Salmon / Ishyá'at / *Oncorhynchus tshawytscha*

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Cultural Importance

Ish**yá'at** is among the most critical foods for Karuk people, and key to ecosystem health. Ish**yá'at** spring runs have experienced severe declines as a result of hydroelectric dams, reduced flows and warmer water temperatures. Restoring the health of spring runs is critical to Karuk eco-cultural and spiritual well-being. Ish**yá'at** is the one of the largest salmonids in the Pacific Northwest and the most rare. It is an anadromous fish born in freshwater streams and rivers, to which it returns to spawn after spending time in the ocean. Cool water temperatures are critical to ish**yá'at** as are spring to early summer high water flows that ish**yá'at** requires to reach summer holding areas, access spawning grounds.

Ishyá'at and Fire

Salmon benefit from pulse disturbances such as fire. Gravel and wood debris that washes into rivers and streams after fire provide fish habitat, and fire in the watershed often increases water yields. Smoke can block solar radiation, cool air and subsequently water temperatures, and thus reduce otherwise higher physiological stress levels during the summer. High severity fire can have negative impacts on ish**yá'at** — yet not as damaging as fire suppression, which reduces fire frequency and can increase watershed impacts.

Effects of High Severity Fire On Ishyá'at Across Time

Immediate	2-Year	Long-Term
• Smoke from fire may block light from the water's surface and reduce water temperatures, benefitting salmon. • Smoke inversions reduce vegetation evapotransporation (water use) increasing temporary water yield. • Stand characteristics supporting cultural use of site specific species altered.	• Burned canopies increase stream temperatures. • Moderate light increases improve aquatic productivity when coupled with higher water yields • Severe post-fire erosion can reduce spawning habitat • High severity difficult to burn in prescribed fire/ cultural burning situation. Patches serve as natural fuel breaks for followup burning.	• High severity patches contribute sediment and woody material replenishing downstream habitat. • Fires that reduce excessive tree density reduce evapotranspiration and can increase pulses of water in sub-drainages • Brush susceptible to repeated high severity fire
Sources: Toz Soto, Robock 1991	F Lake, Dwire and Kauffman 2003	FLake, Dwire and Kauffman 2003

Effects of Karuk Cultural Burning Across Time

Immediate	2-Year	Long-Term
• Smoke may lower air and water temperatures, benefitting salmon • Smoke may increase water yields by reducing evapotranspiration • Altered evapotranspiration may increase surface fuel moisture	• Gravel and wood debris has entered aquatic systems following fire and enriched salmon habitat • Water flows may increase as a result of burned landscape	• Mosaics of burning patches reduce evapotranspiration, and contribute sediment and debris for in-stream habitat. • Reduces large high severity fires, provides fuel break for adjacent fires
Sources: Toz Soto, Robock 1991	Sources: Toz Soto, Frank K. Lake	Sources: Frank K. Lake

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

Prior to Fire	During Fire	After Fire
Suppression limits debris that would normally enter streams after fire Plantations prone to high severity fire	• Fire retardants may affect survivability of Chinook salmon, particularly in earlier life stages	• Salvage logging takes trees that could have otherwise benefitted salmon habitat
Bisson et al. 2003, Noss et al. 2006	Dietrich et al. 2013, Noss et al. 2006	Soto, Noss 2006, Karr et al. 2004