CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

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Project Number

33631

Project Title

Can Plants Predict?

Abstract

Objectives/Goals

The objective was to determine if the undergrowth species in a redwood forest can act as an indicator of the growth potential of overstory redwood trees. My hypothesis was that redwood trees would grow the best in areas where sword fern dominated the undergrowth.

Methods/Materials

To do this project, I went to three 31 year old redwood forest stands, each with a different dominant undergrowth species#sword fern, huckleberry, and salal. Using an increment borer, I extracted 10 increment core samples from 10 different redwood trees at each site, and then measured the past ten years of growth on each core. I also collected additional information by counting the number of neighboring trees within 10 feet around each sample tree and by measuring the diameter of each sample tree using a diameter tape.

Results

Over the past 10 years, redwood trees growing in the area dominated by sword fern had an average growth of 48.6 mm. while trees in the huckleberry area averaged 22.9 mm, and trees in the salal area averaged 29.3 mm. My data shows some interesting relationships between tree growth, neighboring trees, and tree diameter. In general, trees that had few neighbors grew exceedingly well while trees with many neighbors grew much less. Also, I found that larger trees grew faster than smaller ones.

Conclusions/Discussion

The results supported my hypothesis by showing that trees growing in association with sword fern have been growing almost twice as much as those growing with huckleberry or salal. The moist environment that sword ferns enjoy also benefits redwood trees tremendously. Foresters and botanists may find this information useful as they could easily identify the most productive areas of the forest without spending a lot of time and effort extracting and measuring increment cores.

Summary Statement

The purpose of this study is to determine if undergrowth species in a redwood forest could be indicators of the growth potential of overstory redwood trees.

Help Received

Father helped locate forest stands, extract increment cores, and assemble backboard. Brian Watson helped prepare map showing location of the three study sites.

Preliminary