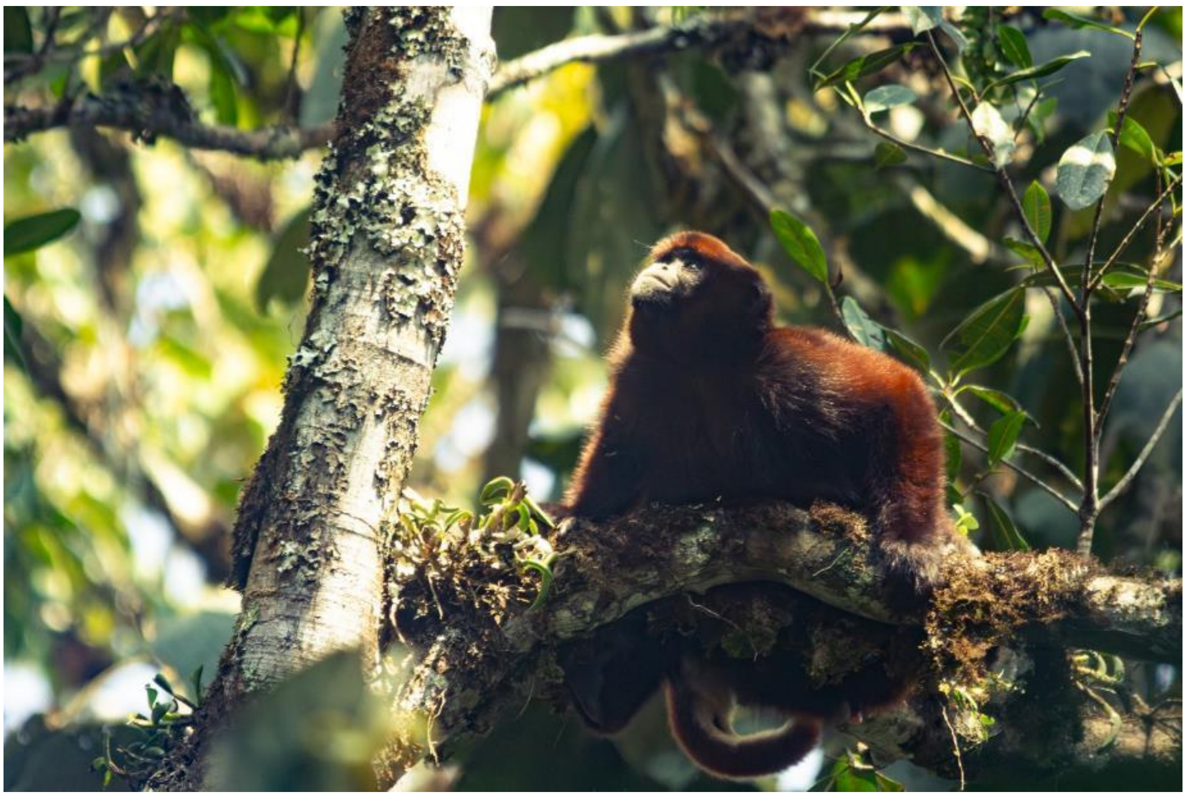
Evaluating the Impact of Fifteen Years of Community Conservation on the Critically Endangered yellow tailed woolly monkey (*Lagothrix flavicauda*), Peru.

Final report to the Primate Society of Great Britain

November 2023 – December 2024



Lorena Fernández Hidalgo, Nestor Allgas, Sam Shanee

Neotropical Primate Conservation

INTRODUCTION

The yellow-tailed woolly monkey (*Lagothrix flavicauda*) is one of the largest Platyrrhine primates and is endemic to the cloud forests of the eastern Andes of Peru. It is found in the regions of Amazonas, San Martín, Huánuco, La Libertad, Loreto (Shanee 2011) and recently a population has been found in Junín (McHugh et al. 2020, Zarate et al. 2023). This species is considered Critically Endangered (CR, Criteria A4cd) by the International Union for Conservation of Nature (Shanee et al. 2021) and under Peruvian law (D.S. 004-2014-MINAGRI) due to habitat loss and fragmentation, commercial and subsistence hunting, pet trade, and anthropogenic activities that promote land use change and unsustainable resource exploitation (Shanee 2011, Shanee 2012, Shanee & Shanee 2014). Believed extinct by scientists until 1974, this year marks the 50th anniversary of its rediscovery. It will also be included for the fourth time on the 2022-24 list of the world's 25 most endangered primate species (Shanee, personal communication).

Conservation work for *Lagothrix flavicauda* in Peru led by NPC started in 2007, using the species as a 'flagship' to carry out different conservation actions in the eastern montane forests of the Andes (Shanee & Shanee 2009). So far, measures such as land protection, research, reforestation, environmental education, economic alternatives, and voluntary conservation agreements have been implemented. In 2008-2009, a first population census was conducted near La Esperanza, Amazonas, prior to starting conservation actions (Shanee 2011), and subsequently, in 2012-2013, a second comparative study was carried out which showed an increase in the number of individuals in the population of approximately 35.9%, with the only significant increases being in infant and juvenile individuals, suggesting population growth through natural increase (Shanee & Shanee 2015).

We carried out a one year population census to continue the monitoring work that we have been carrying out since 2008. We also carried out a study on deforestation rates in the study area and wider landscape across and between the study periods.

METHODS

Study site

We conducted census work near the *Centro Poblado La Esperanza*, Amazonas department, on the eastern slopes of the Andes in north Peru (Fig. 1). The area, known locally as El Toro (S 05°39′46″, W 77°54′32″), lies between 1,800 and 2,300 m.a.s.l. and encompasses ca. 700 ha of disturbed primary forest and regenerating secondary forest interspersed with pasture (Fig. 2). This area is part of a natural biological corridor and is located between 6 protected areas where the species presence has been recorded: Zona Reservada Río Nieva, Santuario Nacional Cordillera de Colan, Reserva Comunal Chayu-Nain, Bosque de Proteccion Alto Mayo, the Area de Conservacion Privada Abra Patricia-Alta Nieva and the Area de Conservation Privada La Pampa del Burro.

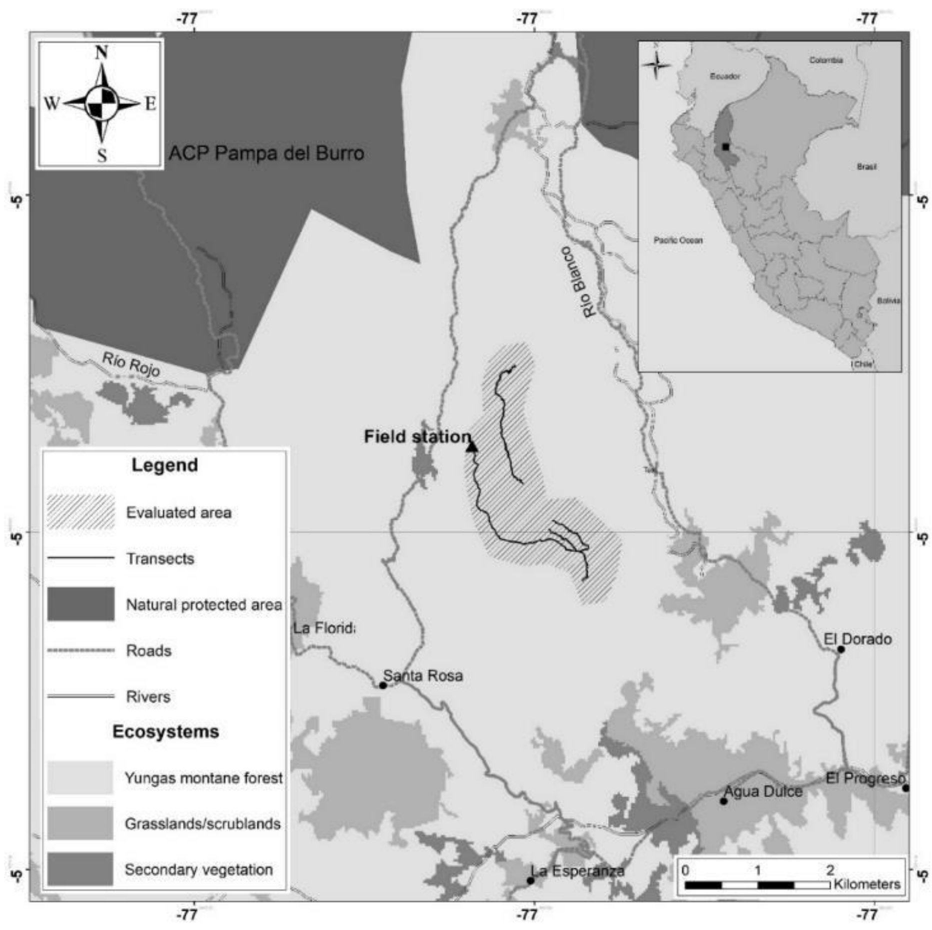


Fig 1. Location of the study site, with inset showing location in Peru. Map shows the location of transects and approximate area of influence of the study groups major habitat types and infrastructure.

Average annual temperature range at the site is between 12°C and 17°C, total annual precipitation is ~3,915 mm and potential evapotranspiration ratio level fluctuates between 0.125 and 0.25 ml/s (Aybar-Camacho & Lavado-Casimiro 2017). Climate in the area is very humid (B4) and warm temperate (B’3) typical of montane forests (Vargas, 2010). The terrain is very rugged, with high ridges and deep valleys characterized by primary premontane and montane cloud forest dominated by Moraceae, Urticaceae, Melastomataceae, Rubiaceae and Lauraceae.

Fig. 2. Landscape at the study site.

Fig. 3. El Toro forest.

Density estimation

Survey work started in July 2023 and ended in July 2024, completing 12 months of fieldwork. As much as possible we followed standardized line transect methodology (Peres, 1999; Plumptre and Cox 2006; Marshall et al. 2008; Buckland et al. 2010a; Buckland et al. 2010b). A total of 4 transects were established (6.55 km total distance), which were walked by a researcher and a local guide at a speed of approximately 1 km/h, stopping every 100m for 5 minutes for better detection probability. The transects were measured using a GPS (Garmin GPSMap 60CSx) and marked every 50 meters with flagging tape. We surveyed the transects for 5 days every 2 weeks. We walked each transect twice on each field trip, once between 06:30 and 11:00 h and once between 14:00 and 18:30 h, with minimum 24 h between walks on the same transect. We included data collected on return walks in the census and used group counts to calculate average group size for the area. We measured perpendicular distances from the transect to the center of the observed group using a 50-meter tape measure (Fig. 3). When this was not possible, due to long distances or inaccessible terrain, we estimated the distances visually.

We recorded data on standardized record sheets and included weather condition, species identity, group size and composition (we defined categories as adult male, adult female, juvenile, and non-locomoting infant) and location of detection along the transect. We also recorded forest strata used, and vegetation features. We allocated ≤10 min to obtaining group size counts (Marshall et al. 2008). When counts were incomplete or inaccurate we used mean group size from all reliable counts for analyses, including counts from return walks and other occasions at the study site.

Fig 4. Researchers marking the transects with flagging tape.

Fig 5. Transect marked.

Deforestation rates

We estimated changes in forest cover between study periods by utilizing high-resolution satellite imagery from the Landsat 9 satellite at 30 x 30m pixel resolution (all Path/Row 009/064), with cloud cover <20%. All datasets were projected in UTM 18S (Datum WGS84). Following the methodology of Wyman and Stein (2011), we employed a hybrid supervised/unsupervised classification approach, implementing the Gaussian Maximum Likelihood technique with 30 training samples for the unsupervised classification process. To refine our land cover change estimates from the image classification, we visually verified and validated the results using our training samples, GPS points, and our understanding of land uses in the study area to address any discrepancies. We then compared the resultant landcover maps with those from previous studies conducted in 2008-2009 and 2012-2013 (Shanee & Shanee 2011, 2015), highlighting any newly deforested areas.

To estimate the possible effect of local deforestation on the population increase in our study area due to the possible migration of groups from recently deforested adjacent areas and/or displaced due to hunting pressure in forested areas contiguous to our study area, we used two thresholds to define distances of possible influence (low and likely). We used information on the dispersal distances of *Lagothrix poeppigii* and *Ateles belzebuth* groups using radiocollars (Di Fiore et al. 2009) and *Alouatta seniculus* (Pope 1989, cited in Di Fiore et al. 2009) to estimate a possible migration distance for *L. flavicauda* groups at our study site. Based on this, we estimated a low influence area by using a 10km buffer around all transects used for the census. This distance roughly approximates 7 *L. flavicauda* home ranges diameters, calculated from previous studies at the same study site (Shanee 2014b). We estimated a likely influence area using an 800 meter (2 home range) buffer in the same way. We then clipped the landcover layers to these thresholds to estimate deforestation rates at the site.

RESULTS AND DISCUSSION

Density

We completed a total of 994.2 km of transect walks, with a total of 176 detections of *L. flavicauda* between direct observations and vocalizations. Detection distances were left truncated to 100m. Using Distance 7.5 software, we estimated an average group size of 17.8 (SE = 0.25) individuals, with a detection probability of 73.8% (SE = 3.7). The model with the lowest coefficient of variation for group density (CV = 8.61) and individuals (CV = 9.14) and the lowest AIC value; and which best defined the detection function, was the Uniform model with a Simple Polynomial expansion series using 8 distance intervals (Fig. 4).

Group density was estimated at 2.9 groups/km^2 (SE = 0.25) and individual density at 52.1 individuals/km^2 (SE = 4.76). The factors that most affected density were encounter rate (58.6%), detection probability (30.2%) and to a lesser extent group size (11.2%).

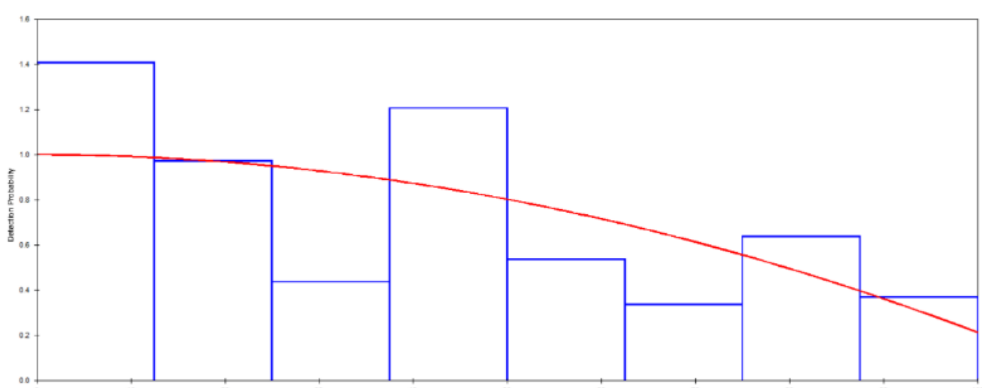


Fig. 4. Probability detection histogram.

We found an increase in both individual density (+82.2%) and group density (+64.5%) compared to the previous study (2008/2009) (Table 1). This increase was higher than that recorded between the previous studies. Group size also increased over both previous surveys, as did increases in the numbers of each age/sex class, which were proportionally greatest in adult females and infants.

The age/sex class with the greatest growth over the years was infants, followed by juveniles and adult females. The increase in the juvenile population could be an indicator of improved survival rates among infants, allowing adult females to have more offspring. This trend is likely linked to the cessation of hunting in the study area, which disproportionately affects adult females and young animals. Overall, these findings suggest that the increase in population density is due to natural growth, with higher birth rates and improved survival rates among infants.

Table 1. Mean population densities and group composition from each census year.

Item	**2008/2009**	**2012/2013**	**2023/2024**	**Change 2008/2009 to 2012/2013 (No/%)**	**Change 2012/2013 to 2023/2024 (No/%)**	**Change 2008/2009 to 2023/2024 (No/%)**
Group density (Km^2)	1.04	1.28	2.93	+0.24/18.8%	+1.65/56.3%	+1.89/64.5%
Individual density (Km^2)	9.26	14.45	52.1	+5.19/35.9%	+37.65/72.3%	+42.84/82.2%
Group size	8.9	11.32	17.78	+2.42/21.2%	+6.46/36.3%	+8.88/49.9%
Adult males	2.3	2.8	3.2	+0.5/17.8%	+0.4/12.5%	+0.9/28.1%
Adult females	2.3	3.5	5.9	+1.2/34.2%	+2.4/40.7%	+3.6/61.0%
Juveniles	1.5	3.2	4.2	+1.7/53.1%	+1.0/23.8%	+2.7/64.3%
Infants	0.4	2.1	2.7	+1.7/80.9%	+0.6/22.2%	+2.3/85.2%

Deforestation rates

Based on our two buffer zones, we evaluated areas of 40,740 ha (10km buffer) and 979ha (800m buffer) (Table 2).

Table 2. Characteristics of two buffer used for analysis.

Area	Buffer 10km	Buffer 800m
Area total (ha)	40,740	979
Area without cloud cover (ha)	36,221	956
Percentage cloud cover	11.1%	2.4%

Our analysis of deforestation in the wider study area showed a slowed deforestation rate between 2013-2022 (767ha), compared to 2007-2013 (803ha); despite twice as long between surveys (Table 3). However, a small increase in deforestation rate was observed for the 800m buffer, comparing the same sampling periods.

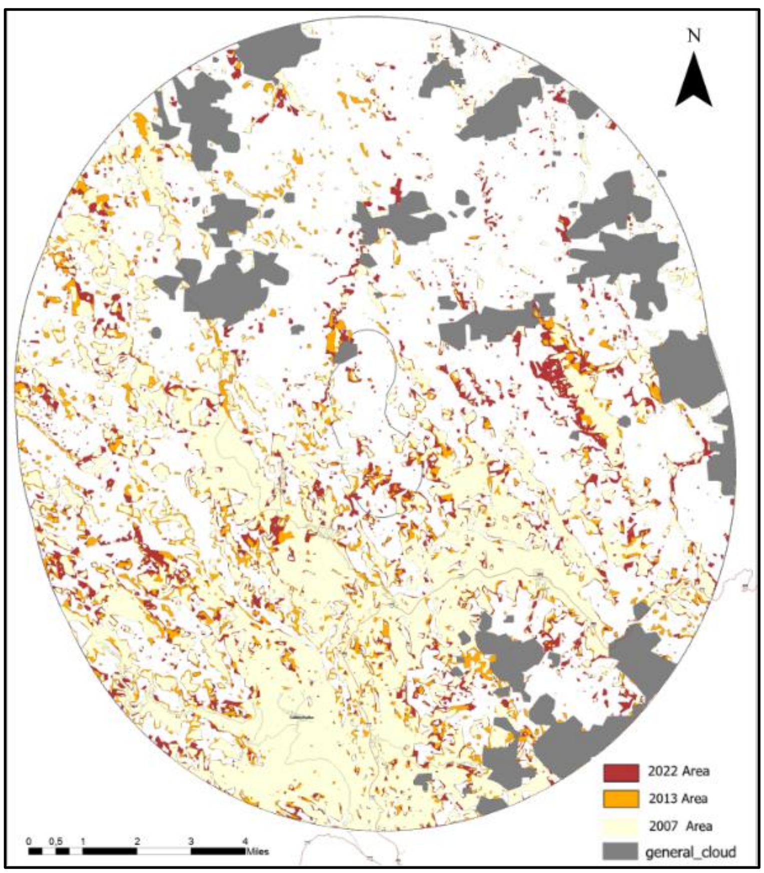


Fig. 5: Map of landcover change in the area surrounding the study site between surveys. Map shows the two buffers used to represent different levels of influence on local populations of *Lagothrix flavicauda*.

Table 3. Deforestation between 2007, 2013 and 2022 in El Toro, Region Amazonas, Peru.

Area	**Buffer 10 km**	**Buffer 800 m**
2007	10,050	81.7
2013	10,853	106.4
2022	11,620	161
Decrease 2007 to 2013	803	24.7
Decrease 2013 to 2022	767	54.6
Decrease 2007 to 2022	1,570	79.3
Deforestation/year (2007 to 2013)	133.3 Ha/year	4.12 Ha/year
Deforestation/year (2013 to 2022)	85.2 Ha/year	6.06 Ha/year
Deforestation/year (2007 to 2022)	104.6 Ha/year	5.28 Ha/year

In general, a decrease in deforestation rates has been observed in Peru during the period 2013-2022; although some studies have also found increases in small-scale deforestation. For example, in Putumayo, Loreto, a 27.03% reduction in deforestation was found, but an increase of 6.5% in deforestation of primary forests (Montánchez-Picardo 2022). Similarly, a study conducted in Madre de Dios, a region with 91% of its forest cover intact, showed a 3% reduction in annual deforestation in 2020, compared to 2019, after the declaration of emergency due to COVID 19. This difference was only 1% when considering only small-scale deforestation (i.e. local farms) in primary forest, suggesting that farmers continued to clear areas during the pandemic, whereas industrial operations did not, or did, but to a lesser extent (Canahuire-Robles 2023). This decrease in deforestation rates on a larger scale could be due to the abandonment and regeneration of deforested areas or the lack of increase in forestry activities by large companies; while the increase in small-scale deforestation could be mainly due to mobility restrictions imposed by the Peruvian government; thus, local people spent more time clearing small areas for cultivation during the health emergency.

Community conservation/Environmental education/Training

In addition to field work, we took advantage of the visits to El Toro to monitor the conservation work carried out by park rangers in the nearby Area de Conservacion Privada La Pampa del Burro, which is a protected area managed by the local community and which we have been supporting since its creation in 2012. Similarly, we carried out environmental education activities in the villages of La Esperanza, Miraflores, and Santa Rosa in April (Fig.

6), which are adjacent to the study site and the protected area. We also made visits, together with San Diego Zoo, to the village of La Perla del Imaza, the closest village to the Area de Conservacion Privada La Pampa del Burro in May and October (Fig. 7). This year these activities reached around 160 children, who took part in classes on the importance of conserving the yellow-tailed woolly monkeys, Andean bears, their habitats, and other species, and the benefits of maintaining healthy forests and the ecosystem services they provide.

Fig 6. Environmental education in La Esperanza.

Fig 7. Environmental education in La Perla del Imaza.

Other education activities included training and testing various students, volunteer and local field assistants in survey methods and at visually estimating distances to a satisfactory level. Many local, national and foreign students have been trained in field methods for censuses and have participated in record-keeping (Table 4); as well as in environmental education activities. In addition to the publication of density data obtained at the end of the study, two of our Peruvian students will use part of the results from the dry season and the rainy season census trips to conduct their undergraduate theses and two international students to obtain their master's degrees.

Table 4. Local, national, and international students involved in the study so far.

Name	Nationality	Profession	Activity
Claudia Gabriela Litano Avalo	Peruvian	Bachelor in biology	Undergraduate thesis student
Melissa Carolina Litano Avalo	Peruvian	Student	Field assistant
Lai Yang Tatiana Chu Vela	Peruvian	Bachelor in biology	Undergraduate thesis student
Sofia de los Ángeles Tucto Romero	Peruvian	Bachelor in biology	Field assistant
Luisa Antuanella Quinto Marca	Peruvian	Bachelor in biology	Field assistant
Silvia Santos Algaba	Spanish	Master in biodiversity conservation	Field assistant
Laura Marginé Argerich	Spanish	Student	Field assistant
Lea Dusquesnoy	French	Student	Field assistant
Leoni Calon	French	Student	Field assistant
Karolina Lodis	French	Marine biologist	Field assistant
Gregoire Michel	French	Student	Field assistant
Elisa Venturini	French	Master in biodiversity, ecology and evolution	Field assistant
Joanne Perrine Amel Martin	French	History and Political Science	Field assistant
Ozzy Moore	British	Postgraduate student	Postgraduate thesis student
Joana Elizabeth Casanova Guerra	Venezuelan	Environmental engineer	Field assistant
Micalah Julieann McCulloch	Australian	Bachelor in ecology and evolutionary biology	Field assistant
Antoine Rocaboy	French	Master in biodiversity, ecology and evolution	Field assistant
Barnaby Lindsell	British	Student	Field assistant

In November we presented the results of this study at the joint congress of Latin American Primatological Society (SLAPrim) and the Colombian Primatological Association (APC) in Pereira, Colombia (Fig. 8). This presentation was a part of a "Lagothrix: Behaviour, Conservation and Ecology" symposium organized by NPC.

Fig. 8. NPC undergraduate thesis student Lai Yang Chu presenting this study in the Latin American Congress of Primatology.

We are currently working on the first manuscript draft of a scientific paper to be submitted for publication in a peer-reviewed scientific journal.

REFERENCES

Allgas, N. (2023). Estimación de la densidad poblacional y caracterización del hábitat del mono nocturno peruano (*Aotus miconax*) en Yambrasbamba, Amazonas. [Tesis de pregrado, Universidad Nacional Mayor de San Marcos, Facultad de Ciencias Biológicas, Escuela Profesional de Ciencias Biológicas].

Aybar-Camacho, C. & Lavado-Casimiro, W. (2017). Atlas de zonas de vida del Perú: guía explicativa. Nota Técnica Nº 003 SENAMH-DHI-2017 Edition, 2017.

Buckland S., Plumptre A., Rexstad E. (2010a). Design and analysis of line transect surveys for primates. *International Journal of Primatololy*, 31:833-847

Buckland, S., Plumptre, A., Thomas, L., Rexstad, E. (2010b). Line transect sampling of primates: Can animal-to-observer distance methods work? *International Journal of Primatololy*, 31:485-499

Canahuire-Robles, R., Aguire, G., Quispe, J., Zavaleta, T., Quispe, S., & Machaca, M. (2023). El Incremento de la Deforestación en Madre de Dios, Durante la Pandemia del COVID-19: Increase in Deforestation in Madre de Dios, During the COVID-19 Pandemic. *Revista Biodiversidad Amazónica*, *2*(1), 1-12.

CDC-UNALM. (2004). *Analisis y modelacion espacio-temporal del pasaje en las areas de intervencion del Pda*. Universidad Nacional Agraria La Molina, USAID, WWF, Lima, Peru.

Di Fiore, A., Link, A., Schmitt, C. & Spehar, S. (2009). Dispersal patterns in sympatric woolly and spider monkeys: integrating molecular and observational data. *Behaviour*, 146:4-5.

Dourojeannie, M. (1981). *Estudio sobre el impacto ambiental de los proyectos de carreteras en la selva central del Peru.* Oficina de Estudios Económicos, Ministerio de Transportes y Comunicaciones. Lima, Peru.

Dourojeannie, M., Barandiaran, A. & Dourojeannie, D. (2009). *Amazonia Peruana en 2021*. ProNaturaleza, Lima, Peru.

Fearnside, P. (1986). Spatial concentration of deforestation in the Brazilian Amazon. *Ambio*, 15:74-81.

Marshall, A., Lovett, J., White, P. (2008). Selection of line-transect methods for estimating the density of group-living animals: lessons from the primates. *American Journal of Primatology*. 70:452-462

McHugh, S., Cornejo, F., McKibben, J., Zarate, M., Tello, C., Jiménez, C. & Schmitt, C. (2020). First record of the Peruvian yellow-tailed woolly monkey *Lagothrix flavicauda* in the Región Junín, Peru. *Oryx*, 54(6), 814-818.

Nepstad, D., Carvalho, G., Barros, C., Alencar, A., Capobianco, P. & Bishop, J. (2001). Road paving, fire regime feedbacks and the future of Amazon forests. *Forest Ecology and Management*, 154:395-407.

Peres, C. & Terborgh, J. (1995). Amazonian nature reserves: An analysis of the defensibility status of existing conservation units and design criteria for the future. *Conservation Biology*, 9:34-46.

Peres, C. (1999). General guidelines for standardizing line-transect surveys of tropical forest primates. *Neotropical Primates*, 7:11-16.

Picardo, E., Cruz, M., Atencio, J., Rebaza, L., & Calisaya, N. (2022). La deforestación de los bosques de la provincia de Putumayo, Región Loreto, Perú en tiempos de pandemia (Covid-19). *Guacamaya*, *6*(2), 122-138.

Plumptre, A, & Cox, D. (2006). Counting primates for conservation: Primate surveys in Uganda. *Primates*, 47:65-73

Shanee, S., Cornejo, F., Aquino, R., Mittermeier, R. & Vermeer, J. (2021). *Lagothrix flavicauda* (amended version of 2019 assessment). The IUCN Red List of Threatened Species 2021: e.T39924A192307818. https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T39924A192307818.en. Accessed on 25 April 2024.

Sam, S., & Shanee, N. (2015). Measuring success in a community conservation project: local population increase in a critically endangered primate, the yellow-tailed woolly monkey (*Lagothrix flavicauda*) at la Esperanza, northeastern Peru. *Tropical Conservation Science*, 8(1), 169-186.

Shanee, S. (2014a). Ranging Behavior, Daily Path Lengths, Diet and Habitat Use of Yellow Tailed Woolly Monkeys (*Oreonax flavicauda*) at La Esperanza, Peru. In: The woolly monkey: Behavior, ecology, systematics and captive research, Defler, T. R. and Stevenson, P. R. (Eds), pp.169-187. New York: Springer.

Shanee, N., & Shanee, S. (2014b). Yellow-Tailed Woolly Monkey (*Lagothrix flavicauda*): Conservation Status, Anthropogenic Threats, and Conservation Initiatives. In: The woolly monkey: Behavior, ecology, systematics and captive research, Defler, T. R. and Stevenson, P. R. (Eds), pp. 283-299. New York: Springer.

Shanee, S., & Shanee, N. (2011). Population density estimates of the Critically Endangered yellow-tailed woolly monkeys (*Oreonax flavicauda*) at La Esperanza, northeastern Peru. *International Journal of Primatology*, 32(4), 878-888.

Shanee, S. & Shanee, N. (2009). A new conservation NGO, Neotropical Primate Conservation: Project experiences in Peru. *International NGO Journal*, 4:329-332.

Shanee, N. (2012). Trends in local wildlife hunting, trade and control in the Tropical Andes Hotspot, Northeastern Peru. *Endangered Species Research*, 19:177-186.

Shanee, S. (2011). Distribution survey and threat assessment of the yellow-tailed woolly monkey (*Oreonax flavicauda*; Humboldt 1812), Northeastern Peru. *International Journal of Primatology*, 32:691-707.

Wilkie, D., Shaw, E., Rotberg, F., Morelli, G. & Auzel, P. (2000). Roads, development and conservation in the Congo basin. *Conservation Biology*, 14:1614-1622.

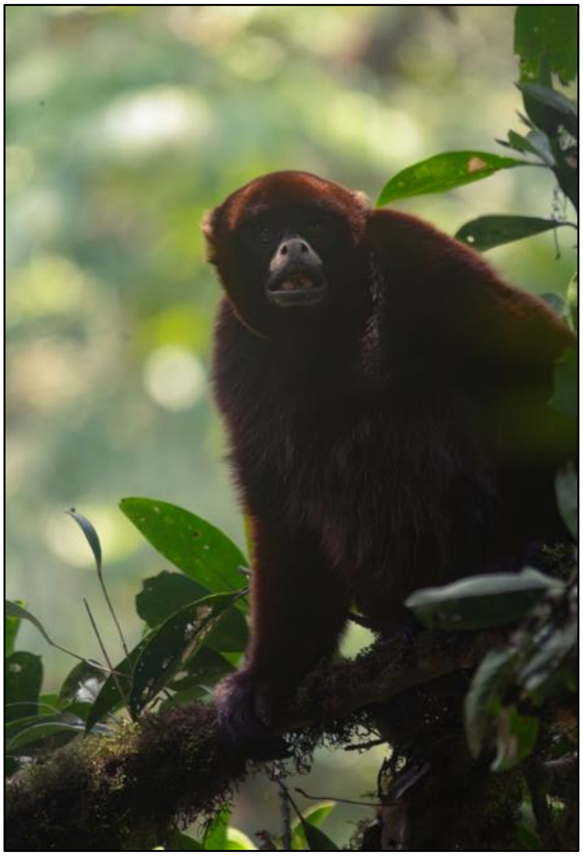
Wyman, M., Stein, T., Southworth, J. & Horwich, R. (2011). Does population increase equate to conservation success? Forest fragmentation and conservation of the black howler monkey. *Conservation and Society*, 9:216-228.

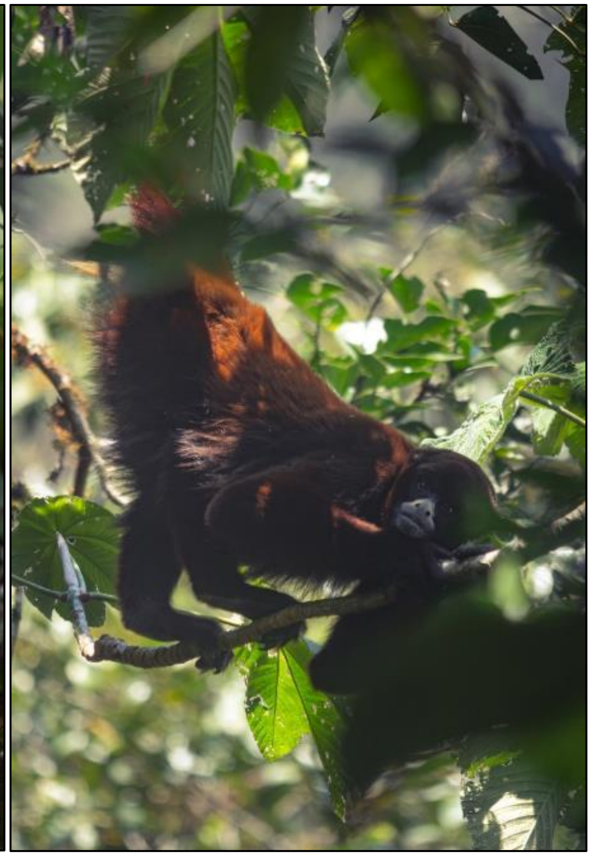
Young, K. (1994). Roads and the environmental degradation of tropical montane forests. *Conservation Biology*, 8:972-976.

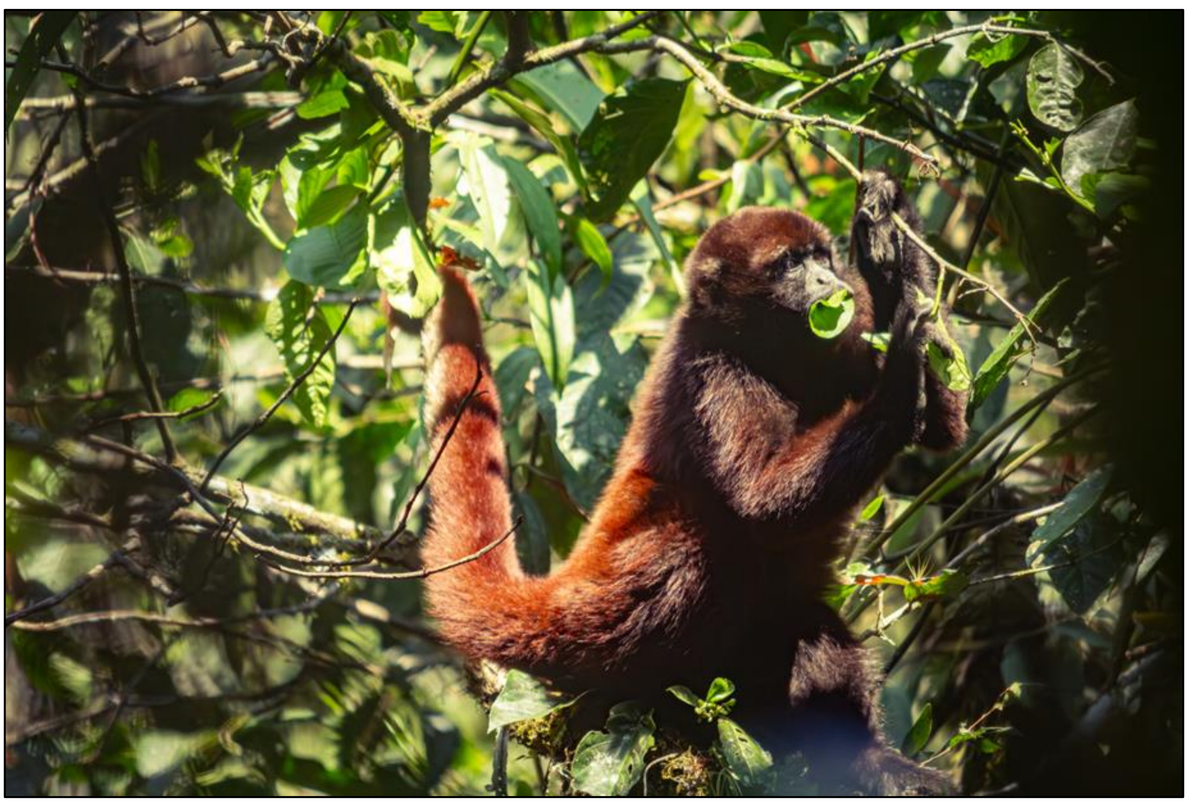
Zarate, M., Shanee, S., Charpentier, E., Sarmiento, Y., & Schmitt, C. (2023). Expanded distribution and predicted suitable habitat for the critically endangered yellow-tailed woolly monkey (*Lagothrix flavicauda*) in Perú. *American Journal of Primatology*, 85(2), e23464.

ANNEXES

<u>Yellow tailed wolly monkey (*Lagothrix flavicauda*)</u>

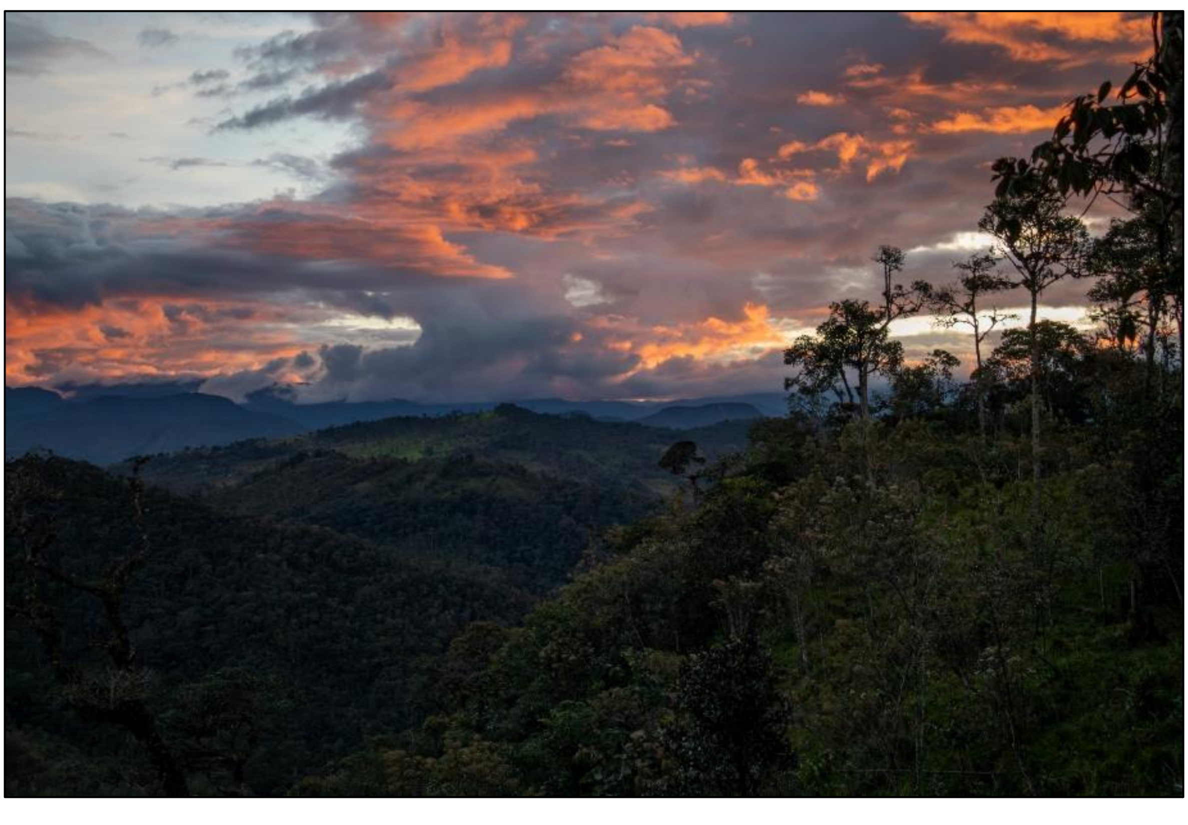






NPC team in the field

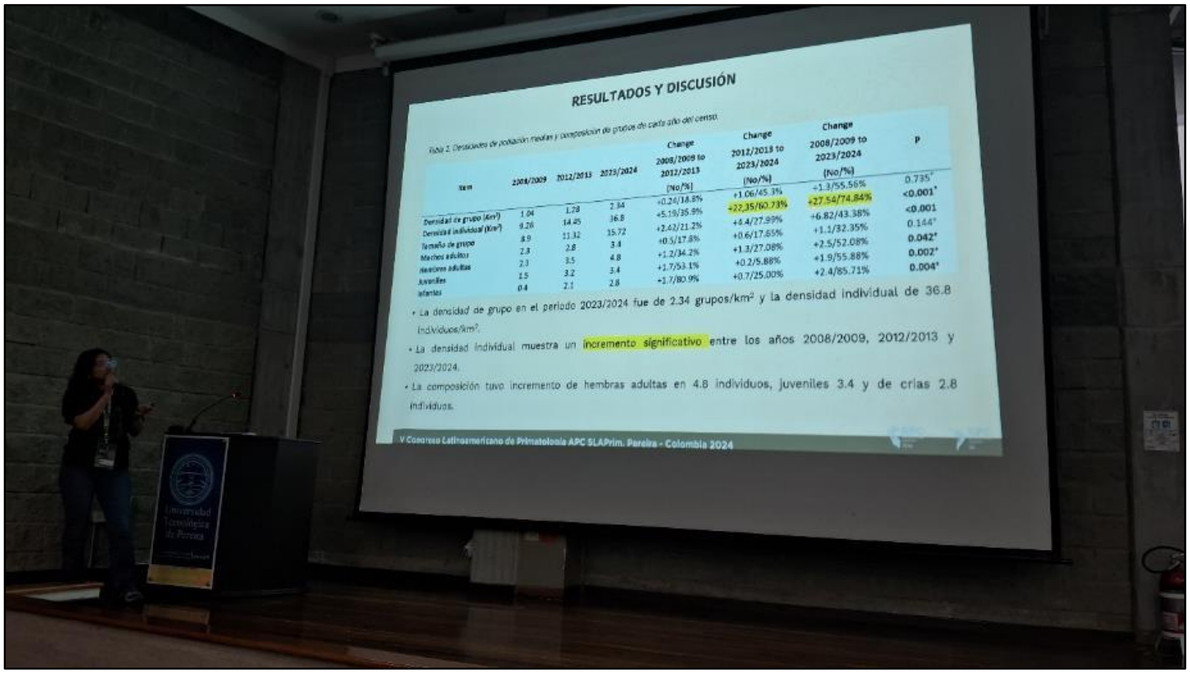
El Toro landscapes



<u>Environmental Education</u>


BALANZA
BALANZA

Latin American Congress of Primatology



V Congreso latinoamericano de primatología

IV Congreso Colombiano | Pereira - Colombia 2024

SIMPOSIO LAGOTHRIX

Comportamiento, ecología y conservación

28 jueves noviembre

09:45 a.m.	La importancia del mono churuco (*Lagothrix spp.)* para la etnia Tikuna en la Amazonia Maldonado, Angela M. (S022)
10:00 a.m.	Posición filogenética del mono choro de cola amarilla (*Lagothrix flavicauda*) basada en datos de secuencia de ADN nuclear de todo el genoma. Di Fiore, Anthony; Chaves, Paulo B.; Cortés-Ortiz, Liliana; Shanee, Sam; Schmitt, Christopher A.; Zarate, Melissa; Roos, Christian; Cornejo, Fanny; Pacheco, Victor (S018)
10:15 a.m.	El mono choro cola amarilla (*Lagothrix flavicauda*) como especie símbolo de la conservación en el distrito de Uchiza de la Amazonía peruana. García-Mendoza, Gabriel; Díaz Jorge; López, Josué; Charpentier, Elvis; Aquino, Rolando (S023)
10:30 a.m.	Quince años monitoreando la densidad poblacional del mono choro de cola amarilla (*Lagothrix flavicauda*) en El Toro, Perú. Chu-Vela Lai, Yang; Allgas, Néstor; Fernández-Hidalgo, Lorena; Venturini, Elisa; Rocaboy, Antoine; Santos-Algaba, Silvia; Shanee, Sam (S020)
10:45 a.m.	Estudio de largo plazo sobre los presupuestos de actividad del críticamente amenazado mono choro de cola amarilla (*Lagothrix flavicauda*) en El Toro, Perú. Fernández-Hidalgo, Lorena; Allgas, Néstor; Walford, Jack; Shanee, Noga; Shanee, Sam (S025)
11:00 a.m.	Un genoma mitocondrial de referencia para el mono choro de cola amarilla (*Lagothrix flavicauda*) utilizando secuenciación Oxford Nanopore, y el potencial de la mitogenómica fecal en conservación. Zarate, Melissa; Di Fiore, Anthony; Shanee, Sam; Schmitt, Christopher A. (S019)
11:15 a.m.	Comportamiento alimenticio del mono choro de cola amarilla (*Lagothrix flavicauda*) en El Toro, Perú. Allgas, Néstor; Fernández-Hidalgo, Lorena; Venturini, Elisa; Rocaboy, Antoine; Shanee, Noga; Shanee, Sam (S021)
11:30 a.m	Monos lanudos del sur y del centro de los Andes peruanos (*Lagothrix flavicauda y Lagothrix lagothricha tschudii*) Shanee, Sam; Charpentier Uraco, Elvis; Allgas, Nestor; Zarate, Melissa (S024)
11:45 a.m.	Discusión general

NPC|PERU