Forest degradation and biodiversity of terrestrial mammals across disturbance gradient in the Chico Mendez Extractive Reserve in Acre, Brazil

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Summer 2018 TCD Field Research Grant Report

Introduction

The Amazon is the largest expanse of tropical forest in the world, containing one-half of all known biodiversity (Foley et al., 2007; RAISG, 2015). Currently 13.3 to 20% of the Amazon has been deforested, and while deforestation rates in the Brazilian Amazon in particular have decreased since their peak in the early 2000s, a new wave of degradation and deforestation is occurring (Assunção et al., 2017, 2015). Protected Areas (PAs) are integral in the fight against deforestation (Bhagwat and Rutte, 2006), however most rely on the exclusion of local actors (Mascia et al., 2014). This strategy diminishes the strategy in developing countries as local participation in rule making and resource management is associated with more sustainable forest use (Persha et al., 2011). Dahlberg, Rohde, and Sandell (2010) found that tensions between conservation and development goals in communities within and around protected areas are primarily due to the social and political contexts in which they were created. If, for example, local peoples were forcefully removed from their land to create the reserve (as done in South Africa in this study), despite rules and regulations attempting to rectify the grievances created-keeping public support and help is hard. Due to the historical formation of Extractive Reserves (RESEX) in 1990 in the Brazilian Amazon, as well as the incorporation and co-management by local communities make them an extremely important conservation mechanism.

RESEXs arose out of grassroots movement for land tenure rights led by rubber tappers in the late 1980s in Acre, Brazil (Fearnside, 1989). This *luta* (fight) incorporated not only land tenure rights, but also the right to develop sustainably and conservation; beyond rubber tappers this *luta* incorporated the interested of other societies which relied on forest products, the catholic church and also garnered international support. RESEXs are government-owned but jointly managed with local residents. As a requirement to continued usufruct rights, residents must follow management rules that prevent significant degradation of the local ecosystem ((Fearnside, 1989; Sabogal, 2015). Since their creation 88 terrestrial and marine RESEX have been created in Brazil (2014) [1].

While there is a trend for increased engagement of local stakeholder in conservation, including in PAs, the effectiveness of this mechanism is questioned and heavily criticized (See: Terborgh and Peres, 2017). As such, more research about the human-ecological systems is needed.

Proposed Research

As my contribution to this greater academic question I want to do research in the Chico Mendes Extractive Reserve (CMER), established in 1990 in Acre, Brazil. This was the second RESEX created in Brazil (Sabogal, 2015). Twenty-eight years after its establishment, there is limited knowledge on the effect of this type of human extractivist activities on biodiversity. This knowledge is essential for fact-based conservation efforts

Prior to my summer field visit my proposed research was the following:

[1] https://uc.socioambiental.org/en/uso-sustentável/extractive-reserve

1. Use satellite imagery to create a land cover map of Chico Mendes Extractive Reserve and, through participatory mapping exercises, map the boundaries of a representative sample of communities within the reserve.
2. From these maps, I will examine forest degradation using normalized vegetation indices, and forest structure data from hyperspectral and LiDAR sensors acquired from University of Florida's GatorEye Unmanned Flying Laboratory (GE-UFL) drone along a disturbance gradient (ie. more human use vs. intact, pasture vs agroforestry) within the reserve.
3. Establish a network of camera traps in conjunction with community stakeholders to study the absence/presence and biodiversity of terrestrial mammals along this disturbance gradient.

For this summer in particular my goal was to meet and liaison with local stakeholders (Professors at the Universidade Federal do Acre, member on the Chico Mendes Institute etc) to (a) assess the feasibility of my proposed research (b) assess whether my research can contribute meaningfully to the growing body of knowledge, or help in any way in management of the reserve, and (c) learn more about and start the permitting process to work in Brazil and in the Chico Mendes Reserve particularly.

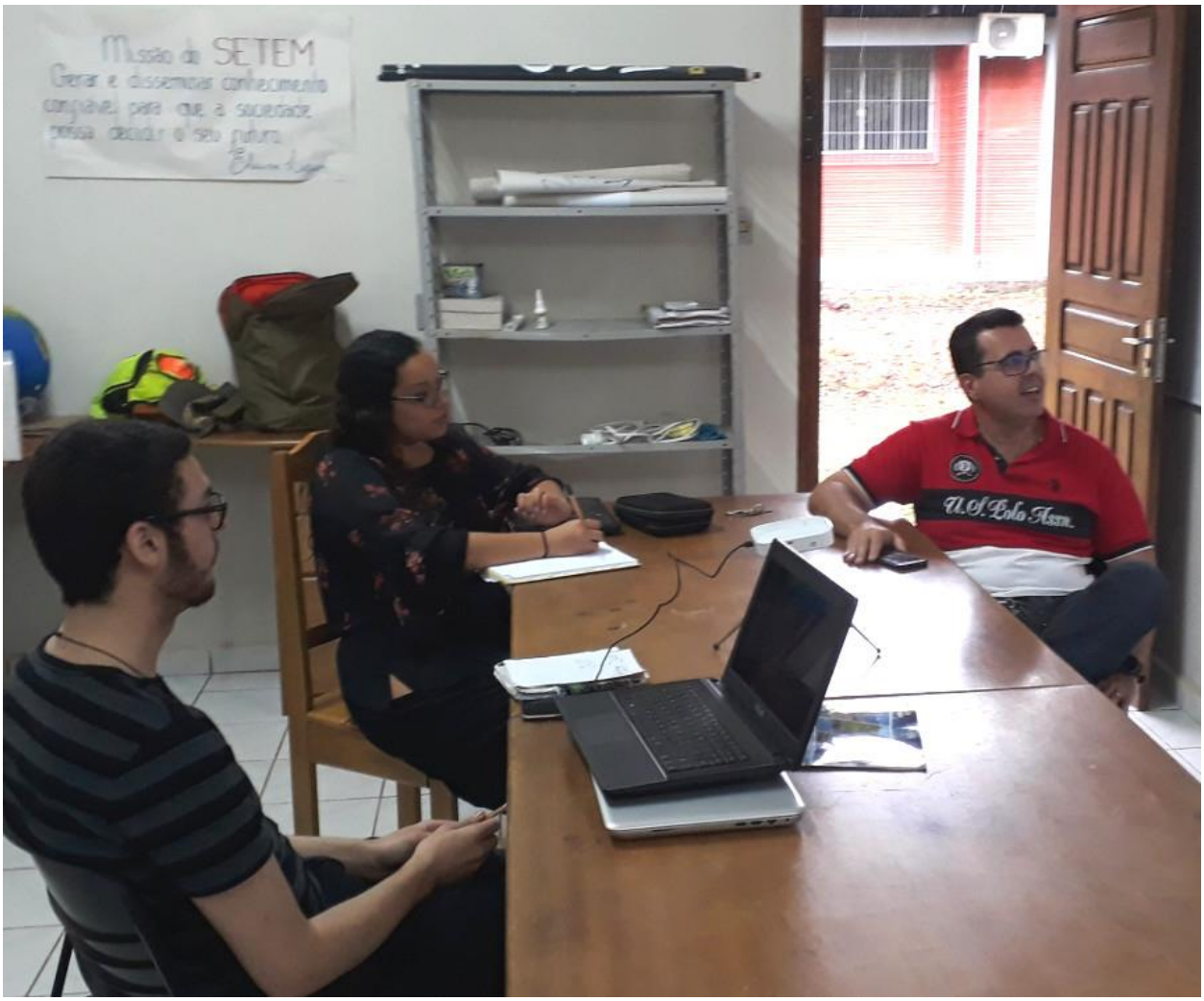
My site visit was a personal and professional success in that I met and surpassed my goals. Throughout my visit I met and spoke to many people most notably:

Fátima Cristina da Silva (ICMBio), Fernando França Maia (ICMBio), Flúvio de Sousa Mascarenhas (ICMBio), Foster Brown (UFAC), Vera Reis (SEMA), Alex Oliveira Silva (Master student at UFAC), Sabina Cerruto Riberiro (UFAC), Fernando Augusto Schmidt (UFAC) Marcelo Oliveira (WWF Brazil), Moacyr Araújo (WWF Brazil) and Evandro Figueiredo (EMBRAPA).

Throughout my meetings with these individuals I discussed my research and asked for extensive feedback, as a result proposed research (1) and (2) are in the process of complete revitalization and I've received camera trap information from WWF Acre which I will incorporate into my research. I also received invaluable knowledge and documents (including maps, videos and publications) about the reserve. I'm also currently in the process of adding Dr. Sabina Cerruto Riberiro to my committee and working closely with Alex Oliveira Silva, a masters student in UFAC, in a cross-collaboration for my remote sensing research. As part of the effort to give back to the community I've volunteered myself to help proofread graduate students and professor's research papers prior to submission to academic papers. These relationships and agreements are currently being formalized.

Pictures

Alex Oliveira Silva (UFAC) and Mabel Baez (UF) August 2018. Rio Branco, Acre, Brazil.



Left to right: Alex Oliveira Silva (UFAC), Mabel Baez (UF) and Evandro Figueiredo (EMBRAPA) discussing remote sensing and drone opportunities and challenges in the Chico Mendes Extractive Reserve. . Not pictured: Foster Brown (UFAC). August 2018. Rio Branco, Acre, Brazil


Mabel Baez (UF) (in green) attending IAPA Conference (International Alliance of Protected Areas). Not pictured: Foster Brown (UFAC). August 2018. Rio Branco, Acre, Brazil.

Mabel Baez (UF) with masters and Ph.D. students at the Universidade Federal do Acre. August 2018. Rio Branco, Acre, Brazil.

Left to right: Evandro Figueiredo (EMBRAPA), Alex Oliveira Silva (UFAC), Mabel Baez (UF), Sabina Cerruto Riberiro (UFAC) and Fernando Augusto Schmidt (UFAC). Not pictured: Foster Brown (UFAC). August 2018. Rio Branco, Acre, Brazil.

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