United States Department of Agriculture

Conservation Enhancement Activity

CONSERVATION STEWARDSHIP PROGRAM

E386D

Enhanced field borders to increase food for pollinators along the edge(s) of a field

Conservation Practice 386: Field Border

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Associated Ag Land

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 10 years

Enhancement Description:

Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide food for pollinators along the edge(s) of the field.

Criteria:

- Field borders shall be established along selected field edges at a width of at least 40 feet.
- Locate borders to eliminate sloping end rows, headlands, and other areas where concentrated water flows will enter or exit the field.
- Field borders shall be established to a mixture adapted species of permanent grass, forbs and/or shrubs that accomplish the design objective.
- **The NRCS at the state level will develop lists of plants suitable for pollinator habitat. The lists must emphasize as many native species as practical.**
- Plants selected for field borders will have the physical characteristics necessary to produce pollen during multiple seasons.

- No plant listed by the state as a noxious or invasive species shall be established in the field border.
- Seedbed preparation, seeding rates, dates, depths, fertility requirements, and planting methods will be consistent with approved local criteria and site conditions.
- Ephemeral gullies and rills present in the planned border area will be eliminated as part of seedbed preparation. If present, ephemeral gullies and rills located immediately upslope from the planned border area need to be treated to ensure more of a sheet flow into the planned border area.
- Operation and maintenance requirements:
    - Repair storm damage.
    - Remove sediment from above, within and along the leading edge of the field border when accumulated sediment either alters the function of the field border or threatens the degradation of the planted species.
    - Shut off sprayers and raise tillage equipment to avoid damage to field borders.
    - Shape and reseed border areas damaged by animals, chemicals, tillage, or equipment traffic.
    - Do not use the field border as a hay yard or machinery parking lot for any extended period of time, especially if doing so will damage or impair the function of the field border.
    - Schedule mowing, harvest, weed control, and other management activities within the field border to accommodate reproduction and other life cycle requirements of target wildlife species. Vehicle traffic should be avoided in the field border area.
    - Maintain desired vegetative communities and plant vigor by liming, fertilizing, mowing, disking, or burning and controlling noxious and invasive weeds to sustain effectiveness of the border.
    - Repair and reseed ephemeral gullies and rills that develop in the border.
    - When managing for wildlife, maintenance activities that result in disturbance of vegetation should not be conducted during the primary nesting, fawning

and calving seasons. Activities should be timed to allow for regrowth before the growing season ends whenever possible.

- Periodic removal of some products such as medicinal herbs, nuts, and fruits is permitted provided the conservation purpose is not compromised by the loss of vegetation or harvesting disturbance.
- Avoid vehicle traffic when soil moisture conditions are saturated.
- Maintain records of the field border maintenance as needed by the land user.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

☐ Prior to implementation, prepare the planned acres for vegetation establishment. Refer to NRCS Conservation Practice Standard Field Border (Code 386). (NRCS will provide technical assistance, as needed.) Total planned amount of field border extension = _____feet

☐ Prior to implementation, select adapted species of permanent grass, forbs and/or shrubs that accomplish the design objective and are best suited to site conditions. (NRCS will provide technical assistance, as needed.)

Species	Seeding Rate (lb/ac pure live seed)	Note specific species characteristic(s)

☐ Prior to implementation, determine liming and fertilizer requirements, select planting technique and timing appropriate for the site and soil conditions. (NRCS will provide technical assistance, as needed.)

Planting Date	
Planting Technique	
Lime and Fertilizer Requirements	

☐ During implementation, install and maintain erosion control measures as needed for the site. (NRCS will provide technical assistance, as needed.)

☐ During implementation, notify NRCS of any planned changes to verify changes meet NRCS enhancement criteria.

☐ During implementation, protect the planting from plant and animal pests and fire.

☐ After implementation, maintain and protect the planting from plant and animal pests and fire.

☐ After implementation, verify the total amount of field border implemented. Total implemented amount of field border extension = _____feet

NRCS will:

☐ Prior to implementation, verify the enhancement is planned within the field(s) or farm boundary.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Field Border (Code 386) as it relates to implementing this enhancement.

☐ Prior to implementation, verify the enhancement is planned for acres that have been appropriately prepared for vegetation establishment. Total planned amount of field border extension = _____feet

☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included.

☐ As needed, prior to implementation, NRCS will provide technical assistance:

- Planning site preparation meeting NRCS Conservation Practice Standard Field Border (Code 386).
- Selecting the adapted species of permanent grass, forbs and/or shrubs that accomplish the design objective and are best suited to site conditions.
- Selecting planting techniques and timing appropriate for the site and soil conditions.
- Planning the use of additional erosion control, as needed for the site.
- Preparing specifications for applying this enhancement for each site using approved state implementation requirements, national technical notes, appropriate state technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.

- ☐ After implementation, verify the vegetation was established to specifications developed for the site.
- ☐ After implementation, verify the planting is protected from pests and fire.
- ☐ After implementation, verify all erosion control needed for the site is functioning and is maintained to specifications developed for the site.
- ☐ After implementation, verify the total amount of field border implemented. Total implemented amount of field border extension = _____feet

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

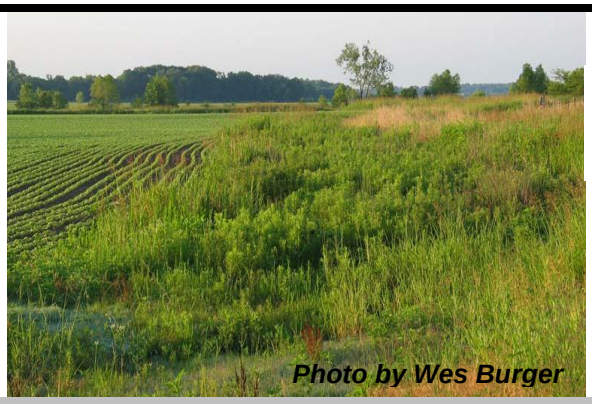
CSP 2018
Mississippi Supplement
E386136Z

Enhanced Field Borders To Increase Food For Pollinators Along The Edge(s) Of A Field

Documentation Requirements:

- **Landowner must be provided with one of the following documents that includes a recommended seed mix, planting specifications, and management/maintenance recommendations: Either a completed Implementation Requirement (IR) sheet, 386 – Field Border, OR a completed job sheet, MS-ECS-386-01(JS/SS), OR a planting prescription and management/maintenance plan approved by a NRCS area/state wildlife biologist.**
- **Management/maintenance activities can be implemented anytime, as needed, within the first year of post-planting. Afterwards, no more than 1/3 of the total acreage should be managed each year. Management and/or maintenance activities must be conducted outside of the growing season or bloom period of November 1 to April 1 (or after the first killing frost to spring green-up) to allow completion of blooming and seed production.**
- **Map(s) delineating the area that will be treated.**

NRCS Natural Resources Conservation Service
MISSISSIPPI



MS-ECS-386-01 (JS/SS)
November 2012

FIELD BORDERS FOR WILDLIFE HABITAT BUFFERS - 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 field borders for wildlife use is to provide early successional habitat buffers. These habitat buffers can provide multiple wildlife habitat components including food, nesting cover and escape cover for quail and other upland birds in cropland areas. A habitat buffer can also provide a transition zone (TZ) and/or travel corridor between cropland and other habitats, such as grazing lands and forest lands. Linking habitats fragmented by croplands with habitat buffers may greatly increase use of an area by quail, upland birds, and other wildlife. In addition to providing wildlife habitat; habitat buffers can reduce erosion from water at the edge of fields; can protect water quality by trapping sediment, chemicals and other pollutants; and can serve as setbacks from sensitive areas when applying pesticides or fertilizers. **Habitat buffers shall NOT be used as turn rows, roads, or for storage of crops or equipment.**

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

- Habitat buffers generally should be established around the entire perimeter of cropland fields. However buffers can be placed on any field edge or combination of connecting field edges. At a minimum habitat buffers will be located in areas where runoff enters or leaves the field.
- Habitat buffers can be located: between the edges of two adjacent crop fields; between cropland edges and existing forests, grazing lands, hay lands, wetlands, ponds, or streams; and along the cropland edges of existing conservation practices, such as riparian forest buffers, forested hedgerows, and grassed waterways.
- Soil types, topography, drainage, climate, and adjacent land uses need to be taken into account.
- Habitat buffers planned to benefit quail and/or other targeted upland bird species 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:

Habitat buffers should be as long as needed to support the targeted species and participant objectives. Locating buffers around the entire field increases the effectiveness and provides more environmental benefits. Habitat buffers will have a minimum average width of 30 feet. Generally, the wider the habitat buffer, the greater the number of species will use it. Additional width is also important to decrease predator efficiency and minimize the destruction of nests. If buffers are used as setback areas the minimum width must be equivalent to the required minimum appropriate to meet nutrient and/or pest management requirements. To provide habitat that is not disturbed by turning equipment, field turn rows must be moved inward. **(Habitat buffer areas shall NOT be used as turn rows, roads, or for storage of crops or equipment.)**

Recommended Habitat Buffer Widths:	Minimum	Optimum
Field Edges – Wildlife travel corridor	30 feet	60 feet
Field Edges – Corridor + Shrub TZ	50 feet	100 feet
Field Edges - Nesting or escape cover	40 feet	80 feet
Field Edges - Nesting or escape cover + Shrub TZ	60 feet	120 feet
Between 2 adjacent fields – Travel corridor	40 feet	80 feet
Between 2 adjacent fields – Travel corridor +Shrub center	60 feet	120 feet
Cropland edges of existing conservation practices	30 feet + practice width	60 feet + practice
Cropland edges of existing conservation practices + Shrub	50 feet + practice width	100 feet + practice

Vegetation:

- Plant species can greatly affect the wildlife habitat components that can be provided by a habitat buffer including nesting cover, feeding cover, escape cover, and/or travel corridors between habitats. Typically a buffer designed and managed with wildlife in mind will have an unkempt appearance with a variety of different plants.
- In most situations, habitat buffers can be established in desirable vegetation by not mowing or disking (keeping the area fallow) for 1 to 2 years. **Natural succession will usually regenerate desirable grasses, legumes, forbs, and shrubs 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. **Habitat buffers should not have to be planted unless: erosion is a problem; the cropland has no native seed bank for desired plant species due to heavy herbicide usage; or a specific combination of plant species is desired (such as native warm season grasses mixed with legumes and/or shrubs).** 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.
- One potential method to “kick start” natural regeneration in the right direction would be to sow a mix of winter wheat (50 lbs/ac), kobe lespedeza (12 lbs/ac), and partridge pea (4 lbs/ac). The wheat in this mix would provide a winter cover crop to protect the soil until the vegetation becomes established, help delineate the buffer area, and provide usable food and cover for quail and other wildlife. The lespedeza and partridge pea would provide perennial food and cover for wildlife to supplement native grasses and forbs that would grow in the buffer the following season.
- The diversity of plants in a well-managed habitat buffer 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).

Vegetation (continued):

- Regardless of establishment methods, measures must be provided to control severe outbreaks of noxious weeds and/or invasive species. If fescue and/or bermudagrass are present in existing field margins/borders, herbicidal control will be required prior to establishment to prevent invasion into the habitat buffer. Spraying or other control methods for undesirable weeds should be done on a "spot" basis to protect the plants that benefit wildlife.
- **If habitat buffers are planted,** a mixture of plants that provide wildlife food and cover in each season should be used. Targeted wildlife needs should be considered when selecting plant species. Native species should be used when feasible. The best results will be achieved when there is a mixture of grasses, legumes, forbs, and/or shrubs. Rates for wildlife seeding mixtures and planting rates and spacing for seedlings 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.
- Species to plant: The following is a recommended mixture for quail – Little bluestem (2 PLS), big bluestem (1 PLS), Indian grass (1 PLS), kobe lespedeza (12 lbs/acre) and partridge pea (4 lbs/acre). See Table 1 for a list of additional recommended grasses, legumes, forbs, and shrubs for habitat buffers. Other plants may be used if they meet objectives and are adapted for the site. Avoid use of species known to be invasive. **Bermudagrass, fescue, and sericea lespedeza are not acceptable grasses to plant in habitat buffers since they are not desirable for wildlife.** A qualified wildlife biologist should be consulted.
- The use of native, warm-season grasses should be encouraged in all buffers to provide nesting and brood-habitat. These bunch grasses provide good nesting sites for ground-nesting birds, and the open spaces between plants allow good feeding habitat for young birds and small mammals. Access to a warm season grass drill is needed to plant warm-season grasses.
- 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 existing conservation practices, such as riparian forest buffers and forested hedgerows, and the herbaceous sections of the habitat buffer. Small group or "clumped" plantings (at least 30'X30' in size) of native shrubs and forbs can add escape cover and/or food to habitat buffers. If shrubs are established in clumps, "ring-arounds" (fire breaks around plantings) should be established for protection, if prescribed burning is used as a maintenance technique for the habitat buffer.
- Leaving several rows of standing crops adjacent to the buffer will enhance fall and winter food.

Maintenance/Management:

- Habitat buffers will require wildlife maintenance/management techniques that disturb plant succession (light strip disking, prescribed burning, and/or spot spraying with herbicides) to be applied on 1/3 of the buffer length each year, beginning in the second year after establishment. 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 after August 15 and before April 1 in order not to conflict with nesting and brood rearing.
- Refer to MS-ECS-647-03(JS/SS), "Wildlife Management Techniques – Light Strip Disking" and MS-ECS-338-02 (JS), "Wildlife Management Techniques – Prescribed Strip Burning" for details.
- Noxious weeds and other undesirable plants, insects and pests shall be controlled, including such maintenance as necessary to avoid an adverse impact on surrounding land.

TABLE 1
RECOMMENDED PLANTS*/PLANTING RATES*
FOR HABITAT BUFFERS FOR UPLAND BIRDS 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*:		

INTRODUCED SHRUBS Species	Minimum Units Per Acre **OR** Spacing	Approximate Plants/Acre
Shrub Lespedeza		
(Seeds)	10-15 Lbs./Ac. (Plant Mar-Apr)	NA
(Seedlings)	3' x 3'	4800
Bicolor	(Planting Dates:	
Thunbergii	November 15 - March 15)	
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
Hawthorn spp.	6' x 6'	1,200
Viburnum spp.	6' x 6'	1,200
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 qualified biologist.** Reference: "Mississippi Planting Guide", 1999.

Landowner _____ **Field Number** _____

Purpose (check all that apply)	☒ Wildlife			
☐ Other (specify)				
Habitat Buffer Layout (Job sketch may be attached if desired)	**Habitat Buffer 1**	**Habitat Buffer 2**	**Habitat Buffer 3**	**Habitat Buffer 4**
Buffer width (ft)				
Buffer length along edge of field (ft)				
Area (acres)				
Lime (tons/acre) (according to soil test)				
N (lb/acre) (according to soil test)				
P_2O_5 (lb/acre) (according to soil test)				
K_2O (lb/acre) (according to soil test)				
Grass/Legume/Forb/Shrub Species Name	**Grasses/Legumes/ Forbs** Seeding rate (PLS) or (lb/acre)	**Grasses/Legumes/ Forbs** Seeding rate (PLS) or (lb/acre)	**Grasses/Legumes/ Forbs** Seeding rate (PLS) or (lb/acre)	**Grasses/Legumes/ Forbs** Seeding rate (PLS) or (lb/acre)
Species #1 –				
Species #2 -				
Species #3 -				
Species #4 -				
Species #5 -				

Shrub Plots Established within Buffers	**Habitat Buffer 1**		**Habitat Buffer 2**		**Habitat Buffer 3**		**Habitat Buffer 4**	
Species / Cultivar Name								
Plot Size (Length X Width) / Area (Ac)								
No. of Plots / Spacing or No. Plants in Plot								
Species / Cultivar Name								
Plot Size (Length X Width) / Area (Ac)								
No. of Plots / Spacing or No. Plants in Plot								
Species / Cultivar Name								
Plot Size (Length X Width) / Area (Ac)								
No. of Plots / Spacing or No. Plants in Plot								

Planting Methods

Ex.: 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. If necessary, mulch newly seeded area with _____ tons per acre of mulch material. May seed small grain as a companion crop at the rate of _____ pounds per acre. Shrub planting: To reduce plant competition, break and harrow a strip as long and wide as the planned shrub plot. 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).

Maintenance

Ex.: Maintain original width and depth of the habitat buffer by placing permanent boundary markers. Set back 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 near a habitat buffer. Fire breaks should be established for protection around shrub plantings, if prescribed burning is used for maintenance. Habitat buffers shall NOT be used as turn rows, roads, or for storage of crops or equipment.

Notes

Ex.: Maintenance schedule – In (month) of the second year, within each habitat buffer, lightly disk 1/3 of the length of the buffer and leave the rest of the buffer "undisked." In (month) of the third year, within each field buffer, disk the next 1/3 of the buffer length and leave the first (disked during previous year) and third section undisked. Continue this rotation. When prescribed burning, follow the same staggered schedule as for disking. Maintenance/management techniques should be conducted after August 15 and before April 1 in order not to conflict with nesting and brood rearing.

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

386 - Field Border
Implementation Requirements

Producer: _____ **Project or Contract:** _____

Location: _____ **County:** _____

Farm Name: _____ **Tract Number:** _____

Practice Location Map

(showing detailed aerial view of where practice is to be installed on farm/site, showing all major components, stationing, relative location to any landmarks, and survey benchmarks)

Index

Description of work:

NRCS Review Only

Designed By: _____ **Date:** _____

Checked By: _____ **Date:** _____

Approved By: _____ **Date:** _____

386 – Field Border
Implementation Requirements

The Practice Purpose(s):

___ Reduce erosion from wind and water
___ Protect soil and water quality
___ Provide wildlife food and cover and pollinator habitat
___ Increase carbon storage
___ Improve air quality

Field Number/Location: _____ **Acres Installed:** _____ **Seeding Date:** _____

Average Width: _____ **Minimum Width:** _____ **Field Border Length:** _____

Site Preparation: _____

Planting Method: _____

Planting Description (*e.g.* shrubs established on outside edge of area, *etc.*):

_____

SEEDING RATES AND SPECIES (woody species units are plants/linear ft)

Plant species	Lbs/acre of seed (PLS)	Total lbs of seed for planned acreage
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTALS =>	0.00	0.00

FERTILIZERS AND AMENDMENTS

Fertilizer Element	Fertilizer Form	Fertilizer Amount (lbs/acre)
N	*e.g. DAP*	as N
P	*e.g. DAP*	as P_2O_5
K	*e.g. K_2SO_4*	as K_2O
S	*e.g. K_2SO_4*	as S
Lime		
Gypsum		

Operation and Maintenance: (check all that apply)

_____ Repair storm damage.

_____ Remove sediment from above or within the field border when accumulated sediment either alters the function of the field border or threatens the degradation of the planted species' survival.

_____ Shut off sprayers and raise tillage equipment to avoid damage to field borders.

_____ Shape and reseed border areas damaged by animals, chemicals, tillage, or equipment traffic.

_____ Maintain desired vegetative communities and plant vigor by liming, fertilizing, mowing, disking, or burning and controlling noxious weeds to sustain effectiveness of the border.

_____ Repair and reseed ephemeral gullies and rills that develop in the border.

_____ Minimally invasive tillage (e.g. paraplowing) may be performed in rare cases where compaction and vehicle traffic have degraded the field border function. The purpose of the tillage is strictly to decrease bulk density and increase infiltration rates so as to provide a better media for reestablishment of vegetation and field border function.

_____ Maintenance activities that result in disturbance of vegetation should not be conducted during the nesting season of grass nesting birds.

_____ Avoid vehicle traffic when soil moisture conditions are saturated.

SPECIES RECOMMENDED FOR PLANTING POLLINATOR ENHANCEMENT AREAS IN MISSISSIPPI

Flowering Dates	Soil	Sun	Botanical Name	Common Name	Color	Height	Visitation by Pollinator
Perennial Flowers							
April-June	moist	sun to partial shade	Coreopsis spp.	Tickseed	golden-yellow	4-18”	butterflies, hummingbirds
March-September	moist to dry	sun to partial shade	Salvia coccinea	Blood Sage, Scarlet Sage	red	12-36”	butterflies, bees, hummingbirds
March-June	moist to dry	sun to partial shade	Salvia lyrata	Lyre-leaf Sage	white, blue, lavender, violet	12-24”	hummingbirds, butterflies
February- May	moist to dry	sun	Nuttallanthus spp.	Toadflax	blue, violet	1-3’	butterflies, bees
May-September	moist to dry	sun to partial shade	Achillea spp.	Yarrow	white, light yellow	10-36"	bees, beetles, flies, butterflies
May-August	moist to wet	sun	Asclepias spp.	Common Milkweed, Butterfly Milkweed, Swamp Milkweed	pink, purple, white, orange to yellow	24-36”	butterflies, bees
May-September	dry	sun to partial shade	Coreopsis tinctoria	Golden Tickseed	yellow with red-brown centers	18-24”	butterflies, syphrid flies, bees
May-July	moist	sun to partial shade	Desmanthus illinoensis	Illinois Bundleflower	white	2-18”	bees, butterflies, flies
May-July	moist to dry	sun to partial shade	Dracopis spp.	Clasping Coneflower	yellow with red-brown centers	12-36”	bees, butterflies
May-July	moist to dry	sun to partial shade	Penstemon spp.	Beardtongue	white to blue	1-3’	bees, hummingbirds
May-September	moist to dry	sun to partial shade	Ratibida pinnata	Pinnate Prairie Coneflower or Greyhead Coneflower	yellow with red-brown centers	3-5’	butterflies, bees
May-October	moist to dry	sun to partial shade	Rudbeckia spp.	Black-eyed Susan, Brown-eyed Susan	yellow, brown center	14-20”	bees, beetles, flies, butterflies
May-June	dry	sun to partial shade	Tephrosia virginiana	Virginia Goat’s-rue	pink/yellow	8-28”	butterflies, hummingbirds
Sept-Oct	moist	sun	Bidens aristosa	Beggar Ticks or Bur-marigold	yellow	24-36”	bees, beetles, flies, butterflies
June-September	moist	sun to partial shade	Chamaecrista spp.	Partridge Pea	yellow	18-30”	bees
July-August	moist to dry	sun to partial shade	Desmodium spp.	Ticktrefoil, Beggar Ticks, Stick Tights	pink to purple	18-30”	bees, butterflies
July-October	moist	sun to partial shade	Eupatoriadelphus spp.	Trumpet Weed or Joe Pye Weed	pink, lavender	to 8’	bees, butterflies, flies
August-Oct	dry	sun to partial shade	Eupatorium spp.	Boneset, Thoroughwort, Sweetscented Joe-Pye Weed	white, pink	18-36”	butterflies, beetles, bees
August-Oct	dry to wet	sun	Helianthus spp.	Narrowleaf or Swamp, Woodland, Hairy Sunflowers	yellow	5-7’	butterflies, beetles, bees
July-Sept	moist to mesic	sun	Liatris spicta	Dense Blazing Star	rosy-pink to purple	3-4’	butterflies, bees, hummingbirds
July-Oct	dry	sun to partial shade	Solidago spp.	Goldenrod	yellow	2-4’	butterflies, bees, beetles
August-October	moist to dry	sun to partial shade	Symphyotrichum spp.	New England Aster, Blue Wood Aster, White Oldfield Aster	white, blue, lavender	18"-6’	butterflies, bees
August-October	moist	sun to partial shade	Vernonia gigantea	Ironweed	purple	3-5’	bees, beetles, flies, butterflies

Forb (flowering) mixtures should contain at least 3 species that bloom before June; 3 additional species that flower sometime between June-July; and 3 additional species that flower after July. The 3 species need not be in bloom for the entirety of a bloom period. Mixtures of forbs and/or legumes should be planted at the rate of 20 - 40 pure live seed (PLS) per square foot.

Native Grasses							
June-October	dry	sun to partial shade	*Schizachyrium scoparium*	little bluestem	yellow	3-6’	butterflies (larval host), bees (for ground nesting)
Aug-October	moist to dry	sun to partial shade	*Sorghastrum nutans*	Indiangrass	yellow	3-8’	butterflies (larval host), bees (for ground nesting)
Aug-October	moist to dry	sun to partial shade	*Andropogon gerardii*	big bluestem	red, blue, brown	4-8’	butterflies (larval host), bees (for ground nesting)
Aug-October	moist to dry	sun to partial shade	*Andropogon spp.*	other native bluestem spp. (broomsedge, bushy, etc.)	yellow, white, brown	3-6’	butterflies (larval host), bees (for ground nesting)
Aug-October	moist to dry	sun to partial shade	*Panicum virgatum*	switchgrass	green, brown	3-6’	butterflies (larval host), bees (for ground nesting)
June-October	moist to dry	sun to partial shade	*Bouteloua curtipendula*	sideoats grama	red, orange, yellow	1-3’	butterflies (larval host), bees (for ground nesting)

Mixtures of forbs, legumes and/or native grasses should be planted at the rate of 40 - 60 PLS per square foot with no more than 25% of the seed mix being made up of a native warm season grass seed.

SPECIES RECOMMENDED FOR MANAGING EXISTING POLLINATOR ENHANCEMENT AREAS IN MISSISSIPPI

Flowering Dates Early Flowering	Soil	Sun	Botanical Name	Common Name	Color	Height	Visitation by Pollinator	Also a host
Perennial Flowers								
April-June	dry	shade to partial shade	Phlox amoena	Hairy Phlox	lavender	12-15"	butterflies, hummingbirds	
April-June	moist to dry	shade to partial shade	Heuchera americana	American Alumroot	white	6-30"	hummingbirds, sweat bees	
March-September	moist to dry	sun to partial shade	Salvia coccinea	Blood Sage, Scarlet Sage	red	12-36"	butterflies, bees, hummingbirds	
March-June	moist to dry	sun to partial shade	Salvia lyrata	Lyre-leaf Sage	white, blue, lavender, violet	12-24"	hummingbirds, butterflies	
February- May	moist to dry	sun	Nuttallanthus spp.	Toadflax	blue, violet	1-3'	butterflies, bees	
March-April	moist	shade	Arisaema spp.	Jack-in the-Pulpit	greenish maroon	12-24"	flies	
April-June	moist	shade to partial shade	Phlox glaberrima var. glaberrima	Piedmont Smooth Phlox	pink	30-36"	butterflies, moths, hummingbirds	X
April-May	moist	sun to partial shade	Amsonia taberneamontana	Eastern Bluestar	blue	to 36"	butterflies, hummingbirds, carpenter bee, moths	X
April-June	moist	sun to partial shade	Coreopsis spp.	Tickseed	golden-yellow	4-18"	butterflies, hummingbirds	
March-May	wet to moist	sun	Iris fulva	Copper Iris	orange	20-26"	bees	
March-May	wet to moist	sun	Iris virginica	Southern Blueflag	blue	24-40"	bees	
Introduced Legumes								
April-June	moist to dry	sun to partial shade	Trifolium spp.	white clover (ex.: Ladino; White Dutch), hop clover	white, pink, yellow	4-12"	bees, butterflies	
Native Grasses								
June-October	dry	sun to partial shade	*Schizachyrium scoparium*	little bluestem	yellow	3-6'	butterflies, bees (for ground nesting)	X
Aug-October	moist to dry	sun to partial shade	*Sorghastrum nutans*	Indiangrass	yellow	3-8'	butterflies, bees (for ground nesting)	X
Aug-October	moist to dry	sun to partial shade	*Andropogon gerardii*	big bluestem	red, blue, brown	4-8'	butterflies, bees (for ground nesting)	X
Aug-October	moist to dry	sun to partial shade	*Andropogon spp.*	other native bluestem spp. (broomsedge, bushy, etc.)	yellow, white, brown	3-6'	butterflies, bees (for ground nesting)	X
Aug-October	moist to dry	sun to partial shade	*Panicum virgatum*	switchgrass	green, brown	3-6'	butterflies, bees (for ground nesting)	X
June-October	moist to dry	sun to partial shade	*Bouteloua curtipendula*	sideoats grama	red, orange, yellow	1-3'	butterflies, bees (for ground nesting)	X
April-June	moist	sun to partial shade	*Tripsacum dactyloides*	eastern gamagrass	brown	3-6'	butterflies, bees (for ground nesting)	X
Vines								
March-April	moist to dry	sun to partial shade	Gelsemium sempervirens	Yellow Jessamine	yellow	10-20'	hummingbirds, butterflies	
March-July	moist to dry	sun to partial shade	Lonicera sempivirens	Coral Honeysuckle	red	10-20'	hummingbirds, butterflies	X
April-May	moist to wet	sun to partial shade	Bignonia capreolata	Cross-vine	red and yellow	30-45'	hummingbirds, bees	
April-May	moist to wet	sun to partial shade	Wisteria frutescens	American Wisteria	bluish-purple, lavender	to 30'	bees	
Trees & Shrubs								
April-May	dry to moist	shade to sun	Amelanchier arborea	Serviceberry	white	12-36'	bees, flies, beetles	
April-May	dry to moist	shade to partial shade	Asimina spp.	Pawpaw	reddish-maroon	6-20'	flies, beetles, moths	
April	dry to moist, tolerates high calcium	sun to partial shade	Rhus spp.	Sumac spp.	white	4-6'	bees, syrphid flies, butterflies	X
March-May	dry to moist	sun to partial shade	Rubus spp.	Dewberry, Blackberry	white	1-5'	bees, beetles, butterflies	
April-May	dry to moist, tolerates high calcium	sun to shade	Vaccinium spp.	Sparkleberry, huckleberry, blueberry	white	6-30'	butterflies	X
March-May	dry to moist, tolerates high calcium	sun to shade	Cercis canadensis	Redbud	pinkish-purple	15-25'	butterflies, bees, flies	X
April-May	dry to moist, well-drained	sun to partial shade	Chionanthus virginicus	Fringe-tree	white	12-15'	butterflies, bees	X
March-June	dry to wet	shade to partial shade	Ilex spp.	American Holly, Possum-haw, Inkberry, Gallberry	white	4-45'	bees, flies	X
April-May	moist to dry	sun to partial shade	Cornus spp.	Dogwood spp.	white, greenish yellow	15-30'	bees, beetles, flies	
April-June	moist to dry	sun to partial shade	Diospyros virginiana	Persimmon	yellow, male and female	30-60'	bees, butterflies, moths	X
March-April	moist to dry	sun to partial shade	Prunus spp.	Chickasaw Plum, Crabapple,	white	to 30'	bees, flies, beetles	
April-May	moist to wet	sun to partial shade	Halesia diptera var. diptera	Two Wing Silverbell	white	to 30'	bees, butterflies	
March-April	mesic, wet to submesic	shade to partial shade	Crataegus spp.	Hawthorne spp.	white	15-35'	butterflies, flies, beetles	X
April-June	moist	sun to shade	Magnolia spp.	Magnolias, Sweet Bay	pale yellow to cream	to 60'	bees, beetles	X
May	moist	sun	Photinia spp.	Chokeberry (red and black)	white	6-12'	bees, flies, beetles	
April	moist, acidic	partial shade	Rhododendron spp.	Native Azalea spp.	pink	10-15'	butterflies, hummingbirds	X
April-June	moist	shade to partial shade	Styrax spp.	Snowbell spp.	white	8-20'	bees, butterflies	
April-May	moist	shade to partial shade	Aesculus pavia	Red Buckeye	red, reddish-yellow	20-25'	hummingbirds, bees	
April-May	moist to wet	sun to shade	Viburnum spp.	Southern Arrowwood	white	to16'	butterflies, bees, beetles, flies	

SPECIES RECOMMENDED FOR MANAGING EXISTING POLLINATOR ENHANCEMENT AREAS IN MISSISSIPPI

Flowering Dates	Soil	Sun	Botanical Name	Common Name	Color	Height	Visitation by Pollinator	Also a host
Mid-Season Flowering								
Perennial Flowers								
May-September	dry	sun	Dalea spp.	prairie clover	white, rose-purple	1-3'	bees, butterflies, beetles	X
May-September	dry	sun to partial shade	Coreopsis tinctoria	Golden Tickseed	yellow with red-brown centers	18-24"	butterflies, syphrid flies, bees	
May-September	dry	sun to partial shade	Echinacea purpurea	Purple Coneflower	purple, reddish purple, pink	12-48"	butterflies, hummingbirds	
May-August	dry	sun to partial shade	Gaillardia spp.	Blanket Flower	yellow, red, yellow and red	1-2'	butterflies	
May-June	dry to dry-mesic	sun to partial shade	Ruellia humilis	Wild Petunia	lavender blue to white	20-36"	butterflies, hummingbirds	
May-June	dry	sun to partial shade	Tephrosia virginiana	Virginia Goat's-rue	pink/yellow	8-28"	butterflies, hummingbirds	
May-September	moist to dry	sun to partial shade	Achillea spp.	Yarrow	white, light yellow	10-36"	bees, beetles, flies, butterflies	
May-June	moist to dry	sun to partial shade	Allium canadense	Wild Onion	violet	12-18"	bees	
May-June	moist to dry	partial shade	Dodecatheon meadia	Shooting Star	white, pink	6-20"	bees	
May-July	moist to dry	sun to partial shade	Dracopis spp.	Clasping Coneflower	yellow with red-brown centers	12-36"	bees, butterflies	
May-September	moist to dry	sun to partial shade	Monarda spp.	Beebalm, Wild Bergamot	pink, purple, reddish purple	12-48"	butterflies, bees, hummingbirds	
May-July	moist to dry	sun to partial shade	Opuntia humifusa	Prickly Pear	yellow	6"-6'	bees, beetles	
May-July	moist to dry	sun to partial shade	Penstemon spp.	Beardtongue	white to blue	1-3'	bees, hummingbirds	
May-September	moist to dry	sun to partial shade	Ratibida pinnata	Pinnate Prairie Coneflower or Greyhead Coneflower	yellow with red-brown centers	3-5'	butterflies, bees	
May-October	moist to dry	sun to partial shade	Rudbeckia spp.	Black-eyed Susan, Brown-eyed Susan	yellow, brown center	14-20"	bees, beetles, flies, butterflies	
May-July	moist	sun to partial shade	Apocynum cannabinum	Indian Hemp	white, greenish	24-36"	wasps, flies	
May-August	moist	sun	Asclepias syriaca	Common Milkweed	pink, purple, white	24-36"	butterflies, bees	X
May-November	moist to wet	partial shade to shade	Impatiens capensis	Jewel Weed	orange	3-5'	bees	
June-July	moist to wet	sun to partial shade	Desmanthus illinoisensis	Illinois Bundle Flower	white	2-18"	bees, butterflies, flies	
May-September	moist to wet	sun to partial shade	Hibiscus spp.	Rosemallow spp.	white to rose, deep red at base	5-7'	bees	
May-August	moist to wet	sun	Asclepias tuberosa	Butterfly Milkweed	orange to yellow	24"	butterflies, bees	X
May-October	wet to moist	sun to shade	Lobelia cardinalis	Cardinal Flower	red	1-5'	hummingbirds	
May-June	wet to inundation	sun to partial shade	Saururus cernuus	Lizard's-tail	white	36-48"	bees, flies	
Vines								
June-August	dry to dry-mesic	partial shade	Centrosema virginiana	Spurred Butterfly Pea	blue	2-3'	butterflies	
May-July	moist to dry	sun to partial shade	Passiflora incarnata	Passion Flower	blue	5-12'	hummingbirds, butterflies, bees	X
June-July	moist to dry	sun	Campsis radicans	Trumpet-creeper	orange	30-45'	hummingbirds, bees	
Trees & Shrubs								
June-July	dry	sun to partial shade	Ceanothus americanus	New Jersey Tea	white	3-4'	hummingbirds, butterflies, beetles, bees, wasps, flies	X
May-June	dry to moist	sun to partial shade	Catalpa spp.	Catalpa	white	70'	bees	
May-June	mesic to moist	sun to partial shade	Gleditsia triacanthos	Honey Locust	greenish yellow	35-75'	bees	
June-July	moist to dry	sun to partial shade	Aralia spinosa	Devil's-walking-stick	white	12-15'	butterflies, bees, wasps, flies	
May-July	moist	partial shade	Hydrangea quercifolia	Oak-leaf Hydrangea	white	4-6'	flies, wasps	
May-June	moist	sun to partial shade	Symplocos tinctoria	Horse Sugar	yellow	15-35'	bees	
June-September	moist to wet	sun to partial shade	Cephalanthus occidentalis	Buttonbush	white	6-10'	bees, beetles, flies	
June-July	moist to wet	sun to partial shade	Rosa spp.	Swamp Rose, Carolina Rose, Climbing Rose	pink	5-7'	bees, flies, wasps, butterflies	
June-July	moist to wet	sun to partial shade	Sabal minor	Dwarf Palmetto	white	4-6'	bees	
Late Flowering								
Perennial Flowers								
July-Oct	dry	sun to partial shade	Chrysopsis mariana	Maryland Golden-aster	golden-yellow	12-18"	bees	X
August-Oct	dry	sun to partial shade	Eupatorium spp.	Boneset, Thoroughwort, Sweetscented Joe-Pye Weed	white	18-36"	butterflies, beetles, bees	
Sept-Oct	dry	sun to partial shade	Pityopsis graminifolia var. latifolia	Grass-leaved Golden-aster	yellow	8-15"	bees	
June-August	dry	sun to partial shade	Silphium astericus var. laevicaule	Rosin Weed	yellow	6-8'	butterflies, bees	
July-Oct	dry	sun to partial shade	Solidago spp.	Goldenrod	yellow	2-4'	butterflies, bees, beetles	X
August-Oct	dry to wet	sun	Helianthus spp.	Narrowleaf or Swamp, Woodland, Hairy Sunflowers	yellow	5-7'	butterflies, beetles, bees	
July-Sept	moist to mesic	sun	Liatris spicta	Dense Blazing Star	rosy-pink to purple	3-4'	butterflies, bees, hummingbirds	
July-August	moist to dry	sun to partial shade	Desmodium spp.	Ticktrefoil, Beggar Ticks, Stick Tights	pink to purple	18-30"	bees, butterflies	
August-October	moist to dry	sun to partial shade	Symphyotrichum spp.	New England Aster, Blue Wood Aster, White Oldfield Aster	white, blue, lavender	18"-6'	butterflies, bees	X
Sept-Oct	moist	sun	Bidens aristosa	Beggar Ticks or Bur-marigold	yellow	24-36"	bees, beetles, flies, butterflies	
June-September	moist	sun to partial shade	Chamaecrista spp.	Partridge Pea (Lark)	yellow	18-30"	bees	
July-October	moist	sun to partial shade	Eupatoriadelphus spp.	Trumpet Weed or Joe Pye Weed	pink, lavender	to 8'	bees, butterflies, flies	
August-October	moist	sun to partial shade	Vernonia gigantea	Ironweed	purple	3-5'	bees, beetles, flies, butterflies	
July-Sept	moist to wet	sun	Asclepias incarnata	Swamp Milkweed	pink to rose	36-48"	butterflies, hummingbirds, bees, beetles, wasps, flies	X
Sept-Oct	moist to wet	sun	Helianthus maximiliani	Maximilian Sunflower	yellow	5-7'	butterflies, bees	
June-Aug	wet or innundated	sun to partial shade	Pontederia cordata	Pickerelweed	purple	1-3'	butterflies	