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# Establishing Native Warm Season Grass and Legume Buffers for Water Quality and Wildlife Habitat Enhancement in Agricultural Landscapes



NRCS Wildlife Habitat Management Institute

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Cover Photo: Hercial W. Cobb, Jr., Delta Wildlife, Inc.



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# Acknowledgements

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Information in this publication was developed as a part of the Delta Wildlife Quail and Grassland Songbird Habitat Restoration Project. The project began in the spring of 2002 and included strong restoration and research components in the Yazoo-Mississippi Delta. Restoration and research components were developed by an Implementation Committee consisting of the following individuals: Don Seay, USFWS Private Lands Biologist; Dave Godwin, MDWFP Small Game Coordinator; Wes Burger, MSU Dept. of Wildlife & Fisheries; Jim Lipe, Mississippi Department of Agriculture and Commerce; Kevin Nelms, NRCS Mississippi Area 4 Biologist; Philip Barbour, MSU Dept. of Wildlife & Fisheries; Richard Ingram, MDEQ Yazoo Basin Coordinator; James MacLellan, MDEQ Office of Pollution Control.

Implementation components of this project were overseen and conducted by the staff of Delta Wildlife, Inc. These staff members included Trey Cooke, Executive Director; Gayden Pollan, Senior Biologist; and Hercial Cobb, Jr., Field Biologist. Hercial Cobb, Jr. and Trey Cooke of Delta Wildlife, Inc. conducted the water quality research under the supervision of USDA-NRCS and MDEQ personnel. Ross Conover conducted the avian research components with seasonal field staff as a part of his Masters Research at MSU under the supervision of Wes Burger and Eric Linder from Mississippi State University. Delta Wildlife, Inc., USDA-NRCS, USDA Wildlife Services, USDA Forest Service and MDWFP assisted with quail covey counts. USDA Program assistance was provided by Ronald Hudspeth, Washington County District Conservationist, MS; Dale Garner, Leflore County District Conservationist, MS; David Brunson, Sunflower District Conservationist, MS; and Justin Norris, Coahoma County District Conservationist, MS.

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## Introduction

### Natural Resources Conservation Service (NRCS)

Advancements in technology and mechanization have vastly improved the profitability of production agriculture. However, these advancements, especially in mechanization, have also led to the destruction of vital riparian areas in agricultural landscapes. Two separate, but equally important, problems have developed from the loss of riparian buffers. The first problem arises from the loss of critical wildlife habitat while the other problem has regulatory ramifications associated with effluent water quality.

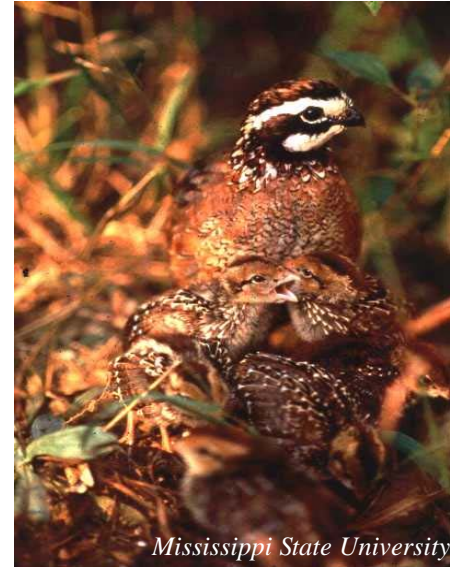
Riparian buffers provide significant wildlife habitat in agricultural landscapes. Without adjacent forestland, grasslands, or wetlands, riparian areas may be the only wildlife habitat on a farm. Riparian habitats can include trees, shrubs, grasses, and/or forbs and can most often be identified as a narrow strip along a fencerow, ditch bank, stream bank, or property line. Many riparian buffers are simply areas where natural succession has progressed from infrequent, or an absence of, disturbance. In many cases, riparian areas provide all major wildlife habitat needs, including food, cover, and nesting/bedding habitat. On farms with other identifiable wildlife habitat, riparian buffers also serve as travel corridors.

In addition to wildlife benefits, riparian buffers filter agricultural non-point source run-off. Trees, shrubs, grass, and other natural vegetation occurring on the lower end of a field act to slow run-off from storm events and irrigation. This allows sediment and other pollutants to fall out in the water column before they reach adjacent wetlands, streams, or lakes. The newly transported sediment serves as a substrate for new plant growth while invertebrates and microorganisms living in the soil and decomposing plant material metabolize a majority of the pesticides. The nutrients trapped by the riparian zone are quickly used by the native plants as a secondary fertilizer. Research has shown that all major non-point source agricultural pollutants can be reduced by 60 or more percent in a 30' riparian zone.

Once natural riparian areas are destroyed, resident wildlife populations are immediately diminished. This is most prevalent in Bobwhite quail populations. Riparian habitat destruction also affects other grassland species, small mammals, and even large game species like white-

tailed deer.

Likewise, effluent water quality is also seriously compromised. Without a natural riparian buffer, non-point source agricultural run-off easily reaches adjacent streams, lakes, and wetlands. This contributes to water quality impairments including sedimentation, low dissolved oxygen, nutrient enrichment, and organic enrichment. In the absence of riparian areas, agricultural landscapes can quickly become ecological wastelands and targets for future water quality regulations.



The natural resource, wildlife, and regulatory communities are all aware of the importance of riparian areas. Because of this understanding, many groups have been working hard to restore riparian areas by planting buffers in critical areas. The only shortfall in these restoration efforts has been in the objective of specific projects. The wildlife community has been planting wildlife friendly plant materials to re-establish riparian areas. The natural resource and regulatory community has been using plant materials that are better adapted to trap sediment and other pollutants. In many cases, each objective is being achieved with the exclusion of the other.

With the proper plant materials, planting rates, and management, natural resource planners and landowners can re-establish riparian areas by planting buffers that benefit both wildlife and water quality equally. This publication outlines several planting prescriptions and management techniques that can be replicated in the Lower Mid-West, Mid-South, and Southeastern United States to address both wildlife and water quality concerns.



# Planting Prescriptions

## Natural Resources Conservation Service (NRCS)

### Standard NWSG Buffer Planting Prescriptions

Natural resource planners have historically used benchmark NWSG planting rates to address either wildlife or water quality concerns. Planting rates and plant materials vary slightly in different regions of the country, but one major problem continues to exist. The use of one planting rate prohibits the buffer's ability to address multiple concerns in the future. For this reason, it is necessary to re-examine current standards for NWSG buffer plantings and develop new alternatives prescriptions that provide multiple benefits.

#### *NWSG and Legume Buffer Mixture for Water Quality*

Plant Material	Rate/Acre	Planting Dates
Little Bluestem	4 PLS	March - May
Big Bluestem	2 PLS	March - May
Indiangrass	2 PLS	March - May
Kobe Lespedeza	12 lbs.	March - April
Partridge Pea	4 lbs.	Feb. - April

#### *NWSG and Legume Buffer Mixture for Wildlife*

Plant Material	Rate/Acre	Planting Dates
Little Bluestem	1 PLS	March - May
Big Bluestem	.5 PLS	March - May
Indiangrass	.5 PLS	March - May
Kobe Lespedeza	12 lbs.	March - April
Partridge Pea	4 lbs.	Feb. - April

#### *Additions to Mixtures*

Plant Material	Rate/Acre	Planting Dates
Bicolor Lespedeza	10 lbs.	March - April
Thumbergii Lespedeza	10 lbs.	March - April
Wild Plum	6' x 6' spacing	Jan. - March
Switchgrass	2 PLS	March - May

### Alternative Buffer Planting Prescriptions for Wildlife and Water Quality

A group of professional wildlife biologists and water quality specialists were used to develop alternative buffer planting prescriptions that would effectively reduce non-point source agricultural pollution and generate wildlife habitat. These "alternative" prescriptions included pre-implementation planning, site selection, site preparation, planting prescriptions, minimum specifications, establishment, and maintenance requirements. Furthermore, this group helped develop research and monitoring components to document the success of these prescriptions. This group included Don Seay, USFWS Private Lands Biologist; Dave Godwin, MDWFP Small Game Coordinator; Wes Burger, MSU Dept. of Wildlife & Fisheries; Jim Lipe, Mississippi Department of Agriculture and Commerce; Kevin Nelms, NRCS Mississippi Area 4 Biologist; Philip Barbour, MSU Dept. of Wildlife & Fisheries; Richard Ingram, MDEQ Yazoo Basin Coordinator; James MacLellan, MDEQ Office of Pollution Control; Trey Cooke, Delta Wildlife; and Gayden Pollan, Delta Wildlife Senior Biologist. All prescriptions were developed for the Southeastern and Mid-South portions of the United States but can also be adapted for lower Mid-Western states.

#### NWSG and Legume Buffer Mixture for Wildlife and Water Quality

Plant Material	Rate/Acre	Planting Dates
Little Bluestem	2 PLS	March - May
Big Bluestem	1 PLS	March - May
Indiangrass	1 PLS	March - May
Kobe Lespedeza	12 lbs.	March - April
Partridge Pea	4 lbs.	Feb. - April

## Buffers:

Purpose: Riparian buffers and field borders placed on the lowest end of a sloping agricultural field adjacent to ditches, streams, rivers, lakes, or wetlands will provide significant filtering capabilities for sediment and other non-point agricultural pollutants. If proper plant materials are used to establish buffers and borders, they will also provide excellent wildlife habitat, especially for quail and grassland songbirds.

### Option 1:

#### Native Warm Season Grasses (NWSG)

A buffer of a width not less than 30 feet or greater than 180 feet placed on the lowest end of production agricultural field no less than ¼ mile long will provide the greatest water quality and wildlife benefits. Prior to planting, a firm, clean seedbed should be prepared. An optional pre-emerge herbicide treatment of Roundup and/or Plateau may be used. Planting should consist of 100% Alamo var. Switchgrass at a rate of 2-6 PLS in areas with extreme erosion or a mixture of 3 other NWSGs in areas with less erosion. (Note: switchgrass planted at higher rates reduces wildlife habitat value) The NWSG mixture should consist of 2 PLS Little Bluestem (Aldous var.), 1 PLS Big Bluestem (Kaw var.), and 1 PLS Indiangrass (Lometa var.). All should be planted between March 1 and May 1. The NWSG mixture must be planted with a special drill designed for fluffy seeded plant materials. After germination, up to 12 oz. of Plateau/acre may be applied to reduce native weed competition on NWSG mixture only. NWSG mixture should be disturbed by mechanization and/or fire after each third growing season during March or early April.

### Option 2:

#### NWSG and Legumes

A buffer of a width not less than 30 feet or greater than 180 feet placed on the lowest end of production agricultural field no less than ¼ mile long will provide the greatest water quality and wildlife benefits. Prior to planting, a firm, clean seedbed should be prepared. An optional pre-emerge herbicide treatment of Roundup may be used. Plant materials should include 2 PLS Little Bluestem (Aldous var.), 1 PLS Big Bluestem (Kaw var.), and 1 PLS Indiangrass (Lometa var.), 12 lbs. of Kobe Lespedeza, and 4 lbs. of Partridge Pea (Lark selection). The NWSG mixture must be planted with a special drill designed for fluffy seeded plant materials. After germination, up to 8 oz. of Plateau/acre may be applied to reduce native weed competition. Entire buffer should be disturbed by mechanization and/or fire after each third growing season during March or early April.



*18-Month NWSG Buffer Adjacent to Milo*



*Partridge Pea and Kobe Lespedeza (legumes)*

Option 3:

NWSG, Legumes, and Shrubs

A buffer of a width not less than 30 feet or greater than 180 feet placed on the lowest end of production agricultural field no less than ¼ mile long with provide the greatest water quality and wildlife benefits. Prior to planting, a firm, clean seedbed should be prepared. An optional pre-emerge herbicide treatment of Roundup may be used. The shrub component should be 10 - 20 feet wide and placed on the side of the buffer closest to the waterbody. Materials should include 10 lbs. of Thumbergii Lespedeza for the shrub component (other plant materials may be used...See "Additions and Substitutions" chart above) and 2 PLS Little Bluestem (Aldous var.), 1 PLS Big Bluestem (Kaw var.), and 1 PLS Indiangrass (Lometa var.), 12 lbs. of Kobe Lespedeza, and 4 lbs. of Partridge Pea (Lark selection). The NWSG mixture must be planted with a special drill designed for fluffy seeded plant materials. After germination, up to 8 oz. of Plateau/acre may be applied to reduce native weed competition on the NWSG and Legume mixture only. Entire buffer should be disturbed by mechanization and/or fire after each third growing season during March or early April.

Option 4:

Forest Riparian Buffers

A buffer of a width not less than 30 feet or greater than 180 feet placed on the lowest end of production agricultural field no less than ¼ mile long with provide the greatest water quality and wildlife benefits. A mixture of bottomland hardwood species suitable for the soil type at the site must be chosen. Seedling should be hand planted on a 12' x 12' basis (302 trees/acres) from Dec. 15 - March 15. An alternative to this would be a planting of cottonwoods, interplanted with oaks.



*18-Month NWSG and Legume Buffer*



*Partridge Pea and NWSG Close Up*



*Thumbergii Lespedeza (Amsquail) Shrub*



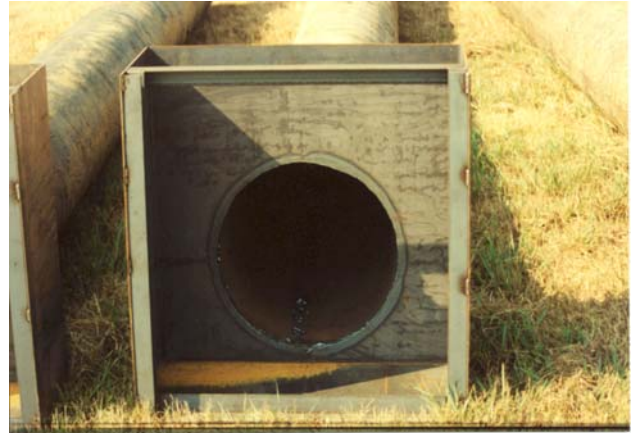
*Oak Seedlings Planted in a new Forest Buffer*

Water Control Structures:

Purpose: Water control structures (WCS) may be installed in sites where point source drains (water furrows, tail ditches, etc...) intersect buffers for purposes of sediment retention. They may also be installed in fields where buffers have not been established so long as the fields are within the same micro-watershed as another field that does have a project affiliated buffer. Stop logs should be placed in structures by November 1 or after harvest (whichever is last) to impound winter water to reduce erosion and sedimentation while providing habitat for migratory waterfowl. Stop logs should not be removed until March 1.



*WCS stopping sediment*



*Fabricated WCS ready for installation*



## Establishment and Management

### Natural Resources Conservation Service (NRCS)

#### Alternative NWSG Buffer Establishment

All of the alternative buffer prescriptions listed above were established on 542.92 acres of land stretching 78.11 miles between 2002 and 2004. These prescriptions were used to plant buffers on 23 landowners in 8 counties located in the Yazoo-Mississippi Delta. Fourteen (14) water control structures were also installed in drains transecting buffered fields. During the establishment process, many questions and solutions were identified.

#### Minimum Buffer Widths

Minimum and maximum buffer widths have been topics of discussion, research, and even arguments over the past decade. There is a basic agreement between biologists and water quality professionals that no buffer should be less than 30 feet in width. However, the wildlife community has expressed a concern that narrow buffers may provide excellent habitat for many wildlife species but also may serve as a predator trap, diminishing reproductive success within the buffer. For this reason, nesting success was monitored on alternative buffer prescriptions with varying widths. Nesting success was high in buffers with a width of more than 80'. Buffers less than 80' wide showed very little nesting success. This suggests that minimum buffer width of 80' is needed to maximize both water quality and wildlife benefits.

#### Site Preparation

NWSGs may be planted with no-till drills into heavy residue and/or stale seedbeds. Although this technique is not preferred, success can be found if proper site preparations are made. If a no-till planting technique is necessary, glyphosate should be used as a burn down 2-4 weeks prior to planting. Immediately before planting, a 4-oz./acre application of imazapic (Plateau®) herbicide is needed on sites to reduce future competition. This application will not harm the NWSGs and Partridge Pea, but it will suppress germination and growth of Kobe Lespedeza initially. If alternative plant materials are used, please check the herbicide label before making any pre-emergent applications to make sure the plant materials will not be harmed. Preferred site preparation for the planting of NWSG includes intensive seedbed preparation and herbicide applications. Sites should be disked thoroughly and culti-packed. The seedbed should be extremely firm and clean. Seedbed firmness is the most important variable. 2-4 weeks prior to planting, a herbicide application should be used for burn down. A 4-oz./acre pre-emergence application of imazapic (Plateau®) is also recommended. This site preparation technique has been proven to be the most successful.

#### Planting

NWSG seeds are "fluffy" and cannot be planted with standard drills or grass seeders. A special fluffy seed drill must be used to plant NWSGs.

NWSG planting may begin in February in most Southern states and late March in Midwestern states. A late frost or snow will not harm NWSG seed after planting. 1st year germination should not be expected if NWSGs are planted after May 15th in the South or June 15th in the Midwest. Planting early is generally considered better than planting late.

NWSGs are planted extremely shallow. Many experts claim that a good rule of thumb is to be able to see 50% of the planted seed on top of the ground. To ensure seed to soil contact with such a shallow planting, a firm seedbed is mandatory.

Legumes should be planted with a drill equipped with a legume seed box to properly regulate planting rates. Furthermore, legumes must be inoculated prior to plantings. EL type inoculate should be used on Partridge Pea and all lespedezas. Legumes can be planted at the same time as the NWSGs.

Drills should be calibrated to plant the proper rate of seed. The NWSGs may be mixed together for planting in the fluffy seed box just as the legumes may be mixed in the legume box. Both should be planted into a firm, clean seedbed.



*Fluffy NWSG Seed*



*Truax NWSG Drill*

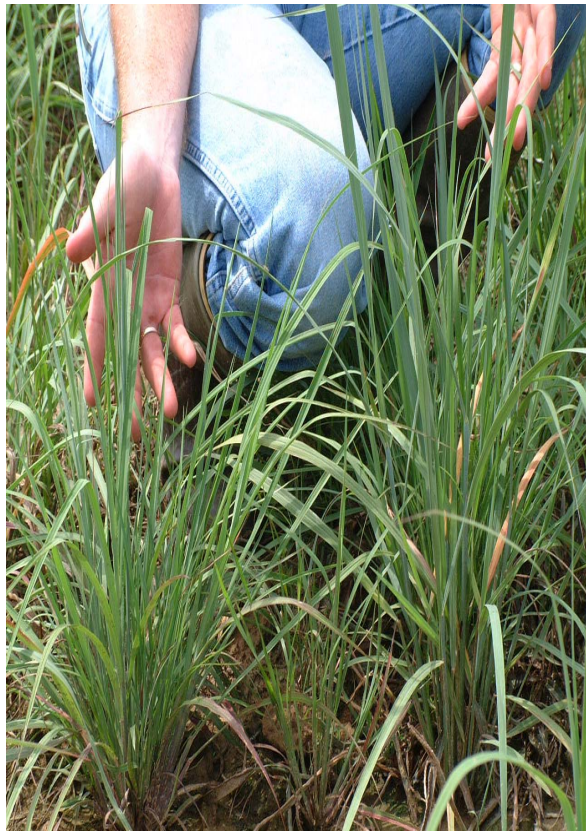
## **Establishment**

NWSGs are slow to germinate and establish. In natural NWSG ranges, fire and/or cold winters are required for seed germination. Production NWSG seed is generally kept in cold storage through the winter before being planted to simulate conditions needed for adequate germination. However, this procedure does not always produce results commensurate with natural conditions. It must be understood that most NWSG seeds will not germinate during the first growing season unless conditions are perfect.

Under optimum conditions, NWSG germination will take approximately 12 weeks. Under normal conditions, it may take up to three years before all NWSG seeds germinate. Legumes should germinate and grow well during the first growing season. After germination, NWSG seedlings will grow slowly until first frost. Seedlings rarely reach a height of 36 inches in the first year. During the second growing season, these seedlings should reach a height of 4 - 5 feet. After three growing seasons, NWSGs generally reach maturity and a maximum height of 5 - 7 feet.

If 1st or even 2nd year NWSG germination is poor, it can be addressed with a prescribed fire 12 - 14 months after the initial planting. Fire will also aid legumes in their natural reseeding process. NWSG germination after a prescribed fire is exceptional. If it is not, the planting can usually be deemed a failure.

To further aid NWSGs and legumes during their initial establishment, post-emergent herbicide applications of imazapic (Plateau®) can be used. A rate of 4 - 8 oz./acre should be used. Higher rates are recommended on sites with intense native weed competition.



*First year growth under optimum conditions.*



*Plateau® application reduces native weed competition.*

## **Management**

NWSG and legume buffers do require periodic management after establishment, especially in cases where the buffers will be managed for wildlife purposes. Over time, the NWSGs will become excessively thick, choking out the legumes. This is acceptable from a water quality perspective but it significantly reduces the wildlife habitat value. Some bare ground component must be left in tact for small mammals and ground birds like the Northern bobwhite. In order to keep the buffers from becoming too thick, they must be "thinned" periodically by disturbance.

"Thinning" should be encouraged when all bare ground inside of the buffer is completely covered by thatch or the NWSG plant density becomes thick enough to engulf the entire soil surface. If a majority of the bare ground is covered with thatch, a prescribed fire may be used. This will encourage additional NWSG growth, but will remove all the thatch. If NWSG plant density is the problem, an herbicide application of glyphosate may be used a rate up to 16 oz./acre in the middle of the growing season. A prescribed fire should follow this herbicide application in early spring of the next year.

Even if the buffers do not become too thick for wildlife habitat purposes, a prescribed fire should be used every 3 - 4 years. This will perpetuate the natural reseeding process of the legumes, reduce thatch created by the NWSGs, and keep the buffer clean of invasive woody vegetation.



## Wildlife & Water Quality Response

### Natural Resources Conservation Service (NRCS)

#### Avian Response

Avian response to these alternative buffer plantings were documented on project areas that were established during the first year of the project so 3 full years of data could be collected. Data was collected from 8 farms during the 3 years. Over 40 buffers were included in the study and controls were monitored on adjacent sites without buffers.

The overall goal of the avian monitoring component was to document the effects of the alternative buffer prescriptions on avian diversity, abundance, and reproduction. The results of the avian monitoring component made it abundantly clear that the buffers provided significant wildlife benefits in addition to water quality benefits.

The avian response to the alternative buffer plantings outline in this document was excellent. Winter and breeding season transects were used to identify 116 species of birds utilizing 28 miles of NWSG and legume buffers established during this project. 74 species were found during the breeding season in NWSG and legume buffers as compared to 58 species in non-buffered field edges. Winter results were similar as 66 species utilized the buffers as compared to 43 species in non-buffered field edges. A total of 16,777 birds used buffered field edges as compared to 5,959 birds found in non-buffered field edges during both winter and breeding season transects.

Nesting density in 30' wide NWSG and legume buffers were found to be 6 times greater than in field edges without buffers. Nesting density in buffers between 30' and 99' were 38 times greater. Furthermore, nesting success greatly increased in buffers with a width of more than 80'.

#### Birds Identified on Alternative Buffer Plantings

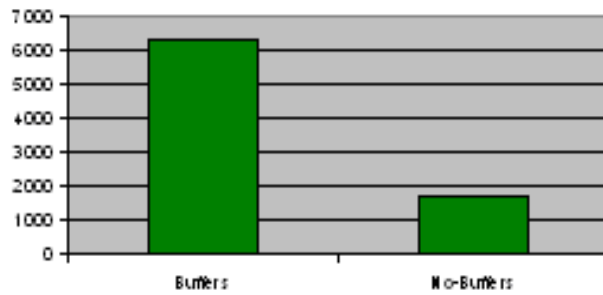
Acadian Flycatcher	3
American Crow	2
American Goldfinch	30
American Kestrel	0
American Pipit	75
American Robin	108
Anhinga	1
Baltimore Oriole	13
Barn Owl	1
Barn Swallow	111
Brown-headed Cowbird	416
Barred Owl	6
Belted Kingfisher	1
Black and White Warbler	0
Black-crowned Nightheron	2
Blue Grosbeak	34
Blue Jay	1070
Blue-gray Gnatcatcher	1
Brewer's Blackbird	13
Brown Creeper	1
Brown Thrasher	41

Canada Goose	12
Carolina Chickadee	365
Carolina Wren	730
Cattle Egret	13
Cedar Waxwing	26
Chimney Swift	18
Chipping Sparrow	2
Cliff Swallow	1
Common Grackle	1439
Common Nighthawk	1
Common Snipe	4
Common Yellowthroat	8
Cooper's Hawk	3
Dark-eyed Junco	50
Dickcissel	823
Double-crested Cormorant	676
Downy Woodpecker	236
Eastern Bluebird	18
Eastern Kingbird	6
Eastern Meadowlark	148
Eastern Phoebe	25

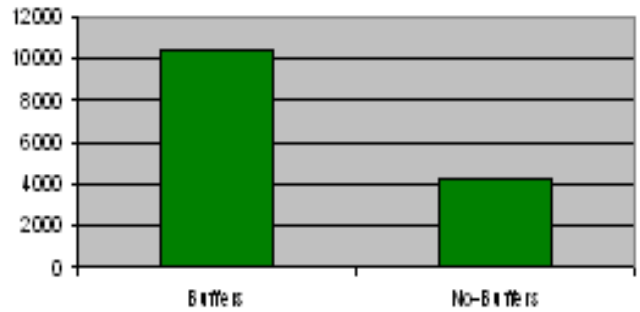
Eastern Towhee	211
Eastern Tufted Titmouse	136
Eastern Wood-Pewee	9
Eurasian-collared Dove	1
European Starling	827
Field Sparrow	8
Fox Sparrow	1
Gadwall	7
Golden-crowned Kinglet	31
Great Blue Heron	24
Great Crested Flycatcher	35
Great Egret	33
Great Horned Owl	17
Greater White-fronted Goose	650
Greater Yellowlegs	2
Green Heron	11
Hairy Woodpecker	4
Hermit Thrush	7
Hooded Warbler	1
Horned Lark	359
Indigo Bunting	637
Killdeer	484
Lapland Longspur	4
Little Blue Heron	1
Loggerhead Shrike	27
Louisiana Waterthrush	2
Mallard	55
Mississippi Kite	1
Mourning Dove	1718
Northern Bobwhite	133
Northern Cardinal	1733
Northern Flicker	47
Northern Harrier	5
Northern Mockingbird	264
Northern Shoveler	8
Orchard Oriole	62
Painted Bunting	18
Palm Warbler	1

Pileated Woodpecker	11
Pine Warbler	4
Prothonotary Warbler	34
Purple Martin	6
Red-bellied Woodpecker	555
Red-eyed Vireo	1
Red-headed Woodpecker	13
Red-shouldered Hawk	1
Red-tailed Hawk	49
Red-winged Blackbird	741
Ring-necked Duck	1
Ruby-crowned Kinglet	21
Ruby-throated Hummingbird	4745
Savannah Sparrow	29
Sharp-shinned Hawk	1
Snow Goose	800
Song Sparrow	256
Summer Tanager	27
Swamp Sparrow	121
Tree Swallow	5
Unidentified	89
Unidentified Sparrow	308
Vesper Sparrow	12
White-breasted Nuthatch	1
White-crowned Sparrow	1
White-eyed Vireo	3
White-throated Sparrow	181
Wild Turkey	3
Wood Duck	35
Wood Thrush	9
Yellow Warbler	1
Yellow-billed Cuckoo	501
Yellow-breasted Chat	11
Yellow-breasted Sapsucker	7
Yellow-rumped Warbler	45
Yellow-throated Vireo	1
<b>Grand Total</b>	<b>22,736</b>

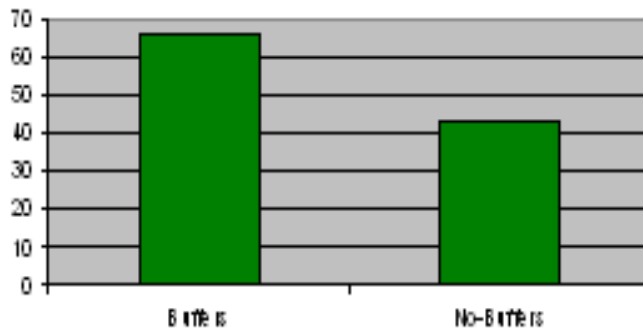
**Total Birds - Winter**



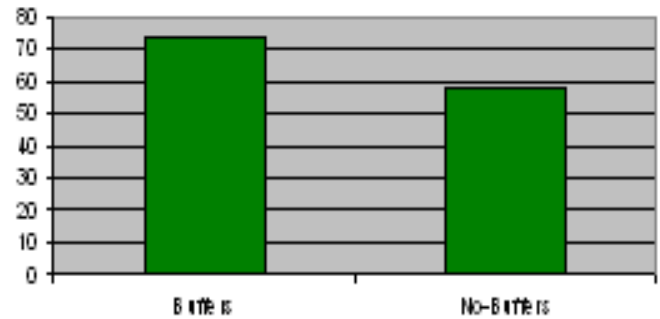
**Total Birds - Breeding Season**



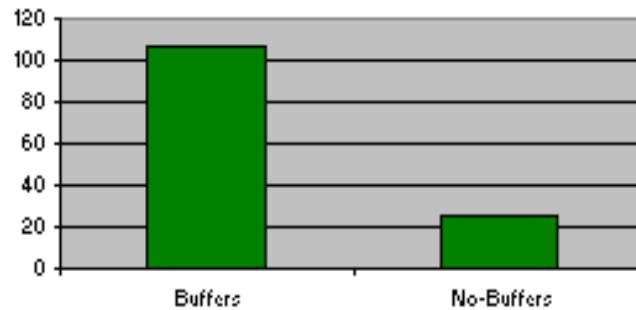
**Total Species - Winter**



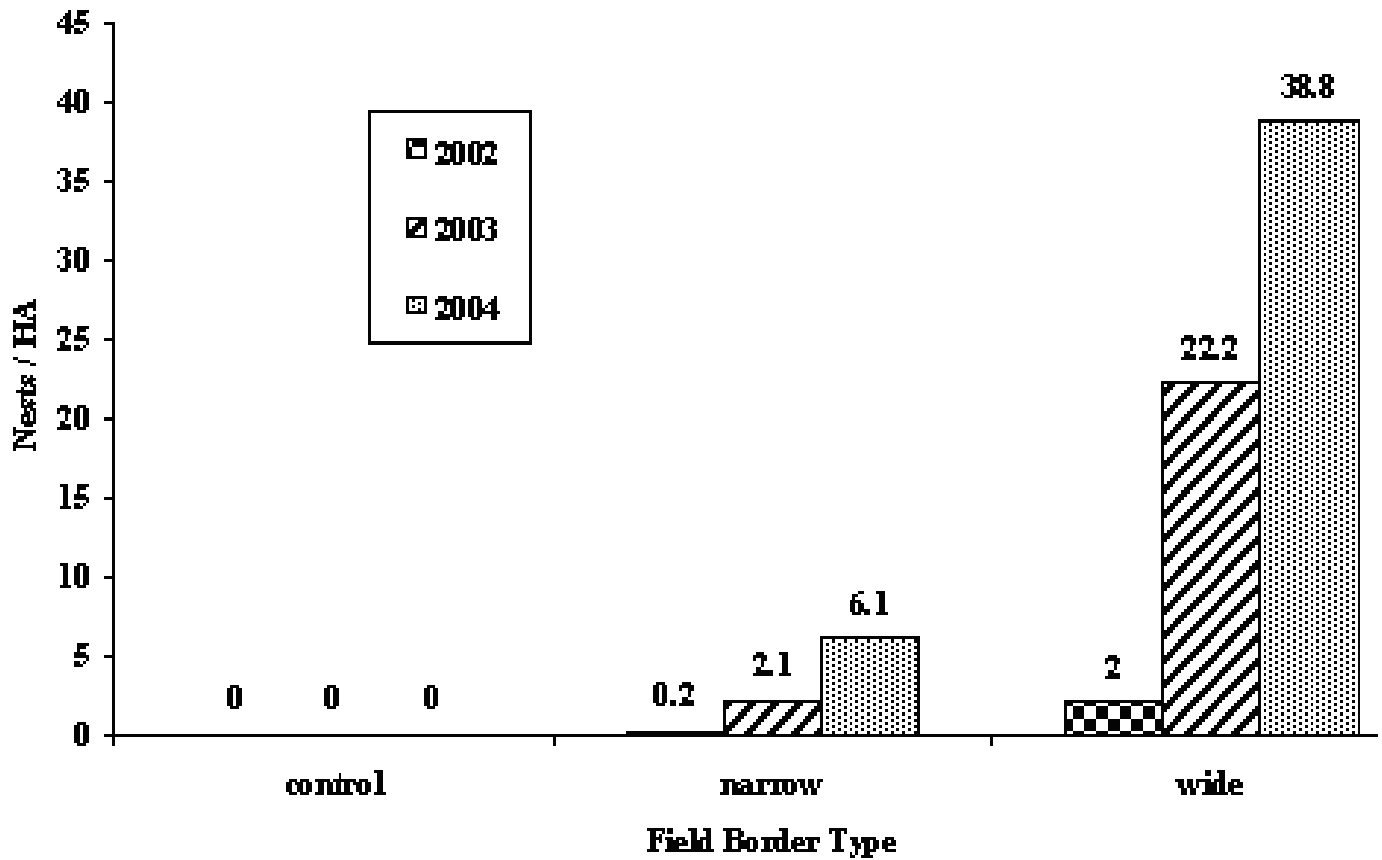
**Total Species - Breeding Season**



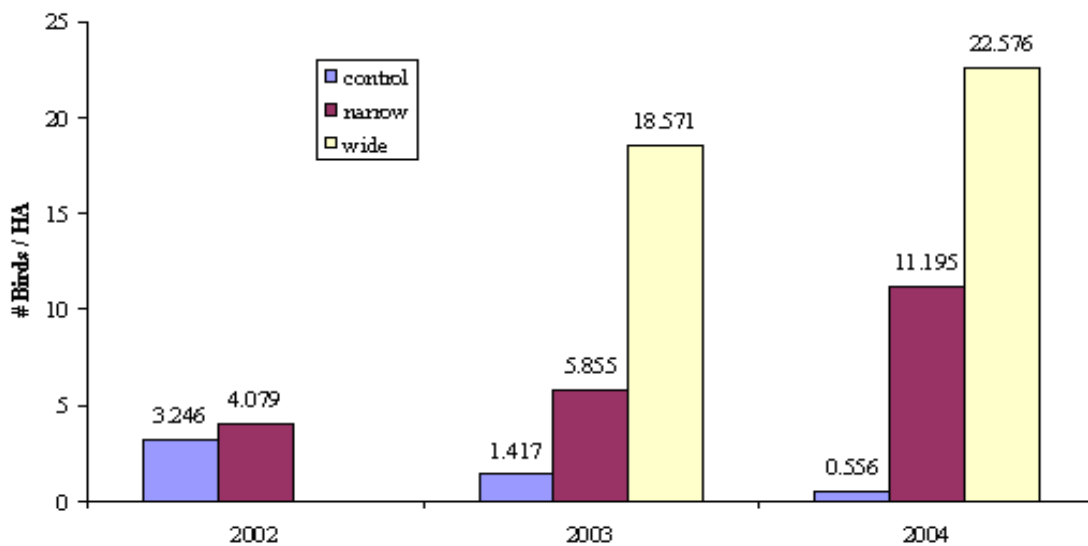
**Northern Bobwhite Quail**



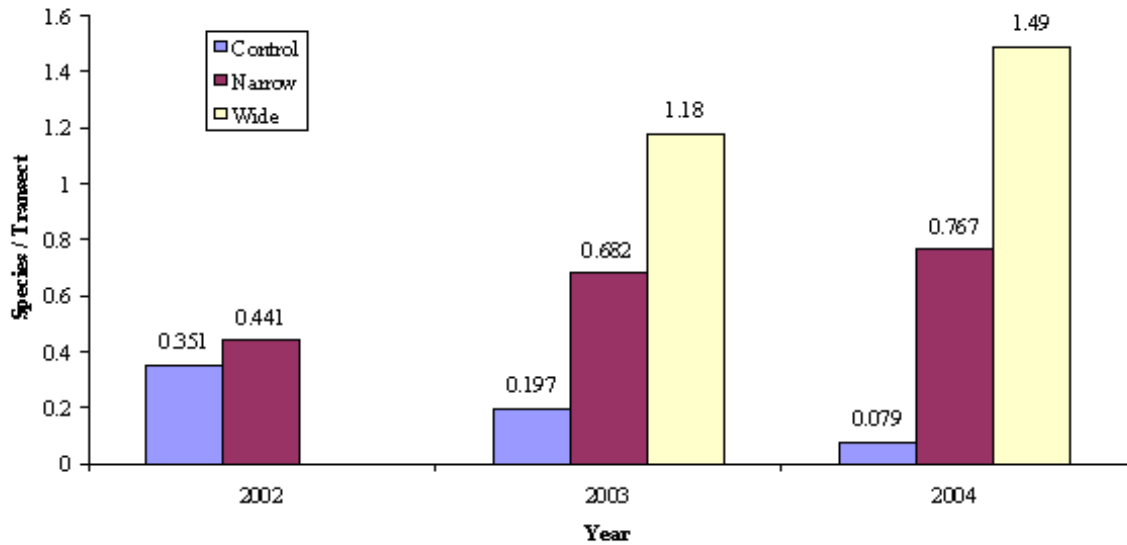
### Nesting Density of Field Border Types



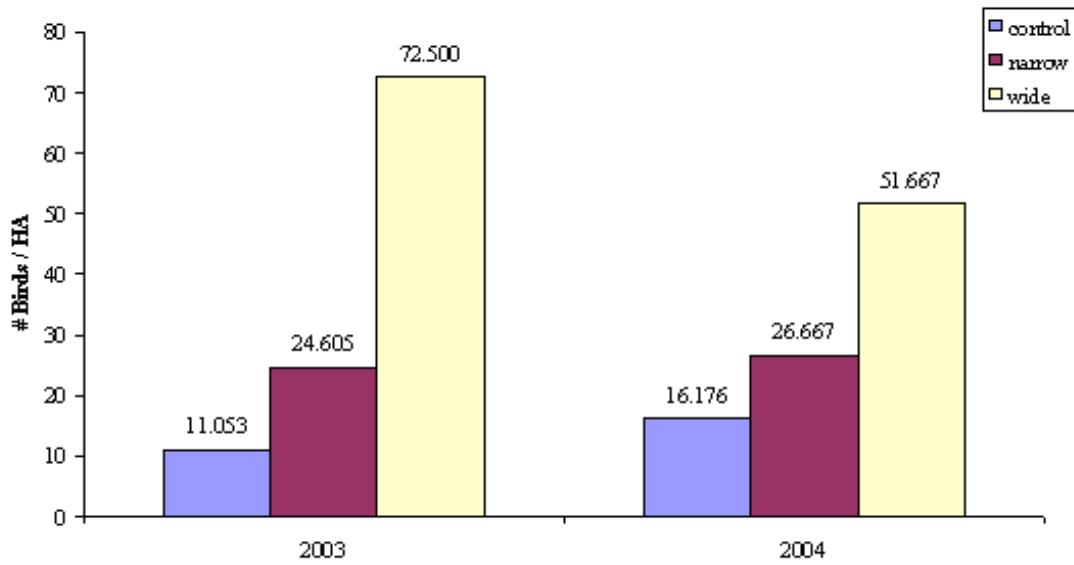
### Summer Avian Density in Field Border



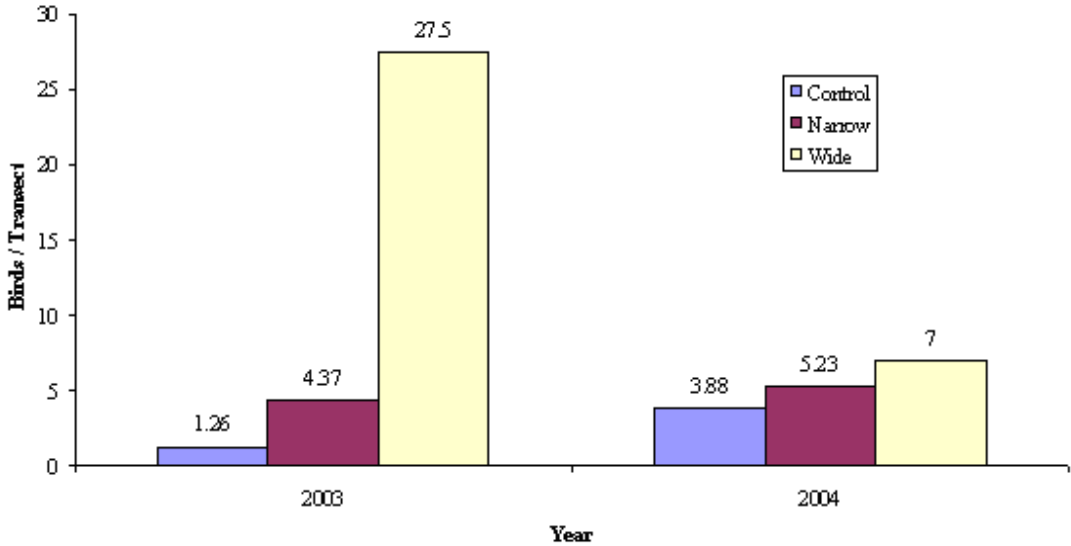
### Mean Richness in Field Border



### Winter Avian Density in Field Border



Densities of Wintering Sparrows 40 m Off Wood Edge



Nest Searching



Redwing Blackbird Nest in NWSG clump

## Water Quality Benefits

Previous water quality research in the Yazoo-Mississippi Delta has shown that a majority of other non-point source agricultural related pollutants are associated with and travel with soil in the water column. Because of this research, EPA and other agencies agreed that the RUSLE model could be used to document the water quality benefits of these alternative buffer prescriptions if an assumption was made that other pollutants would be reduced proportionately to sediment loads as calculated by RUSLE.

Before buffer establishment, project drainage areas contributed 65,348.7 tons of sediment to adjacent waterbodies. This drainage area included 9,376.49 acres of cropland. After buffer establishment, sediment loading was reduced to 42,025.1 tons per year. The buffers and water control structures effectively reduced sedimentation and all associated non-point source pollutants by 35.7% or 23,323.6 tons per year. Other studies have indicated similar results including thesis work by David Shaw and Albert Rankins, Jr. at Mississippi State University. When compared to other standard grass filter strip plantings, the alternative prescriptions outlined in this publication did equally as well in most cases.



*Allen Farms (4/3/02)  
Sediment Load 137.9 tons/yr. on 37 acres*



*Allen Farms (7/25/02)  
Current Sediment Load 39.1 tons/yr. on 37 acres*



## Natural Resources Conservation Service (NRCS)

### Summary

All of the alternative buffer prescriptions were established on 542.92 acres of land stretching 78.11 miles between 2002 and 2004. These prescriptions were used to plant buffers on 23 landowners in 8 counties located in the Yazoo-Mississippi Delta. Fourteen (14) water control structures were also installed in drains transecting buffered fields. Drainage areas of sites selected for buffer establishment contributed 65,348.7 tons of sediment annually to adjacent waterbodies before the project began. This drainage area included 9,376.49 acres of cropland. After implementation, sediment loading was reduced to 42,025.1 tons per year. The buffers and water control structures effectively reduced sedimentation and all associated non-point source pollutants by 35.7% or 23,323.6 tons per year. Additionally, 116 positively identified avian species were found in project buffers where avian density, richness, and reproduction increased as compared to non-buffered areas.

The success of this project has shown that natural resource planners can use alternative plantings to successfully address both wildlife and water quality concerns. However, planners must be given the flexibility to use alternative prescriptions. We live in a world of growing natural resource concerns and shrinking budgets. Therefore, we must adapt in our philosophy and its application.

Looking towards the future, we must remember that no one makes land use changes for the sake of change, but rather for benefit. Therefore, we must ensure buffers and borders are an economically viable option for landowners to implement and maintain. Additionally, we must offer the landowner as many options as can be justified through science. Farm Bill Conservation Title Programs that offer incentives and cost sharing opportunities for buffer and border practice implementation must be protected and enhanced to ensure buffers are accepted and fully utilized on the farm for years to come. And when the practices become an economically viable option, it is up to conservation organization, agencies, and the regulatory community to promote these practices and encourage participation.