CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
36351

Project Title
Post-fire Regeneration in Coastal Sage Scrub: Second Year of Study

Abstract

Objectives/Goals
I studied the number and type of species (native vs. non-native) that grew in burned and unburned areas after fire in Coastal Sage Scrub (CSS). I looked in detail at the recovery of one native, Artemisia californica, to see how the number and height of this common native was affected by growing in an area that recently burned. I am beginning to study how weeding out non-natives in a burn area can affect the growth of native species.

Methods/Materials
I began my study in October 2014 after a fire in July 2014. I put 8 meter long transect lines in a burned and an adjacent unburned area. I sampled 4, 1 meter square quadrats along each transect line once a month, recording the type and number of plants that grew. In July 2015, I added a third transect in the burned area, that I weeding all non-natives out of. I also counted and measured the height of the native plant Artemisia californica, in two large 8 meter by 3 meter quadrats in the burned and unburned areas.

Results
During the dry months of summer, fewer plants grew in both transects. During the winter, many plants popped up because of winter rains. There were more species in the burned area, but also more non-natives. Eighteen months after the burn, Rattlesnake Spurge was the most common native in the burned area, and Matchweed the most common native in the unburned area. Indian Sweet Clover and Black mustard were the top non-natives in the burned area, and Red-Stemmed Filaree in the unburned area. In the burned area there were significantly more and larger Artemisia californica than in the unburned area.

Conclusions/Discussion
My project can help understand how CSS recovers from fire and how to manage this habitat. I saw differences in the type of species and when they appeared between the burned and unburned areas. This information can help with management because I identified major non-native invasive species in CSS (Indian Sweet Clover and Black Mustard), which could be the focus of removal efforts. I also identified what natives grow and when they grow, which could help with native replanting. I showed that fire can have a positive effect on the growth of some plants, as Artemisia Californica seedlings were taller and more numerous in the area that burned. In the future I plan to study whether weeding of a burned area will help to prevent native habitats from being taken over by invasive species.

Summary Statement
I showed that the species, number, and size of plants that grow in Coastal Sage Scrub habitat are altered after a fire.

Help Received
Ranger Chris Axtmann helped me to get permission to go into the burned area in Mission Trails Regional Park. My mom helped me on data taking days by driving me to the park and helping me identify plants. My Dad helped me with Excel and the statistics.