**CURS Spring 2020 – Project Narrative**

**Exploration of the Ongoing Success in Protecting Biodiversity in Costa Rica**

Katherine Marita and Payton Rohrer

**SLIDE 1 (Title Slide):**

Conservation efforts and sustainability have increased as topics of interest as awareness of the urgency to protect the natural world increases. Deforestation and loss of biodiversity are two major issues facing the global environment today. Costa Rica is only 0.03% of the world in landmass; yet, the country contains 5% of the world’s biodiversity (Hannes, 2010). Costa Rica has become a leader in green efforts and has taken significant steps toward becoming the world’s first carbon neutral nation. The country serves as a successful example of governmental interventions improving forest restoration and sustainable agriculture. Through a two-week immersive study abroad experience, this project aimed to observe the biodiversity within Costa Rica and investigate the nation’s conservation efforts.

**SLIDE 2 (Project Itinerary):**

The trip consisted of a two-week study abroad in Costa Rica and topics were investigated through excursions, lectures, and interactions with individuals within each location of the trip. The trip was divided into four phases as shown. The specific focuses for this project were the Costa Rica Animal Rescue Center and Manuel Antonio National Park (within Phase I), Playa Palo Seco (within Phase II), and Golfito Ecotourism (within Phase II).

**SLIDE 3 (Environmental Agencies):**

MINAE is the Ministry of Environment, Energy, and Telecommunications. This agency has ideas dating back to 1888, and developed through many reforms into what it is today. In 1988 it underwent the first reform to direct its resources towards environmental matters. SINAC is the National System of Conservation Areas, and is a division of MINAE. SINAC is the administrator for all of the protected land in Costa Rica, including the national parks. IUCN is the International Union for Conservation of Nature. This agency is based in Switzerland, which is the only country currently greener than Costa Rica. They conduct research and provide insight on how to best manage the protected areas and diversity.

**SLIDE 4 (Tenets of Environmental Legislation):**

According to the law of biodiversity number 7788, “El objeto de la presente ley es conservar la biodiversidad y el uso sostenible de los recursos, así como distribuir en forma justa los beneficios y costos derivados.” This translates to “The purpose of this law is to conserve biodiversity and the sustainable use of resources, as well as to fairly distribute the benefits and costs derived.” Also in the 1980s was an influx of environmental policies, “Five of the most important of these actions are described below: a system of national parks, debt reduction through land conservation, development of ecotourism, sustainable forestry practices, and collaborations between government and industry to develop valuable natural pharmaceutical products,” (Case Studies in Environmental Science Understanding Multiple Views). These five developments are still at the core of environmental policy today. As an example of success these tenets have created, sustainable forestry practices refer to a decrease in deforestation, or *reforestation* of the land. This goal of reforestation began in the 1980s, and from 1987 to 2005 Costa Rica’s forest cover increased from 21% to over 50% (Costa Rica).

**SLIDE 5 (What is a Protected Area?):**

About 28% of Costa Rica is considered a protected area, 12% of this is national parks, and the remaining 16% is comprised of indigenous land reserves, a multitude of refuges, corridors and reserves, (Case Studies in Environmental Science Understanding Multiple Views). A protected area is “A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values,” (About, 2020). This means that each of the afore-mentioned areas are protected areas, including national parks.

**SLIDE 6 (Phase I):**

The hands-on portion of this project included a service-learning experience at the Costa Rica Animal Rescue Center (CRARC) within Alajuela Province. CRARC is a volunteer-based operation dedicated to protecting endangered wildlife that has often been injured or abused, usually due to the negative effects of tourism or illegal pet trading. Manuel Antonio National Park is also located in this region of Costa Rica. We took a day trip there to observe native plants and animals and to document adverse tourist effects on the wildlife and ecosystems within the park.

**SLIDE 7 (CRARC):**

The time spent at CRARC included three volunteering days where we rotated services between food preparation, habitat restoration and cleaning, and vet team efforts to learn how the animals rescued are cared for at the center. We also had a lecture from the Center’s veterinarian, Dr. Andres Perez on the types of animal found within the country and some specific issues of human-animal interactions. He describes Costa Rica as a “biodiversity bomb” due to its unique placement between North and South America and having the influence of multiple oceans; these interactions give the country an impressive biodiversity for its size. We also discussed the Wildlife Conservation Law 7317 that restricts engaging with, feeding, or removing animals. This law includes a ban of hunting and increased fees for illegal animal trading (Rojas, 2012). In addition, better border security and airport control have helped to decrease attempts of illegal transport and captivity.

**SLIDE 8 (CRARC – Animal Documentation):**

This compilation documents the animals we worked with at the Center. Most are native to Costa Rica, although some have been smuggled into the country or traded illegally before rescued from the Center. The Center aims to release as many of these animals back into the wild as possible once their health is restored.

**SLIDE 9 (Manuel Antonio National Park):**

The day trip to Manuel Antonio National Park illustrated many of the issues Dr. Perez discussed with human-animal interactions. The park keeps strict guidelines on food products allowed to enter the park; however, the capuchin monkeys are already accustomed to people feeding them and so they become much more interactive with humans and often aggressively rummage through bags in search of food. In contrast, the monkeys rescued at CRARC are fed a strict diet imitating their natural diet and are much less interactive or aggressive with humans since they have not learned to expect a food source from people. It is likely that as new generations of more conservation-minded individuals emerge, the negative tourist-animal interactions will decrease allowing animals to readapt to their natural instincts.

**SLIDE 10 (Phase II):**

Our focus within the second phase was aimed at reforestation efforts within the barrier island Palo Seco. This phase served as an opportunity to investigate one of the most biodiverse mangrove swamps in the world that is found there.

**SLIDE 11 (Reforestation – Palo Seco):**

Mangroves are vegetation that cover the majority of coastline in tropic regions. They can be made up of over 20 different tree species and form complex structures. They have adapted to resist rotting or death from salty water that is consistently soaking the wood and are integral to preventing damage to the coastlines or flooding to surrounding areas (Pool, 1977). Costa Rica goes through seasonal changes of rain flow divided into a six-month dry season of no flooding, and a six-month rainy season of continuous flooding (Delgado, 2001). These seasonal fluctuations can cause major issues for the coast and inland of Costa Rica; the mangroves are crucial in preventing excessive flooding damage. Within the mangroves of the coast, there are hundreds of species of animals made up mostly of birds, fish, and invertebrates; this makes the area immensely biodiverse compared to the low diversity mudflats that would exist on the coast without the mangroves (Lacerda, 1999).

**SLIDE 12 (Mangroves):**

Mangroves are essential to combat climate change. The mangroves in Costa Rica hold 35 million metric tons of CO₂, (Costa Rica), and they are able to absorb four to five times the amount of carbon a regular forest can, (Costa Rica Mangroves, 2020). Along with protecting coastlines from damage, the mangroves are necessary for shrimp and fish reproduction, provide income to thousands of fishermen, as well as supply communities with food, (Costa Rica). The importance of mangroves led to the National Wetlands Plan of 2017, (Costa Rica Mangroves, 2020). 1% of mangrove populations is destroyed each year in Costa Rica, so this plan relies on environmental education, ecotourism, and taxes to fund restoration and protection efforts to stop this trend (Costa Rica Mangroves, 2020). These efforts are furthering the protection of the nation’s land and biodiversity of plants and animals that inhabit the mangrove ecosystems.

**SLIDE 13 (Palo Seco Cont.):**

The major threats to mangrove success and prosperity come deforestation and commercial farming by the human population. Both firewood extraction and charcoal production are two major industries that rely on excessive utilization of mangrove wood (Lacerda, 1999). Degradation of the mangrove swamps is also occurring due to misuse of coastal water resources. Irrigation and land use of freshwater has led to a decrease in rivers and creeks and an increase in dumping of waste, both of which adversely affect the livelihood of the mangrove population (Lacerda, 1999).

**SLIDE 14 (Phase III):**

Within this phase of the trip, our project focused on Golfito. Golfito is located on the Golfo Dulce South Pacific Coast and has historically been a port town, dating back to the United Fruit Company’s rise and the time of banana plantation trading. The coastal town of Golfito neighbors numerous protected lands, reserves, and Piedrans Blancas National Park; Golfito also houses a branch of the University of Costa Rica, where we received lectures regarding conservation and its connection to ecotourism.

**SLIDE 15 (Golfito – Ecotourism):**

Ecotourism can be described as “nature-oriented travel” and is becoming a popular area of study and phenomenon (Fennell, 1990). Costa Rica is the most visited country in Central America, and tourism serves as a top revenue of income of the nation. The country is also one of the most conservation-driven nations, so the concept of ecotourism is important for Costa Rica. The economic benefits of tourism are paired with environmental improvement in ecotourism (Fennell, 1990).

**SLIDE 16 (Sustainability Connection to Ecotourism):**

Utilizing revenue from the tourism industry for park management, wildlife protection, and sustainability pairs the pillars of both tourism and the environment together and allows Costa Rica to preserve its largest source of revenue while still furthering eco-friendly efforts. Benefits from ecotourism are that the nation’s other sources of income – agriculture, lumber, cattle ranching, and oil palm plantation – can become secondary to the income from tourism. Sustainable tourism can still bring in the nation’s income, while the less sustainable sources of income that lead to deforestation can be reduced (Broadbent, 2012). The value placed on biodiversity and protected lands is increasing as ecotourism becomes a major income since many of the tourist destinations and attractions are beaches, forests, and mountains and are wildlife-related; this will allow Costa Rica to successfully maintain revenue and continue to make strides in conservation.

**SLIDE 17 (Phase IV):**

The final phase of the trip took place in the Central Valley and back to Alajuela.

**SLIDE 18 (Conclusions):**

Compilation of these investigations provides unique insight into the Costa Rican environment and supports the view that governmental involvement in conservation can help preserve the world’s biodiversity. Due to the numerous policies in place by the Costa Rican government, there is a more prominent ideology of sustainable practices and environmental awareness. Costa Rica’s commitment to sustainable action is a global example that can promote worldwide awareness of the urgency to protect the natural world and its wildlife.

References Cited

About. (2020, April 14). Retrieved from https://www.iucn.org/theme/protected-areas/about

Broadbent, E.N., Zambrano, A.M.A., Dirzo, R. *et al.* (2012). The effect of land use change and ecotourism on biodiversity: a case study of Manuel Antonio, Costa Rica, from 1985 to 2008. *Landscape Ecol* **27,** 731–744.

Case Studies in Environmental Science Understanding Multiple Views. (n.d.). Retrieved from http://web.pdx.edu/~rueterj/courses/casestudies/reserves/costa-rica-story.html

Costa Rica. (n.d.). Retrieved from https://www.conservation.org/places/costa-rica

Costa Rica Animal Rescue Center. (n.d.). Retrieved from https://www.costaricaanimalrescuecenter.org/

Costa Rica Mangroves - The Importance of Mangrove Forest in Costa Rica. (2020, January 3). Retrieved from https://www.therealdealtours.com/blog/blog/costa-rica-mangroves/

Delgado, P., Hensel, P.F., Jimenez, J.A., and Day, J.W. (2001). The importance of propagule establishment and physical factors in mangrove distributional patterns in a Costa Rican estuary. *Aquatic Botany* 71(3), 157-178.

Fennell, D. and Eagles, P. (1990). Ecotourism in Costa Rica: A Conceptual Framework. *Journal of Park and Recreation Admistration,* 8(1).

Hannes. (2010). Biodiversity. Retrieved from http://costarica-information.com/nature/plants

Lacerda, L and Schaeffer-Novelli, Y. (1999). Mangroves of Latin America: The Need for Conservation and Sustainable Utilization. *Ecosistemas de Manglar*. 1(2), 5-8.

Law of Biodiversity Number 7788, 1994.

Ministry of Environment and Energy (Ministerio de Ambiente y Energia - MINAE). (n.d.). Retrieved from https://www.devex.com/organizations/ministry-of-environment-and-energy-ministerio-de-ambiente-y-energia-minae-126001

Pool, D., Snedaker, S., and Lugo, A. (1977). Structure of Mangrove Forests in Florida, Puerto Rico, Mexico, and Costa Rica. *Biotropica* 9(3), 195-212.

Rojas, R.G., (2012). Wildlife Conservation Law 7317. *Sistema National de Areas de Conservacion (SINAC)*.Retrieved from http://www.sinac.go.cr/EN-US/visasilves/Pages/default.aspx

Sistema Nacional de Areas de Conservacion Costa Rica. (n.d.). Retrieved from http://www.sinac.go.cr/EN-US/conozca/Pages/default.aspx