

Project Update: July 2022

Achievements to date:

1. Identify the sites with higher abundance of red-handed howler monkeys
Fully achieved
2. Assess the viability of the populations and the impact of hunting and genetic flux in population viability
Not achieved
We are currently organizing the necessary information to carry out this analysis
3. Identify drivers of the species density
Not achieved
We already have most of the variables needed for this analysis. We are now gathering information about the amount of people surrounding each forest patch through GIS, and as soon as we finish this step we will run this analysis.
4. Elaborate a conservation strategy for *A. belzebul* in Amapá
Partially achieved
We already identified the sites with greater density of *A. belzebul*, which are grouped in the eastern part of the study area. We now need to finish the other analysis to have a more complete assessment of the conservation options.

Outcomes so far:

- a).** A conservation strategy for *A. belzebul* in the region, identifying key sites to be conserved and possible management actions
- b).** A baseline for population sizes of *A. belzebul* in the study area which will allow us to infer about the efficiency of the management actions
- c).** The identification of key threats to *A. belzebul* populations through the population viability analysis

Difficulties so far:

The project was expected to start much earlier, at the end of 2020. However, we did not anticipate that the COVID pandemic would last this long and prevent us from starting the project. Thus, the project start was postponed in about one year.

During the pandemic, the university radio station stopped functioning, which prevented us from divulging the project actions in the radio. The university radio station will return to its normal functioning in August 2022.

One of the team members (Saulo Silvestre) got a good job opportunity. Thus, although he is still helping the way he can, his participation was reduced, which is delaying the analyses process.

We had a problem to assess one of the forest patches. This forest patch was recently bought by another landowner that did not allow us to enter the forest patch on his property. Although this was upsetting, we still could survey 17 forest patches, which is more than the 15 forest patches expected to be surveyed at the beginning of the project.

Local community involvement to date:

The institution that managed the funds has an agreement with a car rental company. This agreement reduced the costs of car rental, however, there were extra charges if a distance limit was exceeded. This extra cost made us change our strategy and sleep in the local communities during the field expeditions, which reduced the overall costs with travelling.

Although the infrastructure of local villages is precarious, staying there had some benefits. We hired a local person to cook for the team and paid to stay in local houses. So, local people enjoyed this income and developed a good relationship with the team.

We trained two local people who were our field assistants. The field assistants were trained to record the bearing of the vocalizing groups, allowing us to have three people in the forest patches recording this information. This was important to replace two team members that could not continue their participation in the team due to family and health issues. Thus, the field assistants not only have benefited from learning the research technique, but also benefited from the income. Since their participation demanded training them, they have participated in all the field expeditions (five expeditions each), resulting in a good income. Indeed, they were grateful and satisfied for participating in the project.

Finally, we conducted environmental education activities in four communities. Instead of only talking with the hunters when we deliver the hunting calendars, we decided to also make talks in the communities, in which we explained about sanitary cares that people should take when handling bushmeat, as well as about nature conservation, threatened species, sustainability, and legislation regarding hunting. So, we provided information for the communities that we think will be important for their lives. Overall, 50 people (31 women and 19 men) participated of these talks. We have noticed the the smaller the community, more the people were willing to attend our talk. In the smaller community (<50 houses), 18 people attended the talk. In the intermediate communities (~60 houses and >100 houses), 17 and 10 people attended the talk, respectively. In the larger community, which is close to the state's capital city and has over 1000 people, only 5 women showed up. We tried to reinforce the invitation and repeat the talk, however, none has showed up in the second time. Nevertheless, the smaller the community, the more the people depend on natural resources. So, we are confident that our activity had some importance for the smaller communities.

Future plans:

Yes, we plan to continue working with *A. belzebul* in the region. Besides trying to implement the conservation strategy designed in this project, there are other important information that we plan to obtain in the future, such as assessing the genetic and health status of the populations and investigating possible hybridization with *A. macconnelli*.

We also plan to develop a deeper relationship between the project and local people. For example, we plan to design handicraft products associated with *A. belzebul*, which will be made by people from the local communities. The profit from the sales will be converted to these people, so they will perceive the benefit of conserving *A. belzebul* in the forests.

Sharing results:

We will continue the contact with the hunters that agreed to participate in the research, especially those hunters that live close to the key conservation sites. We will inform them about the results of the study.

We will also inform key local environmental authorities about these results and try to convince them to implement the conservation strategy developed by this project. There will be elections in Amapá in October, and we will have a new state governor from January onwards. So, the environment authorities will also change, and we will begin the contact with them after January, given that there is not time enough for the current environment authorities to implement any conservation measure during the rest of this year.

We will also publish the results of this project as journal articles. We plan to publish two papers, one with the population viability analysis and another with the drivers of the density of *A. belzebul*. So, the scientific results of this project will be made available for other scientists and conservationists.

Next steps:

The most important step now is working to implement the conservation strategy developed in this project. This will not be easy, since politicians may also consider the interests of soybean farmers, who are interested in expanding over the study area, threatening *A. belzebul* populations. However, we will do everything that is possible to try to implement this conservation strategy.

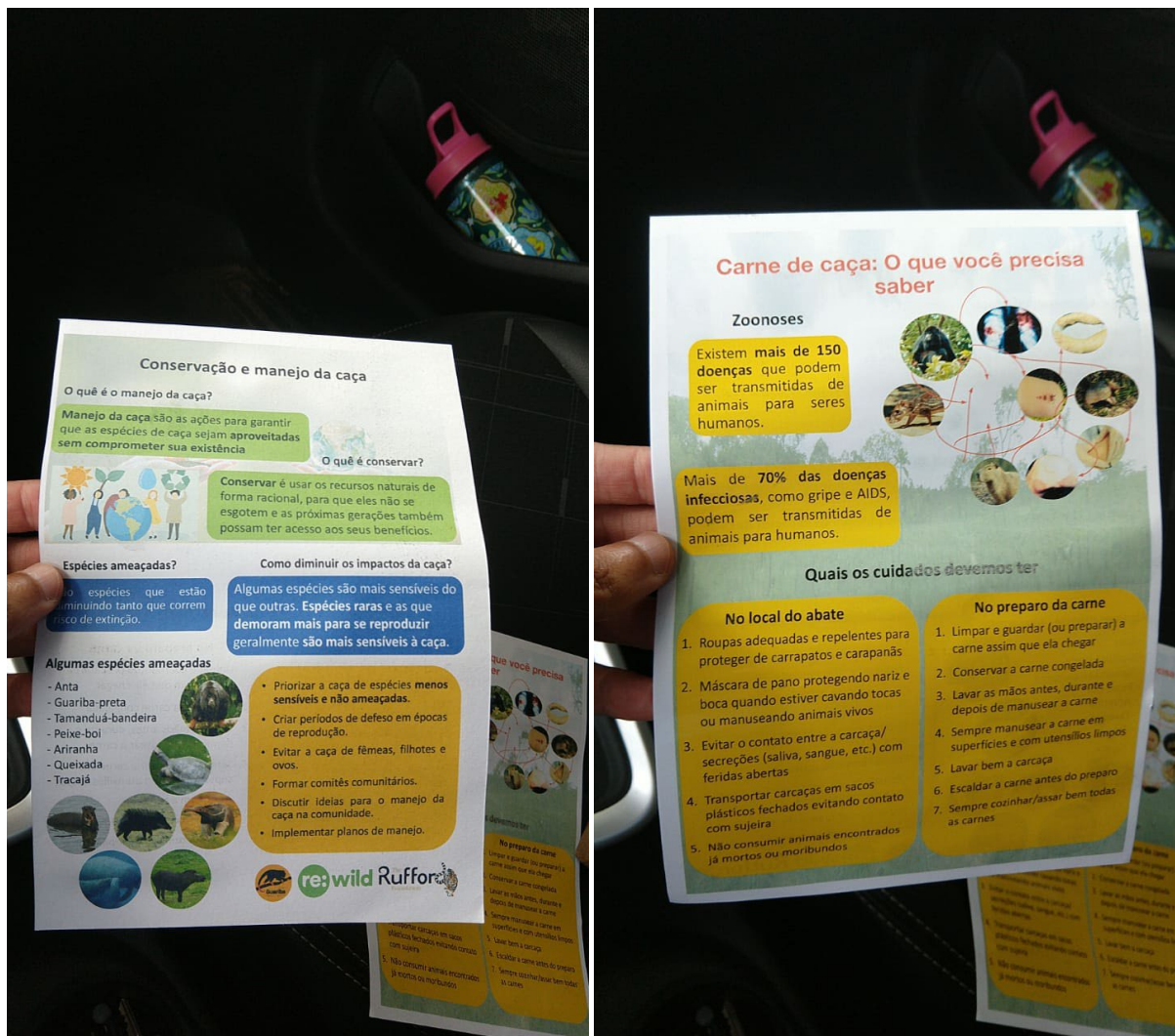
Furthermore, now we have baseline estimates of *A. belzebul* populations, which are important to monitor population changes over time. So, we may replicate this approach in the future in key sites to assess whether conservation actions are being successful in maintaining the population stable or even in increasing population sizes. This can also be made if the conservation measures are not implemented to assess whether populations are declining or not.

We also think it is important to continue monitoring hunting levels, as this may represent a threat for *A. belzebul*.

Lastly, there are other studies that will also be important for the conservation of *A. belzebul*, such as the assessment of the genetic diversity of local populations, the assessment of possible hybridization with *A. macconnelli* in the western part of the study area, and the assessment of the parasitism levels in the populations of *A. belzebul* and its relationship with human presence and activities.

Use of logo:

Yes. Rufford's logo was included in the hunting calendars and in the flyer that we delivered during the environmental education activities. I send attached to the email pictures of the flyer, of the hunting calendar, and of the environmental activities. The description of the pictures is found below:



Flyer with information about hunting and conservation that we gave to the attendees of the environmental activities. Note the Rufford's logo in the flyer



CALENDÁRIO DO COLABORADOR JANEIRO

2022

S	T	Q	Q	S	S	D
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30



JABUTI



TRACAÇA



GUARIBA PRETA



GUARIBA VERMELHA



CAIARARA



COAMBA



MACACO PREGO



MACACO DA NOITE



QUEIXADA



CAITITU



ANTA



FUBOCA



VEADO VERMELHO



VEADO GALHEIRO



PACA



CUTIA



CAPIVARA



TATU BOLA



TATU RABO MOLE



TATU BRANCO



TATU CANASTRA



TAMANDUA BANDEIRA



PÁSSAROS



JACARÉ

Realização:



Apoio:



Hunting calendar that we gave to the hunters that agreed to participate in the research. Note the logo



Hunting calendar hang on the wall of a participant of the research



People were listening to the talk in Mel da Pedreira



We gave away basic food baskets during the environmental education activities in Mel da Pedreira to attract more people



Environmental education activity in São Pedro dos Bois



We also served food (juice and cake) to attract more people to the environmental education activities in Mel da Pedreira



Environmental education activity in Igarapé do Lago

The team:

Renato Richard Hilário – I was the team leader, managing the funds and coordinating the project activities. I was also the academic advisor of two other team members (Paulo Lima and Mariana Amorim) a taught them how to carry out some methods in the field.

Saulo Silvestre Meneses de Sousa – Saulo has extensive experience in our study site and has good relationship with some hunters. This was important for us to assess the forest patches and to carry out the environmental education activities. Saulo was responsible for contacting the people and organizing the environmental education activities. He was also the co-advisor of Paulo Lima and is helping us in the data analyses.

Paulo Rogério Nascimento Lima – Paulo was responsible for carrying out most of the fieldwork, recording the bearings of the vocalizations to triangulate group positions. Paulo is also responsible for maintaining contacts with the hunters who are filling the hunting calendars and remind them to keep up the records.

Mariana Falcão Amorim – Two team members could not continue in the team: Felipe Todeschini and Rafael Gomes Oliveira gave up their participation for family and health issues, respectively. Then, Mariana replaced them. As Paulo, Mariana

was also responsible for carrying out the fieldwork, recording the bearings of the vocalizations to triangulate group positions.

Tiago Miranda Marques – Tiago intended to start his master's course a few years ago, but due to some academic problems, he could not do so. He is now starting his master's course and will work with the diet and seed dispersal of *A. belzebul*.