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Illegal wildlife trade as the leading cause of orphaned pangolin and vervet monkey arrival to the Lilongwe Wildlife Centre

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Illegal wildlife trade (IWT) is a major driver of biodiversity loss, threatening countless species, including pangolins (Pholidota: Manidae) and vervet monkeys (*Chlorocebus pygerythrus*). This study analyzed causes of admission, medical findings, and outcomes of orphaned pangolins and vervet monkeys at the Lilongwe Wildlife Centre (LWC) in Malawi from 2019–2023 to understand the impact of these species' common threats. Medical records of 83 orphaned animals (34 pangolins, 49 vervets) were reviewed. Chi-squared tests assessed associations between variables. IWT was the primary cause of admission for pangolins (97.1%) and vervet monkeys (53.1%). Pangolins confiscated from IWT often presented as dehydrated (48.5%), underweight (42.4%), and lethargic (27.3%), with necropsies frequently revealing pneumonia (83.3%) and gastric ulcers (50%). Top pangolin outcomes included death (36.4%) and release (30.3%). Vervets admitted from IWT were either ex-pets or intercepted while being sold as pets or bushmeat. Ex-pets all exhibited unremarkable physical exams, while intercepted vervets often displayed injuries from rope (38.5%) and malnourishment (23.1%). Top vervet outcomes included remaining in care at LWC (80.8%) and release (7.7%). Admissions of both species peaked during the months of September through February, aligning closely with breeding cycles and the hot, wet season (November–April). This study highlights the main threats these species face and underscores the need for targeted conservation strategies to mitigate these threats. Understanding clinical trends and causes of admission can inform rescue, rehabilitation, and release efforts, contributing to the conservation of these ecologically vital species.

KEYWORDS

veterinary medicine, illegal wildlife trade (IWT), pangolins, vervet monkeys, orphans, Malawi, necropsy reports, conservation

Introduction

Illegal wildlife trade generates \$7–23 billion a year, making it one of the most lucrative crimes worldwide (Coad et al., 2019). Pangolins (Pholidota: Manidae) and vervet monkeys (*Chlorocebus pygerythrus*) are amongst the many species who are targeted by this trade. Pangolins, in fact, are the most trafficked mammal worldwide (Gaubert et al., 2018). All species of pangolins are endangered and listed under Appendix 1 in the Convention on International Trade in Endangered Species of Wild Fauna and Flora indicating that they are threatened with extinction (CITES, 2024).

Pangolins are mammals native to Asia and Africa and the taxonomic group consists of eight species worldwide. The Chinese (*Manis pentadactyla*), Sunda (*Manis javanica*), Indian (*Manis crassicaudata*), and Philippine (*Manis culionensis*) pangolins reside in Asia while the Black-bellied (*Phataginus tetradactyla*), White-bellied (*Phataginus tricuspis*), Giant ground, (*Smutsia gigantea*) and Temminck's ground pangolins (*Smutsia temminckii*) are found in Sub-Saharan Africa (Soewu and Sodeinde, 2015). These animals are distinguished by their protective keratin scales and remarkable tongues, which can reach 40 centimeters in length and are coated in sticky saliva, allowing them to effectively capture insects. Their diet of ants and termites is crucial to their ecological role of insect control, especially for protecting terrains from termite destruction (Hua et al., 2015). Additionally, their long, sharp claws, used for digging in the soil, contribute to nutrient distribution and soil aeration, further promoting ecosystem health (Baiyewu, 2016). Malawi, a country in southeast Africa, is home to the Temminck's ground pangolin. The medium-sized Temminck's ground pangolin is a woodland and arid savannah terrain dweller. They live on the ground and are bipedal, walking only on their hindlimbs (Pietersen et al., 2020). The population of pangolins has been in rapid decline in recent years, posing a threat not only to their species but also to the balance of the ecosystems they help to manage (Aisher, 2016).

Vervet monkeys are an old-world monkey native to Africa and abundant in the East. Their pelage varies from olive green to grey, and juveniles exhibit pink pigmentation on their hands, face, and feet, which progressively darkens to black by five to six months of age (Jorgensen, 2021). They live up to 30 years, have an omnivorous diet and live in social groups called troops (Guy et al., 2012; Jasinska et al., 2022). Vervets are territorial, with territory sizes ranging from 0.063 to 0.28 square miles (Struhsaker, 1967). Like pangolins, vervets play a vital role in their ecosystem. They disperse seeds through their feces, contributing to soil fertilization, control populations of birds, small mammals, and insects, and serve as prey for native predators (Foard et al., 1994; Struhsaker, 1967; Isbell et al., 1999).

The Lilongwe Wildlife Centre (LWC) is the only Pan African Sanctuary Wildlife Alliance (PASA) accredited wildlife rescue center in Malawi (Tworowski, 2020). Vervet monkey and pangolin orphans are amongst the top admitted orphaned species to the center. To better understand the factors—whether disease, injury, or human-induced—that most often lead to their arrival, this project examined the causes of admission of these orphaned

animals. It further analyzed medical records to uncover patterns of illness and injury associated with the common threats these animals face. Understanding these threats is crucial for developing effective conservation strategies, ensuring the protection of these species, and preserving the ecological balance they help to maintain. It was hypothesized that most orphaned animals would be admitted to LWC due to human-related causes and that specific patterns of illness and injury would emerge across both species.

Materials and methods

This study analyzed all data pertaining to orphaned pangolins and vervet monkeys admitted to the LWC in Malawi from 2019 to 2023 (n=83; 49 vervet monkeys and 34 pangolins). The LWC is accredited by the Global Federation of Animal Sanctuaries and the Pan African Sanctuary Alliance (GFAS, 2024; PASA, 2024). It is operated by the Lilongwe Wildlife Trust (LWT), which is registered under Malawi's Trustee Incorporation Act (No. TR/INC4209) and is a member of the Council for Non-Governmental Organizations of Malawi (No. C466) (IUCN, 2025). Additionally, LWT is a member of the International Union for the Conservation of Nature (IUCN, 2025).

Data were collected during a three-week visit to the LWC, where each animal's record was accessed through the sanctuary's medical database, Wildlife Rehabilitation MD, and supplemented with physical medical records that were photographed for later analysis.

Upon admission, every animal at the LWC received a physical exam conducted by their licensed veterinarian, and an intake form was completed. In addition, pangolins were evaluated using a Pangolin Assessment Scoring Form formulated by the LWC, as they are considered government property and require additional documentation. Copies of all relevant records were collected for the animals included in this study.

Orphaned pangolins were defined by the LWC as animals arriving young without care from another pangolin. Upon admission pangolins weighing under 4kg were classified as young by the veterinarian. Vervet monkeys were similarly categorized as orphans if they arrived young and without parental care, with monkeys under 2 years old classified as young.

Physical and digital records for each admitted animal were analyzed. The sanctuary had two versions of intake forms used during the period of this study. One recorded the animal's name, ID, species, sex, age, background, history, behavioral assessment, location and conditions when found. The other recorded the name, sex, species, and clinical exam findings on the patient including neurologic, locomotive, respiratory, cardiovascular, gastrointestinal, dermatological, ophthalmological, urogenital and lymphoid body systems. For the purposes of this study, normal health will be defined as an unremarkable physical exam.

The Pangolin Assessment Scoring Forms scored the wellness of the animal upon arrival based on the presence or absence of injuries or illnesses, weight, body condition score, hydration status, body curl and posture. A score of 4–5 indicated the pangolin was fit for

release, while a score of 1–3 indicated the need for extended rehabilitation. In 2022, the LWC was broken into and the physical records of the pangolins from that year were stolen. As a result, the information on those individuals was minimal.

The records were analyzed for cause of arrival, conditions when found, medical problems seen upon admission, outcome of the animal, month of arrival and sex. Necropsy reports of the orphaned animals who died after arrival were also analyzed to determine causes of death. Commonalities were investigated within the species and across both species.

To test the significance of comparisons, chi-squared statistical tests were used for analyzing categorical data to determine whether there is a statistically significant association between variables.

Results

Causes of admission of both orphaned pangolins and vervet monkeys to the LWC from 2019–2023 are summarized in [Table 1](#). The main cause of arrival for both orphaned pangolins and vervet monkeys to the LWC from 2019–2023 was illegal wildlife trade (IWT) with 97.1% (33/34) of admitted pangolins and 53.1% (26/49) of admitted vervet monkeys arriving due to IWT. Only one orphaned pangolin was admitted for a reason other than IWT: a transfer from another location. The top three causes of admission for vervet monkeys following IWT included 12.2% (6/49) being born to a resident on site, 10.2% (5/49) being hit by a car, and 10.2% (5/49) being found.

Pangolins were significantly more likely to arrive due to IWT than any other cause ($p < 0.001$) and were significantly more likely to be admitted to the LWC due to IWT than vervet monkeys (chi-squared = 18.9, $p < 0.001$). Vervet monkeys, however, were not statistically more likely to arrive from IWT than all other causes of arrival combined ($p = 0.34$).

The months of arrival and outcomes of the orphaned pangolins and vervet monkeys post-admission are represented in [Figure 1](#).

TABLE 1 Causes of admission of orphaned pangolins and vervet monkeys to the LWC from 2019–2023.

Cause of Admission	Count	Percentage (%)
Pangolin		
Transferred from a different location	1/34	2.9
Illegal wildlife trade	33/34	97.1
Vervet monkey		
Brought from other location	1/49	2.0
Mother killed by human and baby found	2/49	4.1
Born to a resident in the LWC	6/49	12.2
Found alone	5/49	10.2
Hit by car	5/49	10.2
Illegal wildlife trade	26/49	53.1
Wild injured monkey from local troop	4/49	8.2

Of the pangolins admitted from IWT, 36.4% (12/33) died after arrival, 30.3% (10/33) were released, 18.2% (6/33) had outcomes that were unknown, 9.1% (3/33) were still in care as of July 2024 and 6.1% (2/33) were transferred to another location. The pangolin who had a cause of admission other than IWT had an unknown outcome ([Figure 1A](#)).

Of the orphaned vervets admitted from IWT, 80.8% (21/26) remained in care as of July 2024, 7.7% (2/26) were released, 7.7% (2/26) were deceased, and 3.8% (1/26) had an unknown outcome ([Figure 1B](#)). The breakdown of the outcomes of vervets based on cause of admission is also depicted ([Figure 1B](#)).

The months with the highest number of orphaned pangolin admissions to the LWC were December (7/34) and September (6/34). The months with the highest number of orphaned vervet monkey admissions were February (10/49) and September (7/49) ([Figure 1C](#)). For both species, months with the greatest number of orphan admissions to the LWC were September (13/83) and February (11/83). IWT animals were significantly more likely to be admitted to the LWC between September and February (67.8%, 40/59) than between March and August (32.2%, 19/59) ($p < 0.001$).

The main findings of the intake exams and the necropsy reports for the pangolins are listed in [Figure 2](#). Amongst the 33 pangolins admitted to the LWC due to IWT, 33.3% (11/33) walked on all fours, 27.3% (9/33) were weak, 27.3% (9/33) were lethargic, 48.5% (16/33) were dehydrated and 42.4% (14/33) were underweight ([Figure 2A](#)). All 12 of the pangolins who died were from IWT and necropsy reports showed 33.3% (4/12) of them had ticks, 83.3% (10/12) were found to have fluid in their lungs and 50% (6/12) had gastric ulcers ([Figure 2B](#)).

The main findings of the intake exams and causes of death listed on the necropsy reports of the vervet monkeys are depicted in [Figure 3](#). The five main findings on the intake exam records of the orphaned vervets were: underweight and malnourished, decreased mentation, rope around the animal, normal health, and cuts, wounds and bruises. Of the 26 vervet monkeys admitted to the LWC due to IWT, 30.8% (8/26) had cuts, wounds and bruises, 46.2% (12/26) were in normal condition, 38.5% (10/26) had rope around them, 7.7% (2/26) had decreased mentation and 23.1% (6/26) were malnourished and underweight ([Figure 3A](#)). The next two main causes of admission of vervets to the LWC – excluding those born to residents at the LWC – were being hit by a car and being found. Of the five vervets whose cause of arrival was being hit by a car, 80% (4/5) of them had cuts, wounds and bruises, and 60% (3/5) of them had decreased mentation ([Figure 3B](#)). Of the five vervets whose cause of arrival was being found, 40% (2/5) of them had cuts, wounds and bruises, 20% (1/5) had decreased mentation and 20% (1/5) were underweight ([Figure 3C](#)).

Significantly more non-IWT vervets (34.8%, 8/23) experienced decreased mentation than IWT vervets (7.7%, 2/26) ($p = 0.03$). None of the vervets admitted by causes other than IWT had rope around them, whereas 38.5% (10/26) of vervets admitted by IWT had rope around them ($p < 0.001$). Of the vervets admitted from IWT, 57.7% (15/26) showed normal condition, but none of the vervets admitted for other reasons showed normal conditions ($p < 0.001$).

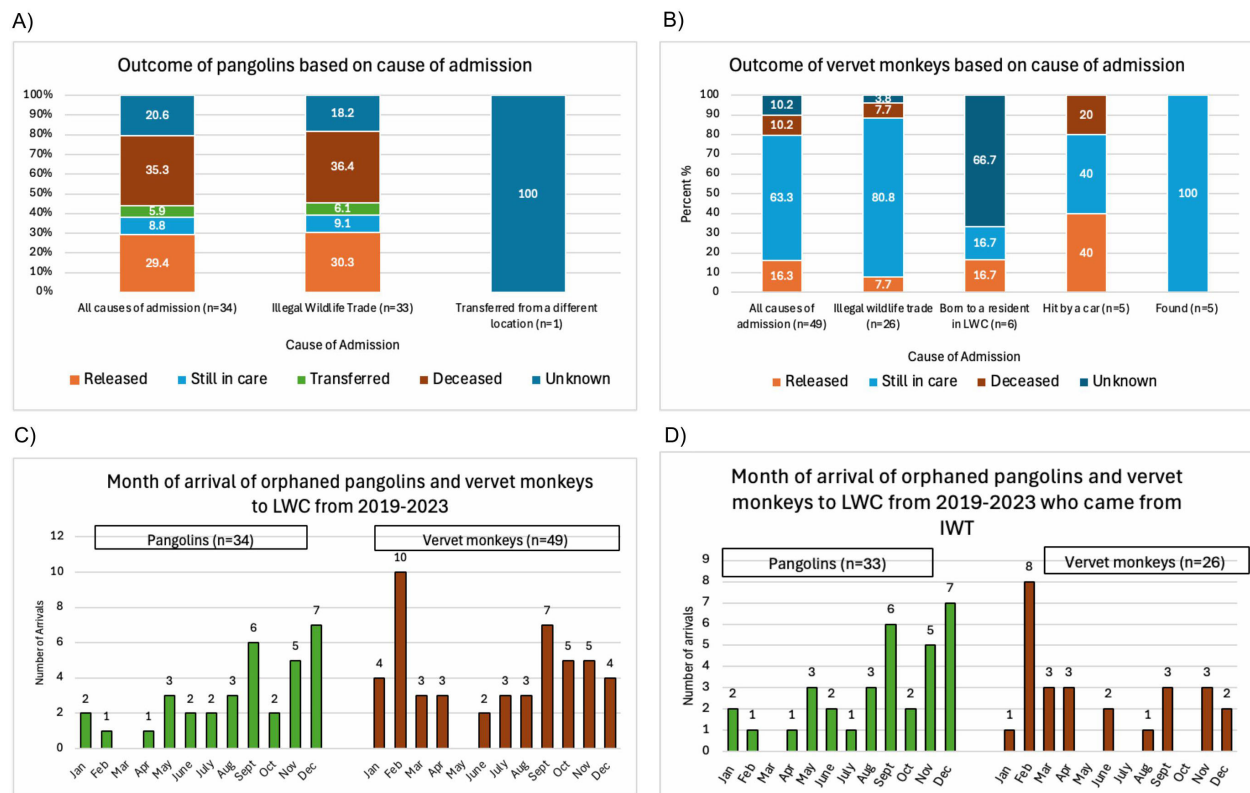


FIGURE 1

Outcome and month of arrival of orphaned pangolin and vervet monkeys who were admitted to LWC from 2019–2023. (A) Percentage of orphaned pangolins admitted to LWC from 2019–2023 that are still in care as of July 2024, transferred to another location, released, or deceased depending on their cause of admission (all causes, IWT and transferred from another location). (B) Percentage of orphaned vervet monkeys by cause of admission (all causes, IWT, born to a resident, hit by a car, and found) that were still in care as of July 2024, were transferred to another location, released, or deceased. (C) Month of arrival of all orphaned pangolins and vervet monkeys. (D) Month of arrival of the orphaned pangolins and vervet monkeys whose cause of admission was IWT.

Lastly, sex predilections were analyzed to see if one sex was more targeted by IWT than the other, but no sex predilection was observed in either species. Of the IWT animals admitted to the LWC, 44% (26/59) were female and 49.2% (29/59) were male. Animals admitted to the LWC for other reasons both had 41.7% (10/24) males and females. The remainder had unidentified sexes.

Discussion

According to the World Wildlife Foundation, 195,000 pangolins were trafficked for their scales in 2019 (Challender et al., 2020). Pangolins are highly valued in many Asian countries (Heinrich et al., 2016). Their meat is considered a delicacy in China and Vietnam while their scales and claws are used in traditional medicine (Bale, 2019). The use of pangolin scales in traditional Chinese medicine has been documented to date back as far as 480 AD (Wang et al., 2020). In these countries it is thought that the scales can cure hangovers, aid breastfeeding, infertility, joint pain, treat liver problems and more (Wang et al., 2020). Pangolin skin is also utilized to make leather products like boots, bags and belts

which are sold in America (Nuwer, 2019). Pangolins can sell for \$3,500 per kilogram in the black market, making them a highly lucrative product (U.S. Department of State, 2022). As a result, these animals are in high demand in the IWT ring.

Similarly, vervet monkeys are not immune to the dangers of humans. Illegal trade of primates alone is estimated to bring in \$117–\$138 million annually (Nijman et al., 2023). An increase in primate pet sales has been observed alongside the increased accessibility to the internet and international communications (Nijman et al., 2023). The orphaned vervet monkeys at the LWC were also found to have most admissions linked to IWT. While reading through the records it was found that many of these animals were either being kept as a pet, sold on the streets to become a pet, or were being sold to be eaten as bushmeat. In a 2020 study on bushmeat consumption in Malawi, 39% of the population had eaten bushmeat and consumption was more prevalent in lower income areas (Van Velden et al., 2020). During the visit to Malawi, it was apparent that vervet monkeys were abundant, easily accessible, and lived closely with humans, making them a readily available source of high-protein food. According to the LWC, when wildlife such as vervets are killed for bushmeat their babies are often taken to be

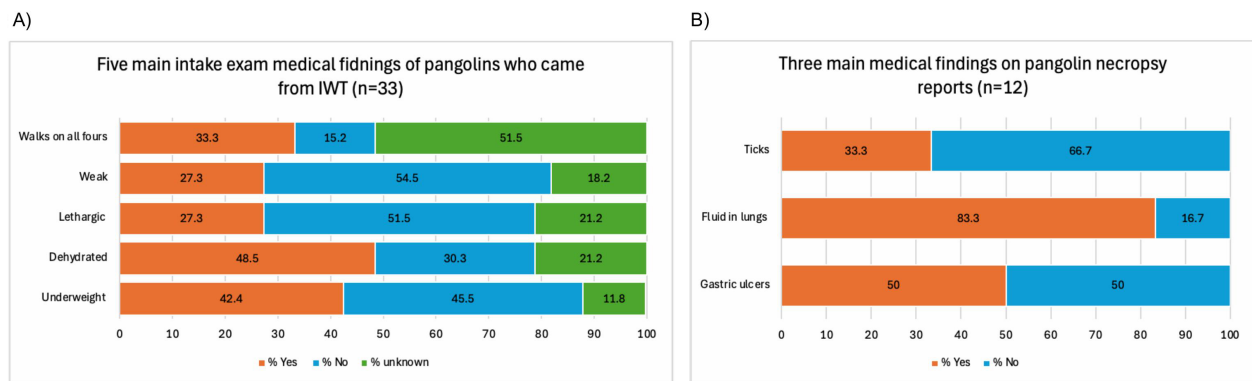


FIGURE 2

Main findings on pangolin intake exams and necropsy reports. (A) The clinical signs of pangolins admitted from IWT summarized as percentages. (B) The necropsy findings of pangolins admitted from IWT summarized as percentages. All deceased orphaned pangolins (n=14) came from IWT.

sold as pets. Baby vervets can be sold for up to \$100 – a significant amount of money for many locals, which makes the trade more enticing (LWC, 2024).

Malawi experiences two main seasons: a cool, dry season from May to October and a hot, wet season from November to April (Demissie and Gebrechorkos, 2024). Orphan season coincides with the hot, wet

season when the rains begin, trees grow, food is abundant, and birth rates tend to peak (Lilongwe Wildlife Trust, 2020). From 2019–2023 the highest number of arrivals of orphan pangolins and vervets to the LWC was from September to February. While this does not align perfectly with the November–April wet season, the greatest number of orphans arrived from the end of the cool, dry season into the middle of

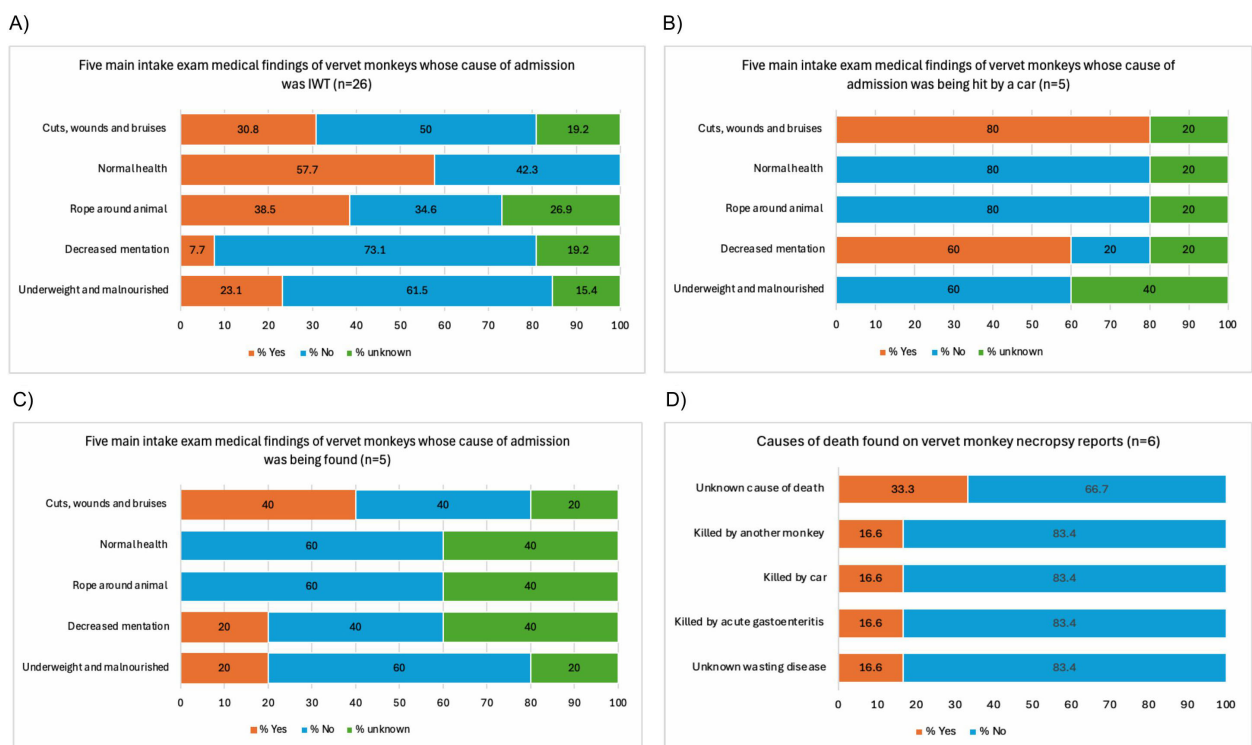


FIGURE 3

Main findings on vervet monkey intake exams and necropsy reports. (A) The percentage of vervet monkeys who came from IWT who had cuts, wounds, bruises, normal health, rope around them, decreased mentation and or were underweight or malnourished. (B) The percentage of vervet monkeys whose cause of admission was being hit by a car who had cuts, wounds, bruises, normal health, rope around them, decreased mentation and or were underweight and malnourished. (C) The percentage of vervet monkeys whose cause of admission was being found who had cuts, wounds, bruises, normal health, rope around them, decreased mentation and or were underweight or malnourished. (D) Causes of death on the necropsy reports of the deceased vervet monkeys. Orphans born to a LWC resident are not included.

the hot, wet season. This pattern was logical as animals admitted during the dry season were generally older, likely from the previous year's breeding season, while vervets admitted during the wet season were typically younger, born during the current season.

A total of 33 pangolins were confiscated from IWT and admitted to the LWC between 2019 and 2023. Upon arrival, 16 were dehydrated, 14 were underweight, 9 were lethargic and weak, and 11 were observed to be walking on all fours. IWT pangolins that show signs of dehydration, weakness, and lethargy are presumed to have been in IWT for at least a week with no access to food or water (Raphael and Hoang, 2023). Animals in IWT for days to months can be underweight from starvation (Raphael and Hoang, 2023). On a physical exam, the presence of these clinical signs may then be an indication of time spent in IWT, with worsening severity correlating with a longer duration of captivity. A pangolin rescue center in Cuc Phuong National Park, Viet Nam, similarly documented admitted captured pangolins to be dehydrated and underweight (Clark et al., 2009). They additionally reported snare and dog bite wounds typically located on the legs, tails or necks of the pangolins from their initial capture. Other commonly reported physical exam findings of rescued illegal trade pangolins include gastroenteritis, conjunctivitis, ectoparasites, and bacterial infections (Raphael and Hoang, 2023). Walking on all fours is abnormal for the typically bipedal Temminck's ground pangolin, who uses its tail for balance (Baiyewu, 2016). LWC intake forms indicated that some of these animals walked on all fours with their tail off the ground while others walked on all fours with their tail dragging. It was noted on these forms by the veterinarian that young pangolins may walk on all fours as a normal age-related behavior but those doing so while dragging their tail is abnormal and indicates weakness. Dehydration, decreased weight, lethargy, weakness and/or inability to walk normally may then be clinical signs to recognize on pangolins confiscated from IWT.

Of the 12 pangolins who died, ten had fluid in their lungs, six had gastric ulcers and four had ticks. After discussion with the LWC veterinarian about these findings, it was noted that many of the pangolins that come in from IWT are transported in small bags like maize sacks and are covered in their feces and urine. They are under high amounts of stress which can cause immunosuppression predisposing them to gastric ulceration and pneumonia. A pangolin rescue center in Vietnam documented that all pangolins transported to them were similarly transported in nets for prolonged amounts of time and were covered in urine and feces (Clark et al., 2009). Others have additionally reported the phenomenon in which pangolins contract pneumonia secondary to immunosuppression caused by stress, poor hygiene and captive conditions (Wicker et al., 2020). In addition, severe respiratory disease like pneumonia is one of the most commonly reported causes of death of pangolins in captivity like IWT (Wicker et al., 2020). Similarly, gastric ulcers have been commonly reported on necropsy reports of captive pangolins. A necropsy report of an IWT-confiscated Sunda pangolin revealed severe gastric ulcerations thought to be caused by stress and inappropriate transport conditions (Wicker et al., 2020). The results from this report and

LWC both suggest that these medical findings may be seen across multiple species of pangolins as it has been shown that both the Temminck's ground pangolins in Africa and Sunda pangolins in Asia present with these clinical signs after confiscation from IWT. At the LWC, four of the IWT pangolins died of tick-borne diseases. Two succumbed to congestive heart failure secondary to *Theileria*, while the other two were diagnosed with *Babesia*, with one of them also infected with *Anaplasma*. Ticks are typical in low burdens on pangolins, however higher burdens of ticks have been reported in pangolins from IWT due to stress-related immunosuppression (Wicker et al., 2020). Pangolins who are victim to stress and poor living conditions as often found in IWT may then present with respiratory disease, gastric ulceration, and higher burdens of tick infestations, ultimately increasing their risk of death.

Post admission, the majority of vervets were kept in care at the LWC. Vervets are social animals and live in troops consisting of 10–50 members; releasing a vervet individually into the wild would lead to a poor prognosis (Pillay et al., 2023). As a result, when sanctuaries like the LWC receive vervet arrivals they must create vervet troops to ensure that individuals have the highest chance for survival upon release while also mimicking the social structures and conditions they would experience in the wild. The process of introducing new members to troops and watching the behavior of new vervets meeting and interacting is called integration (Vilette et al., 2022). This is a complex process of creating the normal hierarchy of a troop while ensuring the members can get along and survive together in the wild. This process takes time, and troops may only be released when there are enough members. This explains why many vervet arrivals to the LWC had an outcome of remaining in care.

Of the 26 vervets who were confiscated from IWT, 15 had normal health; again defined by an unremarkable physical exam. Interestingly, none of the vervets who came from other causes were found to be in normal conditions. Eight of the IWT arrivals were ex-pets while the remainder were being sold to be pets or bushmeat. Of the eight ex-pets, all were noted to be in good health. A similar study in South Africa also found most pet-owned vervets to be uninjured (Healy, 2017). At the LWC, seven of the remaining vervets being sold as pets and bushmeat were found to have normal health while the remainder had more serious injuries. These injuries included a broken tooth, a tire string around one's waist, evidence of previous skull fractures, dehydration, mites and helminths. One vervet was terrified, nervous, unable to walk and presented with alopecia from a leash. These animals tended to be in worse conditions than the pet-owned vervets. Vervets who came from IWT were the only animals found to have ropes around them. In the records, it was seen that some owners would tie their pets to a tree with rope and sellers would use rope as a leash. These ropes could cause as little as no harm to the animals to more serious injuries. One orphaned vervet admitted to the LWC had a large, actively bleeding belly wound from a rope and rope marks on its arms and legs.

The next most common causes of arrival of the vervets were being hit by a car and being found. The animals who were hit by a car were often injured with cuts, wounds and bruises typically

accompanied by a decrease in mentation. These animals had more severe injuries including paralysis, traumatic brain injuries, and death. The vervets who were found were often alone in nearby towns including Majete, Mchinji, and Nkhotakota and brought into the LWC. Some had cuts, wounds and bruises, one had decreased mentation and one was underweight. Unlike the pangolins, vervets did not display consistent findings on their necropsy reports and died of different causes.

In conclusion, this study demonstrates the major role humans play in the admittance of orphaned pangolins and vervets to the LWC. The biggest threat to these animals is humans and IWT. In 2017, Malawi adjusted the National Parks and Wildlife Act to inflict a harsher sentence upon individuals found with illegal wildlife products. Traffickers could now be sentenced to a fine of \$530,000 and up to 30 years in prison when previously the sentence was a maximum of one year in jail but typically resulted in a \$40 fine ([National Parks and Wildlife Act, 2017](#)). While this is a major improvement in sentence severity, the average sentence is only five years with the maximum sentence administered so far being 18 years ([LWT, 2024](#)). Other crimes such as money laundering and aggravated human trafficking can be punishable by life imprisonment in Malawi ([Malawi Law, 2024](#)). In order to decrease IWT, the repercussions of being caught must outweigh the potential benefits of being involved. Increasing the number of law enforcement units like the Wildlife Detection Dog Unit in Malawi, who train dogs to sniff out illegal wildlife products, can also be a positive step in working towards combating IWT ([Waterland et al., 2015](#)). In addition to laws and regulations, it is important to have well-funded and capable sanctuaries like the LWC to grant these victims a chance of survival ([Paterson et al., 2021](#)). Education and socioeconomic development also play a crucial role in addressing IWT and its associated challenges ([t Sas-Rolfes et al., 2019](#)). Community-based education programs can integrate wildlife conservation into school curriculums and create workshops to raise awareness about the ecological and legal consequences of trafficking wildlife ([Jacobson et al., 2015](#)). Collaborative governance, where local residents are engaged as decision-makers in conservation efforts, ensures their active participation and incentivizes stewardship ([Andrade and Rhodes, 2012](#)). International support, including funding for education and conservation projects, can strengthen these initiatives alongside cross-border collaborations to combat trafficking ([Schenning, 2019](#)). Through the implementation of many of these efforts to combat illegal wildlife trade and enhance conservation, significant progress has already been made in Malawi toward protecting pangolins and vervet monkeys, offering hope for their survival. However, continued dedication and improvement in conservation efforts remain essential to secure a safer future for pangolins and vervet monkeys.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study was conducted in accordance with the local legislation and institutional requirements.

Author contributions

IB: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. LH: Funding acquisition, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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