United States Department of Agriculture
Natural Resources Conservation Service

2013 Ranking Period 1

Plant Enhancement Activity – PLT06 – Renovation of a windbreak, shelterbelt or hedgerow for wildlife habitat

Enhancement Description
This enhancement is for the renovation of existing sites that are declining in vigor, need additional woody plants (trees or shrubs) or otherwise no longer provide wildlife habitat benefits. Existing rows of woody plants may be thinned, removed or replaced with new plantings. Existing woody plants may be pruned, either branches or roots or both, to improve windbreak function, health and vigor.

Land Use Applicability
Cropland, Pastureland, Rangeland

Benefits
Renovation restores the function of existing windbreaks, shelterbelts or hedgerows to provide wildlife habitat benefits as well as other benefits such as reduced wind erosion, pesticide drift, mitigation of odor and noise and controlled snow deposition. Species composition may be upgraded by adding trees or shrubs that produce wildlife food and shelter as well as wood products and visual quality, such as spring blossoms or fall colors. Woody species threatened by pests such as emerald ash borer can be replaced with more resilient species that provide wildlife habitat benefits.

Conditions Where Enhancement Applies
This enhancement applies only to the acres of existing windbreaks or shelterbelts in the crop or pasture land use.

Criteria
1. Identify wildlife species to be benefited by the renovation,
2. Develop a plan for new trees and/or shrubs that will provide the desired habitat and windbreak or shelter belt functions,
3. Remove dead or dying trees that do not provide the desired habitat unless habitat for cavity nesting wildlife is desired,
4. Remove other trees or invasives that do not provide the desired habitat,
5. Replace removed trees by planting new trees or shrubs that will provide the desired habitat while serving the required windbreak or shelter belt function, and
6. Prune or thin less desirable trees to encourage the growth of trees that will provide wildlife habitat and windbreak or shelter belt functions.

Adoption Requirements
This enhancement is considered adopted when all six criteria above have been implemented.

Documentation Requirements

1. Brief written description of the tasks completed with dates and any receipts for planting stock, herbicides, etc.,
2. Delineations on a map or aerial photo of renovated windbreak, and
3. Photos of before and after renovation.

References

USDA-NRCS and Xerces Society. 2008. Using Farm Bill Programs for Pollinator Conservation. Technical Note No. 78. Washington, D.C. http://directives.nrcs.usda.gov/OpenNonWebContent.aspx?content=24993.wba

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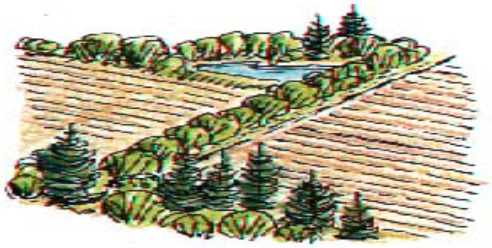

MS-ECS-645-13 (JS/SS)
January 2006

WILDLIFE TRANSITION ZONES AND/OR CORRIDORS - ESTABLISHMENT AND MANAGEMENT GUIDELINES

PLANNING CRITERIA AND CONSIDERATIONS

- ✓ Purposes
- ✓ Location within the field, farm, and local landscape; overall landscape composition
- ✓ Buffer lengths and widths (based on planning criteria)
- ✓ Vegetation
- ✓ Maintenance/management

Purposes:

The primary purpose of establishing hedgerows for wildlife use is to provide transition zones (TZ) and/or travel corridors between habitats. Linking habitats fragmented by croplands, grazing lands, forest lands, and farmsteads or urban development with hedgerows may greatly increase use of an area by wildlife. Hedgerows can also provide multiple wildlife habitat components including food, nesting cover and escape cover, depending upon the variety of vegetation present. In addition to providing wildlife benefits, hedgerows can serve as screens, either as visual, noise, and/or odor barriers; can protect air quality by trapping sediment, chemicals and other pollutants; can serve as setbacks from sensitive areas when applying pesticides or fertilizers; can improve landscape aesthetics; and delineate boundaries.

Location Within the Field, Farm, and Local Landscape; Overall Landscape Composition:

- In general, hedgerows can be established at the edge or around the perimeter of cropland, pasture and hay land fields **and/or** permanent livestock holding areas, such as confined livestock facilities. Hedgerows can also be located: within the field to connect buffer practices to one another; between two crop, pasture and/or hay land fields; between cropland and existing forests, grazing lands, hay lands, wetlands, ponds, or streams; and along the outside edges of conservation practices, such as filter strips, riparian herbaceous buffers, existing field borders, and grassed waterways.
- Soil types, topography, drainage, climate, and adjacent land uses need to be taken into account.
- Hedgerows planned to benefit wildlife should be viewed from a landscape perspective, including the pattern of land use patches, corridors, and the dominant cover type. Food, cover and water must be distributed on the landscape in a manner that provides reasonable access.

Buffer Lengths and Widths:

Hedgerows should be as long as needed for field conditions and purposes. Locating hedgerows around the entire field increases the effectiveness and provides more environmental benefits. Hedgerows established for wildlife purposes should be a minimum of 30 feet wide. Generally, the wider the hedgerow, the greater the number of species will use it. Additional width is also important to decrease predator efficiency and minimize the destruction of nests and to provide habitat that is not disturbed by turning equipment during the primary nesting and brood rearing season.

Recommended Hedgerow Widths:	**Minimum**	**Optimum**
Field edges – Wildlife travel corridor and escape cover	30 feet	60 feet
Field edges – Corridor/escape + nesting cover (NC)	60 feet	120 feet
Between 2 fields – Corridor/escape	40 feet	80 feet
Between 2 fields – Corridor/escape + NC	80 feet	160 feet
Outside edges of conservation practices - Corridor/escape	30 feet + practice width	60 feet + practice
Outside edges of cons. practices - Corridor/escape + NC	60 feet + practice width	120 feet + practice
Confined livestock facility - Corridor/escape + odor	40 feet	80 feet
Confined livestock facility - Corridor/escape + odor + NC	70 feet	140 feet

Vegetation:

- Plant species can greatly affect the wildlife habitat components that can be provided by a hedgerow including nesting cover, feeding cover, escape cover, and/or travel corridors between habitats. Typically a hedgerow designed and managed with wildlife in mind will have an unkempt appearance with a variety of different plants. The best results will be achieved when there is a mixture of trees, shrubs, vines, grasses, legumes, and/or forbs.
- The diversity of plants in a well-managed hedgerow will increase the availability of food resources such as seeds and insect prey (important for many wildlife species, e.g., the diet of species like quail and turkey chicks during the first few weeks of life is composed almost entirely of insects).
- In most situations, hedgerows can be established in desirable vegetation by not mowing or disking for 1 to 2 years. **Natural succession will usually regenerate desirable trees, shrubs, grasses, legumes, and forbs in most areas.** Broomsedge and/or other native warm-season bunchgrasses will naturally colonize most agricultural sites within 2-3 years after fallowing and provide excellent nesting habitat. Shrubs and trees will usually start to dominate the area within 4-5 years. **Hedgerows should not have to be planted unless: accelerated establishment for trees and shrubs is desired; undesirable invasive species are known to exist in the seedbank; cropland has no native seed bank for desired plant species due to heavy herbicide usage; or a specific combination of plant species is desired for purposes, such as visual/odor barriers or to establish specific elements of wildlife food/cover.** When using natural regeneration, field checks should be conducted during the 1st and 2nd growing season to be sure suitable plant species for targeted wildlife are present and growing well. Regardless of establishment methods, measures must be provided to control severe outbreaks of noxious weeds and/or invasive species. If fescue, bermudagrass and/or privet are present in existing field margins, herbicidal control will be required prior to establishment to prevent invasion into the hedgerow. Spraying or other control methods for undesirable vegetation should be done on a "spot" basis to protect the plants that benefit wildlife.
- On areas subject to erosion, a winter cover crop can be sown to protect the soil until the vegetation becomes established. Small grain plantings, such as wheat (ryegrass is not acceptable), can be allowed to develop into native vegetation the following season. A reduction in agricultural seeding rates is desirable for wildlife purposes.
- **If hedgerows are planted,** plants that provide wildlife food and cover should be used. Targeted wildlife needs should be considered when selecting plant species. Native species should be used when feasible. Also low-density seeding rates or reduced agricultural seeding rates are desirable for wildlife seeding mixtures.
- **Species to plant:** See Table 1 for a list of recommended trees, shrubs, grasses, legumes, and forbs for hedgerows. Other plants may be used if they meet objectives and are adapted for the site, soils and climate. A NRCS wildlife biologist should be consulted. Avoid use of species known to be a pest, such as privet or autumn olive. **Bermudagrass, fescue, and sericea lespedeza are not acceptable grasses to plant in hedgerows since they are not desirable for wildlife.**
- Tree species should be included for hedgerows in open areas such as, around, between or within crop fields and/or pastures. Distance between rows and number of rows will vary, depending on species of plants, width of hedgerow and density desired. If planted in two or more rows, stagger plant spacing in adjacent rows. **See Figure 1.**
- A combination of tall and low growing shrubs and/or trees is more effective for cover than a single species. Center row(s) should consist of the tallest growing species and height should decrease down to the outermost rows of herbaceous vegetation. Grasses, vines and forbs should be planted in a strip at least 30 ft. wide adjacent to the woody plants, this will minimize competition between woody species and crops in fields.
- Hedgerows can be used as transition zones, areas that reduce the abrupt change between different types of habitat such as a soybean field and a forested area. A transition zone should be a minimum of 30 feet in width. Hedgerows for transition zones separating fields from forests do not need trees, but should be established with shrubs next to the forest and herbaceous species next to the field.
- Depending on the wildlife objective, narrow (10-20 feet) linear shrub rows can be planted. The shrubs will provide a transition zone between herbaceous vegetation and forestland, wetlands, ponds, and streams; and between the edges of conservation practices, such as riparian forest buffers and existing field borders. Alternatively, small group or "clumped" plantings (at least 30'X30' in size) of native shrubs and forbs can add food and loafing/escape cover to hedgerows. Native shrubs and forbs can be established by planting or by protecting small groups of desirable shrubs that become established naturally. (Firebreaks around woody plantings should be established for their protection, if prescribed burning is used as a maintenance technique for herbaceous sections of the hedgerow.)

Vegetation (continued):

- Habitat requirements for wildlife change during the year. Choose species that produce foods in each season. Plant a variety of fruit- and nut-producing trees and shrubs for wildlife food. Consider when food production will begin. Some shrubs will bear fruit the second year, while some trees may take a decade or more to produce nuts.
- Plant at least 25% evergreen trees or shrubs to provide year-round cover.
- The use of native, warm-season grasses should be encouraged in all hedgerows to provide nesting/brood habitat. These bunch grasses provide good nest sites for ground-nesting birds, and the open spaces between plants provide feeding habitat for young birds and small mammals. Ground nesting zones should not be less than 30 feet wide.
- Plots of annuals such as Kobe lespedeza, browntop millet, small grains, or corn can be planted in the spring alongside the hedgerow if the landowner wants to provide additional wildlife plantings. These plantings should be a minimum of 20 feet in width.
- Leaving several rows of standing crops adjacent to the hedgerow will enhance fall and winter food.
- When considering additional purposes such as visual and/or odor barriers, plant at least 1-row evergreens, especially conifer types. Other key considerations for screens/barriers are: height, continuity, density, orientation, and length. Minimum width should include three rows of trees.
- For additional aesthetic purposes consider season & color of flowers, fruits and leaves and plant form and texture.

Maintenance/Management:

- Control competing vegetation until woody plants are established. Provide protection from wildfire and damage from grazing by domestic animals. Damaging pests should be monitored and controlled.
- Fertilizer and lime should be applied according to soil tests to help maintain plant vigor and production.
- Replant as necessary to maintain a continuous hedge. When renovation of the hedgerow is needed, use fire, herbicides, or mechanical means to set back vegetation to an earlier stage of succession. To preserve wildlife habitat, renovate only one-third of the length of the hedgerow at a time, allowing re-growth before proceeding to the next section. (The value of older established hedgerows can be improved for wildlife by interplanting open areas within hedgerows or renovating one-third of the length of the hedgerow at a time, using species that provide wildlife food and cover.)
- Shrub lespedeza will need to be burned or mowed and burned every 3 to 5 years in late winter to keep it a desirable size to benefit wildlife.
- Hedgerows will require wildlife maintenance/management techniques that disturb herbaceous plant succession (light strip disking, prescribed burning, and/or spot spraying with herbicides) to be applied on between 1/3 to 1/2 of the herbaceous hedgerow area every two to three years. For best results, the management should be done on a staggered basis (e.g., applied to a different area each year). Before a new area is disturbed, any areas previously disturbed should have sufficient permanent cover to provide wildlife habitat and soil loss protection. Maintenance techniques should be conducted between October and March in order not to conflict with nesting and brood rearing. Refer to MS-ECS-645-09(JS/SS), "Wildlife Management Techniques – Light Strip Disking" and MS-ECS-338-02 (JS), "Wildlife Management Techniques – Prescribed Strip Burning" for details on vegetative disturbance.

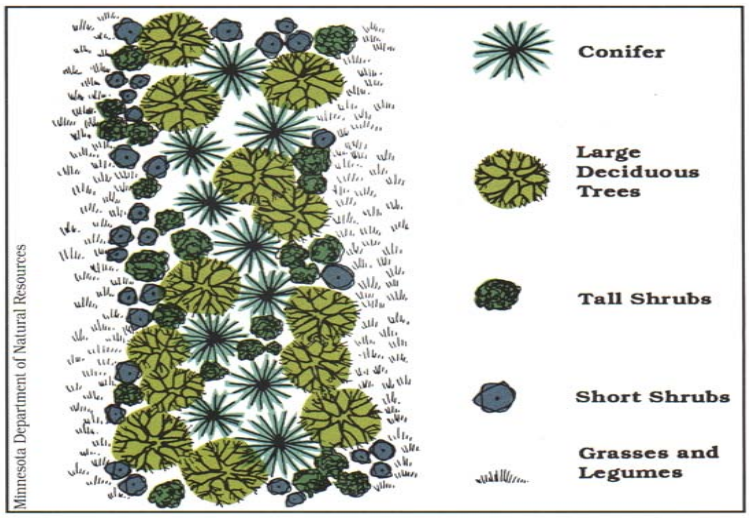

Figure 1. Example of Tree/Shrub/Grass Arrangement

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TABLE 1
RECOMMENDED PLANTS*/PLANTING RATES*
FOR WILDLIFE HEDGEROWS IN MISSISSIPPI

NATIVE GRASSES Species	Minimum Units Per Acre	Planting Dates
Kaw Big Bluestem	5.5 Lbs. PLS (Pure Live Seed)	Apr-May
Earl Big Bluestem	5.5 Lbs. PLS	Apr-May
Lometa Indiangrass	4.5 Lbs. PLS	Apr-May
Alamo Switchgrass	4.5 Lbs. PLS	Apr-May
Kanlow Switchgrass	4.5 Lbs. PLS	Apr-May
Aldous Little Bluestem	5.0 Lbs. PLS	Apr-May
Alantic Coastal Panic Grass	5,000 sprigs;10-20 Lbs.	Nov-Mar; Jun-Sep
Other*:		

NATIVE LEGUMES Species	Minimum Units Per Acre	Planting Dates
Common Partridge Pea	6 Lbs.	Feb-May 15
Lark Selection Partridge Pea	6 Lbs.	Feb-May 15
Beggarweed	10-15 Lbs.	Apr-May
Florida Beggarweed	10-15 Lbs.	Apr-May
Other*:		

INTRODUCED LEGUMES Species	Minimum Units Per Acre	Planting Dates
Ladino and White Dutch Clover	3 Lbs.	Sep-Oct 15
Kobe Lespedeza	15-30 Lbs.	Mar-Apr
Perennial Red Clover	8-12 Lbs.	Sep-Oct 15
Other*:		

TREES (Plant: November 15 - March 15) Species – Primary Application for Wildlife	Minimum Units Per Acre **OR** Spacing	Approximate Plants/Acre
Hawthorn spp. - Wildlife food	6' x 6'	1,200
Viburnum spp. - Wildlife food and cover	6' x 6'	1,200
Persimmon - Wildlife food	6' x 6'	1,200
Crabapple - Wildlife food	6' x 6'	1,200
Eastern red cedar - Screening and cover	6' x 6'	1,200
Loblolly pine - Screening and cover	6' x 6'	1,200
Other*:		

INTRODUCED SHRUBS Species	Minimum Units Per Acre **OR** Spacing	Approximate Plants/Acre
Shrub Lespedeza - Bicolor, Japonica, Thunbergii		
Seeds (Plant Mar-Apr)	10-15 Lbs./Ac.	NA
Seedlings (Planting Dates: November 15 - March 15)	3' x 3'	4800
Other*:		

NATIVE SHRUBS/FORBS (Planting Dates for Plants: November 15 - March 15) Species	Spacing	Approximate Plants/Acre
Native Blackberries (*Rubus* spp.)	6' x 6'	1200
Native Plums (*Prunus spp*., common ex.: Chickasaw Plum)	8' x 8'	700
Native Dogwoods (Cornus *spp*., common ex.: Rough Leaf Dogwood)	8' x 8'	700
Native Hollies (*Ilex spp*., common ex.: Deciduous Holly)	8' x 8'	700
Other*:		

*Due to the wide variety of geographical areas and plant species that might be suitable for wildlife, this listing may be incomplete. Caution should be exercised not to plant species that have an invasive nature. Rates for wildlife seeding mixtures may be less than recommended rates in planting guides. Use 60% of recommended rate for a mixture of 2-3 species. Use 30% of recommended rate for a mixture of 4 or more species. Also recommended planting rates and spacing may vary slightly depending on intended wildlife uses (cover vs. food). **Consult with a NRCS biologist.** Reference: "Mississippi Planting Guide", 1999.

Hedgerows for Wildlife Transition Zones/Corridors Specification Sheet

Landowner _____ **Field Number** _____

Purpose(s) (check all that apply)	☒ Wildlife
☐ Provide a living screen - visual, noise, odor, other	☐ Other (specify)

Hedgerow Layout (Job sketch may be attached if desired)	**Hedgerow 1**	**Hedgerow 2**	**Hedgerow 3**	**Hedgerow 4**
Buffer width (ft)				
Buffer length along edge of field (ft)				
Area (ac)				
Lime (tons/acre) (according to soil test)				
N (lb/acre) (according to soil test)				
P2 O5 (lb/acre) (according to soil test)				
K2O (lb/acre) (according to soil test)				

Trees/Shrubs - Species by row number Row	Species/cultivar	Spacing and/or Total number of plants for row	Spacing and/or Total number of plants for row	Spacing and/or Total number of plants for row	Spacing and/or Total number of plants for row

Grass/Legume/Forb/Vine Species Name	**Grasses/Legumes/ Forbs/Vines** Seeding rate (PLS) or (lb/acre)	**Grasses/Legumes/ Forbs/Vines** Seeding rate (PLS) or (lb/acre)	**Grasses/Legumes/ Forbs/Vines** Seeding rate (PLS) or (lb/acre)	**Grasses/Legumes/ Forbs/Vines** Seeding rate (PLS) or (lb/acre)
Species #1 -				
Species #2 -				
Species #3 -				
Species #4 -				
Species #5 -				

Planting Methods

Ex.: Trees/Shrubs: To reduce plant competition, break and harrow a strip as long and wide as the planned hedgerow. Plant with hand tools or suitable mechanical tree planter. Areas with compacted soil or plow pans should be subsoiled or planted in a matter that would penetrate the pan or compacted soil layer. Seedlings should be planted to just above the root collar (2-3 inches to allow for soil settling). Grasses/Legume/Forbs: Prepare firm seedbed. Apply lime and fertilizer according to recommendations. Plant grass and legume seed _____ inches deep uniformly over area. Establish stand of vegetation according to recommended seeding rate.

Maintenance

Ex.: Maintain original width and length of the hedgerow. Set back herbaceous plant succession with light strip disking, prescribed burning, and/or spot spraying. Alternate the location of these disturbed areas each year as described in the notes below. Reseed and fertilize if needed to maintain plant density. Inspect after major storms, remove trapped sediment, and repair any eroding areas. Shut off pesticide sprayers when turning on a field border.

Notes

Ex.: Maintenance schedule – In (month) of the second year, within each hedgerow, lightly disk a strip of land ___ feet in length and leave a second and third strip, each ___ feet long, "undisked." In (month) of the third year, disk the second strip and protect the first (disked during previous year) and third strip. Continue this rotation.