Rediscovery of the endangered giant pangolin (*Smutsia gigantea*) in Senegal after 24 years

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**Abstract**

Pangolins have generated great interest in recent years, largely due to the unprecedented scale of trafficking the species experiences. Detailed knowledge of pangolin distribution in West Africa is lacking, but many local extinctions are suspected. The last documented sighting of a giant pangolin in Senegal was in Niokolo-Koba National Park (NKNP) and dates back to 1999. Following a large camera-trap survey carried out in NKNP in 2023, we present photographic evidence that giant pangolins are still present in the park. Such rediscoveries not only underscore the importance of systematic biodiversity inventories, but also the critical value of West Africa’s large protected areas.

**Keywords**
biomonitoring, camera trapping, Niokolo-Koba National Park, rediscovery, species conservation, West Africa

**Résumé**

Les pangolins ont suscité un grand intérêt ces dernières années, en grande partie du fait de l’ampleur du commerce illégal auquel ils sont confrontés. Bien que nous manquions de connaissances détaillées sur la distribution des pangolins en Afrique de l’Ouest, de nombreuses extinctions locales sont soupçonnées. La dernière observation documentée d’un pangolin géant au Sénégal dans le Parc National du Niokolo-Koba (PNNK) remonte à 1999. À la suite d’une vaste étude par piégeage photographique menée dans le PNNK en 2023, nous présentons une preuve photographique que les pangolins géants sont toujours présents dans le parc. De telles redécouvertes soulignent non seulement l’importance des inventaires systématiques de la biodiversité, mais aussi la valeur critique des grandes aires protégées en Afrique de l’Ouest.

1 | **INTRODUCTION**

Pangolins have generated a great deal of interest in recent years, not only because of the intense illegal trade they are facing (Emogor et al., 2021; Tinsman et al., 2023), but also for their purported role in the COVID-2019 outbreak (Zhang et al., 2020), which remains dubious (Frutos et al., 2020). The giant pangolin (*Smutsia gigantea*) is the most widely distributed of Africa’s four pangolin species, occurring throughout West and Central Africa from Senegal to western Kenya (Nixon et al., 2019; Sandri et al., 2023). The species is fairly...
generalist in its habitat requirements, occupying a wide range of habitats, including primary and secondary tropical forests, gallery forests, forest-savannah mosaics and wooded savannahs. Despite its extensive distribution, its presence is increasingly patchy due to large-scale habitat loss and overexploitation, particularly in West Africa. As a result, the species meets the IUCN Red List criteria for Endangered (EN) species (Nixon et al., 2019).

Giant pangolin is the only confirmed pangolin species present in Senegal, where it was previously reported from Niokolo-Koba National Park (NKNP) and Basse Casamance National Park (Gueye, 1991). In NKNP, an individual was captured and formally identified by the people of Badi on 15 April 1967 (Dupuy, 1971). Subsequently, two sightings were recorded as part of the ecological monitoring conducted in the park in June 1999 at Simenti (PNNK, 2018). Since then, there has been no documented information on its presence in Senegal despite several large-scale camera-trap surveys conducted in Niokolo National Park (Table 1), although it has been identified in the sub-region, in bordering countries Mali, Guinea and Sierra Leone (Ingram et al., 2022).

Despite the lack of recent confirmation of its continued presence, giant pangolins are listed as Integrally Protected under Article D36 of decree no. 86-844 of 14 July 1986 on hunting and wildlife protection in Senegal. Here, we present photographic evidence of a giant pangolin taken by a camera trap during a large carnivore survey carried out by Panthera and the Direction des Parcs Nationaux (DPN) in NKNP in the dry season of 2023. This observation confirms the continuing presence of giant pangolin in Senegal and in the NKNP, and underscores the importance of the NKNP for Senegal’s and West Africa’s threatened wildlife.

2 | METHODS

We conducted a camera-trap survey in the NKNP, eastern Senegal, from 8 February to 23 May 2023. The park (latitude 13.0029, longitude –13.0311) expands over 9130 km² and contains all the unique ecosystems of the Sudanese bioclimatic zone, including the main rivers (Gambia, Niokolo and Koulountou), gallery forests, flood plains, seasonally flooded grasslands, freshwater swamps and ponds associated with former river lakes, dense dry forests, rocky slopes and hills with patches of closed-canopy forest. We deployed 217 camera traps divided amongst 111 stations (most stations contained paired cameras to photograph both flanks of carnivores) over an area of 4393 km² (size of the minimum convex polygon of the camera grid: 52% of the park’s area). Cameras were set to be triggered 24 h a day. As the survey targeted large carnivores, the cameras traps were placed on the park’s network of roads, game trails, dry riverbeds, and near waterpoints.

3 | RESULTS AND DISCUSSION

This survey totalled 9377 station-level camera-trap nights over 105 days. We detected 45 mammal species >0.2 kg, including the giant pangolin at one station (Figure 1).

The giant pangolin was recorded on 8 March 2023 at 01:37 AM by one of the camera traps deployed in dry riverbeds (Figure 2). This is the first observation of giant pangolin in Senegal since being sighted in 1999 (PNNK, 2018), but, more importantly, represents the first objectively documented evidence of the species’ presence in Senegal since 1967 (Dupuy, 1971). It is also the first observation of the species in the eastern part of the park, as previous observations were in the Simenti area, in the central area of the park. The station was located in a gallery forest, while the previous observations in the NKNP were in wooded savannahs, both known habitats for this species (Hoffmann et al., 2020; Khwaja et al., 2019; Mouafou et al., 2023). As giant pangolins are reported from 3.5% of West Africa’s protected areas, but most protected areas lack recent concrete evidence of presence, observations such as this are important to address this knowledge gap (USAID, 2020).

The low detection rate in this survey could be explained by the rarity of the species and/or the survey design, which targeted large carnivores. Rarity and shy behaviour were cited as potential reasons for the low detection of Temminck’s pangolin (Smutsia temminckii) in Hwange National Park, Zimbabwe (Sabashau et al., 2024). Even in areas where pangolins are known to be present, large carnivore

<table>
<thead>
<tr>
<th>Survey</th>
<th>Area (km²)</th>
<th>Number of camera traps deployed</th>
<th>Number of camera trap days</th>
<th>Number of field researchers</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>-</td>
<td>63</td>
<td>5327</td>
<td>2</td>
<td>2 × 2 cells across park roads</td>
</tr>
<tr>
<td>2020</td>
<td>-</td>
<td>56</td>
<td>2902</td>
<td>2</td>
<td>2 × 2 cells across park roads</td>
</tr>
<tr>
<td>2021</td>
<td>-</td>
<td>66</td>
<td>3840</td>
<td>2</td>
<td>Camera trap for ecological monitoring</td>
</tr>
<tr>
<td>2021</td>
<td>1523</td>
<td>139 including 69 paired stations</td>
<td>11,082</td>
<td>2</td>
<td>Paired camera traps for large mammals</td>
</tr>
<tr>
<td>2022</td>
<td>7020</td>
<td>219</td>
<td>18,478</td>
<td>6</td>
<td>Large systematic camera traps 6 × 6 grids</td>
</tr>
<tr>
<td>2023</td>
<td>4393</td>
<td>111 paired stations</td>
<td>15,610</td>
<td>1</td>
<td>Paired camera traps for large mammals</td>
</tr>
</tbody>
</table>
surveys often fail to detect them, or exhibit very low capture rates (Panthera, Philipp Henschel, Christopher Oribell). Pangolins are rarely considered in systematic protocols and monitoring them using traditional camera-trapping methods can be challenging (Ingram et al., 2019; Wilcox et al., 2019). Indeed, Khwaja et al. (2019) previously showed that the probability of giant pangolin detection is always low and inversely proportional to the distance from rivers. Furthermore, although recent work suggests that targeting giant pangolin burrows will increase detection probability (Bruce et al., 2018; Matthews et al., 2023), a recent burrow occupancy survey conducted in the Simenti area of NKNP failed to capture giant pangolins (Daelemans, 2023), further reinforcing the likely rarity of this species in the park.

The future of giant pangolins in the Basse Casamance National Park, the other area where giant pangolins were reported, is uncertain due to the possible presence of the Movement of Democratic Forces of Casamance (MFDC), making it difficult to protect this area from poaching and other illegal activities. The NKNP therefore protects the largest extent of giant pangolin habitat in the northwestern limit of its range and might represent the last bastion for this endangered species in Senegal. Future efforts aiming to obtain additional insights on the species in the park should target the area around the Niokolo River and its tributaries in the eastern part of the park, including burrows.
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CONFLICT OF INTEREST STATEMENT
The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT
Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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REFERENCES


