Friends of Forest Hill Park

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Ecology of Oaks: Part 2

Chris Catanzaro

This is the second of four articles related to the book *The Nature of Oaks: The Rich Ecology of Our Most Essential Native Trees*, by Douglas Tallamy, 2021, Timber Press, ISBN 9781643260440 (hardcover). This article covers the months of January through March. Dr. Tallamy is a well-known entomologist at the University of Delaware. Our intent mirrors that of Dr. Tallamy--to stimulate further interest in ecological interactions in nature by describing interactions between oaks and animal species, and to provide landscaping tips for better management of oaks and other native species. If you would like to borrow this book or other Good Reads for the Watershed, you can do so as a service of Reedy Creek Coalition. Visit https://reedycreekcoalition.org/good-reads-for-the-watershed-2/

Over millennia, caterpillars in North America have evolved to eat only a few native species of plants. These specialists include hundreds of species of native larvae of Lepidoptera (moth and butterfly species) found on oaks, and collectively they comprise over half of plant-eating insects in the U.S. Thus, oaks are a keystone or "powerhouse" collection of species driving biodiversity. Oaks are large, long-lived trees, with many species found over sizable portions of North America and other continents. However, as tree populations decline, including those of oaks, so do populations of insects and birds.

January: All insect-eating birds are supported by oaks more so than any other native genus of trees. Most songbirds in North America eat insects, especially when fledging their young, and many native insects, including Lepidoptera, have evolved to live on and under oaks. Lepidoptera make up over half of plant-eating insects in the U.S. Even chickadees, which consume primarily seed and grains (granivores), supplement their diet with insects over the winter. Some birds eat only insects and spiders; if they eat only these small creatures, they must eat a lot of them to survive cold January days and nights.

> Some insects are out during winter? Yes. Many moths overwinter as larvae (inchworms or caterpillars) in the bare branches of trees, especially oaks. How do they survive the cold? They produce glycerin, an antifreeze!

Tallamy's research has shown that native plant species support native insect populations much more so than nonnative plants do. In another of Tallamy's books, *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants,* he lists native oaks, willows, cherries and birches as having the ability to support copious numbers of native Lepidoptera species (over 400 species supported by each tree group). Painstaking research has also revealed vast differences among native plants in their ability to support native insects. For example, tulip poplar supports just 20 species of Lepidoptera. Yet, tulip poplar supports 20 more native species than commonly used nonnative plants like camellias, which support none.

February: This month is great for planning, so Tallamy offers advice on tree selection and planting. He encourages selecting smaller trees to purchase and plant on your property when you have a choice of sizes. Research has shown that trees smaller at the time of planting establish themselves more quickly than larger ones, and they may quickly surpass the size of those trees that are larger when planted. Homeowners are also encouraged to plant trees in groups rather than singly. Grouping may reduce their size somewhat and enable their roots to intertwine, thereby reducing the chances of treefall, especially with shallow-rooted species.

Even small yards can accommodate certain species of oaks. For example, dwarf chinkapin oak (*Quercus prinoides*) is a small oak native to the eastern and central U.S. (Fig. 1). It's an understory tree, as are dogwood and eastern redbud. Research has shown that a multilayered canopy, to include understory trees and shrubs, is needed to sustain a diverse population of insects and birds.

Figure 1. Dwarf chinkapin oak (*Quercus prinoides*), a fast-growing species of native oak maturing at a height of 20 feet or less. It serves as a food source for mammals and birds, and host to imperial moth, several species of hairstreak, and other species of Lepidoptera. From: Arnold Arboretum, Daderot Public Domain Mark 1.0

March: Most people don't realize that much more life exists under the canopy of oak trees than on or in them. Not only native moths and butterflies depend on oaks, but also katydids, walking sticks, tree crickets, lace bugs, cicadas, planthoppers, treehoppers and gall wasps. The biodiversity related to oaks also includes mammals, birds, and the tiny creatures in the leaf litter whose counts are in the millions. These insects, arachnids, mollusks, nematodes, centipedes, millipedes, fungi, bacteria and other organisms "together form a complex community of decomposers and their predators." Appreciation for this food web and the services these organisms provide has, in recent years, led to the expression "leave the leaves." Decomposers break down dead plant tissues and their complex molecules such as cellulose, releasing and recycling nutrients essential for future life.

Oak leaf litter (Fig. 2) supports decomposers better than other types of litter, but why?

The decomposition of oak leaf litter is slowed by the presence of lignins and tannins in the leaves, and so it takes several years for oak leaves to break down completely. Since a new supply of oak leaf litter is provided every fall, a continuous supply of litter is created if left undisturbed.

Leaf litter provides the housing, food and humidity required by decomposers. Furthermore, it protects soil from erosion and enhances soil properties as it breaks down. It has also been found to deter invasive species, improve water infiltration, purify water, stabilize water flow in streams, reduce streambank erosion, and protect the health of aquatic communities of insects, crustaceans and fish. The benefits we can trace back to oaks go on and on . . .

Look for more information on the ecology of oaks in our next newsletter issue. Meanwhile, "leaves the leaves" if they aren't smothering your plants. Since fallen leaves are a resource, when you rake them, move them elsewhere on your property to decompose instead of sending them to the landfill, which wastes energy, landfill space, and organic matter. Where possible, "leave the leaves."

Figure 2. Oak leaf litter decomposes slowly on land and in water, providing many ecological benefits related to decomposers, soil quality and water quality. Photo by Rich Renomeron. Some rights reserved.

A Wonder of Nature-Luna Moth

Pat Wood

The Luna Moth (*Actias luna*) thrives in eastern North America, including a large portion of southeastern Canada and as far west as Texas. Luna moths are visually impressive with their 3 to 4 ½ inch wingspan, long tails and seafoam green and yellow coloring. Their name is derived from Luna, the Roman moon goddess. Luna moths are saturnian moths predominately active at night, but daylight sightings do occur.

The visible differences between males and females are few. Females have slender fuzzy antennae. Males have feathery antennae. Males have a tendency to be smaller than females and are a lighter shade of green.

Luna Moth Caterpillar

Luna moth caterpillars are lime green with a series of yellow lines and red-orange spots running down both sides. Their sustenance is tree foliage; alder, birch, beech, red maple, white oak, wild cherry, hazelnut, hickory, pecan, walnut, persimmon, sweetgum, willows, and smooth sumac. In the south, the caterpillars prefer hickories, walnut, persimmon and sweet gum. Caterpillars of the Luna moth molt five times during a three-week span prior to selecting a plant on which to spin a cocoon. The cocoon containing the pupa is spun in a tree over a 2–3-week period and later falls to the ground where it is camouflaged among leaf litter and safe from harsh weather conditions.

Adult Luna moths emerge from their cocoons during morning hours and climb to a secure place where they can expand and dry their wings. Luna moths have a lifespan of one week. Males use the time to fly long distances, if necessary, to mate. Once females lay eggs, they die.

The list of Luna moth predators is long: owls, bats, bald-face hornets, parasitic wasps, and fiery searcher ground beetles view the beautiful Luna moths as tasty morsels. The location of Luna moth eyespots on its wings confuses predators and leads them to attack a less vulnerable part of the body. The head is well hidden, causing a predator to attack one of the sweeping tails which results in the survival of the moth. Although bats are very skilled at hunting Luna moths, the moths use their long hindwing tails to disrupt echolocation used by bats when they're hunting. Even Luna moth caterpillars have defense mechanisms. They make a clicking noise with their mandibles as they raise up the front part of their bodies. Next, they regurgitate a distasteful fluid as an additional warning.

Luna moths are not officially endangered, but their numbers are decreasing. Issues that contribute to Luna moth rarity are habitat degradation, light pollution and the accumulation of pesticides in the environment. If you're out and about at night, remember to be on the lookout for this wonder of nature and maybe you will catch a glimpse if you're lucky.

A Field Guide to Moths of Eastern North America by Charles V. Covell, Jr. ISBN1884549217
Caterpillars of Eastern North America by David L. Wagner ISBN 0691121435

Popular Roaring Twenties Desserts

One hundred years ago, pin striped suits and beaded flapper dresses were in vogue. It was prior to the Great Depression and ice boxes were being replaced by electric refrigerators in most households. The availability of refrigeration affected food storage and meal components, resulting in new recipes and dishes. These century old desserts have survived the test of time:

Pineapple Upside Down Cake

The Dole company began packaging canned pineapple in Honolulu, Hawaii during the early 1900s. By the 1920s, canned pineapple was in many pantries. Using the skillet cake method, pineapple upside down cake was created. Another new product, syrup-packed maraschino cherries, was used in the cakes.

Neapolitan Ice Cream

Ice cream was hundreds of years old by the 1920s, but thanks to refrigeration in households, it became a regular dessert. The popular Neapolitan flavor is thought to have been brought to the United States by immigrants from Naples, hence the name. The result of molding strawberry, vanilla and chocolate together is a representation of the Italian flag.

Fruit Cocktail

During Prohibition, consumption of alcoholic beverages was illegal. Restaurants had a supply of cocktail glasses, which had become useless. Some creative chefs began offering a sweet fruit mixture in the glasses and named their creation fruit "cocktail." By the 1930s, Del Monte was selling canned fruit cocktail to households, businesses and military bases.

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Spring Classic

The fourth annual **Spring Classic Bike Race** will take place **April 21st** (rain date April 28th.)

Mark your calendars and plan to join us for fresh air and family fun.

Details will be forthcoming.