



CALIFORNIA STATE SCIENCE FAIR 2009 PROJECT SUMMARY

Name(s) Madison M. Dutra	Project Number J1204
Project Title Save the Wetlands: Effects of Drought on Pond Water Quality	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals California has lost more wetland habitat than any other state in the Nation. Due to this wetland loss, artificial reservoirs and farm ponds have become important replacements for lost habitat. Evans Pond is a local farm pond established over 100 years ago from runoff. Last year, I tested the water quality in Evans Pond and found the dissolved oxygen was too low. To promote better water quality at Evans Pond, five aerators were installed by the city in early June. The goal of my project was to continue to monitor water quality in Evans Pond and record the effects of the aerators. Another goal was to continue to document the migratory ducks and other animals residing at the pond.</p> <p>Methods/Materials I performed 303 tests using 25 different water samples obtained over six months. I tested water samples for pH, alkalinity, ammonia, hardness, nitrate, nitrite, phosphate, chlorine, chloride, turbidity, dissolved oxygen, biochemical oxygen demand, total coliform, and E. coli. I recorded wildlife observations each time I visited the pond.</p> <p>Results This year, Evans Pond did not receive imported water over the summer which it usually does. As the months passed, the water level dropped and the pond shrank. By the beginning of September the pond temperature was high, the pH was 9.5, and the ammonia was at an unhealthful value. An algal bloom occurred. On September 5th, 2008 a devastating fish die-off took place. This was followed by yet another die-off on September 20th, 2008. On that day, the available dissolved oxygen was 0 ppm. Despite the five aerators, the results of my biochemical oxygen demand tests showed the bacteria consumed all of the available oxygen in the water sample. In December, the pond received water that was paid for and added by the city. This improved water quality. The migratory ducks returned, but I still see few fish and few turtles.</p> <p>Conclusions/Discussion I recommend that the city establish a permanent plan to allocate water on a regular basis. The water the pond received this year was appreciated, but unfortunately five months too late. Unless a plan is established to provide Evans Pond with water at set intervals, the pond will again be at risk and more die-offs will occur. I am concerned that if no plan is set in place to provide water, the city may simply decide not to spend the money, and all the animals that reside in Evans Pond will be in danger again.</p>	
Summary Statement The goal of my project was to monitor the effects of recently installed aerators in a local pond, but I ended up recording the effects of a devastating drought on pond water quality.	
Help Received Thanks to my parents for driving me to Evans Pond. Thanks to my science teacher for providing me with scientific guidance. Thanks to Eileen Rodriguez, Parks and Recreations for supporting Evans Pond and obtaining water in December.	