

Mammal Population Survey in Lowlands and Highlands of Costa Rica

Abstract

In the deep jungles of Costa Rica, a highschool called Forman has a program we like to call Rainforest. This program has been active for the past 27 years collecting data on the ecosystem of Costa Rica and sending it to people who are using it to protect the environment. We were split into three teams but this is the Mammals team of 2020. For the past 25 years we have been going to the same location, until this year. We wanted to find the difference in ecosystems in low elevations and high elevations. And the findings were not just breathtaking but fascinating as well. We traveled to [Tirimbina](#) in the lowlands and [Cuerici](#) in the mountains and the findings were very interesting. We captured footage with our trail cameras of big cats and small mammals. This year was the year with the most findings by trail cameras in all of our 27 years of doing research. We made a plaster footprint from a rare mammal cat we found. We found scat that led to the conclusion that we had found the scat of an *Oncilla*. How we concluded that it was an *Oncilla*, you will have to read the article as to how we did it. If you would like to find out more about our research, then take a peek at our research.

Introduction

We need to gather more data on what is in the Sarapiquí region of the rainforest. In prior years our project has recorded signs of Leopard, *Tayassu tajacu*, Puma, Ocellots, Margay, Jaguars, and the *Tapirus bairdii* in the form of trail cameras and plaster prints. Another organization has done some studies that can be found [here](#). Also, track large cats and their movements. We hope to have this data to share with Panthera to prevent poaching of these beautiful cats within the Costa Rican Rainforest. Our data on cats will hopefully give us a better understanding of where large cats move through and how we can prevent poaching. We share our data with Panthera, a nonprofit conservation organization dedicated to protecting large cats. This is important because majestic hunters like Jaguars are crucial to the ecosystem and to keep the lushes rainforest alive. But it is also crucial that we protect these animals from extinction. Especially when there are so few of them left, and we don't want yet another animal to go into the extinct section. We have also sighted non-large cat mammals such as *Basyprocta punctata*, *Nasua nasua*, *Philander opossum*, *Tapirus bairdii*, and *Eira barbara*. We hope to continue our data on our field study of the area where we use traps to catch small rodents for archiving. Our rodents project could reveal more data on the effect of shrinking natural habitats as logging increases within the area. Rodents account for the majority of secondary consumer's food supply. There has been other research done by other individuals on bats in Costa Rica that can be found [here](#). These are the hopes and goals of the Mammals Team.

Methods

Cameras

How to decide where

We suggest that you place the camera attached to a tree using the included strap. The camera should be placed near an area of high traffic (river bridge, trails, or water supplies).

How to set

The camera should not be placed towards objects that may move because this will trigger false pictures (moving water, windy grass, or windy branches). When setting, use a white board to take a picture of the location and time to keep pictures in order. On the white board we would record in order the camera number, date/time (military), altitude, longitude, latitude, scientific name, and direction lens is facing.

How to retrieve/ review

When retrieving the camera make sure to bring an umbrella incase of rain. This umbrella will ad in keeping the camera dry while opening it in the rain. Make sure to use the same white board to take an ending picture. Make sure that camera is off, and that there is no damage to the camera.

What to Record

- Record #
- Date/Time
- Trap #
- TAXA
- SEX/AGE
- Mark
- Mass
- HB
- TV
- EAR
- HF
- FA
- TR
- Perf
- Preg
- Mam
- Nips
- Obs
- Comments

Bats

Mist Nets

Mist nets are set for population inventory of bats.

Where/when to set

Set bats nets following the same methods as the birds team but at nite due to bates being nocturnal. On top of birds thought you should make sure to never set nets in the rain due to this leading to hypothermia and drowning.

How to take out

Bats should be carefully taken out one my one wings first then head. After being taken out, it should be stored in a breathable bag. While taking bats out make sure to give them something to bite on.

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Trapping

Live Traps (Terrestrial mammals)

Live traps for mammals that do not fly we use Havahart traps.

*When the animal's steps on the bait pan, it will trigger doors on both sides to automatically shut without harming the animal in any way shape or form.

*Never use Snap traps or Sticky traps because they can cause harm to the animal. If you are trying to catch nocturnal animals then set the traps in the late afternoon then check on them first thing in the morning.

* Never leave traps open when the temperature drops below 10c

How to hide traps

Put some leaves and twigs on the traps to hide them in plain sight that are on the ground. As for flying mammals like bats, the fishing line net traps are designed to go against their echolocation and trick them to be tangled but not harmed.

How to care for traps

Check on them every few hours or so. Make sure to never set traps if it is above 24oC or below 10oC. Always set in the shade due to a fear of overheating.

How to decide where to set up

A place where there is high traffic like on a log on a stream. Or in plain sight like on in relatively tall grass. But once placed make sure you take note or pin point where on your map your trap is placed.

What to use to bait the animals

A common bait is rolled oats mixed with peanut butter for the smell, or even fish.

How to extract land mammals from traps

For a box trap you open one side with gloves on and encourage the animal to go into the bag. Once in the bag tie up the top and treat it with care but hold the bag with one hand on the top and the other right above it with the bag suspended in the air. The animals will most likely be terrified so it will squirm and try to fight its way out. Remember to wear gloves.

What do you do once you have analyzed the animal?

Go back to the location that you captured the animal, make sure there is no harm to it then release it where it was captured.

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Results

Mist Nets(Bat species caught)

- Tirimbina

- *Myotis riparius*
- *Carollia castanea*
- *Artibeus phaeotis*
- *Ectophylla alba* (3)
- *Lionycteris spurrelli*

Curerici

- *Montane oxynotus*
- *Sturnira lilium*

Havahart

- Tirimbina
- *Potos flavus*

Scat/Plaster

- Curerici
 - Believed *Puma yagouaroundi* (Based off of footprint)
 - Believed *Leopardus tigrinus* or *Leopardus wiedii* (The scat we dissected had a Talamancan Shrew (*Cryptotis gracilis*) in it. The IUCN lists this species as vulnerable. This is listed as a common food for an Oncilla but the Margay also has a similar diet as well.)

Camera Traps

- Tirimbina
- *Dasyprocta punctata*
- *Nasua narica*
- *Eira barbara*
- *Leopardus pardalis*
- *Puma concolor*

Discussion

Our bat data is going to the reservations we stayed at, Tirimbina & Curerici, it is also going to iNaturalist. Our Mammals data is going to [Wildlife Insights](#), [iNaturalist](#), and our Cats data is going to [Panthera](#). We had astonishing results in Tirimbina and were excited to compare it to the highlands. The lack of camera trap sightings in Curerici we attribute to needing more time there to find the smaller population of wild cats.

All the terrestrial species caught on camera are all listed Least Concern by the IUCN. All but the

Central American Agouti (*Dasyprocta punctata*) populations are decreasing. *Dasyprocta* population remain stable.

Literary Cites

1. Author Andrew L. Mack, Debra D. Wright, Pages 1/143, Training Manual for Field Biology Papua New Guinea
2. Bushnell Camera Trap Guide Book
3. Author Fiona Reid, Pages 1/334, A Field Guide To Mammals of Central America and South East Mexico

Appendices

Appendices

1. Appendix I
 - a. Puma
 - b. Ocelot
2. Appendix II
 - a. Tyra
3. Appendix III
 - a. Agouti
 - b. Coatimundi

Red List

Least Concerned	Near Threatened
ChestNut Short Tailed Bat	Hondorian White Bat
Riparian Mitosis Bat	
Myotis Oxytus	
Pygmy Fruit-Eating Bat	
Little Yellow Shouldered Bat	
ChestNut Long Tailed Bat	

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