



2021 LEBANON COUNTY ENVIROTHON ELEMENTARY & MIDDLE SCHOOL

FORESTRY OBJECTIVES WETLANDS



TREE & PLANT SPECIES LIST

Alder <i>Alnus spp.</i>	Arrowhead <i>Sagittaria latifolia</i>	Black Willow <i>Silax nigra</i>	Bladderwort <i>Utricularia spp.</i>	Cattail <i>Typha spp</i>
Coontail <i>Ceratophyllum demersum.</i>	Eastern Hemlock <i>Tsuga canadensis</i>	Hydrilla <i>Hydrilla verticillata</i>	Jack-In-The-Pulpit <i>Arisaema triphyllum</i>	Jewelweed <i>Impatiens capensis</i>
Larch <i>Larix laricina</i>	Mile-A-Minute <i>Persicaria perfoliata</i>	Phragmites <i>Phragmites australis</i>	Pin Oak <i>Quercus palustris</i>	Purple Loosestrife <i>Lythrum salicaria</i>
Red Maple <i>Acer rubrum</i>	Sensitive Fern <i>Onoclea sensibilis</i>	Skunk Cabbage <i>Symplocarpus foetidus</i>	Spatterdock <i>Nuphar lutea</i>	Water Chestnut <i>Trapa natans</i>
White Water Lily <i>Nymphaea odorata</i>	Yellow Birch <i>Betula alleghaniensis</i>	See last page for a key to which resources you will find each species.		

TESTING RESOURCES

1. A Field Guide to Common Aquatic Plants of Pennsylvania
<https://www.lccd.org/wp-content/uploads/2020/10/A-Field-Guide-to-Aquatic-Plants-in-PA.pdf>
2. Citizen's Guide to the Control of Invasive Plants in Wetland and Riparian Areas
<https://www.lccd.org/wp-content/uploads/2020/10/Citizens-Guide-to-the-Control-of-Invasive-Plants-in-Wetland-and-Riparian-Areas.pdf>
3. Terrestrial & Palustrine Plant Communities of Pennsylvania
<https://www.naturalheritage.state.pa.us/fikebook.aspx>
4. Fact Sheets:
<http://www.envirothonpa.org/documents/purple-loosestrife.pdf>
http://www.envirothonpa.org/documents/mile-a-minute_weed.pdf
<http://www.envirothonpa.org/documents/WhatisanInvasivePlant.pdf>
Fact Sheets: Sensitive Fern, Jewelweed, Jack-In-The-Pulpit (Attached)
5. Common Trees of PA
http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_20029752.pdf
*In addition to using this resource for basic tree information, you should be able to identify, and know the different tree parts and their functions, as listed in the introduction on page X.
6. Summer Key for PA Trees
<https://www.lccd.org/wp-content/uploads/2018/11/FORESTRY-TEST-SUMMER-KEY-FOR-PA-TREES-and-INVASIVE-KEY.pdf>
7. Trees + Me = Forestry: https://www.lccd.org/wp-content/uploads/2020/10/TREES_ME_FORESTRY.pdf
Pages 10-13: Identification practice.
Page 23: Students should be able to identify, and know the functions of the different tree parts.
Pages 45-52: Units of Measurement. (MS ONLY)

8. Timber Harvest Operations Field Guide for Waterways, Wetlands and Erosion Control (Focus on pages 1-7)
<https://www.lccd.org/wp-content/uploads/2020/10/DEP-Timber-Harvest-Operations-Field-Guide-For-Waterways-Wetlands-and-Erosion-Control.pdf>
9. Leaf Characteristics: <https://www.lccd.org/wp-content/uploads/2019/10/Leaf-Characteristics-Updated-2018.pdf>

Must be able to define, identify, and/or label the following:

Deciduous	Coniferous	Opposite leaves	Leaf Structure-Simple Leaf
Simple	Needle-like (cluster & bundle)	Alternate leaves	Leaf Structure-Compound Leaf
Compound	Scale-like	Whorled leaves	Blade
Palmate (compound leaves)	Palmate veins		Petiole
Pinnate (compound leaves)	Pinnate veins		Node
	Parallel veins		Bud
			Stem
MAD HORSE			Leaflet

10. Wetland Types, Functions, Threats, & Benefits:

Wetlands Overview: <https://nepis.epa.gov/Exe/ZyPDF.cgi/500025PY.PDF?Dockey=500025PY.PDF>

Types of Wetlands: <https://nepis.epa.gov/Exe/ZyPDF.cgi/200053PZ.PDF?Dockey=200053PZ.PDF>

Functions and Values of Wetlands: <https://nepis.epa.gov/Exe/ZyPDF.cgi/200053Q1.PDF?Dockey=200053Q1.PDF>

Threats to Wetlands: <https://nepis.epa.gov/Exe/ZyPDF.cgi/200053Q3.PDF?Dockey=200053Q3.PDF>

Economic Benefits of Wetlands: <https://nepis.epa.gov/Exe/ZyPDF.cgi/2000D2PF.PDF?Dockey=2000D2PF.PDF>

Wetlands and Runoff: <https://nepis.epa.gov/Exe/ZyPDF.cgi/9000000U.PDF?Dockey=9000000U.PDF>

ESSENTIAL TOPICS-**Students are responsible for knowing the definitions included below!**

1. Tree/Plant Identification
 - a. Knowledge of identifying characteristics (leaf, bark, buds, branches) and key terms.
 - b. Use of a dichotomous key (Summer Key for PA Trees, #6 above) to ID any given tree/plant/flower/shrub from list.
 - c. Be able to identify as Endangered, Threatened, Invasive, Native, Introduced, and/or Noxious Weed.
2. Wetland Types (Also refer to the [EPA Fact Sheet above, "Types of Wetlands"](#))
 - a. Marine- relating to the sea, or the plants and animals that live in the sea.
 - b. Estuarine- adjective form of estuary. The lower course of a river where the current is met by ocean tides.
 - c. Lacustrine- relating to, formed in, living in, or growing in lakes.
 - d. Palustrine-having to do with small, non-tidal wetlands, dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens. Palustrine wetland types include:
 - i. Bog-a peat accumulating wetland that has no significant inflows or outflows and supports acid-loving mosses, particularly sphagnum. Water comes mostly from precipitation. Some shrubs (heath family) and evergreens also grow in bogs.
 - ii. Fen-a peat accumulating wetland that receives some drainage from surrounding mineral soil and usually supports marsh like plants
 - iii. Marsh-a wetland characterized by soft, wet, low-lying land, marked by herbaceous vegetation.
 - iv. Swamp-a saturated lowland or seasonally flooded bottomland characterized by trees or woody vegetation.
 - v. Vernal Pool-Temporary freshwater pond that exists in the spring.
 - e. Riverine-associated with rivers, streams, and their floodplains.
3. Vegetation Level (resource, ["A Field Guide to Common Aquatic Plants of PA", Page 2](#))
 - a. Emergent-emergent plants grow along water body edges, with only short portions of their stems and roots submerged.
 - b. Floating-floating plants are rooted, with much of their structure, especially leaves, floating on the surface.
 - c. Submerged-submerged plants grow in deeper water and usually are attached to the pond bottom. They remain under water until flowers and seeds form out of the water.

LEARNING OBJECTIVES

Students will be able to:

1. Tree/Plant ID:

- a. Use a dichotomous key (Summer Key for PA Trees (No. 6 above)) to identify common trees/plants of PA Wetlands.
- b. Analyze plant parts to differentiate between species which will aid in proper ID.
- c. Describe “distinguishing characteristics” which aid in quick ID.
- d. Identify by sight and know by name List A and their unique identifying characteristics.
- e. Describe the benefits, uses, and habitat requirements for any given plant from List A.
- f. Identify the tree/plant as native, introduced, endangered, threatened, invasive, or a noxious weed.
- g. Describe methods to improve wetland quality through proper management including invasive control methods.
- h. Measure tree height using a Biltmore stick and volume in board feet (**MS ONLY**).

2. Wetland Types:

- a. Differentiate between wetland types.
- b. Provide examples of trees/plants in different types of wetlands.

4. Vegetation Types:

- a. Identify vegetation types of wetland trees/plants from the **TREE SPECIES LIST**.
- b. Provide examples of trees/plants in different vegetation types.
- c. Identify plant transition zones between wetland and open water with appropriate indicator species.

5. Benefits, Uses & Functions:

- a. Identify which trees/plants are often used in the home landscape, how more could be used, and why they should be used (benefits).
- b. Identify which trees/plants are/have been used for medicinal purposes & how/which ailment; which are edible or poisonous to humans, and how they enhance the landscape.
- c. Explain how the trees/plants in List A are a benefit or detriment to wildlife.
- d. Identify the functions of a wetland.

KEY TO RESOURCES:

The color(s) indicate in which resources you will find the tree species. *Let me know if you find any discrepancies with the key.

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 A Field Guide to Common Aquatic Plants of PA

 Common Trees of PA

 Terrestrial & Palustrine Plant Communities of PA

 Fact Sheets

Onoclea sensibilis

Common Name: **sensitive fern**

Type: Fern

Family: Onocleaceae

Native Range: Eastern North America, eastern Asia

Zone: 4 to 8

Height: 3.00 to 4.00 feet

Spread: 3.00 to 4.00 feet

Bloom Time: Non-flowering

Bloom Description: Non-flowering

Sun: Part shade to full shade

Water: Medium to wet

Maintenance: Medium

Suggested Use: Naturalize, Rain Garden

Tolerate: Rabbit, Heavy Shade, Clay Soil



Culture

Best grown in organically rich, medium moisture, well-drained soil in part shade to full shade. Needs consistent moisture. Although native to swampy and marshy areas, it grows quite well in average garden soil as long as soil is not allowed to dry out. Usually grows taller in wet soils which it tolerates well. Spreads by both creeping rhizomes and spores, and can be somewhat aggressive in optimum growing conditions.

Noteworthy Characteristics

Sensitive fern is a large, somewhat coarse, Missouri native, deciduous fern which occurs statewide in wet woods and thickets and in moist soils along streams and springs. Grows up to 4' tall. Features long-stalked, deeply pinnatifid, bright green, vegetative (sterile) fronds (2-4' long) with leathery, triangular leaflets (pinnae) which have distinctively netted veins. Shorter, erect, woody-like fertile fronds (to 12" tall), whose ultimate divisions are bead-like segments, typically brown up in late summer and persist throughout the remaining season and winter. Commonly called sensitive fern because the green vegetative fronds are sensitive to and suffer almost immediate damage from the first fall frost. Also sensitive to drought.

Problems

No serious insect or disease problems. Foliage may depreciate as summer progresses in hot climates, particularly if soils are not kept moist.

Garden Uses

Best in wet woodland gardens and moist locations along streams and ponds. Also appropriate for shaded areas of a native plant garden or naturalized planting.



*Source: <http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=l300>

Arisaema triphyllum

Common Name: **jack-in-the-pulpit**

Type: Herbaceous perennial

Family: Araceae

Native Range: Eastern North America

Zone: 4 to 9

Height: 1.00 to 2.00 feet

Spread: 1.00 to 1.50 feet

Bloom Time: April to May

Bloom Description: Green/purple

Sun: Part shade to full shade

Water: Medium to wet

Maintenance: Medium

Suggested Use: Naturalize, Rain Garden

Flower: Showy

Fruit: Showy

Tolerate: Heavy Shade, Wet Soil, Black Walnut

Garden locations



Culture

Best grown in fertile, medium to wet soil in part shade to full shade. Needs constantly moist soil rich in organic matter. Does poorly in heavy clay soils. May be grown from seed, but takes five years for plant to flower.

Noteworthy Characteristics

Arisaema triphyllum, commonly called Jack-in-the-pulpit, is a spring woodland wildflower usually growing 1- 2' tall. Flower structure consists of the spadix (Jack) which is an erect spike containing numerous, tiny, green to purple flowers and the sheath-like spathe (pulpit) which encases the lower part of the spadix and then opens to form a hood extending over the top of the spadix. The outside of the spathe is usually green or purple and the inside is usually striped purple and greenish white, though considerable color variations exist. Two large green, compound, long-petioled leaves (1-1.5' long), divided into three leaflets each, emanate upward from a single stalk and provide umbrella-like shade to the flower. The fleshy stalk and leaves lend an almost tropical aura to the plant. Flowering plants initially produce only male flowers, but become hermaphroditic as they further age (male flowers on upper part of spadix and female on lower part). Most plants in a colony will vanish by mid-summer (become dormant), but the mature, hermaphroditic flowering plant will produce a cluster of red berries in mid to late summer which becomes visible as the spathe withers. Roots contain calcium oxalate (same chemical as in *Diffenbachia* or dumb cane) and are poisonous.

Genus name comes from the Greek words *aris* meaning an arum and *haima* meaning blood in reference to the plant being a blood relative of arums. Specific epithet means three-leaved.

Problems

No serious insect or disease problems.

Garden Uses

Best left undisturbed in the shady woodland garden, wild garden or native plant garden.



*Source: <http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=j400>

Impatiens capensis

Common Name: **jewelweed**

Type: Annual

Family: Balsaminaceae

Native Range: Northern United States

Zone: 2 to 11

Height: 2.00 to 5.00 feet

Spread: 1.50 to 2.50 feet

Bloom Time: June to September

Bloom Description: Orange to orange-yellow with red spotting

Sun: Part shade to full shade

Water: Medium to wet

Maintenance: Medium

Suggested Use: Annual, Rain Garden

Flower: Showy

Attracts: Birds, Hummingbirds, Butterflies

Tolerate: Heavy Shade, Clay Soil, Wet Soil

Garden locations



Culture

Easily grown in medium to wet soils in part shade to full shade. Best in wet, humusy soils in part shade. This plant is an annual which remains in the landscape through self-seeding and can become somewhat aggressive under ideal growing conditions. Will often form large colonies in the wild.

Noteworthy Characteristics

Spotted touch-me-not or jewelweed is a Missouri native annual plant of boggy, shady areas. It typically occurs in low woodlands and thickets, along stream banks and in swampy areas throughout the State. It grows 2-5' tall on weak, watery stems. Features 1" long, rear-spurred, cornucopia-shaped, orange to orange-yellow flowers with reddish-brown spotting. Flowers bloom throughout the summer. Each flower dangles from a leaf axil on its own slender stalk. Flowers give way to slender seed capsules which when ripe explosively split open at a touch dispersing the tiny seeds within in all directions, hence the common name of touch-me-not. Oval, coarsely-toothed, bluish-green leaves (to 3.5" long). Dew or rain beads up on the leaves forming sparkling droplets which give rise to the common name of jewelweed. Native Americans used the watery plant juices to relieve itching associated with poison ivy, stinging nettle and insect bites.

Problems

No serious insect or disease problems. Can prolifically self-seed.

Garden Uses

Moist shade or woodland gardens. Bog gardens. Native plant gardens. Pond or stream margins. Low spots.



*Source: <http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=k490>