

***Pinus serotina* Michx., Pond Pine¹**

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This publication provides an in-depth profile of *Pinus serotina* for academic audiences and interested laypersons with some knowledge of biology.

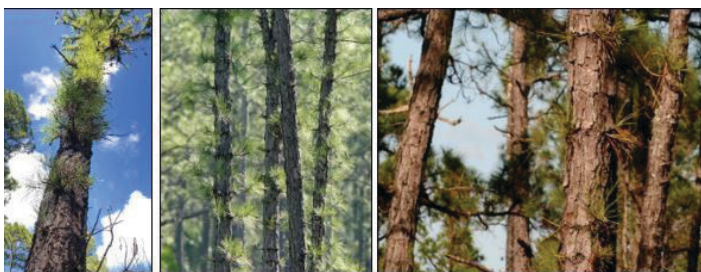


Figure 1.

Credits: Left, Lee Cook, iNat [CC BY-NC]; center and right, Mary Keim, iNat [CC BY-NC-SA]

Taxonomy

Family

Pinaceae, pine family. Characterized by having mature seed cones and winged seeds. The leaves are needle-like.

Genus

Pinus, the only genus of the *Pinaceae* family native to Florida.

Species

The species name *serotina* is from the Latin word for “late.” This species produces female serotinous and male non-serotinous cones. Serotinous cones require heat (e.g., from fire) to open and release their seeds for dispersal.

Common Name

The species is commonly known as pond pine, marsh pine, bay pine, or pocosin pine because it tends to be found on poorly drained, very wet sites (Figure 2).



Figure 2. Recently burned pond pine growing in very poorly drained soil.

Credits: Left, Sharleen J., iNat [CC BY-NC]; right, Scott Ward, North Carolina Botanical Garden, used with permission

Description

Pond pine is a lesser-known native conifer found along the southeastern coastal plain from New Jersey to central Florida (Figure 3) (Bramlett 1990). Pond pine has a maximum height of 15 meters (50 feet) and an average diameter of 50–60 cm (20–24 inches) (Nyoka 2002). The needles typically occur in fascicles of 3 but may appear in fascicles of 2 or 4 (Bean 2021). Needle length varies between 15 and 20 cm (6–8 inches) (Nelson et al. 2014). The bark is a

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brown-red color with moderate flakiness. Pond pine grows slowly due to consistent water saturation in its natural habitat that reduces aeration (Bramlett 1990; Graham and Rebutck 1958). Pond pine adapts to anaerobic conditions through the development of aerenchyma and lenticels (Topa and McLeod 1986). An unusual feature of this pine is the epicormic sprouts along its trunk (Figure 4) (Bramlett 1990). When pond pine is stressed, epicormic sprouts from dormant buds appear as a cluster of needles (Archer 2000; Stone et al. 1943) along the bole, or main stem of the tree, as well as from the root collar (Schafer et al. 2015). Pond pine is also known to hybridize with loblolly pine (*Pinus taeda*) and pitch pine (*Pinus rigida*) (Bramlett 1990).

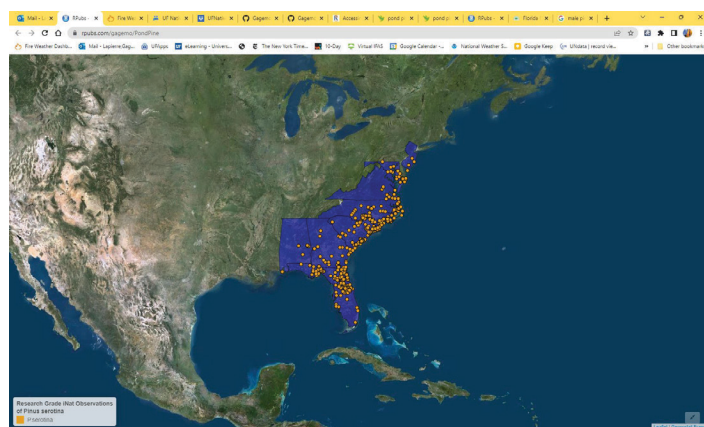


Figure 3. iNaturalist Map featuring the range of pond pine (*Pinus serotina*) as viewed through research grade iNaturalist observations. Credits: Map made by Gage LaPierre in R Studio



Figure 4. Pond pine epicormic sprouts and female cones. Credits: Left, Scott Ward, North Carolina Botanical Garden, used with permission; right, Austin Pursley (iNat) [PD]

In Florida, pond pine is typically found on wet or poorly drained soils and within the following plant communities (see the [Florida Natural Areas Inventory \(FNAI\)](#) for more on community descriptions): wet flatwoods, shrub bogs or pocosins, baygall, and along the margins of cypress domes and tupelo swamps (Florida Natural Areas Inventory 2010). In these communities, fire plays an important ecological role in maintaining plant composition (Florida Natural Areas Inventory 2010). As result, pond pine appears to possess many adaptations to fire such as serotinous female

cones (Figure 5). These cones can accumulate in the crown of tree and may remain sealed with viable seeds for up to 10 years (Bramlett 1990). The resin on the cones melts when exposed to fire, which then triggers the release of seeds for wind-borne or gravity dispersal into freshly burned ground. The conditions following a fire present the ample opportunity for young pines to grow (Proctor and Monroe 2019).



Figure 5. Left, an immature female pond pinecone; center, a mature female cone. Credits: iNat: left, right Austin Pursley [PD]; center, Scott Ward, North Carolina Botanical Garden, used with permission

Applications

Forestry

Pond pine has limited commercial value due to a typically crooked trunk and slow growth. It is opportunistically sold for pulpwood and biomass, but its form is rarely straight enough for sawtimber (Figure 6) (Nyoka 2002; Graham and Rebutck 1958). There are no major breeding programs for pond pine, and efforts to grow it in other countries for timber have not been successful compared with other pine species such as loblolly pine (*P. taeda*) and Monterey pine (*P. radiata*) (Nyoka 2002). It is also susceptible to pitch canker disease (*Fusarium moniliforme*) and may experience dieback when infected, but it is more resistant than Virginia pine (*Pinus virginiana*) and slash pine (*Pinus elliottii*) (Kuhlman and Cade 1985).



Figure 6. A natural stand of pond pine. Credits: Austin Pursley, iNat [PD]

Wildlife

Pond pine has a wildlife habitat value similar to that of loblolly pine (*P. taeda*). However, due to its small diameter, it has less value for cavity nesting birds such as the red cockaded woodpecker (*Picoides borealis*) than other pines (e.g., *P. palustris*, *P. ellioti*, and *P. taeda*). Natural stands of pond pine provide habitat for amphibians such as the green frog, southern cricket frog, and American bullfrog as well as reptiles such as the plain-bellied watersnake (Hutchens and DePerno 2009).

Propagation

Pond pine is readily propagated by seed (Figure 7) that can be collected from mature unopened cones. Mature cones with viable seeds are brown or deep brown, not green. To open the cones carefully crush them with a metal vice or expose them to dry heat of 167°C to 169°C (333°F to 336°F) for 30 seconds. A light application of fire is also effective to burn off the resin encrusting the cones and allow them to release their seeds (Figure 7).



Figure 7. Left, pond pine seed size relative to a hand; center, paler and much larger longleaf pine seeds in comparison to pond pine seeds; right, a pond pine pinecone being burned to release the seeds. Credits: Left, Gage LaPierre, UF/IFAS; middle and right, J. K. Faylo, used with permission

Propagation Trial at UF Native Plant Nursery: A Case Study

From 2021–2022, pond pine was grown from seed at the UF Native Plant Nursery (Figure 8). The seeds were collected from Mallory Swamp in Lafayette County, Florida,

in July of 2021, and sown in August of 2021 outdoors due to this species' extreme intolerance to shade (Bramlett 1990). Seeds were sown via light press (i.e., 1 cm or 0.4-inch depth) into a soil substrate of peat, perlite, and vermiculite at a 5:3:2 ratio. We used D60 pots manufactured by Anderson Pot Company with a cell diameter of 2.5 feet (about 75 cm) and a depth of 14 inches (about 35 cm). Of the 250 seeds planted, 176 seeds germinated (70% germination rate). Seedlings were fertilized using 1 teaspoon of slow-release pellets of Osmocote Plus 15-9-12 to ensure adequate nutrition. After ten weeks plants averaged roughly 7 inches (18 cm) tall. Plants were then out-planted to the edge of a cypress dome after 16 months and averaged 23.7 in (60 cm) tall at that time.



Figure 8. (left) Young pond pines growing at the nursery. (right) The pond pines in cone containers. Credits: Gage LaPierre, UF/IFAS

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