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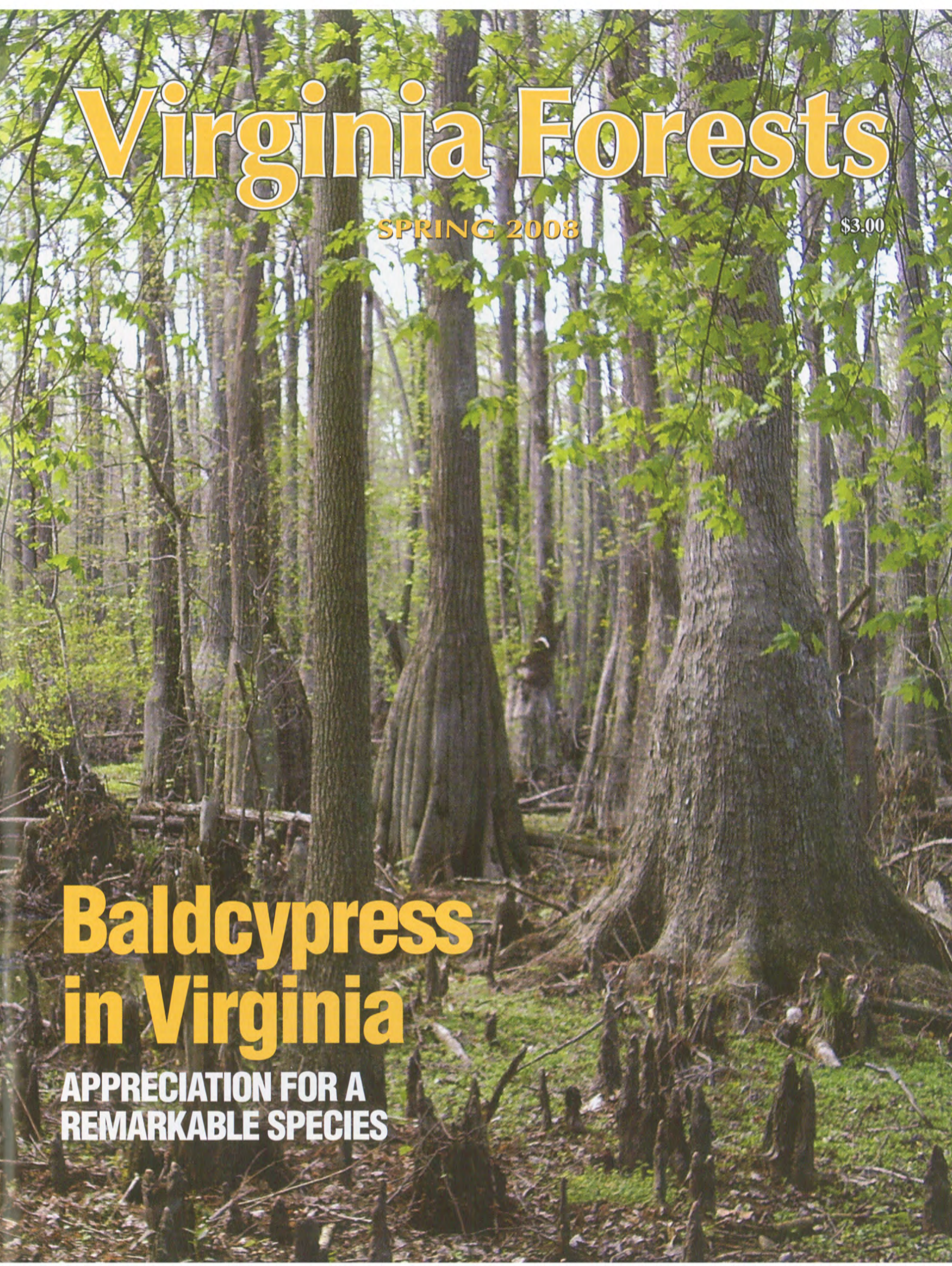

Baldcypress in Virginia

APPRECIATION FOR A REMARKABLE SPECIES

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We promote the stewardship and wise use of the Commonwealth's forest resources for the economic and environmental benefits of all Virginians.

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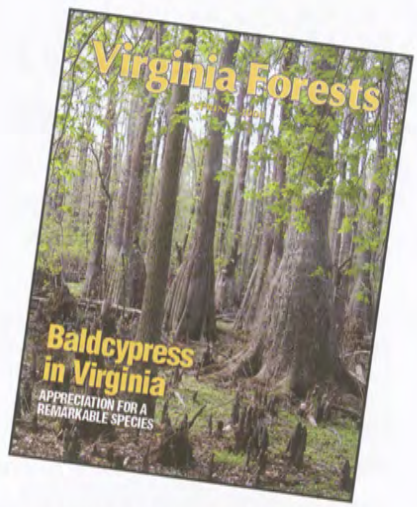
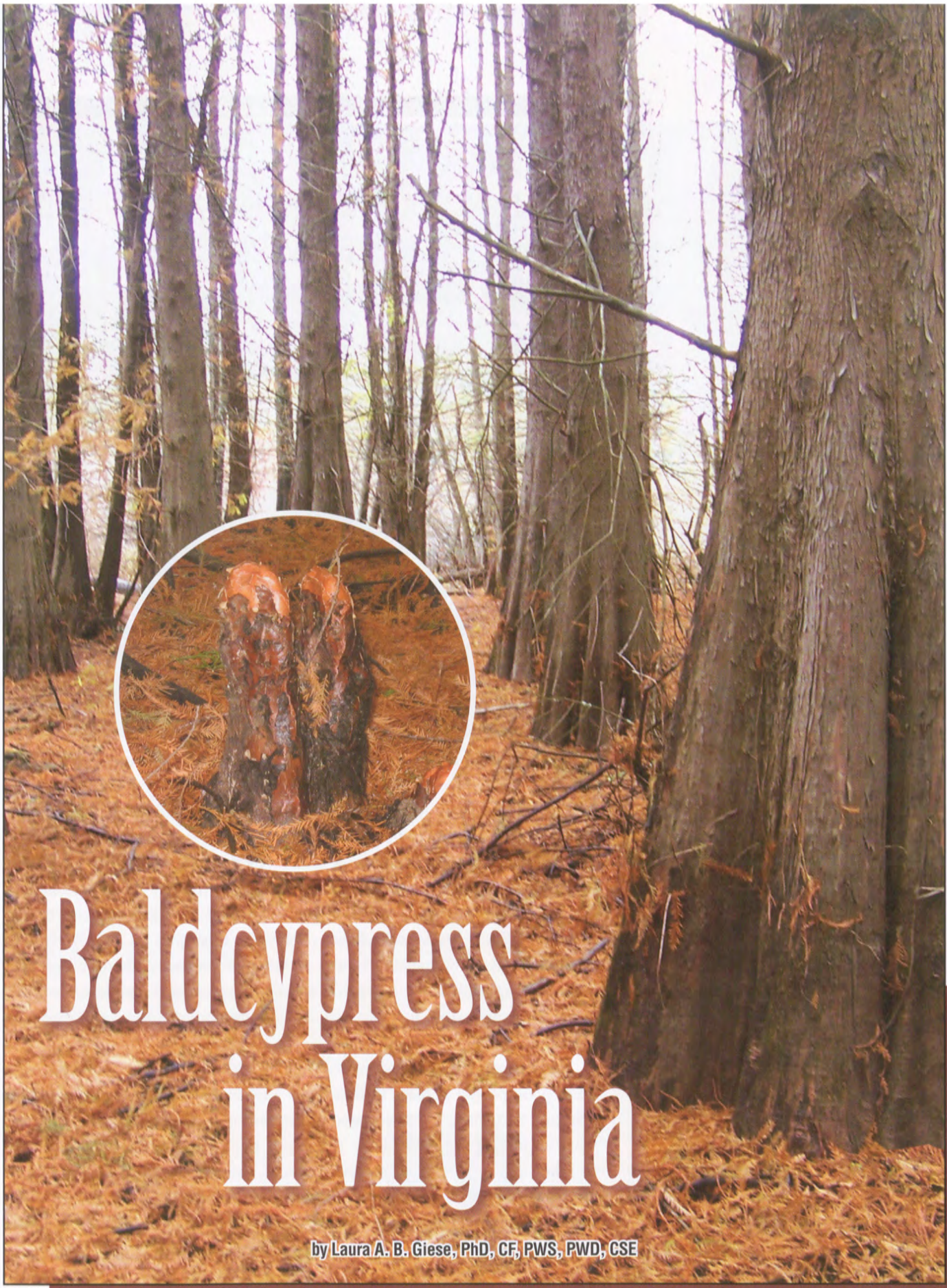
CONTENTS

FEATURES

DEPARTMENTS



ON THE COVER: 100+ year-old baldcypress trees in an Isle of Wight County wetland. Photo courtesy of C. Cody Daniels, Virginia Department of Forestry.



Baldcypress in Virginia

by Laura A. B. Giese, PhD, CF, PWS, PWD, CSE

Buttressing on five year old baldcypress trees in the Piedmont Region of Virginia. *Inset:* ***Even at a young age these trees are providing nesting habitat for birds.***

winter and spring facilitates breakdown of the cones. The relatively small, triangle-shaped seeds are dispersed by water during spring flooding events and can also be dispersed by wind. The seeds need moist or saturated soils, but cannot germinate under water. However, the seeds can remain viable for 30 months under water. After spring floods when there is a dry period with no flooding for one to three months, the seeds will germinate. This dry condition may take several years to occur, but when it does the trees take advantage of the suitable conditions; subsequently producing an even-aged stand. Seedlings are killed by total inundation and therefore, must grow quickly to a height above typical flooded levels. The seedlings need three to five years to grow in non-flooded water to become a thriving seedling and require overhead light for good growth.

Tolerance for growing in flooded conditions allows the baldcypress to out-compete other plants, often resulting in pure stands. It will grow faster and be healthier if not subject to flooding, but in this situation it gets out-competed by other species. Surprisingly, established baldcypress trees are exceptionally tolerant of drought—no doubt associated with their ability to survive in stressful growing conditions (i.e., in anaerobic substrates).

Knees (pneumatophores) and buttressed trunks are morphological adaptations that typically only occur when baldcypress trees are found in a landscape position that receives a periodically flooded hydroperiod. Therefore, these adaptations do not form on all trees, especially in upland areas. Knees, which are unbranched shoots originating from roots, were once thought to be important for oxygen exchange, but this notion has been discredited by many scientific studies. However, it has been documented that knee height corresponds to the flooding depth height. When knees have a reddish top they are actively growing; brown or grayish tops indicate that they are dormant. The interlocking root systems provide stability and buttressing provides additional support in the soft, wet soil.

Baldcypress is one of the few conifer species that sprouts from stumps of relatively young trees. When struck by lightning, the tree usually explodes and sprouts back from the trunk. Unfortunately, the stump sprout is often poorly shaped and not sawtimber quality.

Baldcypress swamps play a vital role in the landscape. They act as floodwater retention basins, sediment and nutrient traps, fish and wildlife habitat, and recreation areas. The canopies occasionally serve as heronries, are suitable for bald eagle nests, and snags are frequently occupied by wood ducks. Prothonotary warblers and other song birds, woodpeckers, owls and even wild turkeys are frequently observed in these swamps. Deer, rabbits and nutria relish the seedlings, which can present a challenge to establishing a stand of baldcypress.

Baldcypress is noted for its high merchantable yields and the lumber is prized for its color, texture, straight grain, resistance to decay and strength. It has been made into railroad ties, bridges, piers, fencing, and garden furniture and has many other construction uses. Even the knees are made into lamps or carved to make folk art.

Because of their long lifespan they are good candidates for tree ring dating methods to look at climate change. A tree ring study of baldcypress trees in Southeastern Virginia, measured back into the 1500s, suggested that Virginia's worst drought occurred when the English settlers landed at Jamestown.

Threats to baldcypress stands include over-timbering, saltwater intrusion associated with sea-level rise in conjunction with global climate change, and being overrun by invasive/exotic species. A fungus that causes brown pocket rot, creating what is known as "pecky cypress," attacks the heartwood of living trees, but it is not known to affect

Trees invoke a sense of awe and wonder and the baldcypress *(Taxodium distichum)*, in particular, is a remarkable species. This is one of three articles that spotlight baldcypress in Virginia and the focus of this article is the ecological aspects.

The baldcypress is a member of the redwood *(Cupressaceae or cypress)* family and as such is known for being long-lived and decay resistant ("eternal wood"). Specimens have been documented to be 800 to 1,200 years old, and may live up to 1,800 years. These stately trees can reach heights from 120 to 150 feet and diameters at breast-height of 10 feet. The flattened needles growing in two rows give the tree a featherlike appearance. The baldcypress is a deciduous conifer and the leaves turn a striking red in the fall before dropping.

Baldcypress can be found from Southern Delaware into Southern Illinois and Indiana, westward to Texas. When used in the landscape it can grow as far north as Maine and Michigan. In Virginia, baldcypress trees are common in the Great Dismal Swamp and its watershed, the Chowan River Basin, the Chickahominy River and tributaries, and Dragon Run. Several notable baldcypress trees, listed on the Virginia Big Tree Database, can be found along the Nottoway River in Southampton County. Their circumferences range from 426 to 476 inches with heights ranging from 67 to 123 feet.

Major coastal plain wetlands are where you will find baldcypress. In the Atlantic Coastal Plain, baldcypress grows best in the red-river bottomlands; rivers that originate in the Piedmont and provide nutrient-rich silt into the bottomlands. The black river bottomlands—rivers that originate in the Coastal Plain—are less fertile and have coarser textured soils resulting in poorer growth. Soils can range in texture from heavy clay to coarse sand to muck and tend to be acidic.

Mature baldcypress (Taxodium distichum).

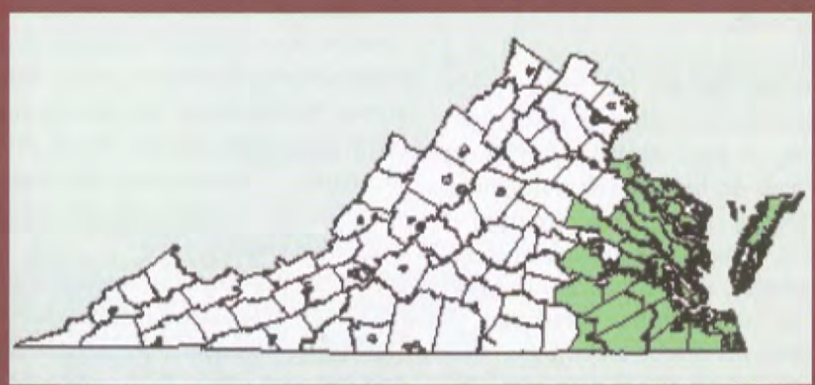
Baldcypress is categorized as an obligate wetland plant, which indicates that this species almost always—greater than 99 percent—occurs in wetlands. It usually grows on intermittently flooded sites with flat topography where there is frequent, prolonged flooding up to three meters or more. Water tupelo *(Nyssa aquatica)* commonly co-dominates with baldcypress. When water tupelo dominates a wetland, it is often an indication that the baldcypress trees were harvested. Other species associated with baldcypress include red maple *(Acer rubrum)*, sweetbay *(Magnolia virginiana)*, sweetgum *(Liquidambar styraciflua)*, ash *(Fraxinus spp.)*, and oak *(Quercus* spp.).

Seedling establishment and growth can be difficult. Mature cones fall between October and December and flooding in the

Opposite page: ***Baldcypress planted by the U.S. Army Corps of Engineers in southeastern Virginia. Note darkened area at base of trees shows seasonal water level fluctuations.*** *Inset:* ***Baldcypress knee. The reddish top indicates that it is actively growing.***

Virginia's baldcypress can be found in the following locations:

- Great Dismal Swamp
- False Cape State Park
- Dragon Run
- Crawfords State Forest
- Seashore State Park
- Cypress Loop - Johnsmithtrail.org
- First Landing State Park



Geographical distribution of baldcypress in Virginia. Source is USDA NRCS Plants Database - http://plants.usda.gov/

cypress lumber quality. There are other fungi and insects that can be found on baldcypress, but none of them pose a major threat. Although not a current threat in Virginia, the Chinese tallowtree *(Triadica sebifera)* extends north to North Carolina and with current warming trends, this species will likely invade the baldcypress swamps of Virginia in the future if no preventative action is taken. It is also important to maintain the natural hydroperiod of baldcypress forests in order to sustain natural regeneration.

Because baldcypress swamps are a dwindling unique feature in the Virginia landscape, efforts to protect the remaining old-growth swamps should be considered. Therefore, foresters and landowners may wish to consider planting and managing this species to insure a continued source of this valuable lumber product. John Burke (as discussed in his article, beginning on page 8) is doing just that by having planted several stands of baldcypress and is monitoring their performance as a timber species in Virginia. Joel Cathey, a forester who specializes in baldcypress procurement, recognizes the value of baldcypress lumber and its many uses (See his article on page 12).

Also, there is potential opportunity in the Virginia Piedmont region, now slightly north of the native Virginia range, to consider growing baldcypress as a timber crop. In the North Fork Wetlands Mitigation Bank, located near Haymarket, Virginia, there are two small areas of planted baldcypress which are approximately five-years old. The seedlings came from the Virginia Department of Forestry, which generally obtain their baldcypress seeds from the Chickahominy River watershed. The trees are growing very well and are even beginning to display buttressing; however, no knees have been observed to date. Tree growth in the two areas is noticeably different. The trees in the more exposed area are shorter (three to five feet tall) and smaller in diameter/caliper (one to two inches) than the trees growing in an area that is more sheltered (height: eight to ten feet, diameter/caliper: two and one-half to four inches). Tree survival is surprisingly high in both areas and at least the sheltered area will need to be thinned. Even at this young age, the trees are providing nesting habitat.

Whether you are a scientist, landowner or forester either interested in the ecology, growth and stand dynamics, or merchantability, I'm sure you will agree that the baldcypress is a remarkable tree.

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