



## Conservation of *Mazama chunyi* and Cervidae status in Southern Peruvian yungas

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### Abstract

The Peruvian yungas (eastern Andean montane and cloud forests) is one of the most diverse and endangered region around the world, and it is considered a research priority. Current and past deforestation threatens restricted-range species like the Peruvian dwarf brocket deer *Mazama chunyi*. This project proposes research on the effect of deforestation on deer species, patterns of habitat use, and creation of a database for *M. chunyi*, as well as implementation of deer management plans. Methods include systematic evaluations in conjunction with local knowledge. Results will determine IUCN threat category, assist three master plans for protected areas, and might help decision-making processes in the area.

### Project Location

The research area comprises the southern Peruvian yungas at 11 locations encompassing the whole range of the species in Peru. The area includes three protected areas, Manu and Bahuaha-Sonene National Parks and Machupicchu Historic Sanctuary, among the locations. The project area is considered a Biodiversity hotspot by Conservation International.

### Goals

1. To generate reliable information on, and create a data base for, *Mazama chunyi* in Peru, including geographic distribution, habitat use and conservation status, to be used as a base for the IUCN Species Survival Commission Deer Specialist Group classification.
2. To design management plans for three deer species, *Mazama chunyi*, *Mazama americana* and *Odocoileus virginianus*. The plan should clearly protect *Mazama chunyi* and the habitat it uses. Based on the populations of the other deer species, it could allow some subsistence hunting on them.

### Objectives

1. To establish relative abundance indexes and a presence-absence matrix for *Mazama chunyi* and other deer species throughout *M. chunyi* range in Peru. Besides *M. chunyi* lack of data, both *M. americana* and *O. virginianus* populations are virtually unknown in the eastern Andean yungas.
2. To quantify the effect of deforestation on the distribution and density of *Mazama chunyi* and other deer species. Deforestation is the main threat for wildlife in the yungas, particularly for species with restricted distribution such as *M. chunyi*.
3. To determine patterns of distribution and habitat use for all deer species present in the study area. Deer species in the yungas lack ecological data, being their only available data occurrence localities from museum specimens.
4. To systematize local people knowledge, experience and observations on deer species in the study area.

### Significance and impact on species conservation

1. The data on *Mazama chunyi* acquired will be the Peruvian population baseline for the IUCN SSC Deer Specialist Group classification.
2. The management plan to be elaborated for the deer species might be included in the next master plans for the three protected areas mentioned.

3. The elaboration of a technical document on geographic distribution, habitat use and densities of deer species in the southern Peruvian yungas will assist in the decision-making processes on the threatened Peruvian yungas. *Mazama chunyi* is currently considered Vulnerable in the Peruvian classification of threatened wildlife.

### Methods

#### 1. Indexes, habitat use and effect of deforestation

Even the most desirable line-transect technique might be useless in the montane and cloud forest habitats, more so with secretive deer as the Peruvian dwarf brocket, unless the sampling size is immense, which may account for several years of sampling. Instead, indexes such as sightings and fresh tracks will be used to infer intensity of habitat use. Eleven locations, where available transects will be walked, will be covered in two months. Patterns of habitat use will be determined by use-availability methods using Bonferoni intervals, considering total transect length, habitat transect length, and sightings and/or tracks locations. Habitat types will be separated by classification of satellite images and visually, and will include only larger macrohabitat divisions, given that even a small deer species uses a great variety of microhabitats. The effects of deforestation will be assessed by the same procedure as explained for habitat use, considering deforested areas as a habitat type. A presence/absence matrix on the deforested areas will also be used, including the edge with the forest.

#### 2. Systematization of local people knowledge on local deer species.

It will be based on interviewing people living near the research areas, and local hunters living in towns close to the areas.

### How to evaluate success

When (1) the IUCN uses this project findings to help determine the threat category for *M. chunyi*, and (2) the NGOs involved in the conservation and decision-making processes of the threatened southern Peruvian yungas include in their papers the conservation and management of deer species, which should include views on halting deforestation.

### Permits

A research permit is needed from INRENA, the Peruvian governmental organization in charge of natural resources and protected areas. The permit is straightforward when no collection is involved. INRENA trusts researchers who have fulfilled all requirements in the past (including on-time reports), and I am among those.

Total Budget: US \$ 3,430.00

### Budget (itemized)

Personnel (assistant and local guide):	US \$ 1,020.00
Local travel (to the area and within it):	US \$ 1,090.00
Food and lodging (in towns and camps):	US \$ 850.00
Materials and services (maps, copies, etc.):	US \$ 470.00

## **CURRICULUM VITAE**

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### **SUMMARY**

- Extensive wildlife fieldwork experience. Sixteen years of experience directing or assisting numerous biodiversity and habitat analyses projects. Ten years of experience researching and analyzing deer (Cervidae) populations in dry forest, montane forest, highland grasslands and jungle. Thirteen years of experience on ornithological evaluations. Four years of experience directing mammal and bird diversity evaluations in numerous habitats.
- Experience researching in several Peruvian protected areas: Huascarán National Park, Manu National Park, Rio Abiseo National Park, Junin National Reserve, Pantanos de Villa Reserved Zone, Aymara-Lupaca Reserved Zone, Tambopata Reserved Zone, El Angolo Hunting Management Area and Chaparri Private Conservation Area.
- Works completed include population viability analysis and minimum viable population estimations, line transect density estimates, calculation of environmental indexes, small mammal trapping, bird mistnetting, experimental design, habitat analysis and biodiversity evaluations.
- Recipient of several Fellowships and grants: Conservation International and APECO, 2005; Idea Wild research equipment grant, 2002; Wildlife Conservation Society, 2000-2001; Chicago Zoological Society, 2000-2001; Tropical Conservation Scholarship, PSTC and Compton Foundation, University of Florida, 1999; Graduate Minority Fellowship, University of Florida, 1998-2001; Fellowship, TCD program, University of Florida, 1996-1998; Lincoln Park Zoo - Scott Neotropical Fund, 1997; Tinker Field Award, University of Florida, 1996 and 1997; Jennings Scholarship, University of Florida, 1996.
- Participant in several conferences and workshops since 1997.
- Nine papers in peer-reviewed publications including Oryx, Cotinga, Ornitología Neotropical, Boletín de Lima, IUCN Deer Specialist Group News and IUCN Cracid Specialist Group Bulletin.
- Experienced in wildlife census techniques and habitat analysis techniques.
- Computer literate in ArcView, Distance, Vortex, Excel, y SPSS.
- Native Spanish speaker.
- Proficient in wildlife photography.

### **EDUCATION**

Admitted to PhD Candidacy, 2001. Wildlife Ecology and Conservation, U. of Florida.

Master of Science, 1998. Wildlife Ecology and Conservation, U. of Florida. GPA: 3.89/4.00

Forestry Engineer, 1997. Universidad Nacional Agraria "La Molina", Lima, Peru.

Bachelor of Science, 1992. Universidad Nacional Agraria "La Molina", Lima, Peru. Best GPA in forest science graduating class.

### **AFILIATION**

International Union for the Conservation of Nature (IUCN) / Species Survival Commission

Deer Specialist Group member since year 2001

Visitant Professor, Universidad Nacional Agraria La Molina, Peru, since 2004