

# Felid and Prey Detections Indicate Cerro Hoya National Park, Panamá, as an Important Conservation Area



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## Abstract

Wildlife research in Panamá has focused primarily on protected areas along the Central Cordillera, where much of the remaining mature rainforest habitat is located. Basic information on felids and prey in isolated habitats in Panamá is limited. During 2014-2015, we conducted a camera-trapping survey ( $n = 2,925$  camera-days) in Cerro Hoya National Park (CHNP), Panamá, an isolated remnant of tropical rainforest habitat separated by 125 km from the Central Cordillera. We detected 5 of 6 felid species (detection frequency = 0.03-3.04 detections/100 camera-days) known to inhabit Panamá, including a likely breeding population of jaguars. We detected 6 important mammalian prey species (detection frequency = 0.21-12.10 detections/100 camera-days) of felids but recorded no white-lipped peccaries in CHNP. We recommend that CHNP be considered a top priority area for wildlife conservation in Panamá.

**Keywords:** Camera trapping; Detection; Cerro Hoya National Park; Felid; Prey; Panamá

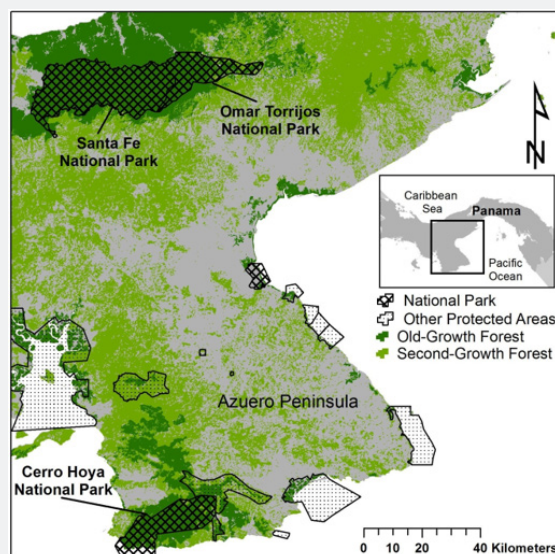
## Introduction

Wild felids are important to humans and as components of ecosystems. For Neotropical felids and their prey, Panamá is the only corridor for maintaining gene flow between contiguous habitat stretching between North and South America. Further, as a megadiversity hotspot, Panamá is recognized as one of the world's most biologically diverse regions also supporting high levels of endemism [1-3]. However, most wildlife research in Panamá has focused primarily on protected areas along the Central Cordillera, where much of the remaining mature rainforest habitat is located. Because basic information on felids and prey in isolated habitats in Panamá is limited, we conducted a camera-trapping study focused on these species in Cerro Hoya National Park (CHNP), Panamá. Here, we provide detection rates of focal felid and mammalian prey species and discuss CHNP as an important conservation area based on these findings.

## Methodology

We conducted research in CHNP (326km<sup>2</sup> in area), an isolated remnant of tropical rainforest habitat located in Los Santos and

Veraguas Provinces in the Azuero Peninsula of Panamá (7°18'-37'N and 80°60'-90'W; Figure 1). We used unbaited camera traps to detect felid and mammalian prey species during January-July 2014 and 2015 at CHNP. We used Cuddeback remote cameras (Model: Cuddeback Capture, Cuddeback Attack, Cuddeback Attack IR, Cuddeback Black Flash E3, and Cuddeback Ambush Black Flash; Non-Typical, Inc., Park Falls, WI) placed along animal and human-made trails, near water sources, and along ridgelines. One or two cameras were placed 2-3m apart at each station and strapped to trees or stakes 30-50cm above ground. Cameras were active 24hr/day with a 5-sec delay between photographs. Due to restrictions on the number of available cameras and to thoroughly cover the study area, we divided each sampling period (2014 and 2015) into two or three separate but adjacent sampling grids ranging from 0.5-50km<sup>2</sup> in area [4]. We deployed cameras on each grid for 30-75 days, visited cameras occasionally to replace batteries and download data, and identified all photographs to species.



**Figure 1:** Cerro Hoya National Park, Panamá, site of camera surveys for wild felids and prey conducted during 2014-2015. Map made by Guillermo Durán and the Azuero Earth Project.

## Results and Discussion

During 2,925 camera-nights of effort, we detected 5 of the 6 wild felid species known to inhabit Panamá: jaguar, puma, ocelot, jaguarundi, and margay (Table 1). Wild felid diversity in our study was similar to other surveys conducted in Panamá [5-6], Costa National Park, Panamá.

Rica [7] and Brazil [8]. We detected no ocellas, which are rare in Panamá [9].

**Table 1:** Felid and mammalian prey detections recorded during camera-trapping surveys during January-July 2014-2015 in Cerro Hoya

Species	Common Name	No. of Detections <sup>a</sup>	Detection Frequency <sup>b</sup>	% of Camera Sites
<i>Dasyprocta punctata</i>	Central American agouti	354	12.1	71
<i>Pecari tajacu</i>	Collared peccary	166	5.68	79
<i>Panthera onca</i>	Jaguar	13	0.44	17
<i>Puma yagouaroundi</i>	Jaguarundi	1	0.03	2
<i>Leopardus wiedii</i>	Margay	7	0.24	9
<i>Dasypus novemcinctus</i>	Nine-banded armadillo	38	1.3	45
<i>Cabassous centralis</i>	Northern naked-tail armadillo	6	0.21	9
<i>Leopardus pardalis</i>	Ocelot	89	3.04	64
<i>Leopardus tigrinus</i>	Oncilla	0	0	0
<i>Cuniculus paca</i>	Spotted paca	33	1.13	28
<i>Puma concolor</i>	Puma	22	0.75	26
<i>Tayassu pecari</i>	White-lipped peccary	0	0	0
<i>Odocoiteus virginianus</i>	White-tailed deer	70	2.39	36

<sup>a</sup> All photos of the same species captured within a 24-hr period were counted as 1 detection.

<sup>b</sup> Number of detections per 100 camera nights.

Previously, in a brief camera-trapping study, members of our research team assessed whether CHNP contained small populations of felids peripheral to the larger known populations that exist in forests in the Central Cordillera [10]. They detected 4 felid species and suggested viable populations of ocelots and pumas may have existed at CHNP, but were uncertain about jaguars

and margays, due to low detection numbers. Here, we conducted a more extensive camera-trapping survey than previously [10], with detection numbers now likely confirming viable populations of ocelots and pumas in CHNP. Although we cannot definitively confirm viable populations of jaguarundis and margays due to few detections, it is unlikely these are just transient individuals

moving through the landscape given the lack of suitable habitat surrounding CHNP. We believe enough jaguars were detected to at least preserve CHNP as an important refuge for such an important flagship species for conservation.

We also detected 6 important mammalian prey species for felids locally (Table 1), with Central American agoutis and collared peccaries being very numerous. However, white-lipped peccaries were not detected in CHNP during this study nor our prior work [10]. Due to larger herd sizes, area requirements, and recent range declines [11], white-lipped peccary populations are particularly susceptible to effects of human activity and land use [12]. Although the IUCN lists the species as “Probably Extant” in the Azuero Peninsula [13], our results confirm that white-lipped peccary populations in CHNP may be close to extirpation if not extirpated already.

### Conclusion

Our study confirms jaguar presence in CHNP and provides evidence of the potential local extirpation of white-lipped peccary in the southwest Azuero Peninsula, making CHNP an area of further conservation concern. CHNP clearly serves as an important refuge for felids and their prey from the surrounding human-dominated landscape relatively close to the Central Cordillera. Given that wildlife are relatively isolated in CHNP, we recommend that Panamá’s Ministry of the Environment (Ministerio de Ambiente [hereafter Mi Ambiente]) and collaborating organizations target CHNP as a top priority area for wildlife conservation in Panamá and consider developing habitat corridors to the Central Cordillera to allow for gene flow.

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