
CONSERVATION ISSUE

CONSERVATION ASSESSMENT AND PLANNING FOR THE YELLOW TAILED WOOLLY MONKEY (*OREONAX FLAVICAUDA*) IN PERU

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Abstract

The yellow-tailed woolly monkey (*Oreonax flavicauda*) is classified as Critically Endangered and is listed by the IUCN Primate Specialist Group as one of the top 25 most endangered primate species in the world. Its distribution is restricted to the Tropical Andes Biodiversity Hotspot. Between March and June 2007 we conducted a preliminary survey of *O. flavicauda* in Amazonas and San Martin states, Peru. We surveyed eleven forest fragments which are known to be part of the distribution range of *O. flavicauda* and gained information on further seven sites. We also collected secondary data on current habitat threats, local communities' practices and views of conservation by using semi-structured interviews. Since the last field survey of this species in 1980 the area has undergone high levels of deforestation and many populations of the species now exist in isolated forest patches. Habitat destruction and hunting are still the main threats for *O. flavicauda*. The main aim of this study was to gather up-to-date information on the actual status and conservation opportunities for *O. flavicauda* in different areas of San-Martin and Amazonas departments. This information is meant for use in encouraging and assisting future conservation initiatives for this species.

Introduction

The yellow-tailed woolly monkey (*Oreonax flavicauda*) is one of the least known and scarcest of the Neotropical primates. It is endemic to the Tropical Andes Biodiversity Hotspot [1] and is restricted to a small area of primary montane cloud forest [2] between 1400 and 2500 meters above sea level (m.a.s.l.) in the departments of San Martin and Amazonas, in the Eastern Cordillera of the Andes in Peru [3-5]. It probably also occurs in small areas of Cajamarca, Huanuco, Loreto and La Libertad [3-9 & R. Aquino pers. com.]. The species is listed by the IUCN [10] as critically endangered (Criteria: CR B1+2abcde, C2a) and features on the current list of the world's top 25 most endangered primates [11]. Although no accurate census data exist, Nowak [12] cites a population estimate of less than 250 individuals surviving in the wild. Low reproductive rates, long inter-birth intervals, low population densities and limited geographic range increase this species' vulnerability to anthropogenic hunting and habitat disturbance [5,10].

The main threat to *O. flavicauda*'s survival is the high level of deforestation and habitat loss [3,5,13,14] affecting it throughout its range. There are several protected areas with populations of this species, including the Rio Abiseo National Park, Alto Mayo Protected Forest (AMPF), Cordillera Colan National Sanctuary, Cordillera Escalera Regional Conservation Area and the Laguna de los Condores Reserved Zone. Hunting and logging are still known to occur in all of these reserves [e.g. 15, for AMPF]. The construction of the Lima-Tarapoto highway in the 1980's brought with it many settlers to San Martin and Amazonas. Most of these immigrants came from the coast and high mountain sierra, which they were forced to leave due to over population and environmental degradation, giving San Martin and Amazonas some of the highest immigration levels in Peru [15,16]. The consequent increase in human density led to a severe increment of

deforestation since the last field survey of *O. flavicauda* [5]. Subsequently, many populations of the species now exist in isolated forest fragments, where genetic drift through inbreeding is a major threat to their survival [2,5,6,14]. This study is intended to up-date knowledge on the status and threats facing *O. flavicauda*, which will assist conservation initiatives for the species through identifying key geographic locations and priority work for its conservation. The information in this article is also presented in the report “Yellow-Tailed Woolly Monkey, *Oreonax flavicauda* (Humbolt, 1812), Pilot Project” [17].

Methods

Between March and June 2007, a preliminary survey of *O. flavicauda* was conducted at eleven sites in Amazonas and San Martin Departments. Data on a further six sites in Amazonas, La Libertad and San Martin departments were also collected. Sites listed in previous studies as *O. flavicauda* habitat [3-9] and sites where all habitat and climatic conditions for the species are met were surveyed to evaluate the presence of *O. flavicauda*. All areas surveyed were located in the mountain cloud forest belt in the two eastern branches of the Andean Cordillera between 05° 34' and 06° 13' South and 77° 01' and 76° 31' West. Altitudes ranged from 1400 m.a.s.l. up to 2300 m.a.s.l.

Average temperatures for these areas are approximately 14-15 °C, with average monthly rainfall between approximately 15 mm in the dry season, and up to 120 mm in the wet season with very high humidity. Canopy height of about 20 - 25 m, with a thick under story and lush vegetation cover.

Primary data were collected during forest walks along existing trail systems accompanied by local residents. Line transect surveys were performed according to Peres [18]. Information collected during encounters referred mainly to: Group size; Age/sex ratios; Behaviour/Activity; Interspecific associations; Time of day and Climatic conditions

Secondary data on the species occurrence and approximate size of populations in the immediate area were collected from key informants using semi-structured interviews. Local residents were asked about the presence of primates in the area and shown high quality images to help identify species' which occur in the area. Additional secondary data were collected during group discussions and *ad-lib*, including Hunting practices in the area; Details of environmental problems affecting local residents; Forest resource uses; Interest in taking part in conservation work; Ideas for more ecofriendly alternatives to current forest use.

Results

Eleven sites were surveyed in this study and information gained on a further seven sites (see Table 1). Presence of *O. flavicauda* was confirmed in five localities between 1600 - 2300 m.a.s.l. with group sizes of eight to nine individuals. In Pedro Ruiz Gallo and Yambrasbamba, where the presence of *O. flavicauda* was recorded in the past [5,9] deforestation is almost complete, also in the areas of Shipasbamba and Gocta, the species only persists in small areas of patchy forest.

Table 1. *O. flavicauda* presence/absence in different sites in San Martin and Amazonas departments, Peru.

Site	Presence	Source	Group Composition	Altitude	State of Forest
Abra Patricia	Yes	ECOAN, Evidence of food consumption, Photos	-	2000m	Patchy
AMPF	Yes	DeLuycker 2007	-		Good, Logged, hunted
Colca	Yes	Local informant	-	1000-2000m	Good, Threatened
Cordillera Colan	Yes	M. Leo pers com.	-	~ 2000m	Good
Gira-Sisa	No	Local informant	-	1800-2100m	Good, Deteriorating
Gocta	Yes	Local Informant, Bite marks	-	2300m	Small, Patchy, logged
La Esperanza	Yes	Visual Observation	8 (5 Adult, 3 Juv)	2000m	Patchy
Los Chilchos	Yes	H. Dignum pers com.	-	~ 2000m	-
Los Corrales	Yes	Local Informant	-	1700m	Good, Logged
Nuevo Mendoza	Yes	Local Informant	-	1800m	-
Paitoja	Yes	Auditory detection ?		1600m	Good, Threatened
Pedro Ruiz Gallo	No	This Study	-	1400m	None
Rio Abiseo	Yes	Local informant	-	350-4200m	-
Rio Metal	Yes	R. Aquino pers com.	-	-	-
Shipasbamba	Yes	Visual Observation	9 (2 Adult M + 3 F, 1 Sub-adult, 3 Juv)	2300m	Small, Patchy
Tocache	Yes	R. Aquino pers com.	-	-	-
Yambrasbamba	No	This study	-	1900m	None
Yurilamas	Maybe	Local Informant	-	1500m	Threatened, Hunted

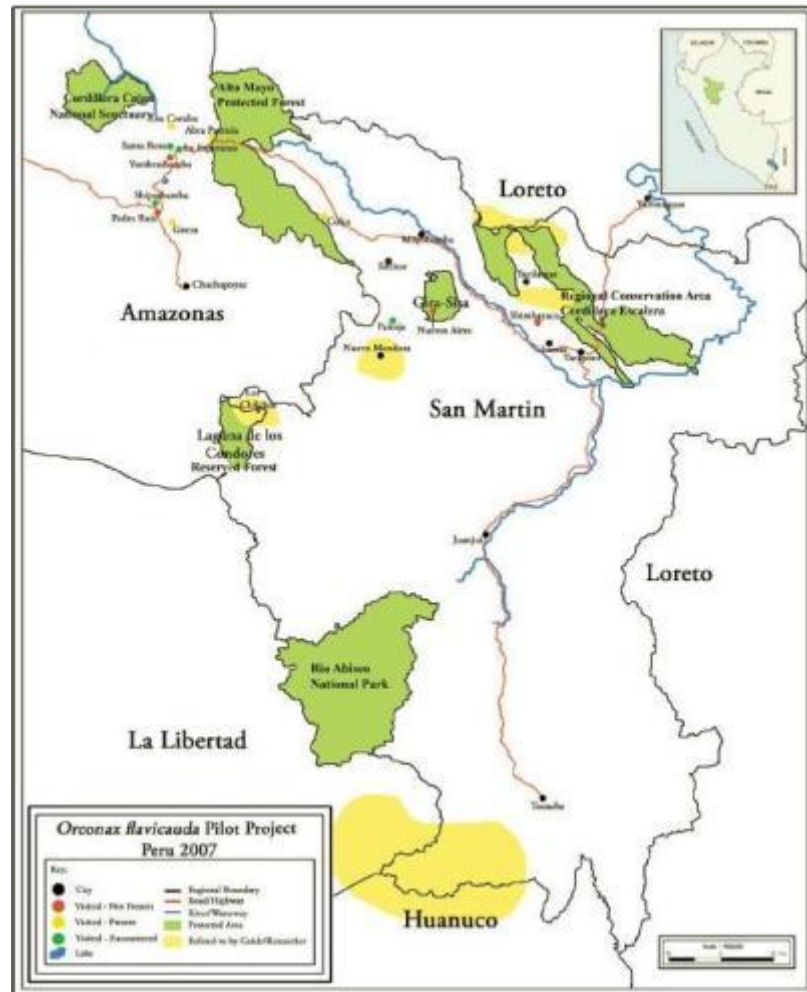


Fig. 1. Map of study area.

Key informant questionnaires ($n = 22$), group discussions and *ad-lib* data collection showed that most people in these areas are, either directly (from sale of timber) or indirectly (through supplemental income and participation in the local economy), dependent on timber extraction for their livelihoods. People showed concern about the level of deforestation and its implications for the future. All key informants said that they had noticed environmental problems affecting their lives and pointed to deforestation as the main cause of problems such as landslides, soil erosion, changes in the local climate and the disappearance of wildlife. This concern was often repeated in group discussions. People showed great interest in cooperation with conservation work and alternative income development.

Due to difficulties in data collection on sensitive subjects such as hunting and logging, both of which are often conducted illegally, most data on these practices were collected in informal group discussion sessions or *ad-lib*, therefore it is only possible to outline trends and not provide specific numbers. Further research is needed to determine the level of influence socio-economic factors have in the conservation of this species and its habitat.

Other threats observed during this study were the construction of roads and associated immigration into new areas, mining operations and logging concessions. Also, hunting of *O. flavicauda* by migrant communities is mainly opportunistic to take animals for the pet trade (during our three months survey we were aware of five *O. flavicauda* caught for the pet trade) and as a deterrent to crop raiding. Indigenous groups, however, are known to hunt this species for consumption.

Discussion

Visited sites and conservation suggestions

We will focus on the five sites visited that showed the greatest conservation potential to give a short description and recommendations.

Colca, San Martin (S 5° 53' 40.9" W 77° 23' 15.2")

Colca is a migrants' village in the buffer zone of the Alto Mayo Protected Forest. There is continuous immigration of people into the area of the reserve, and the community of Colca spends a lot of resources in defending its lands from settlers. Hunting and commercial logging in the village and respective land was prohibited by the municipal representative, who started a small-scale communal reforestation project and seeks to develop ecotourism and conservation projects in the area. The forest was not surveyed for *O. flavicauda*, but local informants have seen the monkeys close by on several different occasions [M. Odil, pers. com., W. Palomino, pers. com.]. This is a very close-knit community with a strong feeling for conservation. Both of these factors would increase the chances of success of any community-based conservation initiative in the area [19]. We believe this village could be a good starting point for protecting the buffer zone of AMPF. By developing eco-tourism and other alternative income projects the community could be strengthened to positively influence many neighbouring communities.

Paitoja, San Martin (S 6° 21' 42.0" W 77° 04' 52.1")

this is a small village about 12 years old whose main income is agriculture. People do not commercially log or hunt and generally do not hunt primates. The forest has very little disturbance and is exceptionally well preserved and dense. During the present survey, in one day of walking, two *O. flavicauda* groups were heard several kilometres apart, even though direct observation was not possible. A local guide provided information about the presence of *O. flavicauda* and *Ateles belzebuth* populations in Nuevo Mendoza, a further six-hour walk south.

The occurrence of *O. flavicauda* and the amount of intact forest makes this an important area for conservation and research, as it could represent one of the largest remaining primate populations in the region. The European backed logging company COMPEFOR (Compania Peruana Forestal) is currently constructing a road from 47,000 ha logging concession near Palmeras [20]. Residents of Paitoja are concerned about immigration into surrounding lands once the road is built. The forest in this area is of particular importance to local human populations as it protects watersheds feeding rivers to the whole region.

We do not believe that there is a way to stop the logging company at this stage, but we feel that organizing and strengthening local communities to protect their land and prevent further immigration into the area could go some way to mitigating the damage that the new road and forestry concession will cause. In order to reduce impacts in the area it is necessary that COMPEFOR follows their environmental mitigation plans.

Gocta (S 6° 01' 18.4" W 77° 53' 12.4")

Gocta is the third highest waterfall in the world and is a fast growing tourist attraction. It is mentioned by DeLuycker [3] and Willy Palomino [pers. comm.] as *O. flavicauda* habitat. These monkeys were not encountered during a 2-day survey in Gocta, although partially eaten fruits showing primate teeth marks were found. Local people, from the indigenous Quechua community of San Pablo, reported frequent observations of *O. flavicauda* and pointed out small forest patches of a few hectares where they had been seen recently. There is very little forest left in this area and the main patch of forest around the waterfall is probably too small to sustain a viable population of *O. flavicauda* in the long term.

The community is organized to receive medium numbers of tourists but has very little knowledge of the ecology and conservation of *O. flavicauda*. An awareness campaign could help people realize the value of preserving such a rare primate species living so close to their land. The site could also be suitable for the initiation of an environmental education program for the large groups of school children that come to visit the waterfall. The value of this species as a tourist attraction could also be used to help start a reforestation project to ensure the future of *O. flavicauda*.

La Esperanza and Los Corrales (S 5° 40' 13.5" W 77° 55' 08.0")

The 20,000 ha community of La Esperanza encompasses five small migrant communities. It was possible to find on La Esperanza's lands a group of eight *O. flavicauda* and a female white bellied spider monkey *Ateles belzebuth* [see 21], a group of *A. belzebuth*, Andean cock-of-the-rock (*Rupicola peruviana*) and capuchin monkeys (*Cebus spp.*). According to the residents of the area, there are groups of *O. flavicauda* in close proximity to the villages with increasing densities going towards an area called Los Corrales. This area is situated in a strategic location between the AMPF, Abra Patricia and Cordillera de Colan reserves, thus presenting immense potential as an area for conservation. The forest in this region is a highly disturbed mosaic of cloud forest interspersed with pasture and canopy gaps due to logging activities. The main income of the village comes from selective wood extraction (mainly Spanish cedar, *Cedrela odorata*), cattle ranching and commercial coffee cultivation (17). All lowland areas within several kilometres of each village have been at least partially cleared for agriculture. Local inhabitants showed a lot of interest in conservation and concern about the level of deforestation, which has caused difficulties in finding timber and changed the local climate.

Worryingly, the regional government has started building a new road through the lands of La Esperanza. This could lead to a sharp increase of immigration and settlement into the area, causing a rapid increase in deforestation [22]. However, road access to the area could also be used for developing community based eco-tourism initiatives and for opening the area up to markets for more sustainable forest products. If started soon enough, conservation orientated development strategies could make a substantial impact on the protection of this important population of *O. flavicauda* and its habitat. The UK based NGO Neotropical Primate Conservation, in cooperation with the Museum of Natural History of the Universidad Nacional Mayor de San Marcos, IIAP (Instituto de Investigaciones de Amazonia Peruana) and Entropika are initiating a long term conservation project for *O. flavicauda* and a sustainable development project in La Esperanza [see: www.neoprimate.org].

Shipasbamba, Amazonas (S 5° 54' 35.3" W 77° 58' 50.3")

Shipasbamba is a Quechua village about half an hour drive from Pedro Ruiz Gallo. During the 1980s the Asociación Peruana para la Conservación de la Naturaleza (APECO) came to Shipasbamba to start a conservation project for *O. flavicauda*. Unfortunately, the regional government at the time chose not to cooperate and distributed the lands between local farmers and so the project was discontinued. The forest has now receded so much that it takes over four hours to walk from the village to the forest edge. Slash and burn agriculture has led to clearance of almost all the forest in the area, leaving only small patches in the highest, most inaccessible areas. However, farmers are continually clearing new fields and pasture even in these areas because of the rapid degradation of existing fields due to continual heavy rains on steep deforested slopes.

On the 2nd of May 2007 a group of *O. flavicauda* were encountered in a neighbouring patch of forest. The monkeys drew attention to themselves with their loud alarm calls. The group consisted of nine monkeys: two adult males, three adult females, one sub adult and three juveniles.

The Association for Production and Commerce of Taya and Others (ASPROCOT) is looking for agricultural alternatives to cattle ranching and coffee (Timber extraction is no longer economically

viable around Shipasbamba). The association has started experimenting with the commercial production of Taya (*Caesalpinia spinosa*), Pitaya (*Hylocereus* sp.), Sacha Inchi (*Plukenetia volubilis*) and Estevia (*Stevia rebaudiana*), all of which are native to the area and have commercial potential. Unfortunately, the association lacks outside funding to start commercial scale production, scientific information about the plant species and details of possible national and international markets. We believe that support for this and other similar associations is the best hope for conservation of the forest in this area.

Oreonax flavicauda is endemic to the Tropical Andes region of Northern Peru. This species is a charismatic, large bodied, diurnal primate with complicated social structure, dietary specialization on a high percentage of mature fruits, and has large home ranges [3,5]. The species does not flee from humans and will sometimes approach people that come near, often with a spectacular display of screaming and branch shaking. Their fur is dark reddish brown; they have a white mouth, yellow tail tip and scrotal tuft which males frequently present during encounters with people. Although this behaviour makes the species an easy target for potential hunters, these impressive displays also make the species very well known and appreciated by local people. This, combined with its endemism and its important ecological role, makes the species highly suitable to be a flagship for the conservation of this very unique and endangered ecosystem [23].

Some Santa Rosa residents reported that this species occasionally descends to the ground to cross small areas of pasture between patches of forest, which together with its tolerance to humans may be the mechanisms by which it is able to persist for a time in small patches of poor and disturbed habitat such as that found in Shipasbamba and Gocta. The migrant populations in the area do not generally consume primate meat but opportunely hunt *O. flavicauda* with the intention of selling young animals as pets. However, during our study we were repeatedly told of the hunting practices of the Aguaruna indigenous groups. It seems that hunting may be a major problem for *O. flavicauda* in these areas as the Aguaruna were said to specialise in hunting of the species. Hunting parties have, in recent years, been encroaching on lands outside the indigenous groups own territory, suggesting that populations of animals within their territories have dropped.

Conclusions

The main threats to *O. flavicauda* continue to be land clearance and habitat degradation. Contrary to recent reports [24], hunting by both indigenous and immigrant communities for subsistence and trade is also a major threat to the survival of the species. Trade in *O. flavicauda* seems to be of a very local nature, but even such small levels of trade in a species as endangered as this could be disastrous.

Range wide, the habitats of *O. flavicauda* are under immense pressures. Nowak's [12] estimate of less than 250 individuals was probably an underestimate; however, we must conclude that the true population size will not now be much higher than this and is most likely decreasing. The growing human population going hand in hand with increasing poverty, unsustainable development and environmental degradation create a situation which is worsened by a complete lack of environmental education actions in any of the visited sites. Moreover, very low enforcement levels of conservation laws by the governmental authorities results in low collaboration of local human populations with most existing conservation initiatives. Currently ECOAN, APECO and Apenheul all have projects in place for the conservation of this and other endemic species in San Martin and Amazonas departments.

We are calling for further, urgent conservation efforts concentrating in the key areas for the species mentioned in this article. Efforts should include protection of large *O. flavicauda* populations and habitat, upgrading of the small isolated forest patches to sustain the smaller populations and to allow genetic exchange between groups. Efforts should also include local and national conservation education, enforcement of conservation laws and promotion of sustainable use and economic alternatives for local communities.

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