

## Ecoregions

Areas of the country can be separated into ecoregions having similar climate, vegetation and wildlife. They are described in very general terms. Wetlands and urban areas are found within all ecoregions.

At the end of each ecoregion description is a list of wildlife species recommended to use when evaluating an area in that ecoregion. You can use any or all of the listed species as well as additional species when applicable. However, only those listed will be used in the National Invitational event. Some of the species listed are considered a nuisance in some areas and circumstances. Contest organizers may exclude such species from local activities or center the activities on why the species are pests and what can be done to decrease problems.

Each ecoregion description is followed by a table that identifies wildlife management practices for various wildlife species that occur in that ecoregion. Specific information on recommended wildlife management practices can be found in the **Wildlife Species** section.

## List of Ecoregions

**Eastern Deciduous Forest**

**Great Plains Grassland – Shortgrass Prairie**

**Great Plains Grassland – Tallgrass/Mixed Prairie**

**Hot Desert**

**Intermountain – Foothills**

**Intermountain – Montane**

**Intermountain – Sagebrush**

**Intermountain – Subalpine**

**Mediterranean**

**Northeast Mixed Forest**

**Pacific Coastal Forest**

**Prairie Brushland**

**Southeast Mixed and Outer Coastal Plain Forest**

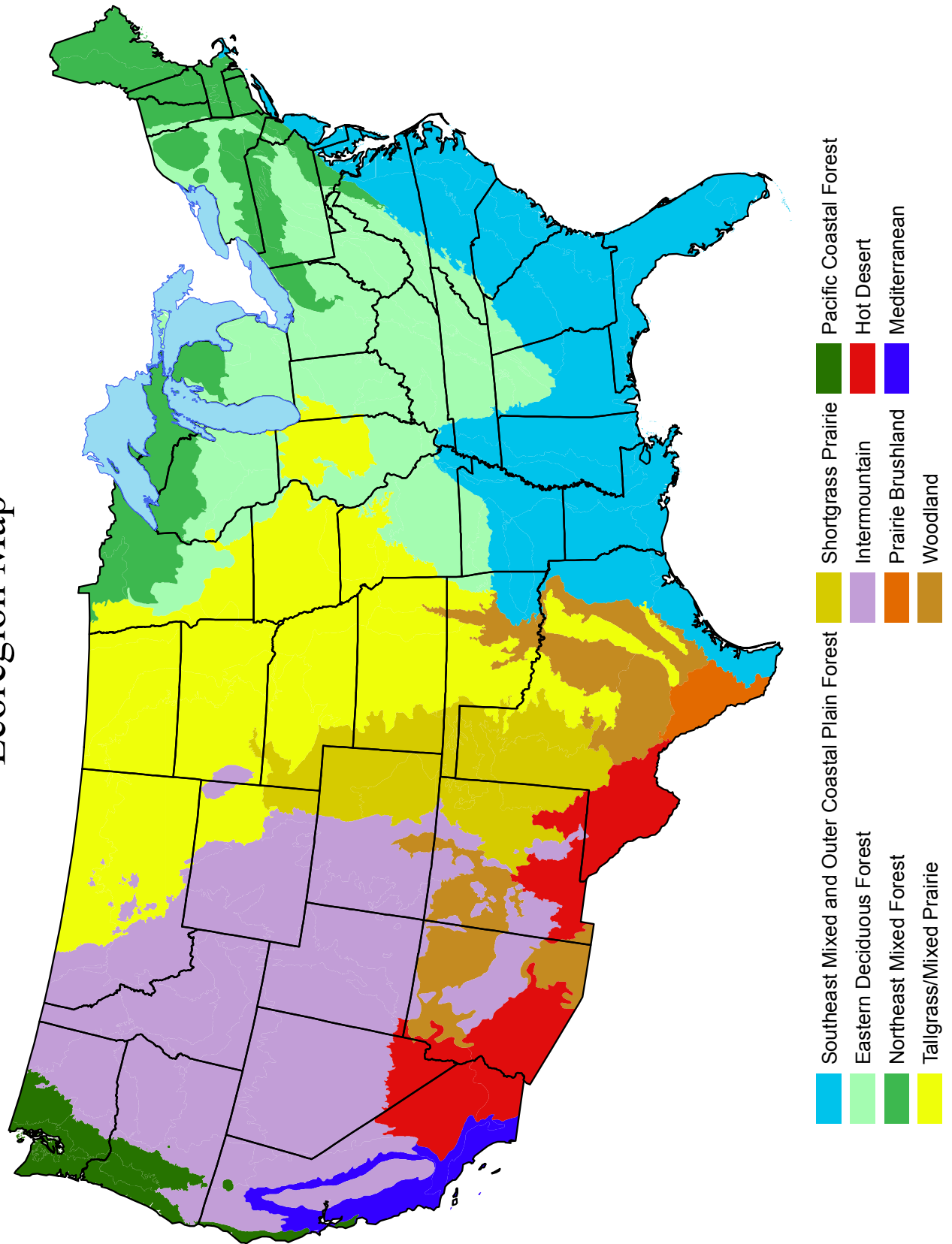
**Woodland**

*Special area considerations within each ecoregion:*

**Urban**

**Wetlands**

# Ecoregion Map



# Eastern Deciduous Forest

## Physical description

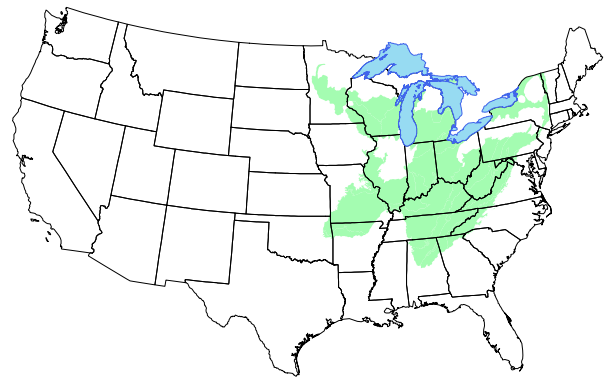
Most of the terrain is rolling except for the Appalachian Mountains and Ozark Mountains, which can be steep. The average annual precipitation ranges from approximately 35 inches to 90 inches and is usually well-distributed throughout the year. Summers are hot; winters are cold.

## Dominant vegetation

Deciduous trees dominate the landscape across the Eastern Deciduous Forest ecoregion where there is a lack of disturbance. Depending on location, trees such as oaks, hickories, maples, American beech, basswood, buckeye, yellow poplar, walnut, and birches are common in the overstory and can be indicators of a climax successional stage. Prevalent midstory trees include flowering dogwood, sassafras, sourwood, eastern redbud, hophornbeam, American hornbeam, and striped maple. Common shrubs include arrowwood, black huckleberry, blueberries, hawthorn, pawpaw, spicebush, viburnums, and witchhazel. A wide variety of forbs and ferns may be found in the understory. Common evergreen trees on many sites undergoing succession include eastern redcedar, Virginia pine, and shortleaf pine. In the Appalachians, eastern hemlock has been an important component in the Eastern Deciduous Forest. However, its decline following invasion of the Asian hemlock adelgid will surely lead to functional changes within this ecoregion.

Changes in the composition, structure, and function of the Eastern Deciduous Forest have already occurred during the past 100 years with the loss of American chestnut and the near total exclusion of fire. Prior to fire suppression, savannas and woodlands dominated by oak and shortleaf pine (depending on geographic location) were prevalent over much of this ecoregion.

Well-interspersed with forested areas in the Eastern Deciduous Forest ecoregion are agricultural fields,



pastures and hayfields, and fields undergoing succession. Virtually all of the “old-fields” were cropped in the past, and the vast majority has since been planted to nonnative grasses, especially tall fescue. Restoring old-fields and other open areas that contain nonnative sod grasses to native grasses and forbs is a major objective concerning wildlife conservation in this ecoregion. Native grasses, forbs, brambles, and shrubs occurring naturally in openings and savannas include bluestems, panicgrasses, indiangrass, switchgrass, asters, lespedezas, tick-trefoils, partridge pea, pokeweed, blackberry, wild plum, and sumacs.

Commonly occurring nonnative invasive plants in the Eastern Deciduous Forest ecoregion include tall fescue, orchardgrass, bermudagrass, sericea lespedeza, royal paulownia, tree-of-heaven, calory pear, autumn and Russian olive, Japanese honeysuckle, bush honeysuckles, Chinese privet, and bicolor lespedeza.

## Farming and ranching

Large areas of the Eastern Deciduous Forest ecoregion have been cleared for crop production and livestock forage. The major agriculture crops in the ecoregion are corn, soybeans, wheat, grain sorghum, and cotton. The dominant grasses grown for pasture and hayfields include tall fescue, orchardgrass, bermudagrass, dallisgrass, and bluegrass, all of which are nonnative. Depending on how croplands and pastures are managed, some wildlife species benefit. Unfortunately, crop-fields are usually



*Deciduous forest occurs over the Eastern Deciduous Forest ecoregion, except where areas have been cleared for agriculture and livestock.*

harvested in late summer or early fall (unless winter wheat is growing), pastures are most often overgrazed (leaving no cover for nesting or loafing), and hayfields are nonnative sod-grasses that provide poor structure for most wildlife species. The vast majority of fields that are

not in crop production are hayed (or mowed for aesthetic purposes) at least twice per year, usually once during the height of the nesting season for grassland birds, and once in late summer/early fall, which destroys any value as winter cover for wildlife.

## Plant succession

Annual forbs such as common ragweed (shown below) and grasses with a few perennial species represent the **initial successional stage**.



Perennial forbs and grasses (such as broomsedge, goldenrod, ironweed (purple flower), and thoroughwort (white flower) shown below) and brambles represent the **second successional stage**.



Young trees and shrubs (such as wild plum and winged sumac shown below, often with perennial grasses and forbs, represent the **third successional stage**.



Hardwood forests typically represent the **fourth successional stage**. In some areas of the Eastern Deciduous Forest ecoregion, pine forests represent the third or fourth successional stage. Regardless, forests are young before they are old. Young forests (below, top) provide a different structure than older forests (below, bottom). Wildlife associated with forests that are only 2- to 4-years-old are often the same species associated with brushy cover provided in the third successional stage (such as eastern cottontail, northern bobwhite, brown thrasher).



8-year old mixed hardwood forest



80-year old mixed hardwood forest



## **Wildlife associated with Eastern Deciduous Forest**

American woodcock  
brown thrasher  
eastern meadowlark  
golden-winged warbler  
great horned owl  
mourning dove  
northern bobwhite  
ovenbird  
wild turkey  
wood duck  
bobcat  
eastern cottontail  
eastern gray squirrel  
gray fox  
Indiana bat  
white-tailed deer  
eastern box turtle  
timber rattlesnake  
bluegill  
largemouth bass

Eastern Deciduous Forest	American woodcock	brown thrasher	eastern meadowlark	golden-winged warbler	great horned owl	mourning dove	northern bobwhite	ovenbird	wild turkey	wood duck	bobcat	eastern cottontail	eastern gray squirrel	gray fox	Indiana bat	white-tailed deer	eastern box turtle	timber rattlesnake	bluegill	largemouth bass
<b>Habitat Management Practices</b>																				
Conservation Easement			X	X			X								X					
Control Nonnative Invasive Vegetation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Create Snags				X	X					X				X	X					
Delay Crop Harvest																				
Edge Feathering	X	X		X	X		X		X		X	X		X		X		X		
Field Borders		X			X		X		X		X	X				X	X			
Forest Management	X	X		X	X		X		X	X	X	X	X	X	X	X	X	X		
Leave Crop Unharvested						X	X		X	X		X	X			X				
Livestock Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Nesting Structures										X					X					
Plant Food Plots						X	X		X	X		X	X			X				
Plant Native Grasses and Forbs			X		X	X	X		X			X				X	X			
Plant Shrubs	X	X		X	X		X		X	X	X	X		X		X	X			
Plant Trees	X			X	X	X		X	X	X	X		X	X	X	X	X	X		
Repair Spillway/Levee						X				X									X	X
Set-back Succession	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X			
Tillage Management					X	X	X		X	X		X				X				
Water Control Structures						X				X									X	X
Water Developments for Wildlife						X			X	X					X	X	X			
<b>Population Management Practices</b>																				
Decrease Harvest							X		X		X	X	X	X		X			X	X
Increase Harvest									X		X	X	X	X		X			X	X
Wildlife Damage Management					X				X		X	X	X	X		X		X		
Wildlife or Fish Survey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Fish Pond/Stream Management Practices</b>																				
Construct Fish Pond																			X	X
Control Aquatic Vegetation																			X	X
Fertilize/Lime Fish Pond																			X	X
Reduce Turbidity in Fish Pond																			X	X
Restock Fish Pond																			X	X
Streams: Create Pools																				
Streams: Remove Fish Barriers																				

# Urban

## Physical Description

According to the U.S. Census Bureau in 2010, more than 80 percent of the American population lived in or near an urban area. The Census Bureau defines an urban area as a large central place with a total population of at least 50,000. In addition to a large human population, urban areas are characterized by residential and commercial development connected and crisscrossed by infrastructure, such as roads, train tracks, and utilities. Areas such as neighborhood parks offer the best possibility for wildlife habitat within an urban environment.

## Dominant vegetation

It is not possible to identify dominant vegetation common in urban areas because urban areas are found in all ecoregions of the U.S. However, urban ecoregions typically contain gravel and paved areas, annual plantings, perennial grasses and forbs, shrubs, and young and mature trees. The vegetation is as likely to be an introduced species as a native species. Additionally, vegetated areas are typically manipulated in a landscaped manner versus “letting nature take over” as in rural areas. Interspersion is an important concept to understand in urban areas because of the fragmented landscape from residential and commercial development.

Urban areas are often dominated by non-native, invasive vegetation because of the disturbed and fragmented landscape and because many varieties of nonnative ornamentals are planted for aesthetic purposes. Educating the public about native versus nonnative cultivars and monitoring should be implemented in all urban areas.

## Wildlife associated with Urban areas

American robin	rock pigeon
bluebird <sup>1</sup>	ruby-throated hummingbird
common nighthawk	song sparrow
European starling	big brown bat
house finch	cottontail <sup>2</sup>
house sparrow	coyote
house wren	eastern gray squirrel
northern flicker	raccoon
peregrine falcon	white-tailed deer

<sup>1</sup>bluebird: may include eastern, mountain, or western

<sup>2</sup>cottontail: may include desert, eastern, or mountain

## Considerations for Urban Wildlife management practices

Attracting wildlife for viewing is popular among people in urban and suburban areas. However, many wildlife species can quickly become a nuisance, especially when they find protective shelter in unintended areas (under houses,



in attics) or begin to damage property (chewing/drilling holes in wooden siding, defecating on property). Care must be exercised when attracting wildlife in urban and suburban areas, especially when using artificial feeders, which can also attract unwanted species, such as mice and rats, and make desirable species more susceptible to unnatural predators (house cats). If you care about small wildlife, keep your cat indoors!

Although there are several active management practices that can be implemented, such as artificial feeders, mowing, planting flowers, and rooftop/balcony gardens, there are also some common-sense considerations that should always be given. For example, when nests of desirable species are found, care should be taken not to disturb them.

**NOTE:** Urban areas vary considerably in the amount of open space available, number of buildings, population density, etc. Thus, there are several wildlife management practices that are applicable in some urban or suburban areas and not in others. Some WMPs, such as those related to livestock and row crops, are not considered applicable for Urban ecoregion. Forages, such as clovers, may be sown in open areas to attract species such as cottontails and white-tailed deer, but grain plots are not applicable.



Dwayne Elmore

*Wildlife damage management is an important consideration in urban areas as wildlife frequently conflict with people. Here, netting is preventing gulls from roosting on houses.*



Dwayne Elmore

*Urban areas provide habitat for some wildlife species. The presence of wildlife is considered beneficial to many people.*

Urban	American robin	bluebird	common nighthawk	European starling	house finch	house sparrow	house wren	northern flicker	peregrine falcon	rock pigeon	ruby-throated hummingbird	song sparrow	big brown bat	cottontail	coyote	eastern gray squirrel	raccoon	white-tailed deer
<b>Habitat Management Practices</b>																		
Conservation Easement																		
Control Nonnative Invasive Vegetation	X	X					X	X			X	X		X	X	X	X	X
Create Snags		X						X					X				X	
Delay Crop Harvest																		
Edge Feathering		X												X	X	X	X	X
Field Borders																		
Forest Management								X				X		X	X	X	X	X
Leave Crop Unharvested																		
Livestock Management																		
Nesting Structures		X					X		X				X					
Plant Food Plots																		
Plant Native Grasses and Forbs		X			X							X		X	X			X
Plant Shrubs	X	X			X		X	X			X	X		X	X		X	X
Plant Trees	X	X			X		X	X			X		X			X	X	X
Repair Spillway/Levee																	X	
Set-back Succession	X	X	X		X			X				X	X	X	X		X	X
Tillage Management																		
Water Control Structures																	X	
Water Developments for Wildlife	X				X							X	X				X	X
<b>Population Management Practices</b>																		
Decrease Harvest														X	X	X	X	X
Increase Harvest														X	X	X	X	X
Wildlife Damage Management				X		X		X	X	X			X	X	X	X	X	X
Wildlife or Fish Survey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Fish Pond/Stream Mgmt Practices</b>																		
Construct Fish Pond																		
Control Aquatic Vegetation																		
Fertilize/Lime Fish Pond																		
Reduce Turbidity in Fish Pond																		
Restock Fish Pond																		
Streams: Create Pools																		
Streams: Remove Fish Barriers																		
<b>Additional Urban Practices</b>																		
Artificial Feeders					X			X			X	X				X		
Plant Flowers											X							
Rooftop/Balcony Gardens											X							



# Wetlands

## Physical description

Wetlands can be described as the zone between deep water and upland areas. They are characterized by various amounts of open water and vegetation with soil that is often wet or covered with shallow water. There are many types of wetlands, including beaver ponds, potholes, playas, ephemeral (temporary) ponds, small lakes, marshes, rivers, streams, swamps, and others. They are found in all of the ecoregions described in this manual.

## Dominant vegetation

Aquatic vegetation can survive in the water or on lands flooded or saturated with water for extended periods. Upland vegetation cannot tolerate saturation for long periods. The vegetation found in association with wetlands varies with permanence of the water, depth of water, salinity, and substrate (bottom). Wetlands with deep, permanent water typically have less emergent (above the water surface) vegetation and more floating or submerged (below the water surface) aquatic vegetation. As the water depth decreases, emergent aquatic vegetation becomes more prevalent. Less vegetation is found on rock and gravel bottoms than on bottoms with more silt, clay, and organic material (dead plants and animals that are decomposed). Emergent aquatic vegetation may include trees, shrubs, grasses, forbs, sedges, and rushes.

Examples of trees often found in wetlands include willows, cottonwood, various oaks, tupelo gum, tamarack, cypress, mangroves, red bay, black spruce, Atlantic white cedar, and pond pine. Shrubs commonly found in and adjacent to wetlands include willows, alders, bog birch, bog laurel, Labrador tea, coastal sweetbells, inkberry, sea myrtle, and marsh elder. Emergent grasses and grass-like vegetation commonly found in wetlands include cattails, bulrushes, saltgrass, cordgrass, saw grass, sedges, arrow grass, shoal grass, eel grass, and wild rice. Water lilies, pondweeds, wild celery, water milfoil, duckweeds, and coontails are examples of floating and submerged aquatic vegetation. Typical invasive plants found in wetlands include purple loosestrife, hydrilla, Eurasian watermilfoil, reed canarygrass, water hyacinth, alligatorweed, and phragmites.

The amount of open water and vegetation is important in determining how suitable the wetland is for different wildlife species. For example, young ducks need open water and emergent vegetation for hiding. Floating and submerged vegetation supports large amounts of food high in protein, such as snails, mollusks, and



crustaceans, which young ducks need for fast growth. Emergent vegetation may supply nesting areas, such as trees for wood ducks, grass for mallards, and cattails for red-winged blackbirds and muskrats. Exposed mudflats are another critical habitat component for some wildlife species, especially shorebirds, which rely on these areas to search for invertebrates in the mud.

Wetlands with stable, nonflowing water levels go through succession similar to the process in uplands. Open-water areas fill with silt and dead vegetation, which allows emergent aquatic vegetation to become dominant. As the wetland continues to fill, it becomes drier, allowing upland vegetation to become dominant.

## Plant succession

Wetland succession typically proceeds in the following stages:

**Stage 1:** deep water with little vegetation

**Stage 2:** shallow water dominated by submerged and floating aquatic vegetation

**Stage 3:** very shallow water or wet ground dominated by any variety of emergent aquatic vegetation

**Stage 4:** ground becomes drier and upland vegetation similar to the surrounding area becomes dominant.

Succession proceeds slowly in wetlands with large amounts of deep water or a rocky bottom. Fluctuations in water levels can cause the final stage of succession to regress to an earlier stage. For example, if a wetland in Stage 3 succession is flooded with deep water for a period of time, the aquatic emergent vegetation may die, reverting a wetland to an earlier successional stage. The extent of this regression depends on the length of time the wetland is flooded with deep water, how much the water level changes, and the extent (length of time) the present vegetation can survive in the changed water level.

Management of water levels is an important tool in managing wetlands for wildlife. The succession process described above is often not applicable to wetlands with constantly moving water, such as rivers, streams, and tidal areas.

Wetlands	American bittern	Canada goose	mallard	northern pintail	redhead	spotted sandpiper	Virginia rail	Wilson's snipe	American beaver	common muskrat	mink	raccoon	river otter	eastern snapping turtle	American bullfrog	crawfish frog	tiger salamander	bluegill	largemouth bass
<b>Habitat Management Practices</b>																			
Conservation Easement																X			
Control Nonnative Invasive Vegetation	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X		
Create Snags												X							
Delay Crop Harvest			X																
Edge Feathering												X							
Field Borders												X							
Forest Management			X									X							
Leave Crop Unharvested		X	X	X								X							
Livestock Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nesting Structures																			
Plant Food Plots		X	X	X								X							
Plant Native Grasses and Forbs		X	X	X		X										X	X		
Plant Shrubs									X			X				X	X		
Plant Trees									X			X					X		
Repair Spillway/Levee	X	X	X	X	X	X	X			X	X	X	X	X	X			X	X
Set-back Succession	X	X	X	X	X	X	X	X		X	X	X							
Tillage Management		X	X	X								X							
Water Control Structures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Water Developments for Wildlife	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		
<b>Population Management Practices</b>																			
Decrease Harvest									X	X	X	X	X	X	X			X	X
Increase Harvest									X	X	X	X	X	X	X			X	X
Wildlife Damage Management		X							X	X	X	X	X	X					
Wildlife or Fish Survey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Fish Pond/Stream Management Practices</b>																			
Construct Fish Pond																		X	X
Control Aquatic Vegetation																		X	X
Fertilize/Lime Fish Pond																		X	X
Reduce Turbidity in Fish Pond																		X	X
Restock Fish Pond																		X	X
Streams: Create Pools																			
Streams: Remove Fish Barriers																			



*Stage 1 wetland—characterized by open water and limited vegetation.*



*Stage 2 wetland—this beaver-influenced wetland provides a mosaic of open water with submerged vegetation, as well as floating islands of debris and emergent vegetation.*



*Over time, Stage 2 wetlands dominated by floating and submerged aquatic vegetation succeed into Stage 3 wetlands with more emergent vegetation, including sedges, rushes, grasses, and shrubs.*



*Stage 3 wetland—this natural emergent freshwater marsh is covered with several species of native grasses and sedges. Over time, these freshwater wetlands become more similar to the adjacent uplands as they slowly fill in.*



*Stage 3 wetland – Forested bottomland swamps, such as this cypress swamp in the Lowcountry of South Carolina, often are relatively stable wetlands because of their proximity to major river systems.*



*Stage 4 wetland — these wetlands are rarely flooded. Here, a riparian area along the Missouri River has recently flooded and sediment is deposited along the river. However, most of the time, this area is dry.*

Dwayne Elmore

## Wildlife associated with Wetlands

American bittern	spotted sandpiper
Canada goose	Virginia rail
mallard	Wilson's snipe
northern pintail	American beaver
redhead	common muskrat

mink	crawfish
raccoon	frog
river otter	tiger salamander
eastern snapping turtle	bluegill
American bullfrog	largemouth bass