

VOICES FROM THE FIELD:

NATIVE AMERICAN MANAGEMENT OF WILLOW DOMINATED RIPARIAN ZONES IN NORTH WEST CALIFORNIA: A COMMUNITY FORESTRY SCALED APPROACH.

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In 2002 when looking for a graduate research project that would serve Native American basket weavers, US Forest Service management, and academic research interests, I happened upon an emergent issue that linked cultural management practices, prescribed fire, and riparian areas. Each issue in its own right was an intriguing topic, but how could I explore all three in a manner that fulfilled each stakeholder's needs? My methodology was a participatory action research approach which involved oral history interviews of Native American tribal elders and practitioners, prescribed burning of riparian willow communities, experimental treatment of individual willows, and an ethnobotanical characterization of sandbar willow (*Salix exigua*) in north-western California.

I conducted oral history interviews of Native American elders and practitioners to document traditional ecological knowledge of tribes in northwestern California. I sought to understand indigenous peoples' uses of fire for land management, historical landscape changes in the region, and tribal community prioritization of fuels reduction and prescribed burning projects for forest and grassland restoration. As a result of the interviews I learned that generally only the Karuk and Shasta tribes used fire to manage sandbar willows whereas the other tribes in the region, who relied less upon willow for basketry, did not burn willows. Karuk tribal basket weavers used fire to stimulate regrowth of willows, reduce insect pest infestations, and improve wildlife forage and habitat during insufficient flood years. Due to dam construction and flow regulation



of the Klamath River, the river did not flood in the magnitude or frequency as it did historically. In order for the Karuk Indigenous Basketweavers to burn willows on National Forest lands along the Klamath River the US Forest Service was requesting additional studies which help assess the impacts of fire on the sandbar willow dominated riparian areas. I spoke with the local US Forest Service, Karuk Indigenous

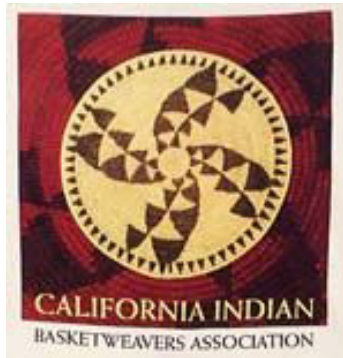
Basketweavers, and proposed to my graduate committee at Oregon State University that I would study the effects of fire on riparian willow communities.

After meeting with the local tribal community and US Forest Service, I determined that I needed study sites that met several criteria. I selected three sites along the Klamath River between the towns of Happy Camp and Weitchpec each of which were accessible to the basket weavers, defensible against escaped fire, and at a size large enough area to conduct the study. I adopted the FIREMON fire effects monitoring method for assessing the affects of fire on the riparian willow plant community structure, composition, and fuel load pre and post prescribed fire. I established permanent transects at each site and recorded the height and number of stocks of each shrub along them. I also established plots to monitor the change in density of forbs and grasses and types of cover. To characterize the fuel loading along each transect I recorded the 1, 10, 100, and 1000 hour fuel types, or the size classes of different fuels as well as the depth and percentage of duff and litter. I conducted the pre burn vegetation surveys in late June and early July of 2005 and the pre burn fuels surveys in September of 2005.

Overall the prescribe burns met the objectives of the Native American basket weavers by top killing the willows and reducing the amount of fuel within each site.

US Forest Service fire crews from the Klamath National Forest's Happy Camp Ranger District and the Six Rivers National Forest's Orleans Ranger District burned the three sites in October, 2005. The burns were patchy and generally resulted in a mosaic of high to low intensity effects of fire within the willow patches. At the time of the prescribed burns it looked as if the objectives of the Native American basket weavers were met due to fire top killing the willows and reducing the amount of fuel within each site. Final post-fire vegetation surveys will not be completed until June of 2006. It was an achievement to even have the prescribed burns conducted given fire season restrictions, fire personnel availability, and air quality restrictions. The year before (Fall 2004) air quality controls, weather conditions, and limitations in fire crew availability prevented effective burning of the sites to meet our research objectives. In an effort to understand how alternative means of management other than fire may still meet the objectives of the basket weavers I designed an experiment to test the effects of propane burning versus pruning on willow growth form at another location.

The study to test the effects of fire and pruning on willow growth was conducted adjacent to the confluence of Camp Creek into the Klamath River near the town of Orleans. I worked with community partners, LaVerne Glaze (Karuk/Yurok) and Bryan Colegrove (Hupa/Yurok/Karuk) and other members of the Karuk Indigenous Basketweavers and Californian Indian Basketweavers Association. Basket weavers got involved with the project in several ways. They provided recommendations on project location, knowledge of what management practices make "good" basket weaving shoots, access to their own harvested materials for study and data measurements. They also assisted me with understanding how bark on and/or peeled willow sticks are used for basket weaving, applied the experimental treatment (pruning), and assisted with interpretation of the results. The US Forest Service conducted the propane burning treatment under the supervision of LaVerne and me. The Karuk Indigenous Basketweavers and USFS, with the assistance of others, annually host the "Passport in Time-Follow the Smoke" cultural heritage camp. These groups have helped with pruning, weeding, and collection of data on willow shoots used for basket



weaving from this project site. Many basket weavers found the experimental process interesting but not necessarily useful in that it "tested" what they already knew to be true based upon their traditional ecological knowledge and experiences. They already know that broadcast burning the whole river terrace will eliminate insect infestations and stimulate willow growth that produces a greater number of useable shoots that can then be pruned and utilized for weaving.

The basket weavers agreed that part of the project's site would be set aside for non-experimental basketry management of sand bar willows as well as for the experiment. I randomly selected individual willow shrubs and assigned a burning, pruning, or control treatment. I counted the number of potentially useable willow shoots on each shrub before and after treatment. I measured the stem diameter and length of a percentage of shoots on each willow to calculate the stem diameter/length ratio. Based upon instructions, observations and measurements of "good" shoots/sticks that Native American basket weavers were using for weaving, I developed my research criteria for assessing what makes a "good" desirable shoot. A "good" willow shoot is a single straight stick greater than 1 mm in diameter and greater than 10 cm in length, without lateral branches, kinks, or signs of insect damage such as holes or galls. This lower size limit and quality describe the smallest sized shoots used by basket weavers. In an effort to better describe and characterize the quality of willow shoots needed by basket weavers I measured the stem diameter and length of thousands of sandbar willow shoots from the collections of basketweavers. "Follow the Smoke" volunteers also helped measure willow shoots harvested from the project site, which were then donated to basket weavers and used for teaching elementary school children as well as for the community basket weaving class organized by LaVerne and with Bryan's help. I developed and graphed the stem diameter/length ratio which indicates that the size and type of sandbar willow baskets depends on the characteristics and quality of the willow shoots. I then used the stem diameter/length ratio as another line of evidence in determining how the treatments resulted in "good" (useable) versus "bad" (non-useable) shoots. A common misconception Native American bas

ketweavers encounter among land managers and the public is that every willow shrub can give them enough quality sticks for weaving. This experiment also allowed me to show potentially how much of an riparian area of sand bar willows is needed to support the material needs of basket weavers as well as to describe how a single managed (burned or pruned) willow shrub can produce a variety of shoots for different types of baskets.

As the data in the table indicate, the number of “good” stems and “bad” stems change as a product of annual growth and the type of treatment. An important component of the study is comparing the Good to Bad ratio (G/B: #) before and after treatment. The higher the ratio the greater the improvement in the number of potentially useable stems for basket weaving. Comparing the change in good and bad stems is another way of assessing the effects of treatments on the number of potentially useable stems and shoots on each willow shrub. Although the control produced many more stems, my experience in the field as well as that of the basket weavers, demonstrates that the shoots are either too high to access, take more effort to search through for “good” stems, and generally have more insect infestations. Height, the annual change in growth after treatment, is indicative of productivity. For example, in the table above #12 Burn grew 1.5 meters, compared to #11 Prune and #10 Control which grew only 0.3 meters, and 0.5 meters respectively. My community partner, LaVerne Glaze of the Karuk Indigenous Basketweavers pruned the individual willow plants for the pruning treatment.

Although I did not measure the difference in height of the stems or how much of the tops she cut off, it is known that the “burn” treatments grew from the ground up to the height at time of post treatment measurement. The “control” grew from the tallest point at time of pre-treatment measurement to the time of post treatment measurement. The growth of the pruned shrubs was somewhere in between these measurements. The numbers of stalks at ground level indicates response to each treatment. Burning generally increased the total number of stalks at ground level. In contrast, the number of stalks at ground level in the prune and control treatments remained relatively constant.

The scaled approach taken in this Community Forestry Research Fellowship supported dissertation research involved a diverse group of agency, academic and community participants. The results will be used by the US Forest Service or other agencies to improve fire management practices necessary to support cultural burns and increase the availability of higher quality and quantity of basket materials for Native American basket weavers. This research has also provided an opportunity for increased understanding of historical uses of fire as a land management tool by Native Americans and how these past cultural practices may be adopted and adapted to today’s restoration and enhancement of culturally significant environments. Lastly, this research has fostered relationships that will continue from now into the future, helping to increase an understanding of Native American basketry management and subsistence needs.

GOOD & BAD STEMS BEFORE & AFTER TREATMENT

Willow #	Before/ After	Height	Stalks at ground level	Number of Good stems	Number of Bad Stems	Ratio	Change in Good Stems	Change in Bad Stems
#12	<i>Before Burning</i>	2.1 m	1	21	90	.23		
	<i>10 months after burn</i>	1.5 m	5	38	34	1.12	+13	-56
#11	<i>Before pruning</i>	1.9 m	4	16	83	.19		
	<i>10 months after pruning</i>	2.1 m	4	80	62	1.29	+64	-21
#10	<i>No treatment</i>	2 m	2	18	121	.15		
	<i>10 months later</i>	2.5 m	134	263	.51	+116	+142	