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REVIEW ARTICLE OPEN ACCESS

Ecological, Historical, and Contemporary Evidence of Ground Pangolin (*Smutsia temminckii*) Presence in Ethiopia

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ABSTRACT

The vulnerable ground pangolin (*Smutsia temminckii*) is distributed in parts of southern and eastern Africa, yet little is known about the most northern parts of their range. Ground pangolins are predicted to occur in northern Kenya and eastern Sudan, but information on whether ground pangolins are present in neighbouring Ethiopia remains limited. We gathered evidence of pangolin presence in Ethiopia from contemporary and historical records to discuss their distribution, ecology, conservation, and possible threats in the country.

Across sub-Saharan Africa, there are four species of pangolin (Pholidota: Manidae), all of which are threatened by local hunting for meat (Ingram et al. 2018) and body parts (Soewu et al. 2019), and international trafficking of scales (Nethavhani et al. 2025). Of the African pangolin species, the ground pangolin (*Smutsia temminckii*) is predominantly found in African savannas, woodlands, and areas of moderate to dense scrub (Pietersen et al. 2019). The species is listed as Vulnerable on the IUCN Red List of Threatened Species (Pietersen et al. 2019), and is threatened by electrocution on electrified fences, the traditional medicine trade, habitat loss, road mortalities, capture in gin traps, and potentially poisoning (Pietersen et al. 2014). They are most well studied in southern and eastern Africa, yet little is known about their distribution in the most northern parts of their predicted range. The IUCN Red List currently shows the ground pangolin to be distributed in South Sudan and Sudan, along the western border with Ethiopia, with hypotheses that the species likely occurs in the far western part of Ethiopia (Pietersen et al. 2019). Kingdon (1974) also predicted the range of ground pangolins in Kenya as up to the northwest corner of the country, along the border with Ethiopia. Pangolins are currently listed on the Ethiopian mammal checklist (Ethiopian Biodiversity Institute 2025) and other mammal checklists for the country (Schloeder and Jacobs 1996; Bekele and Yalden 2013; Lavrenchenko and Bekele 2017; Jenner 2020), yet evidence of the presence of ground pangolins in Ethiopia is limited in the academic literature. Pangolins are most widely referred to as *Mist bel* (ምስጥ በል) in Amharic, as reported in the Omo and Mago National Parks mammal lists. Here, we draw on a range of historic and contemporary sources to discuss the distribution of pangolins in Ethiopia.

1 | Southern Ethiopia

Southern Ethiopia borders Kenya to the south and Somalia to the southeast. Ground pangolins are expected in the far southwest of Ethiopia, given the species' presence in northern Kenya (Pietersen et al. 2019), where the habitat type is a mixture of savanna and shrubland interspersed with forest patches. Multiple

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lines of evidence support the assertion that ground pangolins are distributed in the ecologically connected Omo and Mago National Parks, the Tama Community Conservation Area (TCCA), and the Bayo community-managed forest.

Schloeder and Jacobs (1996) report detaining a pangolin for observation along the Nyalibong escarpment, inside present-day Mago National Park (May 1993), southwest Ethiopia. The pangolin reportedly then walked off into woodland dominated by *Combretum adegonium* and *Cymbopogon giganteus*. Personal communications between Yirmed Demeke (Mago National Park biologist) and the authors suggest he had observed a ground pangolin carcass in 1992, and that park scouts had also reported pangolin presence. A live pangolin was also observed around the same time (pers. comms. Y. Demeke to D.J. Ingram August 2025). Schloeder and Jacobs (1996) also cite Hillman (1993) as corroborating the presence of ground pangolins in Mago and neighbouring Omo National Parks through records in the Ethiopian Wildlife Conservation Organization. Along the western bank of the Omo River in the far southwestern corner of Ethiopia, the presence of a word for pangolin in a local language suggests the species may occur or may have once occurred there, for example, local speakers of the highly endangered Koegu language reportedly refer to the ground pangolin as *góódo* (*Ka góódo*) (Hieda 1991). However, we note that the occurrence of a name for a species in a language may not mean the species is present locally, but could be due to knowledge of animal trade, stories, or neighbouring regions.

Between the Omo and Mago National Parks, in the same area as the TCCA, Chankallo and Kabtehyimer (2023) recorded indirect signs of pangolins along transects in the Bayo community-managed forest area. The authors recorded pangolin tracks and scales (Figure 1A). Pangolins were recorded only in wooded

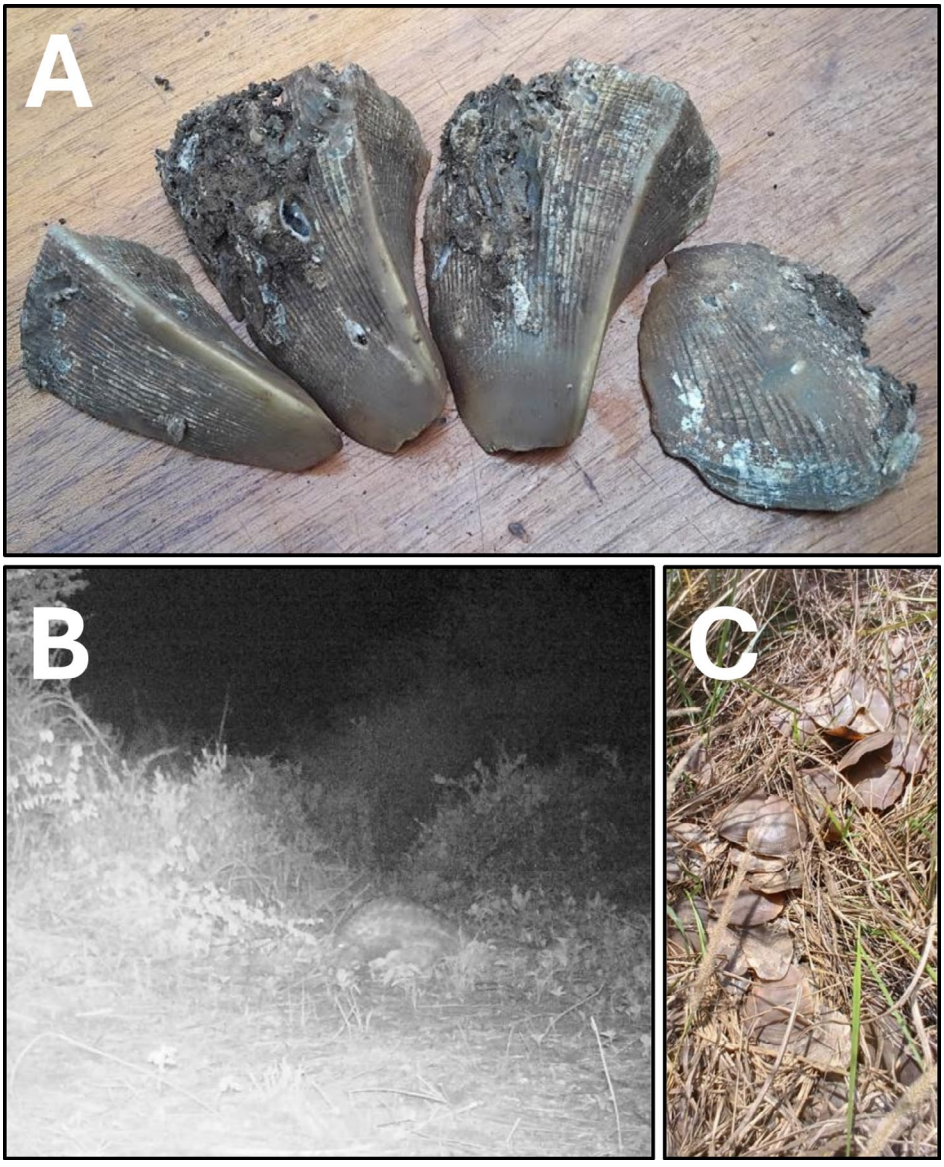

FIGURE 1 | (A) Pangolin scales found in the Bayo community-managed forest area in 2021 (Photo credit: Tamirat Haile Chankallo). (B) Camera-trap image of a ground pangolin *Smutsia temminckii* captured at 22:11 on 11/12/2022 in the Tama Community Conservation Area (TCCA) (Photo credit: Tsyon Asfaw). (C) Pangolin scales found in the wooded grassland habitat of the Tama Community Conservation Area in August 2025 (Photo credit: Tsyon Asfaw).

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grassland habitat, with one record during the dry season and one during the wet season. A relative abundance of 0.003 sightings/km was estimated. Ethiopia comprises more than 86 ethnic groups. Among them, the Dime people of southern Ethiopia refer to the pangolin as *Kukuneche*. Among the Wolaita people, pangolins are referred to as Wala Shosha (ዋላ ኦባብ), a name that reflects their perception of it as a non-charismatic and non-colourful wild animal.

Northeast of Omo and Mago National Parks, a mammal assessment in the Chebera Churchura National Park (CCNP) recorded six pangolins in the wet season and two in the dry season (Timer 2005). The highest relative abundance was estimated in the woodland areas (mixed-species woodland and low-lying *Combretum* woodland dominated by *Combretum* and *Terminalia* species); however, the species was also recorded in grassland areas with scattered trees, montane forest, and riverine forest. Wardens and rangers in the national park reported tracking a ground pangolin to its burrow and encountering a pangolin being killed by local people in a village in the southern part of the park (G. Timer pers. comms. to D.J. Ingram July 2025). To the north of the Omo-Tama-Mago Complex, interviews and questionnaires with local communities in the Gimbo Woreda suggest a pangolin species occurs in the area, referred to as a 'long tailed pangolin' (master's thesis; Kochi 2017).

Recently, Asfaw et al. (2025) detected ground pangolins between 2020 and 2022 in both the CCNP and the TCCA. In CCNP, pangolins were not detected by the camera traps, but by direct observation. Video footage of a pangolin from the same area and time was also recorded by an agricultural officer from the area (T. Asfaw pers. comms. to D.J. Ingram September 2025; Green Ideas 2019). The ground pangolin in the video was deemed demonic/satanic by local residents, and upon receiving the video evidence, the park warden and officers went to the site, but by the time they arrived, the pangolin was already dead (Adane Tsegaye, former warden of CCNP, and Solomon Worku, pers. comms. with T. Asfaw September 2025). In TCCA, the detections were by camera trap in 2022 (Figure 1B; Asfaw et al. 2025), and in August 2025, pangolin scales were also observed in the wooded grassland habitat of the TCCA (pers. obs. T. Asfaw; Figure 1C). In 2023, during SMART training, park rangers confirmed the presence of pangolin in the Omo and Mago National Parks (T. H. Chankallo pers. comms. to D.J. Ingram July 2025), although there were no detections of pangolins by camera trap in Omo National Park in Asfaw et al. (2025).

Ground pangolins reportedly do not occur in Nech-sar or Maze National Parks further to the east (T. H. Chankallo pers. comm. to D.J. Ingram July 2025), partly corroborated by Asfaw et al. (2025) who did not record pangolin by camera trap in the Maze National Park. Jenner (2020) states that local people reported the presence of one ground pangolin from the Mega area of southern Ethiopia, even further east along the border with northern Kenya. Likewise, chief wardens and local elders affirm the species' existence in and around Ethiopia's Geralle and Borena National Parks located north and south of the Mega area, respectively, but no photos or videos have been taken so far (Ato Melkamu Aychew and Ato Nigusse pers. comm. to G. Timer September 2025). These areas are characterised by low-lying savanna habitat. Bekele and Yalden (2013) mention the remote possibility of an arboreal pangolin being present in Ethiopia's southwestern forests based on proximity to Uganda, but there is no evidence for this.

2 | Western Ethiopia

Far western Ethiopia, categorised by savanna and forest, borders Sudan and South Sudan. Ground pangolins have been reported from South Sudan (Ingram et al. 2020) and Sudan (Yalden et al. 1996). In Yalden (1994), local people reportedly know of and affirm the presence of pangolin in the Gambela area of Ethiopia bordering South Sudan. Local residents in neighbouring Boma National Park in South Sudan also have a name for pangolins, but African Parks staff there have never seen one (M. Claase pers. comms. to D.J. Ingram, September 2025). Seizure data from South Sudan suggest that ground pangolins were in the Paloich area of South Sudan prior to being seized (Ingram et al. 2020), which is in relative proximity to the Gambela area in Ethiopia. Pangolin scales were also reportedly used as 'spoons' by chiefs of the Agnuak ethnic group in the Gambela Region (Rombaye *in* litt 1993 cited in Bräutigam et al. (1994)).

In Sudan, a ground pangolin was reportedly collected in the Sennaar state, close to the northwestern border of Ethiopia (P. Grubb in litt. cited in Yalden et al. 1996). The specimen is said to have been obtained by T. von Heuglin and transferred to Berlin (ZMB 16162). Due to the local knowledge of pangolins by residents in Ethiopia, wildlife scientists concluded that ground pangolins must occur in the far west of Ethiopia (Yalden et al. (1996) and Lavrenchenko et al. (1989) cited in Yalden et al. (1996)). In the far northwest of Ethiopia, across the border from Sudan's Sennaar state, Wendim et al. (2014) from the Ethiopian Wildlife Conservation Authority list ground pangolin on a checklist of mammals that have ever been recorded in the Kafta Sheraro National Park. However, there is no other information about the detections or records of pangolin in the park. Pangolin presence in the far northwest remains uncertain, but it is plausible given the predicted distribution of ground pangolins along the border with Sudan (Figure 2; Pietersen et al. 2019), and the possibly suitable savanna habitat.

3 | Central Ethiopia

Central Ethiopia is largely comprised of the highlands and is more agricultural in comparison to the south and west of the country (Figure 2). Much of the original habitat in this area would be a mixture of forest and shrubland, but has been impacted by different types of agriculture (Hailu et al. 2015). Evidence of pangolin presence in this area remains to be confirmed photographically. In an early reference from Johnston (1844), Johnston writes: "*A curious kind of medicine, I observed carefully picked up by my Dankalli companions. This was the hard clay-like fæces of the manus, or pangolin, said to have cathartic effects. This mailed ant-eater excavates, with its strong fore claws, a passage through the thick mud walls of the ant-hills, and the numerous army of soldier and of labouring ants*

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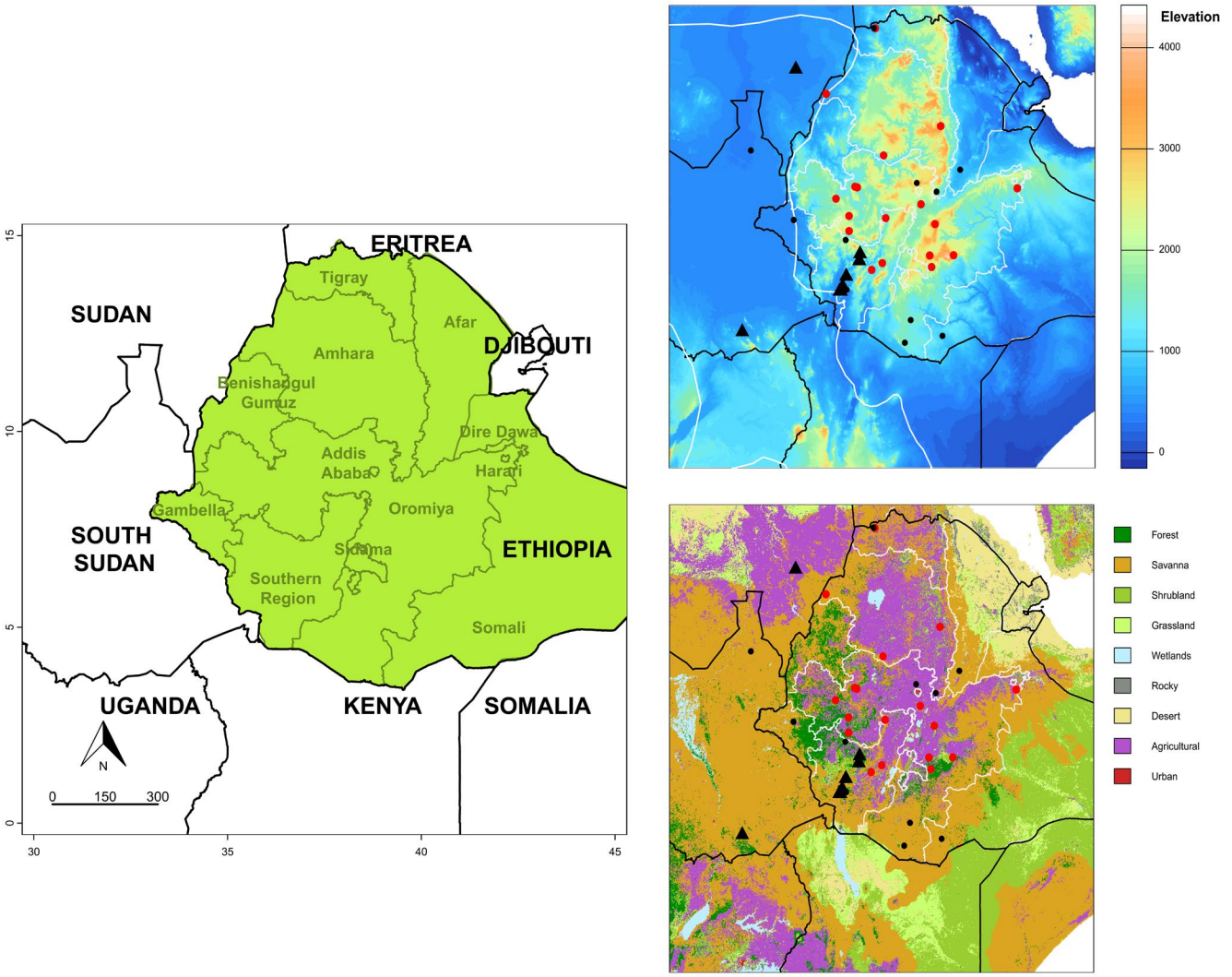

FIGURE 2 | Maps showing the location of Ethiopia, and its regions (grey lines and text), relative to the neighbouring countries (capitalised, left; distance in km). Points where there is evidence of ground pangolin (*Smutsia temminckii*) presence (black symbols) and example wildlife monitoring studies that did not detect ground pangolin (red points) in Ethiopia in relation to elevation (top-right panel) and habitat type (bottom-right panel). Strength of evidence for current presence is shown by the symbol shape as direct evidence (triangle, e.g., camera-trap image, video, scales), or other evidence (black points, e.g., reference to traditional use, personal communication, historical evidence). References for direct evidence in Ethiopia are as follows: Timer (2005); Chankallo and Kabtehyimer (2023); Asfaw et al. (2025); T. Asfaw (scales observation and colleagues' video, Asfaw et al. 2025); G. Timer (pers. comm., 2025). Top-right panel underlying colour gradient shows the elevation above sea level (hole-filled CGIAR-SRTM 90 m resolution Jarvis et al. (2008) accessed via the *geodata* R package on 14/08/2025 Hijmans et al. (2024)). Bottom-right panel habitat classification layer is the composite from Jung et al. (2020). Country borders (black lines not showing contested boundaries; all panels) and the current IUCN SSC Pangolin Specialist Group range map for ground pangolin (white lines top-right panel; Pietersen et al. 2019) are also shown. Designations and boundaries presented do not imply the expression of any opinion of the authors concerning the legal status of any country or territory or concerning the delimitation of its boundaries. Studies plotted as red points are: Lavrenchenko (2000); Lavrenchenko et al. (2010); Yirma and Yirga (2013); Geleta and Bekele (2016); Bauer et al. (2017); Rodrigues et al. (2019); Lema and Admassu (2020); Mertens et al. (2020); Abie et al. (2021); Wale and Yihune (2021); Agebo and Tekalign (2022); Erena (2022); Jira and Mekonen (2023); Mekonnen and Girma (2023); Alemu et al. (2024); Getachew and Yazezew (2024); Worku et al. (2025); Kidane et al. (2025).

[...]. The pangolin materially assists the porcupine in obtaining his food, for after the destruction of the little animals by the former, he takes advantage of the excavated passage, and possesses himself of the hoards of grain and other seeds, collected by these industrious insects." (Johnston 1844, 425–426). Based on information in the document, this record seems to be between the urban centres of Ankobar and Harar, near the Awash River. Pangolins reportedly used to be found around the Kesem (or Germama or Kessem) River in Minjar, Misraq Shewa (Dr Girma Eshete pers. comms. to Tsyon Gizaw September 2025), which is a tributary of the Awash River. In these areas, local people referred to it as Abo Jiraf (አቦ ጅራፍ). The name comes from a cultural association: that the defensive behaviour of pangolins was symbolically associated with Saint Abo's justice or discipline.

Just north of Addis Ababa, Lentakis (2005) reports seeing a pangolin in the Sululta plains. When referring to the pangolin, the author writes: "*it is a curious-looking animal, about a*

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metre in length, and its body is protected from the neck to the tip of the very long tail with big, overlapping horny scales, coffee in colour and almost triangular in shape. This animal has no teeth but instead a very long, narrow tongue—about 35 centimetres long—which it uses for scooping up the ants and termites on which it feeds. It is nocturnal and I only ever saw one in my whole life [...]. We encountered a herd of hyenas, which we blinded with a special torch. One of the hyenas, a huge animal, was holding a pangolin in its teeth, just as a cat holds a mouse." (Lentakis 2005, 204–205). In southern Africa, there are videos and sightings of hyena carrying ground pangolins in this way (Latest Sightings 2025).

4 | Discussion

4.1 | Pangolin Distribution and Ecology

Our review confirms the presence of pangolins in Ethiopia and extends the current awareness of the species distribution based on the IUCN Red List (Pietersen et al. 2019) and Kingdon (2014). It is clear that pangolins occur in parts of the southwest of Ethiopia, and likely in the far west too (Figure 2). Reassuringly, pangolins are found in conserved and community-managed areas such as the Mago, Omo, CCNP and the TCCA. These conserved and community-managed areas neighbour each other, forming a contiguous complex of largely suitable habitat for the ground pangolin. Situated in the middle and lower basins of the Lower Omo River basin valley, these areas are rich in biodiversity (including ant and termite species) and water and are thus likely crucial for ground pangolins in Ethiopia. It is likely that pangolins do not occur in the high-elevation areas, and possibly not areas impacted by agriculture in the centre of Ethiopia (Figure 2).

Reconstructions of the former natural vegetation of present-day agricultural land in Ethiopia suggest that all the areas where we found evidence of pangolin presence are within current or former areas of closed to open shrubland, mosaic forest-shrubland/grassland, and possibly the open broad-leaved deciduous forest (Hailu et al. 2015). This would corroborate the descriptions of suitable pangolin habitat reported in the IUCN Red List (Pietersen et al. 2019). The vegetation of far western and southwestern Ethiopia, where we found evidence of pangolin presence, is partly categorised by Combretum-Terminalia woodlands and wooded grasslands, whereas the eastern half of the country is largely categorised by Acacia-Commiphora bushlands (Abich et al. 2022). If pangolins were or are present near the Awash River in central Ethiopia, the species may have had to disperse through the Main Ethiopian Rift between the western and eastern highlands or were already present in the shrubland, much of which has since been converted to agriculture (WoldeGabriel et al. 2000; Hailu et al. 2015). Several wildlife monitoring studies that have occurred in the higher elevation areas and highlands have not reported pangolin presence (Figure 2), although we caveat that the studies may not have used the optimum monitoring methods to detect pangolins if present (Ingram et al. 2019; Willcox et al. 2019).

4.2 | Local Uses and Perceptions of Pangolins

Lists of animals used in local traditional medicine can be a useful source of information on pangolin presence and extractive uses in an area (Ingram et al. 2022). However, a recent review of 18 studies published since 2011 investigating the animals used for traditional medicine by Indigenous Peoples in Ethiopia reported no ethnozoological uses of pangolins (Lema et al. 2025). In a recent field visit to the TCCA, we understood that pangolins are considered a symbol of bad luck by the surrounding community: a community liaison officer stated during an informal discussion "If we had encountered a live pangolin, we would not have continued along the road we were following and put the camera trap." Perceptions of pangolins as bad omens could result in persecution, as observed in the CCNP area. It is also possible that there is local hunting for meat, and possibly some trade of pangolin parts given illegal cross-border trade of ground pangolins known to occur in the neighbouring countries of South Sudan and Kenya (Ingram et al. 2020). Further research is needed to understand whether exploitation of pangolins for food, traditional remedies, or scale trade occurs in Ethiopia.

5 | Conclusions

Accurate species distribution data are needed to target appropriate conservation actions and policies, and to calibrate and validate species distribution models to provide forecasts of species or biome shifts with ongoing global change (Duputié et al. 2014). Where direct evidence of pangolin has been found in southwestern Ethiopia, we suggest population monitoring to assess the ecological viability and status of the species. Where pangolin presence has not been determined with direct evidence, future research should investigate possible pangolin presence using camera traps and methods optimised to detect and monitor pangolins (Ingram et al. 2019; Willcox et al. 2019). These areas include (1) the Sululta plains and near the Awash River/Awash National Park, in central Ethiopia; (2) the far southern Oromiya/Somali Regions, near the Kenyan border; (3) the far northwest of the Tigray Region, including the Kafta Sheraro National Park; and (4) the western Gambela Region, including Gambela National Park. This would allow for a more rigorous assessment of pangolin distribution in Ethiopia and new range demarcations. Combined with additional information on any threats the pangolins may face, it will be possible to assess the need for specific pangolin conservation actions and policies in Ethiopia.

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Conflicts of Interest

D.J. Ingram is a Field Science Co-Chair of the IUCN SSC Pangolin Specialist Group. He is also a Trustee of The Pangolin Project, which seeks to conserve pangolins in Kenya.

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Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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