria and guidelines in HEDGEROW PLANTING (422), TREE/SHRUB ESTABLISHMENT (612), or WINDBREAK/SHELTERBELT ESTABLISHMENT (380). These standards provide guidelines for clump and block

plantings and reinforcement of existing woody cover. Also see JS-MO612 Tree and Shrub Establishment Conservation Practice Job Sheet.

Where dense woody cover is lacking, but necessary to meet species objectives, consider planting 0.1 to 1.0 acre native shrubs in each 5 to 40 acres of habitat that lacks woody cover. Plant these areas at 3'X3' spacing for greatest wildlife benefit. An increased number of shrub plantings may be needed based on specific wildlife and pollinator objectives. See JS-BIOL-19 Quail Covey Headquarters Wildlife Job Sheet.

Bobwhite Quail Covey Headquarters

- Quail covey headquarters are small tree/shrub seedlings planted in a clump planting at least 30'X50' at 3'X3' spacing within the clump planting (167 plants) or minimum of 500 plants per 0.10 acre. Do not use a weed mat (spreading of shrubs is desired). Perennial herbaceous vegetation control is required. See TREE/SHRUB ESTABLISHMENT (612) for planting methods, etc. The number and location of covey headquarters will be based on landowner's objectives and/or the use of the BWQ limiting factor model. Headquarters areas provide optimum benefits when planted next to bare ground and diverse herbaceous cover.
- Container grown shrubs – plant shrubs on a 5'X5' spacing in a 30'X50' area (60 plants). Do not use a weed mat (spreading of shrubs is desired) and provide starter fertilizer. Herbaceous vegetation control is required. See TREE/SHRUB ESTABLISHMENT (612) for planting methods, etc.
- Direct shrub seeding – seed may be broadcast or planted in a 30'X50' area. Kill existing vegetation and prepare a firm clean, firm seedbed.

See JS-BIOL-34 for further information.

Species to plant – gray dogwood, roughleaf dogwood, blackberry, fragrant sumac, American plum, Chickasaw plum, hazelnut, witch hazel, false indigo bush, elderberry, coralberry, chokecherry, nannyberry, and shrub lespedeza. A covey headquarters may be planted to a single species in order to mimic a natural shrub thicket. Two or more different shrub species can also be planted in the same CHQ to diversify the covey headquarters. Plants can be grouped by species, within plantings, to accelerate the development of the covey headquarters. If deer damage is a concern, the following species are recommended – false indigo bush, aromatic sumac, and blackberry. If other species are planted in areas of high deer populations use deer damage protection techniques. Consult your local USDA office. Native plant materials should always be considered for use first where high quality natural communities exist.

To provide immediate temporary dense cover, consider:

- Downed tree structure – This is a temporary source of woody cover. Each downed tree structure must cover a minimum of 30'X50'. Trees used will be a minimum of 20' in height (not counting the unbranched trunk) and 12 inches Diameter Breast Height (DBH) and well branched to cover the entire 30'X50' area. A minimum of 8 well branched, durable trees is required. These structures are intended to be "open" for quail use so trees should not be packed together in a brush pile but still must be placed so that branches intertwine to provide adequate overhead cover. Recommend oak, hickory, Osage orange, or cedar. Downed tree structures need to be placed on bare ground or on areas where perennial herbaceous vegetation is controlled. The number and location of downed tree structures will be based on landowner's objectives.

See JS-BIOL-21 Downed Tree Structure Job Sheet.

- Edge feathered areas (30'X50') can also meet the covey headquarter requirement. See the Edge Habitat section of this standard.

Pollinator Tree and Shrub Habitat

- A tree and shrub planting that is developed to include pollinator habitat must include at least 0.1 acre per 40 acres of flowering shrubs. A minimum of 3 species are required and at least one must be plum, elderberry, blackberry, prairie willow, choke cherry, false indigo, or shrub dogwood.
- Use the same planting rates as outlined for Bobwhite Quail Covey Headquarters above. See TREE/SHRUB ESTABLISHMENT (612) for planting methods, etc.

Management

Manipulation of woody tree and shrub stands to achieve early successional plant composition encourages re-growth and regeneration (suckering) of palatable and nutritious vegetation beneficial to large mammals. Browse management also increases plant diversity, which supports a variety of other species. Browse management can be accomplished by mechanical (shearing, hand-cutting, etc), or prescribed burning. **Treatment of invading sod-forming grasses may be necessary to maintain quality and attractiveness of shrubby cover.**

In wooded settings where landowner wishes to maximize habitat diversity, encourage old growth trees (greater than 80 years or 16 inches DBH) or deferring timber activities to maximize wildlife values on at least 10 percent of the forested area.

Removal of competition for woody cover control will provide sunlight and growing space necessary for full crown development

by the target species. Thin to 60 percent stocking or less to encourage fuller crown development, increased seed production, and more diverse herbaceous plant development. FOREST STAND IMPROVEMENT (666) will be used for recommendations on thinning extent and techniques. See JS-BIOL-14 Forest Stand Improvement for Wildlife Job Sheet.

Preservation of wildlife trees (den trees and snags) serves many purposes for forest wildlife species. The goal is to leave or establish 7 snag and 7 den trees greater than 6 inches DBH/acre. Ideally, leaving 1 snag tree greater than 20 inches DBH, 4 snag trees 10 to 20 inches DBH, and 4 snag trees 6 to 10 inches DBH per acre provide an optimal mix. Preservation of one den tree greater than 20 inches DBH/acre is recommended. If Forest Stand Improvement is used to improve wildlife habitat, several non-removal methods can be used to kill standing trees and leave them to provide snag habitat, such as girdling or hack and squirt methods.

Artificial nest structures can provide nesting opportunities for cavity or roost nesting birds. Design and construction shall be consistent with plans included in the MDC publication "Woodworking for Wildlife", or other designs specified by a technical wildlife agency.

Permanent forest openings provide open space necessary for young birds to sun themselves, provide singing grounds, and a steady food supply. Openings of 1 to 3 acres are typically desirable, with a minimum size of 0.25 acres. Forest sites less than 40 acres in size generally will not benefit from openings. Openings should not comprise more than 10% of forest tract. Likewise, caution should be exercised when proposing openings in forest sites larger than 250 contiguous acres. Openings in this situation may lead to habitat fragmentation for non-target interior nesting species and increased predation. All trees and stumps should be removed when clearing permanent openings to allow for future management activities. When considering development of permanent forest openings see FOREST STAND

IMPROVEMENT (666). Also see JS-BIOL-16 Permanent Forest Openings for Wildlife Job Sheet.

Temporary forest openings provide thick, brushy, early successional woody habitat for a wide variety of wildlife. The removal and slashing of all woody stems over 1" DBH is required. Openings should be 1 to 3 acres in size and scattered over the forest stand. Minimum size is 0.25 acres. Openings should not comprise more than 25% of the forest tract. When considering development of permanent forest openings see **FOREST STAND IMPROVEMENT (666)**. See JS-BIOL-27 Temporary Forest Openings for Wildlife Job Sheet.

A number of well-scattered **temporary and permanent** openings are more beneficial than a single large opening of comparable size. South facing slopes are preferred for **temporary forest openings** since these areas tend to remain free of snow for a longer time in the spring and fall. **Permanent forest openings need to be placed on relatively flat ridgetops where soil quality is typically better and erosion hazards are reduced.** If woody vegetation encroachment in permanent forest openings comprises more than 10 percent of existing openings, woody vegetation will be controlled to help maintain desired vegetative components. Methods typically include a combination of mechanical, chemical, or prescribed burning practices.

PRESCRIBED GRAZING (528), USE EXCLUSION (472) and FENCE (382) will be used to prevent improper use of tree/shrub/woody cover areas by livestock.

Brushpiles can be developed with the material left from forest stand improvement or opening development. The number and location will be dictated by the objectives of the land user and recommendations based on WHAG model guidesheets.

Grassland/Brushland Development and Management

Apply this component to develop and maintain brushland/grassland habitats in prairie, transition (savanna/open woodland), and forest areas. Glade and Savanna

communities are included within this component. See **EARLY SUCCESSIONAL HABITAT DEVELOPMENT/MANAGEMENT (647)** or **RESTORATION and MNGT. of RARE or DECLINING HABITATS (643)** or the following information sheets – Savanna, Glade, and Prairie for additional information. Also see JS-BIOL-32 Glade, Prairie, and Savanna Herbaceous Establishment Job Sheet.

Mechanical methods (chainsaw, burn, disk, shear/clipper, or use of dozer) used alone or in combination with other techniques can successfully manipulate successional stages of habitat. Bulldozer use is the least desirable method **and use on a glade is not acceptable.** Before bulldozer is used, consult area office staff.

Woody cover control becomes critical in planning areas to restore natural communities of prairie/savanna/glade. Cut stumps should be treated to prevent sprouting, **except on trees that do not sprout such as cedars.** Amount of woody cover removal will be based on soil and site conditions. End product for: (1) *glade* restoration is 0 to 30% woody canopy; (2) *savanna* restoration is 10 to 30% woody canopy; (3) *open woodland* restoration is 30 to 80% woody canopy; and (4) *prairie* restoration should have no more than 10% woody canopy remaining. See JS-BIOL-23 Woody Cover Control – Prairie/Glade/Savanna Job Sheet or **RESTORATION and MNGT. of RARE or DECLINING HABITATS (643)**.

Other management recommendations will be found under the preceding Management section under Permanent Vegetative Cover (Grasses, Legumes, and Forbs).

Edge Habitat -

Development/Management

High-quality edge is a wide band of plants that gradually change from one cover type to another. A minimum of 30 feet of edge is required to prevent excessive predation on wildlife using these transitional areas. Similar edges can be created in pasture/hay land by excluding livestock or leaving

borders unmowed during the nesting season. See JS-BIOL-22 Woody Cover Control – Fencerows/Woody Draws or JS-BIOL-18 Edge Feathering Job Sheet.

Woody root pruning can be used to prevent encroachment of woody material into cropland edges. Root pruning is used to maintain crop yields adjacent to woody fencerows or wooded fields. Root pruning on a 3 to 5 year interval prevents crop yield reduction. See TREE/ SHRUB PRUNING (660) for further guidelines.

When edges are created in an area that is grazed, the edge will be fenced to exclude livestock unless it is included in a grazing plan to protect the wildlife value of the developed edge.

Planting shrubs/small trees at the edge of the field can create Woodland Edge.
HEDGEROW PLANTING (422),
TREE/SHRUB ESTABLISHMENT (612), or
WINDBREAK/SHELTERBELT
ESTABLISHMENT (380) provides species,
planting guidelines and rows/plant numbers
to be planted.

A cutback border or edge feathering (minimum of 30 feet wide, [measured from the tree trunk](#)) can also be created along a woodland edge or existing tree line/hedgerow. This creates a transitional zone of shrubs, vines and herbaceous vegetation between cropland and grassland and the overstory canopy along a wooded edge. The regrowth and sprouting that result will provide benefits for 5 to 10 years. Cut stumps may be allowed to sprout or stump treated depending on woody species selection objectives. Ideally, cut trees will be left where they fall, or piled loosely. The extent and number of cutback borders will depend on landowner's management objectives. See JS-BIOL-18 Edge Feathering Job Sheet.

To maintain maximum values in the cutback border, the area should be re-treated when at least 50 percent of the vegetation in the border exceeds 15 feet tall. Edge habitat provides optimum benefits when located next to bare ground and diverse herbaceous cover.

Treatment of invading sod-forming grasses may be necessary to maintain quality and attractiveness of dense woody cover.

Edges can be allowed to revert to native plants if invasion by non-desirable plants will not be a problem. Tillage of the designated border can speed the plant succession process. Where wildlife habitat development will occur on lands that do not have an erosion problem (NHLE) an effective woody/shrubby edge can be established by natural regeneration. This process is slower than establishment by planting and the land user has less control over plant species selection. Natural regeneration will encourage a greater diversity of annual and perennial plants and better structural cover for wildlife. Sites will need to be within 300 feet of a desirable woody/shrubby seed/plant source. This technique should only be attempted when noxious plants and undesirable/invasive plants do not exist in the seedbank.

Conversion of existing sod may also be necessary to provide the proper seedbed for natural regeneration. Recommendations are found in PEST MANAGEMENT (595).

The section titled Permanent Vegetative Cover (Grasses, Legumes, Forbs) in this standard will be used to develop herbaceous edges for wildlife. Also, see Table 1 of this standard.

Existing herbaceous borders will require renovating if the percentage of species rated poor exceeds 25% of the plant community.

Developed edges must be maintained in a condition to meet the owner's objectives. Herbaceous borders should be treated to control woody vegetation.

Artificial nest structures can provide nesting opportunities. Design, specifications, and construction shall be consistent with plans included in the MDC publication "Woodworking for Wildlife", or other designs specified by a technical wildlife agency.

Crop field Management

Many conservation practices provide high quality habitat components in cropfields. Introduction of cover types and plant diversity add to increased habitat values.

CONSERVATION CROP ROTATION (328), RESIDUE MANAGEMENT (329 & 344-346), CONTOUR BUFFER STRIPS (332), and CROSSWIND (589A & C) can all provide positive habitat values. FIELD BORDER (386) and GRASSED WATERWAYS (412) can introduce a valuable grassland component into cropfield situations when beneficial species and management are used.

Reduced/eliminated chemical use will allow significant growth of annual plants, thus enhancing the cropfield values for wildlife.

WHAG model guidesheets should be consulted for appropriate cropland recommendations for wildlife.

Leave unharvested grain strips along edges of adjacent other cover types. Strips should be at least 30 feet wide and at least one-quarter acre in size. Unharvested grain will be protected from livestock grazing.

Wildlife 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 food plots. The location and spacing will be based on information from the WHAG model guide sheets. Locate food plots whenever possible next to low growing woody cover and diverse herbaceous cover to provide optimum benefits. [Food plots should not be placed in natural communities, such as glades, savannas, or prairies.](#) No more than 4 acres of grain food plots and/or green browse combined are needed per each 40 acres.

See JS-BIOL-25 Food Plots Job Sheet.

Grain Plots

The minimum size of a grain food plot is one-quarter acre (about 12,000 sq. ft.). Grain food plots over 4 contiguous acres are generally not needed. Plots should be at least 30 feet wide.

Greatest food diversity occurs when each year one-half of the grain food plots are planted with the other half allowed to grow annual plants. Rotate this sequence the following year.

Grain food plots should be located adjacent to winter cover on the upwind side. This will reduce snow drifting into critical winter cover. Brushpiles or downed tree structures can be constructed adjacent to food plots to provide winter cover. Food plots should be located on the least erosive areas of each field. Soil loss must be within acceptable soil loss. Adequate vegetative cover must be developed and maintained to provide both wildlife and erosion control benefits. If food plots are relocated or discontinued, the site will be re-seeded based on this standard.

Plots may be located on slopes greater than 5 percent provided soil losses remain within acceptable limits. Plots planted on sloping ground should be on the contour and no greater than 75' wide.

Weed control is not required as the presence of some weeds such as foxtail and ragweed actually benefit wildlife by providing higher protein and greater number of seeds than domestic grains. Fertilization of grain food plots is strongly recommended to develop adequate seed production [and fertilizer should be applied based on a soil test. If a soil test is not available, apply a blanket rate of 1500 pounds Effective Neutralizing Material lime, 30 pounds Nitrogen, 90 pounds Phosphorous, and 90 pounds Potassium per acre](#)

Food plots will be protected from livestock grazing.

Plantings shall be seeded at proper time to ensure maturity of food plants.

Annual Food Plants and Seeding Rates:

Sorghum seeds are rich in energy, persistent on the plant, and usually available to wildlife when snow or ice covers other seeds. If only one grain is to be planted, grain sorghum (milo) will give the best results. Plant grain sorghum at the rate of 16 pounds per acre if broadcast, 10 pounds per acre if drilled and 5 pounds per acre if

row planted. Other recommended single species and broadcast seeding rates: corn 15 pounds per acre, sunflowers 8 pounds per acre, oats 50 pounds per acre, wheat 50 pounds per acre, buckwheat 40 pounds per acre, and millets 20 pounds per acre (these rates can be reduced by 50% if drilled or row planted). "Bobwhite" trailing soybeans are an example of a food plant selected for specific wildlife benefit and can be used in annual food plots – use 6 pounds PLS per acre for solid seeding rate and 4 pounds PLS per acre in mixtures. **Do not exceed seeding rates.** Planting at too heavy of a seeding rate results in little grain being produced.

Grain Mixtures are:	Pounds per Acre:
1. Grain Sorghum	8
Soybeans	12
2. Grain Sorghum	8
Soybeans	8
German Millet	2
3. Grain Sorghum	12
Sunflowers	8
4. Grain Sorghum	8
Corn	8

Perennial Food Plot for Bobwhite Quail

Desmodium species or other perennial forb/legume or mix can provide an excellent perennial food source for Bobwhite Quail. Use 5 pounds PLS per acre seeding rate to produce an excellent cover and food source.

Green Browse Food Plots

Green browse food plots should be at least **0.25** acre in size. Plots should be located and managed so that soil erosion losses are within acceptable limits. Soil loss must be within acceptable limits.

The site should be open, tillable and next to suitable cover. A buffer strip of perennial weeds and woody shrubs should be

encouraged to develop over time between the browse plot and the timber.

The following mixes should be planted with lime and fertilizer applied based on a soil test. If a soil test is not available, apply a blanket rate of 1500 pounds Effective Neutralizing Material lime, 30 pounds Nitrogen, 90 pounds Phosphorous, and 90 pounds Potassium per acre.

For a fall planting, seed 30 pounds wheat, 1 pound Timothy, 2 pounds Ladino clover and 2 pounds red clover per acre. An alternative seed mix is 30 pounds per acre wheat, 5 pounds per acre Alfalfa, and 2 pounds per acre of red clover.

For a spring planting, seed 30 pounds spring oats, 1 pound Timothy, and 10 pounds per acre of annual lespedeza (Korean, Kobe, Marion, Summit, or a mix of these).

Other green browse recipes can be approved by the NRCS Biologist/Wildlife Conservationist or MDC Biologist.

Green browse plots can be mowed annually. Mowing can be done March 15 to May 1, or July 16 to September 30 (preferred) to encourage vegetative diversity. If mowing after mid-April through May 1, one must weigh the benefits of vegetative diversity gains versus impacts on ground nesting wildlife. Mow no more than one-half of the plot every year. Rotate mowed strips across the plot every year.

Renovate and re-establish plots every 3 to 4 years or as needed to maintain the food value.

CONSIDERATIONS

This standard does not attempt to list all possible habitat development and management practices. An NRCS Biologist/Wildlife Conservationist or MDC Biologist may recommend other practices for application.

All land uses provide habitat for wildlife, but there is a great variability in the quality (condition) of the land to support wildlife. A land use may provide one or more of the

habitat elements necessary for a particular species during specific seasons of the year.

Wildlife population control (hunting or trapping to reduce numbers) is the responsibility of state and federal wildlife agencies. Landowners will be required to follow appropriate state and federal guidelines.

Vegetative management recommendations can be directed towards habitat gains while still maintaining the intent of protecting the soil resource.

Consider that manipulations of habitat may impact more than the desired kinds of wildlife. These possible effects shall be evaluated and taken into consideration during the planning process.

This practice may be used to promote the conservation of declining species, including threatened and endangered species.

Consider the problems of habitat fragmentation when using this practice. Consideration needs to be given for the wildlife species of interest.

Consider habitat linkages and habitat corridors when developing upland wildlife habitat.

Proper timing of haying and livestock grazing will avoid periods when upland wildlife are nesting, fawning, etc. and will allow the establishment, development, and management of upland vegetation for the intended purpose.

Guidance for the desired end product for habitat quality for individual species is found in the Missouri Wildlife Habitat Appraisal Guides – Species or Community models.

Drinking water for wildlife is not an over-riding concern in Missouri due to the numerous lakes/ponds and streams. However supplemental water may sometimes be needed. See WATERING FACILITY (614) and JS-BIOL-28 Wildlife Watering Facility for further information.

Final Pollinator Considerations

Pollinators have three basic habitat requirements: season-long floral sources, nest habitat, and refuge from pesticides.

Because pollinators comprise an ecological keystone, necessary for the reproduction of native forbs, and serving as food for other wildlife, such as grassland birds, consider including their needs in the design of habitat for all other upland wildlife.

In general ideal pollinator habitat should have a minimum of three different forbs in bloom during any season (spring, summer, and fall), and will have abundant nest sites, such as standing dead trees, and brush piles, and will be located away from areas subject to pesticide drift.

Many NRCS practice standards can be readily used to enhance or develop pollinator habitat. For specific recommendations, see the technical note: Using Farm Bill Programs for Pollinator Conservation.
http://plants.usda.gov/pollinators/Using_Farm_Bill_Programs_for_Pollinator_Conservation.pdf

PLANS AND SPECIFICATIONS

Plans for this practice shall be prepared for each site. Plans and specifications shall be recorded using approved specification sheets, job sheets, technical notes, or narrative documentation in the conservation plan, or other acceptable documentation.

NRCS staff is encouraged to work closely with the NRCS Biologist/ Wildlife Conservationist or MDC Biologist in developing site specific plans and specifications. All documents developed are to specify the requirements for installing the practice, such as the kind, amount or quantity of materials to be used, or the timing or sequence of installation activities.

OPERATION AND MAINTENANCE

The purpose of operation, maintenance, and management is to insure 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 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 fire, disking, or mowing, and repair and upkeep of the practice (maintenance) such as replacement of vegetative component as needed.

REFERENCES

1. Missouri NRCS Job Sheets –
 JS-BIOL
 JS-WOOD
 Habitat Information Sheets- eFOTG
2. Woodworking for Wildlife – MDC
 Wildlife Division
3. Wildlife Management for Landowners –
 MDC Wildlife Division
4. MDC Guidesheets for Timber and
 Wildlife Benefits on Private Land – MDC
 Forestry Division

5. Missouri NRCS Biology Technical Notes
6. “On the Edge” – A Guide to Managing
 Land for Bobwhite Quail – MDC
7. [Using Farm Bill Programs for Pollinator
 Conservation – PLANTS Database](#)

INTERNET SITES –

[HTTP://EXTENSION.MISSOURI.EDU/EXPLORE/AGGUIDES/WILDLIFE/INDEX.HTM](http://extension.missouri.edu/explore/agguides/wildlife/index.htm)

[WWW.CONSERVATION.STATE.MO.US](http://www.conservations.state.mo.us)

[HTTP://COVEYHEADQUARTERS.COM/](http://coveyheadquarters.com/)

[HTTP://WWW.MO.NRCS.USDA.GOV/TECHNICAL/FORMS/WILDLIFE.HTML](http://www.mo.nrcs.usda.gov/technical/forms/wildlife.html)

[HTTP://PLANTS.USDA.GOV/POLLINATORS/NRCSDOCUMENTS.HTML](http://plants.usda.gov/pollinators/nrcsdocuments.html)

[HTTP://WWW.XERCES.ORG](http://www.xerces.org)

TABLE 1 – RECOMMENDED SEEDING MIXES AND RATES FOR BOBWHITE QUAIL AND RELATED GRASSLAND SPECIES AND NATIVE POLLINATORS. See VEGETATION

ESTABLISHMENT HERBACEOUS SEEDING (723), Native Grass Cultivars/Selections Information Sheet (IS-MO723), [and Native Forbs Information Sheet \(IS-MO643F\)](#)

- **Use in areas where [erosion](#) is not a concern (NHLE)**

[\(seeding rate of the final mix has at least 45% of the seeding rate based on perennial grasses\)](#)

[\(only use this seeding mix on the flattest portions of the NHLE fields\)](#)

[\(soil test and fertility/nutrient additions are not required\)](#)

Little Bluestem

2.0 lbs PLS/ac

Sideoats Grama

1.0 lbs PLS/ac

Plus

3.0 lbs PLS/ac (quail and related grassland species) approved native forbs - include a minimum of ten forb species in mix,

or

5.0 lbs PLS/ac (native pollinators) approved native forbs - include a minimum of fifteen forb species in mix and this seed must be certified as Missouri Source Identified Class (see RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) for additional information):

- with no single forb species to exceed 10% or less than 1% of the forb mix
- preferably a minimum of three flowering forb species should be included for each season (spring, summer, fall) for native pollinators
- with annual/biennial forbs (combined) not to exceed 10% of the forb mix
- see Table 2 - RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) for approved forb listing
- to encourage the forb component of the seeding mix (an important habitat item) **dormant seeding of the grass/forb mix is strongly recommended**

- **Use in areas where erosion is a concern (HEL)**

(seeding rate of the final mix has at least 60% of the seeding rate based on perennial grasses)

(potential erosion exists (HEL) or erosive portions of NHEL fields)

(soil test and fertility/nutrient additions are not required)

Little Bluestem

2.7 lbs PLS/ac

Sideoats Grama

1.4 lbs PLS/ac

Alfalfa

2.0 lbs PLS/ac

Plus

3.0 lbs PLS/ac (quail and related grassland species) approved native forbs - include a minimum of ten forb species in mix,

or

5.0 lbs PLS/ac (native pollinators) approved native forbs - include a minimum of fifteen forb

species in mix and this seed must be certified as Missouri Source Identified Class (see RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) for additional information):

- with no single forb species to exceed 10% or less than 1% of the forb mix
- preferably a minimum of three flowering forb species should be included for each season (spring, summer, fall) for native pollinators
- with annual/biennial forbs (combined) not to exceed 10% of the forb mix
- see Table 2 - RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) for approved forb listing
- to encourage the forb component of the seeding mix (an important habitat item) **dormant seeding of the grass/forb mix is strongly recommended**

- **Use only in wet areas on sites of pasture suitability groups WLB, WCB, WCU, WLO, and WtP**
(soil test and fertility/nutrient additions are not required)

Switchgrass

3.4 lbs PLS/ac

Plus

3.0 lbs PLS/ac (quail and related grassland species) approved native forbs - include a minimum of ten forb species in mix,

or

5.0 lbs PLS/ac (native pollinators) approved native forbs - include a minimum of fifteen forb species in mix and this seed must be certified as Missouri Source Identified Class (see RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) for additional information):

- with no single forb species to exceed 10% or less than 1% of the forb mix
- preferably a minimum of three flowering forb species should be included for each season (spring, summer, fall) for native pollinators
- with annual/biennial forbs (combined) not to exceed 10% of the forb mix
- see Table 2 - RESTORATION and MNGT. of RARE or DECLINING HABITATS (643) for approved forb listing
- to encourage the forb component of the seeding mix (an important habitat item) **dormant seeding of the grass/forb mix is strongly recommended**

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