



Best Survey Period



**Status:** Endangered

**Global and state rank:** G5/S1

**Other common names:** Swamp poplar, downy poplar, black poplar

**Family:** Salicaceae (willow family)

**Total range:** A species of southern Ontario and the eastern and southeastern United States, swamp cottonwood is patchily distributed on the Atlantic coastal plain from Connecticut to Louisiana, and up the Mississippi and Ohio drainages to southern Michigan. It occurs from Ontario to New York in the northern portion of its distribution, ranging from Louisiana to Florida at its southern extent. Major concentrations occur on the coastal plain of North and South Carolina, and in eastern Missouri and southern Illinois and Indiana. It is considered rare in Alabama, Connecticut, Illinois, Kentucky, Massachusetts, New Jersey, New York, Ohio, Ontario, and Rhode Island, and is known only from historical records in Pennsylvania (NatureServe 2009).

**State distribution:** This southern tree species is known only from six documented sites in Michigan, with single historical localities recorded for Berrien and Cass

counties, and four extant occurrences, consisting of one occurrence in Kalamazoo County, one occurrence in Lenawee County (the most recently discovered station), and two localities in Washtenaw County. All of these occurrences are comprised of highly localized colonies. Careful searching in southwestern Michigan has failed to result in the relocation of collections made in 1882 in Cass County and 1917 in Berrien County.

**Recognition:** *P. heterophylla* is a **tree of medium size**, reaching approximately 10-20 m in height, though sometimes ranging to 30 m (Fernald 1950). The crown is round-topped, formed of short, heavy, contorted branches (Wagner et al. 1980). The bark, when mature, is **reddish-brown and deeply fissured**, similar to the mature furrowed bark of sassafras. The alternate, **broadly ovate to heart shaped leaves, which are large (ranging from 8-25 cm long and 6-20 cm wide), are coarsely and bluntly toothed, dark green above, and pale below.** When flushing, the **emerging leaves are densely white hairy, remaining somewhat hairy on the underside when mature, and have distinctly round (terete) leafstalks.** Young twigs have **dark, orange-colored pith** and the ovoid winter buds are shiny, reddish-brown and smooth or slightly sticky with a resinous coating. The flowers are produced in catkins under 10 cm long, with male and female catkins produced on different trees (thus the species is



dioecious). When mature, the fruits, which are capsules, release numerous tiny seeds dispersed by cottony tufts of hairs.

The common Eastern cottonwood (*P. deltoides*) is easily distinguished from swamp cottonwood by its strongly flattened leafstalks, more markedly pointed leaf tips (compared to the barely pointed to blunt tips in *P. heterophylla*), and hairless leaves. The similar and more northern *P. balsamifera* (balsam poplar), which barely reaches southern Lower Michigan, also has rounded leafstalks, but can be distinguished by its very fragrant foliage and twigs, highly resinous buds, and more pointed, hairless leaves with very pale undersides that are often blotched with rust-colored resin stains.

**Best survey time/phenology:** This species is distinctive and can be sought throughout the growing season, from leaf emergence to leaf drop.

**FQI Coefficient and Wetland Category:** 10, OBL

**Habitat:** Michigan's colonies of swamp cottonwood tend to occur in swampy buttonbush depressions that are seasonally inundated, where the associated woody plants include such species as *Acer rubrum* (red maple), *Quercus bicolor* (swamp white oak), *Cephalanthus occidentalis* (buttonbush), *Ilex verticillata* (Michigan holly), and less commonly *Fraxinus pennsylvanica* (red ash), *Tilia americana* (basswood), and *Cornus foemina* (gray dogwood). Ground-cover plants in these depressions may include *Xanthium strumarium* (cocklebur), *Scutellaria lateriflora* (skullcap), *Polygonum pensylvanicum* (smartweed), *Pilea pumila* (clearweed) and *Bidens* sp. (beggar-ticks) (Wagner et al. 1980). In Ohio, *P. heterophylla* occurs in riparian floodplain forests, particularly in old river channels (oxbows), where it is associated with buttonbush, red ash, *Salix nigra* (black willow), *Fraxinus profunda* (pumpkin ash), *Acer saccharinum* (silver maple), and *Ulmus americana* (American elm) McCormac et al. 1995). Swamp cottonwood was rediscovered in the Chicago region in 1989, where it was found in the swampy woodlands of the Kankakee River valley, occurring in a backwater area with standing water most of the year, associated with Eastern cottonwood, red ash, and black willow (Swink and Wilhelm 1994). In the Southeast, *P. heterophylla* occurs in swamps and lowland wet woodlands, and occasionally in sluggish woodland streams (Godfrey and Wooten 1981).

Typical habitat for this tree consists of wet woods on bottomlands, floodplains, or pond and lake margins. In Indiana, it inhabits the borders of woodland ponds having stiff clay soils called "gumbo" (Deam 1940).



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**Biology:** Trees of swamp cottonwood begin sexual reproduction at about ten years of age. The wind-pollinated, unisexual flowers flush in May. In early summer, female trees shed large quantities of cottony seeds which are dispersed by wind and water and have a brief period of viability. Seeds require a wet bed of bare mineral soil and abundant light for germination. Continuous sunlight and moisture are necessary for seedling survival. This species, like several other cottonwoods, also reproduces vigorously by root-suckers; reproduction in Michigan appears to be largely the result of vegetative propagation.

**Conservation/management:** The Michigan Nature Association has secured a conservation easement to protect the Kalamazoo County colony. However, since it consists only of about 25 male trees, possibly





representing a single clone, the introduction of females is advisable to increase viability and dispersal/establishment potential. The Washtenaw County site supports four local colonies of male and female plants, with probable sexual reproduction in addition to suckering. However, this locality lies on subdivided private property close to Ann Arbor and is likely threatened by residential development. Maintenance of surrounding forest and a natural hydrological regime at both sites is undoubtedly critical to this species survival at Michigan localities. The most recently discovered occurrence of swamp cottonwood was found within a state park in Hillsdale County, where the species will be carefully protected by state stewardship staff.

**Comments:** Although widely known as swamp cottonwood, *P. heterophylla* is not a true cottonwood, belonging to a section of the genus (*Leucoides*) characterized by round rather than flattened petioles (Barnes and Wagner 1981). This is one of our few well studied endangered plants. The paper by Wagner et al. (1980) provides a fine model for the base-line data collection required to effectively protect Michigan's threatened and endangered plants.

**Research needs:** More thorough status surveys and annual monitoring of populations are the priority needs at present. Virtually any population and life history studies would further the ability to perpetuate and maintain this species in Michigan.

**Related abstracts:** Floodplain forest, Blanding's turtle, box turtle, cerulean warbler, red-shouldered hawk, smallmouth salamander, yellow-throated warbler, American beak grass, cup-plant, false hop sedge, heart-leaved plantain, pumpkin ash, purple turtlehead, red mulberry, snow trillium, Virginia water-horehound.

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