First record of *Neogale africana* (Desmarest, 1818), Amazon Weasel (Carnivora, Mustelidae), in Bolivia

Nuria Bernal-Hoverud1,3, Daniela Morales-Moreno1, Eyner Eugenio Quispe1, Jorge Rojas1, Omar Torrico3, Robert B. Wallace3, Jorge Salazar-Bravo1,4,5

1 Department of Biological Sciences, Texas Tech University, Lubbock, Texas, USA
2 Asociación de Productores de Café Ecológico Regional Larecaja, La Paz, Bolivia
3 Wildlife Conservation Society, La Paz, Bolivia
4 Academia Nacional de Ciencias de Bolivia, La Paz, Bolivia
5 Instituto de Ecología, Universidad Mayor de San Andrés, La Paz, Bolivia

**Corresponding author:** Jorge Salazar-Bravo (J.Salazar-Bravo@ttu.edu)

**Abstract.** *Neogale africana* (Desmarest, 1818), Amazon Weasel, is a poorly known South American carnivore, with records from north-central Brazil to Ecuador and south to central Peru and central Brazil. Based on two videographic records, we report the presence of this species in Bolivia and document a new elevational record. Furthermore, our new record extends the species’ distribution by 900 km from the nearest locality in Peru, and by 1500 km from the nearest Brazilian locality. Current gaps in its distribution are attributable to the low detectability and rarity of this mustelid.

**Key words.** Detectability, small carnivores, Wallacean shortfall, Yungas


**INTRODUCTION**

Despite more than 200 years of zoological research in South America, meso- and small-carnivore assemblages from large portions of the continent remain poorly characterized (Roemer et al. 2009), and this is especially true for members of the family Mustelidae (Schiaffini 2022). Although there is an appreciation that members of the family are broadly distributed, the actual range of some species, such as *Neogale africana* (Desmarest, 1818) and *N. felipei* (Izor & de la Torre, 1978), are poorly characterized in a prime example of the “Wallacean shortfall”, that is, the lack of knowledge about the geographical distribution of species (Hortal et al. 2015).

*Neogale africana*, Amazon Weasel, is a small carnivore that inhabits Amazonian tropical environments with high annual temperatures and precipitation (Schiaffini 2022). The last compilation of known localities by Schiaffini listed 23 unique sites spread throughout more than 3 million km² from north-central Brazil to Ecuador and south to central Peru and central Brazil, with an evident gap in between western and eastern Amazonia. The IUCN assessment of *N. africana* intimated its presence in northern Bolivia (Emmons and Helgen 2016), which was first suggested by Ramirez-Chaves et al. (2014); however, no records exist in Bolivia to date (Aguirre et al. 2019). Prior to 2021, most records of this species were treated as belonging to *Mustela africana*, although it is now clear that the correct generic placement for the species is in *Neogale* (Patterson et al 2021).

*Neogale africana* is both rare and infrequently encountered, even among hunters of native communities in Amazonian Peru, as documented by Voss and Fleck (2017). In fact, only three records of the species have been reported between 1990 and 2020 throughout the whole distribution of the species (Nagy-Reis et al. 2020). This fact, coupled with the poorly known biology of the species, have prompted calls for an IUCN category reassessment (Schiaffini 2022).

Here, based on two short videos of the same individual, we report of the presence of *N. africana* in a mountain rainforest locality in the Bolivian Department of La Paz. This new record extends the known...
distribution of the species by 900 km to the south of the nearest confirmed location in Peru, and 1500 km from the nearest Brazilian locality. This also constitutes a new elevational record for the species.

METHODS

The sightings were made between 6:00 and 9:00 AM on 21 October 2023 at a natural spring in a shade-grown coffee plantation in the Yungas forest of the eastern escarpments of the Andes (Figure 1), at the Regional Association of Organic Coffee Producers of Larecaja (APCERL). This locality is about 100 km due north of the city of La Paz, Bolivia. The APCERL coffee plantations are located within an Important Biodiversity and Bird Area (IBA Bella Vista BO047) in the south of Madidi National Park (Birdlife International 2023).

RESULTS

Family Mustelidae Fischer de Waldheim, 1817

*Neogale africana* (Desmarest, 1818)

Figure 2

**New records.** BOLIVIA – La Paz • Larecaja, Teoponte, Comunidad Cordillera; 15.5790°S, 067.6921°W; 1400 m above sea level (Figure 1, Appendix Table A1; 21.X.2023; active, outside of burrow near natural spring; obs. Eyner Eugenio Quispe; shade-grown coffee plantation. The animal was originally disturbed whilst hunting a rodent near the spring, and it subsequently photographed and filmed around a nearby burrow where it had fled after being disturbed by the observer. In the following days, the animal was observed using the same burrow, until it was not seen again.

**Identification.** Although the two short videos (Supplemental material, videos SD1 and SD2) are not of high quality, diagnostic traits of *N. africana* are unmistakably illustrated. That is, the upperparts are entirely glossy chestnut-brown and sharply demarcated from the throat and belly, which are yellowish. Importantly, the diagnostic sharp, dark-brown stripe down midline from throat to belly is quite evident (Figure 2). The only other species in the genus possibly present in the area (*N. frenata*) lacks the ventral midline stripe and is smaller (Supplemental material, videos SD1 and SD2).

These morphological characters were compared to those of a voucher specimen at the Field Museum of Natural History (FMNH 106488). Furthermore, details of the morphology of the individual depicted on the video were compared to the diagnosis of the species (Ramírez-Chaves et al. 2014) and the holotype of *N. africana stolzmanni* (Taczanowski 1881), as depicted by Piechnik et al. (2017).
DISCUSSION

This record extends the known distribution of Neogale africana by about 900 km to the south of the southern-most Peruvian, and by over 1500 km to the southeast of the southern-most Brazilian records of the species. Although most records for N. africana come from localities below 300 m in elevation (Schiaffini 2022: fig. 5), thus far the highest elevation record for the species is from a Peruvian specimen housed at the American Museum of Natural History (AMNH 61813). This specimen, an adult female, was reportedly captured at 1200 m, in the valley of río Perené (Peru, Department of Junín), by Carlos O. Schunke in April 1921 (Izor and Peterson 1985, and catalogue of the AMNH). The Peruvian locality of Perené was described as a "coffee plantation at the junction of ríos Paucartambo and Chanchamayo", although most localities sampled there appear to be at 1000 m or below (Stephens and Traylor 1983: 161).

Our record, at 1400 m, thus represents the highest recorded elevation for N. africana and confirms that known western Amazonian localities of this species come from higher elevations than eastern localities in Brazil (Izor and Peterson 1985; Pine 1973). Our new data confirm the expectation that this species is present in Bolivia (Ramirez-Chaves et al. 2014). However, our record also suggests that the species is much more broadly distributed that previously expected, although overall carnivore records (Nagy-Reis et al. 2020) and camera trapping records (Antunes et al. 2022) across the Amazon suggests that it is patchily distributed, and even where it does occur is always extremely scarce. Further, we confirm that our videos are the first of a live animal. Additional regular surveys in more inaccessible places, as well as the incorporation of other methodologies (such as eDNA), are necessary to help address the Wallacean shortfall in this species and to secure the information required to draft urgent conservation plans.

ACKNOWLEDGEMENTS

We want to thank the coffee producers Celso Quispe Mayta and Maria Quemta from the community of Cordillera, in Teoponte, Bolivia, for providing the necessary information on the location of the sighting of the Amazon weasel in their shade-grown coffee plots. Additionally, we would like to thank Dr. Anderson Feijó (Assistant Curator of Mammals, Field Museum of Natural History) for granting access to the collection in support of the identification of this record. We thank Susana Revollo-Cadima and Andrés Rodríguez-Cordero for preparing the map (Figure 1). We also thank Dr. Robert S. Voss (Curator of Mammals, American Museum of Natural History) for helping with the identification of the weasel in the video recording and comments on the first draft. We also acknowledge the reviewers, Dr. Bruce Patterson and Dr. Héctor Ramírez-Chaves, whose comments helped improve the clarity of this manuscript.

ADDITIONAL INFORMATION

Conflict of interest
The authors declare that no competing interests exist.

Ethical statement
No ethical statement is required.

Funding
No funding was required.

Author contributions
Conceptualization: RW, JSB, NBH, DM, JR, OT, EEM. Data curation: JSB, NBH.
Bernal-Hoverud et al.  ·  Neogale africana in Bolivia

831

NBH, JSB. Funding acquisition: None. Investigation: JSB, NBH, RW. Methodology: JSB, NBH. Project administration: None. Resources: None. Software: Does not apply. Supervision: JSB, NBH. Validation: JSB, RW, NBH. Visualization: JSB, NBH. Writing – original draft: JSB, NBH. Writing – review and editing: NBH, JSB, RW.

Author ORCID IDs
Nuria Bernal-Hoverud  https://orcid.org/0000-0002-5688-1201
Daniela Morales Moreno  https://orcid.org/0000-0002-5106-9580
Omar Torrico  https://orcid.org/0000-0001-7795-8098
Robert B. Wallace  https://orcid.org/0000-0001-7411-6338
Jorge Salazar-Bravo  https://orcid.org/0000-0001-5905-2532

Data availability
The two videos recorded of Neogale africana are available at low quality as Supplemental files, Videos S1 and S2. The map (Figure 1), updated from Schiaffini (2022), was prepared using non-duplicated locality data included in Appendix, Table A1. All other data are available in the main text.

Supplemental data. Two short videos recorded in MP4 format by Eyner Eugenio Quispe on a cellphone, on 27 October 2023: Video S1 and Video S2.

REFERENCES


## APPENDIX

### Table A1. Non-duplicated locality data used to map the distribution of *Neogale africana* (Figure 1).

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Reference/voucher specimen</th>
<th>Country</th>
<th>Province/state</th>
<th>Locality</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AMNH 61913</td>
<td>Peru</td>
<td>Junín</td>
<td>Perené</td>
<td>−10.9481</td>
<td>−075.2256</td>
<td>1921</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>USNM 2551199</td>
<td>Peru</td>
<td>Junín</td>
<td>Chanchamayo</td>
<td>−11.0634</td>
<td>−075.3817</td>
<td>1923</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Taczanowski 1881</td>
<td>Peru</td>
<td>Loreto</td>
<td>Yurimaguas</td>
<td>−05.8806</td>
<td>−076.1134</td>
<td>1880</td>
<td>Voss and Fleck (2017) reported the species in the Yavarí-Ucayali interfluve, about 200 km E of type locality.</td>
</tr>
<tr>
<td>4</td>
<td>Orcés 1944</td>
<td>Ecuador</td>
<td>Pastaza</td>
<td>Puyo</td>
<td>−01.4601</td>
<td>−078.0950</td>
<td>N/D</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pine 1973</td>
<td>Brazil</td>
<td>Pará</td>
<td>Maracacuera–Icoaraci</td>
<td>−00.7131</td>
<td>−048.6906</td>
<td>1967</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Pine 1973</td>
<td>Brazil</td>
<td>Pará</td>
<td>Belém, Ramal do Pinheiro</td>
<td>−01.9174</td>
<td>−048.5534</td>
<td>N/D</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Pine 1973</td>
<td>Brazil</td>
<td>Pará</td>
<td>Irutiu</td>
<td>−01.7039</td>
<td>−047.4559</td>
<td>1959</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Izor and Peterson 1985</td>
<td>Brazil</td>
<td>Pará</td>
<td>Belterra, a rubber plantation 25 km S, 26 km W Santarém</td>
<td>−02.4966</td>
<td>−054.9861</td>
<td>1978</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Izor and Peterson 1985</td>
<td>Brazil</td>
<td>Pará</td>
<td>Taueri, on the Rio Tapajós about 30 km south of Belterra</td>
<td>−03.1673</td>
<td>−055.1995</td>
<td>1966</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Ramírez-Chaves et al. 2014</td>
<td>Ecuador</td>
<td>Tungurahua</td>
<td>Rio Jatún Yacu</td>
<td>−00.9570</td>
<td>−077.8435</td>
<td>1937</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Ramírez-Chaves et al. 2014</td>
<td>Brazil</td>
<td>Pará</td>
<td>Zoological Garden</td>
<td>−01.3229</td>
<td>−048.0809</td>
<td>N/D</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Ramírez-Chaves et al. 2014</td>
<td>Brazil</td>
<td>Pará</td>
<td>Marco de Legoa, near the city</td>
<td>−00.8503</td>
<td>−048.9802</td>
<td>N/D</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Ramírez-Chaves et al. 2014</td>
<td>Brazil</td>
<td>Pará</td>
<td>Rio Tocantins, Cametá</td>
<td>−02.2222</td>
<td>−049.5290</td>
<td>1933</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Ramírez-Chaves et al. 2014</td>
<td>Peru</td>
<td>Loreto</td>
<td>Alto Amazonas, Rio Marañón</td>
<td>−05.0270</td>
<td>−075.1073</td>
<td>N/D</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Ramírez-Chaves et al. 2014</td>
<td>Peru</td>
<td>San Martín</td>
<td>Moyobamba</td>
<td>−06.0331</td>
<td>−076.9975</td>
<td>N/D</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Ramírez-Chaves et al. 2014</td>
<td>Brazil</td>
<td>Amazonas</td>
<td>Rio Juruá, Cruzeiro do Sol</td>
<td>−07.5879</td>
<td>−072.6074</td>
<td>N/D</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Nagy-Reis et al. 2020</td>
<td>Brazil</td>
<td>Pará</td>
<td>Parque Nacional Jamanxim</td>
<td>−05.6638</td>
<td>−055.5431</td>
<td>2007</td>
<td>Reported by interview.</td>
</tr>
<tr>
<td>19</td>
<td>Nagy-Reis et al. 2020</td>
<td>Brazil</td>
<td>Pará</td>
<td>Parque Nacional Jamanxim</td>
<td>−05.6599</td>
<td>−055.5226</td>
<td>2007</td>
<td>Reported by interview.</td>
</tr>
<tr>
<td>20</td>
<td>Nagy-Reis et al. 2020</td>
<td>Brazil</td>
<td>Pará</td>
<td>Curuca</td>
<td>−00.7500</td>
<td>−047.8600</td>
<td>N/D</td>
<td>Reported by photo.</td>
</tr>
<tr>
<td>21</td>
<td>Nagy-Reis et al. 2020</td>
<td>Brazil</td>
<td>Pará</td>
<td>Icoaraci</td>
<td>−01.3500</td>
<td>−048.4700</td>
<td>N/D</td>
<td>Reported by photo.</td>
</tr>
<tr>
<td>22</td>
<td>Nagy-Reis et al. 2020</td>
<td>Brazil</td>
<td>Pará</td>
<td>Nova Timboteua</td>
<td>−01.1400</td>
<td>−047.3900</td>
<td>N/D</td>
<td>Reported by photo.</td>
</tr>
<tr>
<td>24</td>
<td>This work</td>
<td>Bolivia</td>
<td>La Paz</td>
<td>Teoponte, Comunidad Cordillera</td>
<td>−15.5791</td>
<td>−067.6921</td>
<td>21-Oct-2023</td>
<td>Reported by video.</td>
</tr>
</tbody>
</table>