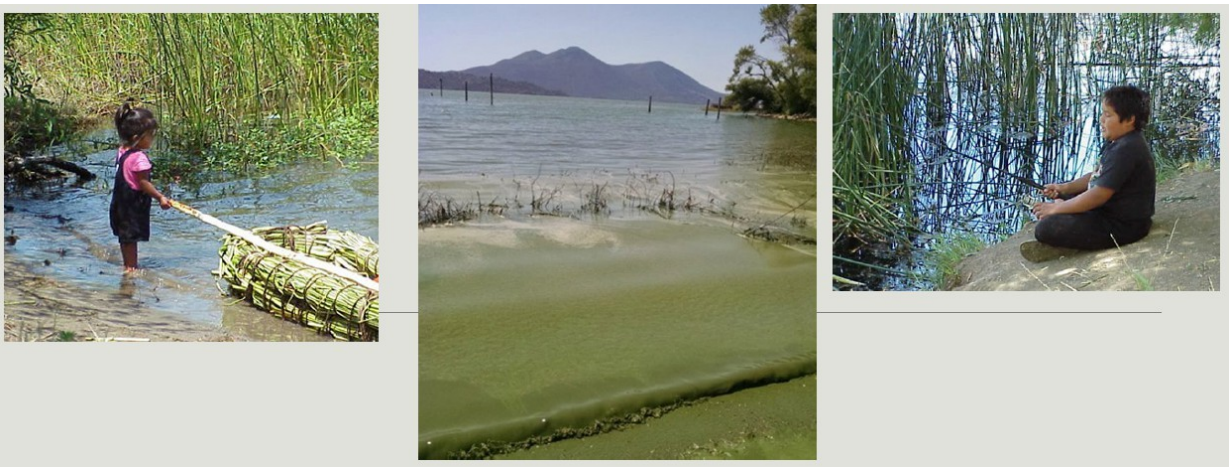
Impacts of Climate Change on the Big Valley Band of Pomo Indians

Warming air temperatures, variable precipitation, drought, wildfire, warming lake temperatures, harmful algal blooms, reduction of fish, birds and animals, as well as other stressors are impacting Tribal livelihood, culture, and traditions.

The Big Valley Band of Pomo Indians of the Big Valley Rancheria of California is a self-governing, federally recognized Tribe of Pomo Indians living on the shores of Clear Lake in Lake County, California. Their ancestors, the Xa-Ben-Na-Po Band of Pomo Indians, inhabited the Clear Lake area for over 11,800 years. Although the Rancheria sits on 350 acres today, the Tribe's traditional lands extend much farther. The Big Valley Pomo rely heavily on Clear Lake and its surrounding resources for subsistence, livelihood, and important cultural and spiritual practices.

Figure 1. Scenes from Big Valley

Left to right: a child at Tule Boat Festival; a harmful algal bloom at Clear Lake; a child fishing in the Tules.



Over the past century, daytime and nighttime air temperatures, which are linked to impacts on human and ecosystem health, have increased at Big Valley. In July 2024, Big Valley Rancheria experienced 15 days of daily maximum temperatures above 100ºF (37.8ºC). This period set records for the hottest week, two-week period, and month. Rising temperatures strain energy demand and infrastructure. Along with lack of rainfall over time, they stress vegetation, increasing susceptibility to pests, disease, and death. This increases wildfire risk for the Tribe and reduces availability of materials and resources important to the Tribe for various cultural and spiritual uses, such as Tules.

Warming temperatures and changing precipitation patterns are also associated with increased harmful algal blooms (HABs) in Clear Lake. HABs produce levels of cyanotoxins harmful to humans, fish and animals, and have become more prevalent in Clear Lake over the last couple of decades. In most of 2021, many parts of the lake were unsafe for contact due to HABs, disrupting many uses and activities.

Rain has been variable at the Big Valley Rancheria, particularly in the last thirty years. The Tribe has experienced years of extremely high and low rainfall. High rainfall events cause a sharp increase of surface water flow into Clear Lake, leading to erosion, sediment deposition into the lake, and decreased water quality. Heavy rains affect infrastructure at Big Valley. Many Tribal members live in mobile homes, which are particularly susceptible to flooding. The Tribe has identified increased mold growth after heavy rain events as an impact of climate change.

Variable precipitation has also led to periods of drought, which has impacted resources, lake water quality, and caused stress to vegetation. Increased reliance on groundwater to support agriculture in the face of drought reduces the water in streams where Clear Lake Hitch, an endemic and culturally significant fish, spawn. Monitoring reveals fewer adult Hitch and a declining number of juveniles. Elders of the Big Valley Tribe have seen Hitch numbers decline in their lifetime. The loss of this fish impacts the community, the history, and the culture of the Pomo people. Restoring their habitat and numbers will also improve the health of Clear Lake overall as Hitch are also an important food source for birds, fish, and other wildlife.

Warming lake waters are associated with lower levels of dissolved oxygen (DO) in water, which poses risks to aquatic species. DO is the most important health indicator of a water body and its capacity to support a balanced aquatic ecosystem of plants and animals. The Upper Arm of Clear Lake, where the Tribe is located, has shown lower DO and increasing frequencies of hypoxia since 2000.

The Tribe is seeing fewer quail, otters, turtles, flickers, red-wing blackbirds and other animals that are important to the Tribe. These species have diminished due to the cascading impacts of climate change on their habitat.

Climate change has exacerbated food insecurity for the Tribe by reducing native wildlife species on which the Tribe has relied on for food such as Indian potato, clover, acorn, pine nuts, edible mushrooms, fish, clams, prickly sculpin, crayfish, and tules. Due to the changing climate and compounded by area development, Tule plants are particularly at risk. Approximately 85% of the Clear Lake shoreline tules have been lost already. Tules are an important plant for the Tribe and are used to build boats, for weaving, in ceremonies, as a food source, and for various household uses.

Wildfires pose a unique and heightened challenge to the Tribe, given their relationship to the land. Non-Native government officials often lack understanding of Tribal customs and priorities related to fire. Historically, Pomo people have conducted cultural burns, low intensity burns that reduce the risk of wildfire by consuming dead wood and other fire fuels on forest floors.

The Big Valley Band of Pomo Indians has been living alongside Clear Lake and managing their ecosystem since time immemorial, and the health of the Tribe cannot be separated from the health of their environment. Increasing temperatures, variable rainfall, HABs, wildfires, exposure to smoke, pesticides, loss of important species, all impact the Tribe. The Big Valley Band of Pomo Indians is working both internally and with outside agencies to help restore a balance and provide a more sustainable and certain environment for future generations.

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