



CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

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| Name(s) Samuel B. Kahn | Project Number S1211 |
| Project Title Post-Fire Regeneration in Coastal Sage Scrub: Third Year of Study | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals I studied plant numbers and species (native vs. non-native) that grew in burned (BA) and unburned areas (UBA) after fire in Coast Sage Scrub (CSS). I measured <i>Artemisia californica</i> number and height in a BA versus an UBA. I tested how weeding out non-natives in a BA affected native species. Finally, I compared the chemistry of soils from BA and UBA.</p> <p>Methods/Materials I began in October 2014 after a fire in July 2014. I put 8 meter long transect lines in a BA and an UBA. I sampled 4, 1 meter square quadrats along each line once a month, recording the type and number of plants. In July 2015, I added a third transect in the BA, that I weeded all non-natives out of. I counted and measured the height of <i>Artemisia californica</i>, a native plant, in two large 8 meter by 3 meter quadrats in the BA and UBA. I sent samples of burned and unburned soil to Wallace Laboratories for analysis of nutrients, pH, and salinity.</p> <p>Results Plant growth correlated with the winter rains. There were more non-native plants in the BA and more species overall, though the percentage of native and non-native species in the transects was the same. Different native and non-native species were seen in the BA and UBA. Rattlesnake Spurge, Sun Cups, and 6 Weeks Fescue were the most common native species in the BA; Matchweed and 6 Weeks Fescue the most common natives in the UBA. Indian Sweet Clover and Black Mustard were the top non-natives in the BA, and Red-Stemmed Filaree and Smooth Cats Ears in the UBA. In the BA there were significantly more and larger <i>Artemisia californica</i> than in the UBA, possibly due to increased nutrients like nitrogen, carbon, magnesium, sulfur and calcium in the burned vs. the unburned soil. Weeding out non-natives did not increase the number of native species, but it did increase the number of plants of some seasonal native species. It also decreased the number of non-natives by the second winter.</p> <p>Conclusions/Discussion My project shows in detail how CSS recovers from fire. This can help with management as I identified major non-native invasive species, which could be the focus of removal efforts, and I identified what natives grew and when they grew, which could help with restoration. I plan to continue taking data until July 2017 (3 years post-fire) to look at the effect of continued removal of non-natives and increased rainfall on plants. Finally, I hope to create an app or website to help others identify seedlings.</p> | |
| Summary Statement I studied the recovery of plants in Coastal Sage Scrub after a wild fire, in particular the numbers and species of native and non-native plants that grew. | |
| Help Received Ranger Chris Axtmann provided me access to the burn area, Garn Wallace of Wallace Laboratories performed chemical analysis on my soil samples, Kyle Ince, Ranger Heidi Gutknecht, Bruce Hanson, John Hopper and Jasmine Bakker helped with seedling identification. | |