AMPARA Silvestre

MONITORING THE SURVIVORS: THE BROWN HOWLER MONKEY IN ATLANTIC FOREST FRAGMENTS IN SÃO PAULO, SOUTHEAST BRAZIL

ANNUAL REPORT

São Paulo/Brazil
July 2024

1. PROJECT TITLE

MONITORING THE SURVIVORS: THE BROWN HOWLER MONKEY IN ATLANTIC FOREST FRAGMENTS IN SÃO PAULO, SOUTHEAST BRAZIL

2. PROJECT ABSTRACT

The brown howler monkey (*Alouatta guariba clamitans*), a threatened endemic species of the Atlantic Rainforest, faced two recent yellow fever outbreaks. Some researchers believe that its population dropped by half in Sao Paulo State due to the disease and recent data to guide decision-making for the species are urged. Therefore, this project aims to monitor the howler populations in some sites in São Paulo, with density data before the outbreak to assess the status of the populations, in parallel environmental education actions will take place with local communities. The data will enable pressing conservation actions for the species.

Key-words: primates, endangered, populations, yellow-fever; *Alouatta guariba*

3. Technical team

Mauricio da Cruz Forlani – AMPARA Silvestre
Felipe Moreli Fantacini– AMPARA Silvestre
Joana Ho Dias – AMPARA Silvestre

4. Introduction:

This report provides a comprehensive overview of the activities conducted as part of the research project funded by the Primate Society of Great Britain (PSGB). The objective of this project is to assess the status of howler monkey populations in selected locations in the state of São Paulo, conducting a population census in areas where previous data are available, predating the yellow fever outbreak. Another goal is to raise awareness and increase knowledge about the species and yellow fever through environmental education activities for the surrounding human communities.

ACTIVITIES REPORT

5. Partnerships e Licenses:

Following the approval of the project by the Primate Society of Great Britain (PSGB), we embarked on the intricate process of requesting and securing licenses and permissions for research across various areas. Considering that forest fragments are scattered across private properties and public parks managed by different authorities (municipal, state, or federal), each with distinct management structures, the process has proven to be

both time-consuming and bureaucratic. After several months of effort, this phase was concluded at the beginning of 2024..

a. São Paulo State research licensing

In the case of parks managed by the state of São Paulo, although the process was conducted online, it involves the submission of an array of documents. The initial request was initiated in May 2023. The latest version and the completion of the entire process were achieved by November 2023 (process nº 000000005425/2023). Subsequently, we have obtained research authorization for 11 state parks in São Paulo, valid until 2025. Even with the granted license, each protected area has a distinct management structure, and certain areas are concessioned to private entities, necessitating direct and specific communication with each respective area (such as Cantareira and Fontes do Ipiranga State Park). Each study site will be systematically sampled as the project activities progress and funding resources are secured. The list of parks included in the research license are:

1. Cantareira State Park
2. Serra do Mar State Park - Curucutu Nucleus
3. Serra do Mar State Park - Itutinga Pilões Nucleus
4. Serra do Mar State Park - Caraguatatuba Nucleus
5. Serra do Mar State Park - São Sebastião Nucleus;
6. Ilha do Cardoso State Park;
7. Alto Ribeira Turistic State Park;
8. Morro do Diabo State Park;
9. Fontes do Ipiranga State Park;
10. Itapetinga State Park;
11. Itaberaba State Park.

Currently, we are conducting samplings in Fontes do Ipiranga State park (FISP) and in Cantareira State Park (Figure 1), as it is going to be better explained further in this report.

b. Partnership with São Paulo City Hall:

Concerning licenses for monitoring within areas managed by the city of São Paulo, the process involved the establishment of a Memorandum of understanding with the city hall administration. This document encapsulates various actions related to howler monkey conservation, encompassing the monitoring of wild populations, the development of the species reintroduction actions (detailed in subsequent sections), and the implementation of communication and environmental education initiatives.

While the administrative process was underway, we secured a preliminary license to monitor wild howler monkey populations in four different municipal parks in São Paulo. This monitoring has been active since September 2023. The parks included are (Figure 1):

1. Municipal Natural Park (MNP) of Varginha,
2. Municipal Natural Park Itaim
3. Municipal Natural Park Bororé
4. Municipal Natural Park Jaceguava.

In these parks, we have the full support of park managers and park rangers' teams, and the outcomes have been highly rewarding (as described in the following sections).

After months of bureaucratic processing, the partnership with São Paulo City Hall was officially approved on February 5, 2024 (process nº 6027.2023/0014886-3). The license is valid until February 5, 2028, allowing for the continuation of research and conservation activities during this period, officially supported by the municipal administration.

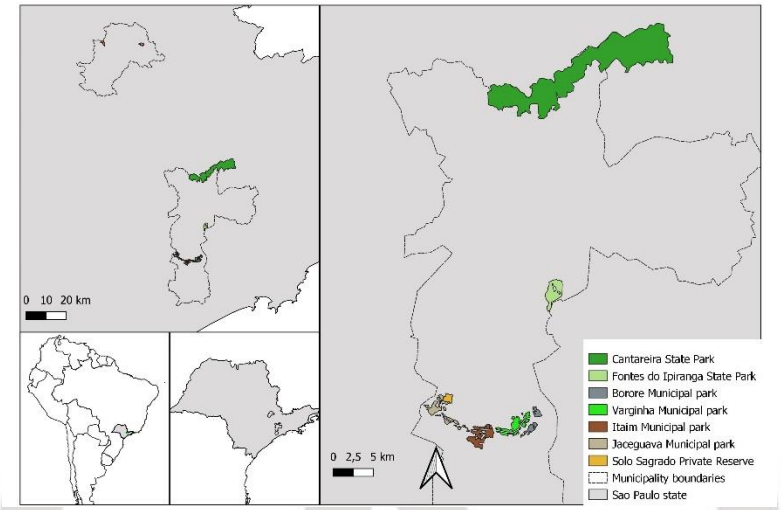

Figure 1. Protected Areas in the Municipality of São Paulo, chosen to Initiate the Howler Monkey Population Monitoring Project. In the North of the city, the Cantareira State Park; in the central region, the Fontes do Ipiranga State Park; and in the southern region, the four Municipal Natural Parks (Itaim, Bororé, Varginha, and Jaceguava) and the private reserve, Solo Sagrado.

c. Private lands

Three private lands have been identified as crucial for monitoring efforts: one in São Paulo city and two outside the capital.

1. **Solo Sagrado Private Reserve** - Property of the World Messianic Church of Brazil: This reserve, adjacent to MNP Jaceguava (Figure 1), has been monitored since October 2023. Authorization for entry was secured in collaboration with the Jaceguava park Manager.
2. **Atlantic Forest Fragments in Campinas/SP** - Two forest fragments, namely Mata de Santa Genebra and Mata Ribeirão Cachoeira (Figure 2), are particularly significant due to historical data indicating the presence of howler monkeys prior to the yellow fever outbreak. Recent monitoring by researchers from the University of Campinas has focused on Mata de Santa Genebra, where they estimated a drastic decline in relative density from 15.13 individuals/10km² (Gobbo, 2003) to 1.1 individuals/10km² (Conti & Setz, 2021). In contrast, Mata Ribeirão Cachoeira has received less attention, with reports from local communities indicating the disappearance of howler monkeys, necessitating

systematic monitoring to verify this information. This area is located on private land within the Campinas Environmental Protection Area (APA). Through online meetings with APA managers, we secured research authorization, formalized during a technical visit in December 2023

3. **Morro Grande Forest Reserve** - Owned by the São Paulo State Basic Sanitation Company: Morro Grande is a vast fragment spanning over 10,000 hectares, making it the largest in the São Paulo metropolitan region and immensely important for species conservation. Unfortunately, we have encountered resistance from the managers to start research in this area, leading us to temporarily cease efforts to access it.

Those private lands can significantly contribute to our understanding of howler monkey populations and their habitats and play a pivotal role in the conservation of the species. However, since Ribeirão Cachoeira and Morro Grande are located outside São Paulo city, we have decided to prioritize our current monitoring sites, including Solo Sagrado, to complete the first stage of the project. We will consider expanding our efforts to regions outside São Paulo once we have completed these initial stages and secured additional funds for the project's expansion.

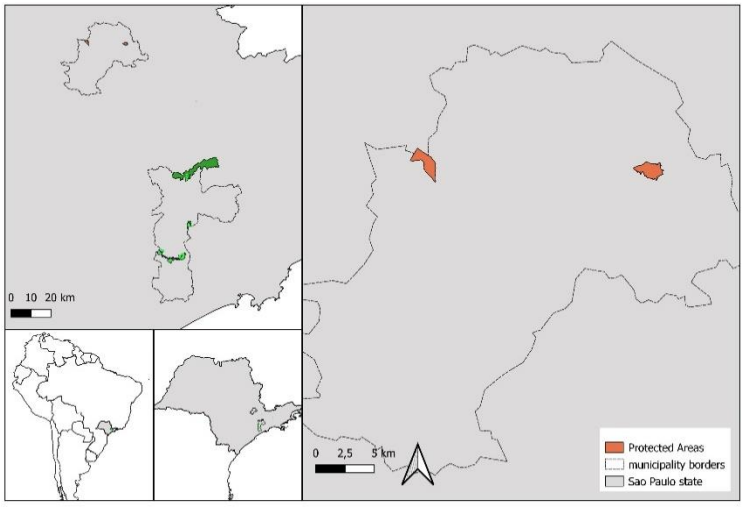

Figure 2. Protected areas in the municipality of Campinas/SP, chosen to start the project to monitor howler monkey populations. To the west is Mata Santa Genebra and to the east is Mata Ribeirão Cachoeira.

6. Volunteer Program

For planning our field activities, we developed a volunteer program in partnership with two universities (FMU and UNISA) and a technical school (SENAC) in São Paulo. Dedicated students actively participated in field activities, accompanying our sampling

efforts across various parks. This collaborative effort enlisted the first 15 volunteers by December 2023, predominantly biology or environmental science students.

During 2024, we expanded our program, receiving three more volunteers during field activities, and we have a list of around 10 more individuals interested in assisting with further data collection. The process has proven exceedingly rewarding, not only contributing to the advancement of our project but also affording students the invaluable opportunity to immerse themselves in research endeavors and gain practical experience. Each volunteer receives a certificate of participation, documenting the hours worked and activities performed.

7. Methods

Line transect surveys are a widely used method for estimating primate population abundances and were chosen for this census (Buckland et al., 2010). At each selected site, transects were walked from sunrise to sunset, with a two-to-three-hour break at midday, at an average speed of 2 km/hour, using available trails and roads. Each site was visited 2 to 12 times throughout the year (Buckland et al., 2010; Ferreguetti et al., 2020), with an average distance of 6.2 km walked per visit. The monitoring is still ongoing, and we plan to conclude once we have walked 100 km in each side.

We standardized the sampling effort to 100 km per site, in accordance with the primate monitoring project conducted by the Forest Department of São Paulo State, which establishes a minimum sampling effort of 100 km per study site. This standardization allows for easier comparison of studies conducted at different sites and aids in understanding the population trends of howler monkeys across São Paulo State.

In addition to the walked transects, park rangers conduct boat patrols around the shores of Varginha and Bororé parks along the Billings reservoir, covering approximately 12 km. On sampling days, we joined these patrols to monitor the riverbanks, resulting in several sightings of howler monkey troops. Although these data will not be used directly for density calculations due to the lack of standardization, they provide valuable insights into the number of groups present in each park.

For each observation, we recorded the perpendicular distance of the first animal sighted from the transect using a digital laser tape measure, as well as the height, date, and time of the observation. Additional information, such as group size, sex ratio, and behavior, was also collected when possible (Ferreguetti et al., 2020). Other data, such as traces (feces) found on the trail or vocalizations, were recorded with their coordinates as well. An encounter rate was calculated by dividing the total observations by the total distance walked. Further analysis will be conducted once we complete the monitoring, after which density and population size will be estimated using the DISTANCE software (Buckland et al., 2001).

8. Study sites:

As previously mentioned, based on the obtained licenses and the project budget, (7) research areas have been chosen within the municipality of São Paulo/SP as illustrated in Figure 1.

In São Paulo, we have elected for systematically monitoring six protected areas (Table 1). We excluded from the survey The Cantareira State Park, since howler monkeys monitoring have already been completed and confirmed the local extinction of the species (more is explained in the further topics).

The monitoring of areas closer to AMPARA headquarters based in São Paulo, has proven beneficial, as, due to the project's constrained budget, it has been possible to conduct more samplings in each area, thereby enhancing the robustness of the collected data.

From June 2023 to June 2024, we conducted a total of **29 fieldwork days**, covering **369 km** of walked transects across the six conservation units. Additionally, we conducted boat

transects, totaling **6 samplings** and covering **74.4 km**. All data are compiled in Table 1. The trails used for the line transects in each site can be seen in Figure 3.

Table 1. Table summarizing the number of sampling days, total kilometers covered by line transects, and the recorded presence of howler monkeys through direct sightings, vocalizations, traces (feces) and carcasses found along the transects at each study site. The data spans from June 2023 to June 2024.

Study site	Sampling times	Nº KM Walked	ind/10 km	Direct sightings - troops	Direct sightings - individuals	Traces (Feces)	Vocalization	Carcass
Billings Reservoir	6	74,4	3,5	6	26		1	1
Bororé MNP	7	42,4	3,3	4	14	1		
FISP - Cientec	10	56,5	11,5	14	65	11	23	
Itaim MNP	9	67,8	0,1	1	1	1		
Jaceguava MNP	10	59,9	7,2	12	43	22	13	
FISP - Botanical Garden	2	11,6	28,5	7	33	26	2	
Solo Sagrado Private Reserve	8	43,2	2,5	4	11	3	15	
Varginha MNP	12	87,6	4,0	6	35	4	8	1
Total	**64**	**443,44**	**7,58**	**54**	**228**	**68**	**62**	**2**

9. Howler Monkey Observations:

During our monitoring, we recorded **48 howler monkey troop sightings** (202 individual sightings) in line transects and **6 troop sightings** (26 individuals) during boat transects. Additionally, there were **62 records through vocalizations, 68 through feces, and 2 carcasses** found along the trails (Table 1, Figure 3). Observed group sizes ranged from 1 to 9 individuals, with an average of 4 individuals per group.

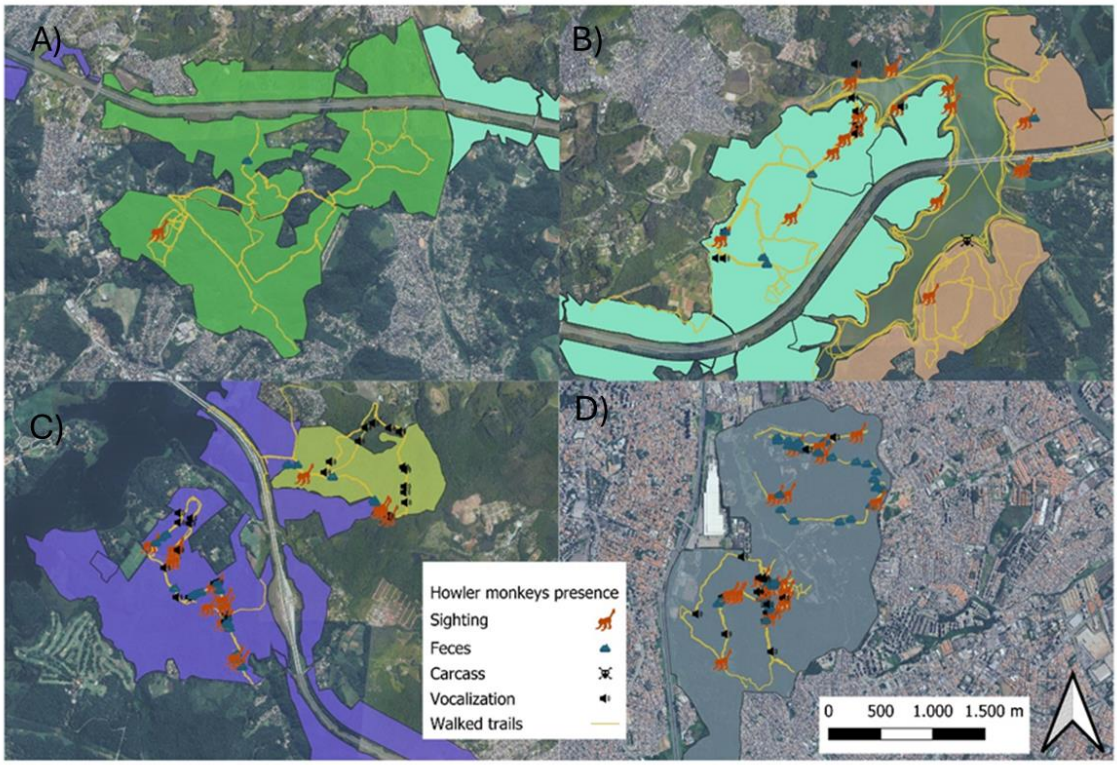

Figure 3. Protected areas in the municipality of São Paulo/SP, highlighting the trails (yellow lines) used during the line transect surveys of howler monkeys and the records of howler monkeys obtained during field trips conducted between June 2023 and June 2024. A) Municipal Natural Park (PNM) Itaim; B) PNM Varginha (green) and Bororé (brown); C) PNM Jaceguava (blue) and Solo Sagrado private reserve (green); D) Fontes do Ipiranga State Park. Orange monkey shapes indicate direct sightings of howler monkey troops; sound signs indicate the team's location when hearing howler vocalizations, and blue feces signs indicate encounters with howler feces on the trails.

The parks with the highest number of encounter rates (individuals per 10km walked) are Fontes do Ipiranga State Park (FISP) in both the Botanical Garden region (28.5 individuals/10km) and the Cientec Region (11.5). The mosaic created by MNP Jaceguava (7.2) and Solo Sagrado Private Reserve (2.5) also showed significant numbers, followed by

MNP Varginha (4), MNP Bororé (3.3), and MNP Itaim (0.15) with fewer records (Table 1).

A study conducted by Ecologic Enterprise on howler monkeys in MNP Bororé from September 2011 to June 2013, as part of the environmental licensing for the Rodoanel road, reported 258 sightings of 7 troops, each with around 3 to 5 individuals. We are currently seeking the raw data from this study to better compare it with our findings. So far, in Bororé, we have observed only 4 direct sightings, indicating 2 troops of about 3 and 6 individuals each, plus a single individual, likely a male, seen further from these troops. Our preliminary results suggest a population decrease following the yellow fever outbreak. Conversations with residents and park rangers also indicate a significant decline in sightings in recent years. Nevertheless, we are encouraged by the records of several individuals and groups in almost every park, indicating that the population has persisted and shows signs of recovery with the presence of young individuals. The four Municipal park and the Solo Sagrado Reserve form a beld of protectec areas in the southern region fo São Paulo and has a better conection among them and with other forest fragments, with means that the growing population has ways to disperse and find new suitable areas.

Figure 4. Fontes do Ipiranga State Park, showing the Botanical Garden and the Zoological Park in the northeast part of the area, and the CIENTEC - the Park of Science and Technology of the University of São Paulo, in the southwest region of the park. These two areas are divided by Miguel Stefano Avenue

In the Fontes do Ipiranga State Park, Morais & Monticelli (2014) estimated a population of 143 howler monkeys with a density of 0.4 ind/ha, and Benedicto (2015) calculated a density of 1.53 ind/km² based on the home range of habituated troops. The park covers a total area of 526.4 ha, including 340 ha of biological reserve. Most previous studies, that show high densities of howler monkeys in the park, were conducted in the northeast region of the FISP, where the zoological and botanical gardens are located (Figure 04), consistent with the high densities found by us there. We initiated our study in the southwest region, in the Cientec area, and only began monitoring the Botanical Garden in May 2024 after obtaining the necessary permits. Despite only two sampling events in the Botanical Garden and ten in Cientec, we observed a stark difference in densities: 28.5 ind/10km in the Botanical Garden compared to 11.5 ind/10km in the Cientec region. This study, the first comprehensive one considering the entire park, will provide a clearer idea of the actual howler monkey density in the area. The disparity in densities might be related to the quality of the forest fragments and differing human pressures and impacts in each region. Both sides, however, exhibit high densities, like other urban and peri-urban areas with howler populations, due to the lack of dispersion (Bicca-Marques et al., 2015). The PEFI, an island of Atlantic Forest in the middle of São Paulo, is relatively isolated from other forest fragments, which could have shielded the population from the yellow fever outbreak. However, other threats such as electrocution, dog attacks, falls, human attacks, and vehicle collisions could still significantly impact this population (Monticelli & Moraes, 2015).

We have not yet completed the monitoring, since we expect at least 100km of transects in each study site to conduct a more comprehensive data analysis. Even so, our monitoring efforts have already provided vital insights into the status of howler monkey populations across various parks. The data suggest that while there has been a decline in some areas due to the yellow fever outbreak, the population remains resilient and shows potential for recovery. The disparities in densities between different regions highlight the need for tailored conservation strategies addressing specific local challenges. The data gathered will be instrumental in shaping future conservation efforts, ensuring the protection and sustainability of howler monkey populations in the São Paulo region.

In addition to howler monkey sightings, various other species have been documented during the surveys, and these records are being tallied for future presentation to park management.

The data collected, not only on howler monkeys but also on various aspects of their habitats, has proven crucial for devising conservation strategies in different areas.

Several threats to the surviving populations have been identified. Among these, notable concerns include reported instances of roadkill in the vicinity of certain parks, issues with kite strings entangled in trees, particularly problematic in densely populated areas around some parks, and instances of electrocution when monkeys use poles and wires as aerial bridges.

Regrettably, our team recorded an electrocution event involving a female howler monkey on December 6, 2023. This individual was part of a large group of over 7 individuals and experienced an electric shock while crossing a road that traverses Varginha Park, by using utility poles for movement. This incident underscores the critical importance of addressing and mitigating the risks associated with such human-made structures within the park environment. Efforts to help prevent further occurrences will be prioritized as part of our ongoing conservation initiatives.

Until surveys are completed, strategies to mitigate these threats will be planned and presented to the relevant authorities. This comprehensive approach aims to address and counteract the various challenges faced by these howler monkeys' populations, ensuring a more sustainable and harmonious coexistence.

10. Population Monitoring and Reintroduction project in Cantareira State Parke:

The Cantareira State Park, situated in the northern region of São Paulo, was initially a priority area for howler monkey surveys due to its historically high population density of the species. However, following a yellow fever outbreak that drastically reduced sightings, transects covering 1008 km from February to November 2022 revealed only one group of 3 individuals (Pinter et al., ongoing). This indicates an exceedingly low sighting rate compared to the pre-outbreak rate of 4.90 sightings/10 km (Trevelin et al., 2007), confirming the local extinction of the species in the park. Subsequently, a reintroduction project was initiated by the Municipality of São Paulo's Environmental Secretariat, coordinated through its wildlife department (CEMACAs), in collaboration with state government and NGOs, including The AMPARA Animal Institute. As part of our established partnership with the municipality, our team is actively involved in overseeing the rehabilitation process and contributing to post-release monitoring efforts.

Since the conclusion of the yellow fever outbreak in 2018, CEMACAs has maintained several howler troops in preparation for reintroduction and release. In 2023, after completing all bureaucratic processes, preparations began for the release of two troops. The first group selected consisted of 5 individuals: one alpha male from the wild, two adult females from the wild, one juvenile female, and one infant male, both born at CEMACAs. In early 2024, the alpha female of this group was fitted with a TELONICs GPS-collar using Iridium technology. On February 19th, 2024, the group was transferred to a temporary acclimatization enclosure within the chosen release area of Cantareira State Park by CEMACAs veterinarians and biologists.

The group remained in acclimatization for 10 days until the enclosure doors were opened on February 29th. It took approximately 2 hours for the animals to exit the enclosure and begin exploring their surroundings. From this point onward, our AMPARA team and CEMACAs teams organized continuous monitoring of the released animals for 30 consecutive days, from wake-up to sleep. Monitoring involved scans every 10 minutes to record each animal's behavior, height, food items consumed, geographical coordinates, among other data.

On the first day after release, the alpha female with the GPS-collar dispersed from the group, leaving behind the infant male, while the remaining 4 individuals stayed together. Monitoring efforts prioritized the cohesive group due to the GPS-collar on the alpha female. Unfortunately, twelve days after release, on March 11th, the alpha female was found dead. It is believed that her death resulted from an aggressive encounter with a group of capuchin monkeys in the area. The group appeared otherwise healthy and continued to explore the territory and feed normally until March 21st, when the infant male began displaying unusual behavior and eventually fell from a tree. Despite being retrieved and taken to the rehabilitation center, the infant did not survive. On March 26th, the juvenile female exhibited similar symptoms and required return to the center, where she also died. Veterinarians identified intestinal issues in both cases, likely due to the transition from a captive diet to an almost exclusive leaf-based diet, for which their microbiota was not adequately prepared. The adult pair, both wild-born, adapted well to the new diet.

After 30 days, the adult pair remained healthy, and continuous monitoring ceased on March 29th. Since then, the team has conducted five consecutive days of monitoring at the end of each month to locate and observe the pair's behavior, following the same scanning methodology. Monitoring has been carried out in April, May, and June, showing the pair's continued adaptation and successful integration into the natural environment. Despite the losses, the initial reintroduction process has been deemed successful.

Preparations are underway for the release of the second group in September, during spring, with efforts focused on resolving intestinal microbiota issues in young individuals to ensure successful adaptation to a natural diet. Actions include complete removal of commercial fruits while in captivity and microbiota transplantation. The released group will continue to be monitored for five days each month for the next two years, with subsequent groups following the same monitoring protocol. We will remain actively involved in all post-soft release monitoring activities.

11. Education and communication:

During the first semester of project activities, our primary focus was on navigating the bureaucratic processes of obtaining licenses and initiating monitoring activities across various protected areas and forest fragments. After a year, with data collection actions well underway, the conclusion of the bureaucratic process, and a deeper understanding of the localities, we are now strategically planning to launch communication and environmental education activities with local communities. We have already selected a list of schools near the survey areas, and we initiated contact with them to plan activities for next year.

The AMPARA communication team has already produced materials such as brochures and pamphlets and has started creating content for the AMPARA Website and Blog. These materials aim to disseminate information about the significance of species conservation and reintroduction in the region. This strategic communication effort aligns with our broader goals of promoting awareness and engagement in the local community.

Another planned initiative involves organizing interactive and educational activities for visitors at the study sites in partnership with park managers. The first educational activity was conducted on June 8th, 2024, as part of the events commemorating World Environment Day on June 5th. On this day, we held a wildlife observation guided hiking activity in Varginha Municipal Park, focusing on howler monkeys, along with a discussion about the monitoring and reintroduction activities and their ecological importance. During the activity, professionals from the Municipality's Wildlife Rehabilitation Center (CEMACAS) released several rehabilitated birds (parakeets, burrowing owls, and caracaras) and mammals (opossums) in the park. The activity attracted approximately 30 people and was highly praised despite not finding any howler monkeys. New activities are already being planned for the next semester.

With the support of the park managers, we are also seeking other opportunities to engage the Conservation Units' management council for communication and education activities within the local population, leveraging the involvement of community leaders associated with this council.

One of our goals is to disseminate and promote citizen science tools in all activities so that the population can help us collect information about the occurrence of various species, including howler monkeys, thereby increasing knowledge about local biodiversity. Another initiative we are planning for the coming months is to train all park rangers to record species sightings during their daily patrols. If we can implement these actions, we will have a much more robust database of information on various species, including howler monkeys.

In the northern region of São Paulo, our communication and education focus are directed towards the reintroduction program. Towards the end of 2023, our communication team produced a concise pamphlet outlining the project. Armed with this material, we conducted visits to schools and community centers in the Cantareira region. Additionally, a meeting took place with environmental agency technicians from the municipality of Mairiporã, where the state park also extends. Due to political constraints, communication and educational activities about the reintroduction were not allowed at the beginning of the reintroduction project. Now, with the first release concluded, we can build on the initial contact made and plan and execute these actions in the coming semesters.

12. Scientific Communication:

The results and data obtained during this study will be used to assist public management in conservation actions for the species. They will also be disseminated in both technical formats and scientific journals. As a first step, a summary with the preliminary results was submitted and has already been approved to be presented as a poster at the 24th Brazilian Congress of Mastozoology, which will take place in September this year.

13. Challenges in Project Development:

The project encounters several significant challenges that serve as important lessons. Securing licenses and permissions, though essential, has proven to be bureaucratically intricate and time-consuming, which has delayed the commencement of survey activities. Fieldwork has revealed notable threats, such as roadkill incidents, kite string entanglements near certain parks, and electrocution events, underscoring the complexity of mitigating human-made risks. In addition to these environmental challenges, reaching populations in the surrounding areas of the parks is hindered by socio-economic difficulties, including poverty, violence, and drug-related issues. However, amid these complexities, there is a beacon of positivity and hope. Preliminary results from the survey provide optimism regarding population recovery in most monitored areas. Regarding reintroduction, a highly complex process, the initial release faced challenges but was considered highly successful, yielding valuable insights to optimize subsequent releases and improve group survival rates. Community engagement, environmental education, and strategic mitigation efforts not only confront the challenges but also inspire positive transformation, nurturing a hopeful outlook for wildlife and community coexistence in these areas, despite adversities.

14. Next steps

The upcoming phase of the project will focus on data analysis and implementing conservation actions. Ongoing systematic monitoring will persist in established areas, consolidating critical data for developing effective conservation strategies. Plans are also underway to expand into new areas across São Paulo State, enhancing understanding of howler monkey populations in diverse fragmented forests and regions. Concurrently, the project will intensify efforts in environmental education and community engagement through citizen science. By collaborating with local schools, communities, and park management councils, the team aims to broaden outreach activities that promote awareness about howler monkey conservation and biodiversity. Crucially, ongoing monitoring of released groups as part of the reintroduction program will be pivotal in assessing its success and facilitating species recovery in Cantareira Park. Furthermore, the project remains committed to partnering with governmental and non-governmental stakeholders to implement targeted conservation measures. This includes addressing threats such as roadkill, electrocution from power lines, and habitat fragmentation, which pose significant risks to howler monkey populations. Recognizing the imperative of securing new funding sources and forging strategic partnerships is also paramount to ensuring the project's sustainability and impact.

15. Financial Overview:

A critical aspect of our project involves efficient field operations to maximize the impact with lower budgets. Considering the £1,250 received for this year's activities, a total of R$5,636.00 (equivalent to £965.00) has been allocated for logistical expenses, covering essential elements such as transportation, equipment, and field supplies. Another R$2,100.00 (£360.00) was allocated specifically for daily allowances for the team during monitoring activities at Cantareira State Park, where the howler monkeys were reintroduced. These funds have been judiciously managed, emphasizing transparency and accountability in the utilization of resources.