



## 2017 FIRE CONGRESS Research Highlight



# Fire Treatments on California Hazelnut to Enhance Karuk and Yurok Indian Basketry

Tony Marks-Block, Stanford University, [tonymb@stanford.edu](mailto:tonymb@stanford.edu)

Frank K. Lake, USDA Forest Service Pacific Southwest Research Station

## MAIN QUESTIONS OR ISSUES THAT YOU ADDRESSED

We investigated the effect of prescribed broadcast fires and fire proxies (e.g., cutting, pile burning, and propane torch burning) on the production of good quality basketry stems by California Hazelnut shrubs (*Corylus cornuta* var. *californica*) for use by Karuk and Yurok Indian basket weavers. We collaborated with basket weavers to inform metrics used to evaluate the effects of fire and proxy treatments on hazel stem growth responses.

## LOCATION AND ECOSYSTEM INVESTIGATED

Karuk and Yurok ancestral territories, Klamath Mountains, California; Douglas fir and mixed hardwood forests.

## KEY FINDINGS OF YOUR RESEARCH

When California hazelnut shrubs are treated with (a) prescribed broadcast fires, (b) cutting, (c) pile burning, and (d) propane torch burning, they produce greater proportions of good quality (straight and unbranched) basketry stems compared to untreated shrubs ( $p < 0.001$ ). Propane torch burning and prescribed broadcast fires also produce greater proportions of good quality basketry stems compared to the cutting of California hazelnut shrubs ( $p < 0.01$ ). Logistic regression models show that Eastern aspects produce greater proportions of good stems ( $p < 0.05$ ) and that the presence of deer browse reduces proportions of good stems ( $p < 0.01$ ). In addition, stem diameters of treated shrubs are significantly smaller than untreated stems ( $p < 0.001$ ), which is a desired quality for basket weavers.

## HOW DID YOU ANSWER THE MAIN QUESTIONS OR INFORM THE ISSUES?

- We experimentally treated 45 individual hazelnut shrubs in May of 2008, to evaluate the effects of prescribed fire proxies on the production of good hazelnut stems for basketry. These treatments included (1) cutting ( $n=15$ ), (2) propane torch burning ( $n=15$ ), and (3) pile burning ( $n=14$ ). Each treatment was conducted on three individual shrubs within 1.0 to 2.0 m of another to create experimental blocks ( $n=15$ ), which also contained a control shrub ( $n=15$ ). Results were analyzed using one-way ANOVA.
- We evaluated the effects of prescribed broadcast fire treatments on 41 individual hazelnut shrubs in five 20 m<sup>2</sup> plots, 30 of which were located in known prescribed broadcast fire areas in March and September of 2015 and 11 of those that were control shrubs burned in an arson fire (July 2015). 30 shrubs in three additional plots served as controls. Results were analyzed using one-way ANOVA.
- The total number of stems at ground level, and the number of good stems for basketry were measured 12 – 18 months post-treatment using digital calipers at each hazelnut shrub. Stems considered good did

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not have side branching, insect pests, or other structural defects. The aspect, canopy cover, deer browse, and slope of each site were also measured and included in logistic regression modelling.

- The maximum and minimum stem diameters (mm at ground level) were measured using digital calipers at each of the shrubs that received the broadcast treatment before and 12 – 18 months after the treatment (corresponding to basketweaver stem harvesting). A paired t-test was conducted to compare the mean stem diameter distributions (n = 54).

## HOW MIGHT/WILL IT INFLUENCE FIRE MANAGEMENT DECISIONS OR PRACTICES?

Our data confirms Karuk and Yurok ecological knowledge of the positive effects broadcast fire and proxy treatments have on California hazelnut stem qualities and densities. When planning prescribed burns and other fuel treatments fire managers should collaborate with indigenous communities to identify sites that include California hazelnut. Sites on eastern aspects are recommended for increased productivity of good basketry stems. In addition, sufficient areas should be burned to reduce competition with deer for good hazelnut stems.

## WHO IS THE MAIN END-USER OF YOUR RESEARCH?

Fire and forest managers in California and the Pacific Northwest, as well as American Indian natural resource managers will use this research to integrate indigenous resource objectives into fuels and fire management planning. Indigenous basket weavers will benefit from the increased availability of a key resource.

## CONGRESS SESSION

Fire Trek: The Next Generation, Timothy Ingalsbee

### Hazel Stem Usable Proportions by Treatment

