# CALIFORNIA STATE SCIENCE FAIR
# 2008 PROJECT SUMMARY

**Name(s)**

Amy Lee; Thomas Wooding

**Project Number**

**S0508**

**Project Title**

## Save the Condors

**Abstract**

**Objectives/Goals**

Bill 821 becomes law on July 2008 the Californian Senate passed legislation to ban lead ammunition that is poisoning endangered Californian Condors. The bill is designed to protect condors by requiring hunters to use non-toxic ammunition for game so that condors will not consume lead particles in any carcasses not recovered. The objective of our project is to determine if solid lead from a hunter#s bullet can be absorbed in the condor digestive fluids.

**Methods/Materials**

We shot copper only bullets, conventional copper jacketed lead core bullets from a 30-06, .22 long rifle lead bullets, steel shot, and lead shot from a shotgun into separate boxes of magazines to represent typical bullets and shot used by hunters. Then we placed the respective collected bullets, fragments, and shot into a solution similar to that of a condor#s stomach fluid that consisted of HCl,amylase, and pepsin. This stomach content was at a pH of 1.9. We poured 100ml of simulated stomach tissue with lead fragments, and used a magnetic stir rod in flasks that was placed on a magnetic stir plate set at 37 degrees Celsius for five hours. The solution was filtered through an acid-free quantitative filter paper and 10 drops of potassium chromate was added to test for lead. This was done for test subjects #2-7. Then we let the residue on the filter paper dry for 48 hours. Then we weighed contents for #1-6 and analyzed data. We repeated this procedure twice for each specimen.

**Results**

The steel shot contained no lead, but came out as a positive test result. The steel shot pellets were a bright gray color, but after the experiment the steel shot pellets were a dull gray color. The copper bullets were negative. The lead fragments with simulated stomach had a slight yellow, which indicated a slight lead presence within the solution. The .22 fragments with simulated stomach tissue had a slight yellow result also. They had a positive test and the second brightest yellow result. The lead fragment results came out positive and had the brightest yellow, which indicates that the most lead was present.

**Conclusions/Discussion**

Our hypothesis that lead bullets and fragments can be absorbed in stomach acid was proven correct. Lead bullet fragments from both the 30-06 and the .22 LR, tissue with lead impact spray were all dissolved in the stomach solution and showed positive test results. Our test results suport Bill 821 rather than some hunters' opinions.

**Summary Statement**

This project to determine the amount of lead and corrosion in bullet fragments absorbed in simulated digestive fluids of a condor.

**Help Received**

Dr. Stenger-Smith helped us to conduct this experiment at the Cerro Coso Community College lab and providing all the necessary materials.; Mr. Ostermann, for purchasing the amylase; Eric Wooding obtained the bullet fragments