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February 5, 2024

Standing Senate Committee on Energy, the Environment and Natural Resources
Committee Clerk: Raymond St. Martin, enev@sen.parl.gc.ca
Subject: Bill S-15 and S-241.

Purpose: We are submitting the attached documents for the consideration of members of the Standing Committee on Energy, the Environment and Natural Resources in their study of Bill S-15, in conjunction with Bill S-241.

S-15 Summary

This enactment amends the *Criminal Code* to create offences related to keeping elephants and great apes in captivity, subject to certain exceptions. It also amends the *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act* to, among other things, specify the circumstances in which the importation or exportation of living elephants and great apes may be permitted as well as the circumstances in which the keeping of these animals in captivity may be authorized.

African Lion Safari

African Lion Safari® is a Canadian-owned family business created in the name of conservation by the late Colonel G.D Dailley. The park opened its gates to the public on August 22, 1969, with 40 lions in 3 reserves; today the park houses in excess of 1,000 animals comprised of over 100 species where animals roam in 2 to 20 hectare (5 to 50 acre) reserves.

The park is comprised of over 750 acres, 250 of which provide animals with large areas of bush, grasslands or forest in which they can interact naturally with other animals. In several Game Reserves, mixed species roam and interact as they would in the wild. 25 to 30 acres has been developed for walk through areas and exhibits and the balance of the property is comprised of farm, bush and other habitat, including 40 acres of provincially significant wetland which we maintain and monitor.

Our wildlife farm provides a unique viewing opportunity for visitors to see, hear, and learn about different species of animals with which they may otherwise never come in contact.

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Our Herd of Asian Elephants

African Lion Safari is recognized worldwide for its expertise in elephant welfare. We are proud to have a very successful Asian elephant conservation programme. Our elephant care professionals are regularly consulted by conservation organizations worldwide for their input on issues of elephant welfare, healthcare management and conservation.

Our herd of 17 elephants live in a very natural social structure with a large cohesive multi-generational family. They enjoy a rich and diverse environment with the ability to roam over 200 acres of woodlands, fields, streams and ponds, year-round.

Key Issues and Concerns with Bill S- 15

1. S-15 was not drafted as a collaborative, welfare-based legislation; instead it is written with a ban approach. As the only institution in Canada, with a large herd of elephants, it is very disappointing that African Lion Safari was not consulted prior to the introduction of this bill to discuss the huge implications it will have on our Asian elephant conservation and research programme.

2. The specific focus of this legislation implicates facilities such as African Lion Safari that are accredited members of CAZA; which adhere to strict animal health and welfare standards. This bill effectively does nothing for animal welfare and does not resolve the Minister of Environment's mandate letter to introduce legislation to "protect animals in captivity." Bill S-15 targets 50-60 Elephants and Great apes, who are well cared for at a few Accredited Institutions across Canada; rather than focusing on the real issue of roadside zoos, the pet trade industry and the hundreds of big cats currently in Ontario alone.

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Key Points of the Bill that would Affect African Lion Safari

1. ***Prohibition on possessing and breeding an elephant or great ape that is in captivity.***

   Bill S-15 fundamentally inhibits African Lion Safari's Research and Conservation work for the Asian elephant. The park has contributed over 40 years to the preservation of this endangered species. African Lion Safari has pioneered many ground-breaking research initiatives for the Asian elephant and has a long history of participating and contributing to conservation and research projects, both at the park and in range countries. Our elephant care professionals are regularly consulted by conservation organizations worldwide for their input on issues of elephant welfare, healthcare management and conservation (see attached document for list of partners, research projects, reference letters and peer reviewed journals).
   African Lion Safari has a proven track record for having one of the most successful conservation programmes for Asian elephants in North America. Since 1991, the park has had 25 births; a 100% live birth rate.

2. ***Prohibition on using elephants or great apes for entertainment purposes.***

   Clarification should be provided on the definition of entertainment. Visitors are often "entertained" simply by observing the animals engaging in natural behaviour. Is it wrong to be entertained and engaged in this case? Observing animals in this manner has been proven to be an effective communication method for visitors on the biodiversity crisis and the many issues that threaten the survival of species in their range countries.

   In a study by Coolman et al. (2020) it was found that people who experienced close-up encounters with "engaging" animals experienced significantly lowered tense (i.e., stress) responses, whereas those without close-up encounters with animals did not experience a change in their tense response (See attached letter dated November 27, section "elephants in zoos foster conservation action by visitors").

The power of being able to see, smell and hear an elephant is a transformative experience. As people understand the plight of elephants in the wild, they are moved to help us save them. African Lion Safari is committed to ensuring a future for elephants. The vast majority of people will only ever experience an elephant at a zoo, where they can also learn how to take action to help the species in other parts of the world.

3. **Exceptions if in the best interest of the animal's welfare, scientific research, conservation, and veterinary care.**

All of these exceptions may apply to African Lion Safari, but nonetheless, it creates a tremendous amount of uncertainty given that "permits" would be arbitrarily granted by the Minister and the department.

Exceptions for those with a provincial license. Import and export of elephants or great apes is prohibited except where a permit is granted (for reasons similar to the exceptions listed above)

Import and export of elephants is federally regulated by CITES, administered by Environment and Climate Change Canada under the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA) and the Wild animal and Plant Trade Regulations. Bill S-15 would prove redundant as all elephants in Canada are in accredited zoological facilities and have oversight by CITES as well as accreditation standards.

The park participates in Population Management Programmes for many animals in their care. Having an "exception" in legislation, which may or may not be granted, creates uncertainty for African Lion Safari and its international partners.

Breeding and reproduction gives elephants an opportunity to express and maintain natural and appropriate social behavior which then leads to positive individual and group welfare as well as enriches their lives.

Requested Amendments

The specific amendments African Lion Safari seeks are as follows:

1. There is no science-based evidence that has established that certain animals, particularly Elephants and Great apes, should not be in captivity. This part of the preamble should be removed. Delete any reference to animal cruelty.

2. There is no need to change current regulations. As an endangered species, Elephants and Great apes are already federally regulated by ECCC through WAPPRIITA and CITES. Institutions acquiring Elephants or Great apes must follow robust WAPPRIITA and CITES regulations. Elephants and Great apes in Canada are housed at accredited institutions that uphold the highest standards and practices of animal care with respect to animal welfare, conservation, scientific research, and public education. Animals must be acquired in a manner that does not harm wild populations, and contributes to a species' survival or recovery.

   Amendments we are seeking:

   a. Delete any reference that it is a criminal offence to possess or breed an Elephant or Great ape. Remove ban approach on Elephants and Great apes.
   b. Strike any reference to it being an offence to import or export a living Elephant or Great ape, reproductive or bio-material. In Canada, to exchange specimens with other institutions, you will require all necessary CITES permits. This applies to any CITES-listed species or its parts or derivatives, including but not limited to blood, serum, and microscope slides.
   c. Make it regulation that any new institutions housing or acquiring Elephants or Great apes must be CAZA accredited.

3. Ensure equality of legislation and regulations by not including any automatic licenses or permits to institutions that have Great apes (Toronto Zoo, Calgary Zoo, and Granby Zoo). Alternatively, licenses or permits could be granted for conservation and science for conservation purposes to all accredited institutions currently housing elephants including African Lion Safari, Parc Safari and Edmonton Valley Zoo. These institutions should be exempted from limitations on ownership or importation / exportation of living Elephants and their genetic materials.

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As an Accredited institution of Canada's Accredited Zoos and Aquariums (CAZA), African Lion Safari supports and encourages the recognition of CAZA standards in legislation and its use as best practices for wildlife in human care in Canada. Members of CAZA should be recognized as animal welfare organizations and be exempted from the limitations of Bill S-15.

We respectfully request that the committee review and consider the factual and science based information provided by African Lion Safari. We are hopeful that science and facts will prevail over emotion and ideology.

At African Lion Safari, we are unwavering in our resolution to continue our conservation mission to provide the highest standard of care for our elephants. Our organization and staff work tirelessly every day, at an international level, to ensure that this endangered species survives for future generations.

African Lion Safari has prepared the attached chart (attachment 1-Response to Misinformation), clarifying misleading allegations, which were previously shared and presented in the Senate.

Please find attached 16 documents supporting African Lion Safari's position statement.

Should you have any questions or require additional details, please feel free to contact the undersigned at the coordinates provided below.

Sincerely,

Trish Gerth
General Manager, African Lion Safari
519-623-2620
tgerth@lionsafari.com

Cc: CAZA National Office

Attachments: 16 files

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Attachments:

1. Response to Misinformation- ALS
2. Senator Klyne November 27 2023 EN
3. Peer Reviewed Publications
4. Research and Conservation Collaborations
5. Elephant Consultations
6. Research Currently underway
7. Conservation Projects through International Elephant Foundation
8. Vietnam Invitation
9. Forum Thank you letter
10. Journal- Monitoring Thermoregulation Patterns in Asian Elephants
11. Asian Elephant Support letter
12. Elephant Managers Association Support letter
13. CSNC-KHS Support letter
14. Forum Support letter
15. African Lion Safari Information
16. AZA Strategic Plan for Thriving Elephant Populations

Attachment 1

AFRICAN LION SAFARI'S RESPONSE TO MISINFORMATION

Concerns/Issues	Allegations and Misleading Information Presented	Response to Misinformation
Intelligence and Emotional Traits	Elephants are intelligent and highly emotional animals with excellent memories and a strong sense of empathy. Their primary sensory experiences are through smell and hearing. They communicate using low-frequency sounds inaudible to humans. They are altruistic, trying to revive sick individuals and mourning their dead.	African Lion Safari's herd of Asian elephants live in a very natural social structure with a large, cohesive, multi-generational family. They enjoy a rich and diverse environment, with the ability to roam over 200 acres of woodlands, fields, streams, and ponds. During this time, the elephants explore and have freedom of choice in terms of their location and activities
Social Structure and Behavior	Elephants have a matriarchal social structure, living in herds with adult females, adolescents, and young. Older females hold knowledge crucial for the herd's survival. They exhibit trust, following a matriarch to a secret drinking hole during drought.	African Lion Safari has a total of 17 elephants. Two family herds made up of grandmothers, grandfathers, mothers, fathers, daughters, sons, aunts, nieces, uncles and nephews.
Captive Elephant Population in Canada	Canada houses 23 captive elephants. African Lion Safari near Hamilton has 17 Asian elephants, Edmonton Valley Zoo has Lucy, a lone Asian elephant, Parc Safari in Quebec has two African elephants, and Zoo de Granby has three African elephants. The capture of elephants from Africa and Asia for North American zoos contradicts elephant conservation efforts.	There are strict rules (CITES) in place when an animal is being moved from the wild into a captive population. African Lion Safari's herd of Asian elephants consists entirely of elephants that were not sourced directly from the wild. African Lion Safari has had a successful propagation program and have had 25 calves born at the facility since 1991. This indicates that these elephants are thriving in their environment and that African Lion Safari provides optimal conditions for their reproduction and overall well-being. Out of the 17 elephants currently in the herd, 14 were born at African Lion Safari, and the herd has had births of elephants to both the second and third generations.

Past Actions Towards Elephant Phase-out	Some facilities like Edmonton Valley Zoo, Zoo de Granby, and Toronto Zoo have committed to phasing out elephants. In 2011, Toronto City Council voted to send three African elephants to a sanctuary in California. Between the 1990s and 2012, over 22 U.S. zoos shut down their elephant exhibits or announced phase-outs.	In 2023, AZA presented its strategic plan for Thriving Elephant populations in zoos. See attached AZA Strategy.
Scientific and Experiential Evidence	Two letters from 23 independent scientists and experts, including Dr. Joyce Poole, support phasing out elephant captivity. The evidence suggests that captivity is detrimental to the physical and psychological well-being of elephants. Confinement, restraint, harmful training practices, exhibition, and isolation negatively impact their health and welfare.	Earlier this year, Senator Klyne provided you a letter dated January 6, 2023 from individuals claiming to be distinguished international elephant specialists, in which they sought to criticize the welfare of elephants held in human care. *Regrettably, most, if not all, of the claims made in the January 6 letter are intentionally misleading and lack sufficient, current scientific support.* **Please refer to attached letter dated November 27th which provides science based facts about elephants in human care.**

Expert Conclusions on Elephant Captivity	Independent experts emphasize that no case supports captive elephants boosting conservation or wild populations.	Zoos participate in conservation actively by managing populations for ex situ reproduction and contributing support to field-based recovery programs (Greenwell et al., 2023). Ambassador animals in zoos, such as elephants, are important for global conservation efforts for in situ populations (Conley, 2019). Without them, the public would not be able to make personal connections, and may be less invested in the survival of their wild counterparts (Conley, 2019). Zoos with elephants have contributed millions of dollars to support research and conservation projects that directly benefit elephant conservation. Those funds exist only because of the presence of elephants in zoos and other facilities where people come to see and learn about them. Ex situ populations are vital to maintain as assurance populations, due to the challenges currently faced by wild populations which lead to species decline. Ex situ conservation efforts in zoos have been credited thus far with preventing the extinction of at least 17 different species (Moss et al., 2023). Additionally, the IUCN-SSC stresses the importance of conservation plans involving both in situ and ex situ practices. In situ conservation plans, when created without considering ex situ management and the parts it can play, may miss chances for appropriate priority ex situ actions, which risks leaving ex situ interventions too late for the survival of the species (IUCN-SSC, 2023). African Lion Safari has had 25 births since 1991. Considering the gestational period of an elephant, our programme's success rate is approximately one baby per year.

Research lacks Conservation Value	Research at African Lion Safari lacks conservation value	Wildlife research conducted at African Lion Safari has been focused on a variety of different topics, all of which directly or indirectly have an impact on in situ wildlife conservation. In regards to elephants, African Lion Safari has participated in studies related to thermography (Lefebvre et al., 2023), endocrinology to assess allostatic load (Moresco et al., 2022), cryopreservation of semen, and extensive work investigating the Elephant Endotheliotropic Herpesvirus (EEHV). Staff contribute and participate in research and conservation initiatives both at the park and in range countries in Asia and Africa. The park is recognized internationally for their commitment to elephant conservation. In August 2023, staff were invited by the government of Vietnam to evaluate elephant initiatives aimed at the promotion of human elephant co-existence. African Lion Safari is a founding member of the International Elephant Foundation (IEF), and has been an active participant in Association of Zoos and Aquariums' (AZA) Elephant Taxon Advisory Group for over 30 years. African Lion Safari is an Advisor to the Asian Elephant Support Foundation, Program Partner for the AZA Asian elephant SAFE (Saving Animals From Extinction) program, as well as a conservation Partner to the IUCN SSC Asian elephant specialist group. The knowledge acquired from research of reproduction, physiology, behaviour has helped advance elephant conservation worldwide. African Lion Safari has participated in over 28 research studies with Asian elephants, consulted at more than 20 institutions worldwide, currently has underway 11 Asian elephant research projects, and has published 26 research papers involving Asian or African elephants.

Brain Damage	Captivity has been shown to cause brain damage in elephants.	The conclusions of the Jacobs et al. (2021) paper are not credible since, despite the focal animals of the Jacobs et al. (2021) paper being cetaceans and elephants, the authors failed to gather any information from elephants or cetaceans themselves. Instead, they used triangulation, based on other mammal brains and elephant behaviour to infer that elephants and cetaceans are experiencing 'impoverishment-related neural deficits.' Please see letter dated November 27, 2023 for more information.
Captive Elephant Health Issues	A 2012 investigation found that 390 elephants had died in accredited zoos in the previous 50 years, mostly from captivity-related injuries and diseases. The preternaturally low birthrate of captive elephants is a significant concern, with instances of stillbirths, reproductive disorders, infant mortality, calf rejection, and infanticide.	The article sited is outdated, poorly researched information and does not give a true or clear picture of the deaths versus births of elephants in captivity. Furthermore, it does not reflect the excellent elephant conservation program at African Lion Safari.
Elephants in the Winter	Elephants in Canada spend most of the winter indoors to avoid frostbite and hypothermia.	African Lion Safari's herd of Asian elephants live in a very natural social structure with a large, cohesive, multi-generational family. They enjoy a rich and diverse environment, with the ability to roam over 200 acres of woodlands, fields, streams, and ponds. Our herd enjoys access to these acres during the winter, spring, summer and fall. There have been no instances recorded in scientific literature that state that elephants have had hypothermia. To the contrary, the real concern is their vulnerability to overheating (hyperthermia). Recent research has confirmed a theory by Phillips and Heath (1992) that elephants will use thermal windows in cooler ambient temperatures to warm ear tissue when needed (Lefebvre et al., 2023). While preliminary, this article provides several examples of why these thermal windows would occur, and how they are suggestive of Asian elephants being more tolerant of colder temperatures than previously thought. Monitoring Thermoregulation Patterns in Asian Elephants

Recent Events at African Lion Safari	In 2021, African Lion Safari offered elephants for sale to a Texas zoo, threatening to break up mother-daughter pairs. The sale was later canceled. In 2019, an elephant attack at African Lion Safari left a trainer with serious injuries.	African Lion Safari participates in managed conservation programs for many species including elephants. Part of these programs includes transferring individuals to other accredited zoological facilities for the purposes of introduction of genetic diversity. Forth Worth zoo is dedicated to the conservation of rare and endangered wildlife. Their staff coordinate or/and support conservation projects in more than 30 countries around the world. The Forth Worth Zoo is recognized as one of the most outstanding zoos in the United States and is accredited by AZA, and American Humane Association (AHA). They, recognizing the value of African Lion Safari's conservation program, offered financial support to further develop facilities. What is the difference of Toronto Zoo/Calgary Zoo paying China lease payments for the display of Pandas? Chinese Guests cause Panda-Monium African Lion Safari was investigated by the Ministry of Labour and was deemed not at fault. No charges were laid.
Concerns about Elephant Performances for Entertainment	Despite recent knowledge, elephant performances for entertainment, such as dunking basketballs, painting, and circus-style tricks, have occurred.	African Lion Safari began transitioning their elephants out of presentations and animal programmes in 2014. Elephant ride interaction programme was phased out in 2019. African Lion Safari's elephant management programme is consistently being updated and improved to ensure that their herd's overall health and welfare is always top priority

Use of Husbandry Tools	Some trainers use bullhooks to control elephants, causing pain and fear. The Association of Zoos & Aquariums announced a phase-out of bullhooks in 2019.	While some AZA institutions may have used bullhooks, that is not the case at African Lion Safari and other CAZA institutions. Our handlers do not use bullhooks. Our elephant management programme uses verbal cues, target training and body language, with a focus on positive reinforcement of food, praise, and social contact. Our handlers sometimes use a tool, known as a guide, to provide directional cues. This guide is used without exerting force.
No permits issued for new elephant captivity	Based on recommendations of independent scientists and other experts, in Senator Klynes view, licenses should not be granted for new elephant captivity in Canada	Regrettably, most, if not all of the claims and recommendations made by these "independent scientists and other experts" are false and misleading. Please refer to letter dated November 27th 2023 for information based on science. African Lion Safari does not understand Senator Kylne's point of view and his determination to phase out elephants in human care, considering the IUCN's statement stressing the importance of zoos and aquariums and how they play a crucial role in the fight against the biodiversity crisis. As a keystone species, the disappearance of elephant species from the wild would include the loss of a variety of flora and fauna found in their environment.

November 27, 2023

Senator Marty Klyne
The Senate of Canada
Ottawa, ON
Canada
K1A 0A4

Re: Bill S-241, (Jane Goodall Act) - Response to letter dated January 6th 2023 and Bill S-15

Dear Senator Klyne,

In consideration of your introduction of Bill S-15 into the Senate last week, we the undersigned would respectfully like to provide some additional information for your review and share a more enlightened perspective on elephants in human care.

We share your passion for improving animal welfare in Canada and have worked tirelessly toward this goal for more than 40 years, but believe Bill S-241 and now Bill S-15 will unnecessarily threaten critical efforts working towards global biodiversity, the conservation of wild elephants and negatively impact the lives of elephants currently living in zoological facilities.

Earlier this year, you received a letter dated January 6, 2023 from individuals claiming to be distinguished international elephant specialists, in which they sought to criticize the welfare of elephants held in human care. Regrettably, most, if not all, of the claims made in the January 6 letter are intentionally misleading and lack sufficient, current scientific support.

Elephants in Zoos Foster Conservation Action by Visitors

In October 2023, the International Union for the Conservation of Nature – Species Survival Commission (IUCN-SSC), an organization which informs the IUCN on biodiversity conservation, the inherent value of species, and their role in the ecosystem, among others, released a position statement on the role of botanical gardens, zoos, and aquariums in species conservation. They expressed that these facilities are able to access large and diverse audiences, as well as influence policy makers, businesses, and governments in making conservation-related decisions (IUCN-SSC, 2023). Institutions such as zoos can, and often do, play a central role in their local communities – socially, culturally, politically, and financially (ICUN-SSC, 2023).

The International Elephant Foundation (IEF) is recognized worldwide for its elephant conservation efforts and receives funds from many sources including from private individuals and a variety of zoological institutions. While there is no doubt a multitude of factors that impact decisions to make such contributions, including eco-conscious activities, interpersonal conversations, and consumer habits, it is clear that individuals who donate to conservation organizations are more likely to be driven by personal experiences, certainly more so than reading or watching videos. This was found by Miller et al. (2020), who conducted a study on another charismatic megafauna species, polar bears. They found that having visitors observe a training session in a zoo, as opposed to watching a video or listening to audio with an image on a screen, resulted in those visitors leaving with a greater interest in conservation compared to the other two groups. Personal observation of the animal also left visitors with an enhanced emotional experience and increased empathic concern towards the animal.

Another study, by Powell and Bullock (2014), examined factors that affected emotional responses in zoo visitors, particularly the impact of visitors' emotion on conservation mindedness. Some key results of this study were that the extent of visual interaction with an animal significantly affected the emotional response of visitors. Emotional responses and individuals' predisposition about nature were highly correlated. Stronger conservation mindedness was found to be the result of strong predispositions towards nature and emotional experiences.

A recent paper by Greenwell et al. (2023) examined a systemic review of literature pertaining to the four main pillars of any modern zoological institution: conservation, education, engagement, and research. This paper highlights that zoos possess a unique opportunity that is known to reach over 700 million people annually. This large platform allows zoos to convey important messages regarding biodiversity, conservation, planetary health, human wellbeing, and sustainable living. This article also states that the value of zoos to nature conservation and science is extensive, with many published works highlighting the conservation advances of the zoological community, the impacts of science and the animal welfare advancements achieved.

In regards to the arguments posed by the authors of the January 6 letter, four of the seven papers cited (Blamford et al, 2007; Broad, 1996; Adelman et al., 2000; Smith et al., 2008) were published over ten years ago, with one dating back to 1996. Using more current and relevant resources, we are able to demonstrate that the conservation actions by patrons cannot solely be attributed to financial contributions.

Zoo Populations Directly Benefit Elephant Conservation

Conservation is a critical aspect of modern zoological facility missions (Greenwell et al., 2023). In their October 2023 statement, the IUCN-SSC states that institutions such as zoos, aquariums, and botanical gardens acquire and make use of many different funding sources, and collectively contribute significant financial support to a variety of aspects involved in species conservation (IUCN-SSC, 2023). Zoos are considerably involved in the financing of conservation projects across hundreds of countries (Greenwell, et al., 2023). For example, the in situ Mbeli Bai lowland gorilla (*Gorilla gorilla gorilla*) study in the Republic of Congo is heavily financed by zoological collections, which has resulted in the development of education programs to aid local community understanding in that region (Greenwell et al., 2023). Educational programs such as these are designed to provide insight, particularly to younger generations, on why biodiversity should be protected, as well as by increasing local interest in becoming involved in conservation-focused jobs such as research assistants (Greenwell et al., 2023; Moss et al., 2023). According to Greenwell et al. (2023), these connections between zoo funding and integrated conservation approaches outside of the zoo itself emphasizes the wide-reaching effects of zoo conservation goals. It should be noted that the World Association of Zoos and Aquariums (WAZA) states that their members deliver more than $350 million in in situ conservation funding annually, as well as globally, zoos and aquaria attract over 700 million visitors every single year (Mooney et al., 2020). This means that zoos and aquaria as a whole represent the third largest conservation organization contributor worldwide (Mooney et al., 2020).

Zoos participate in conservation actively by managing populations for ex situ reproduction and contributing support to field-based recovery programs (Greenwell et al., 2023). Ambassador animals in zoos, such as elephants, are important for global conservation efforts for in situ populations (Conley, 2019). Without them, the public would not be able to make personal connections, and may be less invested in the survival of their wild counterparts (Conley, 2019). In addition to the main goals of conservation work in zoos (i.e., species survival and biodiversity protection), it can provide many societal benefits such as increased health benefits (Greenwell et al., 2023; Spooner et al., 2023; Coolman et al., 2020). For example, in a study by Coolman et al. (2020) it was found that people who experienced close-up encounters with "engaging" animals experienced significantly lowered tense (i.e., stress) responses, whereas those without close-up encounters with animals did not experience any change in their tense response.

Zoos with elephants have contributed millions of dollars to support research and conservation projects that directly benefit elephant conservation. Those funds exist only because of the presence of elephants in zoos and other facilities where people come to see and learn about them. The IEF was founded by zoos and others working with elephants in human care. It seeks to create a sustainable future for elephants by generating and investing resources to support elephant conservation, education, research, and management programs worldwide. Since 1999, the IEF has provided support to well over 200 elephant conservation projects worldwide and close to $10 million in financial assistance. IEF directors and their institutions are the largest stewards of elephants in North America and the largest contributors of biological samples, data, expertise, and funds into the research of elephant reproduction and disease that affect both ex situ and in situ populations of elephants worldwide. In 2022 alone, the IEF provided over $500,000 for projects to protect elephants from poaching, seek solutions for human-elephant conflict, equip and train community conservationists, increase our knowledge of the treatment and prevention of disease, and educate people. To suggest that these benefits that flow directly from zoos would exist without the presence of zoos is disingenuous and illogical.

Zoo Based Elephant Research Directly Benefits In Situ and Ex Situ Populations

Wildlife research conducted at African Lion Safari has been focused on a variety of different topics, all of which directly or indirectly have an impact on in situ wildlife conservation. In regards to elephants, African Lion Safari has participated in studies related to thermography (Lefebvre et al., 2023), endocrinology to assess allostatic load (Moresco et al., 2022), cryopreservation of semen, and extensive work investigating the Elephant Endotheliotropic Herpesvirus (EEHV). Additionally, scientific contributions do not specifically translate to the number of journal articles published. Other scientific contributions can include activities like exchanging knowledge with scientists, conservationists, and organizations in elephant range countries such as through seminars, workshops, and consulting.

Ex situ populations are vital to maintain as assurance populations, due to the challenges currently faced by wild populations which lead to species decline (Olive and Jansen, 2017). It is critical to understand the complexity of elephant reproductive systems, as this ensures that zoological populations have sustainable and genetically diverse populations; therefore, having the ability to study elephant reproduction ex situ provides the opportunity to improve breeding programs and further in situ conservation efforts. For example, wildlife endocrinology techniques have been developed in zoos, and have been used to conserve black rhinoceros (*Diceros bicornis michaeli*) (Spooner et al., 2023). Ex situ conservation efforts in zoos have been credited thus far with preventing the extinction of at least 17 different species (Moss et al., 2023). Additionally, the IUCN-SSC stresses the importance of conservation plans involving both in situ and ex situ practices. In situ conservation plans, when created without considering ex situ management and the parts it can play, may miss chances for appropriate priority ex situ actions, which risks leaving ex situ interventions too late for the survival of the species (IUCN-SSC, 2023).

Elephant Endotheliotropic Herpesvirus, or EEHV, is a virus which is endemic to the elephant population as a whole, both captive and wild (Hayward, 2012) and found in both African and Asian elephants. With respect to EEHV and the argument that it is not a significant threat to wild populations, it is important to understand that the lack of data present on wild populations does not equate to EEHV not being a concern in the wild. This disease is, in fact, a large enough concern in both Asian and African elephant range countries that EEHV working groups have been formed for both Asian and African elephants. These groups are made up of experts, well-respected veterinarians, and leaders in the care and management of elephants in range countries. As well, as elephants in the wild continue to experience population declines, the impact of EEHV in the wild will more than likely be exacerbated. It is therefore vital to understand and develop treatment plans for this disease before its impact further devastates wild populations. Furthermore, the high prevalence of EEHV in ex situ populations is largely attributable to the fact that elephants under human care are closely monitored for early and subclinical signs of the disease in order to prevent fatalities. The ability to consistently detect EEHV within ex situ elephant herds due to close observation of the animals should not be perceived as a higher incidence of the disease in ex situ populations. Studies have shown that the disease does affect populations everywhere, but due to the lack of monitoring on wild individuals, it is not detected at the same frequency as populations under human care. A collaborative study with Johns Hopkins School of Medicine in 2018 found that thirteen cases of acute hemorrhagic disease (HD) with histopathological features were identified in young Asian elephants in India between 2013 to 2017 (Zachariah et al., 2018). Of these thirteen cases, eight occurred in free ranging wild herds, three were camp-raised orphan calves, and two were captive born calves (Zachariah et al., 2018). This indicates that 62% of the identified cases were from wild elephants, 23% were wild orphaned calves, and only 15% were captive-born individuals (Zachariah et al., 2018). Populations under human care have played a large role in the discovery of the disease, and have been vital in providing a platform to further efforts to eradicate the disease for all elephants.

EEHV is estimated to have evolved at least 35 to 40 million years ago, with further speciation occurring more recently (Zong et al., 2014). Divergence between types of EEHV occurred nearly 24 to 28 million years ago, approximately around the time of the divergence of mastodons, the ancestor of all elephant species, and elephantids (Zong et al., 2014). Additionally, the divergence of African elephants from Asian elephants is estimated to have occurred around 7 million years ago, with three known species of EEHV evolving alongside this event (Zong et al., 2014). EEHV is known to have evolved alongside elephants, and has been affecting all species of elephants for millions of years, prior to elephants being housed in zoos.

African Lion Safari has been instrumental in pursuing the latest EEHV monitoring, detection, and treatment protocols. The park has joined other elephant care facilities and researchers throughout the world in actively supporting a global multi-faced EEHV research effort. African Lion Safari is a member of the EEHV Advisory Group, which provides peer-reviewed and accurate information that reflects current thinking on the research and management of EEHV in both wild and captive elephants globally. As the EEHV infection is the result of a complex mechanism that occurs at viral, cellular, and organism levels, unravelling the complexity of EEHV infection will require a novel approach. Understanding this virus also allows organizations like African Lion Safari, who are experienced in detecting the disease early and successfully treating sick animals, to assist other facilities with their cases.

Elephants Are Not Being Captured for Zoos

The claim that elephants are still being obtained from wild populations in order to populate zoo displays is not factual. Wild imports of elephants to western zoological facilities are all but prohibited. Additionally, these captures are typically initiated by governments in those countries, and occur as a result of human-elephant conflict and habitat destruction (Perera, 2009). There are strict rules (CITES) in place when an animal is being moved from the wild into a captive population. African Lion Safari's herd of Asian elephants consists entirely of elephants that were not sourced directly from the wild. African Lion Safari has had a successful propagation program and have had 25 calves born at the facility since 1991. This indicates that these elephants are thriving in their environment and that African Lion Safari provides optimal conditions for their reproduction and overall well-being. Out of the 17 elephants currently in the herd, 14 were born at African Lion Safari, and the herd has had births of elephants to both the second and third generations.

The population of African elephants left in the world is approximately 400,000 compared to Asian elephant populations of 40,000 (Gobush et al., 2022; Williams et al., 2020). In its 2021 report, the IUCN-SSC African Elephant Specialist Group (AfESG) stated that they aim to work with zoo associations, such as WAZA to build trust between organizations, as well as they have created a task force in order to better understand the role of ex situ populations (Okita-Ouma et al., 2021). The IUCN-SSC Asian Elephant Specialist Group (AsESG) openly addresses the importance of ex situ management of Asian elephants, as it represents almost one third of the Asian elephant population (Roberts et al., 2022). Therefore, the role of captive populations in both in situ and ex situ management cannot and should not be ignored.

Elephants Can and Do Thrive in Cold Weather Climates

The claims that elephants do not do well in cool or cold conditions have been repeatedly disproven. There have been no instances recorded in scientific literature that state that elephants have had hypothermia. To the contrary, the real concern is their vulnerability to overheating (hyperthermia) (Weissonbock et al., 2010; Rowe et al., 2013; Mota-Roja et al., 2022). As elephants are such large animals, they have a low surface area to volume ratio, as well as thick skin and an inability to sweat, which makes it very difficult for them to cool down in excessive heat (Rowe et al., 2013). Additionally, their low surface area to volume ratio is actually more advantageous in cooler temperatures, since it facilitates the slow loss of heat (Weissonbock et al., 2010). Concerns have been raised regarding their extremities in extreme ambient temperatures, however it is important to remember that elephants possess thermoregulation mechanisms that allow them to maintain thermoneutrality. It is well known that a primary response to colder ambient temperatures is to vasoconstrict blood vessels in vulnerable tissues, which is seen in the ears of elephants. Recent research has confirmed a theory by Phillips and Heath (1992) that elephants will use thermal windows in cooler ambient temperatures to warm ear tissue when needed (Lefebvre et al., 2023). While preliminary, this article provides several examples of why these thermal windows would occur, and how they are suggestive of Asian elephants being more tolerant of colder temperatures than previously thought. This study not only considers ambient temperatures using infrared thermography, but also discusses the Asian elephant's evolutionary history and known thermoregulation mechanisms (Lefebvre et al., 2023). As well, the research by Lefebvre et al. (2023) at African Lion Safari allowed the elephant herd to participate in non-invasive data collection, and shows a strong integration between ex situ elephant populations and the advancement of understanding around elephant physiology.

While the January 6th letter cites an article from the Buttonwood Zoo, it is a newspaper article, not a peer-reviewed scientific source. The letter also fails to acknowledge that the referenced elephant from the Buttonwood Zoo is now 65 and one of the oldest elephants in the North American Asian elephant population, all due to the exceptional care from the zoological institution. It should be understood that one incident does not warrant a negative opinion of zoos as a whole; there are no places where elephants are completely safe or live an ideal life, and this is demonstrated by new articles from native elephant range countries, such as the one written by Harry Cockburn in 2019.

Exhibit Space Does Not Limit Elephant Activity

The January 6th letter references an article from Holdgate et al. (2016) for its conclusion that zoo elephants walked far shorter distances than those in the wild. However, upon reviewing this paper, this is a misrepresentation. Holdgate et al. (2016) actually found that elephants in captivity (both Asian and African) at 30 different zoos walked an average of 5.3km a day, compared to the wild range for both species being between 5-10km. These zoo elephants, while staying at the lower end of this range, were walking distances comparable to wild elephants. The article also states that more research is needed on this topic, because they found no correlation between distances walked and changes to behaviour (e.g., foraging behaviour, stereotypies) or overall health (Holdgate et al., 2016). The finding proposed in the refute letter is misconstrued. Another study showed that captive elephants walked an average of 0.03 to 2.79km/hr, with ranges in wild elephants between 0.01 to 1.15km/hr and 0.09 to 9.52km/hr (Nagy et al., 2021). This paper argues that it is the amount of walking that elephants do in their daily routine, rather than the amount of space they walk in that counts (Nagy et al., 2021). The January 6th letter also criticized the IEF's use of a paper in their argument opposing Bill S-241, which states that quality over quantity of space is the important factor in ex situ enclosures (Meehan et al., 2016). This fact has been further backed up in a more recent study by Brown et al. (2020), who found that habitat quality showed better indication of improved welfare than the size of the habitat.

African Lion Safari's herd of Asian elephants live in a very natural social structure with a large, cohesive, multi-generational family. They enjoy a rich and diverse environment, with the ability to roam over 200 acres of woodlands, fields, streams, and ponds. During this time, the elephants explore and have freedom of choice in terms of their location and activities (Lefebvre et al., 2023). Lamoureux et al. (2012) did a study with six female elephants housed at African Lion Safari, focusing on tracking their distances using GPS collars while they were wandering in their 200 acres. This paper found that African Lion Safari's elephants were walking an average of 11.4km daily, which is above the average for Asian elephants in the wild (Lamoureux et al, 2012).

Elephants are Thriving in Zoos

The idea that elephants are not or cannot thrive in zoos is an outdated and biased perspective. Elephants living in the wild experience many issues in their range countries that significantly threaten their survival (Cameron and Ryan, 2016). Declines have been seen in in situ populations of African and Asian elephants due to poaching and illegal killings, where the current harvest rate of elephants is causing a global conservation crisis and posing a direct threat to the survival of wild elephant populations (Cameron and Ryan, 2016). Because of the current challenges being faced by in situ populations, captive populations of elephants have become vital to the survival of the species (Cameron and Ryan, 2016).

The authors of the refute letter cite Clubb et al. (2008) to back up the idea that elephants do not reproduce well in captivity and that young die prematurely. Clubb et al. (2008), and the previous report on zoo elephant welfare by Clubb and Mason (2002) where the 2008 paper derived its data, were undermined in 2004 by Wiese and Willis for the fact that they obtained mean life expectancies under historical husbandry conditions, which would not have reflected life expectancy under current practices. As well, they calculated average ages of death for all animals that have died and did not account for the lifespans of all of the animals still currently alive (Wiese and Willis, 2004). Clubb et al. (2008) also stated that the overall welfare of African elephants in zoos was already increasing over time. Scherer et al. (2023) found that overall survivorship of both African and Asian elephants in zoos is increasing, albeit not significantly for Asian elephants, which the authors attribute to a better overall survivorship in Asian elephants compared to African elephants.

The authors of the January 6 letter also cite a paper by Jacobs et al. (2021) to argue that captive elephant brains are 'negatively and persistently impacted by the conditions of captivity.' The conclusions of the Jacobs et al. (2021) paper are not credible since, despite the focal animals of the Jacobs et al. (2021) paper being cetaceans and elephants, the authors failed to gather any information from elephants or cetaceans themselves. Instead, they used triangulation, based on other mammal brains and elephant behaviour to infer that elephants and cetaceans are experiencing 'impoverishment-related neural deficits.'

In their conclusion, it is stated that 'elephants are not suited to any form of captivity, as no captive facility can fulfil the basic biological, social, spatial, cognitive, and intrinsic requirements of elephants,' which is directly contradicted by the statement that sanctuaries are beneficial to elephants as sanctuaries are captive environments. Sanctuaries also often rely on volunteers with little to no experience working with elephants, whereas zoos hire elephant experts and individuals with animal care experience. Further, both of the references that the authors cite to support their claim that sanctuaries improve elephant health are by individuals who own and operate private sanctuaries (Buckley, 2009; Derby, 2009). Their business model relies on fundraising based on emotional appeal from donors and not on scientific based information. They use emotional narratives to encourage an anti-zoo agenda by using imagery and content to grow their support base, resulting in opportunities for revenue generation. These references are not scientifically credible or valid and involve very small numbers of animals. Furthermore, one of these citations, by Derby (2009) highlights in the opening of the paper that it cannot be explicitly stated that all zoos are bad and all sanctuaries are good just based on the title of the facility. Derby then expresses apprehension over stating that moving animals to sanctuaries from zoos or other captive settings automatically guarantees improvements to physical and mental health. The author also acknowledges that the observations made are purely anecdotal and have been done on elephants maintained in substandard environments (Derby, 2009).

Conclusion

In their October 2023 position statement, the IUCN-SSC emphasizes the importance of zoos, botanical gardens, and aquariums, stating that zoos are able to provide people with accessible, or even their first, interactions and experiences with animals; this allows people to build relationships, have educational experiences, and increase their understanding and appreciation of the intrinsic value of animals, fungi, and plants (IUCN-SSC, 2023). Zoos allow people who would otherwise never encounter elephants to be able to see them in person; they support research on a variety of elephant-specific projects that benefit the welfare of both in situ and ex situ populations; and they create security for the future of wild elephants. As a keystone species, the disappearance of elephant species from the wild would include the loss of a variety of flora and fauna found in their environment (Cameron and Ryan, 2016). We would therefore like to stress the importance of elephant populations within zoos; without these populations, supporting and conserving wild populations would be drastically more difficult. Management of captive elephants is consistently being updated and improved to ensure that their overall health and welfare is always top priority. It is of utmost importance to consider the full effects of removing elephants from captivity, and to recognize how critical elephants under human care have been to the conservation of all elephant species to date.

We understand that this is an emotional issue, but are hopeful that science and facts will prevail over emotion and ideology. Should you have any questions about the attached information, we are happy to discuss it with you at your convenience.

Thank you for considering our comments in regards to Bill S-241 and Bill S-15.

Signed,

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PEER REVIEWED PUBLICATIONS - AFRICAN LION SAFARI

Year	Journal	Species	Title
2017	PLOS ONE	African elephant	Effects of GnRH vaccination in wild and captive African Elephant bulls (Loxodonta africana) on reproductive organs and semen quality
2011	Biology of Reproduction	Asian elephant	Role of the Double Luteinizing Hormone Peak,Luteinizing Follicles, and the Secretion of Inhibin for Dominant Follicle Selection in Asian Elephants (Elephas maximus)
2004	Zoo Biology	Asian elephant	Successful Artificial Insemination of an Asian Elephant at the National Zoological Park
2020	Journal of Zoo and Wildlife Medicine	Asian elephant	BIOLOGICAL VARIATION OF HEMATOLOGY AND BIOCHEMISTRY PARAMETERS FOR THE ASIAN ELEPHANT (ELEPHAS MAXIMUS), AND APPLICABILITY OF POPULATION-DERIVED REFERENCE INTERVALS
2012	Proceedings: Biological Sciences	Asian elephant	Gestating for 22 months: luteal development and pregnancy maintenance in elephant
2010	Reproduction	Asian elephant	Luteogenesis during the estrous cycle in Asian elephants (Elephas maximus
2010	reproduction, Fertility and Development	Asian elephant	Ultrasonographically documented early pregnancy loss in an Asian elephant (Elephas maximus)
2018	Animal Reproduction Science	Asian elephant	Prolonged luteal lifespan and pseudopregnancy in Asian elephants (Elephas maximus)
2008	Journal of Zoo and Wildlife Medicine	Asian elephant	Nonsurgical Repair of an Umbilical Hernia in Two Asian Elephant Calves (Elephas maximus)
2014	Journal of Zoo and Wildlife Medicine	Asian elephant	Suppression of testicular function in a male Asian elephant (Elephas maximus) treated with Gonadotrophin- Releasing Hormone Vaccines
2007	Proceedings: Biological Sciences ,	Asian elephant	Foetal Age Determination and Development in Elephant
2008	Theriogenology	Asian elephant	Early embryo development in the elephant assessed by serial ultrasound examinations
2017	Animal reproduction science	Asian elephant	A simple, field-friendly technique for cryopreserving semen from Asian elephants (Elephas maximus
2023	Journal of Zoological and Botanical Gardens	Asian elephant	Monitoring Thermoregulation Patterns in Asian Elephants (Elephas maximus) in Winter Months in Southwestern Ontario Using Infrared Thermography
2022	Journal of Zoological and Botanical Gardens	Asian elephant	Immunoglobulin A and Physiologic Correlates of Well-Being in Asian Elephants
2004	Animal Reproduction Science	Asian elephant	Liquid Storage of Asian elephant (Elephas maximus) sperm at 4C
1998	Animal Reproduction Science	Asian elephant	Plasma concentrations of immunoreactive relaxin activity and progesterone in the pregnant Asian elephant (Elephas maximus)
2021	Journal of Experimental Biology	Asian elephant	Adiposity, reproductive and meatbolic health, and activity levels in zoo Asian elephant(Elephas maximus)
2021	Journal of Zoo and Wildlife Medicine	Asian elephant	Pharmacokinetics of orally administered flunixin meglumine in African (Loxodonta Africana) and Asian (Elephas maximus) elephants
2006	The International Zoo Yearbook	Asian elephant	Aspects of the reproductive biology and breeding management of Asian and African elephants
2009	Journal of Zoo and Wildlife Medicine	Asian elephant	Electrocardiography of the Asian Elephant (Elephas maximus)
1992	Journal of Zoo and Wildlife Medicine	Asian elephant	Arterial Blood Pressure and Blood Gas Values on Normal Standing and Laterally Recumbent African (Loxodonta africana) and Asian (Elephas maximus) Elephants
2012	Journal of Reproduction and Development	Asian elephant	The secretory pattern and source of immunoreactive prolactin in pregnant African (Loxodonta africana) and Asian (Elephas maximus) el
1993	Journal of Reproduction and Fertility	Asian elephant	Non-invasive monitoring of ovarian function in Asian elephants (Elephas maximus) by measurement of 5 beta- prenanetriol
1991	Journal of Reproduction and Fertility	Asian elephant	Altered androstenedione to testosterone ratios and LH concentrations during musth in the captive male Asian elephant
1990	Comparative Biochemistry and Physiology	Asian elephant	Longitudinal study of haematological and biochemical constituents in blood of the Asian elephant
2023	Canadian Science Publishing	Blue Racer	A species-specific digital PCR assay for the endangered blue racer (Coluber constrictor foxii) in Canada
2019	Integrative Organismal Biology	Boobool Owl	Flow Features of the Near Wake of the Australian Boobook Owl (Ninox boobook) During Flapping Flight Suggest an Aerodynamic Mechanism of Sound Suppression for Stealthy Flight
2018	arXiv preprint	Boobool Owl	Unique flow features of the silent southern Boobook owl wake during flapping flight
2009	BIOLOGY OF REPRODUCTION	Giraffe	Ovarian Ultrasonography Correlated with Fecal Progestins and Estradiol During the Estrous Cycle and Early Pregnancy in Giraffes (Giraffa camelopardalis rothschildi)
2021	Sensors	Giraffe	Behaviour Classification on Giraffes (Giraffa camelopardalis) Using Machine Learning Algorithms on Triaxial Acceleration Data of Two Commonly Used GPS Devices and Its Possible Application for Their Management and Conservation
2019	Journal of Zoo and Wildlife Medicine	Giraffe	GROWTH, HUSBANDRY, AND DIETS OF FIVE SUCCESSFULLY HAND-REARED ORPHANED GIRAFFE CALVES (GIRAFFA CAMELOPARDALIS ROTHSCHILDI AND GIRAFFA CAMELOPARDALIS RETICULATA)
2009	Theriogenology	Giraffe	Sonomorphology of the reproductive tract in male and pregnant and non-pregnant female Rothschild's giraffes (Giraffa camelopardalis rotschildi)
2020	Integrative and Comparitive Biology	Great Horned Owl	Direct Numerical Simulations of a Great Horn Owl in Flapping Flight
2020	Jove Journal	Loggerhead Shrike	Visually Sexing Loggerhead Shrike (Lanius Ludovicianus) Using Plumage Coloration and Pattern
2020	The Wilson Journal of Ornithology	Loggerhead Shrike	Evidence and impact of plastic use by the Loggerhead Shrike (Lanius ludovicianus)
2017	Proceedings of the 24th North American Prairie Conference	Loggerhead Shrike	Population demographics of the Loggerhead Shrike: insights into the species decline from a long-term study in the Midewin National Tallgrass Prairie

2018	Ecology and Evolution	Loggerhead Shrike	Migratory connectivity in the Loggerhead Shrike (Lanius ludovicianus)
2018	Ibis	Loggerhead Shrike	Moult in the Loggerhead Shrike Lanius ludovicianus is influenced by sex, latitude and migration
2021	Canadian Journal of Zoology	Loggerhead Shrike	Integrative assessment of intraspecific diversification in Loggerhead Shrike (Lanius ludovicianus) provides insight on the geographic pattern of phenotypic divergence and process of speciation
2020	Integrative and Comparitive Biology	Owl	Turbulent Wake-Flow Characteristics in the Near Wake of Freely Flying Raptors: A Comparative Analysis Between an Owl and a Hawk
2021	Diversity	Parrots	Genetic Diversity and Population Structure of Two Endangered Neotropical Parrots Inform In Situ and Ex Situ Conservation Strategies
2012	Theriogenology	SWRH	Estrus induction in white rhinoceros (Ceratotherium simum)
2022	Animal Conservation		Examining the representation of locally threatened species in North American zoos
2022	Peer Community Journal		Improving species conservation plans under IUCN's One Plan Approach using quantitative genetic methods

African Lion Safari
Research and Conservation Collaborations

Institution	Location	Species
Advanced Facility for Avian Research (AFAR) University of Western Ontario	Canada	Boobok Owl, Great-horned Owl, Harris's hawk
Auburn University	USA	Elephants
Baylor University	USA	Elephant
Caribou Conservation Breeding Foundation	N. America	Caribou
Cheyenne Mountain Zoo	USA	Elephant
Conservation Biology Laboratories, Kingfisher International	Canada	Elephants, White rhino, Cheetah, Bactrian camel, Warthog, Angolan colobus monkey, Giraffe, Lion
Conservation Center for Species Survival	N. America	Bongo, Oryx & Addax
Conservation Centers for Species Survival	USA	Various
Conservation Planning Specialist Group	INTERNATIONAL	Loggerhead shrike/CSI
Cornell University	USA	Elephants
DPZ(German Primate Centre)	Germany	Elephants
Forest Preserve of Dupage Countrty	USA	Barn Owls
Fossil Rim Wildlife Center	USA	Cheetah
Georgia Southern University	USA	Elephants
Harvard University	USA	Elephants
Indiana University Bloomington	USA	Elephants
Leibniz Institute of Zoo and Wildlife Research	Germany	Elephant, White Rhino, Giraffe, Cheetah
Little Ray's Reptile Center	Canada	Reptiles
Mahidol University	Thailand	Elephants
McGill University	Canada	Elephants
McMaster University	Canada	Cheetah, Lion, Loggerhead shrike, Elephants
Nashville Zoo	USA	Loggerhead shrike
NatureSAFE	UK	Blue Racer, Grey Ratsnake, Eastern Massasauga Rattlesnake, Eastern Foxsnake
New Mexico State University	USA	Blue Throated Macaw
Omaha's Henry Doorly Zoo	USA	Greater One Horned rhino
Parc Safari	Canada	Cheetah
Queen's University	Canada	Loggerhead shrike, LSARP
San Diego Zoo Wildlife Alliance	USA	Elephant
Saving Turtles at Risk Today (S.T.A.R.T.)	Canada	CSI focal species
Scales Nature Park	Canada	Blue Racer, Grey Ratsnake, Eastern Massasauga Rattlesnake, Eastern Foxsnake
Smithsonian Conservation Biology Institute	USA	Shrike, Cheetah, Elephants
Southwest Missouri State University	USA	Elephants
The Lindner Center for Conservation and Research of Endangered Wildlife's	USA	Rhino
Tierpark Berlin	Germany	Giraffe
Tokyo University of Agriculture and Technology, Division of Animal Science	Japan	Elephants
Toronto Zoo	Canada	LOSH, Cheetah
University College London	England	Elephants
University of Alabama Birmingham	USA	Elephants
University of California Davis	USA	Elephants
University of Florida	USA	Elephants
University of Guelph	Canada	Cheetah, Elephant, Owls, Parrots, Raptors
University of Melbourne	Australia	Elephants
University of Pennsylvania	USA	Elephants
University of Pretoria	South Africa	Elephants
University of Waterloo	Canada	Elephants
University of Western Cape	South Africa	Elephants
Western Kentucky University	USA	Elephants
Wildlife Preservation Canada	Canada	Bees, Shrike, CSI
World Parrot Trust	Canada	Blue Throated Macaw

Elephant Consultations

Indianapolis Zoo, Indianapolis, Indiana	**AZA**
Rosamond Gifford Zoo at Burnett Park, Syracuse, New York	**AZA**
Saint Louis Zoo, Saint Louis, Missouri	**AZA**
Oregon Zoo, Portland, Oregon	**AZA**
Woodland Park Zoo, Seattle, Washington	**AZA**
Albuquerque Bio Park, Albuquerque, New Mexico	**AZA**
Phoenix Zoo, Phoenix, Arizona,	**AZA**
Hogle Zoo, Salt Lake City, Utah	**AZA**
Houston Zoo, Houston, Texas	**AZA**
Fort Worth Zoo, Fort Worth, Texas	**AZA**
Oklahoma City Zoo, Oklahoma City, Oklahoma	**AZA**
White Oak Conservation Center, Yulee, Florida,	**AZA**
Jacksonville Zoo, Jacksonville, Florida	**AZA**
Disney's Animal Kingdom, Orlando, Florida	**AZA**
Lowery Park Zoo, Tampa, Florida	**AZA**
Miami Zoo, Miami, Florida	**AZA**
Toledo Zoo, Toledo, Ohio	**AZA**
Cincinnati Zoo, Cincinnati, Ohio,	**AZA**
Louisville Zoo, Louisville, Kentucky	**AZA**
Columbus Zoo, Columbus, Ohio	**AZA**
Smithsonian National Zoological Park, Washington, D.C.	**AZA**
Calgary Zoo, Calgary, Alberta	**AZA**

Toronto Zoo, Toronto, Ontario	**AZA**
Granby Zoo, Granby, Quebec	**AZA**
Edmonton Valley Zoo, Edmonton, Alberta	**CAZA**
Parc Safari, Hemingford, Quebec	**CAZA**
Pittsburgh Zoo, Pittsburgh, Pennsylvania	**ZAA**
Zoo Hanover, Hanover, Germany	**EAZA**
Wuppertal Zoo, Wuppertal, Germany	**EAZA**
Mahidol University, Saiyoke, Thailand	
Maesa Elephant Camp, Chiang Mai, Thailand	
Maetaman Elephant Camp, Chiang Mai, Thailand	
Taman Safari, Bogor, Java, Indonesia	
Seblat Elephant Camp, Bengkulu, Sumatra, Indonesia	
Tangkahan Elephant Camp,Tangkahan, Sumatra, Indonesia	
Way Kambas Elephant Camp, Way Kambas, Sumatra, Indonesia	

RESEARCH PROJECTS CURRENTLY UNDERWAY AT AFRICAN LION SAFARI

Tracking estrus in Greater One Horned Rhino using infrared thermography

Variation in migratory behavior in Loggerhead Shrike

Use of infrared thermography (IRT) on Asian elephants

Elephant ambient temperature study

Efficacy of glucosamine supplementation in joint health in Southern White rhino

American and Canadian Institute of Rhinoceros Science – a model for saving species with science ex situ

Investigating progesterone metabolites in different (sub)species of giraffes

Developing a functional protocol for plateletpheresis for elephants

Synthesizing the whole EEHV1a genome as well as making pluripotent stem cells from Asian elephants

Derive induced pluripotent stem cells (iPSC) from elephant primary tissue (placenta and umbilicus)

Determination of best radiographic techniques for obtaining images of the elephant carpus and tarsus

Validating corticosterone ELISA techniques for Loggerhead Shrike

Shrike Thermography- Using infrared thermography to assess nesting patterns in Loggerhead Shrike.

Red tail Hawk and Vitamin E- Measuring serum vitamin E levels in captive red tail hawks

Avian Gonad Cryopreservation

Measuring the impact of UV light and Vitamin D supplementation on several macaw species.

Monitoring Lion Health using Infrared Thermography

Determining the use of Infrared Thermography as a method to track estrus activity in Cheetah

Monitoring giraffe inflammation using Infrared Thermography

Validating the use of Infrared thermography as a method to detect sub clinical inflammation in Asian elephant calves experiencing EEHV.

Monitoring Serum Age Biomarkers in Asian elephants

Validating the use of infrared thermography to track estrus and mammary gland activity in Asian elephants. In conjunction with progesterone monitoring using fecal , blood and saliva samples

Correlating thermal images of the bulbourethral gland to serum testosterone levels in male Asian elephants.

Optimizing protocols for collecting, extending, freezing and thawing Asian elephant (Elephas maximus) semen

Assessing the evolution and conservation of male gametes in the Paenungulata clade

Testosterone characteristics and musth onset of young male Asian elephants

Effects of socialization on behavioral, physiologic and reproductive parameters of male Asian elephants

Securing Genetic Value of Asian and African Elephants for Future Sustainability

Study to determine composition of elephant milk at the initial stages of lactation

Asian elephant biological variation study – sample collection and analyses

Asian elephant immunogenetics and EEHV serology

Population-based reference intervals for monitoring hematologic changes in Asian elephants

Development of elephant assisted reproductive technologies

African Lion Safari supported Elephant Conservation Projects through the International Elephant Foundation: 2023

IEF-supported projects protect elephants from poaching, seek solutions for human-elephant conflict, equip and train community conservationists, increase our knowledge of the treatment and prevention of disease, and educate people. In 2023, IEF will provide over $650,000 to support elephant conservation around the world, adding to the over $8 million total invested in conserving elephants since our inception in 1998. The following elephant conservation and research projects will receive support from IEF in 2023:

Africa Savannah

- Human-Elephant Conflict Mitigation in the KAZA Transfrontier Conservation Area, Zambia ()
- K9 Unit Operations in Lower Zambezi, Zambia ()
- Mount Kenya Horse Patrol Team ()
- Conservation of Elephants in Murchison Falls Conservation Area, Uganda ()
- Big Tusker Project (formally known as: Large Elephant Monitoring Project), Kenya ()
- Mobile Anti-Poaching Teams of Northern Rangelands Trust Conservancies, Kenya ()
- Conserving Namibia's Desert Elephants ()
- Converting Community Attitudes Towards Conservation in Chizarira, Zimbabwe ()
- Creating Environmental & Conservation Leadership in Malawi ()
- Training Village Dogs for Wildlife Protection, Zambia ()

African Forest

- African Elephant Species Distribution and Movement Corridors in West Africa ()
- Guinea Forest Elephants ()
- Forest Elephant Demographic Assessment, Gabon ()
- Protecting Elephants from Development Projects, Cameroon()
- Saving Forest Elephants in Grebo-Krahn National Park, Liberia()

Asia

- Community Based Elephant Conservation in Bardia-Banke Complex ()
- Community Based Protection of Sumatran Elephant Populations & Habitat in Sumatra: (CRU), (ERUs) Sumatra, Indonesia ()
- Community Based Elephant Conservation in Central Nepal ()
- Community Support for Elephant Conservation in Far Western Nepal ()
- Elephant Response Teams for Human-Elephant Conflict Mitigation, Bangladesh ()

- Human-Elephant Conflict in South-Eastern Bhutan ()
- Installing Early Warning Signals for Elephants Crossing Roads, India ()
- Understanding Human-Elephant Conflict in Sarpang, Bhutan ()

Ex-Situ

- EEHV Genomics and Pathogenesis ()
- Realization of an Effective Vaccine Against Elephant Endotheliotropic Herpesvirus ()
- Development of EEHV-specific nanobodies as treatment for EEHV-hemorrhagic disease ()
- Plasma D-dimer Concentration in Juvenile Elephants with and without EEHV-HD

MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
DEPARTMENT OF FORESTRY

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International Elephant Foundation
PO Box 366, Azle, TX. 76098

13th July 2023

Subject: Invitation to a Viet Nam regional workshop on evaluation of pilot elephant conservation initiatives aiming at the promotion of human-elephant coexistence

Dear Mr. Gray,

We are very pleased to inform you that the Ministry of Agriculture and Rural Development (MARD)/Department of Forestry (DOF), Dong Nai Provincial People's Committee (PPC)/Dong Nai Department of Rural Development (DARD)/Dong Nai Forest Protection Department (FPD) and Humane Society International (HSI)/HSI Viet Nam will be cohosting a regional workshop to evaluate pilot elephant conservation initiatives aiming at the promotion of human-elephant coexistence in Dong Nai Province, Viet Nam from 30th to 31st August 2023. Objectives of this regional workshop include:

- Announcing the results of our one-year elephant monitoring project via camera traps in Dong Nai province.
- Sharing insights on human-elephant conflicts (HEC) we have gained by monitoring HEC incidents and compiling data using Airtable.
- Reporting the initial results of the first grid-based distribution survey.
- Raising awareness among the local public about the importance of elephant conservation and key concepts and principles of human-elephant coexistence.
- Identifying directions of the following elephant conservation initiatives.
- Providing several recommendations to other elephant range provinces that have small and fragmented populations.

It is our great pleasure to invite you to attend this workshop. Please find the agenda, venue, and other relevant information on the following pages.

We kindly request that you respond as to whether you will attend by 20th of July 2023 at the latest. Please confirm your attendance to Mrs. Tran Thi Hoa (vpyflowerhoa@gmail.com/+84 (0)903295993) or Mrs. Nguyen Thi Mai (maitn@hsi.org /+84 (0)916472566) to ensure all required support for timely issuance of a business visa, if required.

Sincerely,

Dr. Tran Quang Bao
Director General, Department of Forestry

FORUM KOMUNIKASI MAHOUT SUMATERA
FOKMAS
Jln. Raya Labuhan Ratu, Labuhan Ratu, Lampung Timur

May 29, 2019

Mr. Charles Gray
African Lion Safari
Cambridge, Ontario
Canada

Dear Charlie,

On behalf of my colleagues from FOKMAS in Indonesia, Mr. Tri Sulistiyono and Mr. Hidayat we would like to thank you, your staff, and African Lion Safari very much for the opportunity to visit your facility from May 16 to 21 and view your elephant management program.

Although we have many years of elephant experience in Indonesia we learned a lot from your program and we intend to use what we learned from you to improve elephant management in our country.

We were very impressed with the daily care of your elephants, the cleanliness of the elephant facilities, and the high quality fodder provided to the elephants. All the elephants were in very good health condition.

We found the daily training program to be very well structured in addressing the needs and welfare of the elephants and their age, from very young calves to adult elephants.

This experience was invaluable for us to improve our skills in managing our elephants and we are very grateful to you for the opportunity.

Thank Yuo and Best Wiahea

Kindest regards,

FOKMAS

(Nazaruddin)
Head of FOKMAS

Journal of
*Zoological and
Botanical Gardens*

MDPI

Article

Monitoring Thermoregulation Patterns in Asian Elephants (*Elephas maximus*) in Winter Months in Southwestern Ontario Using Infrared Thermography

Janel Lefebvre [1,*], Charlie Gray [1], Taryn Prosser [1] and Amy Chabot [1,2]

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Abstract: Given the current and future threats to Asian elephants (*Elephas maximus*), maintaining a sustainable ex situ population is crucial for the longevity of the species. Using Infrared Thermography (IRT), thermoregulation of Asian elephants at low ambient temperatures was examined. Thermal images were taken at 15 min intervals over 60–90-min observation periods, once weekly, during January and February 2022. A total of 374 images were examined from 10 Asian elephants, which varied from 1 to 56 years of age. Data from thermograms of the ear and body were interpreted in view of weight, age and behavior. Variability in surface temperature was found most frequently in the ears, occasionally presenting as thermal windows—areas with dense underlying blood supply that aid in heat exchange. Thermal windows occurred most frequently in the distal, then medial, regions of the ear. The pattern of appearance of thermal windows in the ear provides support that the increase of blood flow is utilized as a method of warming. This preliminary study provides key insight into Asian elephant thermoregulation, suggesting that the species may be more well-adapted to lower ambient temperatures than previously thought.

Keywords: infrared thermography; *Elephas maximus*; thermal windows; age; behavior; weight; ambient temperature

check for updates

Citation: Lefebvre, J.; Gray, C.; Prosser, T.; Chabot, A. Monitoring Thermoregulation Patterns in Asian Elephants (*Elephas maximus*) in Winter Months in Southwestern Ontario Using Infrared Thermography. *J. Zool. Bot. Gard.* **2023**, *4*, 312–324. https://doi.org/10.3390/jzbg4020026

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1. Introduction

Asian elephants (*Elephas maximus*) are threatened due to habitat loss and fragmentation, human–elephant conflict, poaching and illegal trade [1]. Disruptions in social hierarchies and decreased disease resilience, resulting from direct threats, threaten the populations of remaining wild animals [2]. Further, climate change models predict that ~42% of the habitat available to Asian elephants at present will be lost by the end of this century, due to the combined effects of climate change and human pressure [3]. As a result, the Asian elephant is classified on the International Union for the Conservation of Nature (IUCN) Red List as "Endangered" [4,5].

Human activities have resulted in altered environmental conditions that are impacting the demography and evolution of the Asian elephant, and many other species, globally [6]. In response to this crisis, an agreement was reached by the United Nations at the Kunming–Montreal biodiversity summit in December 2022, with the goal to halt and reverse global biodiversity loss by 2030. A recent publication assessing the efficacy of each target in the Kunming–Montreal biodiversity framework found that the extinction risk for over half (57%) of the world's threatened species would not be reduced sufficiently without targeted species-specific recovery actions, including ex situ conservation [7]. According to the authors, focused interventions and increased attention on individual species is needed when crafting solutions to address global biodiversity loss. Target Four was developed to address this need, noting that the recovery and conservation of species must include the consideration of both in situ and ex situ conservation [7].

The African Lion Safari has had a program devoted to assisting in the conservation of the Asian elephant since 1987. Given the species' current status and new threats to the wild population due to climate change, maintaining a sustainable ex situ population of Asian elephants, such as the one found at African Lion Safari, will provide an assurance population for the species' long-term persistence [8]. In the continuing efforts to provide excellence in care and to assist in research that can benefit the conservation of Asian elephants, African Lion Safari initiated research on thermoregulation patterns in Asian elephants in 2021, using Infrared Thermography (IRT). IRT is a non-invasive tool that detects surface temperature distribution patterns [9]. It has been used to measure physiological changes in humans and other warm-blooded animals, including in diagnosing disease, gaining insight into reproductive processes, analyzing animal behavior and estimating individuals' thermal states [10]. IRT has been used in several studies of African (*Loxodonta africana*) and Asian elephants. Williams [11] measured heat loss by convection, radiation and conduction on different parts of the elephant (body, legs, head, trunk, neck and ears). Phillips and Heath [12] documented that convection and radiation from the ears alone could account for 100% of the total heat loss in African elephants, with heat transfer being facilitated by "thermal windows." As defined by Šumbera et al. [13] and Mota-Rojas et al. [14], thermal windows are body regions with a high density of blood vessels and arteriovenous anastomoses close to the body's surface in areas devoid of fur, which permits heat exchange via vasoconstriction or vasodilation. The ears of both African and Asian elephants, while differing significantly [15], can be defined under these criteria as thermal windows [12,16]. Further work by Weissenböck et al. [16] suggested that areas of the torso and limbs may also function as thermal windows in Asian elephants. However, the work did not investigate if these areas had the prerequisite underlying vascularization comprising a thermal window.

Elephants in the wild can experience a wide range of ambient temperatures, ranging from 0 °C to 50 °C [17]. Similarly, ex situ populations are located in areas exhibiting a wide range of environmental conditions. Given the temperature variation experienced by the species in situ and ex situ, we sought to more closely examine the responses of individual Asian elephants to varying environmental conditions using IRT. We present findings on the thermoregulation of Asian elephants, in the context of the low ambient temperatures experienced in southwestern Ontario. We were particularly interested in ear surface temperature variation, imparting the sensitivity of the ear tissue in temperature extremes [12]. Our results provide insight into the relationships between age, sex, weight, and behavior, in terms of the surface body temperatures observed using IRT.

2. Materials and Methods

African Lion Safari, Cambridge, Ontario, Canada, (43.3410° N, 80.1801° W) currently maintains a herd of 17 Asian elephants. Individuals are identifiable by unique physical characteristics. A subset of the herd was monitored during a portion of their normal daily routine, during which they roam throughout a 200 acre area consisting largely of woods, with a stream, pond, and open fields. During the observation period, elephants made their own choices in terms of their location in the study area and their activity. The weight of each individual was monitored monthly. Elephant weights were obtained from each individual and averaged over the study period.

Thermal images were obtained using a FLIR T540 thermal camera (Teledyne FLIR Systems, Oregon) with a 24° lens. The camera was automatically calibrated, with an infrared resolution of 464 × 348 pixels, and a spectral range of 7.5 to 14.0 μm. Emissivity was set to 0.96, as is appropriate for this species [18]. Images were obtained weekly during January and February 2022. Thermal imaging commenced after the elephants had left their heated barns and been roaming in the 200 acre area for at least 30 min. During each observation period, three lateral-view images of each elephant were obtained in succession (10 s time period) every 15 min. Each series of three images for each individual at each interval was compared with the others, and the "best" image was chosen for analysis. The "best" image was the one that most closely provided a fully perpendicular, full-frame, lateral view, in which there were no elements obscuring the ear or body, such as the appendages of other elephants or an individual's tail. The distance at which the image was obtained varied from 3.5 m to 10 m, depending on the size of the elephant, with the goal of obtaining an image that filled the frame. The distance remained consistent for each individual across all observational days. Images were analyzed using the FLIR Thermal Studio Pro software (Teledyne FLIR LLC, 2021 Wilsonville, OR, USA).

Ambient temperature (T_a) was recorded using a DS 1923 iButton Hygrochron Temperature/ Humidity Logger ® (Maxim Integrated, San Jose, CA, USA), programmed to record data hourly. Temperatures were recorded to the nearest tenth of a degree. Loggers were placed in an outdoor location on the property, out of direct sunlight and away from other heat sources.

The behavior of each individual was categorized at each 15 min interval, to coincide with the time at which the images were obtained. Behaviors were recorded as "eating" (individuals had been and were eating in a stationary position prior to imaging), "moving" (individuals had been moving immediately before or at the time an image was obtained) or "drinking". Behaviors characterized as moving included walking, running and playing. All observations were recorded by the same observer to maintain consistency.

In each 'best' image, a polygon was drawn that encompassed the entire body or ear, but excluded the outer edge of the body, in order to avoid background interference bias (Figure 1). Within the polygon, the maximum surface temperature/pixel (T_{Max}), the minimum surface temperature/pixel (T_{Min}) and average surface temperature across all pixels (T_{Avg}) were obtained. The mean $\pm$ standard error (SEM) of T_{Avg} of the body, and ear surface temperatures for each individual were calculated for each best image obtained at each interval throughout the observation period. Images in which the difference between T_{Max} or T_{Min} and T_{Avg} was $\geq$5 °C, indicative of a potential thermal window, were included in additional analyses. The $\geq$5 °C criterion was chosen, as it was the same as that used in previous studies of thermal windows in elephants [16]. As solar radiation can influence the surface temperatures obtained from thermal images [10], only images with consistent environmental conditions throughout the observation period were used in further analysis. Specifically, we utilized images that had the same environmental conditions throughout the data collection day. All images analyzed for each individual were either taken in totally overcast or totally sunny conditions, to avoid the difference in solar radiance going from overcast to full sun observations within the same observation day.

The first step in identifying thermal windows was identifying when the $\geq$5 °C surface temperature difference was characterized by a discrete area of increased temperature, occurring in an area with the requisite underlying vascularization. When a potential thermal window was identified, a polygon was drawn around the area of increased temperature. The T_{Avg} of the polygon encompassing the thermal window was obtained and then compared to the T_{Avg} of the polygon encompassing the remaining portion of the ear or body. The percentage of the total surface area of the thermal window polygon within the polygon encompassing the entire ear or body was calculated (Figure 2). The area of occurrence of thermal windows in the ear (the only area in which we identified potential thermal windows) was characterized as occurring in the proximal, medial or distal region of the ear, based on patterns of underlying vascularization (Figure 3). A Chi-squared (λ) test was conducted to determine if the thermal windows were occurring at random, among the analyzed regions.

The index of vasomotion (VMI), as described by Phillips and Heath [19], was calculated for each individual in our study. VMI is a measure of an animal's ability to control their surface temperature, which was calculated using the equation VMI = 0.27717 + 0.27929log (weight in kg) [19]. Phillips and Heath [19] used the equation to describe the ability of 29 species in regulating their body surface temperatures, based on surface area to volume ratio, metabolic production and thermal thresholds. We extended the use of VMI to investigate the extent to which size variations (weight and surface area to volume ratio) could potentially affect an individual Asian elephant's ability to regulate its body temperature, as weight and size varies by degrees of magnitude between young and adult elephants (Table 1). As such, we hypothesized that an individual's thermoregulation would likely vary based on age, similar to the variations observed among other species varying in size.

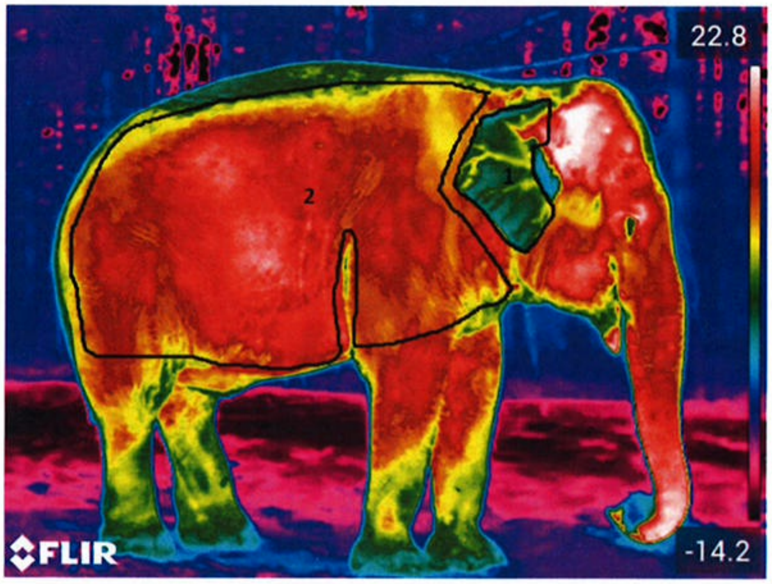

Figure 1. Images were analyzed in terms of both the body and ear. Polygons were drawn by hand within FLIR Thermal Studio Pro software to delineate the ear (1) and body (2). T_{Avg}, T_{Max} and T_{Min} were derived for each polygon.

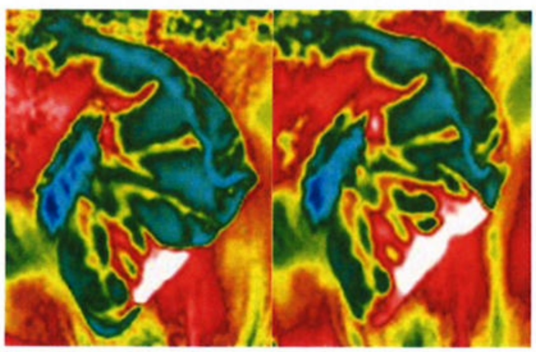

Figure 2. Example of a thermal window in the ear of an Asian elephant J, (**a**) growing in size within a 15 min interval (**b**) on 11 January 2022. The thermal window is characterized by a temperature ≥5 °C when compared to the surrounding tissue [16]. The thermal window(s) was delineated using a polygon. The total area of the thermal window was calculated as a percentage of the ear polygon.

Table 1. Demographic details of the Asian elephants observed in our study. Index of vasomotion (VMI) values were calculated using the equation VMI = 0.27717 + 0.27929log (weight in kg) [19].

Individual	Sex	Age (years)	Weight (kg)	VMI
A	Female	1	397	1.00
B	Female	1	407	1.01
C	Male	3	1132	1.13
D	Female	6	1853	1.18
E	Female	15	3337	1.26
F	Male	22	4084	1.29
G	Female	28	3860	1.28
H	Female	37	2883	1.24
I	Female	56	3346	1.26
J	Female	54	3825	1.28

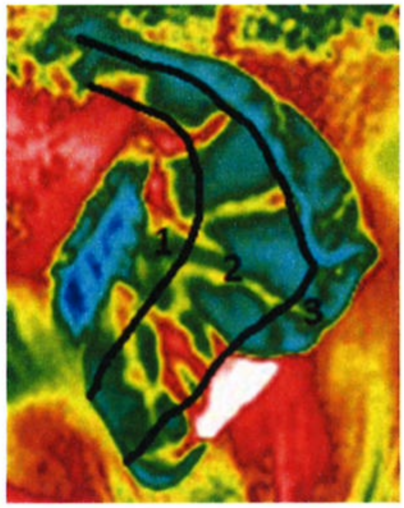

Figure 3. Example of an ear, divided into proximal (1), medial (2) and distal (3) regions, based on the approximation of blood vessels present in the ear in each location [15,16]. In this image, a thermal window is evident in the distal portion of the ear.

3. Results

Data were obtained from 10 of the total 17 Asian elephants within the herd, who varied from 1 to 56 years of age (Table 1), including two male and eight female elephants. Weights ranged from 397 to 4084 kg (Table 1).

A total of 1131 thermal images were obtained from seven observation periods across a six-week period (4 January 2022 to 15 February 2022). Of these, 374 images were used in analyses. Observation time varied from 60 to 90 min/day, with a total of 575 min of observation combined across all individuals. Average ambient temperature during the observation periods ranged from −9.4 to 4.0 °C (Table 2). Surface temperatures, as determined by IRT, in both the ear and body were found to be quite variable. On any one observation day, the greatest difference between T_{Max} and T_{Min} in a single elephant's body varied up to 23.9 °C, and varied up to 29.4 °C within a single elephant's ear. Average body surface temperature was higher than that of the average ear temperature among all observation periods (Figure 4). The pattern of variation between the mean surface temperature of the body versus ear was similar among the observation periods (Figure 4).

Table 2. Summary of data collection and occurrence of thermal windows between 4 January 2022 and 15 February 2022, with ambient temperatures ranging from −9.4 to 4.0 °C.

Date (Day Month Year)	Length of Observation Period (Minutes)	Average Ambient Temperature (°C)	Individuals Monitored (n)	Individuals with Thermal Windows (n)	Thermal Windows (n)
4 January 2022	90	2.6	5	0	0
11 January 2022	75	−9.4	5	2	4
18 January 2022	90	−2.8	10	2	7
25 January 2022	90	−7.3	10	1	2
1 February 2022	90	4.0	10	3	10
8 February 2022	60	−0.3	10	1	2
15 February 2022	75	−2.2	10	1	1

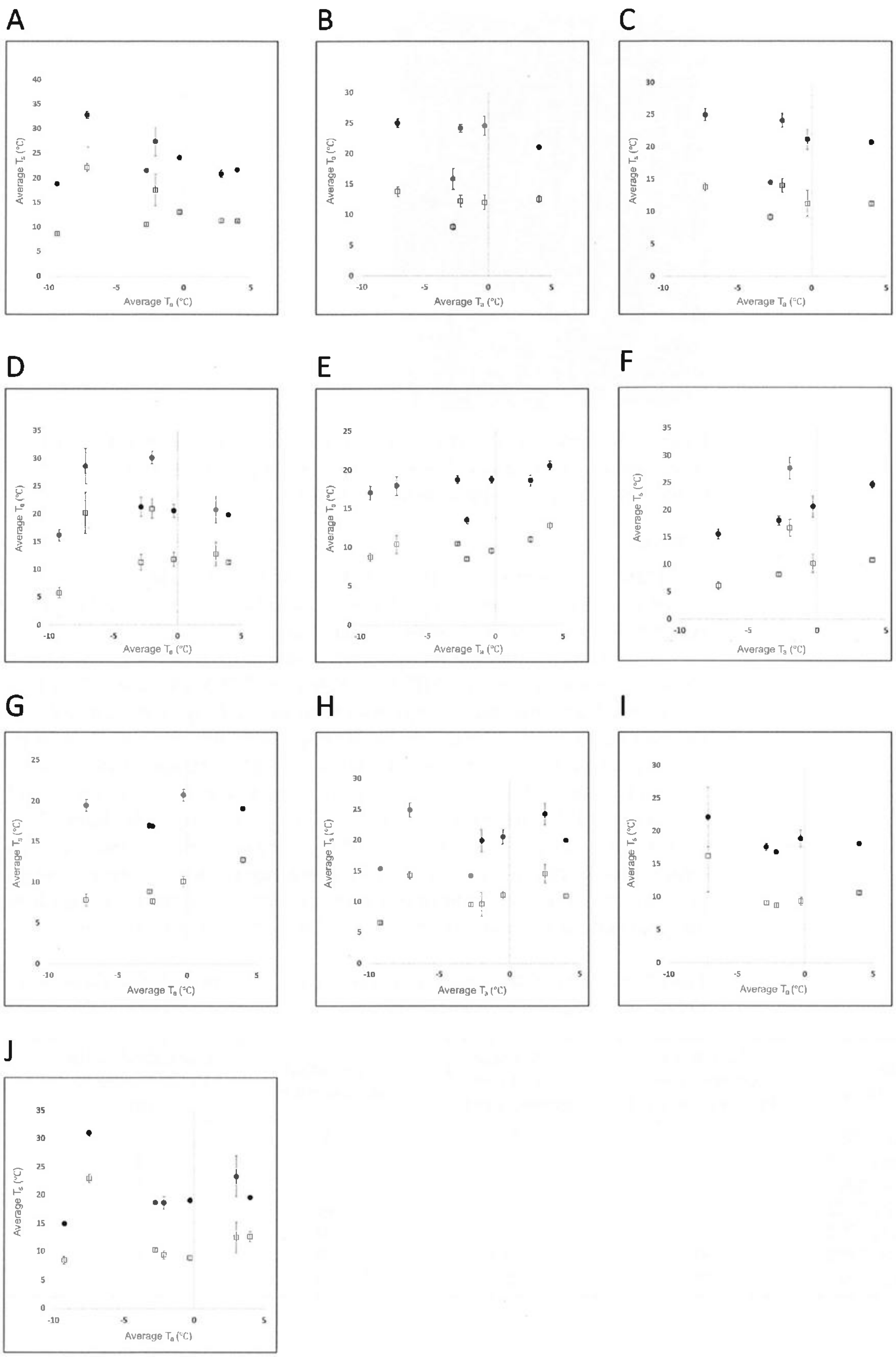

Figure 4. Mean ± SEM surface temperature (T_s) of the body (•) and ear (□), obtained from 10 Asian elephants (**A–J**) across all observation days, with mean ambient temperatures (T_a) ranging from (−9.4 to 4.0 °C).

T_{Avg} of the body surface varied by ≥5 °C from T_{Min} in 343 (92%) and from T_{Max} values in 231 (62%) of the images analyzed. The T_{Avg} of the ear surface varied by ≥5 °C from T_{Min} in 339 (91%) and from T_{Max} in 374 (100%) of the images analyzed. However, on further examination, none of the images of the body with the ≥5 °C differential were found to represent potential thermal windows, but instead could be attributed to other causes. Conversely, several, large potential thermal windows were identified in the ear. In total, five individuals appeared to develop thermal windows in the ear, with thermal windows ranging in size from 2 to 33% of the total surface area of the ear (Table 3). Three individuals had multiple occurrences of thermal windows within a single observation day. However, only one individual developed more than one thermal window concurrently (Table 3). No pattern was apparent that suggested a relationship between the occurrence of thermal windows and ambient environmental temperature (i.e., the thermal windows did not occur only on the coldest days) (Table 3). Thermal windows developed most frequently (74%) in the distal region of the ear, and to a lesser degree (26%) in the medial region of the ear (Table 4). No thermal windows were identified in the proximal region of the ear (Table 4). A Chi-squared test revealed that the thermal windows occurred significantly more frequently in the distal portion of the ear ($\lambda^2 = 2.9 \times 10^{-5}$).

Table 3. Dates and environmental conditions on days when thermal window events were observed in January and February 2022. Thermal windows were only found in individuals A, B, G, I and J (see Table 1 for demographic information on these individuals). Thermal window events were defined as per Weissenböck et al. [16], where the temperature differential between the thermal window and surrounding tissue was ≥5 °C.

Observation Date (Day Month Year)	Individuals with Thermal Windows	Average Ambient Temperature (°C)	Percentage of Observations of Each Individual with a Thermal Window (%)	Thermal Window Surface Area (% of ear)	Temperature Differential between the Thermal Window and Surrounding Tissue (°C)
11 January 2022	J Window 1	−9.4	50	4	9
	Window 2			6	7
	Window 3			4–13	14–15
	A Window1		17	14	5
18 January 2022	J Window 1	−2.8	71	2–9	12–16
	B Window 1		14	14	6
25 January 2022	I Window 1	−7.3	29	12–22	5–6
1 February 2022	J Window 1	4.0	71	3–33	8–14
	G Window 1		43	6	6
	Window 2			2–4	6–10
	B Window 1		29	2–4	5–9
8 February 2022	A Window 1	−0.3	40	6–10	5–8
15 February 2022	B Window1	−2.2	17	23	8

Table 4. Location of thermal windows observed in the ears of each of the five individuals (see Table 1 for a summary of demographics of each individual). If a thermal window extended into a second region of the ear, the thermal window was counted as occurring in both locations. A Chi-squared test revealed a statistically significant pattern of occurrence ($\lambda^2 = 2.9 \times 10^{-5}$), suggesting that thermal windows most frequently developed in the distal portion of the ear.

Individual	Proximal Thermal Windows (*n*)	Medial Thermal Windows (*n*)	Distal Thermal Windows (*n*)
A	0	2	3
B	0	0	4
G	0	2	3
I	0	2	1
J	0	3	14
Total	0	9	25

The index of vasomotion ranged from 1.00 to 1.29, with the smallest/youngest elephant (Elephant A) having the lowest VMI (1.00) and the largest (Elephant F) having the highest VMI (1.29) (Table 1). In general, VMI increased linearly as individual age and weight increased (Table 1).

Behavioral observations suggested that the younger individuals (Elephants A and B) were more frequently active, being observed to engage in play/running/walking activities during 45–56% of the monitoring intervals (Table 5). Older individuals were largely observed eating in a stationary position (Table 5).

Table 5. Summary of the total intervals in which individual elephants engaged in varying behaviors over the study period. Behaviors were recorded every 15 min, and coincided with thermography.

Individual	Eating (%)	Drinking (%)	Moving (%)
A	55	-	45
B	44	-	56
C	56	3.0	41
D	58	-	42
E	100	-	-
F	84	-	16
G	94	3.0	3
H	97	-	3
I	87	-	13
J	100	-	-

4. Discussion

Research on thermoregulation in elephants has, to date, been largely focused on African elephants [11,12,16,20,21], and on the development of thermal windows at higher ambient temperatures. While no study specifically looking at the response of Asian elephants to lower ambient temperatures was found, results suggest that elephants are able to constrict blood flow to their ears as a means of conserving heat in these situations [12,16,18]. We used Infrared Thermography (IRT) to characterize and gain a better understanding of the patterns of thermoregulation at lower ambient temperatures. Our data empirically support what has been observed at African Lion Safari for nearly five decades: that Asian elephants are comfortable during the time spent outdoors in colder temperatures. Patterns of temperature variation among thermograms suggested that individuals were actively adjusting temperatures in their ears, but not their body. We believe our data suggest that an individual's weight, age and behavior impacted the variations we noted in the appearance of thermal windows among individuals. This is the first study to reveal that vasodilation, specifically when presenting as the development of thermal windows, in Asian elephant ears in lower ambient temperatures, is similar to that documented by previous studies as a response to higher ambient temperatures; however, these responses are often accompanied by behaviours such as ear flapping [12,20,21]. Our research revealed that images should be interpreted by taking into account numerous factors. This could include the analysis of behaviors, such as ear flapping, that are important in thermoregulation, but also behaviors such as choosing to stand in the sun versus the shade, which also impacts thermoregulation. Doing so can help to gain a deeper understanding of both behavioral and physiological thermoregulatory adaptations in Asian elephants.

A five degree variability between T_{Avg} and both T_{Min} and T_{Max} was observed in most of our images in both the body and ear. Behavior, solar radiation and underlying physiological processes can all create significant variations in surface temperature [10,22]. Upon further examination of the images, all the variability between T_{Min} and T_{Avg} within the polygons circumscribing the body was due to the presence of materials such as hay, snow or hair. However, patterns were detected that were suggestive of a causal factor for variations in T_{Max} from the T_{Avg} in images of both the body and ear, which could be attributed to (1) increased blood flow (i.e., lactating mammary tissue) (2) surface area to volume ratio considerations or (3) thermal windows. No discrete regions of increased temperature that were indicative of thermal windows could be diagnosed on the body, while several occurrences were found in the ear.

Physiologically, endotherms, which are animals with the ability to maintain a core body temperature [23], produce both metabolic heat and waste, as well as work heat, caused by muscle activity [23,24]. Thermoregulation occurs by both physiological and behavioral mechanisms [23]. For mega-vertebrates [18], such as elephants, their large body size creates unique thermoregulation considerations. Specifically, temperature exchange with their surroundings is hampered by a low surface area to volume ratio, making it difficult for these extremely large animals to adequately lose heat in high ambient temperatures [16]. This is exacerbated even further, as they lack sweat glands to aid in heat dissipation [25]. Conversely, their large body size is considered to be advantageous at low ambient temperatures [26].

Endotherms will employ physiological mechanisms in conjunction with behavior [14] to obtain thermal neutrality [27]. Behavioral thermoregulation is often species-specific and associated with unique morphology [14,23]. For example, both African and, to a lesser degree, Asian elephants will either fan or tuck their ears close to their body as a means of dissipating or conserving heat, respectively [12,20,21]. Additionally, it is well-known that elephants will vasoconstrict blood vessels in their ears as a primary response to lower ambient temperatures [12,15]. The differential that we observed between the body and ear surface temperatures suggests that vasoconstriction occurred frequently in the ear throughout our study period (Figure 4).

The Index of Vasomotion (VMI), as described by Phillips and Heath [19], is a measure of a species' ability to manage heat exchange with their environment. Results of Phillips and Heath's [19] research indicate that higher VMI values are associated with heavier individuals and a greater ability to control their surface temperatures [19]. Smaller individuals have lower VMI values and lesser control over their surface temperature. Similarly, VMI values were lowest in the younger and smaller elephants, and increased with age and size, with an overall linear relationship. Sexual size dimorphism in Asian elephants prevented a complete linear association [28]. Thus, it would be expected that smaller/younger elephants would have a greater need to employ behavioral or physiological mechanisms for thermoregulation compared to larger/older elephants. However, the degree to which specific physiological adaptations that would be employed would be impacted by behavior—more physically active individuals would develop more metabolic heat, and, thus, fewer thermal windows.

We believe that our data reveal that Asian elephants are actively thermoregulating by producing thermal windows in their ears, in order to counter the potential adverse effects of lower ambient temperatures. We found that the older/larger and younger/smaller elephants both developed thermal windows. The greatest number of thermal windows was observed in one of the oldest elephants, conversely to what was predicted by VMI. However, older elephants were more sedentary, and likely not producing the same degree of excess metabolic heat as the younger elephants, which were more active (i.e., they were most often observed to be walking, running or playing). Furthermore, it was anecdotally noted that the older elephants kept their ears close to their body, consistent with heat-conserving behavior observed in previous studies [21]. However, other physiological processes also impact blood pressure and circulation in older elephants, as in older humans [29,30], and additional research is needed to more fully understand inter-individual differences in thermoregulation in older Asian elephants.

Thermal windows were found only in the distal and medial regions of the ear. Thermal windows appeared in the distal region most often, and in some cases, they would extend into the medial region, similar to that documented by Weissenböck et al. [16], in elephants thermoregulating at warmer temperatures. The thermal windows we diagnosed that were observed at lower ambient temperatures were not seen consistently. In most cases following potential vasoconstriction, we believe the thermal windows are indicative of a physiological mechanism, in which individuals supply warm blood to their extremities as a means of warming their ears, as Phillips and Heath [12] theorized would be possible.

The development of thermal windows in the extremities of Asian elephants suggest that this occurs as an adaptation similar to 'counter-current' heat exchange. The historic range of the Asian elephant indicates that their habitats were once much more temperate than they are today, suggesting that, historically, they may have needed to develop this type of physiological adaptation, in order to survive in colder climates [5,26,31]. Counter-current heat exchange is a physiological adaptation that has been observed in several mammal species endemic to habitats with lower ambient temperatures, such as the beaver (*Castor canadensis*) [32]. This adaptation is used in addition to morphological characteristics, such as fur or a thick layer of fat, to enable an animal to survive in low ambient temperatures. For example, in addition to their renowned pelt, beavers possess a counter current heat exchange mechanism in their hind legs and tails. Arteries containing warm blood from the body core are situated in the middle of superficial veins travelling from their legs and tail [32]. The warm blood from the arteries prewarms the blood returning to the body's core from these extremities, thus mitigating both heat loss from extremities and cooling of the core body temperature from cold blood returning to the heart [32].

The Asian elephant is the closest living relative to the woolly mammoth (*Mammuthus primigenius*), sharing more genetic material with it than any other living animal [33]. This relationship may also provide insight into our results. The woolly mammoth possessed several morphological traits that adapted them to life in extremely cold environments [34]. These traits included long, thick fur, a marked layer of subcutaneous fat and prevalent sebaceous glands that aided in insulation, as well as small tails and ears that helped to reduce heat loss [34]. Research to better understand the molecular basis of the phenotypic traits in woolly mammoth revealed other, less readily apparent, genetic adaptations to life in the extreme cold [33]. To the best of our knowledge an assessment of the molecular basis of thermoregulation has been restricted to extinct pachyderms. However, based on these findings, a similar study focused on Asian elephants would likely reveal unique and important insights.

Our findings have broadened the understanding of Asian elephant thermoregulation, and empirically support that the species has a physiological mechanism of warming. However, additional research is needed to fully understand both the cause and the underlying physiological basis behind the occurrence of thermal windows in low ambient temperatures, in particular, how it varies among individuals. Future studies should include efforts to quantify core body temperatures and correlate core body temperature with surface body temperature. Additional physiological factors, such as blood pressure, should also be assessed, as well as environmental factors, in particular relative humidity and solar radiation. Our results suggest that studies should also include animals varying in age and size. While our methodology is broadly used, future studies should also consider alternative analytical methods to identify deviations in minimum and maximum temperature from the average in thermograms.

5. Conclusions

Our results suggest that the Asian elephant may be more well-adapted to lower ambient temperatures than previously thought. Given the species history, it is plausible that thermal windows are a physiological adaptation that was developed historically to survive in colder climates, but which may also still remain relevant today, given the temperature extremes found in situ. Given African Lion Safari's large and diverse herd, we were able to comment on the impact that age, size and behavior may have on the development of thermal windows at lower ambient temperatures. Results suggest that larger or more active elephants have a lesser need to utilize thermal windows as a warming mechanism. Our data on age indicates that sex-specific differences in the size of adult elephants prevents a strictly linear relationship in VMI, which can be used as a measure of an individual animal's ability to control their surface temperature. Our results can assist with Asian elephant conservation both in situ, in light of climate change, and also ex situ, as regards populations managed across different temperature gradients.

Author Contributions: Conceptualization, J.L, C.G. and T.P.; Methodology, J.L. and A.C.; Validation, J.L. and T.P.; Formal Analysis, J.L. and A.C; Investigation, J.L., C.G. and T.P; Resources, J.L., C.G. and T.P.; Data Curation J.L.; Writing—Original Draft Preparation, J.L.; Writing—Review & Editing, J.L., C.G., T.P. and A.C.; Visualization, J.L.; Supervision, J.L. and A.C. Project Administration, J.L.; Funding Acquisition, A.C. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The work was reviewed and approved by the Animal Care Committee at African Lion Safari (ERC-22-JK, December 2021).

Data Availability Statement: Due to institutional policy, data is not publicly available. Data is available upon request from the corresponding author.

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Conflicts of Interest: The authors declare no conflict of interest. The research reported was part of an undertaking to integrate and to better understand potential applications of IRT in the zoological industry.

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ASIAN ELEPHANT SUPPORT

Honorable Senator
The Senate of Canada
Ottawa, Ontario K1AOA4

Dear Senator:

Asian Elephant Support is a United States 501(c)3 nonprofit, supporting the care and conservation of Asian elephants in range countries. We wish to submit our comments in support of Canada's Accredited Zoos and Aquariums (CAZA) amendments to Bill S-241, also known as the Jane Goodall Act.

Our efforts in Asian elephant range countries include educational workshops for veterinarians, elephant owners, caregivers (mahouts), and communities that struggle to co-exist with wild elephant populations. We also fund medical and other supplies that are often needed but unavailable.

Asian Elephant Support supports the responsible public display of elephants as a vitally important means of increasing public awareness of, and ultimately concern for these animals in the wild. We sincerely believe such education results in conservation-related efforts necessary to ensure the future survival of elephants in the wild where the critical issues of habitat loss and human-elephant-conflict threaten the future existence of wild elephants. Many CAZA institutions are supporters of in-situ conservation efforts, including our organization's programs.

Canada Bill S-241 raises the following serious concerns: The language in the Bill does not make clear the sponsors' objectives, or how this particular approach is intended to address any underlying concerns. CAZA amendments to Bill S-241 addresses those issues and should be incorporated into this legislation.

Please feel free to contact us if you need further information on our conservation efforts.

Sincerely yours,

Linda Reifschneider
President

Asian Elephant Support is a 501(c)(3) Non-Profit Organization
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27 September 2022

The Senate of Canada
Ottawa, Ontario
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K1A 0A4

To Whom It May Concern:

The Elephant Managers Association (EMA) respectfully submits this letter in opposition to Senate Bill S-241 ("The Jane Goodall Act"). The EMA feels that the proposed bill will negatively impact the efforts of animal care organizations doing important conservation work such as African Lion Safari (ALS), operating at 1386 Cooper Road, Cambridge, Ontario N1R 5S2. Accredited and professional animal care organizations such as ALS serve the interests of animals across many species through their established and effective care and management programs for animal welfare, conservation, non-harmful scientific research and public education, but in the case of ALS specifically, it will impact endangered Asian elephants most heavily.

The EMA is the premier international nonprofit organization of professional elephant caregivers, veterinarians, conservationists, and researchers. No other professional organization in the world represents elephants as thoroughly, and our membership is composed of experts in the fields of elephant care, ecology, research, and biology. The Association is dedicated to the welfare and survival of the world's elephants through improving communication, husbandry, research, and public education across all parties in the professional elephant management field. As a part of this mission, the EMA offers expert testimony in its constructive efforts both domestically and internationally with governments and regulatory agencies on matters relating to elephant welfare.

The EMA and its members adhere to a strict code of professional ethics and are committed to providing science based elephant care at the highest levels. The EMA professional membership base is predominantly made up of staff caring for elephants at accredited zoos under both the rigorous standards of the Association of Zoos and Aquariums (AZA) and Canada's Accredited Zoos and Aquariums (CAZA). At the institutional level, our memberships include such prominent elephant conservation organizations as the International Elephant Foundation and White Oak Conservation Foundation. In addition, both current and past members of the EMA's leadership are also Administrators and Instructors for the AZA's Principles of Elephant Management professional development schools, which are required classes for all elephant care staff at AZA accredited facilities that manage elephants.

The responsible management of elephants can take many different forms, often dictated by the needs of the individual elephants at each facility. It is only through our collective knowledge and our diversity that new ideas and perspectives are developed. Our members represent many differing viewpoints, but are strongly aligned on the common goal of sharing information and striving for the best possible care for elephants in all settings with the overarching vision of a world in which the threats facing all species of elephants are eliminated.

The EMA remains at the forefront of improving conditions for elephants in all settings, and through that goal, we recognize that each organization that manages elephants may operate with differing levels of staff expertise or resources and that not every organization is always capable of doing exceptional work. As such it is our objective to support all elephant programs in their efforts to grow, and to learn with those that are doing outstanding work towards ensuring a future for these magnificent creatures. It is also important to note that there are current, and widely accepted, professional industry standards such as the EMA Guidelines for Elephant Care and Management, the EMA-supported Elephant Husbandry Manual, the code of ethics for the World Association of Zoos and Aquariums (WAZA), the AZA Standards for Elephant Management and Care, the accreditation standards for CAZA, and many existing animal welfare laws and regulatory agencies that inform and regulate the management and care of elephants and other species.

As a key component in our efforts to support professional elephant management, the EMA values responsible public engagement with elephants and other species as an effective and unique means of increasing public empathy with the species and contributing to their ultimate survival. Complex issues such as habitat degradation, the exponential loss of safe wildlife corridors for elephants to traverse in their ranges, human elephant conflict (HEC) due to expanding human populations, and rampant poaching for ivory threaten their existence throughout the range countries daily. Deeply personal experiences resulting from direct animal encounters at zoological facilities are often the reason that people become invested in conservation and it is through those interactions that people come to feel strongly about saving wildlife worldwide.

However, human connections and empathy are not enough. Ideas and knowledge resulting from science and collaboration are equally critical to eliminating the issues facing animals in their rapidly changing home ranges. Established and experienced animal care facilities like African Lion Safari are already working hard to generate ideas aimed at such conservation challenges as population sustainability, habitat preservation, and the loss of life of people and animals as a result of human elephant conflict.

ALS has long been a pioneer in studying elephant behavior, reproduction, and disease management in elephants in particular but also in many other species. Not only has African Lion Safari successfully fostered a multigenerational herd which addresses the social, developmental, and emotional needs of these complex creatures, but they have also dedicated over 300 acres of land to the herd's physical well being. Through its long-running work with elephants, ALS has conducted extensive non-harmful scientific research and published findings in multiple scientific journals regarding topics such as cryopreservation of elephant sperm in the field (critical to helping ensure the survival of the species), assisted reproduction in white rhinos, and the reproductive physiology of elephants and giraffes. The Jane Goodall Act will effectively discontinue the ability of organizations like ALS to continue their important work. Research conducted with animals under human care trained to cooperate voluntarily in procedures provides opportunities to obtain samples and data in a controlled environment that would not be as readily possible in the wild. As a result, the population of animals in North American zoological facilities plays a critical role in the survival of their wild counterparts.

Due to the dire need to generate open-minded strategies to save our planet's wildlife, the Elephant Managers Association believes that the Jane Goodall Act would unnecessarily undermine the work already being done by experts in the field of conservation simply based on differing ideologies about animal welfare. The act does not recognize the value that animals managed professionally under human care can contribute to the survival of their species, and in doing so, it eliminates opportunities to learn more in settings outside of the range countries, which are becoming less wild and safe every day. In making your decision, please remember that some of the greatest discoveries and solutions are often uncovered in unexpected places, and when we remove proven and effective tools from our collective efforts, we are all lessened in our ability to succeed whether we share the same ideologies or not.

Thank you for your time and consideration. We would be glad to have a representative from our organization speak with you at any time about professional elephant management and how it can benefit these species. Please contact us if you require additional feedback as you determine the best route into the future.

Respectfully,

Vernon Presley
President
Fresno, CA

EMA Board of Directors:
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To:
Dear Honorable Senator
The Senate of Canada
Ottawa, Ontario
K1A OA4

The Community for Sumatran Nature Conservation / Komunitas untuk Hutan Sumatera (CSNC/KHS) respectfully submits this letter in support of Canada's Accredited Zoos and Aquariums (CAZA) amendments to Bill S-241, also known as the Jane Goodall Act.

CSNC/KHS is an Indonesian nonprofit organization dedicated to supporting local communities and authorities in nature conservation to ensure long-term biodiversity through environmental management support and education programs.

CSNC/KHS recognizes and supports the responsible public display of elephants (and other animals) as a vitally important means of increasing public awareness of, and ultimately concern for these animals in the wild. Indeed, such education and resulting conservation-related efforts are necessary to ensure the future survival of elephants in the wild where the critical issues of habitat degradation and destruction threaten the continued existence of wild elephant populations.

With respect to Canada Bill S-241 itself, please note the following serious concerns:
The language in the Bill does not make clear the sponsors' objectives, or how this particular approach is intended to address any underlying concerns.

Zoological institutions managing elephants in Canada have financially supported CSNC/KHS elephant conservation activities in Sumatra (Indonesia) for many years. If these same institutions no longer exhibit elephants, the funding support for KHS conservation activities would likely end, resulting in a negative impact to the conservation of critically endangered elephants and other endangered wildlife in Sumatra.

Thank you for your time and consideration. Please contact us if you require additional information on elephant conservation in Sumatra.

Medan December 20th 2022

Dr. Christopher Stremme DVM
(CSNC/KHS Conservation Programs Manager)

FORUM KOMUNIKASI MAHOUT SUMATERA

FOKMAS

Jalan Raya labuhan Ratu Lampung Timur Sumatera Indonesia

To:Honorable Senator

The senate of Canada

Ottawa, Ontario

K1A OA4

The Indonesian mahout Communication Forum (FOKMAS) Respectfully asks You to amend Bill S-241 (Also know as the Jane Goodall act) as Outlined by Canada's Accredited Zoos and Aquariums (CAZA)

FOKMAS is an Indonesian nonprofit organization of professional elephant handlers,administrators,veterinarians and scientists. FOKMAS is dedicated to the welfare of Indonesian's elephants through improved communication,husbandry,education and conservation.

Elephant care professionals from African lion safari in Canada have visited Sumatra on several occasions and participated in FOKMAS Mahout workshops.additionally FOKMAS representatives have visited their counterparts in Canada to learn from their excellent Elephant management program. These exchanges of experience,knowledge and expertise have greatly helped improve the management and welfare of Elephants in our conservation response units (CRU) in Sumatra. Our CRU elephant patrols,participate in conservation activities to protect and preserve the critically endangered Sumatran elephants and other endangered wildlife.

Thank you for your time and consideration. Please contact us if you require edditional information on elephant conservation in Sumatra

Lampung 23 december 2022

FORUM KOMUNIKASI MAHOUT SUMATERA

Nazaruddin

Forum Leader

African Lion Safari®

Canada's Original Safari Adventure™

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History of our Founder

Colonel Gordon 'Don' Debenham Dailley was born July 24, 1911 in Winnipeg, Manitoba. He attended St. John's College and the University of Manitoba and began his military career in 1940. In 1943 he attended the Canadian War Staff College and then served in England. He held a number of executive positions at Army Headquarters in Ottawa and on the United Nations Armistice Commission in Korea. In 1940 he married Miss Virginia Johnston, a ballet dancer from Texas, and they had four children, Don, Susan, James and Virginia. He was promoted to the rank of Colonel in 1955 when he was assigned the Belgrade, Yugoslavia, as Canadian Military Attaché. Colonel retired from his military career in 1964 and became the Co-Director of the New Brunswick Centennial Administration.

Before joining the Army Colonel Dailley was active in sporting circles in western Canada and England. He was playing Captain of England's Olympic Ice Hockey Team which won the Olympic title and the Gold medal in 1936 and the European titles in 1937 and 1938.

In 1968 Colonel Dailley began pursuing his dream of creating an exciting new attraction in Canada – a drive-through wildlife park dedicated to the conservation of declining wildlife species. He selected a 700-acre parcel of land in Rockton, Ontario and African Lion Safari Ltd. was founded. On Friday August 22, 1969 the safari opened its doors to its first visitors and today over 50 years later, Colonel's dream continues.

Colonel Dailley was an active member of many associations and a founding member of two organizations that still exist today; the Canadian Association of Zoos and Aquariums (CAZA) and Attractions Ontario.

CAZA was founded in 1975 as a networking body for the zoo and aquarium industry. It provided an opportunity for Canadian colleagues to share and gather information. Over time CAZA became a vital resource for the animal industry. Today, it has gained recognition from both levels of government as it continues to highlight public education and conservation of animals throughout Canada and the world. Since 1984, CAZA has been the governing body for the accreditation of zoos and aquariums in Canada.

Attractions Ontario was founded in 1983. It too was developed as a networking and communication conduit for attractions in the province of Ontario. Today this not-for-profit organization strives to develop and co-ordinate joint marketing programs for over 500 members. Its goal is to promote tourism throughout Ontario by working in conjunction with the attraction

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industry and to act as an advocate for the industry. Co-operative initiatives undertaken between the association and its members are key to ensuring that Ontario remains a premier destination.

Colonel Dailley passed away in the spring of 1989 at the age of 77. Attractions Ontario created a scholarship (The Colonel Don Dailley /Attractions Ontario Scholarship) in his memory. Two scholarships are awarded yearly to second or third year students of a post-secondary tourism program in Ontario. The students must be interested in pursuing a career in the attraction sector of the tourism industry. The scholarship commemorates the Colonels outstanding contribution and commitment to attractions and Ontario tourism.

African Lion Safari

The park is comprised of over 750 acres, 250 of which provide animals with large areas of bush, grasslands or forest in which they can interact naturally with other animals. In several Game Reserves, mixed species roam and interact as they would in the wild. 25 to 30 acres has been developed for walk through areas and exhibits and the balance of the property is comprised of farm, bush and other habitat, including 40 acres of provincially significant wetland which we maintain and monitor.

Our wildlife farm provides a unique viewing opportunity for visitors to see, hear, touch and learn about different species of animals with which they may otherwise never come in contact. African Lion Safari® is a founding member (1975) and accredited member of the Canadian Association of Zoological Parks and Aquariums, now known as Canada's Accredited Zoos and Aquariums (CAZA), as well as a member of the World Association of Zoos and Aquariums. African Lion Safari® is also a founding member (1993) of the International Association of Avian Trainers and Educators (IAATE) and the International Elephant Foundation which was established in 1998.

The park has been successful with breeding 30 species that are considered endangered and 20 species that are considered threatened. The original idea of "maintaining self-sustaining populations of species in decline" still remains African Lion Safari's priority.

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Research & Conservation- Asian Elephant

African Lion Safari® is committed to animal welfare, conservation, science and education. As a founding member of Canada's Accredited Zoos and Aquariums (CAZA), we have been accredited for over 40 years and have remained in full compliance of standards that govern our park.

African Lion Safari is recognized worldwide for its expertise in elephant welfare. We are proud to have a very successful Asian elephant conservation programme. Our elephant care professionals are regularly consulted by conservation organizations worldwide for their input on issues of elephant welfare, healthcare management and conservation.

Our elephants live in a very natural social structure with a large cohesive multi-generational family. They enjoy a rich and diverse environment with the ability to roam hundreds of acres of woodlands, fields, streams and ponds. Over the last five years, we began transitioning our elephants out of our presentation and animal programmes, and our ride interaction programme was phased out in 2019.

At African Lion Safari, we have an unwavering commitment to continue our conservation mission to provide the highest standard of care for our elephants. Our organization and staff work tirelessly every day, at an international level, to ensure that this endangered species survives for future generations.

African Lion Safari has a long history of participating and contributing to conservation and research projects, both at the park and in range countries. In 1998, African Lion Safari founded the International Elephant Foundation (IEF) along with several international partners, and has been an active participant in Association of Zoos and Aquariums' (AZA) Elephant Taxon Advisory Group for over 30 years. African Lion Safari is an Advisor to the Asian Elephant Support Foundation, Program Partner for the AZA Asian elephant SAFE (Saving Animals From Extinction) program, as well as a Donor Partner to the IUCN SSC Asian elephant specialist group. The knowledge acquired from research of reproduction, physiology, behaviour has helped advance elephant conservation worldwide.

Asian elephants are an endangered species with less than 40,000 left in the wild. They face many challenges to their existence and are reliant on humans to ensure their conservation. By encouraging a connection with our elephants and other animals, our hope is to inspire our visitors to protect and preserve biodiversity and endangered species.

Research & Conservation- Rhino

African Lion Safari in Hamilton, Ontario is undertaking ground-breaking research using thermography to assess the health and wellbeing of the animals in their care. Thermal imaging has been used in human and equine medicine since the 1960s, and now the park is adapting the technology for use with other animals. African Lion Safari is exploring how a thermal camera, which non-invasively detects changes in surface temperatures, can enhance animal care practices.

Thermography has the potential to provide detailed information on the health of animals and help animal care staff and keepers identify how to better care for them. This has enabled veterinary and animal care staff at African Lion Safari to integrate thermal imaging to help detect injury, identify location of inflammation, detect pregnancy, track reproductive cycles, and monitor individual animal's tolerance to hot and cold temperatures. Canadian zoological facilities are often home to animals who are not native to our climate, so thermography will be an important tool that animal care professionals can use to examine the health and welfare of each species in their current environment.

African Lion Safari uses two very different thermal camera models in their research: the FLIR ONE, a small thermal camera designed to attach to a smart phone, and the FLIR T540 camera that produces research-grade images. The FLIR ONE is more financially accessible technology, so the park is using the research-grade camera to validate its results in hopes that other institutions can integrate the FLIR ONE into their work.

The images produced by a thermal camera are made up of pixels, with specialized software used to process the data. The software assigns a different temperature value to each pixel and then can identify maximum, minimum or average temperatures. The FLIR ONE is proving useful for general check-ups and assists with detecting inflammation. The research-grade camera boasts higher resolution, making it ideal for more sensitive temperature readings that produce a more in-depth look at animal wellbeing and monitoring, for example, detecting estrus cycles in rhino.

Thermography allows animal care staff to take an individualized approach to animal care. However, before this approach is used, staff first need to create a "normal" baseline that reflects each animal's individual physiology, behavioural patterns, and the environment in which they live. Baselines can then be used to assess changes in surface temperatures over time, allowing for the detection of significant changes such as inflammation. By creating baselines for both species and individual animals, thermography enables staff to provide a higher level of care for animals.

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African Lion Safari is a pioneer in their use of thermography. Their efforts will not only assist in the validation of the use of this innovative technology in zoological facilities worldwide, it will also amass a database of new information such as: what is the average body temperature of a giraffe? Rhino? Lion? Thermal Imaging provides an opportunity to increase our knowledge on animal welfare and based on results to date, will likely result in a significant step forward in animal care.

Research & Conservation- Cheetah

Cheetah are a truly rare and endangered species. For many years they were hunted for their beautiful coats. Today, there are now estimated to be less than 7,100 individuals living in the wild, as they face three major threats: human-wildlife conflict, loss of habitat and loss of prey as well as poaching and illegal wildlife trafficking.
Captive breeding has many challenges, mostly believed to be due to a genetic bottleneck which took place sometime during the last ice age, resulting in low genetic variability which can lead to poor sperm motility and high cub mortality.

African Lion Safari has dedicated over 30 years to the conservation of cheetah. Its cheetah management program has had much success. Since 2001, over 40 cheetah cubs have been born here at the park. This success has been attributed to our breeding program that is run out of our conservation centre. The layout of the conservation centre allows the males to pass by the females through an alley way which permits the females to select their breeding partners. Cheetah produce a vocalization known as a stutter-bark which indicates the breeding interests of the cats. African Lion Safari differs from other zoological facilities that simply house a breeding pair as we offer the cheetah the opportunity for mate selection.

African Lion Safari works closely with other zoological facilities to manage a genetically diverse and biologically sound population. Through continued co-operation and staff dedication, we were thrilled to announce the birth of our latest cubs; one in December 2020 and then adding two more in April of 2021.

African Lion Safari's Cheetah breeding and management program has been so successful, the park was awarded the prestigious Thomas Baines award in 2008 from CAZA (Canada's Accredited Zoos and Aquariums) for an outstanding achievement in cheetah breeding and management.

Research & Conservation- Giraffe

African Lion Safari has maintained a herd of giraffe for almost 50 years. In 1977, the park introduced the birth of Ontario's first baby giraffe. African Lion Safari's giraffe management program has seen great success over the years with the birth of 29 calves.

Giraffe are slow to reproduce because of their long gestation period. Development of a successful breeding program and a full understanding of giraffe reproductive physiology therefore, requires a long term commitment. The park has been active in the investigation of the reproductive physiology of giraffes and the development of breeding strategies that will assist in maintaining the health and genetic diversity of both captive and wild populations of giraffe.

The unique body shape and size of giraffe present challenges in the ability to perform husbandry and medical procedures. African Lion Safari has developed a management program that allows us to handle giraffe safely and efficiently. This program has allowed African Lion Safari to gather valuable information on giraffe reproductive physiology while maintaining our giraffe in optimum health and condition.

The regular collection of blood and fecal samples for hormone analysis and the performance of ultrasound examinations has enabled African Lion Safari to gather and correlate data with direct observation. Through these procedures, decisions and predictions regarding reproduction can be made to improve success.

As well as improving reproductive viability and easier access for assisted reproduction techniques and procedures, our giraffe management program has given us opportunities to monitor pregnancies via ultrasound and hormone analysis. As a result, African Lion Safari's giraffe management program has seen many monumental successes.

- On December 31, 2013 African Lion Safari welcomed "Safari", Canada's first giraffe conceived through artificial insemination. This is the first time a giraffe has been born by means of A.I. in Canada and only second in the World.

- In 2017 and 2018, African Lion Safari welcomed the first and second giraffe calves in the world to be conceived by artificial insemination using frozen semen.

- In 2020, African Lion Safari welcomed three giraffe calves; one in August and two in November.

These giraffe births are incredibly significant as we are able to conserve the valuable genetics of our giraffe population to contribute to conservation efforts both locally and globally.

African Lion Safari collaborated with Tierpark Berlin in the testing of a new GPS tracking system for giraffe. Giraffe at the park wore a unique head piece which contained a 3-way accelerometer that records every motion of the giraffe such as walking, sleeping and eating. African Lion Safari's participation in this research project was key as the data collected from our herd was used to calibrate the accelerometer so that it could be sent to Africa and used to study and track the behaviours of wild giraffe. Research collected in this project will have the potential to play a key role in the conservation of wild giraffe and their habitats.

Currently, African Lion Safari is utilizing infrared thermography (IRT) as part of their animal care regime. IRT is a non-invasive technology, which uses a camera that takes an objects emitted thermal radiation and coverts it to a measured surface temperature. Proven to be highly effective in the agricultural industry for detecting inflammation, estrus, pregnancy and overall thermoregulation properties; IRT technology is gaining interest in the zoological industry. The non-invasive nature of IRT makes it an ideal tool for zoological facilities, however this area of study is novel and the validation of the use of IRT in zoological facilities is currently underway at African Lion Safari. IRT is routinely used to examine our giraffe's joints to monitor for any changes in their thermal profile. For our giraffe herd, this technology is adding an additional layer to our animal care.

Giraffe populations have declined by almost half since 1998 with now only 80,000 remaining in the wild. With the largest herd of giraffe in Canada, African Lion Safari is dedicated to continuing its conservation initiatives to preserve this gentle giant for future generations.

Research & Conservation- Blue Throated Macaws

In 2011, African Lion Safari introduced two Blue-throated macaws into its flock in order to share and highlight this critically endangered species. Through conservation efforts focused on fieldwork to better understand the species' ecology and to develop a long-term plan to help this species make a comeback, it is believed that, without increasing the wild numbers with captive bred birds, the population may not increase to the levels needed to sustain the species in the wild.

In 2014, African Lion Safari became a joint conservation breeding facility with World Parrot Trust in efforts to save this iconic species. Through global collaborations, we have been able to contribute to

DNA research, supply new bloodlines to partnering breeding facilities and work toward the goal of increasing the in situ macaw population in Bolivia.

In 2018, a monumental achievement occurred when African Lion Safari welcomed its very first two hatched Blue-throated macaw chicks. Decades of experience working with large macaws at the park helped make this moment a reality. The park has since added an additional 8 more chicks to its flock. These 10 chicks hatched are from four different breeding bloodlines. These successes have resulted in a significant step closer to ensuring this remarkable species survives for future generations, as well as creates hope toward making an impact on wild populations.

Research & Conservation- Eastern Loggerhead Shrike

Eastern Loggerhead shrikes are one of Canada's most endangered songbirds. In the past, they could be found from Manitoba to New Brunswick. Now, however, there are fewer than 25 breeding pairs, restricted to two small isolated pockets in Ontario: the plains of Carden and Napanee.

After a precipitous drop in the wild Eastern Loggerhead shrike population in Ontario, an assurance population was established in the 1997/98. The cornerstone of the program is conservation breeding of birds in the *ex situ* population. *Shrike are housed and breed in* large enclosures situated out in the field. This exposes the young to natural habitat, including predators and prey, and allows them to develop a full range of survival skills. Young are released each year to supplement the wild population in both the Napanee and Carden plains, to supplement existing wild populations in these two core areas. Within just a few years of launching the conservation breeding program, released birds were found to have successfully migrated and returned to breed with wild shrike. This achievement was a first for a migratory songbird conservation breeding effort and brought international acclaim to the program. Since then, we've seen many birds returning to Ontario, often breeding and contributing more young birds to the wild population.

Since 2003, Wildlife Preservation Canada has led the multi-partner recovery effort for Eastern Loggerhead shrike *(*https://wildlifepreservation.ca/eastern-loggerhead-shrike-program/*)*, which includes several partners that provide breeding and overwintering facilities, including: African Lion Safari, Toronto Zoo, Smithsonian Conservation Biology Institute and Nashville Zoo. Later this year, Parc Omega and the National Aviary will also be joining the program.

African Lion Safari joined the program in 2008 and has been a leader in the conservation efforts since then. We have developed a purpose-built facility, which we call the 'Pod' which addressed many concerns regarding husbandry for the species. This design is now the program's

recommended design for new partners. We currently house 25 shrikes, including breeding adults and some young retained to maintain genetic diversity that will become future breeders. To date, African Lion Safari and partners have released a total of 1350 shrike into the wild.

Although little is known about shrike migration and wintering behaviour, it appears that the biggest causes behind the decline of this species are occurring outside Canada. We recognize the need to work with U.S. partners. African Lion Safari's Research and Conservation Programs Coordinator, Dr. Amy Chabot, has been researching loggerhead shrike since 1991. She serves as an Advisor to the Recovery Team, and helped to establish and coordinate the North American Loggerhead Shrike Working Group. She is working collaboratively with researchers at US and Canadian universities to develop genomic tools that can assist with management of the captive population, and help to better integrate ex situ and in situ recovery actions. African Lion Safari has received a grant from the National Science and Engineering Research Council (NSERC) to conduct a study in collaboration with Queen's University, to determine the impact of environment conditions and sustained captivity on the shrike's urge to migrate. The results of this study will be used to adapt management of the captive population, including determining if shrike from the existing captive population can be used to help recover populations in the U.S., and help to determine the impact of climate change on shrike populations.

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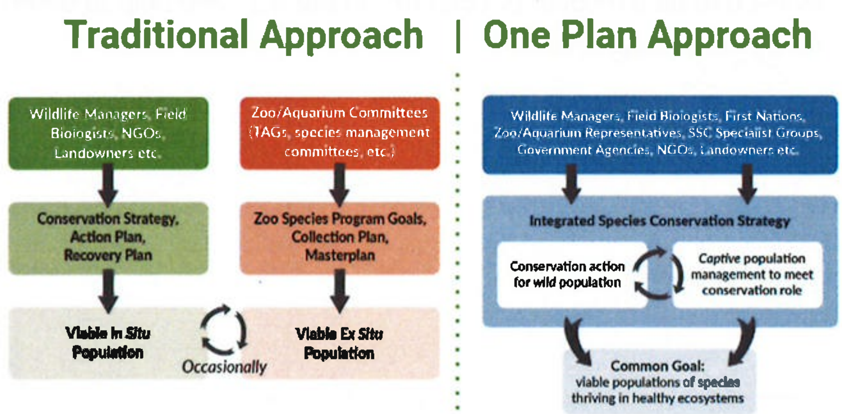
Canadian Species Initiative

The Canadian Species Initiative (CSI) (https://canadianspeciesinitiative.ca/) was co-founded in 2019 by African Lion Safari and Wildlife Preservation Canada, after recognizing the need to establish a coordinated and holistic effort to identify and implement the *ex situ* management needs for Canadian species at risk, and ensure integration with *in situ* efforts. Now recognized as the Canada Regional Resource Center for the IUCN Species Survival Commission Conservation Planning Specialist Group (CPSG), CSI actively promotes the One Plan Approach in Canada and works with diverse groups to apply globally recognized species conservation planning processes to Canadian species, and facilitate implementation of resulting recommendations. Through the use of science-based, inclusive and participatory planning processes, we can ensure that all possible management options are considered, and that the full complement of knowledge, skills, and strengths are brought together to identify the most effective conservation actions for Canadian species at risk.

The One Plan Approach is now the global standard for species conservation, ratified by a resolution at the 2020 IUCN World Conservation Congress to link in situ and ex situ efforts to save threatened species (IUCN Motion 094). This means that IUCN Members, including Canada, have voted and committed to promoting the integration of in situ and ex situ conservation interventions by applying the One Plan Approach. The motion now becomes an IUCN Resolution that will help set the international conservation agenda and influence national conservation policy. The One Plan Approach to species conservation planning has been shown to provide better outcomes for species at risk, and can help us meet Canada's biodiversity goals and targets.



As a recognized CPSG Regional Resource Center, CSI joins a growing network of facilitators trained in globally recognized species conservation planning workshop processes that apply the One Plan Approach and brings those tools and principles into Canada. Well-designed and executed species conservation planning that includes both *in situ* and *ex situ* management consideration can improve existing efforts and stimulate greater ambition, collaboration and resourcing. A 2021 study by

Lees et al. (Science-based, stakeholder-inclusive and participatory conservation planning helps reverse the decline of threatened species - ScienceDirect) demonstrated that this style of planning provides a turning point for those involved in conserving species, helping them transition to more effective ways of collaborating. Over time, this leads to clear and measurable improvements in species' conservation status, illustrating the powerful role of CPSG's planning approach in rapidly increasing the effectiveness of conservation efforts.

Canadian Snakes

In partnership with CPSG, we conducted a virtual workshop in March 2021 to assess *ex situ* conservation options for the 39 taxa of Canadian snakes. A diverse group of experts including zoo staff, government and First Nations representatives, and species experts from across Canada, the United States, and Mexico came together to discuss the *exsitu* conservation options for snakes in Canada. Conservation education, training, and research actions were identified for all Canadian snakes, and more intensive conservation programs were identified for several highly at-risk species. Actions identified in the workshop will complement *in situ* conservation efforts and CSI is looking forward to continuing to work with the Canadian herpetological community to move these efforts forward. The workshop report can be found at Canadian-Snakes-Integrated-Collection-Assessment-and-Planning-Workshop-Final-Report-2021.pdf (canadianspeciesinitiative.ca).

Eastern Loggerhead Shrike

We are currently working with CPSG on a PHVA for Eastern Loggerhead shrike (*Lanius ludovicianus migrans*), a migratory songbird considered critically endangered in Ontario and currently benefitting from a conservation breeding and release program. International in scope, this workshop will bring together stakeholders from across the U.S. and Canada to take a Full Annual Cycle approach to producing management recommendations. Results will form the basis for the development of an international conservation plan for the species in eastern North America, with concrete actions to ensure recovery in Canada.

Eastern Mountain Avens

We are also working with ECCC – CWS Atlantic and the Nova Scotia Department of Natural Resources and Renewables to develop and facilitate an Ex Situ Feasibility Assessment for Eastern Mountain Avens, as part of Southwest Nova Scotia Priority Place planning.

Caribou

In support of CSI more generally, Dr. Amy Chabot, African Lion Safari's Research and Conservation Programs coordinator and co-founder of CSI serves as on the Board of Directors for the Caribou Conservation Breeding Foundation CCBF). CCBF (https://www.ccbf.ca/mission) is a Canadian not-for-profit organization committed to the conservation and recovery of caribou. They advocate and promote the strategic integration of ex situ tools, such as conservation breeding with existing in situ caribou recovery initiatives, such as those being proposed to conserve populations in Jasper National Park.

Yellow-banded bumble bee / Rusty patched bumble bee
African Lion Safari is also supporting the efforts of Wildlife Preservation Canada's conservation breeding program for the yellow-banded bumble bee (https://wildlifepreservation.ca/bumble-bee-recovery/), participated in a conservation planning workshop for the rusty patched bumble bee, one of North America's most threatened pollinators, and have initiated a research project focused on developing Artificial Insemination for bumble bees.

Conservation Centers for Species Survival (C2S2)

African Lion Safari is the only Canadian facility to become a member of the Conservation Centers for Species Survival (C2S2). C2S2 brings together the collective expertise of large-sized institutions committed to the study, management and recovery of endangered species. Historically preserving biodiversity has centered on saving habitat and protecting species living in their native habitats. However, the scale of the species crisis has become so great that approximately 150-200 plant, bird, insect and mammal species go extinct every 24 hours, making it essential to explore more managed initiatives. To safeguard genetically diverse populations of the most endangered species, zoos, conservation centers, private landowners and governments must all work together. African Lion Safari is thrilled to be a member of this association, and contributing toward efforts of species survival around the world.

Conservation Evolution

1969: African Lion Safari® opens its gates

1973: African Lion Safari® introduces three Rothschild giraffe, the first in Ontario

1977: Birth of Ontario's first baby giraffe

1979: Birds of Prey Conservation Centre opens

1980: Canada's first Peregrine falcons are hatched

1985: **Outstanding Achievement Award** – Parrot House

1987: Conservation efforts begin to focus on the Asian elephant

1989: First Bald eagle to hatch under managed care in Canada

1990: First Golden eagle to hatch under managed care in Canada

1991: **Outstanding Achievement Award** - Cheetah Breeding programme

1991: First Asian elephant born at the park

1996: **Outstanding Achievement Award** - Birds of Prey- Their care and training

1998: Four endangered white rhino arrive from Kruger National Park

1998: **Outstanding Achievement Award** - Elephant Breeding programme

2000: **Outstanding Achievement Award** – Bald Eagle programme

2001: First cheetah born at the park

2006: African Lion Safari® welcomes fourth generation of Lanner falcon

2006: **Thomas R Baines Award** – Asian Elephant Breeding programme

2007: **Outstanding Achievement Award** for Giraffe Management and Reproductive Research

2008: **Thomas Baines Award** -Cheetah Breeding and Management Program

2009: First artificially inseminated elephant is born in Canada; African Lion Safari®

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2009: Four (4) Endangered Barn owls released into the wild in Forest Preserve of Dupage County, Illinois.

2010: Nine (9) Endangered Barn owls released into the wild in Forest Preserve of Dupage County, Illinois.

2010: **Colonel GD Dailley Conservation Award** – Bring Back the Endangered Barn Owl

2010: African Lion Safari® participates in the captive breeding and release of the critically endangered Loggerhead Shrike, with Wildlife Preservation Canada

2010: First in Canada to ultrasound, without sedation, a Malayan Tapir to detect pregnancy

2011: African Lion Safari® welcomes 40th cheetah cub

2011: Conservation efforts commence on the critically endangered Blue-Throated macaw

2013: African Lion Safari welcomes the first All Canadian Asian Elephant

2013: Baby "Safari" birth of Canada's first artificially inseminated Giraffe; First time in Canada, only second time ever in the world.

2014: Partnered with World Parrot Trust to focus efforts on the conservation and breeding of the endangered Blue Throated Macaw

2014: **Thomas R. Baines Award** – for ground-breaking work in artificial reproductive techniques in giraffe

2017: Eastern Loggerhead Shrike recovery programme released its 1000th bird which happened to be one of the young hatched at African Lion Safari.

2017: Baby "Jenga" first artificially inseminated giraffe from frozen semen, ever in the world

2018: Baby "Jagur" second artificially inseminated giraffe from frozen semen

2018: Two baby Blue Throated Macaws hatched

2019: African Lion Safari celebrates 50 wild years!

2021: **Colonel G.D. Dailley Award - Large Facility**: Asian Elephant Program –Recognizes achievement in ex-situ propagation and management programs that contribute to the long-term survival of animal species or populations

Peter Karsten Award - Large Facility: Elephant Conservation- Recognizes institutional achievement in the field of in-situ conservation.

2022: **Colonel G.D. Dailley Award – Large Facility:** Ex-situ Species Propagation and management for Eastern Loggerhead Shrike

2023: **Colonel G.D. Dailley Award – Large Facility:** Recognizes in-situ conservation of the Eastern loggerhead shrike.

Peter Karsten Award – Large Facility: For the development of assisted reproductive techniques for bees and snakes.

ASSOCIATION OF ZOOS & AQUARIUMS

AZA's Strategic Plan for Thriving Elephant Populations
Talking Points

Our Shared Commitment to Elephants at Home and Abroad

- The power of being able to see, smell, and hear an elephant is a transformative experience. As people understand the plight of elephants in the wild, they are moved to help us save them. AZA-accredited members are committed to ensuring a future for elephants.

- AZA-accredited zoos and aquariums are often the only way children can connect with wildlife and nature firsthand. The vast majority of people will only ever experience an elephant at a zoo, where they can also learn how to take action to help the species in other parts of the world.

- As an AZA-accredited zoo, the public can be assured that our elephants are receiving exceptional care, with a strong elephant wellbeing program that includes nutrition, welfare, exercise, and enrichment.

- Thousands of elephants are illegally killed every year to fuel the global demand for elephant ivory and elephant products. If poaching rates continue, the long-term survival of elephants is uncertain.

- By visiting elephants in AZA-accredited facilities, guests help make possible the field conservation, anti-poaching, research, habitat restoration, reduction of human-elephant conflicts, and community-based initiatives necessary to protect wild populations.

- AZA facilities' conservation efforts begin at home with the elephants in their care, but their efforts extend to Asia and Africa to ensure a future for elephants worldwide. AZA-accredited members continue to answer the call to action by providing support to elephant conservation around the world. Each year, AZA-accredited facilities invest millions of dollars to support hundreds of field conservation projects that benefit elephants.

Creating a Paradigm Shift

- In the face of declining populations in human care, the AZA community has committed to a collective effort of to secure a future for elephants in accredited zoos.

- In 2021, AZA formed the Elephant Strategy Task Force with representatives from various stakeholders, including the Animal Population Management Committee, Elephant Taxon Advisory Group (TAG), current and former elephant holding facilities, and others.

- The Task Force spent two years gathering and reviewing data while engaging with the AZA elephant community. The resulting recommendation from the AZA elephant community is a paradigm shift for elephants in AZA facilities -- a commitment to reverse the declining population trend and assure a future where elephants thrive at AZA-accredited zoos.

- In July 2023, the AZA Elephant Strategy was approved by the AZA Board of Directors, and funding was committed to support near-term implementation.

- As a community, we now have a shared vision for elephants in our care, a collective picture of success, and metrics to track our progress.

Strategic Priorities for Thriving Elephant Populations

1. *Ensuring elephants thrive in our care.*
    - We go from individual care and welfare standards to going above and beyond those standards, ensuring elephants thrive in our care.
2. *Collaborative, TAG-led decision-making*
    - We go from individual facility decision-making to collective, TAG-led decision-making.
3. *Clear expectations and accountability*
    - We go from individual responsibility to clear expectations and effective accountability within the AZA community.
4. *Centralized Resources and Information*
    - We go from dispersed to centralized resources and information.
5. *A Unified Voice for Elephants*
    - We go from individual voices for elephants to a collective, unified authority.

Next Steps

- The strategy is complete, but the work is just starting.

- Over the next two years you can expect to see work on the tenets of the strategy, including:
    - Reviewing and revising elephant accreditation standards and drafting an Animal Care Manual.
    - Assessing and documenting community needs and assets for elephants.
    - Reimagining the AZA Elephant Program Annual Report.

  - Formalizing the Breeding and Transfer Plan process, including developing criteria to guide the process for placement of reproductively viable animals as they become available.
  - Developing facility-specific, long-range plans for elephants.
  - Creating an elephant communications toolkit for facilities with elephants.
  - Establishing an African elephant SAFE program to facilitate collaborative conservation.

- A call to action:
  - Read the strategy.
  - Ask questions.
  - Be engaged.
  - Turn commitments into actions.
  - Work collaboratively on positive storytelling.