



Species Spotlight The Oaks

Quercus spp.



It's hard to talk about oak trees without slipping into tales of myth and legend. Oaks appear so often in the story of humanity that it could scarcely have been written without them - literally. From as early as the 4th century, ink in much of the world was made from oak galls, or "oak apples", formed when a wasp's eggs are laid in oak leaves. For thousands of years, peoples across North America, Asia, North Africa, and Europe relied on acorns as an important food source. A sacred symbol of strength and endurance for ancient Druids, Greeks, Romans, Celts, Slavs, and Vikings, it was the mystical link between earth and the heavens and was venerated above all other trees. Ancient kings wore crowns of oak leaves and successfully returning Roman commanders received oak-leaf crowns on victory parades. Even today, oak leaves are used as decorative symbols for many military ranks and awards around the world.

Best for Boats and Barrels

White oak, and it's near-equivalent in Europe - the English oak are famous for their use in ship-building. They have a closed-grain wood, rich with tannins and cells filled with natural plastic-like structures called tyloses. In nature, this gives them resistance to water-loss and decay, and helps them retain nutrients and stay healthy during drought. For boat and ship builders, it means this wood is a perfect choice for their craft. A dugout canoe discovered in the spring of 2022 at the bottom of Wisconsin's Lake Mendota was carved from a single piece of white oak 14.5 feet long around 1,000 B.C.E. Archaeologists say this incredible 3,000 year-old vessel is the oldest canoe found in the Great Lakes region, by 1,000 years, and is the earliest yet direct evidence of water transportation there.

European shipbuilders found that English oak limbs often grew at just the right angles for ship frames. A trait master ship-builder Vikings took full advantage of. The hero of the U.S. fleet during the War of 1812 - the U.S.S. Constitution, "Old Ironsides" herself, was famously crafted from old-growth white oak.

Those water and rot-resistant qualities also makes white oak ideal for aging whisky and wine. The tannins slowly release over time, imparting a distinct character often described by connoisseurs as vanilla and licorice notes.

Stretching Across Time and Space

Over about 56 million years, oaks have evolved into roughly 435 species that grow on five continents, about 90 of which

are found in North America. A keystone species, they support more life-forms than any other North American tree genus including fungi, insects, birds and mammals. They can be incredibly long-lived. White oaks routinely live over 300 years and individuals in New Jersey and West Virginia both approached either side of 600 years. A southern live oak in Louisiana is estimated to be near 1,500 years old, and the oldest known living tree in Lithuania is an English oak approaching 2,000 years. All of these venerable oaks are still in their youth compared to the so-called Jurupa Oak in California however. Technically a colony of Palmer's oak clones, this organism has been estimated to be living for the past 13,000 years.

Acorn-ucopia

At risk of stating the obvious, oaks make a lot of acorns. A fully mature white oak can rain-down thousands of acorns each season, and about 3 million over its lifetime. Loaded with protein, fats, and carbohydrates they are a virtual superfood for many creatures of the forest. For

much of human history, acorns were an important part of our diet, and are still used for food in some parts of the world. The practice of actively eating acorns even has it's own word: balanophagy. In

fact, our ancestors have been eating acorns since well before we were human. Going back 600,000 years to the mid-Pleistocene there is evidence of our hominin ancestors dining on acorns.

If your family lineage traces back to anywhere in the northern hemisphere, it is likely your descend from a long line of proud acorn-eaters. Native America tribes would grind them into a flour used in a variety of meals. When leached and cooked, they have a bland, slightly nutty flavor. In what today is California, family groups gathered acorns in the fall making sure to leave some for woodland animals. Dried properly, surplus acorns could be stored in granaries for up to 4 years. Well into the 20th century, the Miwok culture of California still relied on acorns as a key staple of their diet.

The Johnny-Appleseed of Oaks

The ice-dominated Pleistocene was a geological epoch that lasted from about 2.5 million to 11,700 years ago.



Blue Jays plant thousands of acorns each year. Stan Lupo photo.



From left to right: Oaks are famously long-lived. The Stelmuže oak in Lithuania is ca. 2000 years old. Many bird species, like this Blackburnian Warbler fly thousands of miles in spring to feast on the caterpillars in oak tree canopies. A 3,000 year old white oak dugout cane is carefully cleaned by volunteers from the Ho-Chunk Nation and the Bad River Band of the Lake Superior Chippewa.

The glaciers plowed down any forests that may have existed over much of the northern hemisphere. After the ice retreated, surprisingly it was the oaks, a heavy seeded tree, that re-populated the land faster than the lighter, wind-dispersed-seed trees. How is that possible?

Enter: the Blue Jay - a bird that has a relationship with oaks that stretches back through millions of years of co-evolution. Not unlike Darwin's Finches, the bills of Blue Jays evolved with a special hook at the tip that works perfectly as an acorn husk opener. In fall, they harvest small acorns amid the tree-tops of oaks, and can carry 5 at a time over a mile away to individually bury for later. Blue jays are discerning acorn selectors. On a typical oak, only about 10% of acorns get pollinated and are fertile. Blue jays have been shown to select these viable nuts 90% of the time, greatly increasing the odds of them becoming an oak tree. A single Blue Jay can spread and bury up to 5,000 acorns a season at a depth just right for germination, but they only "remember" where 1 out of 4 of those were buried, which means they potentially plant thousands of oak trees a year. In this way, Blue Jays helped oak trees spread northward much faster after the ice retreated than they otherwise could have.

The Gerber of Baby Birds

Providing food (acorns, leaves, sap, etc), shelter, and habitat (from its canopy down to the leaf litter and root system below) countless birds, mammals, fungi, insects and spiders flourish under an oak's mighty limbs. Caterpillar species alone number almost 900 in U.S. oak forests. For comparison, the maple genus doesn't even reach 300 species of wrigglers. About 75% of insect and bird food comes from only few key genera and, no surprise, the oaks lead the list. Because caterpillars love oaks, so do birds. Healthy bird communities coincide directly with healthy insect populations. More than 9 out of every 10 terrestrial North American birds raise their young on insects, mostly caterpillars which are rich in fats and proteins. As one example, the Carolina

Chickadee requires a stunning 390 to 570 caterpillars per day to feed its clutch of 4 to 6 chicks in the 16 day time-span from when they hatch to when they fledge. If you want to help birds, plant oak trees.

When the Leaves Don't Leave

You have probably noticed that on many oak species, especially as young trees, the dead leaves stick around on the branches from fall up to spring. The phenomenon, known as marcescence, isn't fully understood, but as always some interesting theories have been offered. Animals that like to eat the buds of the next year's leaves, primarily deer and moose, could be a reason for this strategy. When surrounded by the dead leaves, it is harder for these bud-eaters to chomp one off without getting a mouthful of foul-tasting, indigestion inducing leaves. So it makes sense to have these leaves on the lower part of the tree, but why 20 feet or so up as well? The answer may lie in the fact that oaks have been around a long time, and have been dealing with plant grazers, often much larger than today's moose or deer, for millennia. For example, mastodons and giant sloths could likely reach as high as 18 feet up an oak tree.

Another marcescent leaf advantage may help oaks that grow in poor soils by catching more snow, and thus channeling more water to the roots. As spring arrives the leaves fall around the tree base creating a beneficial boost of nutrient-rich mulch at just the right time. The diversity and abundance of the little life forms that operate in leaf litter under an oak numbers in the many millions including detritovores (millipedes, springtails, woodlice, slugs, etc.) and fungi. Oak-leaf litter has even been shown to suppress fast-spreading invasives like Japanese stiltgrass and deter soil-eroding crazy snailworms.

For more information

- [Watch](#) how Viking longships were made using oak.
- Learn more about how you can [help birds](#) by planting oaks, and the ways [deer, worms, and invasives](#) are impacting our forests.