Biology Internship Report

Robert Lamb

03/16/06

For the past two months, I have been working with Andres Baquero and his marine science/preservation organization, Equilibrio Azul. The experiences I have been able to gain have benefited my education immensely, and heightened my awareness as a marine biologist. The job positions with which I was charged were varied, but each one had a different application to what I have been learning in classes at OSU, and I believe that in this way they created the perfect compliment. Since I have not yet finished my internship, in reality I still have a month to go, I cannot write about scientific conclusions and statistics. However, I believe that a description of my duties and experiences will provide a good idea as to what my life has been like on a biology internship.

I found out about the possibility of this position as I completed a study abroad in Quito, Ecuador. After spending a semester in the Universidad San Francisco de Quito, I became very enamored with Ecuadorian life and decided to do whatever I could to stay here longer. I looked around in the biology department for professors, students, or graduate students who were perhaps looking for a research volunteer or assistant in some project here in Ecuador for the winter and/or spring. Finally, through the contact of a fellow student in my organic chemistry class, I started communicating with Andres, and found that the work that he was doing on the coast in Ecuador would be a perfect place to gain the experience I was looking for.

Andres had worked with Equilibrio Azul for over three years in a small fishing and tourist village on the central coast of Ecuador called Puerto Lopez. The location of Puerto Lopez in the south of the province of Manabi creates an interesting mix of geographic and climatic forces which lead to an astounding array of ecosystems, flora and fauna. The main controlling factors of the climate of the area are the ocean currents. Since the tropical sunlight is strong and constant throughout the year, the seasons are dictated by the changes in the mixing currents that sweep along the Ecuadorian coast. Summer lasts from May till December, and is very dry. It is the coldest part of the year, but daily temperatures still usually get into the 70´s or 80´s. This is the time of year when the dominant ocean current is the Humboldt, which brings cold water northwards from Antarctica. During the winter months, which last from December to May, the weather is very hot and humid, with frequent rain showers. During this period the dominant current is the El Niño which brings warm waters southward from Panama and Colombia.

The overall rainfall of the region is around 1,500 milliliters per year, which denominates the ecosystem as a dry tropical forest. This ecosystem is the most highly endangered of Ecuador, with only 4 % of its original cover remaining today. Due to the immense stresses from pollution and deforestation for firewood and farmland, the Ecuadorian government designated the Machalilla National Park to protect the last remaining extensive forest. It stretches from the coast eastward and as the elevation rises in the coastal range, the ecosystem changes from dry forest to dense, humid tropical cloud forest. Puerto Lopez is located right in the middle of the park, and as such is the central point for tourism and exploitation of the area.

The environmental richness of the park and the immense pressures put upon it by the population in Puerto Lopez make for a very complex conflict of interests. The

environmental importance of the area is the only irreplaceable resource, yet it is also the most quickly forgotten. It its place, tourism, local fishing, and the unchecked use of the natural resources by the growing urban population have taken priority. The Machalilla National Park is the third most profitable in the extensive Ecuadorian national parks system. It brings in around 35,000 tourists a year mainly from Ecuador, Chile, North America, and Europe. The tourism benefits the park service on the local and national scale, the local restaurant, bar, and hotel industries, the private tourism operators, and many small separate communities that are dependant upon tourist flow to make a living. Unfortunately, the control of the tourists´ usage of the park is very limited. There is a park ranger system and a governing body for the park, but they seem more interested in making money than protecting the environment.

The local fishing fleet constitutes a huge danger for the marine ecological stability of the park, and this is one area in which I work. As in many countries of the world, it is illegal to fish for sharks. Also as in many countries of the world, especially in the developing ones, shark fishing goes on anyway, illegally, and virtually unchecked. The main incentive for shark fishing is not for the large quantities of meat that sharks produce, shark meat is of little value. The fins, however, are very costly and are almost exclusively exported to Asia to be used in shark fin soup, a delicacy. One of my daily activities is to go to the harbor where the fishermen land their boats on the beach. I go every morning at 6:30 am and usually stay until 9:00 or 10:00 and peruse the fish as they are unloaded from the boats and sold to merchants and commercial vendors. Whenever I see a shark, I ask the fisherman´s or vendor´s permission and then measure and weigh the shark, determine its sex and species, and then talk with whoever caught it to find out where it was caught, if they used gill nets or line and hook, how much the shark meat is selling for, and how much the fins are worth.

The goal of this study is to gain a general idea of the quantity of sharks that are caught, how when and where, and what kind and sex. This information can have multiple benefits. First, it can give a relative figure on the shark population and its dynamics, whether it is in decline or otherwise. Second, it can give the park and the national government statistics on an illegal activity for use in gaining support for more law enforcement. Thirdly, by taking multiple measurements of the shark (fork length, standard length, and weight), we can develop equations to mathematically associate these measurements with each other for each species. That is to say, we can develop an equation to get the standard length of a scalloped hammerhead shark when the only data we have is the fork length.

One of my main apprehensions at starting this position was that perhaps the fishermen would be unwilling to cooperate with my studies seeing as how it was a known illegal activity and I could be associated with some type of control. Also, after only working there for about a week, a naval captain started coming to the harbor about once a week to make trouble for the fisherman who were catching sharks by reminding them that it was illegal, making threats, and occasionally confiscating fish. With these new attempts to enforce the law, the fishermen started getting a little untrusting, and were hastier than ever in getting the sharks from the boats to the transport trucks which left me with little time to carry out my measurements. Even so, now that I have gotten to know a few fishermen and vendors, I feel pretty confident in asking to handle someone´s catch. The experience gained from this position is great because I get to see a wide array of tropical fish up close in ways that would be impossible in the wild or in the supermarket. Also, being able to see firsthand some of the conflicts between the needs of the local people and the laws made to protect the environment has given me greater understanding of the situation of small indigenous populations.

Another main project I worked on was a weekly census of three different area beaches to look for sea turtle nests. The nesting season for equatorial pacific sea turtles is from December to March, and so the timing of my internship here is perfect to witness all phases of sea turtle reproduction. At each beach I do a survey, walking from one end of the beach to the other just above the high-tide line to look for sea turtle tracks. Once I find one, I trace the exit and reentry from the water and in most cases, find a nest. Some nests are characteristically made, with a slight depression backed by a small rise of thrown sand. In these cases, it can be assumed that the nest is there with eggs, and an excavation is unnecessary, which is preferable in order to lessen the impact on the maturing eggs. However, the majority of nests we find are hard to interpret, and we have to do careful surface excavations to confirm the presence of eggs. I record the width of turtle tracks and nests, as well as the presence of eggs. One beach in particular, called ¨La Playita,¨ has consistently had 4 to 8 new nests per week!! This was enough information for us to convince the park to post a park ranger at the head of the beach and close it down for Carnaval. This is a four-day holiday that could have meant hundreds of visitors, and with them bonfires and digging in the sand and all manner of other dangers to the nests.

The third major project I´ve worked on here is located on the Isla de la Plata, a small island located about 10 miles offshore with climate and wildlife similar to the Galapagos. It too is part of the Machalilla National Park, and is often used as an anchoring spot for fishermen during there 2-3 day trips out to sea. The problem is that when the fishermen cast their anchors, they catch on coral heads and rocky outcroppings which rips up the substrate and is very hurtful to the ecosystem. What we´ve done is construct ten heavy cement blocks to position in heavily used areas in the waters around the island and connected surface buoys to them. The hope is that the fishermen will tie

onto these buoys instead of dropping their own anchors. We also do occasional scuba diving trips to monitor the state of the marine ecosystem surrounding the island, collect trash, and have attempted to catch and tag turtles in accordance with a Galapagos tagging project, but so far have been unsuccessful.

My experience with this internship has not been quite what I expected. In Ecuador it is hard to make things happen and to find the drive to work in other people. As a result, much of what I have been able to accomplish here has been a result of my own intentions, and I work almost entirely independently. Andres gives me directions and feedback, but he is usually busy with other affairs in the organization. Though this has been a bit of a hurdle, completing these jobs with some measure of independence has made them more rewarding. The familiarization that I´ve gained with species of fishes and turtles as well as their processes of life has been something I could never learn in a classroom. On top of this, I have developed skills for working with others, including strangers and people indisposed to cooperating. My Spanish has also improved immensely. All in all, I believe that the internship was a complete success, that I have gained many skills and experiences outside the scope of the classroom, and that I will return to studying at OSU in the fall with renewed vigor.

As far as costs are concerned, it was pretty minimal. From Oregon to Guayaquil, the closest international airport city to Puerto Lopez, you can consistently get flights under 850 dollars. The bus fare between Guayaquil and Puerto Lopez is four dollars. In the place that I stayed in Puerto Lopez, which was a small cabaña hotel room, a bamboo and cement hut with a bedroom and bathroom, cost 45 dollars per month. This is probably the best deal one could find there, and the student is on their own as far as housing and food are concerned, although Andres did help me to get set up in both aspects. Food ranged anywhere from three to ten dollars per day, depending

on how and what I ate. For the first month and a half, I ate out almost every meal. I ate mostly in small street shacks that sold 1.25 lunches with fried fish, rice, beans, and juice. This is cheap, good food, but not always nutritionally sound, nor free of bacterial tainting. There are also many restaurants, Puerto Lopez being a tourist town, where plates cost between two and ten dollars. Other than that, my costs were minimal. Each time we went scuba diving I was given all the gear and tanks for free, and only had to pay 20 or 25 dollars per outing to help cover the gas. Buses between major cities are cheap as well. It´s two dollars to Portoviejo, the nearest major city, and 12 dollars to Quito.