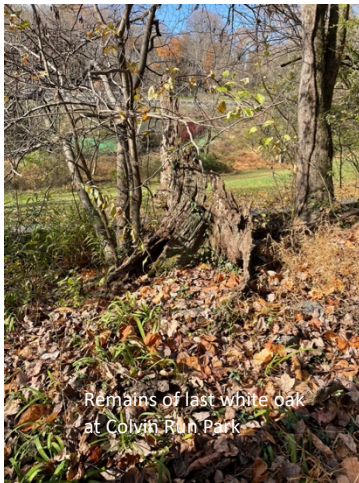


## White Oaks: No Tree Museum for the King!

“The falling leaves drift by the window/ The autumn leaves of red and gold...” Sinatra’s mellow crooning belies hard raking ahead. Acorns ping off the patio table sound like exploding firecrackers in a Chip and Dale cartoon. Caterpillars rappelling down their slender threads onto our heads in the summer are but a memory. Lest you mistake these observations for complaints, let me assure you, they are blessings! But these blessings are dwindling. Unless we pay more attention, Joni Mitchell’s prophecy could ring true: “You don’t know what you’ve got till it’s gone...”

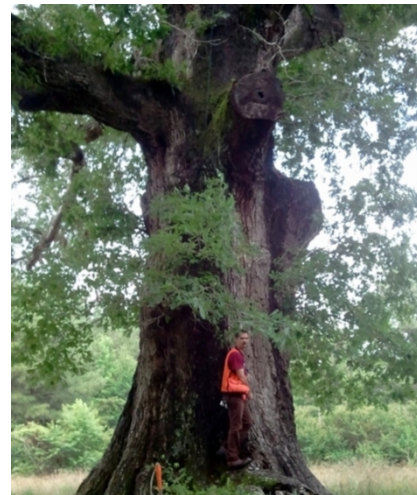
### White Oak: What Makes It Special



Remains of last white oak  
at Colvin Run Park

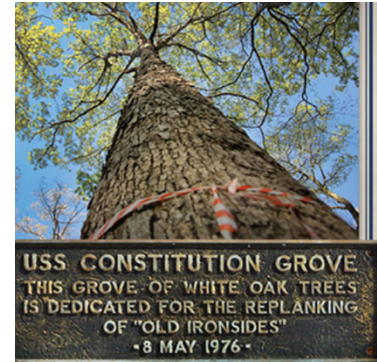
A little known and underappreciated aspect of Colvin Run Mill Park is that it is classified as a resource park, meaning it showcases history AND nature. Granted, most of the park’s nature is on the south side of Route 7. The new pedestrian underpass under the highway will provide safe and easy access for visitors to enjoy the wetlands, Colvin Run, and a bounty of trees. George Washington was attracted to the property, in part, because of its good stand of white oaks. Washington knew his white oaks. In surveying they were used to mark property boundaries. In his land dispute with William Sheppard in November 1799 Washington noted one marker was a “white oak on bridge branch,” i.e. Colvin Run.

Why were white oaks so valued? (*Quercus alba* for those lovers of Latin plant names.) Because they are large, durable, and non-porous, valuable when it comes to operating in and around water. In the eastern US the oak is regarded as the king of trees, and the white oak the king of kings because “no other tree in our sylvia has so great a spread.” (For those who might be wondering, “sylvia” means “forest” in Latin, as in Pennsylvania or Penn’s Forest.) The venerable, now lost, Wye Oak in Talbot County, Maryland grew 96 feet tall topped with a 119-foot-wide crown; one still living in Brunswick County, Virginia measures 86 feet tall with a 120-foot crown.



How durable is a white oak? On average they can live two to three hundred years, but that is just an average. The Brunswick County white oak is believed to be 500 years old. Another in Albemarle County, 400. Imagine, these trees were already 200 years old when the Declaration of Independence was signed. For surveyors requiring a tree that stood out and would be around for a long time, the white oak was it.

The tree's non-porous nature is thanks to large ballooning tyloses that, when triggered by stress (like cutting), close the plant's large vascular tissue – the xylem that transports water and nutrients from the roots to stems and leaves. Size, durability, and density make the white oak the wood of choice for the water wheel and flume at the mill. And for barrels holding liquid like wine and whiskey (to be the subject of another blog). Not surprisingly, the white oak was used to build the USS Constitution in 1797, "Old Ironsides." What is perhaps surprising is that the US Navy still maintains a 50,000 acre "Constitution Grove" of white oaks to keep the vessel in trim!



### Oaks and the Eco System: A Keystone

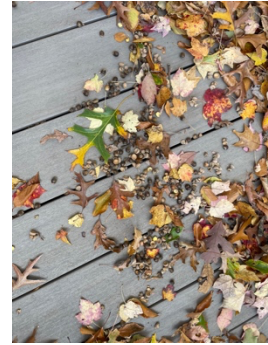
The oak is essential to the increasingly stressed ecosystem. It is unsurpassed in its accommodation for a multitude insects, moths, butterflies, and caterpillars upon which birds rely for food. In his book *The Nature of Oaks* (from which this section draws heavily) Professor Douglas Tallmay recorded 511 species of moths and butterflies thriving on oak leaves. The closest competitor is the cherry tree, supporting about 100 fewer. The mighty maple clocks in supporting 295 species. Those lovely red crepe myrtles, a meager three!

Oaks, cherries, willows, birches, and maples are "keystone" plants. Accounting for only seven percent of all plant genera, they produce about 75 percent of the food for wildlife. That's right. All that is growing green is not edible by nature's smallest creatures. They have evolved their way around the natural defenses of some plants but not others, what botanists call "host plant specialization." Plants newly introduced by avid horticulturalists, so-called invasives, are not on the menu. Tallmay reports one field experiment showed 90 percent fewer caterpillars living on non-native plants. Without native plants, birds would not survive. Silent spring.

Why are oaks so hospitable to insects? Their large size, geographic coverage, and longevity provide some explanation. Not only does an oak live up to 600 years, allowing insects generations to acquire a taste for it, the species has been around 30 million years, permitting evolutionary adaptation. Oaks are equal opportunity hosts, with nooks and crannies providing homes for parasitoid wasps, lace bugs, gall wasps, katydids, and they like. Birds snack on them even in the coldest months, pecking at them snuggled away in the rough bark. Some are natural predators to caterpillars, maintaining nature's balance. That caterpillar parachuting onto the picnic table is probably escaping a gall wasp – its life hanging by a thread until danger passes or you swat it.



Grey squirrels and chipmunks in our yard are hauling bushelsful of acorns (from Old English *akorn*=nut/fruit of a forest tree). Rabbits, deer, racoons, and black bears also munch on the nut. An oak tree needs to be around fifty years old to produce a crop of acorns. But this year seems especially abundant. Oak trees are “masting,” producing an outsized crop. Why this year? Nature has not revealed her secret, but botanists speculate that masting protects against predators eating up all its offspring (really, how many acorns can a squirrel eat?), or the winds allowed for more pollination than usual, or the weather was conducive supplying sufficient energy for tree growth and acorn production. Or all three!



Tufted titmice, red-bellied woodpeckers, American crows, and white-breasted nuthatches enjoy acorns but not as much as blue jays. These birds evolved around the same time and same place (southeast Asia) as the oak tree and depend on it for food. The jay’s hooked peak allows it to rip open the nut and its expanded esophagus allows it to carry up to five acorns. In exchange for food, the blue jay does the oak a favor by broadcasting its seeds. One blue jay can collect and bury up to 4,500 acorns each fall for winter and spring provisions. Alas, it can only remember about a quarter of its hiding places (I can identify). That translates into 3,360 potential oak seedlings each year over the Jay’s seventeen-year life span or 57,120 possible trees. Move over Johnny Appleseed!



The white oak contributes to the health of its immediate environment. Its extensive canopy and root system slows rainwater, impeding soil erosion, and filters out nitrogen, phosphorus, and heavy metal pollutants, rendering clean water for the water table. The oak is a champ at carbon sequestration, converting carbon from the atmosphere to carbohydrates, food for the plant, by using light energy, that is photosynthesis. Tallmay figures that half of the plant’s dry weight is carbon. The tree’s massive root system produces glomalin which is rich in carbon, accounting for dark soil around the tree. What a better end for an otherwise harmful pollutant!

With the changing seasons, the oak’s cooling summer shade gives way to falling leaves in, not coincidentally, the fall, a season previously known as “harvest” until around the mid-sixteenth century when the phrase “fall of the leaf” caught on. A mature oak drops about 700,000 leaves. But take heart. It is more considerate than other trees – delaying the dropping into the winter

and spring. Leaf marcescence, retaining dried leaves, might have been a defense against tall browsing animals, like mastodons, feasting on delicate buds. A mouthful of dried leaves would put them off.



But don't rake them up and stuff them into bags for the trashman. Sweep them into the flower and shrub beds and give them a good mulching with the mower. "Leaf litter" contributes to the water purification process as well as returns nutrients to the soil that had been drawn from the soil by the roots for the tree to grow. Not visible to the naked eye, hundreds of thousands of decomposers – "detritivores" - break down the cellulose, releasing the nutrients.

Logging, housing developments, climate change, oak wilt, oak leaf scorch, deer, and invasive pests like gypsy moths and, more recently, the spotted lantern fly have reduced the share of oaks from 55 percent to about 25 percent of the trees in Eastern US forests. The lantern fly apparently hitchhiked on rocks shipped from China to Pennsylvania in 2014, flourishing in the absence of a natural predator. The gypsy moth (now more politically correct called the "sponge moth") was imported from Europe in 1869 as part of an experiment to mate them with silk moths to increase silk production. The experiment went awry when a storm blew their cage over freeing them to decimate the local forests – a practice their ancestors have carried on.



We all can help oaks flourish which, in turn, will help all sentient beings flourish. With the bumper crop of acorns, the Virginia Department of Forestry is encouraging people to plant acorns or gather and send them to their Crimora nursery so the emerging saplings can be planted around the state. Just think of it: planting a small acorn would create a towering monument to your stewardship 200, 300 years in the future. Your ancestors will bless you for the falling leaves, the dropping acorns, and the rappelling caterpillars. And they won't "have to go to a tree museum to see'm." Another Joni Mitchell prophesy that we trust will not come true.

