



HONDURAS DISSERTATION/THESIS PROJECT

HO20 Monitoring the effects of hunting pressure on the large mammal populations of Cusuco National Park

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Parque Nacional Cusuco (PNC) is highly biodiverse with at least 42 species of terrestrial mammal recorded since 2006. Of the 23 large mammals >2.5kg in body mass that occur in the Park, the most notable are Baird's tapir (*Tapirus bairdii*) which is currently classified as endangered with a declining population status by the IUCN and the margay (*Leopardus wiedii*) which is a near threatened and declining large cat. Ocelots, puma, jaguar, tayra, deer and peccaries are either known or suspected to be in the area.

Large mammals are often a key cause of conservation concern in tropical forest ecosystems as they are particularly impacted by hunting pressures and habitat destruction and degradation. Developing an appreciation of trends in large mammal populations in a given area, and how population densities are associated with particular habitat types, disturbance levels, levels of accessibility etc are key to understanding whether conservation action is needed, and if so, where such conservation action should be directed. However, sourcing fine-grained biological datasets on large mammal populations in tropical ecosystems is often problematic. Despite their size, large mammals are often difficult to observe directly in tropical forests due to their shy nature, frequent nocturnal activity cycles, and low population densities. This means calculating precise estimates of population sizes of given large mammal species in these ecosystems is often very difficult. The solution mammalogists often use to address this is through the use of indirect surveys, such as patch occupancy analysis (which relies on sightings of field signs such as tracks and droppings, rather than visual encounters). Patch occupancy surveys have been successfully employed in Cusuco National Park for 13 years, and have indirectly demonstrated that many large mammal species in the Park are in decline.

Students taking this option would join our long-term transect-based patch occupancy surveys, noting the presence or absence of large mammal species in 50m 'patches' of each transect. This patch occupancy data can then be correlated with information from our large-scale habitat datasets or satellite imagery of deforestation patterns to ascertain the key determinants of large mammal distribution patterns in Cusuco. Students can also complete their own small-scale habitat surveys for each 50m patch, if examining more local scale influences on large mammal occupancy rates were desirable.

Note – The large mammal survey work in Cusuco is physically demanding. Only students with relatively good personal fitness who do not mind walking long, steep forest transects every day should consider taking this option.

Recommended Reading

Benítez-López A, Alkemade R, Schipper AM, Ingram DJ, Verweij PA, Eikelboom JAJ, Huijbregts MAJ. (2017) The impact of hunting on tropical mammal and bird populations. *Science* **356**: 180-183.

Lawes MJ, Mealin PE, Piper SE. (2000) Patch Occupancy and Potential Metapopulation Dynamics of Three Forest Mammals in Fragmented Afromontane Forest in South Africa. *Conservation Biology* **14**: 1088-1098.

MacKenzie DI, Nichols JD, Hines JE, Knutson MG, Franklin AB. (2003) Estimating site occupancy, colonization, and local extinction when a species is detected imperfectly. *Ecology* **84**: 2200-2207.

McCann NP, Wheeler PM, Coles T. & Bruford MW. (2018) Rapid ongoing decline of Baird's tapir in Cusuco National Park, Honduras. *Integrative Zoology* **7**: 420-428.

Urquiza-Haas T, Peres CA, Dolman PA (2010) Large vertebrate responses to forest cover and hunting pressure in communal landholdings and protected areas of the Yucatan Peninsula, Mexico. *Animal Conservation* **14**: 271-282.