

OAK TREES OF THE NAPA VALLEY

Oak trees have been, and will always be, an important part of Napa Valley. This is because Napa's ecosystem is an oak savanna biome. The oak savanna biome is one of the largest terrestrial biomes in North America. It is very plentiful, and has an intricate web of symbiotic relations between plants, animals, and fungi.

Sadly, after the introduction of prune orchards and, soon to follow, the famous vineyards, the oak population plummeted. The good news: it is not too late to restore the oak population. Oak trees insure the health of the soil, and without healthy soil, vineyards cannot thrive. Tree roots increase permeability; the roots support a myriad of beneficial fungi, and leaf litter insures temperature control and moisture control. When trees die and fall, their enormous bodies act like a large vitamin for the soil as the tree decomposes. Without these trees, the soil becomes increasingly unhealthy. Therefore, it is truly in our best interest to protect these trees. Restoration is very necessary for Napa Valley, not only for human interest, but also for the many plants and animals the oak tree supports. Clearly, there are challenges due to the need to build, but with strategic planting, positive movements forward can be achieved. This is why I have been caring for a small sapling that I later intend to plant. I want to turn my words into action, starting with my artwork.

This painting is personal, especially since my family has lived in this valley since the 1800s. We have benefitted from these oak trees for generations. The painting style is inspired by that of local artists, like John Dodge. I also added the romantic charm of this valley. The mountain range depicts the view behind my grandparents' old ranch house. I have a personal connection with oak trees, and I think they are the most beautiful part of this valley.

Hannah

Oaks of the Napa Valley

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The Napa Valley is a very beautiful place, with some of the best wine grapes in the world. The unique and diverse soil here allows for plentiful, high quality crops to be grown here. The natural ecosystem and natural events are what have made this valley able to produce what it can and oak trees are a big part of it. The old growth oak of the valley provide a romantic, timeless atmosphere, and a beautiful aesthetic that people marvel at from all over the world. These oaks have also had a great impact on the land. They naturally maintain the soil, have provided food for past natives, and maintain a multitude of symbiotic relationships with plants, animals, and most importantly - fungi. They even raise property value. It is clear that these trees have an important place here. However, with farming many of these trees have been cut down, and future generations of oak are threatened as well. To insure the health of our valley, we also must insure the safety of these trees.

When I was three, my family moved to our future farm in the hills outside St. Helena. The house was the definition of a “fixer upper”; there were trash pits everywhere, the garden was a prickly mess of juniper, and one lonely chicken lived in the chicken coop that looked ready to fall. We named the chicken Tina.

I loved the place very much. While my parents set to work fixing the property, my brother and I explored our new home, always barefoot and covered in dirt. We built forts and made mud pits. I loved the trees especially. Unlike most kids, I didn’t like climbing them. Instead, I’d play in their shade, collect acorns, and pull the prickly live oak leaves from my bare feet.

I remember every tree that has fallen on the property. My two favorite trees that have lived on the property have now fallen. One was an enormous black oak that had to be 75 feet tall. My brother and I hung a swing from the tree and spent at least three summers taking turns swinging from the old oak. The other was an enormous live oak my mom called grandmother oak. She guarded the front entrance of the house. The old lab we used to have would sleep at her feet, even wearing a big hole in his favorite spot. My brother and I would sit in a nook created by the tree splitting in three directions. Her leaves hurt the most, but I still appreciated the old tree. To this day I spend every summer lying under my favorite trees.

I’m not the only person to benefit from these lovely trees. The birds and squirrels find their homes in the branch, as well as food from the acorns. Fungi grow abundantly in the soil that grows tall green grass. Sheep graze on the delicate grass shoots in spring, and the horses developed a taste for the protein rich acorns. My property wouldn’t be the same without the trees.

Because of my ties to trees, I am looking into studying forestry or environmental science. I want to be a forest ranger when I grow up so I can protect the trees and share their beauty with others.

I am starting by studying the oak trees of my home town. However, to understand the oak trees in the Napa Valley, their history in the Valley, as well as the Valley’s history, must be understood first. Human history and the history of the natural world are intimately intertwined. Without people settling the Valley the landscape would have stayed relatively the same. It was only when settlers settled the Valley that the oaks’ role was changed.

The Napa Valley was originally an Oak savanna. The oak savanna biome is the largest terrestrial biome in North America. Oak savannas offer an ideal model for farming in North America. They produce a lot with only a small amount of human interaction. In fact, the indigenous people of the Napa Valley, the *Wappo*, farmed using the oak savanna biome. The natives would use prescribed burning, selective harvesting, and planted beneficial plants around

theses trees. By farming with the land, they were able to produce plenty of food, while benefitting the trees.

The rancheros and early settlers valued the oaks. The lumber from the valley oak wasn't very useful. However, the trees increased crop production. Oak trees roots support good fungi, and in return the fungi eats other fungi that threatens the oak. The fungi also break down nutrients in the soil for the oak to absorb easier. Without the fungi the oak would die. The oaks aren't the only ones benefitting from this symbiotic relationship; the other plants living around the oak's roots also benefit from the nutrients and protection the fungi gives. This holds true for the crops settlers planted around the oak trees (Napa Historical Ecological Atlas by Robin Grossinger).

Beginning in the 1900s, orchards and vineyards became popular crops in the Napa Valley. This is also when the oaks began being cut down. Orchards of prunes couldn't produce as much with the oaks blocking the sun and competing with their roots. Vineyards need the sun as well; they are also easiest to farm in rows. Farmers of the Valley needed to profit from their crops. The trees were cut to make way for these new commodities.

Vineyards were not farmed much until after the prohibition, which ended in 1933. It wasn't until the 1950s that vineyards became widespread in the Napa Valley. On May 24, 1976, Napa Valley wine went head to head with the best French wines. France, at the time, was regarded to have the best wine in the world. California wine wasn't regarded highly. California was predicted to lose. Surprisingly California wine won, and Napa Valley was put on the map (Stag's Leap Wine Cellars).

After those events, vineyards were planted everywhere. The more vineyards that got put planted, the more oaks were cut down. This is very evident when comparing images of the valley about 100 years apart.

Clearly the oak trees are a key cornerstone in the Napa Valley ecosystem. The oak trees have also played a major role in the history of those who have lived here as well, but how do they benefit humans today? We no longer eat acorns, and our crops need the sun, so why should we keep oaks around?



The Napa Valley has always been famous for the high quality crops. These high quality crops are a bi-product of the fertile soil. Soil is primarily composed of three different mediums, clay, silt, and sand. An even mix of these tends to be best for plants. However, this is not what makes Napa Valley soil so wonderful. "Soils of volcanic, maritime and alluvial origin exist, each created by geological events that have occurred over a 60-million-year history," said Monticello Vineyards. Natural events such as volcanic eruption and flooding and erosion, are what have caused the diversity and overall makeup of the

soil. Even though Napa is a small region, it has extremely high soil diversity. In fact, there are around 30 different soil types, all unique in their makeup (Napa Vintners). From this diversity we are able to farm many varieties of grape, as well as other crops.

The oaks come into the equation because they maintain the soil. They filter water from storms through their roots and the leaf canopy slows the water reaching the ground, almost acting

as an IV. The roots also help prevent erosion and the oak's shed leaves and wood provide new topsoil. "Skorobogatov et al (2013) compared saturated hydraulic conductivity in woody vegetation plantings such as shelterbelts, tree groupings in urban parks, and tree rows in golf courses, with similar soil and topography, to the surrounding areas without trees, and found that trees had a significantly greater impact on soil permeability compared to lawn without trees," said Green Infrastructure in the article *Tree Roots Improve Soil Infiltration Rates*. Permeability is important because the rain doesn't turn into runoff. Instead, the rain is being absorbed and retained in the ground. By cycling this water, the tree also cycles nutrients. This naturally keeps the soil healthy. Not to mention when the tree falls it decomposes, acting as a giant vitamin for the soil.

Not only should we keep around oak trees because they benefit us by keeping the soil healthy, but oak trees also increase property value. Old growth oak trees are extremely beautiful and truly one of a kind. "Several recent nationwide surveys show that mature trees in a well-landscaped yard can increase the value of a house by 7 percent to 19 percent," according to Valerie Finholm. 7 to 19% isn't something to ignore, that's a lot of money! It is in our best interest to preserve oaks.

Clearly oak trees are very important to the Napa Valley's ecosystem, and for the people who live with them. They provide shade, nutrients for the soil, food, and they have countless symbiotic relationships with native animals. They also profit humans through farming and property value. The Napa Valley needs these trees. Restoration is an important new topic. To help the oaks' situation we must not cut down these beautiful trees, instead farm and live with the trees. Planting a new generation of oaks is much needed. While old growth oaks are at times being preserved, younger oaks are not being protected. To insure the population of the oak trees does not keep decreasing, new trees must be planted and cared for, so long as we plant trees in appropriate places. Planting near buildings, roads, sidewalks, etc., is not an appropriate place to plant.

Pacific Tree Care, a local tree company, gave simple steps toward sprouting acorns, and planting saplings. For more information call them at (707) 942-0262:

1.) Look for a parent tree with stable architecture. (a wide crotch, no dramatic leaning, a wide base, etc.)



These are the parent trees I used. The black oak, the photo on the right, leans toward the sun but the structure isn't bad. The live oak, the photo on the left, is small but will be very beautiful when it gets tall. The structure of this tree is very good. For the most part the trunk is straight and the branches aren't droopy. It also has a wide base.

Trees inherit traits from their parents. By picking a tree with good genetics, the offspring will have a greater chance of growing healthily. The architecture of a tree is very important. If the tree is poorly constructed, it has a greater chance of falling.

2.) Search for acorns during acorn season. Pick acorns that are in good shape, (no cracks or bug holes.)

Oak trees drop their acorns during fall. Then during the winter, the rainy season, the acorns will hopefully germinate. Be careful to pick acorns without blemishes. Cracks and holes mean the acorn has been compromised and is probably infested with a bug, fungus, or wevle. The infested acorn will not germinate.

3.) Fill a bowl or bucket with water and drop acorns in. The acorns that float are no good. They are probably infested with a wevle. The acorns that sink are most likely to germinate.

Only one tenth of acorns will germinate and grow into trees. That is why the float test is important; it maximizes your chances to find an acorn that will germinate. It is also important to plant multiple acorns because Here (see right). is my float test. As you can see many of the acorns float. All the acorns in the cup also floated and therefore will probably never germinate. Most of the acorns that sank were live oak acorns. Only three black oaks sank and none of the scrub oaks. Not all planted acorns will germinate.



4.) When planting don't fully submerge acorns.

The rule of thumb is to plant the acorn partly submerged. "Imagine the force that an acorn would hit you head if it fell from a branch, then apply that to planting the acorn," advised Pacific Tree Care. The acorn won't be able to germinate if it is planted too far under. On the other hand, the acorn won't be able to germinate if it doesn't receive water and nutrients from the soil if it isn't nestled into the dirt.

5.) Crumble oak leaves on top of planted acorns.

Oak leaves regulate soil temperature, and provides coverage without the soil being compact. When oak trees are full grown, all the compost it needs comes from its own leaf litter. It is very important to leave their leaves be, if the leaves are blown or raked away the tree is exposed. Their temperature control and moisture maintenance is compromised.

6.) Water similarly to weather patterns, (regular, but not in excess). If the acorns are watered too much then they will rot.

Acorns are adapt to survive in natural settings. They rely on the seasonal rains according to where the oak is from. Scrub oaks are able to survive in rocky areas with hot, dry summers, and cooler, wet winters. Valley oaks prefer looser, loamy soils, with hot, dry summers, and cooler, wet winters, but not to the extreme of the scrub oak. Similarly to their parent trees, acorns prefer these natural patterns. Too much water will make the acorn rot, and too little water won't activate the acorn to germinate.

Here is a photo of my potted acorns and saplings. I planted 6-7 acorns in each pot. I planted the sapling separately because i didn't want it to have any competition. I left the pots outside thinking

it would be good to put them in the environment they were meant to be in. And if they germinated, they would photosynthesize better outside. If I were to do this over again I would plant the acorns on their side, and sprout the acorns inside. The birds ate most of the acorns.

Caring for Saplings:

Congrats! At least one of your acorns has germinated. These next steps will guide you in caring for the saplings.

1.) Keep watering plants in small amounts. Water a few inches away from the plant to encourage the roots to grow out.

Roots go to water. In the beginning it is ok to water next to the plant, if you water too far away from the plant the roots won't be able to reach. The bigger your sapling gets, water further and further away. This will encourage the roots to grow out. By watering too close to the sapling, you run the risk of the sapling strangling itself with its roots.

2.) Treat compost the same way.

The roots will go to nutrients in the same way it will go to water. Refer to step one if compost is used.

3.) Once saplings grow 2-3 inches high it is time to transplant.

The roots are now about 6-8 inches long. Roots are delicate so handle the small tree with care. Move the plant to a spot with adequate sun and good soil. Make sure not to plant the tree near buildings, roads, or sidewalks. Tree roots can wreak havoc on their structure.

4.) Use a sleeve to protect plant. A milk carton with the top cut off works just fine.

The sapling is small and susceptible to the dangers of the natural world. By putting the carton on the sapling, it is less likely to be stepped on or eaten by animals.

5.) Once the tree is big enough, remove the protective sleeve.

Make sure to keep caring for your tree. In time, the oak will grow big and beautiful.

There are solutions to restoring these beautiful trees. For now it is best to the individual to plant as well as maintain pre-existing trees, but we need a long-term solution. While the environment is in decline because of humanity's disharmony with it, there are new efforts to restoration. Countries are starting to implement a carbon tax. The Carbon Tax Center explained carbon tax as, "A carbon tax is a fee intended to make users of fossil fuels pay for climate damage their fuel use imposes by releasing carbon dioxide into the atmosphere, and also to motivate switches to cleaner energy." The idea behind this tax is to incentivize the usage of clean energy to big corporations.

This would be amazingly effective in reducing greenhouse gasses. However, there are also other resources worth saving, such as water and trees. I propose a system in the Napa Valley where a fee is paid for trees that are cut down. This money could go to the Napa Land Trust, or another organization with interest in protecting the land. Something like this would take time to set in place, but in the end it would be in our best interest. For now it is up to the individual to protect the trees.

Oak trees shouldn't be cut out of existence in the Napa Valley, especially the Valley floor. By removing oaks from the oak savanna, the ecosystem is no longer balanced. These wonderful trees can only help us in the long run. If we want to maintain the diverse Napa Valley soil, the trees need to be maintained. Restoration is needed. Not only are these trees good for the soil, but they also increase value of land. Why throw away good money?

The oak tree represents a lot of this valley's history. The natives of the valley farmed with the land. They used prescribed burns and native plants to insure the oaks' health. It was important for the natives to keep the oaks healthy because the acorns were a major source of their food. Not only were the acorns important, but the animals that enjoy the benefits of the oak, were also hunted for food. Even when rancheros entered the valley, they left the trees alone. Their cattle enjoyed the green grass growing around the oak roots while the vaqueros enjoyed the shade under the oaks. It was clear the trees are more valuable standing.

It was only until the mid 1900s' that humans began farming for short term profit rather than taking the time to farm with the land. The wine grape crop, that populates this valley, does need sun. However, that does not mean we need to cut down every oak tree on the allotted land. It would be unrealistic to advise not to cut down any trees, but by preserving at least half the trees, rather than doing a clear cut, would be a realistic and even beneficial. The oak trees will only help in the end.

The best part is the oak savanna biome can still be restored. By placing tree protective measures in place, combined with strategically planting oaks around the valley, the next generation will be put in place. It is also important to maintain existing oaks. Careful maintenance will preserve beautiful old growth oak trees. Old growth trees are very valuable standing. These are the trees that will increase property value the most. Restoration is beneficial to the oaks and humans.

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