

# Riparian Zones Pose Severe Wildfire Threat

EFFORTS TO PROTECT STREAMS MAY HAVE THE OPPOSITE EFFECT

**T**he more our infrastructure dwindles, the more limited our capacity to restore resilient landscapes.

✓ Dense fuels near streams turned the Angora Fire into a fast-moving high-intensity wildfire whose burn area remains visible along Lake Tahoe's southern shore.

*By Malcolm North, Ph.D.*

Conventional wisdom has put critical Sierra Nevada water resources at risk and created unsafe conditions in many Sierra forests.

Instead of protecting water quality, severely limiting management in riparian zones has allowed heavy fuel loads to accumulate and increased the risk of high-intensity wildfire.

Many riparian zones in the Sierra are three times denser with vegetation than they were historically, and in the event of wildfire, 15 times more likely to have the fire “ladder” up into the canopy than pre-Gold Rush forests. During the 2007 Angora and Moonlight Fires, dense vegetation near watercourses essentially wicked flames through watersheds. The Angora Fire quickly grew to about three-quarters of its ultimate size within hours of the flames entering the stream zone.

For hundreds of years, frequent low-intensity fires started by Native Americans and lightning strikes cleared riparian zones and upland forests of debris and prevented excessive fuel build-ups. These fires typically stayed low to the ground, flaring up occasionally to create openings, and larger trees generally survived. But a century of fire suppression has led to denser forests with an abundance of ladder fuels, particularly in productive riparian forests where water is not limited.

Severe wildfire can have greater environmental consequences than low-intensity fire. High-intensity wildfire not only burns off the ground cover that guards soils against erosion during rain events, it often kills the overstory trees and their root systems. With those elements burned off or dead, there is little to hold soils on slopes, and streams can be exposed to mass erosion with detrimental effects on water quality and aquatic species habitat.

## **Inaction can be costly**

Staying out of riparian zones ignores a serious fuel problem and can leave forests prone to severe wildfire. Furthermore, the practices that led to management being virtually eliminated in riparian zones are no longer in use. Harvesting equipment has not been permitted near water in many years and road design has improved to effectively prevent sediment delivery to streams. Regulations are in place to protect water quality, and today's mechanical



harvesting technology is much lighter on the land, such that reducing fuels in riparian zones need not have a significant impact on water quality.

It may seem counterintuitive to encourage harvest activity and prescribed fire near water resources to enhance ecosystem performance, but the benefits of reducing surface and ladder fuels outweigh the risk and consequence of high-intensity wildfire. Recent research has given land managers a better understanding of wildfire behavior and ecosystem dynamics, and there is an art to treating fuels so the future forest is resilient to fire, beetles and other disturbances. Foresters need some latitude to apply Best Management Practices so that when fire enters a treated area, flames stay low to the ground and habitat, soil and water values are conserved.

Fuel concentrations in many Sierra forests are too high to safely reintroduce prescribed fire without first reducing fuels through mechanical treatments. Fuels reduction and restoration treatments, however, can be blocked by litigation or the threat of litigation. Public land managers with limited budgets tend to avoid treatments in areas with the highest possibility of lawsuit, such as riparian forests and sensitive species habitat. The irony is that in areas where fuel treatments are blocked, when wildfire occurs, it may burn up the very forest conditions the litigants wanted to protect.

### **Sawmills and scale**

California's forestry infrastructure has suffered as the acreage of fuels treated has declined.

Half of the sawmills in the Sierra have closed since 1990, resulting in longer haul distances for harvested vegetation, higher costs and less area treated. The more the state's infrastructure dwindles, the more limited the capacity to restore resilient landscapes.

Focusing on scale can help. Most restoration projects take years to plan and treat small areas. If larger areas are treated, lighter treatments in areas that may not be economical on their own, can be coupled with areas such as southwest facing slopes where heavier fuels reduction is likely to include merchantable timber. Working on a 100,000-acre scale over 10 years or more could provide the predictable access to wood and biomass necessary to encourage infrastructure investment and restore greater swaths of landscape.

Public education is critical. Communities need to see the extreme fuel loads throughout the Sierra and understand the tradeoffs between action and inaction. Those concerned with owls and fish should recognize that fuels reduction can be compatible with habitat conservation. In a positive step, the Forest Service is making progress toward building consensus by holding public meetings, requesting input, and conducting field trips to explain treatment options.

Sierra landscapes must be made resilient to conditions that will likely include a warmer climate and a longer wildfire season. Such an achievement will require vision as well as institutional change that recognizes the ecological importance of restoring forests and the economic realities of reducing uncharacteristic fuel loads. ■

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<< Severe wildfire killed most of the vegetation in the Angora Fire burn area.

