



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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Project Title A Comparison of Two Sites in the Rio Guacimal Using Visual Assessment and Aquatic Macro-invertebrates	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective was to determine whether or not human activity was impacting Monteverde's environment significantly.</p> <p>Methods/Materials Using visual assessment and macroinvertebrate study to compare the biodiversity and general health of two sites on the river, Site A in the midst of human activity and Site B not, the effects of human activity on the water quality of the Rio Guacimal were determined. In the NRCS Stream Visual Assessment Protocol, twelve parameters were analyzed on a scale of 1-10 (10= most optimal): Channel Conditions, Hydrological Alterations, Riparian Zone, Bank Stability, Water Appearance, Nutrient Enrichment, Barriers to Fish Movement, In stream Fish Cover, Pools, Invertebrate Habitat, Canopy Cover, and Manure Presence. In terms of the biological indicator study, 12 samples were taken within a 30 meter stretch at the two sites. Samples at each point were taken by kicking up the sediment at the river bottom for 30 seconds. Then, using the D-net, the churned-up water was poured from the net to a large plastic bowl. The water samples were then transferred to appropriately labeled Ziplock bags and taken to the Monteverde Institute. There, books and microscopes were used to taxonomically classify the macroinvertebrates to the order and phylum level.</p> <p>Results Visual assessment indicates that though Site B is slightly worse in health, the difference is small. Macroinvertebrate studies indicate that the sites are also similar in species richness; however, the species compositions do differ. The order Diptera had a significantly higher concentration and their predators (such as Plecoptera) were in lower concentration at site B. Because organisms of the order Diptera are more capable of surviving in polluted areas and deprived oxygen settings, there is biological evidence of reduced dissolved oxygen levels at Site B, an indication of pollution. The data gathered in this experiment indicates a negative correlation between human activity and the overall health of natural water sources.</p> <p>Conclusions/Discussion It was determined that mankind's activities eliminate certain tropic levels, causing imbalance in aquatic ecosystems. This is important because reduction of species richness eliminates organisms that potentially could be used in biological research. In order to preserve the environment and diversity of Costa Rica humans should research how to minimize the impact their actions make on the environment.</p>	
Summary Statement Comparing two sites at the Rio Guacimal indicates that human activity does affect aquatic health.	
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