## Tanoak Mushroom / Xáyviish / *Tricholoma magnivelare*

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### Cultural Importance

Xáyviish is prized as a traditional food and medicine (Anderson and Lake 2013). The tanoak mushroom, also known as the pine mushroom or matsutake, is highly prized in the global market and has at times had very high commercial value, making it vulnerable to overharvest by outsiders (Hosford et al. 1997, Peters and Ortiz 2016).

### Life Cycle & Habitat

In Northern California, xáyviish can be found scattered or growing in groups in well-drained soil or duff under tanoak, golden chinquapin, madrone, or pine trees with which it forms a mycorrhizal, symbiotic relationship (Richards and Creasy 1996, Richards 1997, Anderson and Lake 2013). In addition to rainfall, this mushroom requires low temperatures, and a pattern of warming and cooling. (Viess 2016, Hosford et al. 1997)

### Xáyviish and Fire

Fire can have direct effects on xáyviish by destroying its mycelian mats from which the fruiting body emerges, compromising the continuity of burned patches (Hosford et al. 1997). Additionally, given the tanoak mushroom's dependence on certain tree species such as the tanoak, high severity fire can have indirect effects on the mushroom's present and future population if it destroys large groves of host trees (Hosford et al. 1997, Karuk DRN 2010, Anderson and Lake 2013).

**Effects of High Severity Fire Across Time**

| Immediate | 2-Year | Long-Term |
|---|---|---|
| • Mycelial mats may be burned and destroyed preventing them from fruiting into harvestable mushrooms and compromising survivability of the population | • Xáyviish may struggle to populate or repopulate areas if entire stands of host species have been destroyed by high severity fire. | • The moisture and cool temperatures that xáyviish depends on may be less available in forests with repeated high-severity fire |
| Sources: Hosford et al. 1997, Karuk DNR 2010 | Sources: Hosford et al. 1997 | Sources: Hosford et al. 1997 |

**Effects of Karuk Cultural Burning Across Time**

| Immediate | 2-Year | Long-Term |
|---|---|---|
| • Can avoid or minimally impact tanoak mushroom patches while still burning tanoak stands and acorn piles to prevent pests that affect tanoak health. | • Lower intensity, mixed severity burn patches that benefit mushroom eco-mycrohryzial host rejuvenate and maintain viable shiro colonies. | • Maintains host tree and shrub vitality, and retains duff and some litter (reduced surface fuels), fostering healthy mushroom populations. |
| Sources: Karuk DNR 2010, Anderson and Lake 2013 | Sources: Hosford et al. 1997, Anderson and Lake 2013 | Sources: Anderson and Lake 2013 |

**Effects of Federal Fire Management Strategies on Species' Climate Change and Fire Resilience**

| Prior to Fire | During Fire | After Fire |
|---|---|---|
| • Pine and oak forests with high tree densities, canopy cover, and duff/litter facilitate productive mushroom areas but have a greater risk of high severity fires. | • Fire suppressed forests are more susceptible to climate stressors of drought and wildfire. Higher fuels and dense forests may burn at higher severities. | • Salvage logging may indirectly reduce or eliminate mushroom fruiting until the re-establishment of older aged host trees and shrubs. |
| Sources: Hosford et al. 1997, Anderson and Lake 2013 | Sources: Skinner et al. 2006. | Sources: Hosford et al. 1997. |