



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

<b>Name(s)</b> <b>Daniel S. Bruce</b>	<b>Project Number</b> <b>J2204</b>
<b>Project Title</b> <b>Flight Initiation Distance: Human Presence Impacts on Lagoon Bird Response</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> While observing birds in coastal salt marshes along the California coast, I began to speculate on the possible impact of human presence on birds in these habitats. The goal of this project was to assess the impact of human activity on bird behavior and species diversity by recording the number of people encountered, bird numbers, species diversity, and the Flight Initiation Distance (FID)-the distance from an approaching human at which a bird flees.</p> <p><b>Methods/Materials</b> Four salt marshes, along 100 miles of California coast, were selected based on similar environments and the presence of endangered species such as Belding's Savannah Sparrows and Light-footed Clapper Rails. Field observations of bird quantity, species diversity, and FID, as measured with a laser range finder were made. Noise levels caused by trains, cars, and aircraft were measured with a digital decibel meter. Observations were made over a period of 41 field hours during the winter season of 2013-2014. Data from published literature and monthly bird counts were used for comparison.</p> <p><b>Results</b> An average number of 71 people were observed per hour at the Penasquitos Lagoon, 20 at the Tijuana Estuary, 23 at the San Elijo Lagoon, and 91 at Upper Newport Bay. The average noise levels in decibels, was 65.5 dB at Penasquitos, 62.5 dB at Tijuana, 63.6 dB at San Elijo, and 61.7 dB at Newport. Average FID, in meters, for passerine birds was 5.5 m at Penasquitos, 3.7 m at Tijuana, 1.8 m at San Elijo, and 4.6 m at Newport. Wading birds and Waterfowl did not flee when approached up to 20 meters, which was the closest distance that trail use would allow. There was an inverse relationship between the human activity and the diversity of bird species in the lagoons observed. Noise levels were similar throughout all the lagoons.</p> <p><b>Conclusions/Discussion</b> FID for smaller birds was shorter than FID findings of previously published studies in other lagoons. This suggests possible habituation due to human presence in these four California lagoons. Wading Birds and waterfowl would not flee since they were further from the trails. This FID difference confirms my hypothesis that different bird species are affected in various ways by human activity. The fact that higher levels of human activity were inversely associated with bird species diversity, suggests that human presence may be negatively impacting birds in these lagoons, perhaps by interrupting foraging or nesting.</p>	
<b>Summary Statement</b> The goal of this project was to assess the impact of human activity on bird behavior.	
<b>Help Received</b> My science teacher provided measuring instruments.	