



Oak Planting Guide



This guide reflects the collective wisdom of Napa RCD staff who have planted native oak trees with our local community for over ten years

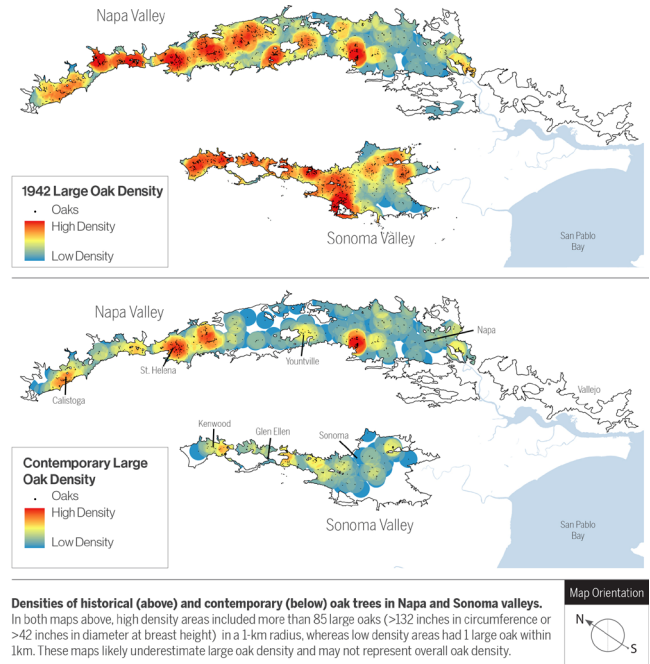
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Historic Background

- Much of the oak woodland and savanna habitat that covered Napa County prior to European settlement has been cleared for the development of agriculture and towns.
 - » On the Napa Valley floor specifically, the number of mature valley oak trees decreased from an estimated 45,000 in the early 1800s to fewer than 1,000 in 2020.
 - » There has been significant loss of oak habitat outside of the valley floor as well, such as blue oak and valley oak savanna in the Berryessa region.
- Oak woodlands and savannas are home to some of the highest plant and animal diversity in California and are adapted to low-intensity wildfires and drought. Oak trees can thrive in both urban and rural settings.
- Oaks are of immense cultural importance to a wide variety of indigenous communities.



San Francisco Estuary Institute

Benefits of Oaks

- Oaks, particularly valley oaks (*Quercus lobata*), are a keystone species in Napa County. They provide the ecological foundation upon which thousands of other organisms depend.
- Planting oak trees can provide the following benefits:
 - » High quality habitat for wildlife
 - » Wildlife movement and genetic connectivity
 - » When mature, more carbon sequestration from the atmosphere than many other common landscaping trees
 - » Shade and cooling
 - » Runoff reduction and improved infiltration of water into the water table



Tools and Materials

- Zip lock bags
- Bleach
- Water
- Vermiculite

Collection



- Restoration professionals generally recommend planting acorns sourced from within 50 miles distance and 500' elevation of the planting site. These guidelines are being reevaluated given an interest in assisting oaks to adapt to climate change.
- It's best to collect acorns in late summer/early fall (August to October), when acorns start to turn from green to brown and some are starting to drop.
- When collecting, remember that the timing of acorns ripening varies by species and weather in a given year or multi-year period. General guidelines:
 - » **Blue oaks:** late August to mid-September
 - » **Black oaks:** late August to early October
 - » **Valley oaks:** mid-September to late October
 - » **Coast live oaks:** late September to late October
- Acorns should be entirely brown, free of cracks and insect holes, and solid when squeezed. Avoid acorns that rattle when shaken.
- Acorns may be collected from the ground or from the tree. If collecting from the tree, ripe acorns should easily separate from their caps.



Acorns of Common Oaks in Napa County

Valley oak (*Quercus lobata*): shape varies greatly but is usually conical or bullet-shaped; 1-2 inches long, caps may be shallow or deep and often have warty knobs; matures in a single year.



Coast live oak (*Quercus agrifolia*): an elongated, narrow, light brown acorn, 1 to 1 1/2 inches long, pointy ends, often distinctly cone-shaped and striated; scaly, gray-brown cap; matures in one year.



Black oak (*Quercus kelloggii*): 1 to 2 1/2 inches long, reddish-brown; cap is deep, covering about half the nut. Matures in two years.



Blue oak (*Quercus douglasii*): oval to gently tapering; 3/4 to 1 1/2 inches long; shallow caps with warty scales; matures in one year.



Processing

- Keep acorns from different species and sites separated.
- Rinse the acorns in a cool or lukewarm bleach solution to eliminate fungal spores. For a standard 6% concentration bleach product like Clorox, use a 1:10 bleach to water ratio.
- Remove acorns that float, and any that have holes or cracks.
- Let the acorns air dry on a tray or paper towels.

Storage

- Pack the acorns into bags with a few scoops of damp (but not saturated) vermiculite. This will keep them moist while preventing mold growth.
- Label the bags with the following information:
 - » Species
 - » Date collected
 - » Location collected
 - » Date put into refrigerator
- Refrigerate acorns until they are ready to be planted.
 - » Acorns cannot be stored more than a few months and should be planted in the fall or winter following collection.
 - » Black oaks and coast live oaks do best if planted after 60 days of refrigeration. This is referred to as "cold stratification."
- Occasionally check acorns for mold and rinse them if you see it.

References:

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Acorns and young oak saplings are highly susceptible to predation and herbivory from deer, gophers, voles, and small mammals. An acorn protection basket, much like a garden-variety gopher basket, can help protect young plantings from being eaten in the field.

Tools and Materials

- Hog ring pliers
- Hog rings
- Basket sides: 24" x 24", 1/4" mesh, 23-gage hardware cloth
- Basket bottoms: 10" x 10", 1/2" mesh chicken wire squares
- Work gloves

This section details Napa RCD's method for building protection cages from non-galvanized metal so that the metal will rust away on its own, decreasing the need for maintenance. However, depending on maintenance capacity and needs, a wide variety of pre-built cages and other materials may also work well.

Guide

Safety note: always wear gloves when building protection baskets, and be careful of sharp ends.

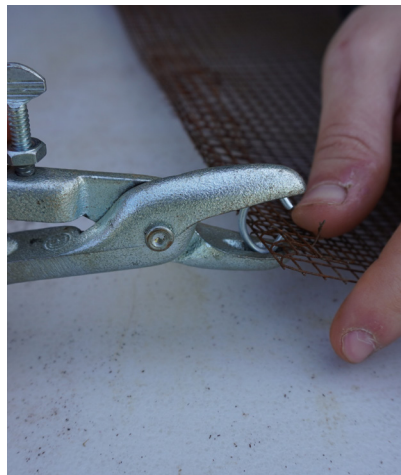
Step 1: Take one sheet of hardware cloth and fold it almost in half, so that there are 1-2 inches left over on one side.



Step 2: Fold the remaining overhang down.



Step 3: Clip the overhang to the other side of the cage using pliers and hog rings. Use 4 hog rings per cage. If you are labeling your planting, now is a good time to attach the tag.



Step 4: Attach the chicken wire bottom to the cage, either by clipping it with additional hog rings or securely folding it in place. It only needs to hold its place until the basket is in the ground.





It's best to plant from November to early March, as close to the beginning of the rainy season as possible. Early planting maximizes root development before dry weather arrives. Acorns planted later in the season should be irrigated until the seedling is established.

Tools and Materials

- Gloves
- Hoes
- Shovels
- Protection baskets
- Mulch
- 5-gallon buckets
- Acorns
- Wooden stakes
- Hammer or mallet
- Burlap sacks (optional)
- Burlap or hardware cloth lids (optional)
- Planting ID tags (optional)

Planting Guide

Step 1: Using a hoe, clear weeds in a 3'-5' diameter circle, down to mineral soil. This helps reduce competition for water.



Step 2: Dig a hole several inches deep, roughly the depth and width of a standard shovel head. Remember to drop your soil right next to the hole. You can use the burlap sack to hold it.



Step 3: Place the protection basket in the hole and fill it with gently compacted soil up to ground level. Fill in the soil around the basket.



Step 4: Cut an X in the burlap sack and place it over the cage, flat to the ground. The burlap will help prevent weed growth.



Selecting a site

- » **Coast live oaks** do well in most parts of Napa County.
- » **Valley oaks** prefer flat areas with relatively high water tables and do well on the valley floor.
- » **Black oaks** do well on hillsides at higher elevations in Napa County.
- » **Blue oaks** prefer warm, west-facing slopes.
- » Choose planting sites at least 10' from other trees.
- » Plant in a pattern similar to naturally occurring populations.
- » Seek further guidance from Napa RCD, the Natural Resource Conservation Service, or other trusted plant experts.

Step 5: Place 3 acorns on top of the soil in the cage and push them in to the soil about 1/2 inch. Place acorns horizontally, so roots can shoot down and the sprout can grow upward. If any acorns have already germinated, position them so the root is facing down. Be careful not to break the emerging root.



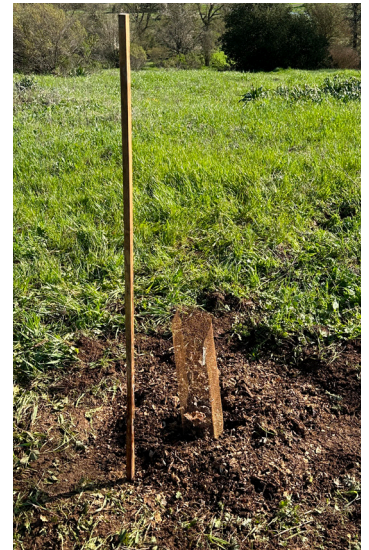
Step 6: Cover the acorns with a handful of fallen leaves from native oaks to help keep them shaded. If you choose, cover the cage with a square of burlap or a hardware cloth lid to protect and shade seedlings.



Step 7: Spread 2 5-gallon buckets of mulch, 2"-4" deep in a 3' circle around the planting area. Don't use mulches that can introduce weed seeds. Bark mulch is a good option.



Step 8: Hammer in the stake, which will help you locate your planting.



Care and Maintenance

- The level of care and maintenance will depend on the goals of the individual planting effort. More care and maintenance results in more success!
- Remove weeds, add mulch, and adjust baskets and stakes as needed. It is best to remove weeds at the beginning of the dry season.
- Avoid chip mulch from areas infected with Sudden Oak Death disease and mulches that can introduce weed seeds.
- Oaks are adapted to the local climate and are drought-tolerant; however, watering plantings in the first several years can increase their chances of establishing and thriving.
 - » If able, complete 2-3 deep waterings in the first several dry seasons after planting.
- Remember that even if a sapling appears to die during drought, it can put out new shoots the following year.

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