



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Claire Abele; Julia Cable</b>	<b>Project Number</b> <b>J0101</b>
<b>Project Title</b> <b>Saving Raptors, One Windmill at a Time</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Many birds are dying in the Altamont pass from the wind turbines. Wind turbines are getting so large that birds must fly very high to pass by them without being injured. Our goal was to generate the same amount of power with a smaller blade set. <b>Methods/Materials</b> Using simulations of vortexes created by the windmill we designed our own blade set. Our design has blades on different planes instead of just one plane. Three blade designs are currently used because the vortex created by one blade can cause the following blade to slow if it is too close. By setting the blades in different planes, we believe that the vortexes will then help the blades spin faster instead of slowing the rotation of the windmill. And, by using many smaller blades, the area that the birds may hit is decreased. <b>Results</b> Our new blade design generated almost three times what the traditional blade set generated. <b>Conclusions/Discussion</b> The distance between the layers of blades in the design still needs to be optimized, but based on the initial results we believe that the design is superior to that which is currently in use. With good placement of these windmills the deaths of birds might be reduced.	
<b>Summary Statement</b> We designed a new blade set that is smaller (killing less birds) than the three blade style and generated triple the amount of electricity.	
<b>Help Received</b> Dad helped us with the use of power tools; GE sent us model windmills.	