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NRCS Natural Resources Conservation Service

Biology Technical Note

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Wetland Plantings for Wildlife

Land users can have a significant impact on wildlife species and populations by taking action to maintain or improve existing wetlands. Managing wetlands for a specific group of plants or animals can be a successful and rewarding experience.

This document is a tool to assist individuals who wish to restore, manage, or enhance wetlands. A landowner can increase the likelihood that their wetland will be used by a wider variety of wildlife if some of the recommended plants are incorporated into management plans. Because wetlands are complex habitats, consider working with one of the specialists listed in the **Where To Go For Help** section.

WETLAND HABITATS

The term "wetland" describes a wide range of habitats including:

- **Wet meadows** consisting mostly of saturated soils with grasses and sedges
- **Shallow water marshes** containing emergent vegetation such as cattails, bulrushes and sedges
- **Scrub/shrub wetlands** with lowland shrubs such as willows, dogwoods, and buttonbush
- **Forested wetlands** containing green ash, silver maple, water tolerant oaks and hickory trees
- **Open water areas** with floating vegetation like water lilies

The depth and permanence of water primarily determine which flora and fauna will dominate a wetland. It is this variation in water conditions and vegetation types that most often determine which wildlife will be found in wetlands across the state. All types of wetlands regardless of size, depth, and duration of flooding, can be important to wildlife as a source of food, water, and cover.

Trees, shrubs, and emergent wetland plants stand above the water's surface and supply wildlife with cover and food. Wetland-adapted wildlife depends upon these plants to provide shelter for feeding, resting, and reproduction.

Wild Iris - Ken Collins, NRCS

At various times of the year, wetlands also provide cover and other benefits for other upland wildlife species including rabbits, deer, great-horned owls, and red-tailed hawks. By learning more about the basic needs of various wildlife species, landowner efforts to influence wildlife can be more effective.

MANAGING THE SURROUNDING LANDSCAPE

Wetlands do not exist in isolation. Much of what goes on around a wetland directly affects how that wetland functions. Thus, a landowner can influence the wetland through activities on the adjacent lands. Depending on the type of vegetation, the surrounding landscape can serve as valuable habitat for wildlife. For example, ducks such as mallards and blue-winged teal and other waterfowl often nest in grasses near wetlands. On the other hand, if your wetland contains woodland with snags, the site might attract wood ducks. Wooded borders are also used by a variety of amphibians and reptiles during the non-breeding season.

Buffers

A buffer between the adjacent land and the wetland is an important management tool. A minimum buffer width of at least 20 feet can filter nutrients, sediments, and toxins from the wetland. Normally, greater widths provide greater benefits. Depending upon the species planted, buffers can also act as a visual screen or noise barrier, as well as provide habitat for wildlife.

Muscatatuck WRP - Jerry Roach, NRCS

Buffers that include cool season grass/legume mixes can provide food and cover for wildlife. These plants are called cool season because growth occurs primarily during the spring and fall. An example mixture is Orchardgrass, Timothy, Alfalfa, and Ladino Clover. Recommended mixtures and seeding rates can be found in the Natural Resources Conservation Service (NRCS) *Upland Wildlife Habitat Management* Standard under the **Reference Information** section.

Grass buffers need to be maintained by periodic disturbance at intervals of one (1) to three (3) years. This will provide a healthy grassland area and prevent encroachment by trees. Acceptable disturbance techniques include prescribed burning, strip disking, strip spraying or inter-seeding forbs and legumes. These practices can be found in the NRCS *Early Successional Habitat Development/ Management* Standard under the **Reference Information** section. The buffer should not be disturbed during the primary nesting season for grassland birds of April 1 through August 1.

Many landowners are also planting the upland areas adjacent to the wetland with warm season grasses, such as Big Bluestem, Indian Grass, and Switchgrass. They are called warm season grasses because growth primarily occurs during the heat of the summer. These grasses are popular because of the excellent habitat provided for many upland game birds and grassland songbirds, as well as nesting habitat for waterfowl. When mixed with native wildflowers, warm season grass plantings can also provide an attractive border around the wetland. Special care is needed for planting and managing warm season grasses. See *Warm Season Grass Establishment* under the **Reference Information** section, or consult one of the specialists listed in the **Where to Go for Help** section.

Another option is to maintain the buffer in trees and shrubs with a minimum width of 50 to 100 feet. Tree and shrub buffers take longer to establish than grasses because woody plants are slower to develop and require special maintenance during the first few years. Wooded buffers are especially beneficial to many amphibians and aquatic reptiles that require this type of habitat during the non-breeding season. Tree species and planting rates (see NRCS *Wetland Restoration* Standard), and planting procedures (see NRCS *Tree/Shrub Establishment* Standard) can be found in the **Reference Information** section.

Fencing

For wetlands in agricultural areas, you may need perimeter fences to keep cattle or other livestock from entering the wetland. Cattle in particular do considerable damage to the plants and can cause significant amounts of sediment to enter the water. Options can include single-strand or double-strand, high-tensile electric fence. Woven wire is more likely to trap debris and is less favored as an option.

Fencing should be placed as far from the wetland as possible to maximize the adjacent buffer acres. In areas where streams and wetlands coincide, cattle crossings may be necessary.

ESTABLISHING WETLAND PLANTS

Recently Restored Wetlands

Many restored wetlands do not require planting, as long as the original topsoil is preserved. Many wetland plants produce seeds that can lie dormant for years under drained conditions, but will germinate when water is restored to the site. The total amount and variety of seeds that have remained viable in the soil is commonly known as the “seed bank”.

Landowners are often surprised at the variety of wetland plants that establish themselves within the first year after restoration. These plants come from both existing seed banks and by colonization from off-site sources, such as nearby ditch banks. The longer the intervals between draining and restoration, however, the less successful seed banks are, and planting may become necessary. Natural regeneration of native plants is preferred, but the seeds of invasive and aggressive species may also lurk in the seed bank. Consider your planting options after evaluating the plant composition of the wetland following the first growing season.


Buttonbush - Ken Collins, NRCS

Invasive and Aggressive Species

It is important to know that there are plants that can dominate wetlands to the exclusion of other plant species. Most non-native plants introduced to new areas by humans do not cause significant environmental problems. Some plants however, reproduce aggressively and spread into wild habitats. These plants may crowd out native species and inhibit the use of the area by wildlife.

Purple Loosestrife (*Lythrum salicaria*), Phragmites (*Phragmites australis*), and Reed Canarygrass (*Phalaris arundinacea*) are examples of invasive plant species that will often move into a new wetland uninvited and dominate the site. In more open water sites, non-native species like water lily can spread to nuisance levels. It is therefore recommended that you do not plant exotic or non-native species in your wetland. Because even native species like cottonwood, black willow, and cattails can dominate a wetland under the right conditions, monitoring your wetland is highly recommended.

Planting considerations

At times, it may be necessary to supplement the natural regeneration of wetland plants. Planting of nursery stock may be needed in these cases. The timing of seed planting is critical for plant survival. Contact your local NRCS office for information regarding planting dates and seeding rates for specific species. Nursery stock may need to be ordered several months to a year prior to planting. Plants and seeds should be appropriate for your region (plants adapted to the southern part of the state, for example, may not fare well in northern Indiana). See table below for appropriate seeding dates.

The selection of plants should also reflect the expected water conditions of the site. Many grasses, sedges, and rushes require moderate fluctuations in water level, but submergent or floating species (such as pond lilies) need more stable and deeper waters. Few woody species can tolerate continuous flooding, so placement at the drier end of the wetland is recommended.

Indiana Seeding Dates

Species/Mix	Growing Seeding Dates	Dormant Season Seeding Dates*
Warm Season Grasses	4/1-6/15	12/1-4/1
Legumes	3/1-5/15 or 8/1-9/15	12/1-3/1
Cool Season Grasses	3/1-5/15 or 8/1-9/15	12/1-3/1
Forbs	4/1-6/15	12/1-4/1

*Increase seeding rates by 25% dormant seeding. Broadcasting of warm season grasses should only be done into a prepared seedbed with protection from erosion as a consideration.

Plant species

Tables 1-5 at the end of this document contain recommended native plant species common to Indiana wetlands. Each table contains a "Soil Moisture Tolerance" column that gives a general range of soil moisture preferred by each plant. Contact your local NRCS office regarding the specific soil characteristics of your property.

Table 1 contains common wetland plants that promote wildlife by providing food, cover and other benefits. The column headings found in the table give examples of possible wildlife benefits. Note however, that there is no guarantee that a listed wildlife species will automatically inhabit the wetland by planting a particular species of plant. For example, although bur oak is listed as benefiting raptors, planting it will not necessarily guarantee that raptors will nest on site. In addition, there are also many other wildlife species which are not listed that may utilize various plants for a portion of their life cycle.

Tables 2-5 contain additional native plants including grasses, forbs, shrubs and trees that can be used to diversify and improve habitat for wetland wildlife. See the **Reference Information** section for additional information on wetland habitat and management.

WHERE TO GO FOR HELP

The following agencies and organizations can provide more information about wetlands. The bulleted items listed under each group describe the type of assistance provided.

U.S.D.A. Natural Resources Conservation Service (NRCS)
Offices are located at the USDA Service Center in each county and are listed in the telephone book under *U.S. Department of Agriculture*. Service Center locations can also be found at:
http://offices.sc.egov.usda.gov/locator/app

- Provides funding for wetland restoration programs
- Provides technical assistance on wetland management
- Makes wetland determinations on agricultural land

U.S. Environmental Protection Agency (EPA)
http://www.epa.gov/owow/wetlands/

- Provides wetland information regarding education, regulations, and protection

U.S. Fish and Wildlife Service (FWS)
http://midwest.fws.gov/Bloomington/

- Provides technical assistance on wetland and wildlife management
- Provides technical guidance regarding Threatened and Endangered Species
- Provides funding for wetland restoration programs

U. S. Army Corps of Engineers (COE)
Detroit District: http://www.lre.usace.army.mil/what/detroitresources/
Louisville District: http://www.lrl.usace.army.mil/

- Provides guidance on, and issues Nationwide Permits
- Makes wetland determinations on non- agricultural land

Purdue University Extension (CES) - Wildlife Specialist
http://www.agriculture.purdue.edu/fnr/Extension/wetlands.htm

- Provides technical assistance on wetland and wildlife management

IN Department of Natural Resources (IDNR) Div. of Fish & Wildlife - District Wildlife Biologists
http://www.state.in.us/dnr/fishwild/huntguide1/wbiolo.htm

- Provides technical assistance on wetland and wildlife management

IDNR Division of Water
http://www.in.gov/dnr/water/

- Issues Construction Within a Floodway Permits for riparian wetlands

Indiana State Department of Agriculture (ISDA) Division of Soil Conservation
http://www.in.gov/isda/soil/

- Facilitates the protection and enhancement of Indiana's land and water

Indiana Soil and Water Conservation Districts
http://www.in.gov/isda/soil/swcd/index.html

- Determines and addresses local wetland resource needs in each county

REFERENCE INFORMATION

Natural Resources Conservation Service (NRCS) techincal resources:

Electronic Field Office Technical Guide (http://www.nrcs.usda.gov/technical/efotg/)

- *Wetland Restoration* (Standard 657)
- *Wetland Enhancement* (Standard 659)
- *Wetland Wildlife Habitat Management* (Standard 644)
- Restoration and Management of Declining Habitats (Standard 643): see *Sedge Meadow Habitat*
- *Upland Wildlife Habitat Management* (Standard 645)
- *Early Successional Habitat Development/Management* (647)
- *Tree/Shrub Establishment* (Standard 612)

Indiana Biology Technical Note: *Wetland Macrotopography*

- http://www.in.nrcs.usda.gov/intranet/TechnicalNotes/Wetland_Macrotopography_TechNote.pdf

Indiana Department of Natural Resources (IDNR) publications:

- *Life Series*. Information on species-specific habitat requirements, diets, distribution and abundance for many common Indiana wildlife (http://www.in.gov/dnr/fishwild/4932.htm)
- *Habitat Management Fact Sheets.* Information on beneficial habitat management and practices for Indiana wildlife (http://www.in.gov/dnr/fishwild/4435.htm)
- *Warm Season Grass Establishment* (http://www.in.gov/dnr/files/warmgrass.pdf)

The Department of Forestry and Natural Resources, Purdue University:

- Publications on wetlands, wildlife, and forest management practices http://www.agcom.purdue.edu/agcom/Pubs/fnr.htm

The Indiana Native Plant and Wildflower Society (INPAWS):

http://www.inpaws.org/

- *Sources for plants native to Indiana & the Lower Midwest*
- *Landscaping with Plants Native to Indiana - Recommended Plants and their Sources*
- *Recommended reference books for plants native to Indiana*

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Helping People Help the Land

Table 1 – Common Wetland Plants Beneficial to Wildlife

TREES	Soil Moisture Tolerance[1]	Waterfowl (Food)	Songbirds (Food & Nesting)	Mammals (Food & Shelter)	Raptors (Nesting & Perch Sites)	Comments
Ash, Green (*Fraxinus pennsylvanica*)	VPD – WD		X	X		
Gum, Black *(Nyssa sylvatica)*	PD – WD	X	X			Eaten by wood duck and turkey
Hackberry (*Celtis occidentalis*)	SPD – WD		X	X		
Hickory, Bitternut *(Carya cordiformis)*	SPD – WD	X		X		Eaten by wood duck, squirrel & turkey
Hickory, Shellbark *(Carya laciniosa)*	VPD – WD	X		X		Eaten by squirrel & turkey
Oak, Bur (*Quercus macrocarpa*)	PD – ED			X	X	
Oak, Cherrybark (*Quercus pagoda*)	SPD – WD		X	X	X	Use south of U.S. 40
Oak, Pin (*Quercus palustris*)	VPD – WD	X	X	X		
Oak, Shumard (*Quercus shumardii*)	SPD – WD	X	X	X	X	
Oak, Swamp Chestnut (*Quercus michauxii*)	SPD – WD	X		X		
Oak, Swamp White (*Quercus bicolor*)	VPD – WD		X	X	X	
Pecan (*Carya illinoinensis*)	SPD – WD		X	X		Use south of U.S. 40
Persimmon *(Diospyros virginiana)*	SPD – WD		X	X		
Serviceberry (*Amelanchier arborea*)	MWD – WD		X			
Sweetgum (*Liquidambar styraciflua*)	PD – WD	X	X	X		
Sycamore (*Platanus occidentalis*)	PD – WD	X	X	X	X	

SHRUBS	Soil Moisture Tolerance[1]	Waterfowl (Food)	Songbirds (Food & Nesting)	Mammals (Food & Shelter)	Raptors (Nesting & Perch Sites)	Comments
Buttonbush (*Cephalanthus occidentalis*)	SPD – WD	X	X	X		Wilted leaves may be toxic to livestock
Cherry, Choke (*Prunus virginiana*)	SPD – WD		X	X		
Chokeberry, Black *(Aronia melanocarpa)*	SPD – WD		X			
Dogwood, Alternate Leaf (*Cornus alternifolia)*	SPD – WD	X	X	X		Twigs browsed by deer and rabbits
Dogwood, Gray (*Cornus racemosa)*	SPD – WD		X	X		Eaten by pheasant, turkey and grouse
Dogwood, Red-osier (*Cornus stolonifera*)	VPD – WD		X	X		Eaten by grouse, quail, deer & rabbits
Dogwood, Rough Leaved *(C. drummondii)*	PD – WD		X	X		
Dogwood, Silky (*Cornus amomum*)	VPD – WD	X	X	X		Sometimes browsed by rabbits & deer
Elderberry (*Sambucus canadensis*)	VPD – WD		X	X		Eaten by pheasant, turkey and quail
Highbush Cranberry (*Viburnum trilobum*)	VPD – WD	X	X	X		Fruit eaten by grouse and pheasant
Nannyberry (*Viburnum lentago*)	SPD – WD	X	X	X		
Ninebark *(Physocarpus opulifolius)*	VPD – WD		X	X		Eaten by ruffed grouse
Spicebush (*Lindera benzoin*)	VPD – WD			X		Eaten by rabbit, quail and grouse
Spirea (*Spiraea alba and S. tomentosa)*	VPD – WD			X		Eaten by grouse, deer and rabbits
Wild Sweet Crabapple *(Malus coronaria)*	SPD – ED		X			Recommended for quail
Winterberry (*Ilex verticillata*)	VPD – SPD		X	X		Emergency food source for wildlife

[1] KEY: **ED** = Excessively Drained **WD** = Well Drained **SPD** = Somewhat Poorly Drained **PD** = Poorly Drained **VPD** = Very Poorly Drained

Table 1 – Common Wetland Plants Beneficial to Wildlife (continued)

GRASS or GRASS-LIKE	Soil Moisture Tolerance[1]	Waterfowl (Food)	Songbirds (Food & Nesting)	Mammals (Food & Shelter)	Butterflies (Food)	Comments
Canada Blue Joint Grass (*Calamagrostis canadensis*)	SPD – VPD	X		X		
Fowl Manna Grass *(Glyceria striata)*	SPD – VPD	X				
Prairie cordgrass (*Spartina pectinata*)	SPD – VPD	X	X	X		
Switchgrass (*Panicum virgatum*)	PD - WD	X	X	X		
Virginia Wildrye *(Elymus virginicus)*	PD - WD	X	X	X		
Wild Rice (*Zizania aquatica*)	VPD – PD	X	X			Prefers shallow water

WILD FLOWERS	Soil Moisture Tolerance[1]	Waterfowl (Food)	Songbirds (Food & Nesting)	Mammals (Food & Shelter)	Butterflies (Food)	Comments
Arrowhead, Broadleaf (*Sagittaria latifolia*)	VPD – PD	X		X		Prefers shallow water
Aster, New England *(Aster novae-angliae)*	PD – WD		X		X	
Aster, Flat Topped *(Aster umbellatus)*	PD – SPD		X		X	
Aster, Swamp *(Aster puniceus)*	PD – SPD		X		X	
Bottle gentian (*Gentiana andrewsii*)	VPD – PD				X	
Cardinal Flower (*Lobelia cardinalis*)	PD – SPD		X		X	
Coneflower, Tall (*Rubeckia laciniata*)	PD – WD		X		X	
Cup Plant (*Silphium perfoliatum*)	PD – WD		X		X	
Dense Blazing Star *(Liatris spicata)*	PD – WD				X	
Dock, Prairie (*Silphium terebinthinaceum*)	SPD – ED			X	X	
Irises (*Iris virginica*)	VPD – PD			X	X	
Joe-pye-weed (*Eupatorium fistulosum, E. pupurpeum, or E. maculatum*)	VPD – SPD	X	X		X	
Lily, Michigan (*Lilium michiganense*)	PD – WD			X	X	
Milkweed, Swamp (*Asclepias incarnata*)	PD – SPD		X		X	
Nodding Bur Marigold *(Bidens cernua)*	PD – SPD	X	X			
Obedient Plant *(Physostegia virginiana)*	PD – SPD				X	
Prairie blazing star (*Liatris spicata*)	PD – WD				X	
Reed, Giant Bur *(Sparganium eurycarpum)*	VPD – PD	X				Prefers shallow water
Rushes, Native (*Juncus spp.*)	VPD – WD[2]	X	X	X		Examples: Spike & Slender
Sago Pondweed *(Potamogeton pectinatus)*		X				
Sedges, Native (*Carex spp.*)	VPD – WD[2]	X	X			Examples: Lake & Fox
Smartweeds, Native (*Polygonum spp.*)	VPD – SPD	X	X	X		Example: Pennsylvania
Wild Celery *(Vallisneria americana)*		X				

[1] KEY: **ED** = Excessively Drained **WD** = Well Drained **SPD** = Somewhat Poorly Drained **PD** = Poorly Drained **VPD** = Very Poorly Drained

[2] Varies with species

Table 2 - Additional Native Grass/Grass-like Species

SPECIES	Soil Moisture Tolerance[1]	Sun Exposure	Wet Prairie/ Sedge Meadow	Unsaturated Muck	Saturated Muck	Seeds per Ounce[3]
Bluestem, Big (*Andropogon gerardii*)	PD-ED	P,S		X		N/A
Bulrush, Green (*Scirpus atrovirens*)	PD-SPD	P	X		X	460,000
Bulrush, Soft (*Scirpus validus*)	PD-SPD	P			X	N/A
Cordgrass, Prairie (*Spartina pectinata*)	VPD-MWD	P,S	X		X	6,600
Cutgrass, Rice (*Leersia oryzoides*)	PD-SPD	P,S	X		X	34,000
Deer tongue (*Panicum clandestinum*)	MWD-ED	P				18,000
Dropseed, Prairie (*Sporobolus heterolepis*)	SPD-ED	P,S	X			16,000
Fescue, Nodding (*Festuca obtusa*)	MWD-ED	P,S				20,000
Grass, Barnyard (*Echinochloa crusgalli*)	PD-MWD	P				N/A
Grass, Beek (*Diarrhena Americana*)	SPD-WD	P,S				2,500
Grass, Canada Blue Joint (*Calamagrostis canadensis*)	VPD-SPD	P,S,W	X		X	Plugs only (50/ac.)
Grass, Bottlebrush (*Elymus hystix*)	SPD-WD	S,W				N/A
Grass , Fowl Manna (*Glyceria striata*)	VPD-MWD	P,S,W			X	160,000
Grass, Indian (*Sorghastrum nutans*)	PD-ED	P,S		X		N/A
Rush, Soft (*Juncus effusus*)	VPD-SPD	P			X	N/A
Rush, Torrey's (*Juncus torreyi*)	PD-DPD	P			X	N/A
Stout Wood Reed (*Cinna arundinacea*)	PD-SPD	W				N/A
Sedge, Awl-fruited (*Carex tribuloides*)	VPD-MWD	P,S		X		120,000
Sedge, Bristly (*Carex comosa*)	PD-SPD	P	X		X	30,000
Sedge, Crested (*Carex cristatella*)	VPD-SPD	P,S	X			N/A
Sedge, Field Oval (*Carex molesta*)	SPD-WD	P,S,W				25,000
Sedge, Franks (*Carex frankii*)	VPD-SPD	P,S		X	X	N/A
Sedge, Fringed (*Carex crinita*)	PD-SPD	P,S,W				23,000
Sedge, Fox (*Carex vuplinoidea*)	VPD-WD	P,S	X	X	X	100,000
Sedge, Lurid (*Carex lurida*)	PD-SPD	P,S,W				12,000
Sedge, Hop (*Carex lupilina*)	PD-SPD	P,S,W	X			3,300
Sedge, Pointed Oval (*Carex tribuloides*)	VPD-SPD	P,S			X	N/A
Sedge, Short's (*Carex shortiana*)	SPD-MWD	P,S,W				17,000
Sedge, Spreading Oval (*Carex normalis*)	SPD-WD	P,S,W				25,000
Sedge, Tussock (*Carex stricta*)	VPD-SPD	P,S			X	Plugs only (50/ac.)
Switchgrass (*Panicum virgatum*)	SPD-WD	P,S		X		14,000
Wildrye, Canada (*Elymus canadensis*)	MWD-ED	P,S		X		5,200
Wildrye, Riverbank (*Elymus riparius*)	PD – WD	P,S				2,900
Wildrye, Virginia (*Elymus virginicus*)	PD – WD	P,S,W		X	X	4,200
Woolgrass (*Scirpus cyperinus*)	PD-SPD	P	X			1,700,000

Table 3 - Additional Native Forbs

SPECIES	Soil Moisture Tolerance[1]	Sun Exposure	Wet Prairie/ Sedge Meadow	Unsaturated Muck	Saturated Muck	Seeds per Ounce[3]
America bugleweed (*Lycopus americanus*)	PD-SPD	P				130,000
American germander (*Teucrium canadense*)	SPD-MWD	P,S				20,000
Angelica (*Angelica atropurpurea*)	VPD-SPD	P,S,W		X		N/A
Arrowhead, Common (*Sagittaria latifolia*)	VPD-PD	P,S			X	N/A
Aster, Flat-top (*Aster umbellatus*)	PD-SPD	P,S			X	67,000
Aster, Marsh (*Aster lanceolatus*)	SPD-MWD	P,S				N/A
Aster, New England (*Aster novae-angliae*)	PD-WD	P,S		X		66,000
Aster, Swamp (*Aster lateriflorus*)	PD-SPD	P,S,W				250,000
Beardtongue, Foxglove (*Penstemon digitalis*)	SPD-MWD	P,S,W	X	X	X	130,000
Black-eyed Susan (*Rudbeckia*)	MWD-ED	P,S				92,000
Black-eyed Susan, Sweet (*Rudbeckia subtomentosa*)	MWD–WD	P,S		X		43,000
Blazing Star, Dense (*Liatris spicata*)	PD-WD	P,S		X		N/A
Boneset (*Eupatorium perfoliatum*)	PD-SPD	P,S	X		X	160,000
Brown eyed susan (*Rudbeckia triloba*)	SPD-MWD	P,S	X			34,000
Coneflower, Purple (*Echniacea purpurea*)	MWD-ED	P,S	X			6,600
Coneflower, Tall (*Rudbeckia triloba*)	SPD-ED	P,S		X		34,000
Coneflower, Yellow (*Ratibida pinnata*)	MWD-ED	P,S		X		N/A
Coreopsis, Palm Leaf (*Coreopsis palmate*)	MWD-ED	P,S	X			10,000
Cup plant (*Silphium perfoliatum*)	PD-MWD	P,S	X	X		1,400
Flag, Blue (*Iris virginica shrevei*)	VPD-PD	P,S,W			X	N/A
Flag, Sweet (*Acorus calamus*)	VPD-PD	P,S			X	N/A
Golden Alexander (*Zizia aurea*)	PD-MWD	P,S	X			11,000
Goldenrod, Giant (Solidago gigantean)	PD-SPD	P,S,W		X		N/A
Goldenrod, Riddle's (*Solidago riddellii*)	PD-ED	P,S			X	N/A
Goldenrod, Swamp (*Solidago patula*)	VPD-SPD	P	X			44,000
Goldenrod, Stiff Leaf (*Solidago rigida*)	MWD-ED	P,S	X			41,000
Goldenrod, (*Solidago rugosa*)	PW-WD	P,S		X		N/A
Indigo, Wild White (*Baptisia leucantha*)	MWD-ED	P,S	X			1,700
Ironweed, Smooth (*Vernonia fasciculata*)	PD-MWD	P,S	X	X	X	N/A
Ironweed, Tall (*Vernonia atlissima*)	SPD-WD	P,S		X		N/A
Joe Pye Weed, Spotted (*Eupatorium maculatum*)	PD-SPD	P,S			X	95,000
Lobelia, Great Blue (*Lobelia* siphilitica)	PD-SPD	P,S	X			500,000
Marigold, Nodding Bur (*Bidens cernua*)	PD-SPD	P				21,000

[1] KEY: **ED** = Excessively Drained **WD** = Well Drained **SPD** = Somewhat Poorly Drained **PD** = Poorly Drained **VPD** = Very Poorly Drained

[3] Average seed count. Counts can very depending upon seed cleaning techniques, etc. Consult with the supplier for specific seed count information.

Table 3 - Additional Native Forbs (continued)

SPECIES	Soil Moisture Tolerance	Sun Exposure[1]	Wet Prairie/ Sedge Meadow	Unsaturated Muck	Saturated Muck	Seeds per Ounce[3]
Meadow Rue (*Thalictrum dasycarpum*)	SPD-MWD	P,S				11,000
Milkweed, Swamp (*Asclepias incarnata*)	PD-SPD	P	X		X	4,800
Mint, Virginia Mountain (*Pycnanthemum virginianum*)	SPD-WD	P,S		X		N/A
Monkey Flower (*Mimulus ringens*)	PD-SPD	P,S	X			2,300,000
Obedient Plant (*Physostegia virginiana*)	PD-SPD	P,S	X			11,000
Plantain, Water (*Alisma subcordatum*)	VPD-PD	P	X		X	N/A
Prairie Dock (*Silphium terebinthinaceum*)	SPD-ED	P,S		X		N/A
Rattlesnake Master (*Eryngium yuccifolium*)	MWD-WD	P	X			7,500
Rosinweed (*Silphium integrifolium*)	MWD-ED	P,S		X		N/A
Snake Root, White (*Eupatorium rugosum*)	SPD-MWD	P,S				150,000
Sneezeweed, Autumn (*Helenium autumnale*)	PD-SPD	P,S			X	130,000
Stone Crop, Ditch (*Penthorum sedoides*)	PD-SPD	P,S	X			1,300,000
Sunflower, False (*Heliopsis helanthoides*)	MWD-ED	P,S		X		6,300
Sunflower, Sawtooth (*Helianthus grosseserratus*)	PD-WD	P,S	X	X		15,000
Trefoil, Hoary Tick (*Desmodium canadensis*)	MWD-ED	P,S				5,5000
Vervain, Blue (*Verbena hastate*)	VPD-SPD	P,S				93,000
Wild Bergamot (*Monarda fistulosa*)	SPD-ED	P,S	X	X		70,000
Wild Golden Glow (*Rudbeckia laciniata*)	SPD-MWD	P,S,W	X			14,000
Wild Senna (*Cassia hebecarpa*)	PD-WD	P,S		X	X	1,400
Wingstem (*Verbesina alternifolia*)	SPD-MWD	P,S				9,000
Yellow Crownbeard (*Verbesina helianthoides*)	MWD	P,S				14,000

[1] Sun Exposure Key:
P = Prairie Plants normally grow best in full sun with up to 20% shade.
S = Savanna Plants normally grow best in 20% to 70% shade.
W = Woodland Plants normally grow best in 70% to 100% shade.

[3] Average seed count. Counts can very depending upon seed cleaning techniques, etc. Consult with the supplier for specific seed count information.

Table 4 - Native Shrub List

Common Name Scientific Name	Soil Moisture Tolerance[1]	Average Mature Height (ft.)	Wildlife Information	General Comments
Alternate Leaf Dogwood *Cornus alternifolia*	SPD – WD	18	Fruit eaten by birds. Twigs browsed by deer and rabbits.	Blue-black fruit with red stems. Leaves not opposite.
Black Chokeberry *Aronia melanocarpa*	SPD – WD	10	Fruit eaten by songbirds.	Fruit 1/3" long, dark-purple.
Bladdernut *Staphylea trifolia*	SPD – WD	10		3 lobed balloon like capsule.
Buttonbush *Cephalanthus occidentalis*	VPD – SPD	5	Seeds consumed by many bird species.	Nutlets, best on wet sites. Wilted leaves may be toxic to livestock.
Devils Walking Stick *Aralia spinosa*	SPD - MWD	20	Fruit eaten by birds.	Stout stem with spines, showy white flowers that produce a black drupe.
Eastern Wahoo *Euonymus atropurpureus*	SPD – WD	12	Fruit eaten by birds.	4 lobed red capsules, sometimes winged stem.
Elderberry *Sambuscus canadensis*	VPD – WD	9	Fruit eaten by many birds including pheasant, dove and turkey. Plant contains hydrocyanic acid. Recommended for quail.	Purple-black drupe used for jams, jellies, pies, and wine.
Gray Dogwood *Cornus racemosa*	SPD – WD	8	Fruit eaten by pheasant and grouse.	Red pedicles in winter, white drupe.
Hazel Alder *Alnus serrulata*	VPD – WD	18	Deer browse on the twigs.	Prefers wet to moist soils. Long lenticels on the stem.
Highbush Cranberry *Viburnum trilobum*	VPD – WD	9	Fruit eaten by grouse, pheasant and songbirds.	Tart red fruits. Showy.
Indigobush *Amorpha fruticosa*	VPD – WD	6		Small pods, flowers purplish spikes.
Nannyberry *Viburnum lentago*	SPD – WD	18	Fruit eaten by songbirds.	Blue-black fruits similar to raisins.
Ninebark *Physocarpus opulifolius*	VPD – WD	10	Fruit are small dry bladders lasting through winter.	White to pinkish flowers.
Pawpaw *Asimina triloba*	SPD – WD	20	Fruit eaten by opossum, squirrels, raccoon and fox.	Large leaves, likes deep moist soils.

[1] KEY: **ED** = Excessively Drained **WD** = Well Drained **SPD** = Somewhat Poorly Drained **PD** = Poorly Drained **VPD** = Very Poorly Drained

Table 4 - Native Shrub List (continued)

Common Name Scientific Name	Soil Moisture Tolerance[1]	Average Mature Height (ft.)	Wildlife Information	General Comments
Prairie Crab *Malus ioensis*	PD – WD	30	Fruit eaten by opossum, squirrels, raccoon and fox.	Small fruit, showy flowers.
Prickly Ash *Xanthoxylum americanum*	SPD – WD	9		A thicket-forming shrub with prickly leafstalks. Fruits are a small reddish-brown pod. Chewing plant parts was once a popular toothache cure.
Red Osier Dogwood *Cornus stolonifera*	VPD – WD	10	Fruit eaten by songbirds, grouse, and quail. Twigs browsed by deer, rabbits.	Reddish stem, white drupe, good winter color.
Rough Leaved Dogwood *Cornus drummondii*	PD – WD	18	Fruit eaten by songbirds, grouse, quail, turkey and pheasant. Browsed some by rabbits and deer.	White drupes.
Shrubby St. Johnswort *Hypericum prolificum*	SPD – WD	6		Bright yellow flowers, 3-valved capsule.
Silky Dogwood *Cornus amomum*	VPD – WD	10	Sometimes browsed by rabbits and deer.	Bluish fruit, likes moist soils and partial shade.
Spicebush *Lindera benzoin*	VPD – WD	9	Twigs and fruit eaten by songbirds, deer, rabbit, opossum, quail and grouse.	Small red drupe.
Spirea *Spirea alba* *Spirea tomentosa*	VPD – WD	4	Spirea buds eaten by ruffed grouse and twigs browsed by deer and rabbits.	Pink flowers. Also called Meadowsweet or Hardack.
Wild Sweet Crabapple *Malus coronaria*	SPD – ED	30	Recommended for quail.	Yellow-green edible fruit with highly fragrant flowers.
Winterberry *Ilex verticillata*	VPD – SPD	10	Red fruits used as an emergency food source for wildlife.	Erect shrub with small greenish white flowers and bright red berries that persist through winter. Must have male and female plants for pollination.
Witch-hazel *Hamamelis virginiana*	SPD – WD	18	Seeds, buds and twigs eaten by deer, rabbit, quail and pheasant.	Pale yellow flowers that produce pods with seeds.

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Table 5 - Native Tree List

Common Name Scientific Name	Soil Moisture Tolerance[1]	Average Mature Height (ft.)	Wildlife Information	General Comments
American Hornbeam *Carpinus caroliniana*	SPD - ED	20	Seeds and catkins consumed by songbirds and squirrels.	Shrub or small tree in the birch family. Also called muscle wood due to the smooth gray, striated bark. Common in floodplains.
American Sycamore *Platanus occidentalis*	PD - WD	90	Sycamore does not have much food value to wildlife; however, this species forms an important structural component of bottomlands and floodplains.	The sycamore is on of our largest trees capable of obtaining heights of over 100 feet. Attractive multicolored bark.
Baldcypress *Taxodium distichum*	VPD - WD	80	Waterfowl occasionally consume seeds. Trees also serve as perching areas for song and wading birds.	The baldcypress is one of two deciduous conifer trees native to Indiana. Perhaps the most flood tolerant of our trees. Often forms an attractive elliptical crown.
Beech, American *Fagus grandifolia*	SPD - WD	75	Nuts consumed by turkeys, deer, and squirrels.	Extremely shade tolerant species with decorative smooth gray bark.
Birch, River *Betula nigra*	VPD - WD	50	Stands of birch serve as important cover for riparian dwelling animals.	Small to medium sized tree of floodplains. Attractive cinnamon colored, exfoliating bark.
Black Gum *Nyssa sylvatica*	PD – WD	60	Fruits consumed by songbirds, turkeys and pileated woodpeckers.	Medium sized tree, which thrives in both upland and wetland conditions. Foliage turns an attractive red color in fall.
Buckeye, Ohio *Aesculus glabra*	SPD - WD	60	Nuts sparingly consumed by eastern fox squirrels.	Fast growing species. Twigs poisonous to livestock.
Catalpa *Catalpa speciosa*	PD – WD	50	Trees provide cover for a variety of wildlife.	Medium sized tree with large heart shaped leaves and cigar like fruits.
Cedar, Eastern Red *Juniperus virginiana*	SPD - ED	45	Berries consumed by songbirds.	Small coniferous tree tolerant of dry, sterile soils.
Cottonwood, Eastern *Populus deltoides*	ED – PD	90	Twigs and bark consumed by deer and beavers. Buds and catkins eaten by ruffed grouse.	Large tree typical of riverbanks. The triangles shaped (deltoid) leaves, which flutter in breeze, give this tree its specific name.
Hackberry *Celtis occidentalis*	SPD – WD	50	Fruits are sparingly consumed by songbirds, including cedar waxwings, mockingbirds, and robins, throughout winter.	Small to medium sized tree of calcareous soils and floodplains. The taste of the fruits may be likened to dates, but contain a large seed.

[1] KEY: **ED** = Excessively Drained **WD** = Well Drained **SPD** = Somewhat Poorly Drained **PD** = Poorly Drained **VPD** = Very Poorly Drained

Table 5 - Native Tree List (continued)

Common Name Scientific Name	Soil Moisture Tolerance[1]	Average Mature Height (ft.)	Wildlife Information	General Comments
Hawthorn, Cockspur *Crataegus crus-galli*	ED – SPD	30	Fruits make up an important winter food source for many species of songbirds including ruffed grouse. Fruit eaten by deer, fox, rabbit, grouse and pheasant. Excellent nesting habitat for songbirds.	Large shrubs or small trees that usually bare stout spines. Attractive white flowers yield small, apple like fruits. Common in disturbed woodlands that had previously been pasture.
Hawthorn, Washington *Crataegus phaenopyrum*	ED – SPD	30		
Hawthorn, Green *Crataegus virdis*	ED – SPD	30		
Hickory, Bitternut *Carya cordiformis*	SPD – WD	50	The nuts of these species constitute an important food source for squirrels. Wood ducks and wild turkeys also consume a significant quantity of these nuts.	Medium sized tree of moist woodlands. Winter buds are sulfur-yellow. The common name is derived from the bitter taste of the nut.
Hickory, Shellbark *Carya laciniosa*	VPD – WD	70		Similar to shagbark hickory, but more frequent in poorly drained soils.
Kentucky Coffeetree *Gymnocladus dioicus*	SPD – WD	50	Fruits relished by squirrels, opossum, raccoon and songbirds.	Uncommon, medium sized tree with gray, scaly bark. Fruit a thick, brown pod.
Maple, Black *Acer nigrum*	MWD – WD	70	Samaras are widely consumed by birds and squirrels. Browsed by deer.	Medium sized tree very similar to sugar maple, but usually found in moister soil conditions. The leaves tend to be mostly 3-lobed.
Maple, Red *Acer rubrum*	VPD – WD	70		Characteristic medium sized tree of swampy areas, but also found in upland conditions. Leaves turn an attractive scarlet red in fall.
Maple, Silver *Acer saccharinum*	VPD – WD	80		Exceptionally fast growing medium sized tree of floodplains and poorly drained soils. Small yellow (female) and reddish (male) flowers appear very early in the spring.
Mulberry, Red *Morus rubra*	SPD - WD	40	Purplish fruits preferred food source of birds and small mammals.	Small tree. Fruits edible and used in jellies, jam, and pies.
Northern White-Cedar *Thuja occidentalis*	PD – WD	40	Foliage often browsed by deer in late winter as an emergency food source.	This medium sized evergreen was once common in northern Indiana bogs. Attains best form on calcareous soils. Commonly planted ornamental.

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Table 5 - Native Tree List (continued)

Common Name Scientific Name	Soil Moisture Tolerance[1]	Average Mature Height (ft.)	Wildlife Information	General Comments
Oak, Bur *Quercus macrocarpa*	PD – ED	80	Acorns from oaks are perhaps the most important food source for a variety of wildlife including woodpeckers, squirrels, and deer. Recommended for turkey.	Medium to large sized tree, which grows most typically in mesic woodlands and along floodplains, but is also very drought and fire tolerant. Large acorns with fringed caps.
Oak, Cherrybark *Quercus pagoda*	SPD – WD	75		Large tree of bottomlands and well-drained soils. In Indiana, found only in the extreme southwestern part of the state.
Oak, Pin *Quercus palustris*	VPD – WD	75	The smaller pin oak acorns are particularly favored by wood ducks.	Common medium sized oak of poorly drained soils and floodplains. Dead branches are seldom shed from the trunk of this species giving it a characteristic appearance.
Oak, Shingle *Quercus imbricaria*	SPD – WD	50	Acorns from oaks are perhaps the most important food source for a variety of wildlife including woodpeckers, squirrels, and deer. Recommended for turkey.	Small to medium sized tree of mesic woodlands. Leaves remain on tree through winter, but unlike other oaks, the leaves of this species are un-lobed.
Oak, Shumard *Quercus shumardii*	SPD – WD	75		Large sized tree of well-drained soils and bottomlands. Closely resembles red oak, but usually occurs in a lower position on the landscape.
Oak, Swamp Chestnut *Quercus michauxii*	SPD – WD	70		Medium to large sized tree of poorly drained soils. Bark may be confused with that of white oak, but the coarsely serrate margined leaves distinguish this species.
Oak, Swamp White *Quercus bicolor*	VPD – WD	70		Medium sized tree of poorly drained soils. The specific name, bicolor, refers to the two toned leaves which are dark and shiny above, and dull and white below.
Pecan *Carya illinoensis*	SPD - WD	120	Ellipsoid nuts readily consumed by a variety of wildlife.	Large tree with sweet edible nuts.
Persimmon *Diospyros virginiana*	SPD – WD	50	Large berries are readily consumed by raccoons as well as some songbirds.	Small tree found in bottomlands and old fields. Fruit, a large berry, is edible when ripe.
Sweetgum *Liquidambar styraciflua*	PD – WD	85	Seeds consumed by “northern” finches in winter.	Large tree common in bottomlands of southern Indiana. Leaves are palmately five-lobed. Fruit is a prickly ball with multiple capsules.
Tamarack *Larix laricina*	VPD – SPD	60	Seeds consumed by “northern” finches in winter.	Small to medium sized tree found in northern Indiana bogs and swamps. The only deciduous member of the pine family found in Indiana. Small cones grow upright along twigs.

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