Native Vegetation Response to the Washburn Fire

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Just three weeks since the Washburn Fire began, native vegetation is beginning to resprout, growing through the ash to revegetate the hillslopes that were burned. Fire is a natural process in the Sierra Nevada, with typical fire return intervals between 10-35 years below 6,000 feet in elevation. Plants that live in fire prone ecosystems have developed unique strategies to survive and thrive. Three common strategies are: resprouting, resisting, and responding.

The plants pictured above all resprouted since the Washburn Fire started. Some species will resprout even if all their above ground biomass is charred or consumed. Different species utilize different plant structures to resprout from. Some have fire hardened buds that rapidly resprout from the tips of the burned plants (bear clover). Some trees produce epicormic sprouts from dormant buds along their stems or at their bases (oaks). Some shrubs develop burls with dormant buds at their base (some manzanitas). Many herbaceous plants resprout from specialized roots called rhizomes (yarrow). Other herbaceous plants have above ground stems that lay flat and crawl along the ground called stolons that new shoots will develop from even after being severed from their ‘mother’ plant (strawberries).

Many of our conifers, like ponderosa pine, incense cedar, and the world’s most massive tree, the giant sequoia, will resist the impacts of fire. Their thick bark and high canopies can withstand low to moderate ground fires, and indeed many old growth individuals experience dozens or even hundreds of fires in their lifetime.
The Galen Clark Tree burned in the Washburn Fire and should recover with little to no impact. Large fire-resistant conifers cannot, however, resist high severity crown fires such as those experienced during the Castle/SQF Complex, KNP Complex, and Windy Fires. While fire is a natural process in these mountains, the high intensity mega fires of the past decade are well outside of the norm for the fire regimes that our native flora and fauna have evolved to live with over many thousands of years. Around 20% of all giant sequoias were lost in the last three years due to unnaturally high intensity crown fires.

A third strategy native plants have developed is to respond to environmental cues from fire, like heat, chemicals found in ash leachate, and newly available sunlight and water. We expect to see many wildflowers like lupines next summer in the Washburn Fire footprint. Sometimes these species are referred to as fire followers.

Some fire responders don’t just capitalize on newly available resources, they are dependent on the environmental cues from fire to trigger their germination. They may be found in low numbers without fire, but they greatly increase their abundance following fire. Local examples of these species include the mighty giant sequoia and flowers like golden eardrops and bush poppy.

The seeds of fire responder herbaceous plants lay dormant in the soil, waiting for those cues to flourish. These plants rapidly colonize burned areas, stabilizing soil, providing bountiful resources for pollinators, and colorful displays for people.

Giant sequoias hold their serotinous cones high in the treetops where they remain for up to twenty years. They wait for the heat of a fire to trigger the cone to open, and the tiny seeds fall to the newly exposed bare ground and germinate.

The BAER Team will be providing more information on the analysis of the impacts of the Washburn Fire, including the fate of the Mariposa Grove of Giant Sequoias. For more information about native plants found in Yosemite National Park: Plants - Yosemite National Park (U.S. National Park Service) (nps.gov).
A backburn of the Tuolumne Grove of Giant Sequoias during the 2013 Rim Fire (left) led to thousands of baby sequoias in 2014 (right). Sequoias respond to the environmental cues of fire to germinate and are fire dependent because nearly all seed germination requires fire to heat and release seed from their serotinous cones (though long horn beetles and Douglas squirrels can also trigger seed release).

A field of lupines respond one year after the Rim Fire, similar floral displays are expected in the Washburn Fire footprint next year.