



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

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Project Title From Ashes to Life: Burned Region Plant Regeneration/ Soil Transformation	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The San Diego County Cedar Fire of October 2003 was the largest fire in California's history. Black and white ash blanketed my hometown of Poway, and I wondered if the plants would ever recover. I hypothesized that a wildland fire would cause invasive species to flourish during the first few years due to lack of competition and an abundance of nutrients, though over time the burned areas would return to their original state, with native plants replacing non-natives. I postulated that the number of plants observed in eight fire response functional groups would fluctuate over time leading to a more homogeneous and less diverse population.</p> <p>Methods/Materials I chose a fire test site at a local preserve and surveyed the site every three weeks for 42 months. I documented and classified plant regeneration in multiple plots and took notes on observations of the surrounding hillside. I recorded soil and ambient temperatures, moisture levels, and degree of slope. I used Simpson and Shannon equitability indices to analyze biodiversity trends. I worked as a parobotanist with the San Diego Natural History Museum, providing fire response research data. I pressed species samples for its collection and mine.</p> <p>Results Between 2006 and 2007, 1188 new plants germinated in my test plots. In the 42-month period, 2499 native plants germinated versus only 37 non-native plants. The native plants were comprised of 35 species and 21 different families. Endemic and frequent fire followers, opportunistic annuals, and native postfire specialists reached their maximum populations within two years. Native fire followers, such as <i>Cryptantha micromeres</i> and <i>Phacelia parryi</i>, were predominant in the first 14 months. Obligate seeders, facultative seeders, and obligate resprouters like <i>Lotus scoparius</i>, <i>Adenstoma fasciculatum</i> and <i>Hazardia squarrosa</i>, showed increased density and cover by the third postfire year. Simpson and Shannon equitability indices rose between 2004 and 2005. In 2006 and 2007, both indices declined.</p> <p>Conclusions/Discussion Native plants regenerated at significantly higher rates than non-native plants. Native alien grasses thrived in all plots. No non-native grasses were observed. Fire response trends seen thus far are as expected: the native fire followers have disappeared, the number of postfire specialists and opportunistic annuals has significantly declined, and the shrub cover and density is increasing.</p>	
Summary Statement This project examines the regeneration of native and non-native plants, tracks the transformation of soil, and measures the biodiversity of a chaparral community affected by a wildfire.	
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