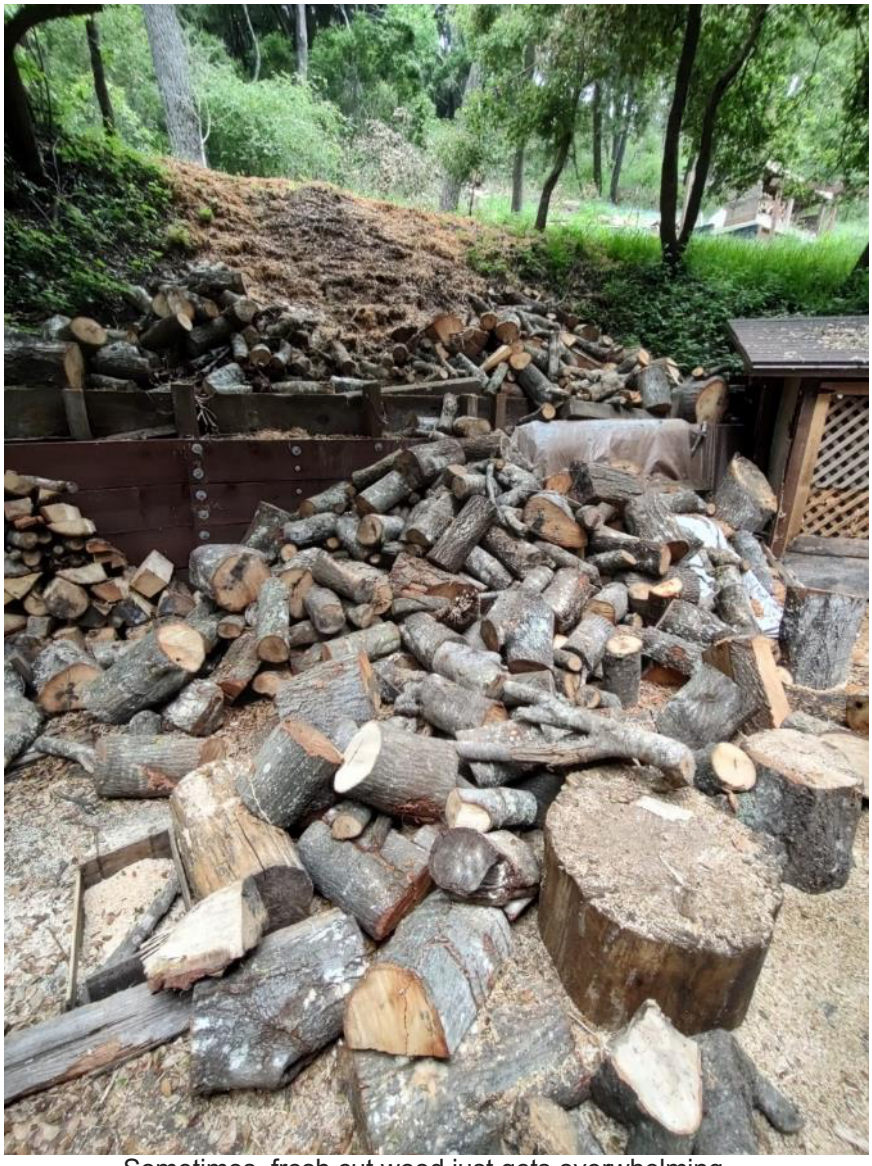
Storing Green Wood Blanks

Choices and Rationale to Make Usable Blanks
And Avoid Making a Pile of Labor-Intensive Firewood

May, 2023



Sometimes, fresh cut wood just gets overwhelming...

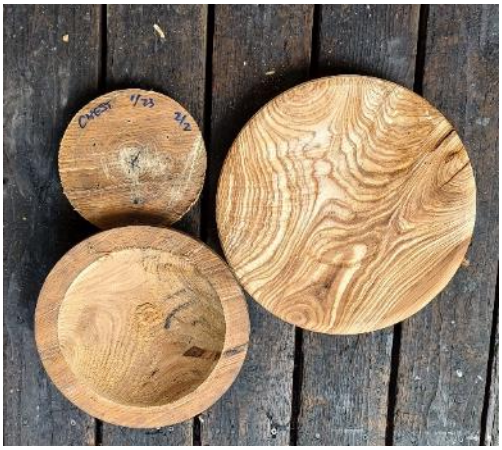
Nicole asked: *I have been generously gifted wood. At this point the wood is in sections, not rounds. I can't rough turn all this to be set aside to dry and re-turn. I want to store the wood until I turn it. I have scoured the web and now see the twice turned method.* ***But is there a "no-turned" way to store this wood?***

Wells: Perfect question! **My short answer is: "Not without expectation of significant casualties** with unbalanced drying, splitting, checking, warping...in addition possibly decay and insect damage. Sometimes that's an acceptable risk.

Like every "axiom" in wood turning, you can find diversity of opinion about processing freshly cut wet wood in order to have un-checked wood for later turning. The Law of Eovaldi says...There must be at least three!

- The ideal, by a long margin as you have discerned, is the **"Twice Turned" method**. This is bowl making 101. It takes time up front...and space...but losses are small.

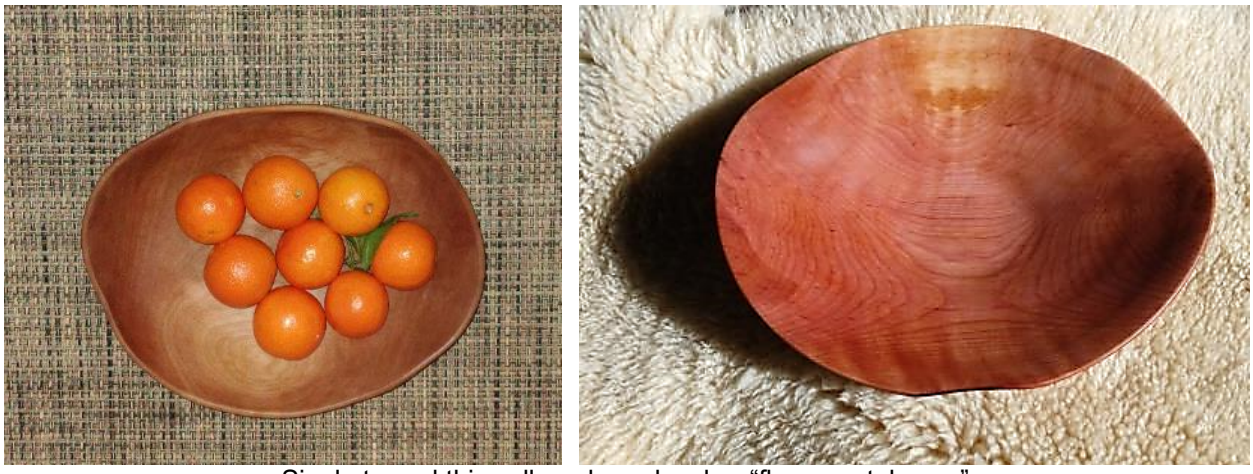
    1. Promptly (within a week or two) turn the irregular blank into a rough exterior shape and scoop out the interior to create **uniform wall thickness** while wet. Rule—make rough wall thickness about 10% of blank diameter.
        a. Coring accomplishes this while creating 2-4 nesting blanks instead of just one plus a big bag of shavings. Worth the time for a special blank!
    2. Promptly (within a day or two) **seal the rough-out** to suppress uneven drying of end-grain vs face grain. If that's not feasible, store up to a week in moist shavings in a loosely closed garbage can or heavy paper bag. Beyond that, you'll be getting mold...nasty black mold, not artistic spalting figure.
    3. **Store the sealed blanks in a location with fairly steady temperature and humidity**...the proverbial "cool, dark place." (Not everybody has one.)
    4. Stack them with wooden shims or sticks to **keep them separated** and allow air to flow over all of the surfaces. (Wine corks work, too!)
    5. How long? **Generally a year per inch of wall thickness**, until the moisture content of the wood equilibrates with the atmospheric humidity (12-14% moisture content). Drying rates of different woods vary by species...denser → longer.
    6. After the year or so waiting, **re-mount** the now elliptical and likely modestly warped dried blank on the lathe and turn to your final design for shape & wall thickness. The result will be true round for traditional bowls.



Chestnut rough outs: a cored pair of future bowls and a nicely figured platter.

To be coated with Tree Saver and stored for about a year before finish turning.

- **"Single turned bowls"** are turned while wet to finish dimension. They warp in interesting ways, but generally don't split if the walls are uniform and thin (<6 mm or 1/4"). They are never round, but often cool. Sanding takes patience.

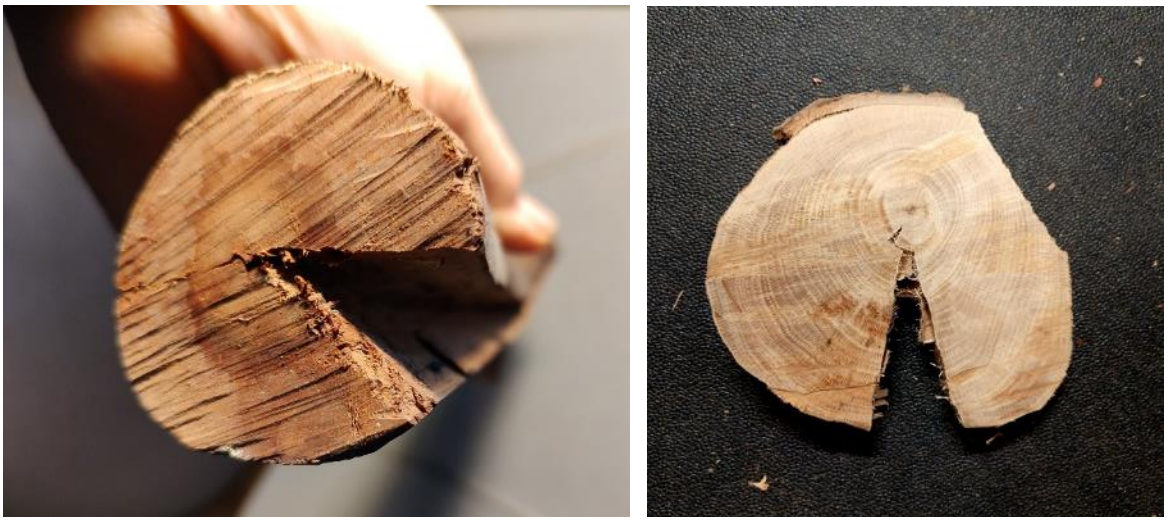


Single turned thinwall madrone bowls—"flower petal warp"

As usual in turning, there are other methods and other complexities. Reducing loss of blanks is the goal for the alternatives to the promptly roughed-out, twice-turned strategy. It's not realistic to eliminate loss no matter which method you choose.

- Important considerations:

1. **Wood is essentially a bundle of microscopic straws** running from the roots up to the canopy.
2. **All wood must shrink**, the question is how fast, how much, and how evenly. It won't shrink in the long dimension, but it will shrink along the radius and shrink even more along the circumferential growth rings.



Extreme shrinkage w radial cracks: End grain view: (L) Manzanita branch & (R) oak crosscut wafer

3. **Free water in the space between the tubules** is called ***inter-****cellular* water, and fresh cut wood feels really wet...it sometimes oozes visibly from a fresh cut.

4. **The water trapped inside the tubules** is called ***intra-****cellular* water. It usually stays in place until the intercellular water has vacated. That's when shrinkage starts. As the water leaves, the tubules contract, and the wood will shrink side to side. That continues until the intracellular water content has equilibrated with the atmospheric humidity.

5. When the intracellular water migrates out, it diffuses through the walls of the tubules slowly, but **quite a bit faster through the open, cut ends** of the tubules. *Remember the drinking straws analogy—we move fluid quickly through the open ends, not the sides.*

6. That means that **wood adjacent to the exposed cut end grain will dry out faster**...and shrink faster...than deeper wood which is drying more slowly through the sides of the tubules.

7. **Consequence?** Wood starts to split at the end grain where it's shrinking fast, and checking and radial splits are virtually unavoidable. That's why we do something to slow down the loss of moisture out the ends and achieve a more uniform rate of shrinkage. (That's what sealers do.)

8. Wood is **"wetter" in the California winter** and spring as the sap is running. The air is cooler with higher ambient humidity, so we have a little more leeway in October through April than we do in our hotter, drier seasons.

9. The species of the wood matters a great deal.

    a. Dynamic splitters (high coefficient of shrinkage >10%) (e.g. live oak, madrone, and sycamore) need right-away rough out unless you want a stack of labor intensive firewood. What's "right away?" Within a week. Honest.

    b. Most hardwoods run in the 6-8% shrinkage range, including most of our local trees, like walnut, maple, tan oak, ash, birch, & black acacia. For these, "prompt" roughing could wait a couple weeks in cold, wet weather, but do it same weekend in hot dry weather. Meanwhile, keep it out of the sun!

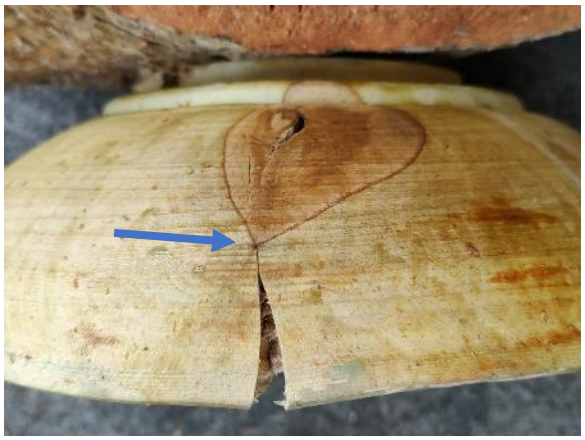
    c. Rather stable hardwoods are less common, but include locust, olive, and many of the slow growing exotics, some of which may be planted in local residential areas.

    d. Conifers vary. Old growth redwood (4%) is remarkably stable. Cypress, Doug fir, & cedar not bad! Pine not too good.

Reference for the science and a compendious list of different species features, including shrinkage coefficient: R. Bruce Hoadley's **Understanding Wood.** Special attention: Chapter on moisture!

- Other ways to mitigate loss, even if you can't rough out early:

1. Make certain the center pith has been deleted from your blank. Because wood shrinks more along the circumferential growth rings than the radius, radial splits are essentially impossible to avoid if that center pith is part of the blank.

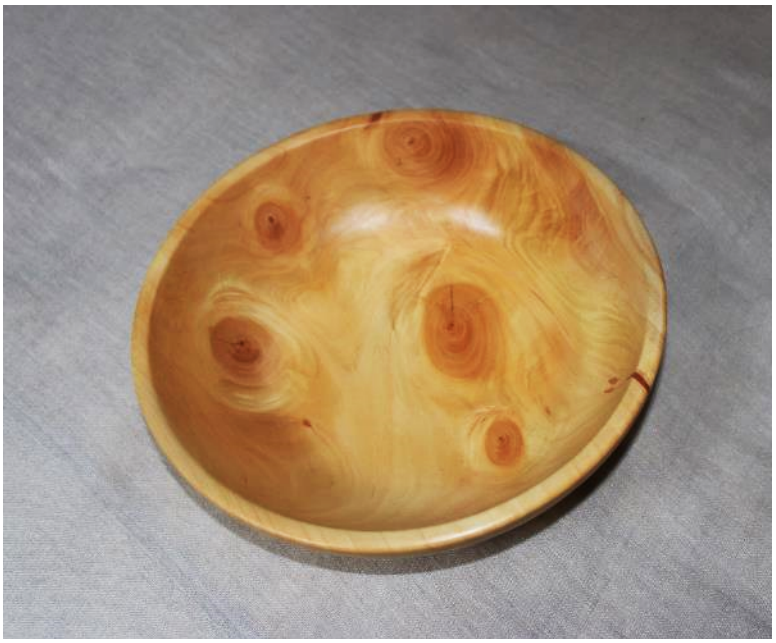


Holly

Live Oak—in a week! ...it got much worse!

2. Coat the end grain with a sealer, or if you have the time and money, coat the whole thing. PVA (common wood glue) based "Tree Saver" is a consensus best, as it has some elasticity with shrinkage and water cleanup. Wax (Anchor Seal) used to be considered the best and still has devoted fans. Latex paint in an old partial can in the garage...not the best, but much better than nothing.

3. Also expect splits and unpredictable warping around knots and in wood with compression and tension figure. (See short discussion in Appendix 1)



Monterey Cypress

4. Get rid of the bark—crowbar, hatchet, saw, chisel—your choice. If you don't have time to do this, let somebody else have that wood. Bugs large and small, fungi and outright rot...all sorts of bad things happen under the bark.

Artsy beetle tracks in the cambium under the bark...cool to see, not likely to help a bowl. Some borer holes penetrate 2-3” in a matter of weeks.

5. Store the wood in a cool, dark, relatively dry place with fairly stable fluctuations of temperature and humidity. If that's not available, at least find a place where the temperature is fairly stable over a day—e.g., crawl space, windowless wall of the garage, closet on the north facing side of your home, shed under a shade tree.
6. Dark is important...powder post beetles (oak borers) only work in the light...and they'll destroy a blank of oak and ransack the sapwood of most trees in a matter of months.
7. Store it stacked with "stickers" so there is air flow between the blanks. Otherwise, it's mold city...and nests can glue themselves together.

Still the best—rough them out early, thoroughly coat w Tree Saver, store in a neutral environment

Other Strategies with exponents among adventuresome turners

- Some turners endorse **storing fresh cut wood in water**—in a **plastic** garbage can, with rocks to keep it submerged—if you can't get to it in the shop. That's expedient for a while, especially in hot, windy times of year, but it's not a great long term solution. Among other things, that water gets nasty. A durable, high quality plastic garbage container with lid is not cheap ($40-50), and it won't hold many bowl sized blanks. A normal person can't budge a full, 30-40 gallon container (weight 250-350 pounds!). That's a lot of water if it leaks, too. You're eventually going to need to remove the wood and rough turn...and you'll be starting late for drying that wood.

- Just the opposite—**Kiln drying**. This process takes weeks and requires a lot of work and cost, or else real creativity for a shop made kiln. That's not realistic for someone who lacks time for roughing out, but mainstream in the commercial world and occasionally feasible for high volume pro turners.

- **Boiling.** This process has advocates, as heat denatures some of the fibers responsible for shrinkage. It still has to dry. It's not feasible for a salad bowl dimension vessel without serious investment in cauldron infrastructure...and a fearless streak.

- **Wrapping wet wood in plastic?** It's going to mold unless it's already fairly dry. You need to have air flow for the lost moisture to vacate, so an impervious plastic barrier is not too good...and very time consuming...and impractical with large slabs.

- **Tarping?** Keeping the sun off seems obvious, and a reflective silver tarp can help in sun exposed areas, but ideally do this in the shade in a north facing area to reduce temperature fluctuations. Use sticks to keep blanks apart and allow air flow. Prop up the tarp so that end-to-end air movement is possible. Some people may use a low speed fan. Don't let the tarp sit directly on the wood (black mold and rot ensues).

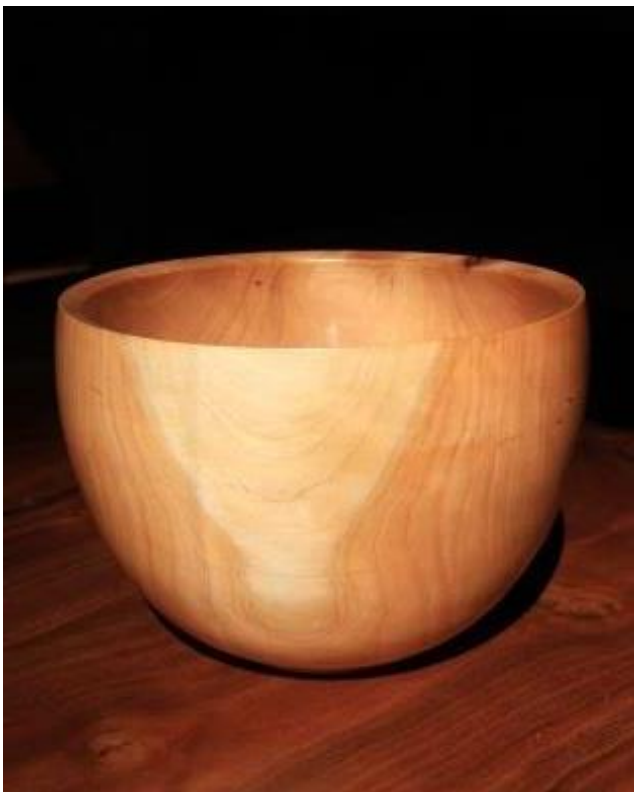
- **Chemicals?** Not my thing, but there are ways to soak wood in glycol and other solutions that replace intracellular water with chemicals to reduce shrinkage. But who wants that stuff in your bowl...or even in your shop?

Albizia (Mimosa) rough-out & cores

Appendix 1: Tension and Compression wood

Hoadley's book eloquently and understandably describes the difference between compression wood and tension wood...inevitable when a tree or a limb grows in some way other than straight up. It's a marvel of nature...and grain figure...and frustration.

For fun, here's a photo of an extreme contrast between the two, from a horizontal, fast growing limb on a Monterey Cypress a quarter mile from the ocean. This section measures about 14" top to bottom. The center pith is a dot skewed way up to the top of the log. The bulky compression wood on the underside created a buttress that kept the limb from sagging or breaking. Call it a natural angle brace for perhaps 3/4 ton of limb sticking out sideways for 20 or 30 feet, getting thrashed in the wind, too. The growth rings are quite fat as that tree figured out the "moment arm" without ever setting foot in a mechanical engineering school. The tension wood above the center pith shows the same growth rings condensed into a mere inch, straining like crazy like a high tension cable to stay horizontal. What those two sections have in common is that, once that balanced tension is relieved, they dry erratically and move like crazy. Separate them with your first cut (red line below) and give yourself a better chance for a blank.

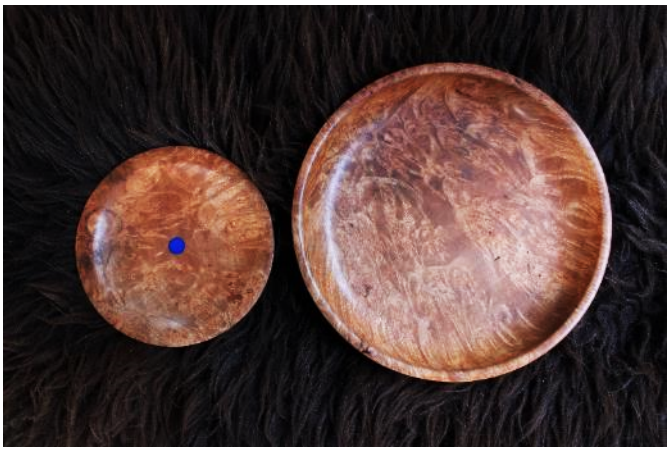


Boards made from compression and tension wood notoriously warp and split. Bowls likewise. However, the figure in the wood as the tree struggled to stay upright can be worth saving for human admirers, at least for those of us turners who can accept losses gracefully.

Appendix 2: Drying Burls

Needless to say, turners love burls for extravagant figure—swirls, waves, birds-eyes, streaks of contrasting color—just gorgeous to behold. Burl figure commands 3 times the price for “ordinary grain” wood of the same species. Naturally, if one of us scores a freshly cut, wet burl, we’ll give it special attention.

Plain grain blanks tend to check at the exposed ends because of unbalanced shrinkage of fast drying end grain versus slower drying face grain. Paradoxically, burl wood tends to dry with less deformity and cracking. Using a magnifier to look at burl, the grain is “micro-curly,” without long stretches of parallel fibers to shrink in unison. The tangled tubules do shrink, but not in a coordinated way, and consequently, long cracks and splits are less likely to occur.

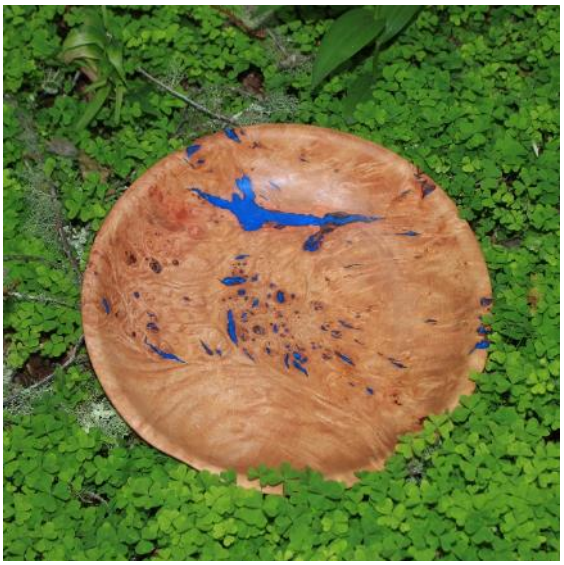


Some of the same rules apply—ideally rough out early to uniform wall thickness, seal, and allow to dry in a stable environment.

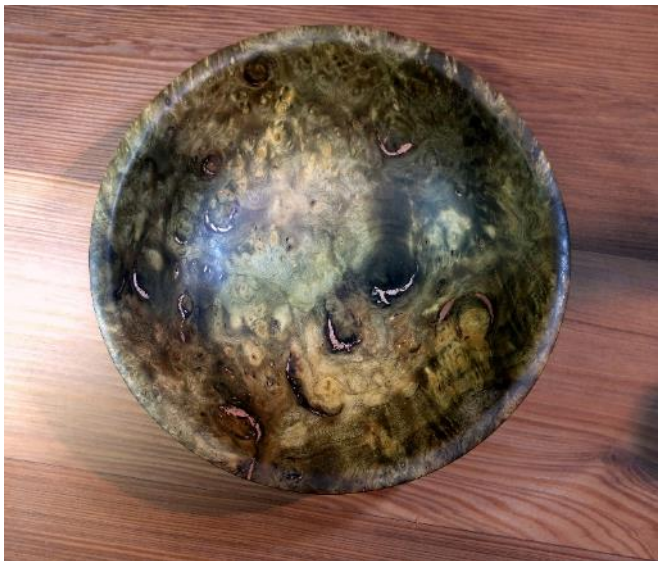
Because it’s so precious, consider coring a larger burl blank to maximize the number of vessels you can make. It’s a crying shame to turn a beautiful burl into shavings! If you don’t have experience with coring, ask one of our members for some help.

Burls from dynamic shrinking species may dry leaving **internal voids,** a trait I've seen particularly in madrone (of course), avocado, sycamore, and oak. Even redwood and bay will make some voids...and it's OK. I've heard testimonials that boiling the burl can reduce this phenomenon...although that's hard to envision with a 16 inch blank.

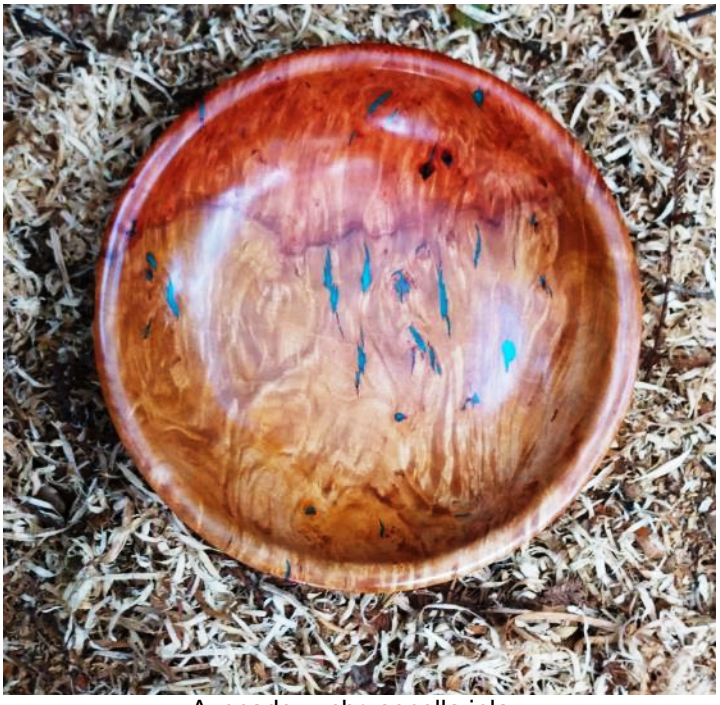
I've tediously filled the voids with decorative inlay...another example of the axiom that there are multiple ways to solve any turning challenge.



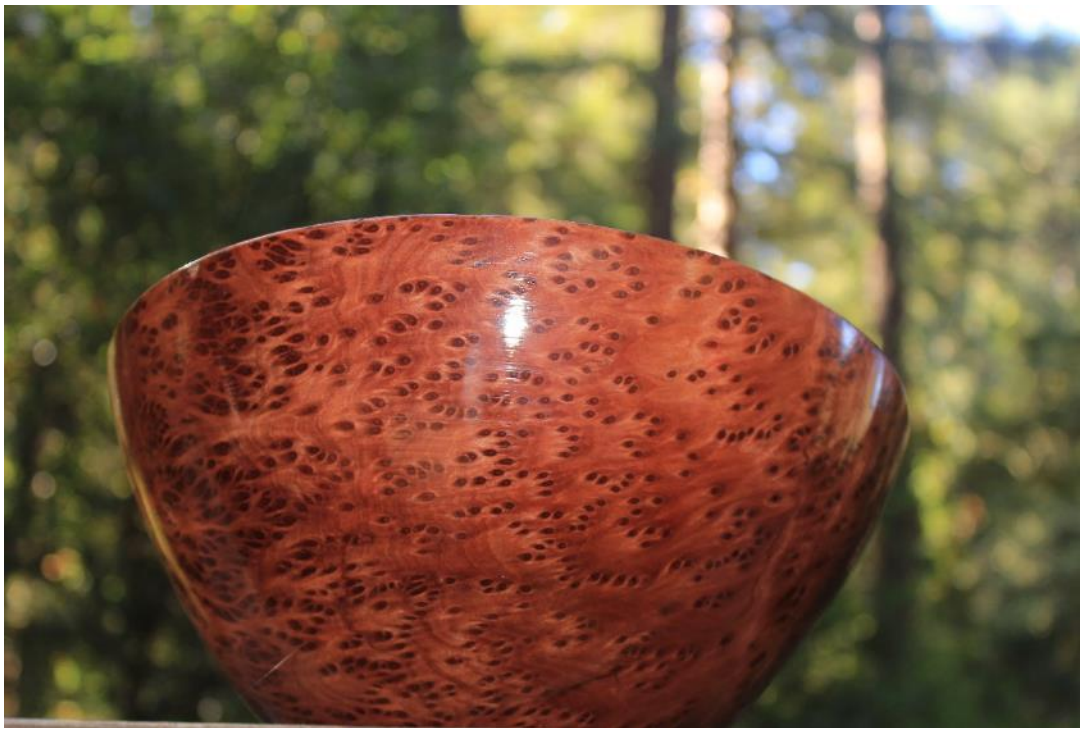
Avocado burl with "Lake Powell" lapis inlay



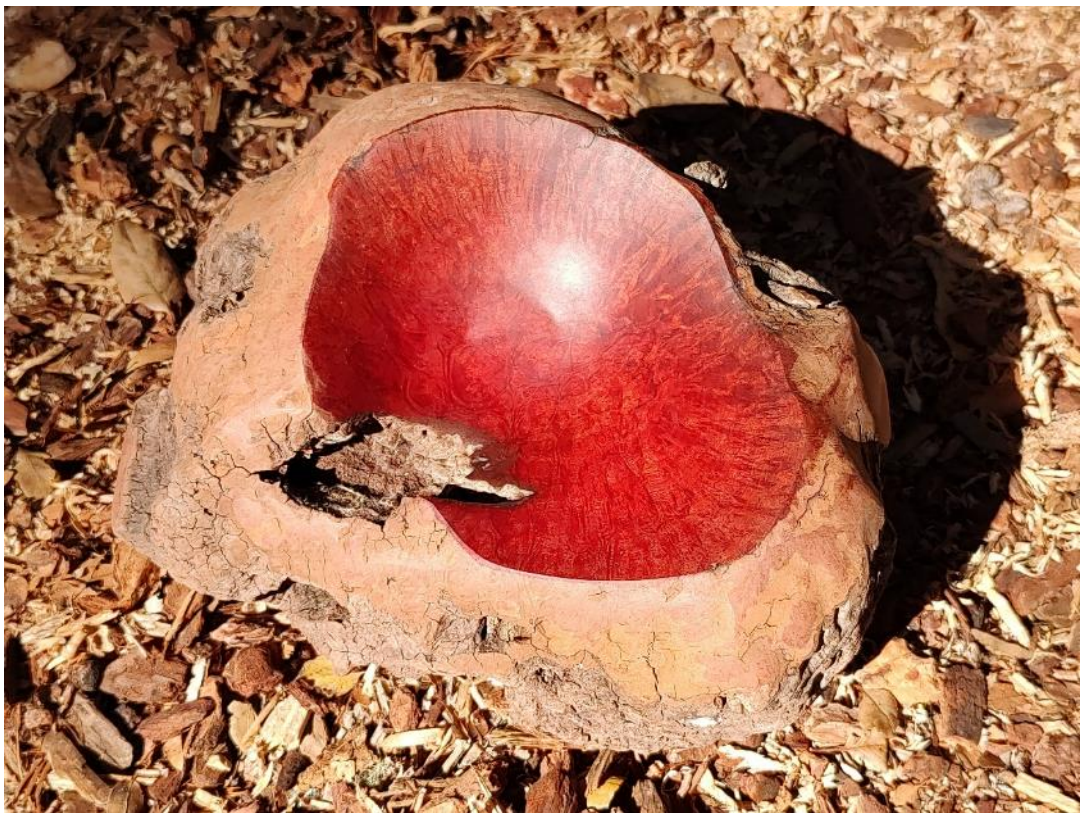
Bay burl w copper powder inlay



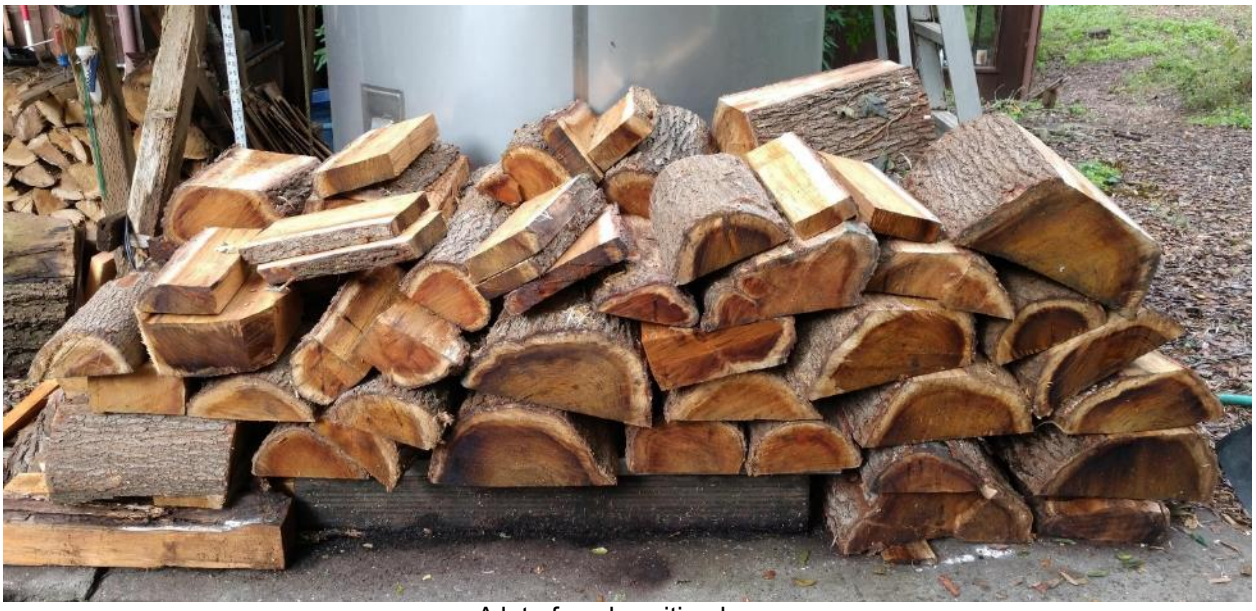
Avocado w chrysocolla inlay



Local heroes—Redwood and Manzanita burls



My final shot—only accept as much wood as you can process properly. Otherwise, honestly, you'll have a space-occupying pile of wood you won't want to use when it’s finally dry.



A lot of work waiting here

Black Acacia is worth it!