Declaration of William Keith Lindsay

I, William Keith Lindsay, declare as follows:

Introduction and Qualifications:

1. My full name is William Keith Lindsay. I am also known more generally, and in some published work, by the name Keith Lindsay. I was awarded Bachelor of Science with Honours in Zoology from the University of British Columbia, Vancouver, Canada, in 1974. I completed an MSc in Zoology at the University of British Columbia in 1982, under the supervision of Professor A.R.E. Sinclair, with a dissertation entitled "Habitat selection and social group dynamics of African elephants, in Amboseli Kenya." I received a PhD in Zoology at the University of Cambridge in 1994, under the supervision of Dr. S.K Eltringham, for my dissertation entitled "Feeding ecology and population demography of African elephants in Amboseli, Kenya." I have published over forty scholarly articles related to elephants. My CV, which lists these articles, is attached as **Exhibit A**.
2. I submit this Declaration in support of the Nonhuman Rights Project, Inc.'s petition for a writ of habeas corpus regarding the captive elephants at the Pittsburgh Zoo & Aquarium. I have personal and professional knowledge of the facts to which I attest, and I am not a party to the proceedings.
3. I am a natural resources advisor/monitoring & evaluation expert with over 40 years of professional experience in Southeast Asia, Africa, Latin America, the Caribbean, North America and Europe, in planning, conducting and evaluating field projects and in senior administrative and leadership roles. I was a senior staff member at the Oxford-based consultancy, The Environment & Development Group (EDG), during 1994-2013. I undertook a variety of long and short-term consultancy missions and project work, both independently and with EDG, in project/programme monitoring and evaluation, environmental assessment and land-use planning, community-based natural resource management, protected area monitoring and management, and biodiversity research and conservation. Since 2013, I have been an independent consultant on assignments for international donor agencies and nongovernmental organizations (NGO) in Africa and Asia.
4. My life-long involvement with elephants began in 1977 when I joined the Amboseli Elephant Research Project (AERP) in southern Kenya. I went on to undertake and complete my MSc and PhD research projects on feeding ecology and population processes, through observational study of free-ranging wild African elephants in their natural environment. I have remained a Collaborating Researcher with AERP, focusing on ecosystem change,

elephant ranging, and human-elephant co-existence. There has been cross-over into my professional work; since the late 1980s/early 1990s, I have had elephant-focused assignments in all parts of Africa, including southern Africa (elephant management policies in Botswana and South Africa), Central Africa (regional elephant conservation coordination for the Convention on Migratory Species), West Africa (research on the movements, population structure and habitat requirements of the Gourma elephants in Mali) and East Africa (Kenya's national elephant strategy, woodland habitat conservation in Tanzania). My work in Asia includes community-based natural resource management and conservation in elephant-populated regions of Cambodia and Thailand and promotion of human-elephant coexistence in Myanmar. My current concerns include stopping the international trade in ivory and live elephants through supporting African elephant range states in a coordinated action on CITES (the Convention on the International Trade in Endangered Species) and facilitating dialogue towards resolution of human-elephant land-use conflict, in partnership with practitioners within and between Africa and Asia. For the past 15 years, I have been active in promoting improved well-being for elephants held in captivity in North American, European, and Asian zoos and circuses.

5. My participation in academic groups include, as Associate Fellow from 2003-2006 at the Environmental Change Institute, University of Oxford; and, as a Member from 2009-present at the Oxford Centre for Tropical Forests, University of Oxford. I have been a member of the International Union for Conservation of Nature/ Species Survival Commission's African Elephant Specialist Group (AfESG) during 1992-2001, and more recently from September 2020 to present.
6. Much of my experience with elephant biology derives from my work with African savanna elephants but the fundamental principles of elephant ecology and behavior are applicable to African forest elephants and to Asian elephants. There is extensive literature on all three species, and while there are certainly documented distinctions between them in terms of habitat and food choices, and social behavior and relationships, the similarities due to common phylogeny, physical attributes and needs far outweigh these differences of detail. Throughout this document, I will simply refer to ‘elephants,’ but the consequences apply equally to all elephant taxa. The observations herein apply generally to captive elephants as well as those living in the wild.

Autonomy and higher cognition demonstrated in elephants' foraging decisions and use of space.

7. As the largest living land animals, elephants have proportionately enormous metabolic requirements and thus the greatest need to find sufficient nutrients for maintenance, growth and reproduction (Christiansen 2004). They are the ultimate generalist herbivores, and they satisfy this ongoing need for nutrition by selecting diets from the diverse vegetation offered in complex and constantly variable natural ecosystems (Roever *et al.* 2012; Woolley *et al.* 2011; Lindsay 1994). These ecosystems present both foraging opportunities and existential risks from natural and human hazards.
8. To navigate their way through this landscape of potential rewards and threats, elephants have evolved sensory systems and cognitive capacities that allow them to develop and exhibit flexible and responsive decision strategies—appropriate to each individual animal as well as to members of their social groups—to cope and prosper in the face of these multi-layered challenges (Poole & Granli 2009).
9. It has now been recognized that elephants possess complex cognitive abilities comparable in many respects to higher primates and cetaceans. Byrne & Bates (2011) reviewed the findings of research on elephants in the wild and in captivity and confirmed that elephants possess significant capacity in several areas of physical and social cognition:
    - Physical cognition:
        - Knowledge of environmental spaces and objects
        - Use of tools and understanding of causality
        - Learning to discriminate among features and categories
        - Quantity judgments
    - Social cognition
        - Knowing about others and their interactions
        - Communication and social manipulation
        - Social learning
        - Theory of mind
10. Elephants display a high degree of autonomy in the choices they make throughout their decades-long lives. Several of the aspects of elephants' physical cognition, particularly in the way they find their way around their natural environment, its rewards and hazards, will be discussed in the sections below.

Foraging strategies: selectivity, manipulation, memory, anatomy and cognitive ability

11. Elephants select items from all parts of plants and a vast range of species in plant communities (Poole & Granli 2009; Lindsay 1994). The major component of biomass in

most plants is structural materials, including fibrous stems, branches, and roots. Down the abundance scale, with less fiber and greater soluble cell contents, are leaves and finally the most nutritious plant parts: fruits, seeds and flowers. In order to satisfy their large foraging needs, elephants must include in their diets large quantities of coarse plant material and cell walls, with varying degrees of lignification, and relatively smaller amounts of easily digestible material. The relative amounts of digestible plant parts will vary greatly between plant communities, and between seasons in the same locations (Roever *et al.* 2012; Duffy *et al.* 2011).

12. An elephant's foraging strategy must be able to respond to these changes, making use of the best foraging opportunities at any given time and place. These opportunities present themselves in areas of land ranging from tens to many thousands of square miles, depending on the productivity of the plant communities and their spatial extent (Sukumar 2003). In zones that are more stable and well-watered, large amounts of digestible plants will be more-or-less continuously available and there may be little need to cross more than a few square miles in search of food. In the more arid savannas and semi-deserts of sub-Saharan Africa, the timing and localization of rainfall events is much less predictable and elephant range areas are necessarily much larger, and more flexible (Young *et al.* 2009, Duffy *et al.* 2011). Paradoxically, the forests of much of Asia and the African Congo basin provide relatively little food at ground level, with biomass and leaf canopy locked up in treetops. Forest elephants rely on scattered and ephemeral openings in the forest cover and seasonally fruiting trees for their forage (Campos-Arceiz & Blake 2011). To achieve the optimal nutritional intake, elephants must have considerable capacity for spatial and categorical memory of the localities of the plants available in the best foraging sites and their maturation timings within such ranges (Roever *et al.* 2012).
13. There are different components to the predictability of food supplies: some plant communities, such as wetlands, will be continuously productive although with possibly less nutritious/more fibrous food, while others may be temporarily productive only during times of abundant rainfall yet may have highly nutritious plant components. The pattern of food abundance can change between years, varying between times of drought and plenty (Birkett *et al.* 2012). In forests, the timing of fruiting varies between different tree species, which are widely distributed and often isolated. Elephants must learn and remember all these locations and timings, and are able to recall them when appropriate (Polansky *et al.* 2015). Older elephants retain knowledge of past events and locations of food and water that were appropriate at specific times of drought or plenty, and they teach this knowledge to younger

family members (McComb *et al.* 2001).

14. Elephant memory spans years and even decades, and there is evidence that older female elephants in family groups have better odds of survival in droughts than do younger animals, and they can lead their companions to historically most favorable locations (McComb *et al.* 2001). Areas of the brain active in spatial memory are well-developed in elephants (Jacobs *et al.* 2011). But to make use of this memory, elephants must also be able to put memories together with current sensory information, as they make the correct, context-appropriate decisions on the direction and distance to move (Polansky *et al.* 2015, Jacobs *et al.* 2014).
15. Olfactory (*i.e.* relating to the sense of smell) areas of the elephant brain are also highly developed (Jacobs *et al.* 2014). With their highly developed sense of smell, and in combination with hearing thunder, elephants can detect the direction of distant rainstorms that will result in flushes of fresh vegetation (Birkett *et al.* 2012).
16. The location of other necessary resources, and their spatial and temporal availability, are searched for, monitored, remembered, and recalled. An elephant must drink large amounts of water every few days. Thus they must find sources of clean water for drinking. Other resources include: water or mud for cooling/wallowing; minerals - if they cannot be found in vegetation, then areas of salty soil or rock ('salt-licks') must be located; and shelter, such as tree canopies, for relief from the sun during the heat of the day (Boult *et al.* 2019).
17. Elephant bodies are adapted for covering large distances. The average distance of ground covered per day is a remarkably consistent at ±10km in 24 hours (as evident in a variety of studies reviewed in Miller *et al.* 2016). This figure has been documented across very different biomes, from arid deserts, through different semi-arid savanna types, to moist tropical forests (Douglas-Hamilton 1998, Leggett 2009, Wall *et al.* 2013, Wyatt & Eltringham 1974, Merz 1986, Galanti *et al.* 2000). Within this stable daily movement pattern there is, however, a wide range in distance traveled in any given day, from less than 1km when foraging locally to 30km or more of directed movement when moving to new foraging areas.
18. Striding over large areas is accomplished most efficiently with long legs, and as longer legs evolved, there was the parallel evolution of foraging anatomy to reach from ground to mouth. Modification of a prehensile upper lip has led to the development of the trunk seen today (Shoshani 1998), which is a highly specialized organ useful not only for different forms of feeding, but also for drinking, olfaction, grooming, visual and auditory social signaling, and other motor functions.
19. Studies of elephants (*e.g.* Guy 1976, Short 1981, Lindsay 1994) have documented they

forage on hundreds of species of plants, including fruits, buds, leaves, climbing shoots, flowers, growing stems, woody stems and branches, bark, and roots. Because it forms continuous ground cover and is easy to pluck/harvest, grass forms a significant portion of elephants' diets when it is available and abundant. All grass parts - flowers/ seeds, leaves, stems, and roots - are eaten, as and when each is most nutritious at the time of year and growth stage. Each item of food requires specific processing and handling. In selecting the most nutritious parts, elephants will prioritize the digestible bits and discard the less digestible parts or those holding soil or other contaminants (Poole & Granli 2009).

Use of trunk, other body parts and tools

20. The musculature of the trunk requires millions of sensory and motor nerve connections, and the trunk is capable of both immense strength and fine control in selecting, picking up, and moving objects in the environment. Elephants use their trunks in extremely dexterous manipulation of food items, analogous to the human hand in its ability to handle objects with delicate control, with the added quality of olfaction (Rasmussen & Munger 1996). As in humans, the evolution of this manipulation organ required accompanying neural development (Onodera & Hicks 1999).
21. Other food preparation techniques include the lifting and moving of branches to reveal lush grass beneath. Such adjustment of the local environment implies a deeper understanding of the localization of plant productivity. Elephants also use other body parts to process food items. Tusks are used in different ways: to cut grass stems, break twigs and branches, carve bark from trees, dig for roots or water. Feet are used in kicking up roots, crushing, or flattening thorns (Poole & Granli 2009).
22. Tools may be fashioned from tree branches and used to pry into bark or dig salty soil from ground sources. Tools in the form of branches serving as 'back scratchers' are also used for grooming, and matts of vegetation may be used as sunshades (Hart *et al.*2001).

Acute awareness of and response to risk factors in the environment

23. Elephants have a keen awareness of risk factors in their environment, and they can make swift assessments and respond appropriately. Predation is a key risk. Very young calves are vulnerable to attack by lions, and when these predators are detected, all family members are cooperatively protective; alerted by a specific alarm call, they will rush to protect the calf and chase away the predator. Older females in particular show rapid and appropriate responses (McComb *et al.* 2011).

24. The primary risk to elephants, however, is human beings. There are two ways this risk presents itself: through competition for land and through killing for the ivory trade (Thouless *et al.* 2016). The international trade in hunting trophies and live elephants to captive destinations has been seen as an additional threat to wild elephant populations (Sarnoff 2024). In land use competition, elephants risk coming into conflict with humans who practice both agriculture and livestock husbandry.
25. Elephants are displaced when their previously available wild habitat is converted to agriculture or settlement (Mmbaga *et al.* 2017). When this happens, there is active competition for the use of those fields, particularly when the plants in fields are more attractive to elephants than the vegetation offered in natural habitats. Elephants make the rational foraging choice of preferring domesticated yet more nutritious food sources to many of their natural foods that are declining in quality (Osborn 2004). Elephants also come into direct conflict with livestock owners who may also be semi-mobile pastoralists. There is more scope for the sharing of livestock grazing lands, but the key points of conflict are at waterpoints. There can be injury and mortality to elephants when confronted by humans (Kuriyan 2002).
26. There is very rapid learning by elephants of the dangers posed by these potential conflicts. One way that they avoid the conflict is to change their movement and foraging patterns to times of day when humans are less active. Typically, this is at night. Elephants 'raids' into agricultural fields are most common at night, as are visits to livestock waterpoints. If there is a protected area (national park or other designated wildlife protection zone) in the vicinity, elephants will retreat into it during daylight hours and emerge at night into the surrounding lands (Douglas-Hamilton *et al.* 2005). Evidence from radiotracking of elephants shows that they move much more quickly through landscapes they share with humans, from one zone of perceived relative safety to another (Graham *et al.* 2009).
27. Killing of elephants by rural villagers or armed gangs for their ivory is a much greater threat to elephants in the immediate term. Elephants can detect alarm calls from some considerable distance and avoid the area where killings take place (O'Connell-Rodwell & Wood 2007). Again, they seek the refuge provided by protected areas when they are secured by wildlife agencies.
28. There is clear evidence that elephants' response to humans is based on an ability to distinguish the risk posed by different human groups. Playback experiments show that this is mediated by vocal cues – elephants can recognize and respond to the sounds of Maasai warriors as distinct from that of women and children, and other ethnic groups, and respond

with a flight response to the former but not the latter (McComb *et al.* 2014). Elephants can also differentiate among types of humans through visual and olfactory cues (Bates *et al.* 2007).

Human-elephant conflict transformed to coexistence through negotiation.

29. Many different attempts to mitigate or eliminate human-elephant conflict have been attempted over past decades. Several attempts have involved aggressive deterrence methods or hard barriers. But they have been met with mixed success, in large part because elephants are able to respond and find ways around them. The most effective responses to such conflicts treat elephants as autonomous and sentient beings and work with their biological nature to achieve solutions that promote coexistence rather than conflict (Shaffer *et al.* 2019).
30. One commonly used approach has been to try to scare elephants when they enter fields, with the use of firecrackers, 'thunderflashes,' or shots from guns. While these measures may work in the short term, elephants soon discover that the noises are localized and generally nonlethal. Their use can also make elephants more fearful and, thus, potentially more aggressive in their approach to humans (Davies *et al.* 2011).
31. Electric fences are sometimes erected by people to keep elephants out of crop fields (e.g. Kioko *et al.* 2008). Elephants, while initially deterred, respond to the hazard of electric shocks by handling the 'hot' wire with non-conducting tusks; they are then able to snap the wire and enter the field. They may also break fences by pushing other elephants into them; both these approaches demonstrate higher cognitive ability and autonomy. But it is the use of branches and logs as tools to break fences that is their most impressive feat. And these techniques, once discovered are rapidly copied and replicated by other elephants, a form of cultural transmission. The use of these fences, which deliver a powerful shock, also make elephants more aggressive and more likely to attack humans in retaliation.
32. More effective fences have been developed that recognize the natural aversion elephants have to pungent plant products, such as chilies (Osborn 2002), and their aversion to the stinging attacks of honey bees (King *et al.* 2017). Fences using these more natural approaches have the additional advantage of providing a livelihood supplement to the farmers. A fence system that startles elephants with strobe lights, rather than alarming noises, has also proven effective; indeed, several of the described methods are more effective if used without noise-makers (Davies *et al.* 2011). Early warning systems, where observers share information about the presence of elephants in an area or near contested

sites, have allowed more targeted, preventive approaches for reducing damage to human life, property, and livelihoods (Sugumar *et al.* 2013, Graham *et al.* 2011).

33. As noted above, it is now increasingly recognized by conservation workers that elephants are autonomous and sentient beings, and that coexistence can be achieved by people entering into 'negotiation' with elephants (Shaffer *et al.* 2019). Such programmes have reduced the use of aggressive methods that serve only to escalate the tension between humans and elephants and increase the potential for mutual harm. Instead, they emphasize more positive approaches that work with elephants' perceptions and decision-making, allowing them some autonomy in their movements and feeding choices, while at the same time protecting human interests (e.g. Songhurst *et al.* 2016). A number of these innovative approaches to Human-Elephant Coexistence, incorporating knowledge of elephant behavior, have been consolidated in a user-friendly "toolbox" that can be deployed in appropriate situations (STE 2025).

Summary of elephants' intrinsic cognitive qualities and needs based on their use of space

34. Elephants, in their detailed understanding of, and carefully tailored responses to, the challenges of their natural habitats, demonstrate a deep degree of autonomy, sentience, and judgment in their foraging and movement strategies. The strategies for flexible, reactive problem-solving and decision-making make use of elephants' highly developed anatomical, sensory, and cognitive adaptations and abilities, and are fine-tuned over decades of experience in navigation of environments with both predictable and unpredictable elements. The experiences gained over a lifetime are then shared between members of their strongly bonded social groups through example, teaching and learning. When we recognize that these qualities of elephants are deeply ingrained through millennia of evolutionary selection and adaptation to their particular native ecosystems, we must inevitably move from a position of domination towards appreciation of them as creatures deserving of, and requiring, autonomy to the greatest extent possible in appropriate environmental conditions.

Observations on minimum standards for captive elephants.

35. It is instructive to consider some of the so-called "standards" for the husbandry of elephants held in captivity that have been developed and modified over time by different zoo associations and other concerned groups. A discussion of these standards, in comparison to

the actual needs of elephants, is presented below.

36. The American Association of Zoos and Aquariums (AZA) is currently revisiting its approach to elephant management (Krcmarik 2024), while its standards for 2022 specify the following minimum acceptable spatial areas for indoor and outdoor enclosures for its member zoos regarding the confinement of elephants:

    - Indoor: Females – 37m^2 (400 square feet) per animal; females with calves – 56m^2 (600 sq.ft.); Males – 56m^2 (600 sq.ft.)
    - Outdoor: Females and males – 500 m^2 (5,400 sq.ft. or 0.12 acre) per elephant.

    The AZA standards also specify minimum figures for size and composition of social groups:

    - Females: 3 adult females; Males: 2 adult males; Mixed group: 3 adults of either sex.

37. For the purpose of comparison, it is worth considering the 2021 standards of the British and Irish Association of Zoos and Aquariums (BIAZA). They go some way beyond AZA standards, having increased steadily over recent years, and include:

    - Indoor: Females – 600m^2 (6,458 square feet) for up to and including 4 females; additional females 100m^2 each (1,076 sq.ft.); Males – 320m^2 each (3,444 sq.ft.)
    - Outdoor: Females and males – 20,000m^2 for any shared space (215,278 sq.ft. or 4.9 acres).

    The BIAZA standards for minimums regarding size and composition of social groups are:

    - Females: 4 compatible adult females; Males: at least 2 adult males of different ages in bachelor groups and with the opportunity of mixing with females.
    - All elephants must have the option to get away from other elephants if so desired, through use of space and visual or physical barriers in the enclosure.

38. The "Best Practice" guidelines developed by the Coalition for Captive Elephant Well-Being (CCEWB) (Kane *et al.* 2005), which were the result of a meeting attended by elephant husbandry and welfare experts and zoo professionals at Tufts University in 2004, are intended to take greater cognizance of elephant biology. The CCEWB recommends the following minimum conditions for space:

- Indoor: Females – 60m^2 (645 sq.ft.) per animal, overnight; 185m^2 (1,990 sq.ft.) per animal in winter quarters (i.e. longer term); males – 110 m^2 (1,184 sq.ft.) overnight; 320m^2 (3,444 sq.ft.) winter quarters
- Outdoor: Females and males – Sufficient to allow walking of 10 km (6.2 miles) per day.

and for social groups and companions:

- African savanna elephants: 10 individuals; African forest elephants and Asian elephants: 5 individuals
- Females; related animals and socially bonded animals never separated; Males: separated from their maternal group only by or after sexual maturity (10 years or older); Sub-adult and adult males: separate facilities, including separate night quarters and yards for male elephants, as well as the option of common housing and yards for males and females.

39. The fundamental biological needs of elephants have been established by the extensive scientific research undertaken thus far on the living elephant species in their natural ranges, as described in part above. A comparison between the sets of space and housing standards with each other, and with the evidence from elephant biology, makes it clear that the minimum standards adopted by the AZA for zoos located in the United States are not only exceedingly inadequate, they are also weaker than both those of the United Kingdom and of the CCEWB elephant welfare experts, which are themselves inadequate for elephants.
40. The AZA standards for social conditions are equally inadequate. These guidelines appear to be a compromise between the actual needs of elephants and the financial and logistical difficulties faced by AZA member zoos in meeting such requirements, with the balance tilted firmly towards the latter.
41. All zoo standards fall far, far short of fulfilling requirements for the space and sociality in both indoor and outdoor facilities that elephants need to thrive (in fact, they fall short by several orders of magnitude; one merely needs to compare the lives of elephants at zoos to those in the wild).
42. A review by Atkinson & Lindsay (2022) has argued persuasively that "*Quality space means that elephants can forage in natural, diverse vegetation, walk for miles each day, and exert a high degree of control over their social interactions. They suffer in zoos psychologically and physically because of the limits of what can be provided within such restricted environments.*" The authors conclude that for captive scenarios, only "*100ha* [0.38 sq.

miles] *or more of diverse, natural habitat in a warm climate would offer individual elephants the opportunity to live fulfilling lives.*"

Information sources and observations of Savanna, Angeline, Tasha, Victoria and Zuri at the Pittsburgh Zoo & Aquarium.

43. There are five elephants currently held captive at Pittsburgh Zoo & Aquarium (PZA). The history of capture at an early age and movement to the PZA, or birth in the PZA itself, along with observations of their present state, indicates these elephants have led lives with very limited ability to exercise their autonomy. In relation to the quality of their lives in captivity, I have studied the following information sources:

Satellite imagery

- A satellite image on Google Earth Pro (©2025; version 7.3.6.10201), image date 3 June 2022, showing the PZA elephant exhibit. Zooming and moving around this image allowed visual inspection of the elephant enclosure and its features. The Ruler tool was used for measuring linear distances and areas of polygons to estimate the dimensions and size of the elephant enclosures and their features.

Documents

- A Word document, with publicly available hyperlinks, summarizing the location and management of the PZA and its elephant exhibit, along with the history of the five current elephants and others that have been held at the Zoo. Available at: https://docs.google.com/document/d/14RdfAeBKg_g5rBtsE3QCd0ToSmWx8KCLchWlYxvrD6E/edit?tab=t.0 .

Websites

- The PZA official website, https://www.pittsburghzoo.org/.
- The Elephant Database. A database that attempts to collate information on all elephants held in captivity worldwide. Its accuracy depends on the information supplied by informants and should be viewed with a healthy critical eye. Available at: https://www.elephant.se/.

Photographs and video clips

- 60 image files (in *.jpg format), showing aspects of the elephant compound, the barn

and the elephants. Available at: https://drive.google.com/drive/folders/17iFCnQkrhe8UMo93x3vvpxjzBrdpXSx8.

- 26 short video clips (*.mp4 and *.MOV format) of varying length, showing aspects of the elephant compound, the barn, the elephants and zoo visitors. Available at: https://drive.google.com/drive/folders/17iFCnQkrhe8UMo93x3vvpxjzBrdpXSx8.

Documentary film

- *Elephantalia*. 2012. Boccella Productions.

Facebook videos

- Watch as two Pittsburgh Zoo elephants celebrate their sweet 16. USA TODAY Travel, 26 July 2024. https://www.facebook.com/watch/?v=802598601722097 .

YouTube videos

- Visit to the Pittsburgh Zoo (and aquarium). 4 June 2024. https://www.youtube.com/watch?v=l_7rwlSJlig&t=914s
- Elephants at the Pittsburgh Zoo! 6 February 2025. https://www.youtube.com/shorts/sf_kODlqfcQ
- Elephants at the Pittsburgh Zoo. 13 August 2024. https://www.youtube.com/shorts/X1rPzQIK5A0
- Elephants _ Pittsburgh Zoo, 7 May 2023. https://www.youtube.com/shorts/vFWtTS8i6A0
- Very Old Elephant in Pittsburgh Zoo. 13 November 2022. https://www.youtube.com/shorts/FMOir8T8xJU
- Untitled. 10 January 2025
- https://www.youtube.com/shorts/sB2AAqKFHD8

Information on the elephants held at Pittsburgh Zoo: present and past

44. The five elephants currently held at PZA are female African savanna elephants with the following details:
    - **Savannah (Nan)** is 42 years old, born at an undocumented African location in 1983, she was captured from the wild in 1985 and imported to US in 1986. She was held

captive at Zoo Miami from June 4, 1990, to June 29, 1992, and then moved to the PZA where she has remained – for 33 years – up to the present date;

- **Angeline** is 17 years old, born July 9, 2008 at the Pittsburgh Zoo & Aquarium. Her mother was Savannah and father was Jackson;
- **Tasha (Natasha)** is 49 years old. Wild-born in South Africa around December 1976, she was captured in 1978 and arrived at the PZA in July 1982 via J.C. Schulz Inc., an animal dealer based in Texas, where she has remained for 43 years;
- **Victoria** is 26 years old. She was born in September 1999 at the PZA. Her mother was Moja, now at Winston Wildlife Safari, and her father was Jackson;
- **Zuri** is 17 years old. She was born in July 2008 at the PZA and her parents were also Moja and Jackson.

45. Other births of African savanna elephants at PZA included:

- A male elephant, the son of Savannah and Jackson, who was **stillborn** at PZA in 1998;
- **Callie (Callee)**, a male elephant, who was born at PZA in 2008, the son of Savannah and Jackson. He was moved in 2011 at age 3 to Birmingham Zoo, then in 2018 at age 10 to Henry Doorly Zoo, and finally in 2023 at age 15 to Sedgwick County Zoo. These moves represent three intensely disruptive transfers of location and companions in twelve years.

46. Other African savanna elephants who were kept at PZA from 1951 to the present day include (note: elephants in the wild who do not succumb to poaching or predation at a young age regularly live into their 70s):

- **Moja**, a female aged 43, at PZA from 1994 to 2015. Born at San Diego Zoo Safari Park in 1982, she was moved three times before arriving at PZA. In 2002, she fatally crushed a PZA elephant keeper but was kept at the Zoo for another 13 years – see discussion below. She is now kept at Winston Wildlife Safari, her fifth location in captivity. When she was moved from PZA in 2015, she was separated from her family group which consisted of the females Victoria and Zuri, aged 16 and 7 years at the time.
- **Thabo-Umasai**, a male who was born in Dresden Zoo in 2006 and was brought to PZA at age 5 in 2011. He was euthanized at age 11 in 2017, said to be suffering from an arthritic auto-immune disease;
- **Irish (Arusha)**, a female who was brought to PZA in 1951 at age 5 and died from a bacterial infection at age 36;

- **Tribby (Tibby)**, a female who died at age 18 of an infection at Cleveland Metroparks Zoo. She was taken from the wild to PZA at age 4 in 1981, was moved via Allen Campbell to Miami Metro Zoo in 1991 and then to Cleveland a year later in 1992.
- **Daisy**, a female whose life details are not documented, apparently was taken from PZA in 1985 and is now thought to be dead.
- **Jackson**, a male aged 49 and father of the three living females and one stillborn male at PZS, as well as Callie, who was kept at PZA for four years from 2004 to 2008 when he was moved to the International Conservation Center (also known as Fairhope Conservation Center), which is associated with the PZA. Before that, he was kept by Disney Animal Kingdom (2001-2004), PZA (1994-2001), Hamid Circus (1990-2001), the elephant "trainer" Allen Campbell (1990-91), Miami Metro Zoo (1989-1990), Allen Campbell and Mike Rice – another elephant "trainer" – briefly in 1989, Robert Bobby Moore (1983-1989), and International Animal Exchange (dates not documented) since his capture in the wild in 1978 at age 2. Thus Jackson was moved to eleven different captive situations in the US during his lifetime.

47. Asian elephants were kept at the zoo from 1928 until 1975. Almost all of the records of these 11 elephants are incomplete. They include:
    - **Sally**, a female who arrived at PZA in 1951, aged 24. She is though to be dead, though whether this occurred at PZA is not documented.
    - **Roberta**, a female who arrived at PZA in 1928, aged two. She is thought be dead now but little else is recorded.
    - **Gloria**, a female who died in 1947 of pneumonia and was apparently at PZA at some point.
    - **Danny**, a male who arrived at PZA in 1938 and was killed one year later. Before being brought to PZA, he had been kept at seven different circuses for 1-3 years at a time.
    - **Gunky**, an elephant whose sex was unrecorded, along with all other information apart from the apparent fact he/she died at PZA.
    - **Rani IV**, a female thought to be born in 1975 and now dead, with no other information.
    - **Ruthie**, a female born in 1972 in the wild and brought to PZA one year later. She is said to have died somewhere in the US.
    - **Tiela**, a female born in 1919 who arrived at PZA in 1943 and was sent to Southwick Wild Animal Farm in 1975 and is now thought to be dead.

- **Ruth**, a female born in 1928 and who apparently spent some time at PZA. No other information has been recorded.
- **Rani II**, a female born in 1969, with circumstances similar to those of Ruth.
- **Lindy**, a male who was sent to an unspecified location from PZA in 1928. He is now considered dead, but there is no other information available.

The elephant facilities and their management at PZA.

48. It is clear to me in my professional opinion that the facilities (indoor and outdoor) and their management at the PZA fall far short of fulfilling the physical and psychological needs of the five elephants, including the particular need to exercise their autonomy. Inevitably, the extremely confined space offered by the exhibit, and the intensive control of every aspect of the elephants' lives—as depicted very clearly in the documentary film *Elephantalia* (2012)—frustrates their exploratory and inquisitive nature. This environmental impoverishment and coercive control have been stressful and clearly inhumane to the point of cruelty.
49. The PZA was first opened as the Highland Park Zoo in 1898, and the African Savanna elephant exhibit was opened in 1987. It has remained essentially unchanged since then. The total area of the elephant exhibit is reportedly 0.75 acres, including infrastructure and off-exhibit management facilities as well as the elephant barn and the outdoor compound.
50. The size of the barn is said to be some 13,500ft^2, although there is contradictory information giving dimensions of 130x70ft = 9,100ft^2; the latter is consistent with measurements from the Google Earth satellite image. The space available to the elephants (including two female stalls, bull stall, family room and public viewing area) is a total 5,833ft^2. The floors are concrete, and the walls and ceiling are plastered concrete or bare concrete blocks, which reflect the noise from any management activity and from the loud voices of zoo visitors.
51. The barn might be physically spacious enough to "hold" the current number of elephants, but only for a few hours of any given day. It is completely unsuitable to elephants to keep them confined for more than this brief amount of time; confinement for longer periods is likely to lead to foot and joint damage from standing on hard concrete substrate, and psychological damage from the noise and the frustration of prevented choice and movement. In one of the videos reviewed, an elephant is seen pacing repeatedly back and forth in one of the small stalls; this type of repetitive movement, which may manifest as head bobbing, swaying on the spot, or continuous walking on the same path is a clear example of stereotypy (i.e., the dysregulation of motor control circuitry in the brain due to

impoverished living conditions and lack of choice—stated succinctly, stereotypies are physical manifestations of brain damage).

52. The size of the outdoor exhibit area is said to be 0.75 acres. It comprises one main yard, which has a pool. Examination of Google Earth images indicate that the various sections available to the elephants actually have the following dimensions:
    - Main yard, including the pool: 0.52 acres. Long axis = 335 feet; width = 151 feet
    - Bull pen: 0.02 acres (873ft^2)
    - Pool 0.07 acres (3,057ft^2).

    These measurements suggest an outdoor area of 0.6 acres; if the pool is not included, the land area is just over half an acre. As noted above, the natural ranges of elephants are much, much larger, by several orders of magnitude, than these tiny exhibit areas.

53. The maximum linear distance available for directional walking within the outdoor exhibit yard is little more than 112 yards; in the wild, elephants typically spend one or more periods of every day in directed walking which is impossible in this zoo compound. The majority of the movements of elephants within the yard appear to be controlled directly and exclusively by PZA staff.

54. The outdoor area and its management are described below:

    - Much of the ground cover in the exhibit yards is bare, compact soil. The terrain is mostly flat with some slight undulations. There is little stimulation or room to explore; a few boulders are stuck in the ground. While this landscaping may look appealing to the visiting public, the features provide no novelty or variety to the elephants themselves. They do nothing to alleviate the tedium of these sterile surroundings.
    - There is some shade provided by two sunshades that appear roughly 285ft^2 each; trees to the west side of enclosure might provide shade in afternoons. The landscaping appears to be designed more to project a feeling to visitors of a quasi-natural environment, rather than providing anything meaningful to the elephants.
    - There is a pool in the exhibit area. It appears to be deep enough only in the centre to support an elephant's body weight, to take weight off their feet.

55. Since 2024, the handling modality of the elephants by keepers has been protected contact (PC), as mandated by the AZA. PC means a barrier is always between elephants and keepers, and management contact is made through positive reinforcement training. The PC system protects keepers from injury or death, and is less physically coercive for the

elephants. Prior to 2024, however, the elephant handlers used free contact (FC), with direct hands-on control and considerable direction of the elephants' movements and placement in exhibit areas.

56. Control of the elephants under most FC systems requires punishment training and is reinforced using a bullhook (a bullhook is a stout pole with a metal hook and a metal tip on the end. It is used in training and controlling elephants by a handler applying pressure to sensitive points on an elephant's body). A demonstration of the risk inherent in FC occurred in 2002, when the female Moja attacked and killed a keeper, who was said to be preventing her from access to her 3-year old calf, Victoria (Los Angeles Times 2002). Nevertheless, PZA kept Moja at the zoo and continued with hands-on management of her. Indeed, in 2015 the PZA chose to forfeit its AZA accreditation by refusing to retire the bullhook, insisting they would continue their hands-on management contrary to the AZA's PC-only mandate (AZA 2015). The PZA finally agreed to adopt PC in 2021 and recovered their accreditation in 2024 (PZA 2024).
57. The management philosophy involving continuous control over every aspect of elephant behaviour was captured in the *Elephantalia* documentary. Using FC prior to 2023, PZA keepers moved the elephants around their outdoor enclosure, including directing them towards and into the pool, directing them on "exercise" walks along an asphalt road, directing their separation and joining together of social groups, and directing them into the barn by requiring each elephant to hold the tail of the animal in front of them, on a daily basis.
58. The PZA has a stated policy of breeding elephants. To this end, they trained the male Jackson in electro-ejaculation procedures and practice artificial insemination with the females. The ultimate birthing process is equally artificial. *Elephantalia* recorded birth events where the females were restrained with discretely placed leg chains and prevented from immediate contact with their newborn calves through the closure of barred gates. Considerable stress was evident in the mothers' attempts to reach their calves. It appeared that PZA staff did not trust the mothers to behave properly towards their offspring. Despite this highly unnatural and intensive approach to breeding, the PZA and its sister institution (the International (Fairhope) Conservation Center) 80 miles to the southeast in Pennsylvania, have produced only seven calves since 1998. Of these, three have died and a fourth—the male Callie—was sent to another zoo. Only Angeline, Victoria, and Zuri, the three females born at PZA since 1999, remain.

59. It appears that the elephants are kept in their stalls when zoo staff are not on duty, which means they spend at least half their day and probably longer in the close confines of the tiny barn. On cold winter days, they are kept in the barn almost all day. As elephants in the wild are actively moving for up to 18 hours every 24-hour period, this involuntary confinement is both physically and psychologically devastating. It also removes agency from the elephants, depriving them of the basic need to make their own decisions on how and where they spend their time.
60. In 2014, trained dogs were used to herd the elephants, by darting around and nipping at the feet, in an apparent extra layer of protection for the keepers (KDKA News 2014). This approach was condemned as inhumane by the USDA in 2015 (USDA 2015), but there are reports that the dogs have been reintroduced to the elephant management recently pursuant to photographs reviewed for the drafting of this Declaration.
61. Because of the PZA's apparent intent on forcing the elephants "to behave normally," (which means nothing when dealing with sentient, wide-ranging individuals who have had their autonomous essence stripped by confinement) the behavioral repertoire of the five elephants in the PZA is extremely limited, and widely divergent from that of free-ranging elephants. Observations from the video clips and photographs have informed this conclusion. When the elephants are not simply standing and feeding, they can be seen walking between the front and back of the outdoor yard on the same path every time. There is no variety in their lives, no challenge to employ their mental capacity for exploration, spatial memory, or problem-solving. There is no opportunity to employ their wide range of vocalisations, to communicate and interact with a range of other elephants over distance.
62. The best that could be said for the PZA elephants is that they do not appear to have overt personality conflicts that result in aggressive actions between them. The two older females have spent over 30 years together, but it is not clear the extent to which their social interaction is affiliative, aggressive or ambivalent. There is no space in their outdoor compound to avoid each other, and it is likely that the female Moja was finally sent to another zoo because of her conflicts with the other elephants.

Summary of elephant management by the zoo

63. The elephants are managed intensively, with hands-on training and exercise activities that included until very recently the use of coercive free contact and, for a period of time, the deployment of dogs. This approach, which is recognised as cruel and potentially dangerous to zoo staff, leaves little scope for autonomy in decision-making and inevitable frustration

for the elephants. The zoo managers appear to believe that this micro-management manipulates elephant behaviour "for their own good" but nothing could be further from the truth. The emphasis placed on "enrichment" appears intended to provide novelty and stimulation to the elephants' minds, and accompany the apparent concern for maintaining bodily health. However, all this intervention imposed on the elephants is in fact evidence of the impoverishment of their environment, with all vestiges of autonomy having been removed.

64. In addition, elephants need the freedom to choose their own social companions, to avoid antagonism and bond in social groups with compatible others. In an area as small as the PZA compound, and under the intensive management regime, there is little opportunity for them to form and maintain separate sub-groups.
65. It is now accepted that elephants experience permanent damage to their brains as a result of the trauma endured in impoverished environments like the PZA (Jacobs *et al.* 2021). Angeline, Savannah, Tasha, Victoria and Zuri are undoubtedly suffering in many different ways, including cognitively because they are unable to truly exercise their astounding extraordinary cognition.

Conclusions

66. Based on my review of the PZA and its elephants, my own extensive professional knowledge and understanding of elephant biological needs, I conclude that Angeline, Savannah, Tasha, Victoria and Zuri are not being kept in anything close to a satisfactory environment consistent with an acceptable life for an elephant.
67. The life of these five elephants at PZA is nothing but a succession of boring and frustrating days, damaging to their bodies and minds, and punctuated only by interaction with their keepers. Their physical and psychological health has been severely compromised by the sustained deprivation of their autonomy and freedom of movement. They spend at least half, if not more, of each day in a barn with very little cushioning for their feet and joints; in the winter months, they are kept indoors for most of every day. When allowed outside, they are commonly unable to walk more than 110 yards in any direction, they have limited shade from the sun, and the water feature is deep enough in only one area to allow proper bathing. The elephants receive predictable enrichment activities, and are unable to separate from their companions or communicate over large distances.
68. My professional conclusions and recommendations are:

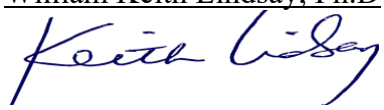
- The continued keeping of elephants at Pittsburgh Zoo & Aquarium cannot be justified on any basis. It is inhumane and cruel to subject these sentient animals to continuous control over their lives in such inadequate conditions.
- The five elephants should be moved, as soon as possible, to a "rewilding" facility in their native Africa or to a suitable, accredited elephant sanctuary in the United States. If there is a possibility of rewilding the elephants, then that scenario should be considered. However, if rewilding is not viable, the elephants should be immediately relocated to the latter.
- Their behavior has been completely controlled by their human handlers, and for this reason has been stressful to the point of psychological damage.
- There is no obstacle to their recovering some measure of successful and fulfilling lives in the favourable ecological and social surroundings of a large, appropriate habitat area such as a sanctuary.
- Pittsburgh Zoo & & Aquarium should never be used again to keep elephants captive, for public display or for any other purpose.

I declare under penalty of perjury under the law of Pennsylvania that the foregoing is true and correct.

Executed on the 14th of August 2025

at Oxford, United Kingdom

William Keith Lindsay, Ph.D



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