

**Effect of fragmentation on medium-sized mammal's diversity and connectivity  
analysis at Three Quebrachos Forest, Central Sub-humid Chaco, Argentina.**

**Interim Report – May 2015  
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**Introduction**

The agricultural expansion and deforestation occurring in the Argentinean Chaco has been intensive in recent decades (1992-2010), comprising 85% of land use change in the country. Technological advances and increased commodity prices in global markets are the main drivers of deforestation in Latin America, including Argentina. In the Three Quebrachos area in the Sub-humid Argentinean Chaco 60% of the forest has been cleared, with remaining forest fragments embedded in an agricultural landscape matrix. Furthermore, the remaining forest patches are threatened as the soils that support them are highly suitable for agriculture.

We are studying the composition of the meso – mammal community and its relationship to forest fragmentation, as well as connectivity among forest patches, with the aim to elucidate the drivers determining patterns of species distributions as a function of forest fragmentation towards conserving species and their functional roles within the fragmented forest landscape.

**Activities developed to achieve the objectives**

*1. Identifying forest fragments*

I mapped forest fragments in the Tres Quebrachos (3Q) area using unsupervised classification of a LANDSAT 8 satellite image (May, 12th 2013). I used the ISODATA algorithm to assign classes within 0.99 of the convergence threshold.

To validate the classification, I used ground truthing a visual interpretation of images from Google Earth to construct a confusion matrix. The reliability of the unsupervised classification was 95%.

The study area covers 3648 km<sup>2</sup>, of which 665.4 km<sup>2</sup> (18%) is forested (Figure 1), with a large variation in the structural characteristics of fragments, such as size, shape and condition. Forest fragments are used for grazing, less frequently for logging, or are unexploited.

**2. Field work**

We employed 25 remote cameras to sample mammals, including 10 acquired through the funds from Rufford. I also acquired all necessary equipment, such as SD memory cards and batteries. Additionally, to prevent theft, we adopted a method to secure each camera with padlocks (Figure 2). To date, I have not lost cameras due to theft, but some were damaged by ants.

I obtained the cooperation of several landowners and during several meetings we selected areas to sample using the study area map that I developed. Through the original cooperating landowners I was able to contact additional owners and to date I have 15 land owners who have granted permission to work on their properties. The forest fragments sample range in size from 30 to 800 ha (Figure 1, Figure 3).

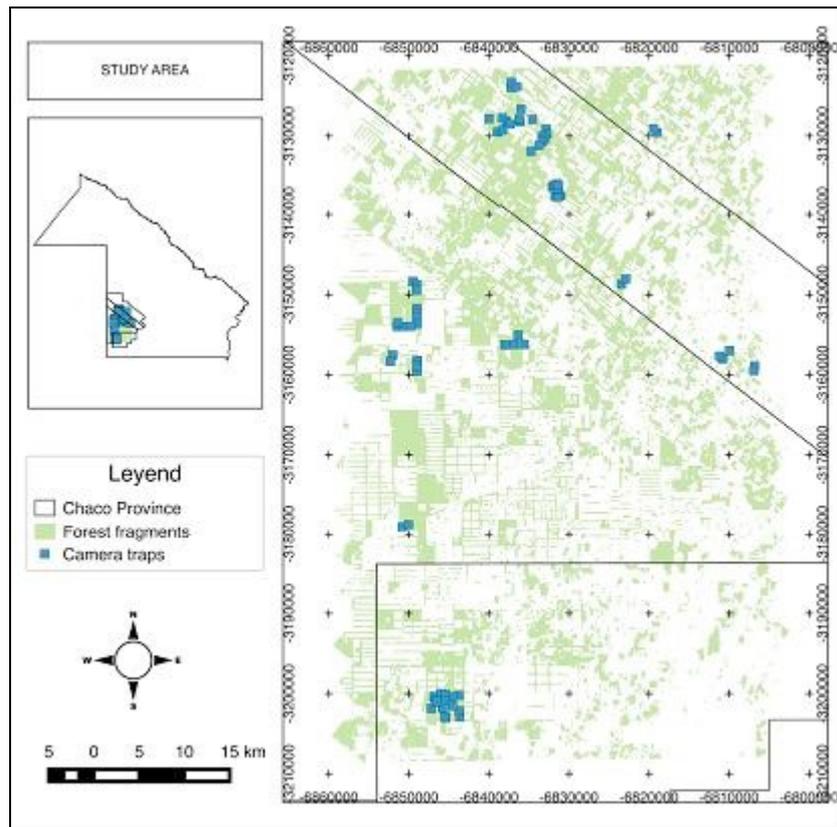


Figure 1. Study area showing delineated forest fragments obtained by unsupervised classification of the Landsat-8 satellite image. In blue are the sample sites.



Figure 2. The installation and security arrangement of camera-trap.

I have made four trips to the field to install the camera traps, each trip lasting six days on average. So far, the total sampling effort is 3.375 camera trap/nights. In all cases, I had a positive response from the owners, and in some cases, they accompanied me during the camera trap installation (Figure 4). I have two more scheduled trips, in June to relocate camera traps and in August to remove the cameras from the field to finish the sampling (Table 1).



Figure 3. Tres Quebrachos forest fragments and agricultural surrounding activity.



Figure 4. Camera trap installed in forest fragment with collaboration of landowners.

After each fieldwork, I selected the videos with mammal detections for each property and made a CD to give them to every producer who has allowed me to work on their property. For those without access to a computer I provided them with printed photos.

Table 1. Sampling effort at Tres Quebrachos, Chaco Province Argentina.

<b>Date</b>	<b>Camera trap</b>	<b>Duration</b>	<b>Camera/night</b>
November 2014	15	45 days	675
January 2015	15	45 days	675
March 2015	22	45 days	990
April 2015	23	45 days	1035
Total	75	180 days	3375

### 3. Preliminary results

We detected 15 species of medium and large-sized native mammals and one exotic species of five orders and nine families (Table 1).

Table 1. Species detected in forest fragments at Tres Quebrachos, Chaco Province, Argentina and their national IUCN Red List status. VU: Vulnerable, NT: Near Threatened, LC: Least Concern.

ORDER/FAMILY	SPECIES	COMMON NAME	Red List Status
<b>PILOSA</b>			
Myrmecophagidae	<i>Myrmecophaga tridactyla</i>	Giant Anteater	VU
<b>CINGULATA</b>			
Dasypodidae	<i>Dasyus hybridus</i>	Southern Long-Nosed	NT
	<i>Dasyus novemcinctus</i>	Nine-banded	LC
	<i>Chaetophractus vellerosus</i>	Screaming Hairy	LC
	<i>Cabassous chacoensis</i>	Chacoan Naked-tailed	NT
<b>CARNIVORA</b>			
Canidae	<i>Lycalopex gymnocercus</i>	Pampas Fox	LC
Felidae	<i>Leopardus geoffroyi</i>	Geoffrey's Cat	LC
	<i>Puma yagouaroundi</i>	Jaguarundi	LC
	<i>Puma concolor</i>	Puma	LC
Mephitidae	<i>Conepatus chinga</i>	Molina's Hog-nosed Skunk	LC
Procyonidae	<i>Procyon cancrivorus</i>	Crab-eating Raccoon	VU
<b>ARTIODACTYLA</b>			
Tayassuidae	<i>Pecari tajacu</i>	Collared pecari	VU
Cervidae	<i>Mazama gouazoupira</i>	Gray Brocket	LC
<b>LAGOMORPHA</b>			
Leporidae	<i>Silvilagus brasiliensis</i>	Tapeti	LC
	<i>Lepus europaeus</i>	European Hare	Exotic



Figure 5. Medium and large-sized mammals detected by camera-traps in Tres Quebrachos forest fragments, Chaco Province, Argentina.

#### 4. Future activities

- Two field trips during June and August to finish sampling.
- Perform occupancy analysis including structural indices of fragments and landscape as covariates.
- Get maps with forest fragments relevance for forest landscape connectivity for anteater, pampas fox and grey Brocket deer.
- Develop a project video based upon the project results and upload it to YouTube to distribute to contacts in the area.

#### 5. Dissemination

- Argentinian Conference of Mammalogy. 4-7 November, 2014 in Esquel.
- GÓMEZ B., THOMPSON J. y J. ADÁMOLI.** 2014. Medium and large mammal diversity in forest fragments, Campo Plata Agroecosystem- Chaco.

- **Interview:** A delegate of the local radio station in Charata, Radio Mocoví and editor of the agricultural magazine "Nuevo Siglo", accompanied us in the field for the installation of camera-traps. In the interview we talked about the project and its importance for forest conservation. The video will be uploaded to YouTube.



- **Magazine:** Special section in the "Nuevo Siglo" magazine made from the interview.

