

Shasta-Trinity National Forest Burned Area Emergency Response

Yolla Bolly Complex Native Plant Community Resource Assessment

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CRITICAL VALUES/RESOURCES AND THREATS

The Yolla Bolly Fire burned in the southern portion of the Shasta-Trinity NF and the northern portion of the Mendocino NF. The fire burned approximately 89,900 acres. Of the total acreage approximately 34,200 acres burned on the Shasta-Trinity NF and will be addressed in this report. The potential values at risk include the following plant communities that occur within the Yolla Bolly Fire area.

- Klamath mixed conifer forest
- Red fir forest
- Aspen
- Montane Chaparral

BURNED AREA CHARACTERIZATION

Klamath Mixed Conifer forest

The canopy in this plant community is dominated by Douglas fir (*Pseudotsuga menziesii*). Ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), red fir (*Abies magnifica*), and incense cedar (*Calocedrus decurrens*) are also common. All of these conifers rely on wind to disperse seed. Seeds can disperse from off-site trees to colonize the burned area.

When fires do not kill all the trees in a stand, seedling establishment by Douglas fir may begin within a year or two after burning. Mineral soils exposed by fire are generally considered favorable seedbeds for conifers. Most of the high-severity fire areas are small enough for conifer seeds to reach the interior of the burn. Larger areas of conifer forest where stand-replacing fire occurred may be converted to chaparral. Conifer forests at high elevations below Black Rock and North Yolla Bolly Mountain appear to have been converted to chaparral due to previous fires. The fire return interval in chaparral is generally shorter than in conifer forests and it may be many years before conifers can reestablish in these converted areas.

Several common shrub species were observed to be resprouting in forest openings and at forest edges: deerbrush (*Ceanothus integerrimus*), whitethorn (*Ceanothus cordulatus*), bittercherry (*Prunus emarginata*), silktassel bush (*Garrya fremontii*), gooseberry (*Ribes roezleii*). All of these are also found in the chaparral plant community. The resulting shrub layer in Klamath Mixed Conifer forest will likely be dominated by deerbrush, whitethorn, and bittercherry.

Deer brush appears to be important in early postfire succession but only a minor species in mature mixed-conifer forest. It recovers from fire by establishing from seed and by sprouting from the root crown. Seedling establishment is the most common method of postfire regeneration. Seedlings are often dense in the first few years after fire. Although deer brush has been reported to be a weak sprouter after fire, abundant small resprouts were observed in some forested areas of the Vinegar fire.

After fire whitethorn regenerates by stump-sprouting or from seed depending on the severity of the burn. It is characterized specifically as an obligate sprouter in moderate fuel-consumption burns and a facultative seeder following high fuel-consumption fires. Whitethorn sprouts were observed in forest openings and chaparral areas in the Vinegar fire. It is expected to be abundant in much of the burned conifer forest.

Bitter cherry sprouts from the root crown following fire. It establishes from buried seed or seed dispersed onto burned sites. Several studies have reported rapid recovery and substantial postfire increases in bitter cherry densities. It was observed resprouting and is expected to be abundant in the Vinegar Fire.

Silk tassel bush recovers rapidly after fire. Severe fire consumes or kills the above ground portion of the plant but root crown has a high rate of survival. It resprouts vigorously in the first year after fire and can reach or exceed its original height after 3 years.

Very few herbs were found growing in burned areas. Hounds tongue (*Cynoglossum* sp.), Lupines (*Lupinus* spp.), rabbit brush (*Chrysothamnus nauseosus*), buckwheat (*Eriogonum* spp.) were found resprouting. Other herbs in nearby unburned or lightly burned areas are likely to colonize the understory and forest openings. These include several native grasses: Idaho fescue (*Festuca idahoensis*), California fescue (*Festuca californica*), and squirrel tail (*Elymus elymoides*). Native grasses in high-severity areas may be threatened by cheatgrass which proliferates aggressively after fire.

Riparian areas in conifer forests

Several tributaries of Shell Mountain creek in the Trough Fire were burned at high severity. Willow species (*Salix* spp.) were observed during this assessment by BAER team members to be resprouting vigorously in these areas with new shoots up to 2 feet tall. White alder (*Alnus rhombifolia*) trees in high-severity burn areas did not survive. Although it has the ability white alder often does not resprout after fire. Fires that remove organic soil layers and expose mineral soils may possibly provide favorable seedbeds for the establishment of white alder seed, providing the soil remains moist. Alders are expected to regenerate in low numbers in these riparian areas. Sedges (*Carex* spp.) were also reported in riparian areas where high-severity fire occurred. The presence of sedges is usually indicative of healthy streams due to their dense root masses that hold soil and stabilize banks. The species of the existent sedges in the Trough Fire are unknown and therefore their response to fire cannot be determined.

Red Fir

At higher elevations red fir is the dominant tree species in the canopy. Stands typically consist of complete monocultures, though they can mix with white fir and sugar pine at their lower margins. Because stands typically are dense with heavy shade and a thick duff layer, few other species grow in the understory. Common species found in the understory when present are *Ribes roezleii*, *Symphoricarpos* spp., *Hieracium albiflorum*, *Pyrola picta*, and *Chimaphila umbellata*. In open sites with rocky soils, red fir can grow with montane chaparral species such as *Ceanothus integerrimus*, *Ceanothus cordulatus*, and *Arctostaphylos patula*.

Much like white fir forests, red fir forests generally will begin in a grass/forb seral stage following disturbance such as fire. On good sites, this stage can last approximately 10 years before progressing into the shrub/sapling stage. In the shrub/sapling stage, shrubs and other species dominate while red fir saplings continue to grow. This can take 20 years on good sites. On poor sites, seral patterns can take longer, sometimes doubling total cumulative time to maturity. Where stands burned with moderate severity, it can be expected that some trees will have brown, scorched needles that will fall and create minor ground cover. Grass and forbs should establish and dominate by the next growing season. In open stands of red fir that contain species of montane chaparral, fire adapted shrubs such as *C. cordulatus*, and *Arctostaphylos patula* will rapidly resprout following fire. For stands that experienced high severity, recovery will be slower. Finer fuels will be completely consumed leaving no needles to fall to create ground cover. Fire adapted shrubs growing with the red fir may not sprout due to lignotuber damage in the high burn severity. The shrubs instead will reseed. Growth can be delayed up to a year minimizing immediate regrowth for soil stabilization.

Aspen

A small grove of Aspen (*Populus tremuloides*) trees is located in Cedar Basin, approximately 1 air mile south of North Yolla Mountain. This represents the southern most occurrence of this species in the Coast Ranges of California and it is disjunct from other further south Aspen groves located in the Sierra Nevada mountain range. Aspen groves are significant unique habitats usually associated with high plant diversity. It is a disturbance-dependent species known to respond favorably to fire. Historically, this grove has probably experienced frequent low intensity fires. During the Yolla Bolly fire this area received low severity fire. It is likely that this grove will respond favorably to the fire by producing abundant new suckers.

Montane Chaparral

Prior to the Yolla Bolly Complex a chaparral plant community existed in portions of the wilderness area. This is likely to be a result of a short fire return interval over many years in the past. Most estimates of historic fire-return intervals in California chaparral range from 20 to 60 years, although fire-return intervals at high elevations and on northerly aspects range from 50 to 100 years.

During this assessment several areas of chaparral were observed. There are areas of chaparral that burned at moderate to high severity where shrubs are regenerating vigorously. Several species of oak were observed to be the dominant resprouting shrubs.

Interior live oak (), canyon live oak (), Brewer's oak (), and black oak () were all resprouting. Generally, oak resprouts can reach up to 3 feet in the first year after fire, and 6 to 7 feet by the end of the second year. Repeated fires generally produce small multitemmed trees. This was observed along Syd Cabin Ridge and Plum Garden in the Vinegar Fire.

Surface fires thin the canopy and create small openings for California black oak seedling establishment by killing fire-intolerant, late successional conifers. Mixed-severity and stand-replacing fires provide large openings where California black oak stands may establish. Under some circumstances, postfire regeneration from seed may occur although acorns are vulnerable to heat. Favorable weather conditions are necessary for good germination, and sprouting appears to be the primary mode of regeneration in most areas.

Greenleaf manzanita (*Arctostaphylos patula*) is abundant in the chaparral plant community. In areas of high-severity fire close to 100% was killed. It often does not resprout after fire and reestablishes by seeds that depend on fire for scarification. High-severity fire usually results in an increase in number of plants per acre.

The above information was derived from the Fire Effects Information System (FEIS, 2007)