Species Status Assessment

Common Name	swamp cottonwood	**Date Updated:**	2024-03-19
Scientific Name	*Populus heterophylla*	**Updated By:**	Rachael A. Renzi
Family	Salicaceae		

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

Swamp cottonwood is a perennial deciduous tree in the willow family. It is one of seven species of the genus *Populus* in NY, and one of five considered native to the state (Werier et al. 2023). Though it ranges from Ontario south to the panhandle of FL and LA, the core of this species' range occurs in the Atlantic coastal plain of NC, SC, VA, and DE as well as the Mississippi Valley (NatureServe 2023).

NY is near the northeastern edge of this tree's range, and it occurs in five counties in the lower Hudson Valley, New York City, and Long Island: Westchester, Ulster, Dutchess, Suffolk, and Richmond. *Populus heterophylla* is limited to various hardwood swamp habitats in NY. These populations have between two and two hundred mature trees yet hundreds to thousands of seedlings. Though the populations have been relatively stable over the past 35-40 years, it is likely that this plant will remain rare. Because these populations are small, they may be threatened by local disturbances (NYNHP 2023). More research is needed to determine the rate of sexual and vegetative reproduction in NY.

I. Status

a. Current legal protected Status

i. Federal: **Candidate:**

ii. New York: Threatened

b. Natural Heritage Program

i. Global: G4G5

ii. New York: S2 **Tracked by NYNHP?** On Active Tracking List

Other Ranks:

COSEWIC: Not listed in Canada
IUCN Red List: Least Concern

Status Discussion:

Populus heterophylla is Threatened in New York (Ring 2023). There are fourteen known populations, and an additional ten historical locations. Most of these populations are restricted to a few counties in southeastern NY where this tree is often locally dominant (NYNHP 2023, 2024). As a wetland tree, it may be susceptible to hydrological change, but few direct threats have been observed. There are only limited opportunities for new populations, so this plant will likely always be a rare member of the New York flora (NYNHP 2023, 2024).

II. Abundance and Distribution

Region	Present?	Abundance	Distribution	Time Frame	Listing status or S-Rank	SGCN?
North America	Yes	Unknown	Unknown	Unknown		
Northeastern US	Yes	Unknown	Unknown	Unknown		
New York	Yes	Unknown	Unknown	Unknown	T	
Connecticut	Yes	Unknown	Unknown	Unknown	S2	
Massachusetts	Yes	Unknown	Unknown	Unknown	S1	
New Jersey	Yes	Unknown	Unknown	Unknown	S2	
Pennsylvania	Yes	Unknown	Unknown	Unknown	SH	
Vermont	No	-	-	-		
Ontario	Yes	Unknown	Unknown	Unknown	S1	
Quebec	No	-	-	-		

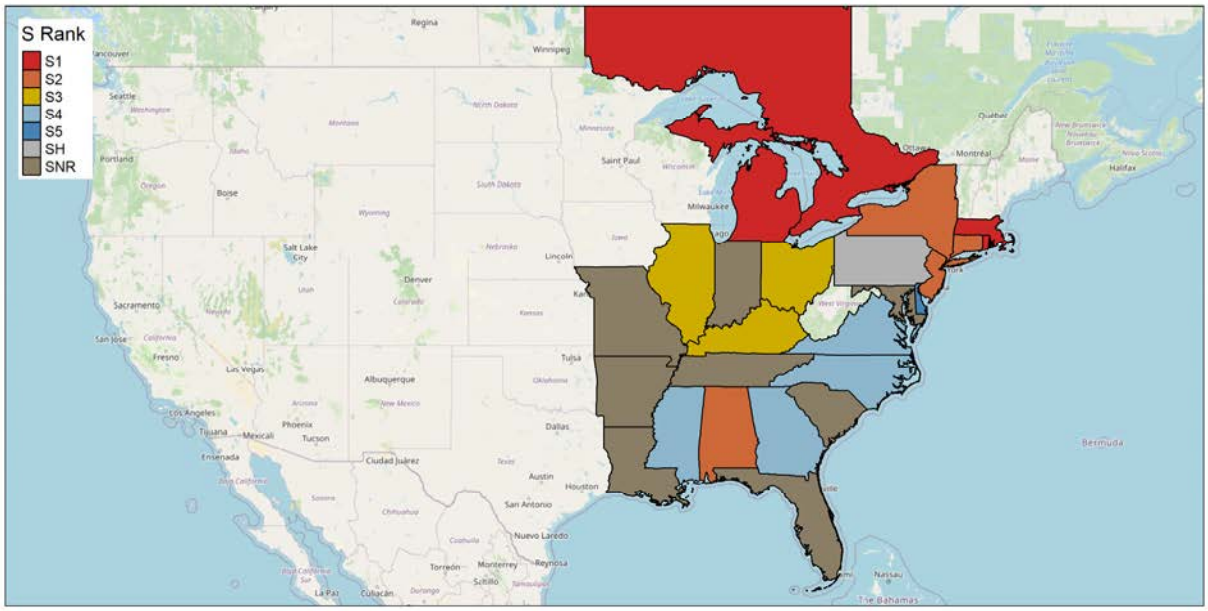


Figure 1. Populus heterophylla North American distribution.

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	≥50km

III. NY Rarity and Trends

Trends Discussion

The earliest report we have of this tree in New York is 1811, but it was probably present long before then (NYNHP 2023, 2024). Over this time, a few populations have been lost but the total number of populations has remained relatively stable. The populations in Ulster County were more recently documented, and may represent either a recent establishment or an overlooked representative of a more widespread historical distribution. Limited habitat is available, so little expansion is expected (NYNHP 2023, 2024).

Details of historic and current occurrence

This tree is known from scattered wetland sites of eastern Long Island, Staten Island, Ulster County, Dutchess County, and Westchester County (NYNHP 2023, 2024). The average population may have only a few mature trees, with many tens of saplings and hundreds of seedlings. Overall, there are about 400 mature trees and over 2,000 seedlings and saplings in the state (NYNHP 2023). Though there is a high number of seedlings and saplings, vegetative reproduction is likely responsible for the majority of successful regeneration (McMaster 2003).

Populus heterophylla ranges from Ontario in the north and southern New England in the east, then south to FL and LA in the Coastal Plain and Mississippi Valley (NatureServe 2023). It is most common on the Atlantic Coastal Plain of the Carolinas, VA, DE, and the Mississippi Valley (NatureServe 2023; Weakley et al. 2024).The range extent was estimated to be 1.75 million square kilometers using herbarium specimens and photo-based observations documented

between 1992 and 2023 (NatureServe 2023; Burns and Honkala 1990; FNA 2010; GBIF 2023; iNaturalist 2023; SEINet 2023).

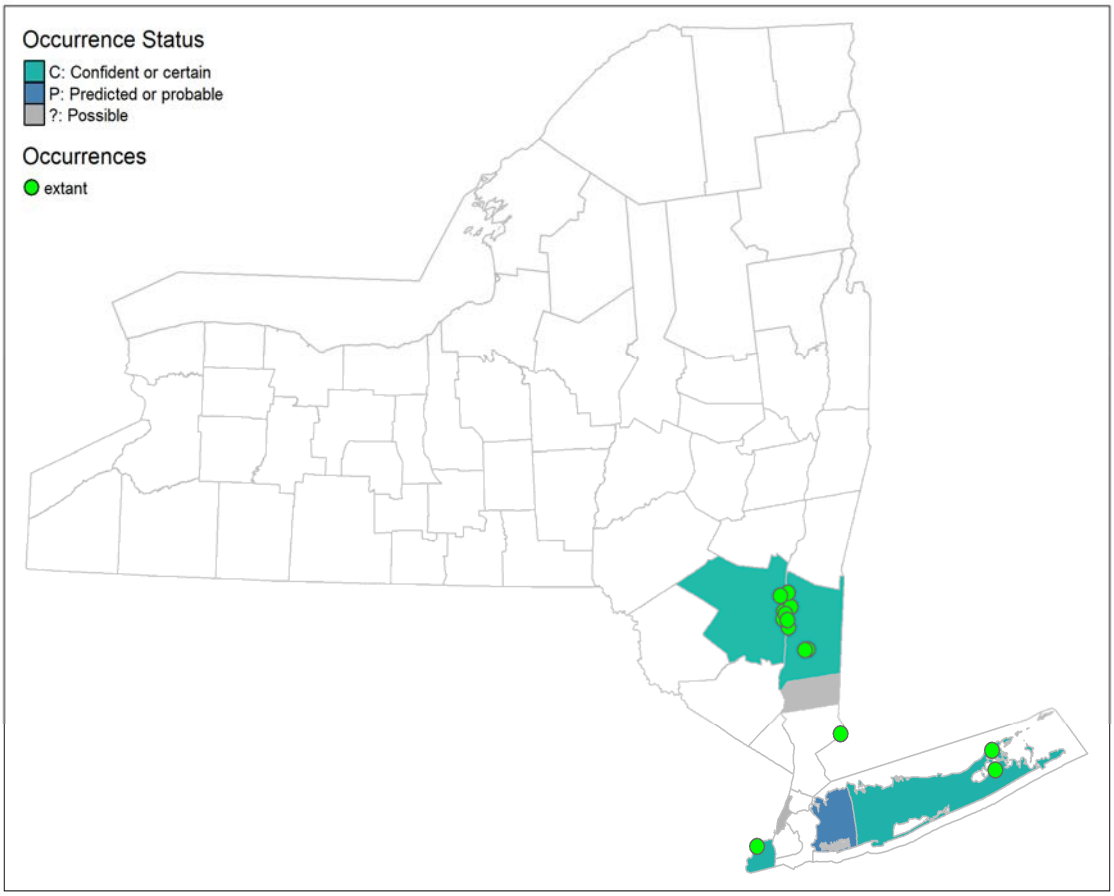


Figure 2. *NYS distribution for* Populus heterophylla*. Only extant populations are shown.*

Table 1. *Number of records (element occurrences) of* Populus heterophylla *grouped by the dates known to be extant (the years spanning first observation to last observation) and the number and percent of total of USGS 7.5 minute map quadrangles these observations fall within for New York State.*

Years	# of Records	# of distinct quads	% of quads in State
Pre-1995	9	6	0.6
1995-2004	4	3	0.3
2005-2014	5	3	0.3
2015-2023	4	4	0.4

Monitoring in New York

Two populations occur on state park land, which are surveyed on a ten-year rotation. One occurs in a wildlife management area. The remaining populations occur on municipal, local, or privately owned land, including local and private land trusts, and lack regular monitoring

(NYNHP 2023). One population was first documented in1920, but most of the populations were first documented in 1980 or later (NYNHP 2023).

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

NatureServe broad habitat types: forested wetland (NatureServe 2023).

Northeast Habitat Classification Macrogroup: Coastal plain swamp, Central hardwood swamp, Emergent marsh.

NY Ecological Communities: Red maple-blackgum swamp, Red maple-hardwood swamp, Shallow emergent marsh, Red maple-sweetgum swamp (Edinger et al. 2014).

Habitat or Community Type Trend in New York

Declining:	**Stable:**	**Increasing:**	**Unknown:** ✓
Time Frame of Decline/Increase:			
Habitat Specialist	**Yes:** ✓	**No:**	

Habitat Discussion:

Populus heterophylla forms clonal stands in wet pockets of red maple-hardwood swamps within the Hudson Valley. It is also found in and red maple-blackgum swamps, swamp white oak wetlands, shallow emergent marshes adjacent to forested swamps, wet swales, and other types of hardwood swamps (NYNHP 2023, 2024).

Elsewhere in the northeast, *Populus heterophylla* is found in swamps, shores, and low, wet woods and wet hollows (Crow and Helquist 2000; Gleason & Cronquist 1991; Voss 1985). More specifically, it is reported from inundated swamps, shores of major streams, tidal swamp forests, drainage ditches, bottomlands, and other wet depressions in the coastal plains, central lowlands, and the Piedmont; it is absent from the southern Appalachians (Weakley et al. 2024; FNA 2010; Fernald 1950).

Associated species include *Acer rubrum* var *rubrum, Boehmeria cylindrica, Dioscorea villosa, Fraxinus pennsylvanica, Nyssa sylvatica, Onoclea sensibilis, Platanus occidentalis, Quercus bicolor, Thelypteris palustris.*

V. Species Demographics and Life History *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Populus heterophylla is a perennial deciduous tree. The leaves are present from mid-spring to mid-fall. The trees are dioecious, and the staminate and pistillate catkins mature at about the same time (Fernald 1950; Britton 1887). Flowers may be produced in May with fruits persisting into mid-summer; yet local reproduction may be most dependent on asexual reproduction (NatureServe 2023; NYNHP 2023; McMaster 2003). There are typically numerous seedlings and asexual clones scattered around the base of each tree (NYNHP 2023, McMaster 2003). The life cycle of *Populus heterophylla* as described below is based on information compiled by McMaster (2003) for the New England Plant Conservation Program.

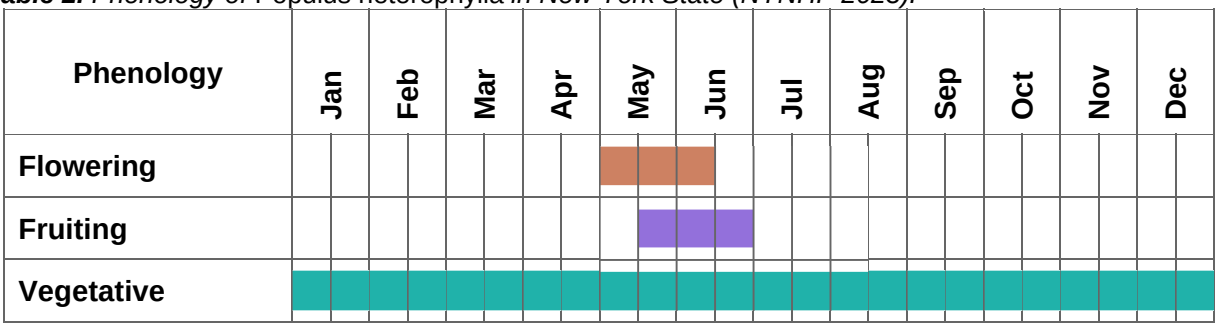
The plant's seasonal cycle occurs alongside river dynamics; for example, seeds are dispersed with the decline of floodwaters in late May and June. The saturated soil during this time is ideal for germination and root growth (Braatne 1999). The rapid growth seen in seedlings and saplings of *Populus heterophylla* slows with maturity, at around 40-50 years. It is intolerant of shade and will grow slowly once the canopy closes.

The trees also reproduce vegetatively through root and stump suckers (Wagner et al. 1980). While vegetative reproduction allows for local expansion of a population, it does not contribute to the foundation of new populations or contribute to genetic diversity within populations. Entirely male or female populations may rely on vegetative reproduction to persist, perhaps for tens of thousands to a million years, in the case of another *Populus* species, *P. tremuloides* (Mitton & Grant 1969).

For some of the smallest *P. heterophylla* populations, disturbance to the habitat, either natural or anthropogenic, may be disastrous to its existence. The diversity in adaptive traits allowed by recombination may be lacking in clonal populations. In addition, *Populus* species were found to have sex-specific responses to stressors, such as drought, nutrients, salinity, and heavy metal concentrations (Melnikova et al. 2017). The sex of *Populus* species is genetically controlled and originates with the formation of the seed (Kim et al. 2021; Melnikova et al. 2017). Thus, sex ratios of small, isolated populations may prove to be important indicators for the success of a population in certain conditions. More research on the stress response and sex ratios of *Populus heterophylla* in NY is needed.

With the plant's apparent reliance on vegetative reproduction, the question of its population's genetic diversity presents itself. It is likely that some of the small populations in NY are comprised of a single clone, or if not, are inbreeding. Research is needed to determine the genetic diversity within and between populations in NY.

Table 2. *Phenology of* Populus heterophylla *in New York State (NYNHP 2023).*



VI. Threats

There has been development around many of the wetlands where this tree occurs but so far the wetlands have been protected (NYNHP 2023, 2024). Due to the relatively small population sizes, natural and anthropogenic disturbance may disproportionately threaten these occurrences (McMaster 2003). Across its range, fragmentation and loss of habitat threaten this tree (NatureServe 2023). Changes in hydrology, especially extended periods of drought, may limit seedling recruitment and promote competition (McMaster 2003).

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes:	No:	✓	Unknown:

If yes, describe mechanism and whether adequate to protect species/habitat:

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Adequate buffers around the wetlands should be maintained in order to prevent undue hydrologic changes.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection) - https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Table 3. *Recommended conservation actions for* Populus heterophylla.

Conservation Actions	
Action Category	**Action**
Land/water protection	1.1. Site/area protection
Land/water protection	1.2. Resource & habitat protection
Land/water management	2.1. Site/area management
Land/water management	2.2. Invasive/problematic species control
Land/water management	2.3. Habitat & natural process restoration

VII. References

This SSA drew heavily from these resources:

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