Exhibit 5

COUNTRY OF UNITED KINGDOM)

COUNTY OF OXFORDSHIRE) ss :

MUNICIPALITY OF OXFORD)

Affidavit of William Keith Lindsay

William Keith Lindsay, being duly sworn, deposes and says:

Introduction and Qualifications:

1. My full name is William Keith Lindsay. I am known more generally 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 affidavit in support of the Nonhuman Rights Project, Inc. (NhRP) for a writ of habeas corpus on behalf of the elephants Nolwazi, Amahle, and Vusmusi, who are confined at the Fresno Chaffee Zoo (FCZ) in Fresno, California. 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 10 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, 2003-2006, Environmental Change Institute, University of Oxford, and Member, 2009-present, Oxford Centre for Tropical Forests, University of Oxford. I have been a member of the IUCN/ 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 and 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 on offer 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 their 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 fibre and greater soluble cell contents, are leaves and finally the most nutritious plant parts: fruits, seeds and flowers. In order to satisfy their large absolute forage 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 within and between years, 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 between years and their range areas are necessarily much larger, and 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 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 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 learn all these locations and timings, remember, and 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. This memory spans years and even decades, and there is evidence that older female elephants in family groups have better survival in droughts than do younger animals, as they lead their companions to the best spots that had been favorable in the past (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, they must also be able to put memories together with sensory information, and make the correct decisions on direction and distance to move (Polansky *et al.* 2015, Jacobs *et al.* 2014).
15. 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). Olfactory areas of the elephant brain are also highly developed (Jacobs *et al.* 2014).
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 at least 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. Elephants' bodies are adapted for covering large distances. The average distance of ground covered per day is a remarkably consistent at ±10km in 24 hours (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). 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.
18. To cover this ground, elephants must have long legs, and as longer legs evolved, this has required the simultaneous evolution of foraging anatomy that can reach from ground to mouth. Modification of a prehensile upper lip has led to the development of the trunks seen

today (Shoshani 1998), which are also a highly specialized organ useful not only for feeding, but also for drinking, olfaction, grooming, social signaling, and other motor functions.

19. Studies of foraging elephants (*e.g.* Guy 1976, Short 1981, Lindsay 1994) have documented that a wide range of food items are chosen from hundreds of species of plants, including fruits, buds, leaves, climbing shoots, flowers, growing stems, woody stems and branches, bark, and roots. Because it is abundant and 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, to select the most nutritious, 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 make swift assessments and take appropriate responses. 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 that this presents itself: through competition in the way they use land and through killing for the ivory trade (Thouless *et al.* 2016). In land use competition, elephants can themselves come into conflict with human groups 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 on offer in natural habitats. Elephants make the rational foraging choice of preferring these 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. Again, there is injury and mortality on both sides of this conflict (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 people 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 – they 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). There is a similar ability to 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 the past decades. Several of these 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, however, does make the elephants more fearful and, thus, potentially more aggressive in their approach to humans (Davies *et al.* 2011).
31. Electric fences are 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 elephants' natural aversion to pungent plant products, such as chillies (Osborn 2002), and 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).

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 conflict with and domination towards a coexistence with and appreciation of them as creatures deserving of 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 Standards of the American Association of Zoos and Aquariums (AZA 2022) specify the following minimum acceptable spatial areas for indoor and outdoor enclosures for its member zoos:

- 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).

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 current standards of the British and Irish Association of Zoos and Aquariums (BIAZA 2019). They go some way beyond AZA standards, having increased steadily over recent years, and include:

- Indoor: Females – 300m^2 (3,229 square feet) for up to and including 4 females; additional females 80m^2 each (861 sq.ft.); Males – 160m^2 each (1,722 sq.ft.)
- Outdoor: Females and males – 3,000m^2 for any shared space (32,290 sq.ft. or 0.75 acre); this is a minimum and a much larger space for 5 or fewer females and males of 20,000m^2 (4.9 acres) is considered desirable.

The BIAZA Standards minimum figures for 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 (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. They recommend 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 standards summarised above 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 weaker than both those of the United Kingdom and of the Coalition elephant welfare experts, which are themselves also inadequate. Furthermore, they all fall far, far short of fulfilling elephants' requirements for space in both indoor and outdoor facilities (in fact, by several orders of magnitude). 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 criteria.

Information sources and observations of Nolwazi, Amahle, and Vusmusi at the Fresno Chaffee Zoo

40. Nolwazi and Amahle are female African savannah elephants, aged approximately 27 and 12 years old respectively. Vusmusi is an 18-year-old male African savanna elephant. The three elephants are currently at the Fresno Chaffee Zoo. Their history and observable present state indicate that they have led lives with only 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 (©2021; version 7.3.4.8248) accessed on 22 February 2022, showing the Fresno Chaffee Zoo elephant exhibit. Zooming and moving around this image allowed visual inspection of the elephant enclosure and its features. I made use of the Ruler tool for measuring linear distances and areas of polygons to estimate the dimensions and size of the main elephant enclosure, the shade screen, and the wading pool.

Documents

- A Word document provided by the NhRP, with publicly available hyperlinks, summarising the location and management of the Fresno Chaffee Zoo and its elephant exhibit, along with the history of Amahle, Nolwazi, Vusmusi, and others that have been held at the Zoo. Available at: https://bit.ly/3tYWvhe.
- A presentation on the discovery and treatment of EEHV infection in two elephants at Fresno Chaffee Zoo (Nodolf & Presley 2020), one of which died (Miss Bets) and one which has survived – so far (Amahle). Available at: https://bit.ly/3vZSzQ6.

Websites

- Facebook post: Video clip "Stomp & Chomp" 2020. Vusmusi feeding on pumpkins. Available at: https://bit.ly/3CKddoz.
- Tiktok posts: 2 clips of Vusmusi. Available at: https://bit.ly/3tQybOC and https://bit.ly/3t9vF73.
- YouTube videos: 2 videos. Available at: https://bit.ly/3Ja0U7x, and https://bit.ly/3JckyzM.
- KSEE24 news item showing the arrival of Amahle and Nolwazi. Available at: https://bit.ly/3i8dZlL
- Zoophoria interview with the designer of the current elephant exhibit (Ponti 2017). Available at: https://bit.ly/3JcHuPq.
- 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

- One hundred eighty-two (182) image files (in *.jpg format), showing aspects of the elephant compound, the elephants Amahle and Vusmusi, and the interaction of Vusmusi with zoo staff. Available at: https://bit.ly/3t9ZhB3.
- Twenty-six (26) short video clips (*.MOV format) of varying length (3-31 seconds), showing zoo visitors. Available at: https://bit.ly/3t9ZhB3.

Information on the elephants held at Fresno Chaffee Zoo: present and past

41. Vusmusi was born in captivity at San Diego Zoo (SDZ) Safari Park on 23 February 2004. His mother, Ndula, was taken to SDZ Safari Park from a fenced reserve area within Hlane Royal National Park, Swaziland (now eSwatini) in 2003, when she was pregnant with Vusmusi. The justification given for this transfer was that the reserve in Swaziland was said to be overpopulated and the elephants would have been culled, but this was a fiction that was useful to both the reserve managers and the importing zoos. In reality, the reserve managers simply wished to thin the elephant numbers in the small fenced area where elephants were kept within the much larger Park, and at the same time earn some revenue (Siebert 2019).
42. On 21 August 2015, at the age of 11 years, Vusmusi was taken from his family in San Diego and sent to FCZ. This removal of males from their natal family, so that they are unlikely to ever see them again, is sadly typical of the husbandry of male elephants in North American and European zoos, and completely unlike the natural situation. While at San Diego, Vusmusi repeatedly damaged and broke his tusks "because he likes to hit them on things", an unnatural behavior indicative of stress and/or boredom. Two years after he arrived at FCZ, metal caps were fitted to the ends of his tusks; the damage apparently ceased and the caps remained in place until his tusks grew longer (Acla 2017).
43. Amahle and Nolwazi were born in Hlane National Park in Swaziland (now eSwatini). Nolwazi is Amahle's mother. In 2016, 13 years after the AZA's first import of wild Swaziland elephants—which included Vusmusi's mother—there was a second importation for the same questionable reasons as mentioned by Seibert (2019), and Amahle and Nolwazi were imported to Dallas Zoo, along with 3 other female elephants from the same population. Two years later, on 20 October 2018, Amahle and Nolwazi were separated

from their companions from Swaziland, who remained in Dallas, and they were taken to FCZ to form the nucleus of the Zoo's planned African elephant "family", in the revamped exhibit – see below.

44. The longer history of elephant keeping at FCZ is even more dismal. It began in 1949, and since then there have been only 12 elephants in total: 5 African and 7 Asian. Three Africans remain alive, while two have died. Four of the Asians were moved on to other zoos, while the other 3 died at the zoo. There have been no recorded births of any elephants during the entire period from 1949 to the present day.
45. The first elephant to be kept at FCZ was an Asian female called Nosey (not to be confused with the former circus elephant of the same name who is now at the Tennessee Elephant Sanctuary). She arrived at the zoo in 1949 from an unknown wild source at age 3 and until 1981, spent the next 32 years completely alone. She died in 1993 at the age of 47, when she was euthanized after suffering from arthritis, a typically zoo-caused ailment never seen in the wild. A 2-year old zoo-born male Asian was brought in during 1981 and two wild-born females came in 1983, arriving from a small-scale circus trainer in Sarasota. The male died in 1993, while one of the females was euthanized and the other was moved to the LA Zoo in 2017.
46. Three more Asian elephants spent varying times at FCZ. Two wild-born females arrived at the same time in 2003 from Santa Barbara Zoo, only to be sent back a year later. A wild-born male Asian spent 8 years at Fresno during 1995-2003, having been at 4 other zoos and animal traders before then. He was sent to the entertainment-industry supplier Have Trunk Will Travel in 2003.
47. African elephants did not arrive at the zoo until 2015. Two females were brought in during May 2015 from elephant dealers, the Riddle family. Both have since died:
    - Miss Bets – Born in captivity at Riddles' "Sanctuary", she was brought to FCZ at age 7. She was euthanized in 2019, 4 years after arrival at FCZ after contracting EEHV, which was not detected until after autopsy.
    - Amy – Born in the wild, she was brought from Riddles' to FCZ at the same time as Miss Bets. She was euthanized in 2017 after suffering a torn ligament in her right elbow.
48. The deaths of Amy and Miss Bets are indicative of the poor husbandry record at the Fresno Chaffee Zoo. Miss Bets died of EEHV in 2019. Amahle was also diagnosed with EEHV but was successfully treated after intensive veterinary interventions.
49. With the death of Miss Bets, there is now no adult companion for Nolwazi.

The elephant facilities and their management

50. It is clear to me in my professional opinion that the facilities and their management at the Fresno Chaffee Zoo fall short of fulfilling the physical and psychological needs of Amahle, Nolwazi, and Vusmusi, including the need to exercise their autonomy, in both indoor and outdoor facilities.
51. The elephant exhibit was redesigned and re-built in 2015 under the direction of the Portico Group, who have designed a number of recent zoo exhibits in the US. Information on its features can be found in Ponti (2017). While the architect notes the importance of catering to natural behaviors of wild animals, it is clear that the primary purpose is to "create an experience that was as natural as possible" for zoo visitors, a place that "looks" like a fragment of wild habitat with animals placed within the display. The new elephant exhibit was to replicate a mock African savannah, stocked with elephants that would form a natural-looking "family" of individuals.
52. The location of the zoo is an urban area of mixed use, apparently with light industry and business premises as well as housing. The elephant exhibit is located in the southeast corner of the complex. There are major transportation arteries on all four sides of the zoo grounds, with attendant noise a constant source of auditory disturbance to the elephants. A freeway, the Golden State Highway (State Route 99), runs along the western edge of the grounds, while four-lane roads border the other three sides. These are: N Golden State Boulevard running along the eastern boundary, W Olive Avenue along the northern boundary, and Belmont Avenue on the southern boundary. The N Golden State Boulevard is about 100 yards from the elephant barn, and Belmont Avenue is about 200 yards. There are restaurants and a nightclub located across Belmont Avenue from the elephant enclosure.
53. A double-track railway line, serving both Union Pacific and Burlington Northern & Santa Fe (BNSF) networks, runs along the eastern boundary, about 25 yards to the east of N Golden State Boulevard – 125 yards from the elephant barn – and dozens of trains pass along this line on a daily basis. The local area is thus an entirely unsuitable setting for keeping elephants; it subjects these animals with acute hearing to a sustained sensory onslaught.
54. The indoor and outdoor areas provided to the elephants have been examined with different information sources. Information on the structure of the indoor quarters has been gleaned from an elephant "training" video, available at: https://bit.ly/3KJb3IA. The stalls have flat concrete floors with a thin layer of sand; there is very little cushioning of the hard substrate.

This will be hard on the elephants' feet and joints if they spend any significant time indoors. Water is provided in a square box-like trough outside the bars. The walls are flat concrete, with no exterior views; the doors to the outside area are flat steel sheets. Light comes from above, either from artificial lighting or skylights. The walls reflect all sounds, and it is a noisy place.

55. The size of the elephant living space within the barn is estimated, from examination of the Google Earth image of the barn, to be some 60 x 15 yards, or roughly 8,000ft^2. It is not clear how many stalls there are, at what size, or whether the holding stalls are fixed in size, or the separating bars can be adjusted to increase or decrease the space per stall. The Portico Group interview suggested that there was a separate bull barn, but it was not possible to tell from Google Earth whether there was a separate building for this purpose, or whether it was a subdivision of the main barn building.
56. This 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 for keeping them confined for any more than this brief amount of time; confinement for any longer periods is likely to lead to foot and joint damage from standing on the hard substrate, and psychological damage from the noise and the frustration of prevented choice and movement.
57. The size of the outdoor area is said to be 5 acres according to the statements of zoo employees. It is divided into a front and back yard, and has a large pond with a dividing wall down the middle that separates the elephant exhibit from the adjacent exhibit housing rhinos, giraffes and other species. Examination of the Google Earth satellite image indicates that the various sections available to the elephants have the following dimensions:
    - Front yard: 2.35 acres. Long axis = 150 yards; width = 80 yards
    - Back yard: 1.1 acres. Long axis = 110 yards; width = 50 yards
    - Holding compound/ inspection area next to the barn: 0.2 acres
    - Pond to the dividing wall separating it from the adjacent animal enclosure: 0.22 acres

    The total area of the front and back yards and holding compound comes to 3.65 acres. Adding the pond area available to the elephants brings it to a total of 3.87 acres. As noted above, the natural ranges of elephants are much, much larger, by several orders of magnitude. The linear distance available for directional walking is little more than 100 yards, a tiny fraction of the miles that elephants cross on a daily basis in natural environments.

58. In addition, elephants need to be able to choose their own social companions, to avoid antagonism and bond in social groups with compatible others. In an area the size of the current zoo compound, there is little opportunity to form and maintain such separate sub-groups.

59. The management of male elephants in zoos, with their distinct social needs and competitive reproductive behaviour, is a particular challenge that has not been successfully addressed and for which solutions remain elusive (Hartley *et al.* 2019, Schmidt & Kappelhof 2019). Allowing males to live separately from females, in mixed age groups of compatible associates, but to associate at times of their own choosing, is one challenge. A second, arguably more profound conundrum, is the need to separate the sexes to avoid unwanted breeding, and with older males, their seasonal state of musth. The latter involves heightened testosterone levels, more aggressive contesting between males and highly motivated seeking of females with whom to mate (Eisenberg *et al.* 1971. Lee *et al.* 2011).

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

- Much of the ground cover is grassy, which is apparently kept green by irrigation (Ponti 2017). It provides a soft substrate for walking but is too short to allow significant grazing by elephants. The terrain is flat and unvarying, offering no stimulation or encouragement to explore. A few boulders are stuck in the ground, including in the passage between front and back yards. 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 trees that were allowed to remain in the compound. The trunks of the trees are protected from the elephants by wire mesh. There are also palm trees, whose bark is not damaged. The trees offer some limited relief from the sun, which is said to be hot during summers in Fresno. As noted, 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 are two water features, one large and one smaller. Neither appears deep enough to support elephants' body weight, to take any weight off their feet. An artificial waterfall is another feature of more interest to visitors than to the elephants, as it will have quickly become a part of everyday life. The most that can be said is it provides a source of drinking water.

61. In combination with the bleak appearance and size limitation of the enclosure, there are several deficiencies in its management, including the feeding regime. It appears that oat hay, grain, vegetables, alfalfa cubes, and occasionally woody browse are scattered on the ground or suspended from hooks or baskets. There are also small niches in the mock baobab tree and wall next to the artificial waterfall where food can be hidden for the elephants to find. None of these "enrichment" efforts would provide much stimulation to the intellect of elephants when compared to natural foraging challenges; elephants would soon grow accustomed to the predictable routine of these food provision modalities. None of this so-called "enrichment" would be necessary, of course, in a natural habitat, or an appropriate sanctuary, with extensive areas of native vegetation.
62. It appears that the elephants are moved into their stalls when zoo staff go off duty, spending at least half their days and probably longer in the close confines of the barn. On cold days, they are kept in the barn all day. As elephants in the wild are actively moving for up to 18 hours of every 24-hour period, this involuntary confinement is both physically and psychologically harmful. 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.
63. The handling modality of the elephants by keepers appears to be protected contact, with the keepers giving demonstration shows to the public. Such performance in front of a noisy public is undoubtedly disturbing to the elephants. The behavioral repertoire of the three elephants in the Fresno Chaffee Zoo is extremely limited, widely divergent from that of free-ranging elephants, and indicative of the pathology of zoo husbandry. Observations from the video clips and photographs have informed this conclusion. When the elephants are not simply standing and feeding, they can be seen to walk between the front and back yards 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.
64. The best that could be said for the current elephants is that they do not appear to have personality conflicts that resulted in aggressive actions between them. It is not clear how much social interaction there is between Vusmusi and the two females.
65. It is now accepted that elephants experience permanent damage to their brains as a result of the trauma endured in impoverished environments (Jacobs *et al.* 2021). However it is less clear whether this impact is more damaging when the animal has had a longer period of independent, nature-based living before the deprivation; whether the trauma occurs

earlier or later in their lives. Most of the elephants currently held in zoos were either born in captivity, or were taken from the wild at a very early age. The two female elephants at FCZ, Nolwazi and Amahle, were removed from the wild at ages 21 and 6 respectively, and they spent more than half their lives in natural surroundings – for Nolwazi, over three quarters of her life.

66. Drawing from my own experience and from consultation with other elephant experts (J. Poole & B. Jacobs, personal communication), it remains unclear whether the transition to captivity would be more traumatic for a young naïve elephant, or an older animal who has had relatively little experience with captive conditions, and a longer memory of rich natural environments. On balance, both Poole and Jacobs consider it more likely that a younger elephant would suffer more profound damage than an older animal, because their fundamental brain structures are still developing and they would then have a longer period of reinforcing the damage in the impoverished environment of a zoo. An elephant born in captivity, such as Vusmusi, would suffer these impacts from birth. However, an older elephant coming to captivity will suffer as well, with depression-like symptoms, frustration and the effects of chronic stress, as they continually compare the current captive conditions with the freedom they had known. This could certainly be very debilitating.

Conclusions

67. On the basis of my review of the sources of evidence I have studied and my analysis in relation to my own extensive professional knowledge and understanding of elephants' undeniable biological needs, I conclude that Nolwazi, Amahle, and Vusmusi are not being kept in anything close to a satisfactory environment that is consistent with an acceptable life for an elephant.

68. The life of these three elephants at Fresno Chaffee Zoo 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. When allowed outside, they are unable to walk more than 100 yards in any direction, they have limited shade from the sun, and their artificial water features are not deep enough to allow proper bathing. The elephants receive predictable enrichment activities, are unable to communicate over large distances, and their acute hearing is

bombarded by constant auditory disturbances from major transportation arteries on all four sides of their enclosure.

69. A return to the wild is not a realistic option for these elephants, particularly Vusmusi who has spent a lifetime in captivity, as elephants lose knowledge of appropriate foraging and social behavior the longer they spend away from natural ecosystems. However, elephants are extremely intelligent and adaptable animals, and Nolwazi, Amahle, and Vusmusi could still lead something approaching a normal life if they were removed from the zoo and relocated to a suitable sanctuary of appropriate habitat.
70. My professional conclusions and recommendations are that:

    - Nolwazi, Amahle and Vusmusi should be moved, as soon as possible, to a suitable sanctuary in North America, according to practice that is well-established by sanctuary professionals. Even though Vusmusi in particular has spent his entire life since birth in the barren confines of zoo compounds, and his behavior has been completely controlled by his human handlers, this is no obstacle to his developing a successful and fulfilling life in the favourable ecological and social surroundings of a large, appropriate habitat area such as a sanctuary.
    - It is possible that Nolwazi and Amahle might adapt more quickly to a natural environment with interesting terrain and living vegetation, since they have lived for only a few years in the artificial zoo environment. If a return to a sanctuary natural ecosystem in Africa (TAP 2022) was financially feasible, this would be an even better option, particularly for Amahle and Nolwazi.
    - Fresno Chaffee Zoo should never be used again to keep elephants captive, for public display or for any other purpose.

I, William Keith Lindsay, PhD, certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

William Keith Lindsay PhD

Dated: MARCH 17, 2022

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Exhibit A

Curriculum Vitae

Name	William Keith LINDSAY
Profession	Natural Resources Advisor/ Monitoring & Evaluation Expert
Date of Birth	5 November 1952
Nationality	Canadian / British (dual citizenship)

Key experience

Keith Lindsay is a natural resources advisor/ monitoring & evaluation expert with over 40 years' 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. He was a senior staff member at the Oxford-based consultancy, The Environment & Development Group (EDG), during 1994-2013. He 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, Dr Lindsay has been an independent consultant on assignments for international donor agencies and NGOs in Africa and Asia.

Dr Lindsay has been actively involved in research on the ecology of African elephants with the Amboseli Elephant Research Project of southern Kenya since 1977, focussing on the relationships between habitat conditions, foraging behaviour and population dynamics. His work continues on policy support for elephant conservation, international trade in ivory and live elephants under CITES, and efforts to improve their well-being in both the wild and captivity.

Education

Ph.D. Zoology, 1995, University of Cambridge
M.Sc. Zoology, 1982, University of British Columbia, Vancouver, Canada
B.Sc. (Hons.) Zoology, 1974, University of British Columbia, Vancouver, Canada

Summary of selected employment record

- Myanmar: Monitoring & evaluation of Human-Elephant Coexistence project (Elephant Family, 2019-present)
- UK/ Europe: Support to African Elephant Coalition, CITES CoP18 & Intersessional Committees (Fondation Franz Weber, 2017-present)
- Tanzania: Terminal Evaluation Kilombero wetlands conservation (Enabel - Belgium, 2018)
- UK/ Brussels: Revision of project design for Sustainable Wildlife Management Project (EU/FAO, 2018)
- UK: CITES Information Document on live trade in African elephants (Humane Society International, 2017)
- Japan: Survey and report on solitary elephants in Japan's zoos (Elephants in Japan/ Zoocheck, 2017)
- Kenya: Guidelines for transboundary conservation projects in Africa (European Commission, 2017)
- Mongolia: Results Framework, Forest conservation project (FAO, 2015–16)
- UK/ South Africa: Support to African Elephant Coalition, CITES CoP17 (FFW, 2015-16)
- Tanzania: Mid-term Evaluation CBNRM project suite (EC, 2015–16)
- Tanzania: MTE southern Tanzania parks (SPANEST) project (UNDP/GEF, 2015)
- Thailand: MTE Sustainable management of biodiversity (SMBT) project (UNDP/GEF, 2014–15)
- Zambia: Benefit sharing study in Zambia's Game Management Areas (UNDP, 2014–15)
- Cambodia: Revision of MTE of Sustainable Forest Management project (UNDP/GEF, 2014)
- UK/ Global: Revision of Monitoring & Reporting Framework for UNREDD, 2011-15 (FAO, 2013-14)
- Botswana: Terminal Evaluation Improved Sustainability of Protected Areas project (UNDP/GEF, 2013)
- UK/ Central Africa: Gaps & options for elephant conservation in Central Africa (CMS/UNEP, 2011)
- Kenya: National Conservation & Management Strategy for Elephants (Kenya Wildlife Service, 2007–08)
- South Africa: Contributing author SA Elephant Assessment (CSIR, 2007)
- South Africa: Corresponding member Science Round Table (Dept. Env. Affairs & Tourism, 2005–06)
- Cambodia: MTE Conservation of Cardamom Mountains forest (UNDP/GEF, 2004-05)
- UK/ Chile: Technical support at CITES CoP12 (Care for the Wild International, 2002, 2004)
- Mali: Initiating Measures to Protect Gourma Elephants (US Dept. of State/ USFWS, 2003–2005)
- Jordan: Range ecologist (IFAD, July 1995)
- Botswana: Support to stakeholders' conference: African Elephant in the Context of CITES (EU, 1994)
- Botswana: Wildlife Ecologist/ Elephant policy, Department of Wildlife & National Parks (EU, 1988-92)
- Kenya/ UK: Research & analysis, PhD - Amboseli elephant ecology, University of Cambridge (1982-87)
- Kenya/ Canada: MSc - Amboseli elephant ecology, University of British Columbia, (1977-82)
- Kenya: Field ecologist Amboseli National Park (New York Zoological Society, 1977-79, 1983)

Publications

Scientific publications and technical reports

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2018: *Elephant conservation: International trade in live African elephants: an update.* PAWS International Captive Wildlife Conference 2018, 9-11 November 2018. Performing Animal Welfare Society, Los Angeles.

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Exhibit B

Fresno Chaffee Zoo

The Fresno Chaffee Zoo is currently holding captive 2 female African elephants and 1 male African elephant.

- Nolwazi is an approximately 27-year-old wild born female African elephant. She was born in Hlane National Park, imported to the Dallas Zoo from Swaziland in 2016, and transferred to the Fresno Chaffee Zoo in 2018. Her daughter is Amahle, who was imported from Swaziland with her and lives with her at the Fresno Chaffee Zoo.
- Amahle is an approximately 12-year-old wild born female African elephant. She was born in Hlane National Park, imported to the Dallas Zoo from Swaziland in 2016, and transferred to the Fresno Chaffee Zoo in 2018. In 2019, Amahle was diagnosed with EEHV. Here is a presentation on the Fresno Chaffee Zoo's treatment of Amahle, including training her to be restrained (pg. 57-78).
- Vusmusi, also known as Moose or Musi, is a 17-year-old male captive born African elephant. He was born in 2004 at the San Diego Zoo Safari Park. His mother is Ndulamitsi, she was pregnant with Vusmusi when she was imported to the US from Swaziland and his father is unknown. He was transferred from the San Diego Zoo Safari Park to the Fresno Chaffee Zoo in 2015. In 2017, after breaking and cracking his tusks numerous times, the zoo had metal covers made for them.

There have been 3 elephant deaths at the Fresno Chaffee Zoo since 2017

- Amy, a 30-year-old wild-born African elephant, died in 2017 after being euthanized due to a torn ligament in her leg which impacted her mobility. She died two years after arriving at the Fresno Chaffee Zoo. Her daughter was Miss Bets, who also died at the Fresno Chaffee Zoo.
- Miss Bets, an 11-year-old captive-born African elephant, died in 2019 of EEHV. She died four years after arriving at the Fresno Chaffee Zoo.
- Kara, a 42-year-old wild-born Asian elephant, died in 2017 when she was euthanized due to pain from chronic osteoarthritis. She had lived at the Fresno Chaffee Zoo for 34 years.

The Elephant Exhibit

The Fresno Chaffee Zoo remodeled its elephant exhibit in 2015 and it is one of the exhibits that comprises the zoo's 13-acre African Adventure section of the zoo.

The elephant exhibit is approximately 4 acres, although the usable space for the elephants appears closer to 3 acres. When it opened, the then zoo director said: "Elephants also will live in a typical matriarchal setting as they do in Africa…the zoo will start with three and could build up to six or eight on the 4-acre portion of the expansion." When the zoo separated Nolwazi and Amahle from the Swaziland herd at the Dallas Zoo and brought them to Fresno, they said it was for breeding purposes. They also touted that Amahle would have a similarly aged female elephant to socialize with (Miss Bets); however Miss Bets died less than six months after Amahle's arrival.

The outdoor yard includes two water features, a pond/pool and a waterfall that is at times turned off. There is a fake rock wall that is a part of the waterfall feature that has holes in it which the elephants can reach in and grab food from. There is a pond-like water feature which separates the elephants from the rhinos, it is unclear how they prevent the elephants from crossing over as there is no visible barrier. The elephants are able to see the rhinos and other species from their exhibit. There is a significant amount of traffic and construction noise that can be heard at the elephant exhibit. The zoo is right off the SR-99 freeway and a new exhibit, "Kingdoms of Asia," is being built very close to the elephants.

The primary substrate of the exhibit is natural grass and there are different types of trees which the elephants are able to touch. Some trees appear to be wrapped in wire. The yard is separated into a front a back yard, with a gated walkway that the elephants can pass through to access each yard. There appears to be access to the barn from both sections of the yard. There is also a small pen that the elephants are put in for public training sessions. The pen is at the furthest part of the yard away from the barn.

In addition to the rock wall, there is at least one feeding station, a pole that has hay hanging from it. There appeared to be some hay scattered near the pathway Vusmusi was walking on the day I visited. The elephants' diet includes grass, oat hay, grain, vegetables, and alfalfa cubes. During my visit, Vusmusi spent most of his time at the feeding wall and walking the same path between the front and back sections of the yard. He was the only elephant out during the 90 minutes I observed the exhibit. When it is too cold outside, the elephants are kept in the barn.

Photos and Videos

Photos and Videos from NhRP Visit to Zoo

Elephant "Stomp and Chomp" (2020)

Video of Training Session Inside the Elephant Barn

Video from Oct. 2021 Showing all 3 elephants in yard

Video from zoo visitor from Sept. 2021 (elephant are in clip from 1:50 to 3:20)

TikTok of Vusmusi tearing branch from tree

TikTok "Meet Musi"

TikTok of Nolwazi and Amahle in barn, Amahle appears to be engaging in stereotypic behavior