"*Vines and Trees will teach you that which you will never learn from masters*"

– Bernard of Clairvaux, Knights Templar

Chapter Four

BARKING UP THE WRONG TREE

Seriously… If you were like me before I researched for this book, trees were great but other than the basics – *bark, branches, leaves, and having to clean up those leaves,* I was basically clueless. Never did the word taxonomy ever part my lips. If you were like me, let me clue you in about what taxonomy is:

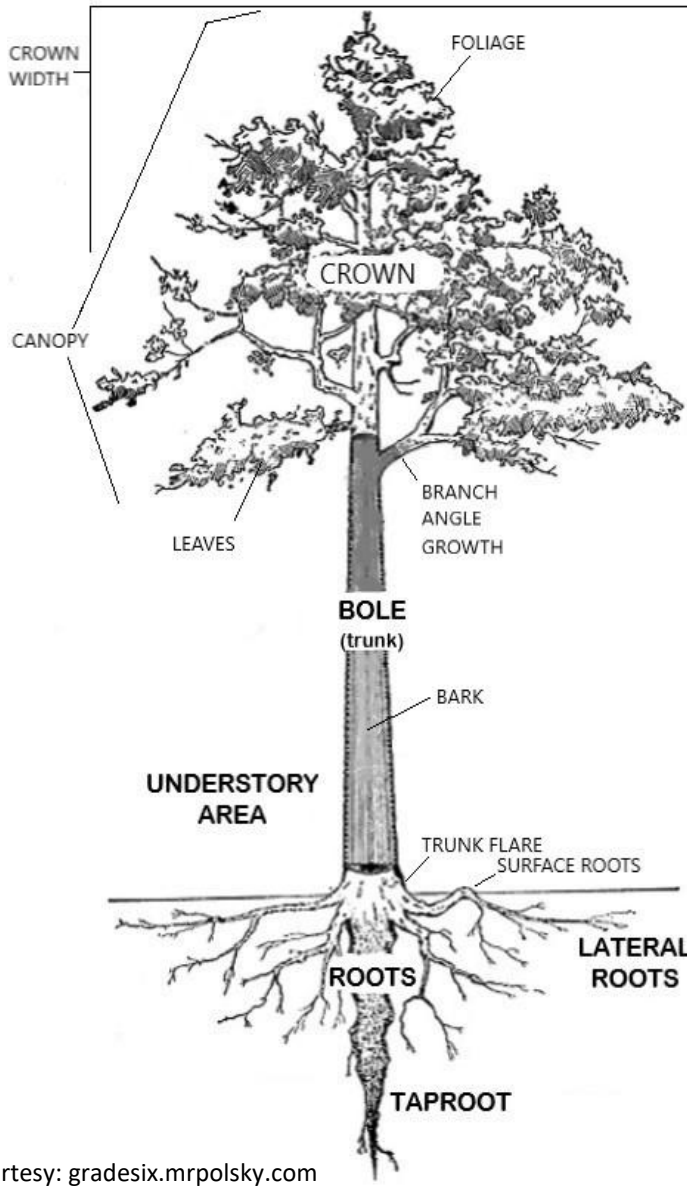
> "*The classification and naming of organisms in an ordered system that is intended to indicate natural relationships, especially evolutionary relationships*."

I promise not to make you an expert on taxonomy. However, the material is rich in information communicating why we can tell the canopied-trees on Oak Island are not oaks. Normally, I would put much of this in a related appendix, but unlike some of the other appendices, this information is critical to putting it all together.

I offer a few pointers, so we stay together as we move forward in this new dialect! On the following page is an image of *Genus* species, "*Generic,"* with the Common Name – 'Everyday Tree.' The diagram names some of the more important parts we will be discussing as we distinguish species. The crown of our tree is also called a 'canopy.' The shape of the crown is an important factor in identifying a species, although there are certain impacts that can impinge on the shape of any tree you may find. The bole, or trunk is the section cut from a tree for lumber and is the location of the bark that also helps to identify a tree. The glossary in the back has other terms that you will come across throughout this book.

There are certain tree species we basically recognize from their shape. Like a Willow Tree (*Salix alba*), or an Italian Cypress (*Cupressus sempervirens*), or a Douglas Fir (*Pseudotsuga menziesii*) for our Christmas Tree selection. Surprisingly, the Douglas Fir is neither a true Fir, Pine, or Spruce! Yet we see them. We know

somewhat about them, or we played within them. They are trees we '**recognize.**' Which is why we are here in the first place – *we don't recognize the species of those canopied-trees.*



Courtesy: gradesix.mrpolsky.com

At this juncture, we no longer have access to those canopied-trees to answer their species to a definitive degree without DNA testing. So how do we get to the answer from here with the level of certitude that can end this question and allowing us to move on to solving the legend? The answer is buried in allot of multisyllabic words which will stunt your growth, as they say.

Plants and trees grow in a somewhat predictable and relatively similar fashion throughout the world, time after time, season after season. There are many mutations, variants, and occurrences that effect how plants grow as well. However, you can usually spot a willow as a willow. As for tree species, the outer shape of the crown is a primary criterion for species identification. Especially so when trees have grown in isolation and not within a stand, a grove, or a forest. When growing in the open, this outer shape is associated with genetically fixed, species-dependent factors like the branching angles, and the way the tree grows its leaves (phyllotaxy). More generally, the developmental characteristics of the branching architecture, known as the "architectural model" of the species, informs us of what we are seeing. But crown shapes are also affected by environmental growth conditions (in a genetic-dependent manner). Trees will grow differently if they are isolated or in a forest, as well as if they are subject to climatic stress like wind, ice, or snow cover. The most severe of these growth changes are called, "Krummholz."

These are trees stunted due to ice, severe and chronic winds, and frequent salt spray exposure. Newfoundland has embraced this tree deformity with a national name of *Tuckamore*.

Limber Pine, NPS - Public Domain

Plants and trees have developed different tropisms (Definition: *effects on growth*). In particular, they re-orient the growth of their branches towards light (phototropism) or upwards (gravitropism or geotropism). How these tropisms affect the shape of a tree is being better understood.

In our case tropisms are defined as the re-orientation of a growing branch following cues from the environment. The two tropisms most affecting trees outside of weathering are:

1. *Phototropism,* leading growth toward light, and
2. *Gravitropism*, driving the direction due to earths gravitational pull.

Here is additional undecipherable verbiage to help stunt your growth but help you understand all the fascinating things trees do to live as we see them do. The last three lines say it best…

> *"The first mechanism is due to lateral sensing of the spectral signature of the light reflected by neighboring plants, through the phytochrome pigment. This sensing results in a photomorphogenetic synchronization of the growth in length of the neighboring stems, keeping the top of the canopy flat. The second mechanism involves the sensing of wind-induced strains. Whenever a shoot over-reach its neighbors, it is not sheltered by the canopy anymore and its growth speed is reduced until the front is flat again. It has been shown nicely in herbaceous populations of shoots that these two mechanisms are responsible for the flattening tendency of canopy tops, as dramatically illustrated by the flatness of the top surface of crops such as wheat or corn."*

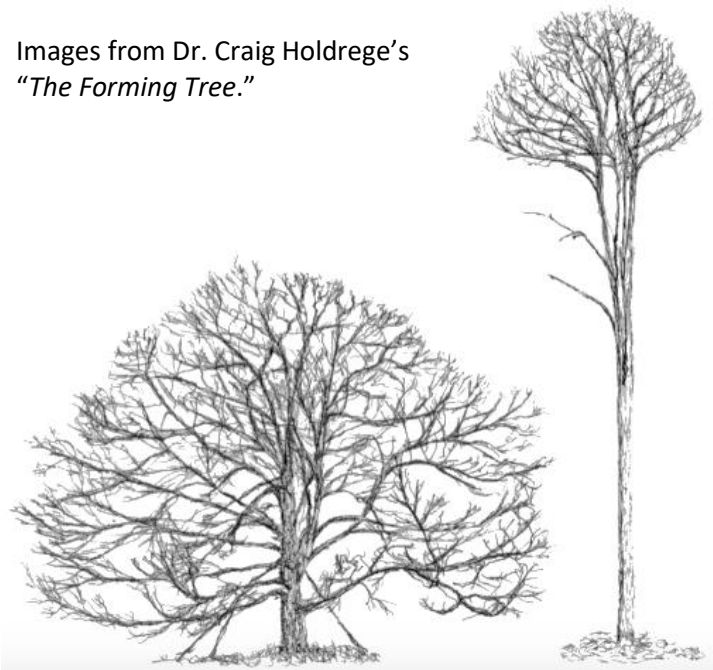
Extracted from "Tree Crowns Grow into Self-similar Shapes controlled by Gravity and Light Sensing," by Laurent Duchemin, et. al., Royal Society Interface HAL, 2018. Page 2.

Shape Shifting Forests

Most tree species display their characteristic and heritable crown shapes during some stages and most often when trees have grown in isolation. Yet again, crown shape is remarkably varied with the environmental plasticity (phenotypicplasticity) [change]: trees grow differently if they are isolated in full sunlight, or in a forest or if they are submitted to wind or protected from it. A study of the Maritime Pine for example, one of our candidates, shows it to have a rapid gravitropic response of >30 degrees. This shows they are some of the best shape-shifters.

In a more understandable primer, Dr. Craig Holdrege in 2005, wrote "*The Forming Tree*", which illustrates the specific tropisms discussed here. I have added it as an attachment to this book.

Images from Dr. Craig Holdrege's "*The Forming Tree*."



Here, *Quercus alba* (White Oak) as seen living free-standing on the left, or in a forest on the right.

In discussing tree species crowns, botanists and biologists have generalized the shapes of those crowns into six basic groupings common in trees:

1. Columnar Shaped Trees

- Tall and very thin, with upright branches. Their vertical shape adds height and also provides great screening without taking up much room.

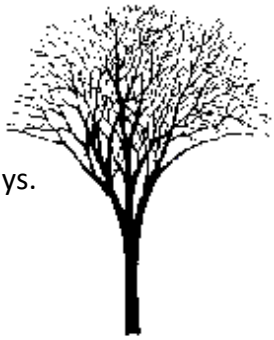
Examples: *Italian Cypress, Pyramid Oak, Lombardy Poplar*

2. Pyramidal or Conical Shaped Trees

- Classic Christmas Tree shapes, Wider at bottom with main center trunk, horizontal branches. Classical pyramidal trees but also applying to deciduous trees as well.

Examples: *Blue Spruce, Fraser Fir, Pin Oak, Western Red Cedar*

3. Vase Shaped Trees



- Like a vase, they have a central trunk that branches into an upright, arching shape, widest at the top. Offers shade and headroom, Perfect for lining walkways.

Examples: *Crape Myrtle, American Elm, Kwanzan Cherry*

4. Round or Oval Shaped Trees

- Upright trees, with a central strong trunk that branches into a dense round or oval-shaped crown. Strong shade trees with dense foliage concealing branches.

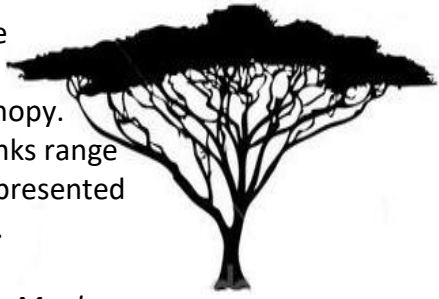
Examples: *Sugar Maple,*
Bradford Pear,
White Ash, Sourwood

5. Weeping Shaped Trees

- Flexible, long branches that hang down and may even touch the ground. Making excellent accent trees, their shapes often are irregular and dramatic.

Examples: *Weeping Willow,*
Weeping Cherry,
Weeping Mulberry

6. Umbrella Shaped Trees



- Umbrella-shaped trees have fairly high branches spread wide to make an umbrella canopy. Open view of understory, trunks range in thickness but the crown is presented as a thinner or horizontal top.

Examples: *Acacia,*
Cutleaf Japanese Maple,
Palo Verde

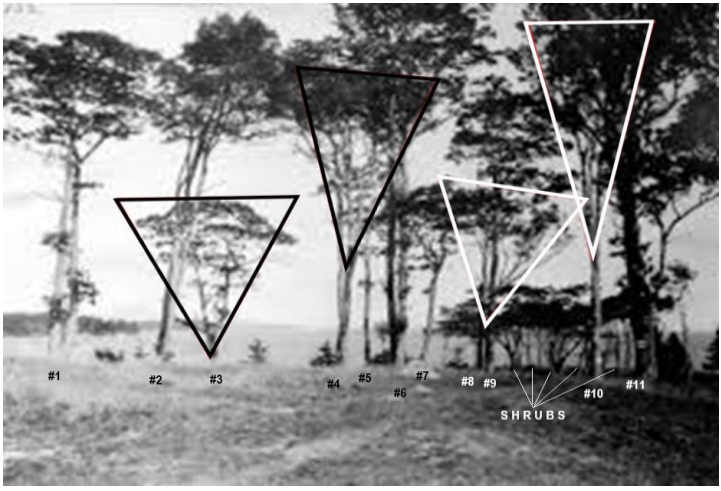
All tree shapes seen here, courtesy of IStock.com

Isaac's Point at Smith's Cove. Courtesy of Nova Scotia National Archives

Our Oak Island mystery trees would fall under "*Umbrella Shaped Trees*" for their characteristic and heritable crown shape. This is unlike the Northern Red Oak, Southern Live Oak, or Burr Oak, which clearly, as a mature tree there is no denying their crown shape. Yet we have photographic evidence that juvenile generations of these trees start off as a vase-shaped bush. A Sapling is a tree that is less than four feet tall and has a trunk diameter of 1-5 inches. I get hung up with that term as to me it implies the tree is just a foot or two tall. Juvenile is a term that also represents a sapling tree.

In the photo on the opposite side we see successional juvenile trees growing into maturity amongst some saplings. Though the view is from the top of the beach embankment level with the Money Pit, you can see some of those taller trees are growing beyond the ridge, closer to the water. You can even see peeking above the ridge the tops of shorter Spruce or conifers, also growing nearer the shoreline. Yet in this image we see many of the canopied-trees in a more vase-like shape. Counting from left to right, we see trees #3, #4, #8, and #10 to have selected the 2-limb branching characteristic of the mature canopied-tree. Also in this photo we have a grouping of true saplings that represent the future growth rotation for our lofty mystery trees. Unfortunately, we now can

see the reason for the canopied-trees demise. As mining operations spread and larger areas of Lots #17, #18, #19, and #20 are cleared for grazing, these shrubs are cleared out and in so doing, effectuate the start to the end of the line for these trees.



The enhanced image below examines the dense shrubbery of as many as seven saplings (shrubs) of our canopied-tree, hoping to reach overstory like their taller brethren. Courtesy of the Bowdoin Expedition, Nova Scotia National Archives.

"In nature, nothing is perfect, and everything is perfect.
Trees can be contorted, bent in weird ways,
and they're still beautiful"
– Alice Walker

Blowin' In the Wind

Weather tropisms can be seen impacting tree growth. These morphologies are especially seen on trees located on the exposed outer edges of tree stands and groves or if the tree is growing alone and unprotected. The photo below shows those mystery canopied-trees are growing on an extremely exposed, raised beach on the thin peninsula called Isaac's Point. The peninsula is less than 75 ft. across. The aerial photo view of Isaac's Point as it was in the 1920's. The canopied-trees we are discussing are circled.

I count approximately 11-12 trees. Most have died and are now snags - *dead, upright trees*. Several are still alive and show their canopy. The image is taken from a southeasterly to westerly view.

Southeastern end of Oak Island. Courtesy oakislandsociety.ca

What little photographic evidence existing shows their growth only in the trunk, mouth, and face of our Dumbo drumlin, and nowhere else on the island. And in this section of the drumlin, they are exposed to wind, salt mist, and extreme weather. They can also be seen from quite a distance out in Mahone Bay.

Below: Exposed White Birch trees on the outside edge of a grove of trees behind the roadway. The trees are overlooking the Atlantic Ocean from Corney Brook in Cape Breton Highlands National Park. Tree species have been verified by Park Ecologist at Ingonish Beach, NS, Canada. See Appendix C, "*On the Record*," item #76. These crowns are dissimilar to those on Oak Island, but they grow in similar weather conditions.

Corney Brook Park, circa 1950s. Courtesy Nova Scotia National Archives

Though taken at different times, the photos show the understory growth. The bottom photo shows line marks identifying where the first branching is seen on these trees. Unlike any other Oak when not in a thick stand.

All images Courtesy Nova Scotia National Archives

Let's review the Burr Oak, Northern Red Oak, and the Southern Live Oak which were the species of trees most thought to be those mystery canopied-trees on Oak Island. Do they meet the minimum examination requirements to be those trees?

Oaks Out On a Limb

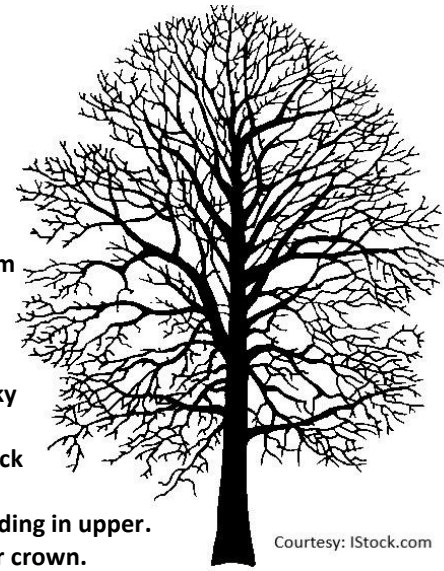
This chart compares the taxonomic characteristics between the Northern Red Oak (T-1), the Burr Oak (T-2), the Southern Live Oak (T-3), and those identified by arborists for the mystery canopied-trees on Oak Island (T-4). See how they compare.

Taxonomic Characteristics of Tree Species	T-1	T-2	T-3	T-4
DECIDUOUS	●	●		?
EVERGREEN			●	
UMBRELLA-SHAPED CROWN, EXPOSED ENVIRONMENT				●
ROUNDED-SHAPED CROWN, EXPOSED ENVIRONMENT	●	●		
SPREADING/OPEN-SHAPED CROWN, EXPOSED ENVIRONMENT			●	
MATURE BARK, DARK, FURROWED, RIDGES, FURROWS	●	●	●	
STOUT BRANCH ANGLES, ALMOST HORIZONTAL TO TRUNK	●	●	●	
SINUOUS LIMBS			●	●
ENVIRONMENT-EXPOSED BRANCHES ALL ALONG BOLE/TRUNK	●	●	●	
KNOWN TO PRODUCE ACORNS	●	●	●	
KNOWN TO PRODUCE OTHER PRODUCTS*	●	●	●	
EXPOSED ENVIRONMENT HEIGHT OVER 80 FT.				●
SURVIVE NOVA SCOTIA MARITIME CLIMATE	●	●		●
THIN CURVY TRUNK				●
STRAIGHT AND TALL TRUNK	●			
THICK, STOUT, AND SHORT TRUNK		●	●	
ALLOWS HEAVILY ACTIVE UNDERSTORY				●
LARGE LEAVES	●	●		
TOLERANT TO SOIL SALTS	●		●	●
TOLERANT TO SALT SPRAY OR MIST			●	●
TOLERANT TO FLOODING			●	●

*catkins, samaras, cones, etc.

T-1 = Northern Red Oak (*Quercus rubra*)
T-2 = Burr Oak (*Quercus macrocarpa*)
T-3 = Southern Live Oak (*Quercus virginiana*)
T-4 = Mystery canopied-tree (not *Quercus*) .

Burr Oak (relating to the NEAF)


Courtesy: IStock.com

Latin Name: ***Quercus macrocarpa***
Season: **DECIDUOUS**
Maximum Height: **29m**
Common Height: **12-18m**
Crown Shape: **Rounded or Oval**
Crown Spread: **+40'**
Overall Description: **Small to medium**
Trunk: **Straight and tall.**
Trunk Size: **Less than 60-80cm.**
Bark Color: **Very dark to dark grey.**
Bark Characteristics: **Attractive corky texture, becomes rough and deeply furrowed with ridges broken into thick irregular scales.**
Branches: **Principle branches ascending in upper crown, nearly horizontal in the lower crown.**
Foliage: **Glossy lobed large leaves up to 15-26cm long, with pale hairy underside.**
Foliage Winter Color: **Coppery bronze, yellow, brown.**
Fruit Description: **Acorns 1.5 to 3cm long, deep cup covering 2/3 of the acorn. Cup has a bristle fringe around upper edge.**
Age Range: **Up to 200 years old.**
Hardiness: **Hardiest of oak species, very slow to grow.**
Root System: **Wide-spreading and considerably deep taproot.**
Notes: **Native from Nova Scotia to Manitoba. If grown in shallow soil, tree becomes much smaller with a twisted trunk and gnarled branches.**

Source: United States Department of Agriculture, Natural Resources Conservation Service. Bur Oak – Plant Fact Sheet

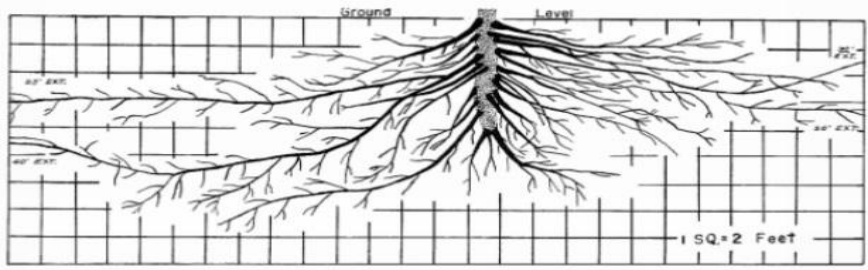


Fig. 4. Bur oak: 80 years, 20 feet tall, water table 50 feet, Peorian and Loveland loess, Nance County. The rate of lateral root growth in older trees is greater than the rate of depth penetration. Root depth, 16 feet; lateral spread, 72 feet (d/s = 0.21).

As we have shown in the NEAF research, Burr Oak represented 3% of the range and population within our area of interest. It was heavily harvested for its 'white oak wood,' to the point where it is threatened with extirpation as a native species today. The Burr Oak is majestic and when in the open, this massive tree is used as a windbreak and part of shelterbelts to protect other trees.

Pictured below, subject to strong winds blowing across this massive field, this Burr Oak can demonstrate its scale and morphological changes for survival compared to mystery trees of Oak Island.

Courtesy: Missouri Division of Conservation.

This deciduous tree is neither salt spray tolerant nor tolerant of flooding and would not find Isaac's Point exposure on Oak Island a place to live its potential life span of +200 years. Notice the wind morphology on the above mature tree. Do you see a similar morphology with those canopied trees on Oak Island? Definitely not.

Northern Red Oak (relating to the NEAF)


Courtesy: IStock.com

Latin Name: ***Quercus rubra***
Season: **DECIDUOUS**
Maximum Height: **85ft**
Common Height: **55-75ft**
Crown Shape: **Round or Oval shaped.**
Crown Spread: **Outside forest a 60-75ft spread.**
Overall Description: **Medium to large & sturdy inside forest grows tall columnar bole with small, rounded head. Symmetrical.**
Trunk: **Straight and tall.**
Trunk Size: **35-75cm diameter.**
Bark Color: **From greenish brown to dark brown to dark gray at maturity.**
Bark Characteristics: **Broken into ridges with shiny stripe at center which extends thru the length of the trunk. Heavily fissured. Inner bark orange/yellow.**
Branches: **Stout branches arranged at right angles to the main stem, thick twigs, reddish to greenish brown with hairs.**
Foliage: **Dull, dark green with 7-11 bristle-tipped lobes, yellow-green underneath.**
Foliage Winter Color: **Russet-red to bright red.**
Fruit Description: **Acorns are medium brown, ¾ to 1 inch long, barrel-shaped, with thin, flat cap appressed scales barely enclosing ¼ of the nut.**
Age Range: **150-175 years old.**
Hardiness: **Medium shade tolerance, moderate to fast growing in variety of soils and topography, often forming pure stands.**
Root System: **18" from ground level and require obstacle-free space under the ground, but two oaks of same species can share a common root system. Deep spreading lateral roots spread to 3-7 times the trees crown diameter, with a tap root. Need much space above and below ground.**
Notes: **Native to Nova Scotia. Moderately Tolerant soil salt, intolerant to salt spray. Wood is more porous and not as durable in moist sites. Intolerant to flooding.**

Source: Forest Ecosystem Classification for Nova Scotia: Vegetation types (2010) Baker Settlement, Lunenburg County. *and* **TH6. Shade and Flood Tolerance of Trees, 9-2005, University of Tennessee Agricultural Extension Service.**

The Northern Red Oak has become the “default” species to vie for the coveted “mystery canopied tree” of Oak Island. Not only a native Canadian oak, but one that has members growing on Oak Island today. The claim of a ”*Dense Growth*” of ‘Oaks’ had heralded this island as the destination it would become. Back in 1776, locals resoundingly rejected ‘Gloucester Island’ and chose to name the island after those purported oaks. Yet none of the existing *Quercus rubra* trees on Oak Island were alive until as much as 100 years after the Money Pit was discovered. Nor do they “tower” over the forest canopy in any way. Some claim the current Northern Red Oaks on the island are “old growth,” a definition for any tree over 150 years old. However, the aerial photograph taken in 1920, on page 9 shows much of the eastern island drumlin had been cleared for agriculture and livestock.

Northern Red Oak tree in open field, Northern New York State.
Courtesy of the American Forestry Institute.

There is little comparison between a Northern Red Oak growing in an exposed location and those canopied trees on Oak Island.

Below is a 1945 aerial view of most of the islands' western drumlin, depicting a heavily cleared portion for farming. See below.

Oak Island. Courtesy Information Services Fond, NS National Archives.

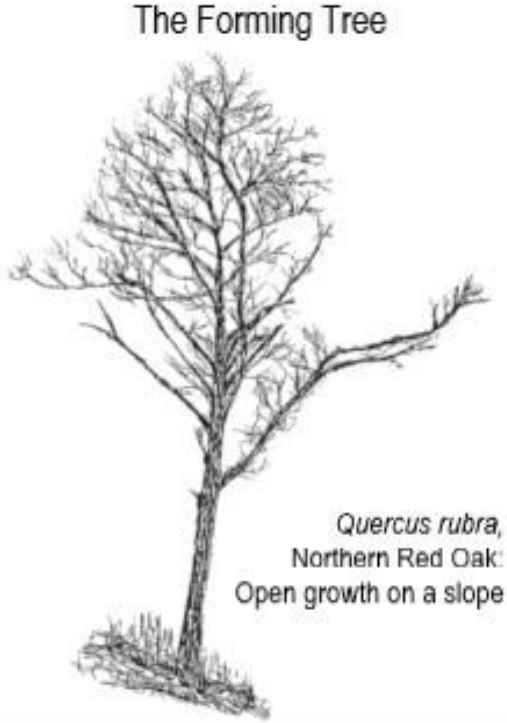
Nowhere else on Oak Island were trees found similar to those that grew on Isaac's Point. The bulk, if not all the Northern Red Oak species currently grow on Lot #5 far from the risk of salt spray, flooding, or cold winds. The owner of that lot is proud of his stand of 28 Red Oaks and is a firm believer they are the remnants of the dominating oak trees for which the island was named as well as the species of the canopied trees on Isaac's Point. Review the photograph taken of the island from the mainland, on page 1, Chapter #1, *"Getting Logged In."* It clearly depicts the mystery canopied trees on Isaac's Point and Smith's Cove area as dominating the skyline above the island canopy cover. This is what the locals saw when they gazed over at Oak Island. This is why they renamed the island in 1776. None of the known Northern Red Oak Trees on Lot #5 tower over the forest canopy like those on Isaac's Point. Default species or not, *Quercus rubra* is not our tree.

The Northern Red Oak is not an evergreen, as most have acknowledged those canopied trees on Oak Island seem to have been. Nor has anyone written any commentary about their visually

vibrant red autumn foliage waving in the winds of Mahone Bay. The Northern Red Oak would have quickly succumbed to the salty ocean mist which it is intolerant of; and surely, they would have been hacked down by amateur and professional lumbermen sailing '*to and fro,'* looking exactly for such victims.

Quercus rubra is Intolerant of flooding, which would happen several times a year during hurricanes, gales, and extreme high tide occurrences. No photos, comments, or notations of Red Oak catkins or abundant acorns are written about. Even the poor quality photographic evidence shows light colored bark, where these oaks would have dark brown to dark grey and heavily fissured bark. Northern Red Oak trees would be fenced off from the roaming island grazers such as cattle, sheep, and horses so as not to ingest unripe acorns and be sickened or die of tannin poisoning. Photographs of the area show fencing only around the mining operation and immediate surrounding work areas. No livestock fencing can be seen, and eyewitness accounts notated by Mildred Restall reveal cattle were allowed to roam under those canopied-trees of Oak Island - *day and night*.

Even exposed to the extreme weather conditions and open growth, the Red Oak is simply not a viable candidate to be the mystery canopied-tree species.

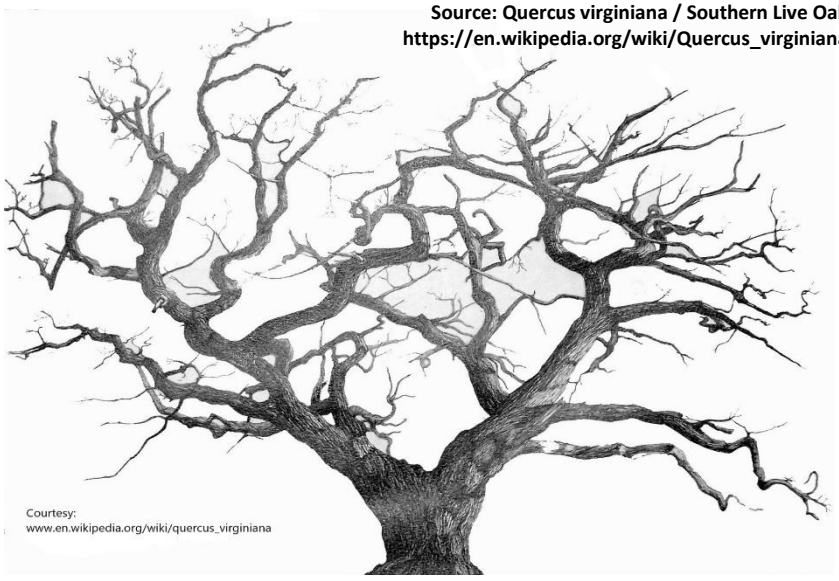


Courtesy:
Dr. Craig Holdrege

Southern Live Oak (unrelated to the NEAF)

Latin Name: ***Quercus virginiana*** Season: **EVERGREEN**
Maximum Height: **60-65 ft** Common Height: **50-60 ft**
Crown Shape: **Spreading /Open Shaped.** Trunk Size: **6-7 ft diameter**
Trunk: **Thick, stout, and short.** Age Range: **400-1000 years old.**
Crown Spread: **Outside forest – 120ft spread.**
Foliage Color: **lighter green with new growth**
Overall Description: **large & massive, with thick, strong sinuous branches.**
Bark Color & Characteristics: **Dark gray, thick, and furrowed longitudinally.**
Branches: **Limb spread can be up to 27m, typical open-grown branches with lower limbs often sweep down towards the ground, again curving up. Limbs can grow at severe angles.**
Foliage: **Stiff and leathery, with tops shiny dark green and bottoms pale gray.**
Fruit Description: **Acorns are small 1-2.5cm, oblong, shiny and tan-brown to nearly black, often with black tips. Smallest of *Quercus* acorns.**
Hardiness: **Reliably hardy, prefer acidic loam but can grow alkaline soils, sand, or clay, wet or well-drained soils, and are tolerant of aerosol salt along coastal areas. They resist strong winds and are drought tolerant once established.**
Root System: **Deep taproot that anchors it, Developing extensive and widespread root system.**
Notes: **Not known for growing north of Maryland or Tennessee. Does enjoy coastal regions, tend to survive fires as their dense cover strongly discourages growth of any flammable understory. Can withstand floods and hurricanes.**

Source: Quercus virginiana / Southern Live Oak
https://en.wikipedia.org/wiki/Quercus_virginiana



The Southern Live Oak (SLO) is included in this review for the sole reason that many of the noted commentators so declared them to be our mystery canopied trees. The farthest-north a known mature SLO was found in Baltimore, Maryland. Though similar looking to a Burr Oak, Live Oak biology and physical characteristics clearly eliminate it as a contender for serious consideration, even when examining harsh wind morphology along the coastal United States. Below is a photograph taken of a very old SLO on the Gulf Coast in Aransas National Wildlife Refuge in Texas.

Clearly, the Southern Live Oak *(Quercus virginiana)* manages all the tropisms and deals with all the weather conditions we discuss in Appendix G, "*Dendro Disguised*." We see none of the dramatic impact and morphologic changes we would need to see in those old images had a true 'Live Oak' been the mystery canopied tree of Oak Island. Again, as with most oaks, the SLO is replete with tannins which make its wood undesirable to carpenter ant infestation but would also cause its leaves to poison vascular plants, saplings, chutes, and other life within its canopy biome. This argues against the photographic evidence of those canopied trees on the island around Smith's Cove and Isaac's Point. In those photos we see a multitude of conifers growing throughout and

underneath them and cattle allowed to freely roam amongst them. The erected fences only deter the ox, cattle, horses, goats and other grazers or forager, from entering the mining operation area.

As an anecdotal side note: Both the Burr Oak and the SLO resemble the description told of at least one of the potentially three large oaks growing around the depression when it was discovered. As you examine those pictures – do you really suppose either species was so close to the 13 ft diameter pit? Did the original diggers not need to lop off most of the tree just so they could haul up, sort boulders from dirt, and commence their operations? What about the amazing tangle of roots? Were the roots not supposed to grow back when our Three adventurers sauntered their way back down 30 ft into the pit in 1795? And three large oak trees - all within 13 ft of each other; just cranking out acorns for decades or even centuries. The evidence is obvious once you step back and know what these trees do, how they live, and what their environment is. Or so It seems clear to me.

Old Nova Scotia Northern Red Oak

I suppose in this case, the Centre is well named.

Above: Teresa Henshaw sits beneath the oak tree located in front of Oakdene Centre in Bear River, N.S. Below: Teresa measures the rare red oak tree, which is suspected to pre-date the community.

Courtesy:
Nova Scotia
National Archives