

Natural pruning saves energy AND removes branches that could carry fire to the canopy.

9. Fire Fuels: Do you see trees other than redwoods growing beneath the redwoods? Big leaf maples, bays, and tanoaks often grow in the redwood understory. In the past, frequent fires kept the understory trees from growing tall enough to reach the redwood canopy. Since fire has been suppressed, understory trees can serve as “ladders,” that allow fire to climb into the canopy. The death of many tanoak trees from Sudden Oak Death Syndrome has resulted in “fuel jackpots” that will burn hotter, with more intensity.

As you continue walking, look for examples of redwood fire survival adaptations such as thick bark, root crown sprouting, and natural pruning. Also look for threats such as fuel jackpots and fire ladders.

10. After a while, you will come to a **tree with a ramp**. This is a great place to hug a tree and give thanks for all that trees provide, such as **helping combat climate change** by storing or sequestering carbon, removing carbon dioxide from the air and storing it in their wood. This is also a good place to see the thick, fibrous bark that helps protect redwoods from fire.

11. When you get to the **Armstrong Tree**, look up the valley to the left. The understory in this area burned in the Walbridge Fire, and fire crews removed small dead trees. Now there is little fuel. Compare it to the fuel-filled forest behind you.

12. As you walk the **Armstrong Nature Trail** towards the picnic area, notice that the hillside to your left was burned in the Walbridge Fire, while the valley floor to your right was not. **The fire moved slowly downhill** from the ridges to the north. Firefighters and Fife Creek kept the fire from entering the main Armstrong grove. Some burning trees fell across it, but Fife Creek proved to be a good natural **fire break**.

Look for trees such as redwood, tanoak, and bay sprouting from root crowns, and sword ferns and redwood sorrel sprouting from underground stems.



sprouting tanoak, sword fern and sorrel

New sprouts, a layer of leaf litter, and a lack of rain in the winter of 2020-2021 helped prevent landslides on the exposed slopes. Slides will remain a risk, though, until mature plants again stabilize the hillsides.

13. When you come to the “fallen giant” (on your left), and the charred tree just beyond it, note the thick fire-resistant bark.

14. As you walk along the Armstrong Trail, compare the thick, overgrown understory to your right and the hillside that has been opened up by the fire. If you look beyond the road to the right, you will see that the hillside beyond the road has also burned.

15. As you walk along Armstrong Road towards the entrance, note that the hillside to your left was burned by firefighters using a controlled “backfire” to prevent the wildfire from roaring down into the valley from the burning ridges. Look for signs of recovery by plants whose above-ground parts were burned but whose underground parts survived.



16. Not only do many plants survive fire, but fire can actually spur plant growth by removing leaf litter that keeps seeds from the soil, reducing shade, and providing nutrients from the ash. In fact, there are “fire follower” plants that depend on fire and only thrive after a fire has gone through an area.

Tomorrow: As we learn more about the value of low intensity fires to our forest ecosystems, park and forest managers will continue to strive to prevent devastating wildfires from doing more harm than good. Prescribed fire is a valuable tool, but it can be difficult to implement for a variety of reasons, including cost. Are we willing to do what it takes to protect our forest resources for future generations?

ARMSTRONG REDWOODS FIRE ECOLOGY WALK



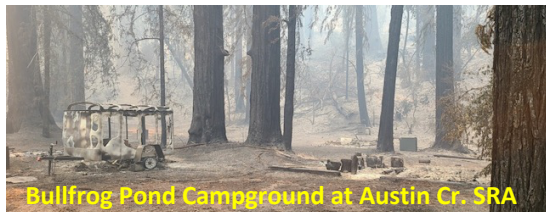
Stewards of the Coast and Redwoods

www.stewardscr.org
stewards@stewardscr.org
707-869-9177



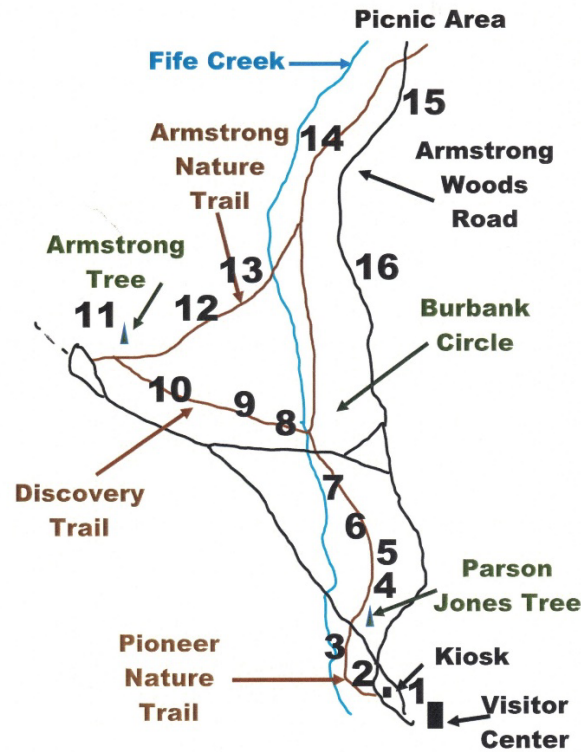
Introduction: While the fires that have swept through California in recent years have been devastating to human communities, fire is a natural part of California's natural communities, including the coast redwoods.

In August and September, 2020, the Walbridge Fire burned through 3801 acres (64%) of Austin Creek State Recreation Area and 511 acres (68%) of Armstrong Redwoods State Natural Reserve. The Walbridge fire caused a lot of damage on the ridges, but little damage on the valley floor. This Fire Ecology Walk will help you understand how



redwoods are adapted to survive, and even thrive, in periodic wildfires.

1. Start your walk at the panel near the Welcome Center. Read about fire scars in tree rings. Tree rings tell us that fires occur naturally in redwood forests, and in the past swept through the forests every 5-25 years or so. Also, for thousands of years, Native Americans have used fire to maintain clearings where food plants and other resources would grow. In some places they set fires every year or two!



2. Fuel Load: As you **begin your walk on the Pioneer Nature Trail**, look to your right. Do you see lots of branches on the ground? Such down wood provides fuel for fires. If fires burn the fuel every few years, the fuel load remains small and any wildfires will be easier to control. If fires are suppressed for too long, larger, more destructive fires may result.



3. Bark is the redwood's first line of defense. **Gently** press your hand against the bark of a redwood. Notice how soft it is - like a sponge. The soft bark absorbs water during lightning storms, which helps keep it from

catching fire. The bark is very fibrous. The air between the fibers doesn't conduct heat well. The tannins that give the bark its red color also help reduce its flammability.

(The charred bark on the valley floor trees is from a 1923 wildfire.)

After crossing the road, you will come to a large round with some dates marked on it.

4. As trees grow, they produce a light and a dark growth ring each year. The **date round** is from a tree that grew for more than 1000 years! All of the rings are very close together, which tells us that it grew very slowly for all that time. Since there wasn't a thousand-year drought, the slow growth is probably due to living in a dark shady forest. There were undoubtedly fires during that period, but they weren't severe enough to open up the forest canopy and allow light in, which would probably have caused a period of rapid growth.

5. Family circles: Just beyond the growth ring display is a sign explaining the formation of family circles from root crown or stump sprouting.



6. Root Crown Sprouting: Redwood trees have buds under the bark, especially at the top of the root system (the root crown). If the tree is under stress, or if it is cut down, the buds can sprout into new trees. Even if

the top of the tree is burned, the root crown sprouts may survive to grow a new redwood tree. Tanoak and bay can also sprout from root crowns. As you walk, look for sprouts at the bases of trees.

7. Goose Pen: As you approach the road you will find a tree with a hole at its base and a scar extending 25 feet up its side. This is where a fire burned through the bark and burned some of the heartwood, creating a "Goose Pen." Redwoods have an amazing ability to survive even if a large portion of their heartwood is burned out. Goose pens provide important wildlife habitat and are valuable to the redwood forest ecosystem.



8. Natural Pruning: As you walk along the **Discovery Trail**, notice that the lower branches of most of the mature redwoods are dead and far above the ground. The job of branches is to support leaves, but shaded leaves don't produce food for the tree. Trees stop providing food for shaded branches and the branches die and break off.

