

Atlantic White Cedar

by Sarah Stewart, BBVMN, 2014

Kidneys of the Pine Barrens

“Atlantic white-cedar forests are like the kidneys of the Pine Barrens” so said State Forrester, John Sacco referencing this cedar’s remarkable ability to filter and absorb pollutants in the water. This iconic tree of the Pine Barrens once covered approximately **135,000** acres in NJ alone; across the Pine-lands, Hackensack Meadowlands and Sandy Hook prior to European settlement. Now, only about **20,000** acres remain. If conditions allow, these trees can live up to 1,000 years, though 200 years is likely the maximum age for stands in old growth forests.

A Little History

For 4,000 years, the Atlantic white-cedar (*Chamaecyparis thyoides*) has been part of the Pine Barrens landscape. European settlers immediately recognized the unique qualities of the tree’s very hardy wood which is very resistant to decay, shrinking and warping despite water saturation for extensive periods, even years. The wood splits very easily and takes on paint well. AWC trees submerged for 50 years were still viable for timber use (Korstian and Bush, 1931, Little 1950 as cited in Mylecraine & Zimmerman, 2000). Logging of the Atlantic White-cedar (AWC) soon followed to harvest the wood for siding, shingles, fencing, poles, tubs, barrels, pails, boat-building, and for exports which helped fuel a booming economy. The demand for the wood soon out-paced the supply which drove increased incentive for more cutting and harvesting. As a result, huge quantities of AWC forests were removed during the 18th through the 20th centuries in NJ.

AWC stands were cleared for agricultural purposes as well. In the 17th and 18th centuries, many cedar swamps were cut, flooded for cultivation of cranberry bogs which easily adapted to the former cedar habitat. By the 20th century, New Jersey was the leading source of Atlantic white-cedar lumber. As availability of cedar forests for harvesting decreased due to repeated logging and diminished market demand for some uses (roof shingles), the AWC economic value waned as well. Today, the amount of cedar timber cut is reduced to a small amount due to extensive cutting, land use changes, and wetlands protection (Ward, 1989 as cited in Mylecraine & Zimmerman, 2000).



Source: commons.wikimedia.org Credit: John B.

Benefits to Plants & Wild-



Pine Barrens Treefrog, Source: commons.wikimedia.org



Yellow crested orchid , Source: commons.wikimedia.org

- Provides vital resources and habitat to wildlife including many threatened and endangered species:
 - ⇒ Hessel's Hairstreak caterpillar (*Callophrys hesseli*)
 - ⇒ Pine Barrens Treefrog (*Hyla andersonii*)
 - ⇒ Barred Owl (*Strix varia*)
 - ⇒ Timber Rattlesnake (*Crotalus horridus*)
 - ⇒ Black-throated Green warbler (*Dendroica virens*)



Black-throated Green Warbler, Source: commons.wikimedia.org Credit: John Harrison



Swamp Pink, Source: commons.wikimedia.org

- Mature AWC stands block sunlight to the mid-story and forest floor, creating favorable conditions for several rare or endangered plants, as well as native beauties:
 - ⇒ endangered Swamp Pink (*Helonias bullata*)
 - ⇒ rare Curly Grass Fern (*Schizaea pusilla*)
 - ⇒ Yellow crested orchid (*Platanthera cristata*)
 - ⇒ Inkberry Holly (*Ilex glabra*)
 - ⇒ Sweet Pepperbush (*Clethra alnifolia*)
 - ⇒ (Red Maple (*Acer rubrum*)

Vitals:

Height: 40 ft – 90 ft

Spread: 10 ft – 20 ft

Light: Full Sun

Soil Moisture: moist, wet (OBL – obligate wetland)

Soil pH: acidic (5.5 or lower)

Habitat: Freshwater bogs/ swamps, hummocks (mounds of soil rising in a wetland)

Range: United States, East coast US, Gulf coast east of Mississippi River

Form: straight bole

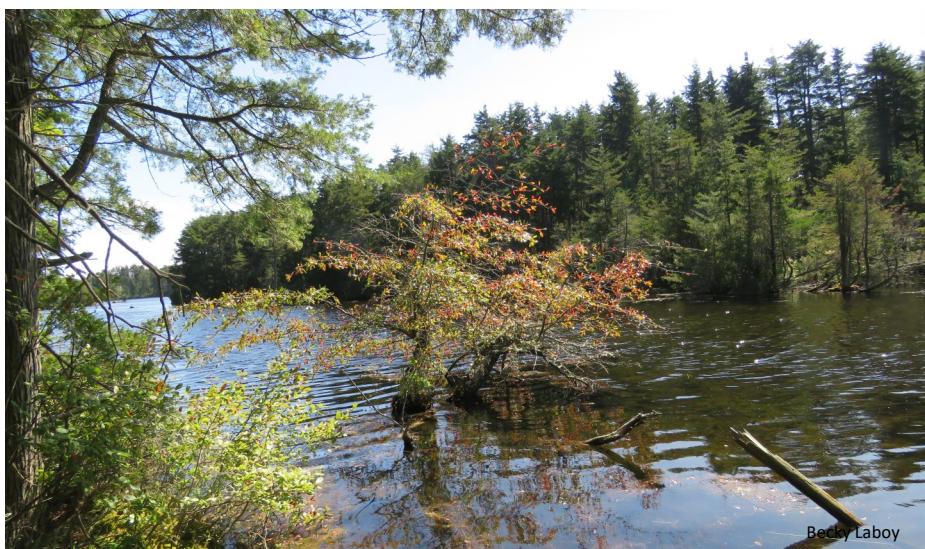
Fruit: Cones are $\frac{1}{4}$ inch, blue-green when mature, turning brown

Leaf: evergreen, scaly, aromatic when crushed

Characteristics: durable, rot-resistant, straight-grained, aromatic, lightweight

Ecosystem Services

- Filters water
- Absorb pollutants
- Protects stream banks from soil erosion
- Flood water control
- Holds stormwater and releases it slowly for drought mitigation
- Supports nutrient retention
- Creates a natural firebreak



Becky Laboy

Cedar in Trouble

Atlantic white-cedar forests are in trouble globally due to saltwater intrusion resulting from sea level rise caused by climate change. In New Jersey, this is compounded by the fact that southern NJ is still settling from the last Ice Age. Even a few high tides can initiate an AWC die-off. Many cedar stands died after Superstorm Sandy pushed saltwater inland changing the groundwater salinity to a brackish mix ultimately choking the cedar's salt-intolerant roots and killing the trees. Large stands of dead AWC or 'Ghost Forests' are becoming more characteristic in the Mullica Valley.

The ghost descriptor refers to the dead trees that remain long-standing due to their inherent rot-resistant trunks.

Atlantic white-cedars are susceptible to fire especially if the fire reaches the canopy or trees in the seedling stage. The seeds are fire-resistant and can withstand fire if the occurrence is during the wet season where the seeds can be preserved in the sphagnum moss till germination. Some seeds have been identified as viable up to 14 years in optimal sphagnum conditions. One mitigating factor is the wet habitat which can be a deterrent for some less catastrophic fires.

The cedar is susceptible to high winds or windthrow due to its very shallow root system. The denser the stand, the more vulnerable the trees are to severe winds should an opening occur for some reason. Trees that grow in more exposed areas tend to be more windfirm.

Flooding from beaver dams are another stressor for the AWC. The cedar is adapted to wet soils but not permanent flooding. Habitat loss due to changes in land use, coastal development has also contributed to the disappearance of the AWC.

Another threat to the AWC is white-tailed deer-browsing during winter and the over-population of deer due to hunting restrictions. Young AWC trees are most at risk.

On the upside, few insects and fungi attack the Atlantic white-cedar, and those that do, rarely cause serious damage.



Dead cedar forest along Mullica River post Superstorm Sandy Source: nj.com

Uses: timber, roofing, fences, siding, shingles, poles, furniture, hunting decoys

Potential Solutions

To counter saltwater intrusion, foresters are restoring cedar forest farther inland than their original coastal habitats since once the soil is 'salted', regrowth of the cedar is not an option. Currently, restoration is underway by the State of NJ for restoring 10,000 to 20,000 acres of Atlantic white-cedar over a 10-year period, including 164 acres of cedar forest in **Double Trouble State Park**.



- Foresters address the deer browsing issue by fencing around restoration areas, or by installing mesh collars around individual trees.
- Increased requirements in state and federal regulations targeting wetlands protection and improved forest management have helped protect the cedar swamps from further destruction.

Atlantic White vs. Eastern Red

Both Atlantic white-cedar and Eastern Red Cedar trees belong to the *Cupressaceae* family. Eastern Red Cedar is more common and adaptable and prefers drier soil versus the wet acidic soil favored by Atlantic White-cedar. Both have straight trunks and rot-resistant wood. Eastern Red Cedar is more aromatic. The barks on these trees are distinct as well.



Unripe cones on Atlantic white-cedar are larger and have pointed scales.



Eastern Red Cedar cones are smaller, smoother, turn blue when ripe and resemble berries.

source: bplant.org (creative commons)



Atlantic white-cedar bark is deeply ridged that often swirls around the trunk.

source: bplant.org (cc)



Eastern Red Cedar bark is straight, reddish, thin, and peels in strips.

source: bplant.org (public domain)

Technically speaking, neither tree is a true cedar. True cedars are part of the *Cedrus* genus and belong to the pine/Pinaceae family. The Atlantic White-cedar is a cypress, and considered a false cedar or "New World" cedar since its genus is *Chamaecyparis*. Eastern Red Cedar is in the genus *Juniperus*. It's suggested that their common name attributions may have been made due to their aromatic wood and vegetation, which resembles the scent of true cedar.

In Summary

The Atlantic white-cedar is a tree in recovery. The successful forest restoration in southern NJ would bring many significant and welcome benefits to Pine Barrens flora and fauna in maintaining a unique ecosystem for species under stress as well as those that are not. The benefit to humans is simple: really great drinking water quality in addition to all the natural marvels these magnificent towering trees support and which we can revel in if we take the time to notice.

The next time you find yourself in the bogs, stop and look up, see how high these amazing trees pierce the sky, and have survived near extirpation. A hike through Double Trouble Park, Bass State Park and many others in south Jersey and you may come toe to trunk with an Atlantic white-cedar that just maybe, has been around for a hundred years or more.



Becky Laboy

References

- <https://plants.ces.ncsu.edu/plants>
- <https://www.njconservation.org/restoring-the-kidneys-of-the-pine-barrens/>
- <https://www.state.nj.us/dep/parksandforests/forest/Atlantic%20white-cedar.pdf>
- <http://dendro.cnre.vt.edu>
- <marine.rutgers.edu>
- <https://www.srs.fs.usda.gov>
- <http://harwichconservationtrust.org/traveling-back-in-time-with-atlantic-white-cedars>

Mylecraine, K.A., & Zimmerman, G. L. (2000). Atlantic white-cedar Ecology and Best Management Practices Manual. Retrieved from http://atlantic-white-cedar.org/pubs/Mylecraine&Zimmermann_2000-BMP-for-AWC-symposium-2006.pdf