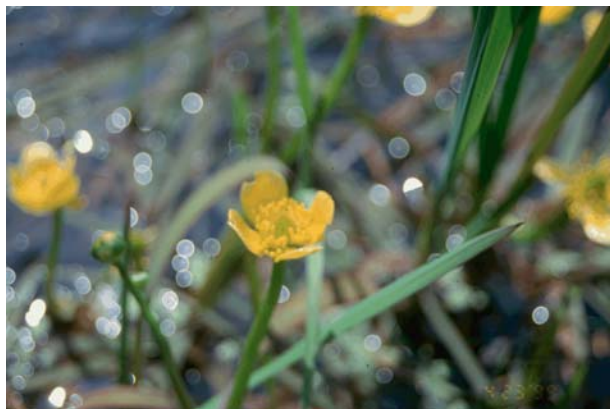


Characteristic Ohio Plant Species for Wetland Restoration Projects v. 1.0

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This entire document can be downloaded from the website of the Ohio EPA, Division of Surface Water:

<http://www.epa.state.oh.us/dsw/wetlands/WetlandEcologySection.html>

BACKGROUND

The lists provided here were derived from wetland plant species *INTEGRATED WETLAND ASSESSMENT PROGRAM Part 2: An Ordination and Classification of wetlands in the Till and Lake Plains and Allegheny Plateau regions* (Mack 2004). In this classification, wetland class is based on dominant landscape position dominant plant community. There are seven landscape positions identified: depression, impoundment, riverine, slope, fringing, Lake Erie coastal, and bog which correspond generally to the hydrogeomorphic classification system outlined by Brinson (1993). There are three main plant community divisions: forest, emergent, and shrub. Each of these types has several subtypes: forest (swamp forests, bog forests, forest seeps); emergent (marsh, fen, other sedge-grass communities, sphagnum bog); and shrub (buttonbush swamp, alder swamp, mixed shrub swamp, bog and fen shrub swamps).

In the appendices of Mack (2004), are species lists with average abundance values based on data from that community type in Ohio EPA's reference wetland data set. These species lists were primary source for the list of characteristic species provided here. Other community descriptions can be found in Tables 45 to 57 of Mack (2001). Nomenclature follows Andreas et al. (2004).

It is important to understand that the lists provided here should be considered "average values" for Ohio wetlands and the use of these lists is not a substitute for knowledge of local, county, and regional presence and abundance of a particular plant species. Care should be taken to not introduce species new to the flora for that locale. At a minimum, the user of this list should consult the county distribution maps in the following texts:

The Monocotyledonae: Cattails to Orchids (Braun 1967)

The Dicotyledonae of Ohio Part 1: Acanthaceae through Zygophyllaceae (Furlow, unpublished)

The Dicotyledonae of Ohio Part 2: Linaceae through Campanulaceae (Cooperrider 1995)

The Dicotyledonae of Ohio Part 3: Asteraceae (Fisher 1988)

Species with natural distributions to just part of Ohio should not be included in planting plans for locales where they are not or would not be expected to be found growing naturally. For example, speckled alder (*Alnus incana*) is largely confined to the glaciated Allegheny Plateau of northeast Ohio (Furlow unpublished). It should be excluded from planting plans for other ecoregions (with a couple of exceptions). Smooth alder (*Alnus serrulata*) is distributed across the eastern half of the state in the glaciated and unglaciated Allegheny Plateau (Furlow unpublished); it should be excluded from planting plans for the till and lake plains of western Ohio (again with a couple of exceptions). Conversely, some species have simply not been collected and specimens deposited in an herbarium but likely are found in the county of interest. For example, Braun (1967) does not report *Carex tribuloides* from Delaware County but given its statewide distribution and the fact it is found in counties around Delaware County, it would be expected to be found there. Other species may be common to a particular type of wetland but not in others. American water lotus (*Nelumbo lutea*) is a common aquatic species in Lake Erie coastal marshes but would be very unusual in any type of inland marsh.

Planting plans developed by persons unfamiliar with the flora of Ohio should be

reviewed by an experienced botanist. Atypical assemblages are strongly discouraged. Use of seeds and plant material from local genotypes is always recommended and preferred and in some instances required, e.g. for planting of rare or listed plant species, restoring certain wetland communities, e.g. Oak Opening sand prairies.

HOW TO USE THIS LIST

This list separates Ohio wetland plant communities into five main groups written in bold-face ALL-CAPS: SHRUB COMMUNITIES, WETLAND FORESTS, MARSHES, WET MEADOW, and BOG. Just after the main group name is a qualifier description in small-caps, underlined, boldface, e.g. MARSHES, deepwater assemblages. The community qualifier refers to a vertical strata, e.g. WETLAND FORESTS, tree species, or community variant, e.g. WET MEADOW, Oak Openings Prairies. The herb layer is often separated into graminoids (sedges, grasses), ferns and forbs. Next to each species name is a description of its abundance in that community type (Note: additional information regarding the typical abundance of that species, limitations on its geographic extent, etc is provided in the description "habitat comments" column). Abundance can be low, medium, or high or a range, e.g. low to medium, medium to high. Even plants with "low" abundances are frequently part of the flora of that community type. Abundance values can be equated to which species are community dominants, subdominants, and present but never dominant (Table 1). The abundance descriptions were intended to be used as guidelines for what would be typically observed in a natural wetland of that type in order to aid in wetland restoration projects, specifically in

developing planting plans and seed mixes for wetland restorations.

Ecoregions used in the Appendix follow Woods et al. (1998): EOLP = Erie-Ontario Drift and Lake Plains of northeast Ohio, ECBP = Eastern Corn Belt Plains of western and central Ohio, WAP = Western Allegheny Plateau of southeast Ohio, HELP = Huron-Erie Lake Plains of northwest Ohio.

Table 1. Abundance descriptions.

abundance	description
low	Not a dominant or subdominant member of the community. Occasionally to frequently encountered but usually as scattered individuals or clumps
medium	Moderately abundant to approaching a subdominant part of the community. May form stands within the community in areas that are drier or wetter, brighter or shadier, etc. than the rest of the community
high	A dominant or subdominant part of the community, often the distinguishing species used to describe the community, e.g. a "buttonbush" swamp, a "twigrush" meadow. Depending on how the community is stratified vertically or horizontally, there may be multiple dominant species.

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APPENDIX
LISTS OF CHARACTERISTIC SPECIES FOR OHIO WETLAND PLANT COMMUNITIES

APPENDIX
LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
SHRUB COMMUNITIES, full sun	<i>Shrub species</i>		
buttonbush swamp	<i>Alnus serrulata</i>	med to high	edges of marshes, hummocks, sometimes pure stands
alder swamp	<i>Alnus incana</i>	med to high	EOLP ONLY, edges of marshes, hummocks, sometimes pure stands
mixed shrub swamp	<i>Cephalanthus occidentalis</i>	med to high	deeper water, seasonal to permanent hydroperiod
	<i>Cornus amomum</i>	low to med	edges of marshes, hummocks, shorter hydroperiods
	<i>Cornus sericea</i>	low to med	edges of marshes, hummocks, shorter hydroperiods
	<i>Ilex verticillata</i>	low to high	edges of marshes, hummocks, shorter hydroperiods
	<i>Rosa palustris</i>	med	edges of marshes, hummocks, shorter hydroperiods
	<i>Salix discolor</i>	low to med	edges of marshes, hummocks, shorter hydroperiods
	<i>Salix exigua</i>	low	edges of marshes, hummocks, shorter hydroperiods
	<i>Salix eriocephala</i>	low	edges of marshes, hummocks, shorter hydroperiods
	<i>Salix sericea</i>	low to med	edges of marshes, hummocks, shorter hydroperiods
	<i>Viburnum recognitum</i>	low to med	edges of marshes, hummocks, shorter hydroperiods
SHRUB COMMUNITIES, herb layer	<i>Sedges</i>		
buttonbush swamp	<i>Carex bromoides</i>	med to high	pool edges or extensive stands in wet woods and forest seeps
alder swamp	<i>Carex crinita</i>	low to med	scattered clumps on saturated soils
mixed shrub swamp	<i>Carex crus-corvi</i>	low to med	scattered clumps on saturated soils
	<i>Carex intumescens</i>	low to med	scattered clumps on saturated soils
	<i>Carex lupulina</i>	low to high	scattered clumps on saturated soils
	<i>Carex seorsa</i>	low to med	EOLP ONLY, pool edges or extensive stands in wet woods and forest seeps
	<i>Carex typhina</i>	low to med	scattered clumps on saturated soils
	<i>Carex atlantica</i>	low	scattered clumps on saturated soils
	<i>Carex stipata</i>	low	scattered clumps on saturated soils
	<i>Carex tribuloides</i>	low	scattered stems on saturated soils
	<i>Grasses</i>		
	<i>Cinna arundinacea</i>	low to med	scattered stems on saturated soils
	<i>Glyceria striata</i>	low to med	saturated soils to deeper water
	<i>Glyceria septentrionalis</i>	low to med	grows in seasonal to permanent pools
	<i>Glyceria acutiflora</i>	low	saturated soils, LISTED, <u>local genotype only</u>
	<i>Forbs</i>		
	<i>Bidens discoidea</i>	low to med	grows on tussocks, hummocks, buttonbush stems
	<i>Bidens</i> spp.	low to med	connata, frondosa
	<i>Boehmeria cylindrica</i>	med	common forest forb
	<i>Caltha palustris</i>	low to high	esp. on saturated soils, muck soils, and with groundwater
	<i>Decodon verticillatus</i>	low to med	deeper water, forms tussocks and stands
	<i>Galium</i> spp.	low	asprellum, tinctorium, triflorum
	<i>Impatiens capensis</i>	low to med	saturated soil, <i>I. pallida</i> grows in mesic floodplains
	<i>Iris versicolor</i>	low	saturated soil to shallow inundation
	<i>Lyocopus rubellus</i>	low	but regularly encountered
	<i>Lysimachia terrestris</i>	low to med	saturated soils
	<i>Lysimachia thysiflora</i>	low	saturated soils

John J. Mack:
Note: It is very important to consult county distribution maps for the Ohio flora before finalizing a planting plan using this list.

John J. Mack:
Depending on light regime, water depth, and openness of shrub canopy, additional marsh or forest species can be introduced in more open zones of the shrub swamp or under a drip line of trees at the edge of the shrub swamp.

APPENDIX
LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
	Polygonum hydropiperoides	med	in deeper water
	Proserpinaca palustris	low	in deeper water
	Ranunculus flabellaris	med to high	in deeper water
	Ranunculus hispidus	low	pool margins
	Riccia fluitans	med	aquatic liverwort
	Ricciocarpos natans	med	aquatic liverwort
	Rumex verticillatus	med	saturated soil to shallow inundation
	Scutellaria lateriflora	low	saturated soil
	Veronica scutellata	low	saturated soil
	<i>Ferns</i>		
	Dryopteris carthusiana	low	on drier microhabitat, saturated hydroperiods, pool edges
	Dryopteris clintoniana	low	on drier microhabitat, saturated hydroperiods, pool edges
	Dryopteris cristata	low	on drier microhabitat, saturated hydroperiods, pool edges
	Osmunda cinnamomea	low to med	grows in tussocks
	Osmund regalis	low to med	can form large stands often under Pin Oaks
	Onoclea sensibilis	low	can sometimes form clumps or stands
	<i>Tree species</i>	Refer to wetland forest trees for restoration of shrub swamp pool margins	
WETLAND FORESTS, <u>shrub species</u>	Alnus incana	low	EOLP ONLY, successional community to forest, will hold out in shade
understory of wetland forests	Alnus serrulata	low	successional community to forest, will hold out in shade
shady margins of shrub swamps	Aronia melanocarpa	low to med	successional community to forest, will hold out in shade
wetland forest enhancements	Carpinus caroliniana	low	pool edges, hummocks
	Cephalanthus occidentalis	low	successional community to forest, will hold out in shade
	Ilex verticillata	med to high	wet woods, pool edges, hummocks
	Lindera benzoin	med to high	wet woods, pool edges, hummocks
	Ribes americanum, R. hirtellum	low	wet woods, pool edges, hummocks
	Rubus hispidus	low	low woody ground cover
	Vaccinium corymbosum	low to med	wet woods, pool edges, hummocks
	Viburnum recognitum	low	successional community to forest, will hold out in shade
WETLAND FORESTS, <u>tree species</u>	<i>Conservative tree species</i>		
wet woods	Betula nigra	med to high	WAP REGION ONLY
margins of shrub swamps	Carya laciniosa	low	occasional on saturated soils
vernal pools	Fraxinus nigra	low to med	frequent but usually not dominant
margins of vernal pools	Fraxinus profunda	med to high	sometimes dominant with oak and maple
	Nyssa sylvatica	low to med	EOLP in snowbelt
	Populus heterophylla	low	esp. edges of buttonbush swamps
	Quercus bicolor	med to high	often with ash, maple as dominants
	Quercus palustris	med to high	sometimes forms pin oak flats
	<i>Common tree species</i>		
	Acer rubrum	low	common but avoid planting
	Acer saccharinum	med to high	subdom. w/ oaks or dom. or co-dom. with ash

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community	species	abundance	habitat comments
	Fraxinus pennsylvanica	med to high	subdom. w/ oaks or dom. or co-dom. with maple
	Ulmus rubra, americana	low	subdominant in all forests
	<i>Associated mesic tree species</i>		on drier microhabitat, saturated hydroperiods, pool edges
	Betula allegheniensis	low	EOLP in snowbelt
	Carya cordiformis	low	on drier microhabitat, saturated hydroperiods, pool edges
	Carya ovata	low	on drier microhabitat, saturated hydroperiods, pool edges
	Fagus grandifolia	low	on hummocks, pool margins
	Liriodendron tulipifera	low to med	on hummocks, pool margins
	Populus deltoides	low	sometimes dominant on floodplains
	Quercus rubra	low	on hummocks, pool margins
	Acer saccharum	low	on hummocks, pool margins
WETLAND FORESTS, <u>herb layer</u>	<i>Sedges</i>		
	Carex bromoides	low to high	pool edges or extensive stands in wet woods and forest seeps
	Carex crinita	low to med	scattered clumps on saturated soils
	Carex crus-corvi	low to med	scattered clumps on saturated soils
	Carex gracillima	low	wetland edges or microhabitats
	Carex grayi	low to high	large stands esp. on floodplains
	Carex hyalinolepis	low to high	ECBP, HELP ONLY. Can form large stands
	Carex intumescens	low to med	scattered clumps on saturated soils
	Carex lacustris	low to high	Can form large stands esp. under Pin Oaks in NW Ohio
	Carex lupuliformis	low	scattered clumps on saturated soils, LISTED, <u>local genotype only</u>
	Carex lupulina	low to high	scattered clumps on saturated soils
	Carex muskingumensis	low to med	ECBP, HELP only, often on floodplains
	Carex prasina	low	scattered clumps on saturated soils
	Carex seorsa	low to med	EOLP ONLY, pool edges or extensive stands in wet woods and forest seeps
	Carex squarrosa	low to med	scattered clumps on saturated soils
	Carex tuckermanii	low	scattered clumps on saturated soils
	Carex typhina	low to med	scattered clumps on saturated soils
	<i>Grasses</i>		
	Cinna arundinacea	low to med	saturated soils
	Glyceria striata	low to med	saturated soils to deeper water
	Glyceria septentrionalis	low to med	grows in seasonal to permanent pools
	Leersia virginica	low	saturated soils
	<i>Forbs</i>		
	Actaea alba	low	mesic forest herb on microhabitats
	Agrimonia parviflora	low	common forest herb
	Arisaema triphyllum	low	var. triphyllum on microhabitats, var. stewardsonii saturated soils
	Boehmeria cylindrica	med	common forest herb
	Caltha palustris	low to high	esp. on saturated soils, muck soils, and with groundwater
	Circaea lutetiana	low	mesic forest herb on microhabitats
	Hydrocotyle americana	low	seeps, and clear pools

John J. Mack:
Planting plans can include mesic spring ephemerals and other mesic forest herbs on drier microhabitat features like pool edges and hummocks, etc.

APPENDIX
LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
	<i>Impatiens capensis</i>	low to med	saturated soils, l. pallida grows on mesic floodplains
	<i>Iris versicolor</i>	low	saturated soils to deeper water
	<i>Lobelia cardinalis</i>	low	esp. on floodplains in part shade
	<i>Lysimachia ciliata</i>	low to med	common forest herb
	<i>Maianthemum canadense</i>	low	mesic forest herb on microhabitats
	<i>Maianthemum racemosum</i>	low	mesic forest herb on microhabitats
	<i>Maianthemum stellatum</i>	low	usually low but can form stands, saturated edges
	<i>Polygonum virginianum</i>	low	mesic forest to saturated soils
	<i>Senecio aureus</i>	low to med	pool edges or extensive stands in forest seeps
	<i>Symplocarpus foetidus</i>	low to high	pool edges or extensive stands in forest seeps
	<i>Viola cucullata</i>	low to med	saturated to seepy ground
	<i>Ferns</i>		
	<i>Dryopteris carthusiana</i>	low	on drier microhabitat, saturated hydroperiods, pool edges
	<i>Dryopteris clintoniana</i>	low	on drier microhabitat, saturated hydroperiods, pool edges
	<i>Dryopteris cristata</i>	low	on drier microhabitat, saturated hydroperiods, pool edges
	<i>Osmunda cinnamomea</i>	low to med	grows in tussocks
	<i>Osmund regalis</i>	low to med	can form large stands esp. under Pin Oaks
MARSHES, deepwater assemblage marshes openings in shrub swamps	<i>Full sun species</i>		
	<i>Brasenia schreberi</i>	low to med	floating, regular to permanent hydroperiods
	<i>Ceratophyllum demersum</i>	low to high	submersed, regular to permanent hydroperiods
	<i>Ceratophyllum echinatum</i>	low to high	submersed, regular to permanent hydroperiods
	<i>Elodea canadensis</i>	low to med	submersed, regular to permanent hydroperiods
	<i>Elodea nuttallii</i>	low to med	submersed, regular to permanent hydroperiods
	<i>Glyceria septentrionalis</i>	low to med	grows well in shade of seasonal pools
	<i>Lemna trisulca</i>	low to med	submersed, regular to permanent hydroperiods
	<i>Nymphaea odorata</i>	low to high	floating, regular to permanent hydroperiods
	<i>Nuphar advena</i>	low to high	floating to emerged, regular to permanent hydroperiods
	<i>Peltandra virginica</i>	low to high	floating to emerged, regular to permanent hydroperiods
	<i>Pontederia cordata</i>	low to high	floating to emerged, regular to permanent hydroperiods
	<i>Potamogeton</i> spp.	low to high	floating, regular to permanent hydroperiods
	<i>Proserpinaca palustris</i>	low to med	submersed, regular to permanent hydroperiods
	<i>Ranunculus flabellaris</i>	low to high	submersed, regular to permanent hydroperiods
	<i>Ranunculus longirostris</i>	low to high	submersed, regular to permanent hydroperiods
	<i>Spirodela polyrhiza</i>	low to high	regular to permanent hydroperiods
	<i>Utricularia vulgaris</i>	low to high	submersed, survives drawdowns as turion, generally regular to permanent
	<i>Utricularia gibba</i>	low to med	grows on saturated muck or in water column
	<i>Utricularia</i> spp.	low	submersed, other <i>Utricularia</i> spp. regular to permanent hydroperiods
	<i>Zizania aquatica</i>	low to high	LISTED, LOCAL GENOTYPE ONLY, regular to permanent hydroperiods
MARSHES, emergent assemblage mixed emergent marshes	<i>Graminoids</i>		
	<i>Bolboschoenus fluviatilis</i>	med to high	can form extensive stands

John J. Mack:
These deepwater marsh species can form layered "stands" so that there are multiple dominants ranging from partially emerged, floating, and multiple submersed species.

APPENDIX
LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
	Carex comosa	med to high	saturated soils to shallow inundation
	Carex cristatella	low	saturated soils to shallow inundation
	Carex lacustris	med to high	can form extensive stands with Typha latifolia and Polygonum amphibium
	Carex lurida	low	saturated soils to shallow inundation
	Carex scoparia	low	saturated soils to shallow inundation
	Carex tribuloides	low	saturated soils to shallow inundation
	Carex vesicaria	low to med	saturated soils to shallow inundation
	Carex vulpinoidea	low	saturated soils to shallow inundation
	Eleocharis spp.	low to med	E. palustris, smallii, erythropoda, can form stands
	Juncus spp.	low	e.g. J. torreyi, nodosus
	Schoenoplectus tabernaemontani	low	saturated soils to shallow inundation
	Scirpus atrovirens	low	saturated soils to shallow inundation
	Scirpus cyperinus	low to med	tussocky, saturated soils to shallow inundation
	Sparganium americanum	med to high	EOLP, WAP ONLY can form extensive stands
	Sparganium eurycarpum	med to high	can form extensive stands
	Typha latifolia	low to med	can form extensive stands
	Forbs		
	Acorus americanus	low to med	can form stands esp. in floodplain marshes
	Asclepias incarnata	low	saturated soils to shallow inundation
	Bidens spp.	low to med	B. cernua, connata, frondosa, discoidea, cornota
	Cicuta spp.	low	C. maculata, bulbifera
	Decodon verticillatus	med to high	regular to permanent inundation, forms tussocky stands
	Epilobium spp.	low	saturated soils to shallow inundation
	Eupatorium perforliatum	low	saturated soils to shallow inundation
	Galium tinctorium	low	saturated soils to shallow inundation
	Hibiscus spp.	low to med	H. laevis, moscheutos, saturated soils to shallow inundation
	Iris spp.	low to med	I. versicolor, virginica
	Lycopus spp.	low	L. americanus, rubellus, virginica
	Mimulus spp.	low	M. ringens, alatus
	P. arifolium	low to med	saturated soils to shallow inundation
	P. hydropiperoides	med to high	deeper, more permanent inundation
	P. punctatum	med to high	deeper, more permanent inundation
	P. sagittatum	low	saturated soils to shallow inundation
	Penthorum sedoides	low	annual, saturated soils
	Polygonum amphibium	med to high	floating leaved form, also saturated soils to shallow inundation
	Rumex verticillatus	med	saturated soils to shallow inundation
	Sagittaria spp.	low to med	S. latifolia, brevirostra, australis, cuneata, montevidensis
	Scutellaria spp.	low	S. galericulata, lateriflora
	Sium suave	low to med	saturated soils to shallow inundation
	Utricularia spp.	low to med	U. vulgaris, gibba
	Verbena hastata	low	saturated soils to shallow inundation
	Shrubby margins		Refer to full sun SHRUB assemblage, shallow edges of marsh

APPENDIX
LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
WET MEADOW, deep soil prairie	<i>Graminoids</i>		
prairie (southern) sedge meadow	<i>Calamagrostis canadensis</i>	med to high	becomes dominant on saturated to shallow seasonal inundation
bluejoint sloughs	<i>Carex atherodes</i>	med to high	becomes dominant on deeper seasonal inundation
prairie cordgrass sloughs	<i>Carex lacustris</i>	low to med	becomes dominant on deeper seasonal inundation
	<i>Carex pellita</i>	low to med	subdominant in sedge meadow, sloughs
	<i>Carex sartwellii</i>	low	subdominant in sedge meadow, sloughs
	<i>Carex stricta</i>	low to med	codominant with <i>C. atherodes</i> , <i>C. lacustris</i>
	<i>Eleocharis elliptica</i>	low to med	subdominant in sedge meadow, sloughs
	<i>Muhlenbergia mexicana</i>	low to med	often codominant w/ <i>Calamogrostis</i>
	<i>Spartina pectinata</i>	med to high	forms stands or is subdominant with other graminoids
	<i>Forbs</i>		
	<i>Aster praealtus</i>	med	saturated soils to shallow inundation
	<i>Aster racemosus</i>	med	saturated soils to shallow inundation
	<i>Euthamia graminifolia</i>	low	saturated soils to shallow inundation
	<i>Galium obtusum</i>	low	saturated soils to shallow inundation
	<i>Gentiana andrewsii</i>	low	saturated soils to shallow inundation
	<i>Helenium autumnale</i>	low	saturated soils to shallow inundation
	<i>Helianthus grosseserratus</i>	med	saturated soils to shallow inundation
	<i>Iris versicolor</i>	med	saturated soils to shallow inundation
	<i>Lathyrus palustris</i>	low	saturated soils to shallow inundation
	<i>Lycopus americanus</i>	med	saturated soils to shallow inundation
	<i>Lythrum alatum</i>	med	saturated soils to shallow inundation
	<i>Pycnanthemum virginianum</i>	med	saturated soils to shallow inundation
	<i>Silphium trifoliatum</i>	med	saturated soils to shallow inundation
	<i>Solidago riddellii</i>	med	saturated soils to shallow inundation
	<i>Stellaria longifolia</i>	low	saturated soils to shallow inundation
	<i>Tradescantia ohiensis</i>	low	saturated soils to shallow inundation
	<i>Verbena hastata</i>	low	saturated soils to shallow inundation
Wet meadow, Oak Openings Prairies	<i>Graminoids</i>		
	<i>Calamagrostis canadensis</i>	med to high	
	<i>Calamagrostis stricta</i>	high	KEY SPP., usually codominant with <i>Carices</i> and <i>Euthamia remota</i>
	<i>Carex alata</i>	low	
	<i>Carex atherodes</i>	low to med	
	<i>Carex buxbaumii</i>	low	
	<i>Carex cryptolepis</i>	low	KEY SPP.
	<i>Carex granularis</i>	low	
	<i>Carex lasiocarpa</i>	high	KEY SPP., dominant <i>Carex</i> with <i>Euthamica remota</i> and <i>Calamogrostis</i>
	<i>Carex pellita</i>	low to med	
	<i>Carex sartwellii</i>	low	
	<i>Cicuta maculata</i>	low	
	<i>Cirsium muticum</i>	low	

John J. Mack:
Increase *Carices* where water is deeper, increase grasses as hydroperiod shifts from seasonal inundation to seasonal saturation. Mesic prairie grasses and forbs can be added as hydroperiod decreases. Use emergent or deepwater marsh assemblages for embedded pothole marshes; full sun shrubs can be added as individuals or scattered stands.

John J. Mack:
When restoring Oak Openings sand prairies only local genotype seeds or plants should be used.

APPENDIX
LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
	<u>Cladium mariscoides</u>	high	KEY SPP., where Cladium cover high, Carex cover is reduced, and vice versa
	Eleocharis elliptica	med	
	Juncus acuminatus	low	
	Juncus brachycarpus	low	
	Juncus canadensis	low	
	Juncus dudleyi	low	
	Juncus marginatus	low	
	Juncus torreyi	low	
	Panicum implicatum	low	
	Panicum rigidulum	low	
	Panicum virgatum	low	
	Schoenoplectus acutus	low	
	Scirpus pendulus	low	
	<u>Forbs</u>		
	Asclepias incarnata	low	
	Aster lanceolatus	low	
	Aster novae-angliae	low	
	Aster praealtus	med	
	Equisetum laevigatum	low	
	Eupatorium maculatum	med	
	Eupatorium perfoliatum	low	
	<u>Euthamia remota</u>	high	KEY SPP., with C. lasiocarpa, Calamogrostis
	Galium tinctorium	low	
	Iris virginica var. shrevei	low to med	
	Lathyrus palustris	low	
	Liatris spicata	low	
	Linum medium	low	
	Lobelia kalmii	low	
	Lobelia spicata	low	
	Lycopus americanus	low	
	Lycopus uniflorus	low to med	
	Lythrum alatum	low to med	
	Osmunda regalis	low to med	
	Oxypolis rigidior	low	
	Pycnanthemum virginianum	med	
	Solidago riddellii	med	
	Solidago rugosa	low	
	Thelypteris palustris	low	
	Triadenum virginicum	low	
	Vernonia missourica	low	
	Veronica scutellata	low	
	<u>Shrubs</u>		

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LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
	Rosa setigera	low	
	Salix bebbiana	low to med	
	Salix discolor	low	
	Salix humilis	low	
	Salix petiolaris	low to med	
Wet meadow - Fens	Bromus ciliatus	low	
	Calamagrostis canadensis	low	
	Calamagrostis stricta	low	
	Carex aquatilis	med	can form extensive stands
	Carex buxbaumii	med	
	Carex flava	low	
	Carex granularis	low	
	Carex hystericina	med	
	Carex interior	med to high	often sub to co-dominant
	Carex lasiocarpa	med to high	often sub to co-dominant
	Carex leptalea	low	
	Carex pellita	med	
	Carex prairea	low	calciphile obligate
	Carex sterilis	low	calciphile obligate
	Carex stricta	med to high	often forms extensive stands
	Carex suberecta	low	
	Carex tenera var. echinodes	low	
	Carex tetanica	low	
	Carex trichocarpa	med to high	often forms extensive stands
	Cladium mariscoides	low to med	
	Deschampsia cespitosa	med	calciphile obligate, marl meadows
	Eleocharis elliptica	med	
	Eleocharis rostellata	med to high	calciphile obligate
	Juncus arcticus	low	
	Juncus brachycephalus	low	calciphile obligate
	Juncus dudleyi	med	
	Rhynchospora capillacea	low	calciphile obligate
	Schoenoplectus acutus	med to high	
	Schoenoplectus pungens	low	
	Scleria verticillata	low	
	<i>Forbs and Ferns</i>		
	Angelica atropurpurea	med	
	Apios americana	low	
	Asclepias incarnata	low	
	Aster puniceus	med	
	Bryophytes	med	

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community	species	abundance	habitat comments
	Cacalia suaveolens	med	calciphile obligate
	Caltha palustris	low	
	Campanula aparinoides	low	
	Cicuta maculata, C. bulbifera	low	
	Cirsium muticum	med	
	Clematis virginiana	low	
	Drosera rotundifolia	low	
	Eupatorium maculatum	med	
	Filipendula rubra	low to med	calciphile obligate
	Galium boreale, G. asprellum	low	
	Helianthus giganteus	low	
	Lathyrus palustris	low	
	Liatris spicata	low	
	Lobelia kalmii	low	calciphile obligate
	Lycopus americanus, L. rubellus	low	
	Lysimachia quadriflora	low	
	Lythrum alatum	low	
	Maianthemum stellatum	low	
	Melanthium virginicum	low to med	calciphile obligate
	Monarda fistulosa	low	
	Osmunda regalis	low to med	
	Oxypolis rigidior	low	
	Parnassia glauca	low	calciphile obligate
	Phlox maculata	low	
	Pycnanthemum virginianum	low to med	
	Rubus hispidus	low	
	Rumex orbiculatus	low	
	Sanguisorba canadensis	low to med	calciphile obligate
	Senecio aureus	low	
	Silphium trifoliatum	low to med	
	Solidago ohioensis	low to med	calciphile obligate
	Solidago patula	med	
	Solidago rugosa	low	
	Sphagnum sp.	low	
	Thalictrum dasycarpum	low	
	Thelypteris palustris	low	
	Tofieldia glutinosa	low	calciphile obligate
	Triglochin maritima	low	calciphile obligate
	Viola macloskeyi	low	
	<u>Shrubs</u>		
	Cornus amomum	low	
	Cornus sericea	low to med	

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community	species	abundance	habitat comments
	Physocarpus opulifolius	low to med	
	Potentilla fruticosa	med to high	
	Rhamnus alnifolia	low	
	Salix discolor	low	
	Salix petiolaris	low	
	Salix sericea	low	
	Toxicodendron vernix	low	
BOG, tall shrub	Aronia melanocarpa	med	
	Bidens discoidea	low	
	Bryophyte	med	
	Calla palustris	med	
	Carex canescens	med	
	Carex intumescens	low	
	Carex seorsa	med	
	Cephalanthus occidentalis	med	
	Cicuta bulbifera	low	
	Dulichium arundinaceum	med	
	Galium tinctorium	low	
	Ilex verticillata	med	
	Lysimachia ciliata	low	
	Lysimachia thyrsoiflora	low	
	Maianthemum canadense	med	
	Nyssa sylvatica	med	
	Osmunda cinnamomea	low to med	
	Osmunda regalis	low to med	
	Polygonum arifolium	low	
	Polygonum hydropiperoides	low to med	
	Populus heterophylla	med	
	Quercus bicolor	low	
	Quercus palustris	low	
	Rosa palustris	low	
	Rubus hispidus	med	
	Salix bebbiana	low	
	Salix discolor	med	
	Salix sericea	low	
	Sium suave	low	
	Sphagnum sp.	med	
	Thelypteris palustris	low	
	Toxicodendron vernix	low	
	Triadenum virginicum	low	
	Trientalis borealis	low	
	Vaccinium corymbosum	med	

APPENDIX
LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
	<i>Viburnum recognitum</i>	low	
BOG, <u>Tamarack-Hardwood</u>	<i>Acer rubrum</i>	low to med	
	<i>Caltha palustris</i>	low	
	<i>Carex atlantica</i> var. <i>atlantica</i>	low	
	<i>Carex leptalea</i>	low	
	<i>Carex trisperma</i>	low	
	<i>Coptis trifolia</i>	med	
	<i>Dryopteris carthusiana</i>	low	
	<i>Fraxinus nigra</i>	med	
	<i>Galium tinctorium</i>	low	
	<i>Glyceria striata</i>	low	
	<i>Huperzia lucidula</i>	low	
	<i>Ilex verticillata</i>	med	
	<i>Larix laricina</i>	med	
	<i>Lysimachia terrestris</i>	low	
	<i>Maianthemum canadense</i>	med	
	<i>Mitchella repens</i>	low	
	<i>Nyssa sylvatica</i>	low	
	<i>Osmunda cinnamomea</i>	high	
	<i>Osmunda regalis</i>	med	
	<i>Quercus bicolor</i>	low to med	
	<i>Rubus hispidus</i>	med	
	<i>Rubus pubescens</i>	low	
	<i>Sphagnum</i> sp.	med	
	<i>Toxicodendron vernix</i>	low	
	<i>Trientalis borealis</i>	low	
	<i>Vaccinium corymbosum</i>	med	
	<i>Viola blanda</i>	low	
BOG, <u>small kettle</u>	<i>Aronia melanocarpa</i>	low	
	<i>Carex atlantica</i> var. <i>atlantica</i>	low	
	<i>Carex canescens</i>	med	
	<i>Carex lasiocarpa</i>	med	
	<i>Carex seorsa</i>	med	
	<i>Cephalanthus occidentalis</i>	low	
	<i>Dulichium arundinaceum</i>	med	
	<i>Eriophorum virginicum</i>	med	
	<i>Galium tinctorium</i>	low	
	<i>Ilex verticillata</i>	low	
	<i>Lysimachia thyrsoflora</i>	low	
	<i>Menyanthes trifoliata</i>	med	
	<i>Osmunda cinnamomea</i>	med	
	<i>Osmunda regalis</i>	med	

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LIST OF CHARACTERISTIC SPECIES

community	species	abundance	habitat comments
	Rubus hispidus	low	
	Salix bebbiana	low	
	Scirpus cyperinus	low	
	Sphagnum sp.	high	
	Spiraea alba	low	
	Toxicodendron vernix	med	
	Vaccinium corymbosum	med	
	Vaccinium macrocarpon	med	
	Viburnum recognitum	low	
BOG, <u>leatherleaf</u>	Calla palustris	med	
	Carex canescens	low	
	Carex oligosperma	med	
	Chamaedaphne calyculata	high	
	Decodon verticillatus	low	
	Eriophorum virginicum	med	
	Larix laricina	low to med	
	Nuphar advena	low	
	Osmunda cinnamomea	low	
	Sphagnum sp.	high	
	Toxicodendron vernix	low	
	Vaccinium corymbosum	low	
	Woodwardia virginica	low to med	