Finding evidence of 70 years of road impact on wildlife, Route 2: Interamericana Sur-Costa Rica

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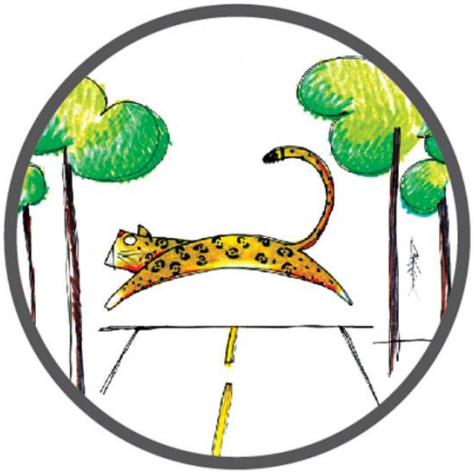
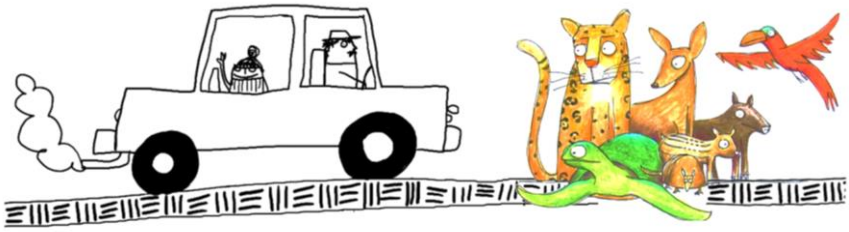


CAMINOS AMIGABLES CON LOS FELINOS

PANTHERA

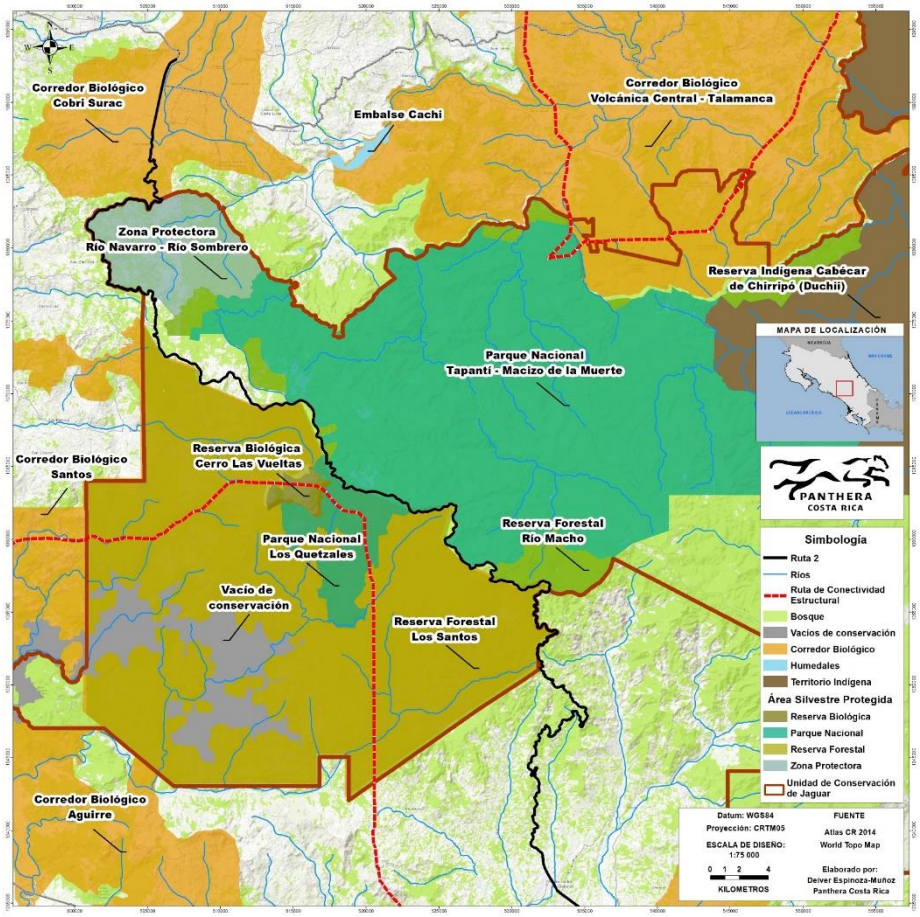


The major threats for our planet are biodiversity loss; alteration of the nitrogen cycle (due to chemical pollution) and Climate change (Rockström et al. 2009). Thru many scientific studies in North America, Europe and Autralia, biodiversity loss by road systems has been identified and measure, and it has overpass the impact of poaching (Forman y Alexander 1998). Roads impact range from the small insects, acuatic ecosystems, birds, up to big mammals and even humans (Van der Ree, Smith y Grilo 2015).

Roads are important for human development, so in biodiverse tropical regions strong evidence on the impact on wildlife must be collected to support the implementation of measures to reduce it. Mesoamerica is a biodiverse region and road expansion and improving is on the way (Dulac 2013). We lack of proper data on the Mesoamerican regions of the implications of the impact of roads on wildlife and specific mitigation measures. We need to display with solid research what is beneath for proper mitigation measures. Taipirs, oncillas, Dice's cottontail rabbit and many other species will be monitored. Camera traps and road surveys will give us information about their distribution and vulnerability towards roads. This information will guide us to implement measures for them to cross safely and ensure connectivity for their populations. Panthera Wild cats friendly project has more than 10 years of experience on road monitoring and recommendation of measures (Panthera 2019)

1. **Vulnerable species involved.** Tapir (*Tapirus bairdii*) endangered, Dice's cottontail rabbit (*Sylvilagus dicei*) (vulnerable, lack of information and endemic of Costa Rica and Panamá) and Oncilla (*Leopardus tigrinus oncilla*), vulnerable and suspected to be a different species from South American population.

2. **Project location**. Costa Rica, Talamanca Range (Los Qutzales National Park-Tapantí Macizo de la Muerte National Park-Río Macho Forest Reserve-Los Santos Forest Reserve). LAT 9.616132 LON -83.829502



3. Project Background

We start looking for a study area where we can compile evidence of road effect on wildlife. We were looking for an old primary road, an old protected area surrounding it, with vulnerable species, evidence of roadkills and lack of mitigation measures.

Route 2: Interamericana Sur was in operation in 1946 and in 1945 was proposed the protection of a Quercus forest buffer of 2 km from each side of the road. From surveying this area we can find evidence of road impact on wildlife from more than 70 years.

We have data of roadkills of tapirs, Dice's cottontail rabbits (*Sylvilagus dicei*) and oncillas on this road. A study by Brenes-Mora (2018), from NAI, identify the distribution of tapirs among the road, tapir roadkills and roadkill sites, but not enough measures have been implemented (just signs and an informative campaign). He identified the presence of jaguars, pumas, yaguarundis, and collared peccary at the protected areas surrounding the road. He recommend the need of estimating the size of the tapir population. From 2010 to 2020, 30 tapirs have die in this area by car accidents.

Long term camera trap survey by Mooring et al. (2020), from Point Loma Nazarene University, a surrounding protected area, have evidence of taipirs, oncillas and Dice's cottontail rabbits and jaguars at the edge of the road. He had express the need of safe crossings for this species. There is evidence that the oncilla from Costa Rica and Panama *Leopardus tigrinus oncilla*, is geographically apart and genetically different from the subspecies found in South America and probably qualifies as a separate species (Payan & de Oliveira, 2016).

We plan to survey this road and the environmental fragile areas (2 national parks and 2 forest reserves) surrounding it to identified the impact on wildlife and recommend mitigation measures.

4. **Main objective**. Implement the Costa Rica Environmental Guide: Wildlife Friendly Roads (Pomareda et al. 2015). This instrument will let us use the data collected to measure the impact and support the proposal of mitigation measures.

Specific objectives:

- Identified vertebrates (amphibians-reptiles-birds-mammals) crossings and roadkills sites on Route 2: Interamericana Sur.

- Identified density, presence and distribution of mammals at the Protected Areas (Los Quetzales National Park-Tapantí Macizo de la Muerte National Park-Río Macho Forest Reserve- Los Santos Forest Reserve) surrounding Route 2: Interamericana Sur

- Propose mitigation measures to the Ministry of Environments (MINAE) and to MOPT for their implementation.

- Share at a local and regional level learned lessons and main results from this study.

5. **Methods**. The methods we will use are based on the Environmental Guide: Wildlife Friendly Roads (Pomareda et al. 2015 and Araya-Gamboa et al. 2015).

- We will do a workshop to present the study to local communities, local tourist businesses, MOPT and MINAE representatives. They will received training on how to report sightings and roadkills at I Naturalist App, complete interviews and provide feedback to improve the study.

- We will survey a length of 50km of Route 2, between the protected areas (two national parks and two forest reserves) for one year. We will drive (speed 35km/h) searching for roadkills and sightings thru early morning (6am) and night (7pm), for a total of 40 surveys (20 nights and 20 mornings). Vertebrate individuals will be identified up to specie level and the site registered with a GPS unit. We will interview road users to collect local knowledge. We will do the surveys with the collaboration of Police officers, PROGAS (Programa de Gestión Ambiental y Social del MOPT) and SINAC (Sistema Nacional de Áreas de Conservación) representatives.

- Camera traps will be set in the understory and canopy of the forest of Tapantí-Macizo de la Muerte National Park, Los Quetzales National Park, Río Macho Forest Reserve and Los Santos Forest Reserve. The distribution of the cameras will be based on the Costa Rican grid shape for camera trap monitoring. Also a set of camera traps will be set at the edges of the road and in the culverts. Cameras will be at the field for three months of the dry season and 3 months of the rainy season. Batteries will be checked and images will be extracted each 30 days.

- From the compilation of data from the camera traps and road surveys, mitigation measures will be proposed. A field trip for the validation of the proposed measures will be done in coordination with representatives of MOPT. Final mitigation measures proposal (including: location, design, quantity and target species) will be delivered to MINAE. MINAE will validate the study and if it is approved, will request the implementation of the measures to MOPT.

- Local communities, local tourist guides, MOPT and MINAE will received a presentation of the results of the study, and future actions would be defined together. A poster of the species identified during the study will be created and delivered to stakeholders.

6. Expected outputs

- Local Stakeholders train in the use of INaturalist app and in the Impact of Roads on wildlife.

- Final Report for MINAE: Implementation of the Environmental Guide: Wildlife Friendly Roads on Route 2: Interamericana Sur.

- Final Report for MOPT: Mitigation Measures to reduce Route 2: Interamericana Sur Impact on wildlife.

- Popular Poster. Wildlife Guide of Cerro de la Muerte Protected Areas. Made with camera trap images of the species found in the protected areas for communities, schools, Ecotourism business and local tourist guides.

- Popular Video. Summarizing the methods, main findings and recommendations of the project.

7. Time table

	Ruta 2: Interamericana Sur	**2021**			
	Activities	**Trim 1**	**Trim 2**	**Trim 3**	**Trim 4**
1	Planing	x			
2	Ground thruthing	x			
3	Camera Trapping		x	x	
4	Road Surveys		x	x	
5	Analysing Data			x	
6	Report				x
7	Project presentation and final report	x			x

8. Budget

Data collection phase coverd by Humane Society International, Trust for the Americas, Mosqueritos and Panthera. Still pending the financial support for supporting the Government through the implementation of the measures.

9. References

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