



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Ramona T. LaBolle</b>  | <b>Project Number</b><br><b>J1716</b> |
| <b>Project Title</b><br><b>The Effect of Fire on the Seed Bank of Lupinus arboreus</b>  |                                       |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>The objective of my project was to study how fire effects the seedbank of Yellow Bush Lupine ( <i>Lupinus arboreus</i> ). Yellow Bush Lupine is an invasive non-native plant found on the sand dunes of Humboldt County beaches. It is harmful to both the physical structure and plant ecology of the dunes. I wanted to find out if fire kills the seeds or helps them to germinate. If fire kills the seeds or prevents them from germinating this could be helpful because fire could be used as one way to remove Yellow Bush Lupine from the dunes.<br><b>Methods/Materials</b><br>A test box containing an artificial sand dune was constructed. Lupine seeds were buried at different levels in my sand box with a thermometer at each level. Branches, litter, and duff collected from beach dunes were placed on top of sand and burned. Temperatures were recorded at each level in the sand. Seeds were recovered and then incubated to determine germination rates.<br><b>Results</b><br>In the top layer of sand the temperature increased rapidly. In the lower levels the temperature stayed the same (as starting point) for a long time and only rose slightly after an hour or more. The results showed that most seeds in the shallowest layer (2") were killed by fire and that seeds buried deeper were not effected by the heat.<br><b>Conclusions/Discussion</b><br>A major problem with the physical removal of Yellow Bush Lupin from the dunes is that the large seed bank that Lupines produce remains to start new plants. My experiment showed that fire will kill the seeds in the top layer of the sand, and this could reduce the number of plants that grow and need to be pulled from the dunes. |                                       |
| <b>Summary Statement</b><br>I studied the use of fire as a tool for removing non-native Yellow Bush Lupine from Humboldt County sand dunes.   |                                       |
| <b>Help Received</b><br>My mom helped me with editing and setting of the backboard. My dad helped me with developing the idea, providing tools and equipment and supervising me while using them. My principal, Lynda Yeoman coached me for my county interview.  |                                       |