Activity Locations of Varying Primate Species in Finca Las Piedras, Peru: A Comparative Study

Tess Balsley

Corresponding emails: tessyb209@gmail.com & info@sustainableamazon.org

Abstract

This study aims to display the habitats most utilized by primate species in the Finca Las Piedras region of Madre de Dios, located in the Peruvian Amazon. Illegal activities such as logging, drilling, and wildlife trade are all risks to the survival of primate communities, hence research on important locations is essential to the survival and the ability to thrive of primate species in the Amazon rainforest. By following Capuchin monkeys, spider monkeys, titi monkeys, and squirrel monkeys, as well as owl monkeys, an understanding of habitat versus activity is obtained, with hopes of substantial conservation efforts and focus on such areas in the future. Demonstrated is the importance of primary forests in the conservation of primate species in the Peruvian Amazon, and thus essential focus must be put on conserving and protecting old, primary forests.

Introduction

The Western Peruvian Amazon is home to one of the most diverse range of species in the world, with plants, amphibians, birds, and mammals all sharing the region. However, despite the region's vast importance to their survival, illegal activities such as oil and gas drilling, logging, ‘controlled’ burning, and wildlife trade, all work to destroy the habitat that so many call home (Aquino, 2014). The Finca Las Piedras area of the Madre de Dios region in Peru is home to a rich diversity of primate species, each with unique ecological requirements and behavioral patterns. Understanding the habitat preferences and home ranges of these primates is essential for effective conservation management. Primates in the Peruvian Amazon are especially essential to seed dispersal, allowing for new trees and plants to be naturally spread and continue the conservation of such an important forest.

A previous study observed that primate species in the Peruvian Amazon exhibit habitat preferences ranging from primary rainforest to disturbed and secondary forests which have been regrown, as well as near rivers such as the Madre de Dios river and the Amazon River (Bodmer, 2000). In a separate study, Researchers tracked the movements of spider monkeys (*Ateles spp.*) using GPS collars and found that their home ranges varied depending on the availability of fruiting trees (Stevenson, 2000). Similarly, comparative studies in both pristine and disturbed forest habitats revealed differences in primate species composition, abundance, and behavior. Species such as titi monkeys were found to be more sensitive to habitat disturbance compared to squirrel monkeys (Aquino, 1994). In a study of Habitat and Abundance of primates in the Western Amazon, a table of species versus number of primates found in each location was produced to display the

abundance of species in varying terrains. Also noted is a display of the side of the Rio Carraray versus primate species. "*Saguinus tripartitus* and *Pithecia napensis* were observed only north of the river (left bank) and *Saguinus lagonotus*, *Sapajus macrocephalus*, and *Pithecia aequatorialis* were observed only south of the river (right bank)" (Aquino, 2014).

While varying and important studies have been done on primates in the Peruvian Amazon, a concrete analysis of primates in Finca Las Piedras remains unexplored. This research project aims to observe the common locations and activities of varying primate species in the Finca Las Piedras area of Madre de Dios, Peru. By following different primate species over several days and observing their activities and where they occupy, their habitat utilization patterns become apparent. Habitats found on the Finca Las Piedras land include primary forest, secondary forest, stream, and swamp. Observing in which habitats monkeys most occupy is essential for conservation efforts and focus. This research will contribute to our understanding of primate ecology and habitat requirements in Finca Las Piedras, providing valuable information for land management strategies. By identifying critical habitats and activity patterns of primate species, we are better able to prioritize areas for protection and mitigate potential threats to their survival through activities such as logging, deforestation, and gold mining. Through this study, we aim to observe and compare the habitat preferences and home ranges of different primate species in the Finca Las Piedras region of the Peruvian Amazon, document the activities of primate groups at different locations throughout the day, and create spatial maps and activity graphs illustrating the distribution of primate locations and associated behaviors.

Methods

In the Finca Las Piedras area of the Madre de Dios region of Peru, various monkey species were observed over a period of one week, from June 5th to June 13th, 2024. Observations were conducted between the hours of 5:30am to 6pm, alternating in two hour shifts throughout different periods of the day, as well as different days of the week. Pre-made trails at the Finca Las Piedras camp were alternately traversed, switching between the leftern region of the camp and the rightmost region, where the left possesses streams and vast palms, and the rightmost side hosts Brazil Nut's and thick forest, as well as the direction of travel, each trip starting from a different end of the trail. While all primates were open to study if found, the most focused species consisted of Capuchin monkeys (*Cebus imitator, Cebus apella*), tamarin monkeys (*Leontocebus fuscicannis*), titi monkeys (*Plecturocebus brunneus*), and squirrel monkeys (*Saimiri boliviensis*), as well as owl monkeys (*Aotus nigriceps*). As a trail was walked, if any monkey species were seen, a GPS location was taken using GPSTracks, while noting the identified species, the time, as well as the activity. Activities were categorized into four groups - feeding, socializing, resting, and traveling. Feeding involves both currently eating, as well as foraging for food. Socializing involves playing, hygienic interactions like cleaning each other, and fighting. Resting describes no movement for more than two minutes. Traveling involves any movement across trees that does not depict foraging or play. When noting an activity, the first seen monkey was observed, and if no longer in sight, observation switched to the next visible primate. Subsequent GPS locations were taken every two minutes for as long as the

monkeys were seen. Maintaining a quiet composure and adequate distance was of specific importance so as to observe primates in their natural states. Off-trail navigation was often used as primates were followed along their natural route, using both GPS, compass, as well as a map of the Finca Las Piedras land.

Results

Through observations of primates in Finca Las Piedras, four species were observed over four separate days, despite observation time lasting a full eight days. While each species was only seen on one occasion, data points were taken every two minutes. Species found included *Saimiri boliviensis, Leontocebus fuscicannis, Cebus imitator*, and *Cebus apella*, exhibiting activities such as feeding, traveling, socializing, and resting. Monkeys were often seen high in trees, foraging on branches for ants, picking bugs out of each others' hair, or laying in the sun. The Brown Capuchin Monkey (*Cebus apella*) was only seen once, with the only activity observed being traveling along the forest floor (Fig 1), an usual travel pattern for monkeys who most often occupy tall trees for food and safety. Squirrel Monkeys (*Saimiri boliviensis*) were seen both feeding and traveling over a 16 minute interval (Fig 2), with no socializing observed, as well as no periods of rest. Time spent with Squirrel Monkeys was extremely close to the Finca Las Piedras campsite, in which abundant banana trees occupy. Tamarin Monkeys (*Leontocebus fuscicannis*) were seen over a 45 minute time interval, exhibiting each activity at varying rates (Fig 3). The most abundant activity seen was socializing - cleaning each other, fighting, and chasing each other through trees. White Capuchin Monkeys (*Cebus imitator*) were observed for a total of 33 minutes, with zero instances of traveling and a greatest frequency of feeding (Fig 4).

For all primate species, the least observed activity was resting, which can be justified by the fact that they are not vocal during resting times, and they remain still for long periods of time, making it especially difficult to spot and identify. A satellite map of the Finca Las Piedras land (Fig 5), displays the locations of each data point along with the species corresponding color. A clear display of habitat ecosystems is derived. Tamarin and Capuchin monkeys were all observed in primary forest, while Squirrel Monkeys were observed in secondary forest regrown by ASA in the last seven years. No monkeys were observed in stream portions of the land, nor

Figure 1: Brown Capuchin Monkey (*Cebus apella*) activity versus frequency,where frequency corresponds to the amount of times observed, and activity is strictly defined.

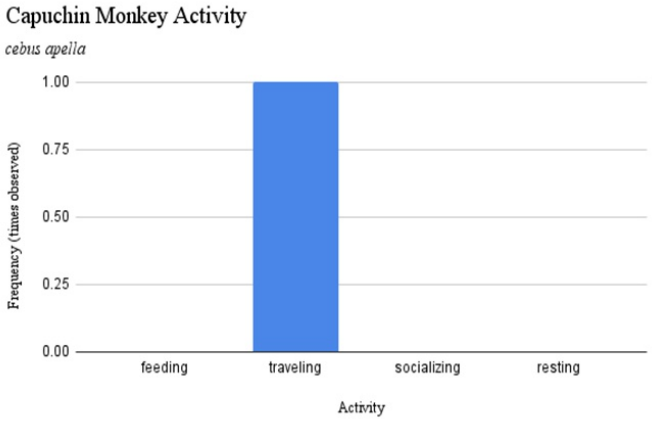


Figure 2: Squirrel Monkey (*Saimiri boliviensis*) activity versus frequency, where frequency corresponds to the amount of times observed, and activity is strictly defined.

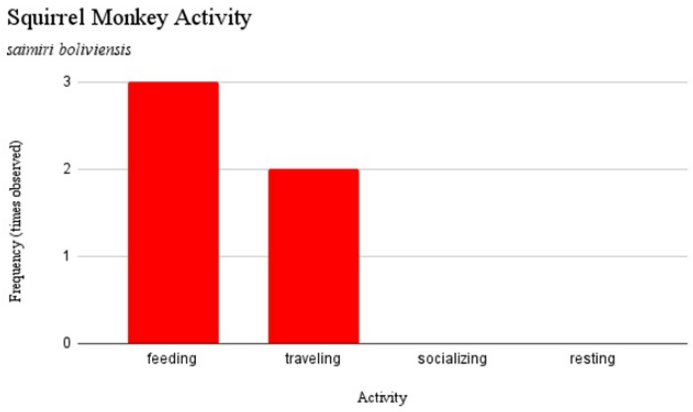


Figure 3: Tamarin Monkey (*Leontocebus fuscicannis*) activity versus frequency.

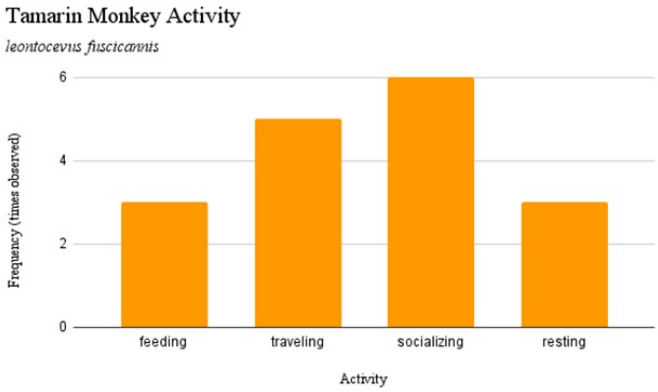
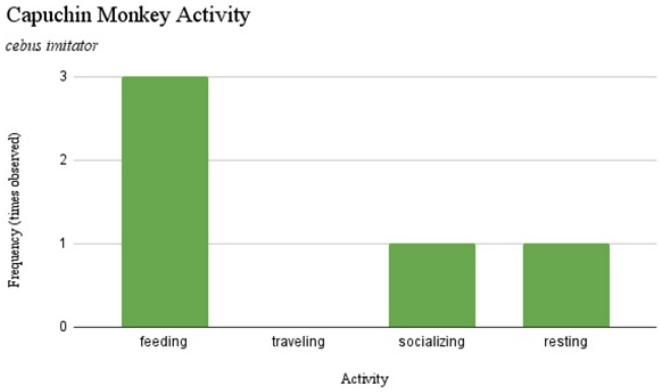
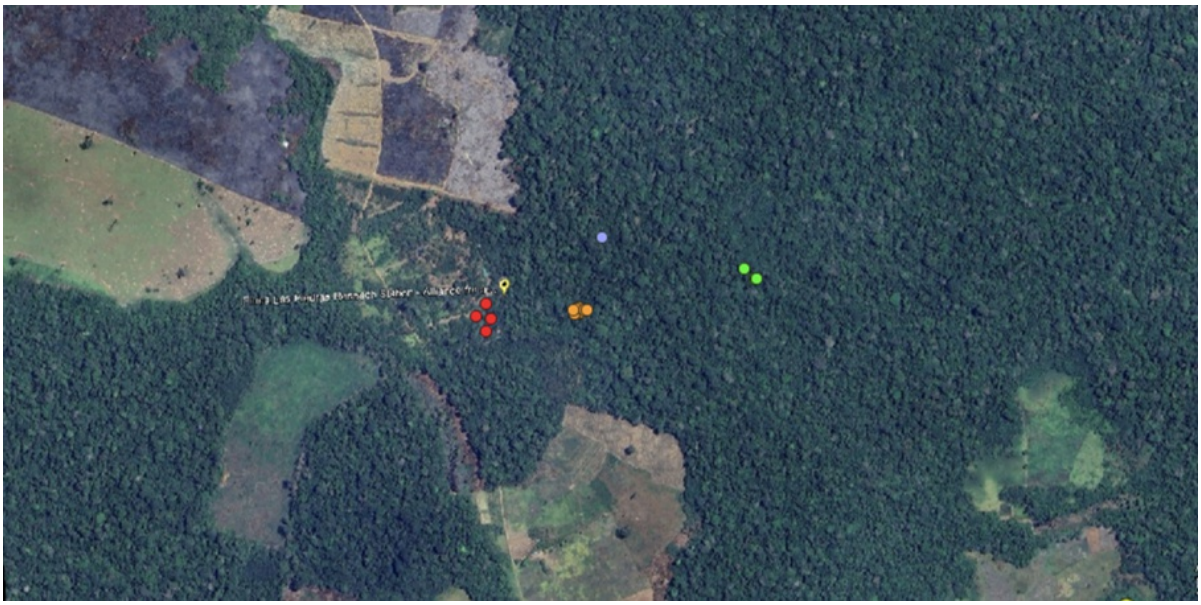


Figure 4: White Capuchin Monkey (*Cebus imitator*) activity versus frequency,where frequency corresponds to the amount of times observed, and activity is strictly defined.



swamp, though this is not conclusive in deciphering that primates do not occupy such areas. Three-fifths of the Squirrel Monkey data points revealed to be feeding, demonstrating that secondary forest is especially helpful for feeding habits of primates. The majority of the Tamarin data points, 6/17ths, were observed socialization by primates, revealing the importance of primary forest in communication and interrelationships between monkeys. The majority of data points involving traveling lay in primary forest regions, where trees are large and accessible for climbing.

Figure 5: Satellite image of Finca Las Piedras land taken by Google Earth. Georeferenced using QGIS, and data points imported depicting monkey locations. Red - Squirrel Monkey, Orange - Tamarin Monkey, Blue - Brown Capuchin, Green - White Capuchin.



Discussion

A comparison of satellite imagery of the Finca Las Piedras land to the personal map created by staff highlights the various habitats and ecosystems that contribute to the entirety of the 54 hectare plot. Especially important is the finding that most primates were found occupying primary forest - forest that has not been destructed by human consumption, and is filled entirely with old trees and biology. Primary forest reveals to be essential in the lives of Amazonian primates, and hugely demonstrates its importance in conservation focus and future efforts. While secondary forests are especially useful in recovering previously done damage, it is largely the primary forests that conservation must focus on, as seen through presented data.

While the coordinates taken in this study do not reflect the entirety of the habitats used by each primate, one can infer that taken locations are important to the daily lives of primates in Finca Las Piedras, as they were utilized for substaint time, and primates were not seen elsewhere during observation hours. To protect old forests is to protect the homes of Amazonian primates, and further the biodiversity of our planet. While Finca represents a portion of the Amazon, it does not highlight a huge understanding of primates in Southern America and their habitat preferences, as the sample size is far too small and human activity is much more rich. Despite vast trail systems that cover much of the available land, much of Finca is unable to be seen and walked by any one person as to efficiently and completely trek the entirety of possible monkey habitats. Further limitations are due to a lack of time - a two week research period with minimal time slots for observation. Lastly, resting as an activity is extremely difficult to observe, as monkeys become silent and still, and are often high in large trees where they are invisible to the eye.

Understanding the habitat preferences and activity patterns of primate species is crucial for effective conservation management. This study hopes to contribute valuable insights into the ecology of various primate species in the Finca Las Piedras

region, informing conservation strategies aimed at preserving these biodiverse ecosystems for future generations, specifically with primates in mind, as they require forestry for survival.

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