Traditional and Ecological Knowledge and Tan Oak Acorn Collection in the Klamath Watershed Northern California

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Introduction

(Use of acorns, both their direct use as food stuff and the indirect engagement of social and cultural practices, represent one of the most important indigenous California resource systems (Anderson, 2005).(They provide food to humans, fodder for game and forest animals, engage the manufacturing of acorn associated cultural use items, and the management of traditional habitat types.(2) Animals play an important role in the dispersal of acorns; deer, birds rodents bury acorns in the soil which promote acorn germination.(4)Tanoaks (*Notholithocarpus densiflorus*, Fagaceae are the acorns favored by the Indians of northwestern California. The Karuk Indian Tribe of California cared for Tanoak acorn orchards utilizing traditional management techniques such as prescribed fire and coppicing (Anderson 2005). The management of these culturally important habitat types additionally encourages the sustainable yield of other understory, shrubs, and herbaceous cultural Tanoak associated plants such as Huckleberry *(Vaccinium spp*.), Iris (*Douglasina spp*.) and mushrooms such as Matsutake (*Tricholoma spp*.) (1) As central place foragers , the Karuk utilize methods of acorn collection that would yield a greater yield of calories per nut collected (Bettinger, 2005) Acorns are infested by the Filbertworm (Cydia latiferriana) and the Filbert Weevil (Curculio occidentalis), adults bore holes in the shell of acorns and lay their eggs inside which, after hatching, will eat the developing nut meat. In order to determine the viability of the nut meat, traditional acorn gatherers would look at the acorn shell, weight and utilize a suite of traditional characteristics to determine whether the nut meat was edible. (pers.comm. Frank Lake, Bill Tripp 2010) This research asks the question, do indigenous acorn collection criteria accurately assess acorns as having a food grade nut meat vs. acorns which have an inedible nut meat (lower nut weights, mites, mold, and or insects), “bad acorns”?

Methods

This research project is based on the observation of acorns by comparing viable acorns determined by indigenous criteria vs. inviable infested acorns. Both good and bad acorn’s were harvested by using Native American criteria from a single 5 acre property on the Klamath River in Northern CA. All acorns were dried for about a year in brown bags of around 50 acorns in each bag. After drying, every acorn in both method batches were numbered, measured in diameter with a caliper and the nut meat was weighed by using a centigram balance, without its shell. Extra acorn data on acorn length and acorn weight in shell was collected on the good acorns. All acorn meat was placed in separate bags and that were labeled mold/mites, semi mold, and perfect nut.

The average, standard deviation of acorn densities, and nut weight without shell was calculated and compared between the Good vs. Bad acorns. An analysis of variance (ANOVA) was created to compare between good and bad nuts and between weight of acorn nut meats and acorn diameter. The Pr (>F) was looked at to distinguish whether or not the probability would reject the null (make no difference) or not reject the null (difference is significant).

This method was chosen to determine the utility of the criteria employed by native Californians and how food collection was streamlined. One of the limitations in using this method is that the quality of the acorn meat can not be determined until after collection and removal of the shell. A strength in using this method is that both good and bad acorns are collected by using indigenous methods.

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The Karuk Tribe of California, Frank Lake USFS-PSW, Bill Tripp, Karuk Tribe of California

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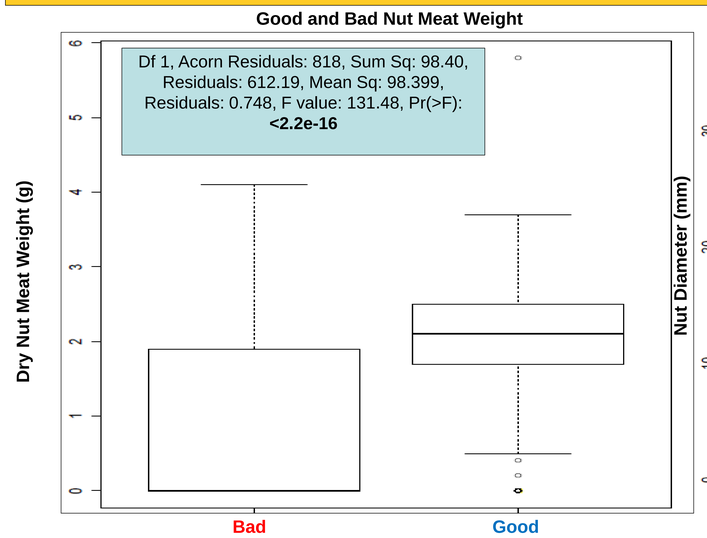
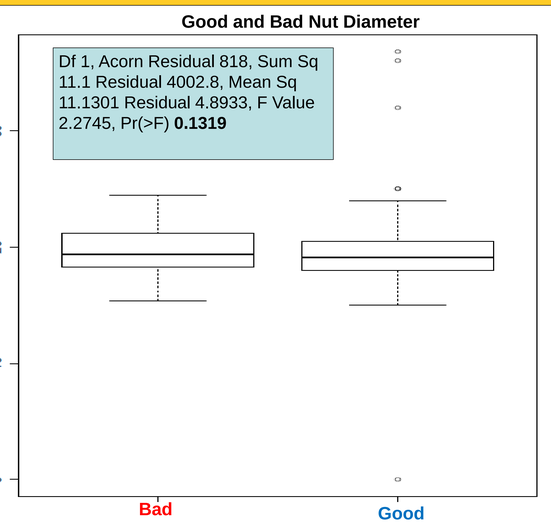
Results





Good Dry Nut Meat:

728 acorns collected. **642** good acorns**, 103** moldy**, 9** semi moldy/ mites/dust**, 39** blackened**, 64** no nut**.** Average Weight:**1.979 (g)**, Max: **5.774**(g), Min:**0.000**(g), STDV:**±0.820.**

Bad Dry Nut Meat:

91 acorns collected, **24** good acorns, **20** moldy**, 47** no nut, **4** blackened nut Average Weight**: 0.840659341(g),** Max **4.1,** Min **0,** STDV: **±1.103224193**

Good Nut Diameter:

Average Diameter:**19.35123626**(mm) Max: **36.8**(mm),Min:**0**(mm),STDV **±2.106209751**

Bad Diameter:

Average Diameter**: 19.6956044**(mm)**,** Max **24.5,** Min **15.4,** STDV: **±2.1180133**

Conclusion/Discussion

ANOVA indicates that there is no statistical significance in the nut diameter between groups Good and Bad acorns. However, there is statistical significance indicated in the weight of the nut meats between the two groups. This would indicate that indigenous acorn collection methods are able to accurately identify food grade nut meats before the shell has been removed. During the measurement process of diameter, there was a small error in caliper reading in the Good Nut batch in the last digit. The sample sizes of acorns were different between good acorns (728 individual acorns) and bad acorns (91 individual acorns). A larger sample size of bad acorns will be collected and reassessed by using the same methods of acorn collection and compared to good acorns to see if anything changes. If I were to further this study, I would want to research how and why certain nuts in shells are blackened because according to the Karuk, indigenous people a blackened nut is considered a specialty. (pers.comm. Frank Lake, Bill Tripp 2010)

Being able to differentiate good and bad acorns was important to the culture of Native Americans. In using this method, acorn collectors were able to be time and energy efficient in there gathering and processing acorns. Larger nut meat gathered meant for food per acorn.

References

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Image1: #CSA1835 Courtesy of Field Museum of Natural History, Chicago, IL.

Image2: Circa 1892, Courtesy of Smithsonian Institute, Washington, D.C

Image3:Circa 1938. #41886-0 Courtesy of Smithsonian Institute, Washington, D.C

2) Barrett, R.H. 1980. Mammals of California oak habitats—management implications. In: Plumb, T.R. tech. coord. Proceedings of the symposium on the ecology, management, and utilization of California oaks. Gen. Tech. Rep. GTR-PSW44. Berkeley, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 275-291.

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