

## Plant Materials for Conservation Buffers

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# Plant Materials Technical Note

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### **Background**

Conservation buffers play an important role in helping conserve our natural resources. These areas of vegetation protect our soil resources, improve air quality, improve water quality and quantity, enhance fish and wildlife habitat and beautify our landscape. Unfortunately, conservation buffers are not planned and applied to the extent that they should be.

### **Purpose**

The purpose of this technical note is to provide information for the support and application of conservation buffers across the landscape. Provided within this document is a listing of plant material and the corresponding buffer practice for which they can be used.



## Types of Conservation Buffers

### **Contour Buffer Strips (CP 332)**



Contour buffer strips are narrow strips of permanent, herbaceous vegetative cover established along a hill slope in conjunction with contoured farming between the strips. The primary purpose of contour buffer strips is to reduce sheet and rill erosion, reduce sediment and water-borne contaminant transportation and increase water infiltration. A secondary benefit can be providing wildlife habitat.

Grass, forbs and legumes are used in contour buffer strip plantings. Special consideration must be given to ensure that the appropriate stem densities are planned and established to meet the resource need. For areas with maximum row grades, the established vegetation should be permanent sod-forming vegetation with stiff, upright stems. Refer to the Vegetation List below and Appendix 1 in eFOTG for more plant species and site adaptability information.

## Windbreak/shelterbelt (CP 380)



Windbreaks or shelterbelts are multiple rows of trees or shrubs in linear configurations. This practice has many conservation uses including reducing soil erosion from wind, reducing energy consumption, providing screening cover and increasing carbon storage in biomass and soils. As with all buffer practices, wildlife habitat can be enhanced while addressing other resource concerns using this conservation practice.

Naturally, the type of tree/shrub planted as well as the number of rows planted is dependent upon site specific needs and the function of the practice (i.e. windbreak around a house, shelterbelt along a roadway, visual screen adjacent to a poultry house, etc.) In general, a combination of deciduous and evergreen trees and shrubs adapted to the site should be utilized. Refer to the Vegetation List below and the Windbreak/Shelterbelt Establishment Specification in eFOTG for more plant species and site adaptability information.

## Field border (CP 386)



A field border is a strip of permanent vegetation established at the edge or around the perimeter of a field. Field borders are used to reduce wind and water erosion, protect soil and water quality, manage pest populations, provide wildlife food and cover, increase carbon storage and/or improve air quality. These areas represent a very small amount of total acreage but contribute immensely in conserving natural resources and providing wildlife habitat.

The type of vegetation planted in field borders depends upon the resource concern treatment objective. Plants selected will have the physical characteristics necessary to control soil erosion, caused by wind and water erosion to tolerable levels. In general, these will be stiff-stemmed, upright plants that are able to trap wind or water-borne soil particles. Field borders are an excellent tool in providing wildlife habitat. This can be achieved through the addition of targeted wildlife specie(s) habitat plants. When the main objective is providing pollinator habitat, the field border seedmix should consist of no more than 25% grass and at least 75% forbs/legumes that flower throughout the year. Refer to the Vegetation List below and Appendix 1 in eFOTG for more plant species and site adaptability information.

## Riparian Herbaceous Cover (CP 390)



The purpose of this practice is to establish or manage herbaceous cover in the transitional zone between terrestrial and aquatic habitats. This practice helps provide wildlife and aquatic habitat, improve water quality and quantity, stabilize stream banks/shorelines, establish and maintain habitat corridors, increase water storage, and increases net carbon storage in the biomass and soil.

Riparian herbaceous cover plantings are applied to areas adjacent to perennial and intermittent watercourses or water bodies where the natural plant community is dominated by herbaceous vegetation. The vegetation used for this buffer must be perennial and able to sustain and/or thrive in intermittent saturation or flooded conditions. These plants must provide the structural and functional diversity preferred by the fish and wildlife.

In many situations these areas are revegetated or allowed to revegetate following disturbance with native seed and propagules currently present within the soil. If there is not a native seed bank present, the lower sections of the buffer will usually be planted with OBL, FACW and FAC plant species. In the drier sections of the buffer, FACU and UPL plant species may be appropriate. Refer to the Vegetation List below and Appendix 1 in eFOTG for more plant species and site adaptability information.

## Riparian Forest Buffer (CP 391)



A riparian forest buffer is land next to streams, lakes and wetlands that is managed for perennial vegetation to enhance and protect aquatic resources from adverse impacts of agricultural practices. These areas are natural or re-established streamside forests made up of tree, shrub, and herbaceous plantings. They buffer non-point source pollution of waterways from adjacent land, reduce bank erosion, protect aquatic environments, enhance wildlife habitat and increase biodiversity.

There are potentially three management zones that are applied in a riparian buffer. The vegetation found or planted within each Zone can be different according to the intended purpose and site condition. Management Zone 1 is found immediately adjacent to the water up to the top of the bank. Within this zone, both water-loving herbaceous and woody plants dominate the vegetation. Management Zone 2 extends from the top of the bank up to the outer edge of the stream ecosystem. Zone 2 consists primarily of trees and shrubs. Management Zone 3 is up to the outer edge of the floodplain and is dominated primarily with herbaceous plant material. This zone provides protection against scour erosion within the floodplain. Refer to the Vegetation List below as well as Appendix 1 and/or Tree/Shrub Establishment (Practice Code 612) in eFOTG for more plant species and site adaptability information.

## Filter strip (CP 393)



Filter strips improve water quality by removing contaminants from overland water flow. The purpose of a filter strip is to trap sediment, plant nutrients, organic matter and chemicals as runoff passes through vegetation. As runoff moves through the filter strip, sediment and other suspended materials may be filtered from the runoff through deposition.

Plants selected for filter strips should have stiff stems and a high stem density near the ground surface. These species need to exhibit dense and vigorous growth habits which enable site stabilization and provide soil protection. Over time, filter strips will trap sediment deposition. Proper filter strip vegetation needs to be able to withstand partial burial from sediment deposition as well as be tolerant of herbicides used on the area that contributes to the runoff. Wildlife habitat can be improved by adding herbaceous plant material to areas **beyond** the minimum designed filter strip width. Considerations should be given to include plant material beneficial to pollinators and other targeted wildlife species of interest. Refer to the Vegetation List below and Appendix 1 in eFOTG for more plant species and site adaptability information.

## Grassed waterway (CP 412)



A grassed waterway is a shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Grassed waterways are used to convey runoff from terraces, diversions or other water concentrations without causing erosion. Ultimately, grassed waterways protect and/or improve water quality.

Grassed waterways are designed to convey a minimum peak runoff capacity. The width, side slopes and depth is determined by the watershed leading into the waterway. The vegetation planted should be selected according to current site conditions, intended use and ability to achieve adequate density, height and vigor appropriate to stabilize the waterway. Perennial vegetation should be used for erosion protection. Refer to the Vegetation List below and Appendix 1 in eFOTG for more plant species and site adaptability information.



## Cross wind trap strips (CP 589C)



A cross wind trap strip is a vegetative wind erosion practice used to reduce soil erosion caused by wind. Vegetative strips may consist of annual, perennial, cool or warm season vegetation that is resistant to wind erosion. Herbaceous cover is established in one or more strips across fields and perpendicular to the prevailing wind direction. The strip location(s) and width is dependent upon the conservation purpose and height of the strip vegetation planted. Cross wind trap strips are applied on the land to:

- protect growing crops from wind-borne particle damage
- induce deposition and reduce the transport of wind-borne contaminants/sediment
- provide food and cover for wildlife

Refer to the Vegetation List below and Appendix 1 in eFOTG for more plant species and site adaptability information .

## Herbaceous wind barrier (CP 603)



Herbaceous wind barriers consist of tall grass or other non-woody plants established in rows or narrow strips across a field and perpendicular to the prevailing wind direction. These barriers reduce soil erosion from wind due to a reduction in wind velocity at the soil surface. Additionally, these barriers help trap snow, resulting in an increase in plant-available moisture. Some wildlife species use herbaceous wind barriers for food, shelter, nesting and travel lanes.

Herbaceous wind barriers may be composed of perennial or annual vegetation. At a minimum they must have a stiff, erect non-spreading growth habit, be resistant to lodging, have good leaf retention, be tolerant to herbicides used in adjacent crops and provide minimum competition to adjacent crops. Refer to the Vegetation List below and Appendix 1 in eFOTG for more plant species and site adaptability information.

## Vegetation List

Following is a list of common species used or adapted to the conservation buffer practices. This list is not an all inclusive list nor is it meant to replace technical analysis and evaluation by the conservation planner. Each site is unique and must be evaluated and planned as such.

Plant Materials for Conservation Buffers	Contour Buffer Strips	Windbreak/Shelterbelt	Field Borders	Riparian Herbaceous Cover	Riparian Forest Buffers	Filter Strips	Grassed Waterways	Cross Wind Trap Strips	Herbaceous Wind Barriers
<b>Grasses</b>									
bahiagrass					X	X	X		
Berumdagrass; Seed & Sprig			X	X	X	X	X	X	
Bluestem: big	X		X	X	X	X	X	X	X
Bluestem: little	X		X	X	X	X	X	X	X
Bluestem: silver			X			X		X	X
Bluestem: yellow	X		X			X	X	X	X
Bristlegrass: plains			X	X		X	X	X	
Bristlegrass: streambed			X	X	X	X	X		
Buffalograss				X		X	X		
Cottontop: Arizona	X		X			X	X		X
Dallisgrass					X	X	X		
Dropseed: giant	X		X		X	X	X	X	X
Dropseed: sand			X	X		X	X	X	X
Dropseed: spike			X			X	X		X
Dropseed: tall	X		X	X	X	X	X	X	X
Eastern gamagrass	X		X	X	X	X	X	X	X
False Rhodesgrass	X		X			X	X	X	X
Grama: blue			X	X		X	X		
Grama: sideoats	X		X	X		X	X		X
Green sprangletop			X	X		X	X		X
Indiangrass	X		X	X	X	X	X	X	X
Lovegrass: sand			X			X	X		X
Lovegrass: Weeping			X			X	X	X	X
Lovegrass: Wilman			X			X	X	X	X
Millet: Foxtail, Pearl				X		X		X	
Pappusgrass: Pink, Whiplash			X			X	X		X

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Sacaton: Alkali, Big	X		X	X	X	X	X		X
Switchgrass			X	X	X	X	X	X	X
Texas wintergrass					X	X			X
Vine mesquite				X	X	X	X		
Wheatgrass: Tall	X		X			X	X	X	X
Wheatgrass: Western	X		X	X	X	X	X		X
Wildrye: Canada	X		X	X	X	X	X	X	X
Wildrye: Virginia	X		X	X	X	X	X	X	X
Windmillgrass: hooded			X			X	X		
Windmillgrass: shortspike			X			X	X		X
<b>Small Grains</b>						X			
Barley						X		X	
Millet: Foxtail, Pearl					X				
Oats						X		X	
Rye						X		X	
Speltz						X		X	
Triticale						X		X	
Wheat						X		X	
<b>Forbs and Legumes</b>						X			
Alfalfa			X		X	X	X		
Awnless bushsunflower	X		X		X	X	X		X
Black sampson			X		X	X	X		
Blackeyed Susan			X		X	X	X		X
Clover: arrowleaf	X		X	X	X	X	X		
Clover: berseem	X		X	X	X	X	X		
Clover: red	X		X	X	X	X	X		
Clover: subterranean			X	X	X	X	X		
Engelmann daisy			X	X	X	X	X	X	X
Gayfeather: dotted			X		X	X	X		X
Globemallow: Scarlet/Orange			X		X	X	X		X
Greyhead coneflower			X		X	X	X		

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Herbaceous mimosa	X		X	X	X	X	X		
Illinois bundleflower	X		X	X	X	X	X	X	X
Lespedeza; sericea			X			X	X	X	X
Maximilian sunflower			X	X	X	X	X	X	X
Orange zexmenia	X		X			X	X	X	X
Pitcher sage			X			X	X		
Prairie acacia	X		X			X	X		X
Prairieclover: Purple	X		X		X	X	X		X
Prairieclover: White	X		X		X	X	X		X
Sunflower, common			X			X	X		X
Sweetclover: White, Yellow			X			X	X		
Velvet bundleflower	X		X		X	X	X		
Partridge pea			X		X	X	X		
Western ragweed				X	X	X	X		
<b>Woodies</b>									
American Holly					X				
Anaqua		X							
Bernardia		X							
Black Gum					X				
Black Willow					X				
Bitternut hickory					X				
Boxelder					X				
Brazil		X							
Bumelia (Coma)		X							
Bald cypress					X				
Cottonwood					X				
Desert Yaupon		X							
Dewberry					X				
Dogwood					X				
Eastern Persimmon		X							
Green Ash					X				

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Guayacan					X				
Honeysuckle					X				
Hornbeam					X				
Hackberry		X			X				
Huisache		X							
Lotebush					X				
Mulberry (Texas)		X			X				
Oak: bur		X			X				
Oak: Nuttall					X				
Oak: Live		X			X				
Oak: Overcup					X				
Oak: Post		X			X				
Oak: Water		X			X				
Pecan		X			X				
Redbud		X							
River Birch					X				
Sycamore					X				
Skunkbush sumac		X							
Texas Kidneywood		X			X				
Texas persimmon		X			X				
Western Soapberry		X			X				
Wild Plum - Rainbow		X							
Willows					X				
Yaupon		X							

### **Buffer Maintenance**

Maintenance is critical to proper buffer function. Each buffer practice can have its unique maintenance requirements to ensure practice longevity and function. Refer to each individual conservation practice standard in eFOTG for more information.

Robert Ziehr  
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## References

- USDA, ARS. 1987. Stability design of grass-lined open channels. Agriculture Handbook 667.
- USDA, NRCS. 2007. National Engineering Handbook, Part 650, Engineering Field Handbook, Chap. 7, Grassed waterways.
- U.S. Department of Agriculture, Soil Conservation Service. 1954. Handbook of Channel Design for Soil and Water Conservation, SCS–TP–61. Washington, DC.
- Leeds, R, L. Brown, M. Sulc and L. VanLieshout. (1994). Vegetative Filter Strips: Application, Installation and Maintenance. In Ohio State University Extension Fact Sheets. Retrieved January 12, 2012, from <http://ohioline.osu.edu/aex-fact/0467.html>.
- Doskey, M, D. Schultz and T. Isenhardt. (January 1997). University of Nebraska at Lincoln Agroforestry Notes. In Riparian Buffers for Agricultural Land. Retrieved January 2012, from <http://www.unl.edu/nac/agroforestrynotes/an03rfb02.pdf>.

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