

# JEMA

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Elephant Managers Association



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**ELEPHANT  
MANAGERS  
ASSOCIATION**



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# Journal of the Elephant Managers Association

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- Spring issue (released in March)
- Summer issue (released in July)
- Fall/Winter issue (released in November)

- February 1**
- June 1**
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#askmeaboutelephants

## ON THE COVER

Over the years, African elephant “Stephanie” has seen a lot of changes at the Sedgwick County Zoo. Learn more from her dedicated keepers in this issue’s *Animal Ambassador* column. Photo by Sedgwick County Zoo.



# THE CONSERVATION ISSUE

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# Last year *your* support of IEF enabled...



35,168+ elephants protected



311,626+ square kilometers of habitat protected



1642 Rangers supported



66,166 patrol man days



6322 snares, traps, & nets found and removed



594 poachers caught



289,899 community members



520+ community educational opportunities





# President

**T**hanks to everyone that joined us in Columbus for the 2024 EMA Conference. 120 elephant professionals, researchers, and enthusiasts came together to share their work. It's always inspiring and rejuvenating to hear what's going on around the community and go back and share it with our teams. Thanks to the Columbus Zoo and Aquarium for hosting the conference, the Cincinnati Zoo & Botanical Garden for the pre-conference trip and for showing off their new barn and habitats, and the Indianapolis Zoo for showing off their program during the post-conference trip. **I'm happy to share the news that the 2025 conference hosted by Fresno Chaffee Zoo will take place October 5 to 9.** Stay tuned on our website and through our social media channels for updated information.

This issue of *JEMA* is our conservation edition. It's the biggest *JEMA* each year that shares what's going on in range countries and in our own backyards related to conservation. Thanks to the EMA Conservation Committee (along with our partners at the International Elephant Foundation) for the hard work to put this together.

Recently the application process for this upcoming year's EMA Leadership Cohort program wrapped up. Thanks to the thirty members that applied for a chance at this ten-month program. Out of the thirty members that applied, we selected ten to be a part of the cohort. Thanks to Jessica Scallan and Shawn Finnell for bringing this program to life.

The leadership cohort is one on many perks of being an EMA member. Another big perk is the EMA conference scholarships. Each year, we award four members scholarships to attend the conference. Keep an eye out for scholarship information to come out in the spring of 2025.

I recently finished a documentary titled "Join or Die." It's a film about the rise and fall and rise again of different clubs in America. If you have a chance check it out (it's on Netflix). I'm happy to say that EMA over the last several years has kept stable membership numbers and in fact has grown recently with numbers currently at 355. Thanks again for being a member!

If you ever have any questions or comments don't hesitate to reach out to board members individually or through the EMA Board email address: [EMABoard@elephantmanagers.com](mailto:EMABoard@elephantmanagers.com)

**Tripp Gorman**  
President, Elephant Managers Association



PHOTO: SEDGWICK COUNTY ZOO

# Stephanie: The Heart and Matriarch of Sedgwick County Zoo's Elephant Herd

Micaela Atkinson and Jenn Marshall

**A**t 53 years old, Stephanie is tied for the third oldest African elephant in an AZA facility. She resides at Sedgwick County Zoo (SCZ) in Wichita, Kansas, and is the matriarch of our multigenerational herd. This herd consists of 2.6 African elephants ranging from 13 to 53 years of age. Stephanie has a long history at SCZ and has always been a staff and community favorite; though she is a smaller elephant she has a big personality

and is often recognized by her large ears, short tusks, and sassy attitude.

In 1972, Stephanie, along with companion elephant Cinda, arrived at SCZ. They were approximately two years old and were among some of the first mammals to join the newly opened zoo. Stephanie and Cinda were born in Kruger National Park in South Africa and arrived in the United States with many other elephants as part of



PHOTO: SEDGWICK COUNTY ZOO

a large transport. The two elephants called the African Veldt their home for about four decades. In 2014, after nearly a decade of planning, the zoo began to build a new elephant habitat—The Elephants of the Zambezi River Valley. The goal was to provide more adequate space for Stephanie and Cinda as well as increasing the size of our herd. Unfortunately, before construction was complete, Cinda passed away. In 2015, Stephanie made the short trip across the zoo and was the first elephant to explore the new barn and habitat.

In March 2016, 1.5 elephants arrived from eSwatini (formerly known as Swaziland) as part of a multi-zoo import. Until this point, Stephanie's social interactions had been limited to Cinda. The elephant team was curious about how and if she could be integrated with the wild-born elephants. Upon their arrival, Stephanie was apprehensive and hesitant; she chose to avoid the situation and often spent her time as far away as possible. Over just a few weeks, she became curious and started to spend her time eating and socializing through a barrier. After several weeks of introductions amongst the eSwatini elephants, we introduced Stephanie to the five juveniles. While Stephanie was still unsure of these young elephants, the juveniles took to Stephanie as the matriarch from the first day. Their confidence flourished after adding a leader to the herd even swimming in the large pool after Stephanie tested the waters first. Since this first introduction, Step-

hanie has maintained her matriarchal position of the female herd to this day.

As Stephanie has aged, her most significant health complication has been her dental health. In 2012, the animal care staff noticed she was having difficulty chewing and processing her hay leading to uncomfortable GI issues. It was determined that she was losing her last set of teeth in an unusual way, essentially deteriorating from the inside out. After consultations with a dental veterinarian and some trial and error, a treatment plan was put in place. This included shredding all hay, daily teeth cleaning, and increasing dietary supplements. These accommodations have continued over the years with some minor adjustments; today, just a few remnants of teeth remain and teeth cleaning is done less frequently.

As we look toward the future, we are thrilled about the expansion of our multigenerational elephant herd with five confirmed pregnancies. Our team is hopeful that Stephanie will remain a vital part of this growth, continuing her influential role as the matriarch. Her legacy of leadership and nurturing is invaluable, and we anticipate that she will be instrumental in guiding and interacting with the new calves. We are excited about what lies ahead and are committed to ensuring Stephanie's continued health and happiness, cherishing her presence for many more years to come.



## Together for People and Wildlife in Sabah, Malaysia, Borneo

Sharon Stuart Glaeser, PhD

Elephant Conservation Lead, Oregon Zoo

**A**s I write this article, I am working with Oregon Zoo's conservation partners in the Malaysian state of Sabah on the island of Borneo. Oregon Zoo's Care and Conservation of Borneo Elephants program supports long-term projects in Sabah to create forest connectivity for safe movement and harbor of elephants, orangutans, and other wildlife in fragmented and degraded landscapes; to reduce human–elephant conflict (HEC)

and promote coexistence; and provide life-long care when, despite these efforts, elephants come into a captive situation through conflict, injury, being orphaned or separated.

Much of Sabah—which covers the northern portion of the island of Borneo—has been logged and converted to oil palm plantations. Malaysia produces more than 40% of the world's palm oil, and intertwined with conservation efforts are the impacts of palm oil production.



The Oregon Zoo is a member of the Round Table on Sustainable Palm Oil (RSPO), which has developed and is implementing global environmental and social standards for sustainable palm oil. As a member, we are committed to the use of and advocacy for sustainable palm oil as one of our conservation priorities.

The Oregon's Zoo's relationship with Borneo began in 1999 when the Sabah Wildlife Department entrusted an orphaned elephant named Chendra to our care. Then in 2008 the zoo developed a partnership with a community-based conservation organization, HUTAN–Kinabatangan Orangutan Conservation Program (HUTAN-KOCP), in support of orangutan research and conservation in secondary forests. Chendra got a second chance. Despite the trauma of her early years, she settled easily into a new family group, and she forged a partnership between Sabah and the Oregon Zoo that has lasted more than 20 years, inspiring us and others to do more to help wildlife and people in this biodiversity hotspot. The Oregon Zoo and Oregon Zoo Foundation have since supported community-based organizations working to conserve threatened species, restore habitat, reduce conflict, and promote coexistence in Sabah. Donors have given generously, allowing us to commit to and sustain long-standing partnerships; and through these partnerships, we are able to take a holistic approach to conservation in Sabah, considering the well-being of communities as well as wildlife, supporting efforts to keep elephants in the wild, and helping to provide the best care possible once elephants come into human care.

### IUCN Recognizes Borneo's Elephants as a Unique and Endangered Subspecies

Bornean elephants are found mainly in Sabah, with a small population in the Indonesian state of Kalimantan. They are **genetically distinct from all other Asian elephant populations**, and are distinguished by their smaller size and different skull shape giving them a wider face. Last year, an international team of scientists and conservationists identified the Borneo population of Asian elephants as a distinct subspecies requiring special protection (McLean 2023). In June of this year, the IUCN declared the Borneo elephant (*Elephas maximus ssp. borneensis*) as a distinct subspecies and classified it as **Endangered on the IUCN Red List of Threatened Species**, with a decreasing population trend and a severely fragmented population. Based on recent population estimates, it is likely that fewer than 1,000 elephants remain in the wild (Cheah et al. 2022), with about 400 being adults.

According to the Red List Assessment, logging, expanding agriculture, and palm oil plantations are reducing

contact between subpopulations, as well as shrinking the forest area available for each subpopulation (Othman et al. 2019). Furthermore, linear human infrastructures (roads, electrical fences, drains) and other man-made infrastructure impact the elephants' movements (Leimgruber et al. 2003). Interestingly, a distinctive fission–fusion behavior has emerged over the last two decades, where large herds travelling together are rarely seen. Instead, the elephants travel in smaller groups that can be supported by the availability of food in the fragmented habitat. Adding to the risk of conflict is their reliance on non-protected areas for their movements, dispersal, and foraging activities (de la Torre et al. 2022) as the current network of Forest Reserves is largely unsuitable habitat for elephants (English et al. 2014a, Evans et al. 2018). Since 2010, the number of elephant deaths not attributable to natural causes recorded by the state authorities equates to a decline in population of more than 13% in less than half a generation.

Despite this bleak picture of hardship for the Bornean elephant, the last two decades have seen extensive efforts both to understand and to conserve them. The Bornean Elephant Action Plan 2020–2029, aims to implement ways to secure a future for this subspecies while also allowing for socio-economic development of the areas where these elephants are living (Sabah Wildlife Department 2020).

### Our Partners and Reasons for Hope

While the future of Borneo elephants is uncertain, there is much cause for hope. Community-led reforestation teams with HUTAN (which means “forest” in Malay) are reconnecting isolated forest fragments to create wildlife corridors, providing safe harbor and movement of elephants and other wildlife. Wildlife surveys have documented over 150 species—including hornbills, orangutans and flying lemurs—taking advantage of the abundant resources in these restored habitats.

Other conservation efforts are focused on the human side of the equation. Seratu Aatai (which means “living together” in the Orang Sungai language), founded and led by Dr. Nurzhafarina Othman, promotes peaceful coexistence between people and wildlife through community engagement, safety education, and public awareness.

Despite these initiatives, a number of elephants inevitably wind up in human care. Over the past 15 years, the Sabah Wildlife Department has rescued more than 20 baby elephants. Survival is the top priority, but assuring the wellbeing of these orphans throughout life stages is another big concern, and an area where we, as zoo professionals, are well-positioned to help. In addition to funding salaries of full-time caregivers, we provide professional

development and capacity-building opportunities for elephant caretakers and veterinarians.

## Management of Elephants Under Human Care

The Oregon Zoo supports the Sabah Wildlife Department/Wildlife Rescue Unit (SWD/WRU) in the care and welfare of orphaned and rescued elephants. In this region there is no history of keeping wildlife in captivity; rather it has become a necessity with individuals of various species requiring treatment and rehabilitation but with no opportunity for release. With over 60 years of managing elephants through the evolution of animal care, we have learned much about training for cooperative care, the changing needs of elephants across life stages, and supporting natural herd dynamics with social opportunities for both male and female elephants of all ages—experience which has proven to be valuable for captive care in Sabah.

WRU rangers are highly skilled with wild elephants. They translocate from conflict areas and do collaring operations; they treat them for injuries and health concerns; they stay in the forest and try to reunite separated calves and juveniles, and as a last resort bring them into human care. The orphaned and rescued elephants in Sabah have benefited greatly through the dedication of the rangers. The rangers have served as surrogate mothers for many calves, and they share a close bond. But a major challenge is the majority of the orphans are male, and they are becoming young bulls.

The overarching goal of our partnership is to make continuous progress towards managing elephants in accordance with the Captive Elephant Management Plan (CEMP) for Sabah, 2020-2029. The CEMP was developed by local stakeholders and an international team of advisors appointed by the SWD for the purpose of advising the SWD and its partners on best management practices to improve health care and welfare of captive elephants in Sabah. The Oregon Zoo was represented on this team of advisors, and we are committed to supporting the priorities and guidelines set forth for both staff and elephants.

We work closely with WRU leadership to determine support priorities. Since 2018, our areas of support include salaries and benefits for one to three WRU rangers on an annual basis, including allowances for overtime for round-the clock feeding and treatment and

outstation for peer training and exchanges, sponsorship of rangers and veterinarians for regional training opportunities, funding of husbandry supplies, development of teaching aides for care staff (e.g., series of video trainings), and sending keepers to Sabah to work directly with care staff onsite at two facilities on the east coast of Sabah. In 2022, Oregon Zoo keeper Jason Miles spent two weeks onsite, followed by Gilbert Gomez in 2023. The rangers and their elephants were fast learners, and we accomplished much more than anticipated. Staff and elephants were trained on foundational behaviors needed for daily husbandry and health checks, which comprised a progression of twelve behaviors for movement and shifting, body positioning, and body part presentations. We worked on training young elephants for EEHV monitoring and treatment, including desensitization for blood draws and rectal fluids. We reviewed the biological needs of elephants with an emphasis on feeding strategy, socialization, physical activity, and mental stimulation, and worked together on changes to help address those needs. With so many males, musth management was a priority as well. Finally, we worked on developing the two most experienced rangers as coaches for ongoing peer training and development. This year, we facilitated a training by Rob Conachie from Pairi Daiza, who cares for Sayang, one of two Bornean elephants in Europe. Sayang was orphaned and exported in the same timeframe as Chendra, and she too inspires a special connection to Borneo. Given the current facilities, free contact management is still needed to provide good care, physical exercise, social opportunities, and mental



stimulation. It is imperative that we work within the reality of the situation and help develop the skills to manage in multiple contact systems. The rangers have benefited greatly from a professional exchange with the Sumatra CRU/ERUs over the last two years. Rob was able to build on that training and provide further guidance to help meet the needs of each individual elephant and improve safety.

In November 2023, we conducted a four-day veterinary workshop on EEHV diagnostics, monitoring, and response in Sabah. The course was co-organized with the Sabah Wildlife Department, fully funded by the Oregon Zoo, and taught by the Oregon Zoo's Director of Animal Health, Dr. Carlos R. Sanchez, assisted by veterinary technician Heather Brittingham. Workshop objectives were to build awareness of EEHV and the threats to young captive and wild elephants and to develop veterinary capacity to monitor, diagnose and treat EEHV in Sabah. In preparation for the workshop and to support ongoing health and disease monitoring, we funded and helped local veterinarians set up the first hematology laboratory in Sabah.

The first day of presentations was intended for a broad audience, including officials, managers, and anyone working with wild or captive elephants. Twelve people from six organizations also participated in the three days of clinical pathology with wet labs, which were aimed for veterinarians, pathologists, scientists with clinical experience, and rangers caring for elephants.

This workshop helped reinforce the importance of the behavior training. Rangers had the opportunity to demonstrate foundational behaviors to allow Dr. Carlos

to examine for indicators of EEHV or other issues of concern. Rangers also learned to carry out basic blood screening and to prepare blood for diagnostics, which is critical for elephants living far away from the laboratory. Communication is paramount in disease response, and table-top drills helped develop effective communication between rangers and veterinarians with regards to diagnostics and treatment.

Many follow-up needs were identified, one of which is an EEHV prevalence study in Sabah, of which Oregon Zoo is a collaborator and funder. A strong coalition was built through this workshop, which will be critical in developing and implementing a monitoring, diagnostic, and response plan for Sabah.

## Community-led Habitat Restoration and Monitoring

Oregon Zoo's partnership with HUTAN-KOCP has spanned over 15 years. Specific to elephants was an alliance focused on enhancing scientific knowledge of elephant ecology and conservation status, and on reducing HEC in the Lower Kinabatangan Wildlife Sanctuary (LKWS). In recent years, our support has focused primarily on reforestation. We supported a long-term biodiversity monitoring program to document the state of biodiversity in oil palm plantations and the dynamic of habitat recolonization by local wildlife in newly created forest corridors. Replanting forests helps create a better future for all. HUTAN's Reforestation Unit, all women employed from the village of Sukau, prepares planting sites, plants saplings grown at a nursery in their village, and maintains planted sites for five years, cutting grass with machetes and pulling weeds by hand to prevent them from overtaking the tiny saplings. Each site is monitored for five years to make sure the trees are established. The goal is to create forest corridors, allowing orangutans, elephants and other wildlife to move freely along the riverbanks while bypassing the palm plantations.

The HUTAN team plants about 30,000 saplings each year, about 80% of which reach maturity. Since the organization's founding, the women have planted more than 200,000 trees that still stand today. The tree diversity of planting plots is further enhanced by wild trees dispersed naturally. Wildlife surveys have documented at least 185 vertebrate species utilizing these restored habitats, and about 15% are listed as vulnerable, endangered, or critically endangered.



HUTAN considers human well-being and wildlife conservation as interdependent. Community-led habitat restoration helps secure the long-term survival of endangered species while members of the local community are earning income supporting conservation activities. Furthermore, young people are getting opportunities to become leaders through certificate programs, training and education, which means they can find career opportunities in the village where they grew up. Our current focus is on strengthening our relationships with team leaders to build a professional exchange program.

A new partner this year is KOPEL, a village-based cooperative promoting coexistence by utilizing eco-tourism as a mechanism for protecting remaining forest ecosystems while generating a sustainable long-term income for the local people of the area. KOPEL's community-based ecotourism activities provide alternative livelihoods and establish a link between the forest restoration work and the visitors coming to stay. Our support aims to build capacity in leaders and teams to increase the impact of community science and forest restoration in the Lower Kinabatangan Wildlife Sanctuary, and to increase effectiveness of KOPEL's environmental education program. We are facilitating the formation of a consortium of organizations in the Lower Kinabatangan who will work together to determine short and long-term needs for habitation restoration at a landscape level, implementation strategies, and methods of measuring impact; increasing skills and knowledge in conservation science within KOPEL and this consortium. Coexistence through community education and outreach Project Seratu Aatai promotes coexistence between people and elephants through research and education. Seratu Aatai's founder, Dr. Nurzhafarina Othman, collaborates with stakeholders (local communities, government agencies, palm oil industries, and academics) to reduce conflict and find solutions for wildlife. The main concern of villagers and people in oil palm plantations is their safety when elephants are in the area. Oil palm plantations are so extensive, it is not feasible to prevent elephants from



entering the plantation, or to quickly drive them out to a forested area without driving them into nearby villages. In the short term, elephants can survive in the oil palm; so if owners and workers can tolerate their presence and remain safe, then elephants can move through slowly and safely and coexistence is possible.

In 2017, the Oregon Zoo collaborated with Dr. Farina and the SWD to develop an Elephant Behavior Field Guide for safety workshops with plantation workers and villagers in HEC areas. In 2021, we supported the filming of virtual reality videos to bring people to the rainforest to learn about elephants and other wildlife. The VR films are inspiring and fun, and the storylines tie together their educational messages about the importance of elephants, elephant conservation and how we can coexist.

Together with the Sabah Wildlife Department, Seratu Aatai established a Community Honorary Wildlife Warden (CHWW) program in multiple villages within the Kinabatangan landscape. The main activities of the CHWWs currently include elephant control, research, community education and awareness, and enforcement. The first teams were established in 2021 in three villag-

es within or near the Lower Kinabatangan Managed Elephant Range (MER). Then in 2023, the program was expanded to include an additional village in the Lower Kinabatangan, and one village in the Upper Kinabatangan, which lies in the Central Sabah MER. In 2024, the program is being further expanded in the Upper Kinabatangan. Oregon Zoo has funded the formation of and/or operations of some of these teams over the past few years. The CHWW teams, each consisting of two to five members, play a crucial role in the region's efforts for wildlife coexistence, conservation and protection. Each local team understands the landscape in which they are working, and has a better understanding of their local communities, which is crucial in building trust and effective partnerships.

The Oregon Zoo is the sole funder of a new education program we believe will have a strong impact for both wildlife and people. Seratu Aatai is transitioning its school education programs from community schools to plantation schools with the aim of reaching a new demographic of children and youth who have had fewer opportunities to participate in education/awareness activities with various conservation organizations. The oil palm landscape provides vital connectivity for elephant movement within Sabah, so people working and living within the plantations are integral to coexistence efforts. Furthermore, palm oil

production in Sabah employs a large number of migrant workers from Indonesia and the Philippines, and thus are less connected to the land, its biodiversity, its history, and future.

Seratu Aatai's education program for plantation schools will be in the Humana schools, which are for children who are unable to access Malaysian schools for various reasons, including distance, affordability, and/or legal status as children of migrant workers. They have already visited these schools in plantations for which they already have partnerships. The curriculum will focus on safety around elephants and learning about the biodiversity in Sabah. In addition to the primary goal of reducing conflict and promoting coexistence, another goal of the program is to develop a junior wildlife ranger program to foster peer learning in an engaging and fun way, to give children and youth the knowledge and skills to advocate for wildlife to their families and community, and to develop communication and leadership skills.

*Interwoven with all of this work is much joy, laughter, great food, awe, and admiration.*

*It is an honor and privilege to work with partners so capable and dedicated to the wildlife and people who call this beautiful place home.*

# PARTNERS IN ELEPHANT *Conservation*

Since 2018, I have had the amazing opportunity to be part of a grant project at the Kansas City Zoo & Aquarium that focuses on the protection of elephants in Lower Zambezi National Park in Zambia. We work with Conservation Lower Zambezi (CLZ) and the Department of National Parks and Wildlife (DNPW) to provide support for their patrols, place cameras in the field, and conduct watering hole surveys. This successful project was first introduced to us by the International Elephant Foundation and has become one of the Zoo's lead conservation efforts.

The elephant census showed a significant decline in the elephant population in the Lower Zambezi National Park between 2013 and 2016. This was due to a few reasons, but one leading cause was poaching. This elephant population is part of the Lower Zambezi ecoregion which includes Zambia, Zimbabwe, and Mozambique, and is considered one of the last strongholds of African elephants.

Kansas City Zoo & Aquarium donates each year to help fund patrols on the ground in the Luangwa area of the park. The money is used for food rations, communications, first aid kits, patrol equipment, transport, and a 24/7 control center that monitors patrol teams on difficult or dangerous patrols. With the Zoo's assistance, CLZ supports 24 patrols each year. CLZ also has a small plane to conduct aerial patrols in the park and this has been a big help in seeing poacher camps, fire, and poached animals. For two years, the Zoo has funded these aerial patrols, and last year I was able to participate in one while I was there.

The second part of this grant program is placing camera traps annually and performing watering hole surveys. The camera trap program has evolved over the years. The initial goal was research and wildlife protection, so cameras were placed around known poaching trails to help identify poachers for potential prosecution, but that was unsuccessful. Now the cameras are placed throughout the park and surrounding game management areas to help identify what species of wildlife are present and which may need more conservation effort.

Working with CLZ and DNPW in this collaborative program has been very successful. We are gaining data from the camera traps and watering holes and most importantly, the elephant population in the area has increased with fewer animals poached each year.

*—Katie Muninger,  
Animal Manager - Savannah at Kansas City Zoo & Aquarium*





PHOTO: ECoDAs and IEF

# Community and Security for Africa's Forest Elephants

Sarah Conley

International Elephant Foundation

**I**n some ways, twenty-five years of elephant conservation work feels like we are just getting started. 2025 marks the 25th Anniversary of the founding of the International Elephant Foundation (IEF). We have funded nearly 250 projects with more than \$9 million in direct financial support. During this time we supported the construction of 15 ranger stations in Uganda (among other infrastructure), provided thousands of boots to rangers, supported thousands of hours of aerial surveillance to stop poachers, sponsored thousands of community meetings and educational opportunities, among numerous other vital conservation actions. Yet there is still massive work

to be done. IEF is committed to building a sustainable future where elephants thrive, and that means never letting up.

While it may only have recently been officially recognized as its own species, the African forest elephant (*Loxodonta cyclotis*) is one of IEF's conservation priorities. We currently have multiple projects addressing this critically endangered species. For much of conservation history they have been lumped in with African savanna elephants, and it is now up to scientists to both confirm overlaps and differentiate the characteristics, needs, and challenges of these two species. By supporting the African Elephant



Building conservation ethic within communities in Gabon. Photo by IEF & Conservation Justice.

Species Distribution and Movement Corridors of West Africa project with the IUCN-SSC African Elephant Specialist Group, we are learning not only where each species of elephant resides, but also the presence of hybrids and transboundary corridors throughout the western African countries of Benin, Burkina Faso, Cote d'Ivoire, Ghana, Guinea, Guinea Bissau, Mali, Nigeria, Niger, Liberia, Sierra Leone, Senegal, and Togo. This non-invasive study uses dung sample analysis and will provide results that can inform conservation choices moving forward.

The demographic structure and behavior of forest elephant herds is also important in helping determine future actions. In Gabon's Batéké Plateau National Park, IEF is supporting work with the Aspinall Foundation to use camera traps and foot patrols to learn more about herd demographics, sex ratio, and poaching pressures on their forest elephant population. The herd information will add to our knowledge of the species and their specific needs, while any DNA samples will be added to Gabon's national reference DNA database to be used in prosecuting poaching, ivory, and wildlife trafficking cases.

In Guinea, working with the African Forest Elephant Foundation, we are supporting GPS collaring and studies that will help determine habitat usage, movement corridors, and pinpoint any conflict hotspots. Because forest elephants live in more densely vegetated habitats than

savanna elephants, they are difficult to study. The use of satellite collars is an excellent solution to this issue. Data are already being used to determine areas of conservation focus, as well as used to help local communities. Coupled with community education campaigns, the elephant habitat usage data are part of an overall plan to increase security for elephants and provide quality of life improvements for people that build community acceptance and commitment to conservation.

Speaking of community education, our projects in Ghana (Scaling-up African Forest Elephant Conservation in Kakum Landscape) with the Ghana Wildlife Division and in Cameroon (Community-based Protection of Forest Elephants and Habitat Restoration) with The Environment and Community Development Association (ECoDAs) both target forest elephants for conservation by taking a community approach. In Ghana, local outreach and awareness programs are coupled with workshops that connect stakeholders with security and wildlife officers. These activities build capacity and bolster the community-based antipoaching teams that protect both wildlife and communities affected by human–elephant conflict. In the Banyang-Mbo Wildlife Sanctuary in Cameroon, elephants are negatively affected by habitat loss in this region that is also a poaching hotspot. Because human behavior is the driver of both actions, the first step is to try to change that





◀ Collared forest elephant in Guinea. Photo by African Forest Elephant Foundation and IEF.

behavior. Village conservation groups are created to help enforce wildlife law, conduct forest patrols, restore habitat, and perform community outreach. Information is provided to the people on alternatives to a life of wildlife crime, and the importance of stewarding and protecting their natural heritage. This community approach is important to creating long-term, sustainable change that will help all involved.

Another important approach to protecting forest elephants, and all elephant populations, is security and law enforcement. In Gabon, IEF is supporting Wildlife Law Enforcement and Awareness in Haut-Ogooue Province with Conservation Justice. Gabon is home to the largest population of forest elephants and is also a major source of ivory trafficking. Because the region is biodiverse, other species like giant pangolin, chimpanzee, mandrill, and lion are targets of poachers and wildlife criminals as well. Through strengthening wildlife law enforcement efforts, supporting investigations, following through with arrests,

and providing legal assistance with prosecutions, this project helps stop and deter wildlife crime. By making it too costly and too dangerous to pursue wildlife crime, and then providing community outreach, this project is tackling the problem head-on, protecting elephants and other important species.

These are only a few of the 24 projects in 15 countries that IEF is supporting this year alone. From Asian, African savanna, African forest elephants, and research affecting all three species, there is mammoth work to be done. Some are big tasks, like building another ranger station, while others are smaller like providing a laptop and printer so a project can run more efficiently. Every step moves the needle a little further; no support is wasted. After 25 years, IEF is just getting started. We are grateful to our supporters for the past two-and-a-half decades and look forward to working for elephants alongside many more supporters and conservation partners, old and new, for years to come.

# Building a Path to Coexistence: Elephants and Sustainable Agriculture in Kenya Project, Community Outreach, and Support

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**T**he Elephants and Sustainable Agriculture in Kenya project (ESAK) was initiated in 2016 by researchers at Western Kentucky University, Wildlife Works Kenya, and Jomo Kenyatta University of Agriculture and Technology with funding from the Earthwatch Institute and the International Elephant Foundation (IEF), amongst others. ESAK's experimental site is located in Sasenyi valley in southeastern Kenya. The area is adjacent to Rukinga Wildlife Sanctuary, and wildlife (mainly elephants) frequently venture into the farmland to forage on crops.

ESAK has six objectives (five research-oriented and one outreach and support): (1) Human Elephant Conflict Mitigation (Von Hagen et al. 2021; Von Hagen et al. 2023; Corde et al. 2023; Corde et al., in review); (2) Climate Smart Agriculture (Bowers et al. 2024); (3) Elephant Identification & Database (Von Hagen et al. 2023); (4) Habitat Monitoring (Vaccaro & Schulte 2024); (5) Early Information Network; and (6) Community Outreach &

Support. The focus for this article will be the community outreach and support objective.

The Earthwatch Institute has the mission to connect “people with scientists worldwide to conduct environmental research and empowers them with the knowledge they need to conserve the planet.” Through Earthwatch, citizen scientists joined ESAK researchers with teams fielding in 2017 to 2019, and 2023. The COVID-19 pandemic prevented teams from fielding in 2020-22. Many of the volunteers formed a lasting bond with ESAK researchers and the Sasenyi community following their time in the field, with some providing funding to ESAK through donations to IEF. The overarching goal is to establish means for the local community and especially the schools to improve access to education and enhance positive attitudes towards elephants, hence, promoting peaceful coexistence.

The school outreach has six specific objectives, which we will describe in detail in this article.

## Objective 1: Increase school enrollment and test scores by providing consistent lunch hour meals for students through donations.

A vast majority of the communities in this part of Kenya are subsistence agro-pastoralists. The region is semi-arid with average annual rainfall in the 300-450mm range. Farming is rain-fed; hence, the low rainfall is insufficient to sustain reliable farming practices, making communities in the area food stressed nearly year-round. The area borders Rukinga Wildlife Sanctuary, and there is no physical barrier between this protected land and community land. Therefore, crop foraging by elephants and other wildlife further compound the risk to food security. To augment the other ESAK strategies to address this existential risk to food security while promoting elephant conservation, the project and its first Earthwatch volunteer group started the Sasenyi primary school feeding program in 2019 as an immediate measure to cushion the most vulnerable members of the local community. Initial donations from a single volunteer who played a pivotal role in spearheading this initiative funded the purchase of food for one month. The main goal was—and still is—to provide a daily lunch for the pupils, as most of them walk long distances to and from school. Some of the students also bring portions of this meal back home to share with their families. Based on the headteacher's account, the lunch provision has motivated most pupils to remain in school and encouraged parents to enroll new students to the school. The school feeding program promoted a good relationship between ESAK and the school, especially because ESAK's elephant deterrent experiments (Kasaine metal strip fence) ran parallel adjacent to the main road leading to the school.

## Objective 2: Provide consistent supply of clean water to the school and neighboring community by connecting the school water supply to the main water pipeline.

Donations from several volunteers have enabled the school to be connected to the main water pipeline. This connection supplies several tanks within the compound and improves accessibility to a reliable clean water source. Before



the connection, the school was reliant on rainwater harvesting, and pupils were also required to carry water from home where it was also insufficient for domestic use. The school now has access to reliable clean water all year. Most importantly, the water is also shared with the neighboring communities, especially during the dry seasons, hence, minimizing the risk of negative encounters with wildlife while going to fetch water at distant water points.

## Objective 3: Improve school hygiene and reduce disease risk by constructing two pit latrines for the kindergarten classes.

The pit latrines were funded by a special donation to IEF from two Earthwatch volunteers who participated in 2019 and have remained good friends of the Sasenyi School. With additional aid from other donors, this led to the construction of a four-unit ablution facility for the kindergarten classes. The aim was to improve hygiene for the little ones and reduce the risk of exposing them to diseases because they were sharing existing facilities with their older peers.

## Objective 4: Increase the capacity of school leaders and promote digital learning.

The school is in a remote area about 10 kilometers away from the main electricity grid, leading the facility to rely solely on solar energy. Only the school administration building had solar power installed. Therefore, recent do-



nations funded the purchase of three solar panels, batteries, and other electric installation accessories that were used to install solar power to the kindergarten block and the office for teachers .

To promote digital learning at the school, which is a very strong element in the newly introduced competency-based school curriculum (CBC) in Kenya, donations from a number of sources with one couple again providing a large portion of the funds were used to purchase two laptops and one desktop computer for the school's under-equipped computer lab.

The school has also benefited from other donations such as stationeries (e.g., pencils, writing papers, chalk, and erasers) and equipment. Earthwatch volunteers and other visiting donors often brought a variety of school supplies, and school visits were organized for them to present their donations directly to the school and visit with the teachers and students.

### Objective 5: Repair and maintain various school infrastructure to improve safety and create a better learning environment.

Sasenyi Primary School was started in 1987 and some of its oldest buildings were in need of refurbishment. A special donation from a regular donor has facilitated installation of a completely new roof for a block of two classrooms because the older one was leaking. Additional ongoing construction in the same block includes new floors, three blackboards, and other exterior repairs.

Immediately after the current repairs are done, plans

are in place to buy and install new windows for two classrooms, repair and repaint the main school kitchen, and improve the rain-water harvesting infrastructure via installation of new gutters and pipes to the collection tanks in four classrooms.

### Objective 6: Facilitate interactions between researchers, the community, and Earthwatch volunteers.

From 2017 to 2023, extensive interaction occurred between ESAK researchers, international volunteers, members of the community, teachers, and students through collaboration in ESAK's experimental fields (e.g., building and setting up deterrent fences, checking camera traps, and data collection), local village tours, and school visits. Through ESAK's findings, the school erected a CSA garden using zai pits to grow food for the students and enclosed it with Kasaine metal strip fence (a new elephant deterrent fence). The garden and Kasaine fence are used as educational demonstrations in which students and teachers actively participate. Overall, the headteacher was encouraged to communicate to students, teachers, and parents the relationship between ESAK's outreach and support initiative and the project's other objectives.

These interactive elements enabled a wide array of people to exchange knowledge and build lasting connections despite their diverse backgrounds. The ESAK project concluded in 2023, but the needs of the Sasenyi village and regional communities remain. A major benefit of the ESAK project was the building of trust between researchers and community members that will hopefully facilitate increased food security, habitat conservation, and the harmonious coexistence between people and elephants in southeastern Kenya.

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### Acknowledgements

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PHOTO: GALEN GARWOOD

## Memories of Richard Lair (25 September 1942 to 19 July 2024)

Janine L. Brown

**R**ichard Lair, artist, award-winning filmmaker, and distinguished figure in the world of Asian elephant conservation, passed away peacefully on July 19, 2024, at his home in Lampang, Thailand. He was 81 years old.

The exact moment of my first encounter with Richard eludes me. His long-standing and influential presence in Thailand predated my arrival in 2000 by several

decades. But, when we did meet, there was an immediate sense of familiarity, as if I had known him for years. Known affectionately throughout the country as Professor Chang, he was celebrated for his fluency in classical Thai and deep integration into Thai culture. His life was a testament to the profound impact one person can have on the world when they follow their passion with unwavering dedication. And he had an impact on me. I still remember

how thrilled I was to receive my copy of *Gone Astray* from the Food and Agriculture Organization of the United Nations (FAO) office in Bangkok; people call it the elephant bible. To me, he was always larger than life. Visiting him in Lampang during my frequent trips to Thailand was always a highlight. When he became ill earlier this year (an unresolved issue with an abdominal hernia that became inoperable), I was in Thailand working with colleagues at Chiang Mai University. He knew his time was limited, but in true Richard style, he didn't dwell on that. Rather, he wanted to know about the biology of dying – what would happen when he could no longer take in solid food, should he take supplements and which ones, and how long would his already frail body last? He wanted a scientist's point of view. Curious to the end. He was clear, however, about not giving up his whiskey and cigarettes. I miss those calls and texts.

Born in Lompoc, California, in 1942, he was among the many children who contracted polio before its eradication in the early 1950s. During his recovery, he became an avid reader, devouring a book a day on various topics. His fascination with elephants was apparent from early childhood, though, as he filled countless notebooks with sketches. Lair would later dedicate his life to preserving and understanding Asian elephants, but not until after a successful career in filmmaking. Some might not know that Richard had multifaceted talents and diverse interests that extended far beyond his renowned work with elephants, embodying the essence of a modern-day polymath. His wide-ranging expertise and accomplishments across various fields exemplified the spirit of a true Renaissance man.

Richard started as an art major at San Francisco State College in the late 1960s but soon transferred to the film department, where he developed his filmmaking skills. He produced films for the psychedelic scene in San Francisco during the 1967 “Summer of Love.” In the early 1970s, he produced the wildlife documentary [“Where Will They Go?”](#), addressing endangered species in California with a foresighted message that is eerily relevant today. His filmmaking talents earned him accolades, including work on award-winning projects such as “The Taiwan Experience” for the 1974 World's Fair and “Welcome to Washington” for the National Park Service in 1976. His documentary [“Alice Elliott,”](#) focusing on one of the last Pomo Indian basket makers, won the prestigious CINE Golden Eagle Award in 1975.

In 1973, he traveled to India to photograph and learn more about Asian elephants, and in 1977, he spent a year working with elephants at Marine World/Africa USA in Redwood City, California. But then, seeking a change from the fast-paced American lifestyle and with an increasing fascination with elephants, Richard moved

to Thailand, where he found his true calling. He initially spent years in the forest counting elephants before moving on to issues related to captive elephants. Logging had been the primary source of income for elephants and their keepers (i.e., mahouts) in Thailand, but after it was banned in 1989 due to environmental destruction caused by deforestation, the livelihood of elephants and mahouts was threatened. Many out-of-work elephants and their mahouts found their way into the tourist industry, where today, about 3,500 work by providing rides, participating in shows, or just being observed. The care of these “captive” or “tamed” elephants, not “domesticated” as Richard would explain, became a major focus of his life's work. As a consultant to the Thai Elephant Conservation Center (TECC), he became a leading voice in elephant care and management. A skilled writer, Lair wrote the master plan for the TECC in 1991. He played a crucial role in establishing Thailand's first school for mahouts, bridging traditional wisdom and training skills from Burmese mahouts with modern veterinary and husbandry practices. Today, the TECC remains a beacon of hope for elephant conservation, veterinary medicine, and research.

Richard was an innovator and jumped at opportunities to highlight the uniqueness and intelligence of elephants. He consulted and trained elephants for *“Operation Dumbo Drop”* in 1995, a movie based on an attempt to transport an elephant through the jungle to a local South Vietnamese village to help American forces monitor Viet Cong activity. It dealt broadly with themes of war, politics, and animal welfare. During production of the 1984 film, *“The Killing Fields,”* Richard crossed paths with storyteller Spalding Gray, which left an impression that was memorialized by Gray in his book and film, *“Swimming to Cambodia”*. In 1997, he teamed with Russian-American artists Vitaly Komar and Alex Melamid to start an “Elephant Art Academy” at the TECC, providing opportunities for elephants to paint while increasing awareness of the plight of elephants in Asia. Partnering with the World Wildlife Fund and prestigious auction houses like Christie's, this effort raised funds for elephant conservation. However, perhaps Richard's most endearing contribution was co-creating the Thai Elephant Orchestra in 2000 at the TECC with American musician and Columbia University neuroscientist Dave Soldier. Together, they developed over twenty elephant-ergonomic instruments tailored to the musical styles of northern Thailand, resulting in three CDs of improvised music recorded in an outdoor clearing at the TECC. The elephants often played spontaneously and used the activity as a social event. Importantly, the orchestra demonstrated that a non-human species could create beautiful instrumental music. Orchestral improvisations by the elephants have been arranged for human mu-

sicians, including Steven Beck and the Composer's Concordance Orchestra. While the Thai Elephant Orchestra no longer performs, it was the subject of a documentary by the British Thai filmmaker Paul Spurrier and profiled by many press outlets, including the BBC, The Economist, the New York Times, and the Bangkok Post. The orchestra's performances touched the hearts of audiences globally, changing perceptions about elephant intelligence and creativity.

As an author, Richard's books have become essential reading for anyone working in elephant conservation. His seminal work, *"Gone Astray: The Care and Management of the Asian Elephant in Domesticity,"* published in 1997, is regarded as the definitive book on elephant care and conservation, carrying the imprimatur of the United Nations FAO. Richard's dedication to elephant welfare also led to his conception and co-authorship of the *"Elephant Care Manual for Mahouts and Camp Managers,"* published in 2005 in Thai and English. The book, written for mahouts and camp managers, provides information on elephant diseases, hygiene, and biology and has been widely distributed throughout Thailand. His writing style, both informative and engaging, made complex elephant biology and conservation issues accessible to a wider audience. As a translator, he also brought important cultural works to the English-speaking world, including Nikom Rayawa's, *"High Banks, Heavy Logs,"* a poignant tale of cultural change involving elephants, and *"Sihanouk Reminisces,"* along with many Thailand travel guides. He was known as a perfectionist, especially in his writing. As Dave Soldier recalled, 'he would take months fretting about commas, and it took him over a year to edit one page of the introduction to the orchestra piece.' I suspect he would find many flaws in this eulogy – sorry Richard.

Richard's contributions to research conducted at the TECC were notable. For example, the "running index" describes the mechanics of running, and while it was known that elephants could be extraordinarily fast, their manner

of locomotion was unknown. In a 2003 paper in Nature, Lair and coauthor John Hutchinson found that for short periods of time, their speed reached 15.5 miles per hour, and they exhibited a gait that qualified as running. Josh Plotnik, a comparative psychologist, collaborated with Richard on the first experimental study of elephant cooperation, finding that elephants not only understand how cooperation works, but that partner behavior contributes to its success. In 2016, Veterinarians International president Scarlett Magda bestowed upon Richard a Lifetime Achievement Award in acknowledgment of his commitment to enhancing our understanding of Asian elephants and their welfare. Richard's final and unfinished project is "EyeD," a deep learning software application that would allow individual elephants to be identified by photos of the distinctive wrinkle patterns around their eyes: if and when completed, using his voluminous photos of elephant eyes for training, it will provide a fitting completion to the circle of his life's passion.

Richard's legacy lives on in the countless lives he touched - human and elephant. He mentored mahouts, researchers, and conservationists, sharing his vast knowledge and infectious passion for elephants. While to the uninitiated, he could appear gruff and even curmudgeonly at times, he is most remembered as a patient teacher, always ready with a witty remark or a fascinating anecdote. He was known for bridging cultural gaps and earning the respect of local Thai communities and international conservationists alike. His work has inspired a new generation of conservationists and changed how we understand and interact with elephants. As we bid farewell to Richard, we celebrate a life of purpose and passion. His impact on elephant conservation will be felt for generations to come, a fitting tribute to a man who dedicated his life to these magnificent creatures. Richard is survived by his brothers Jim and Mike, and his longtime partner Boonpeng Khantong. He will be deeply missed by the global elephant community and all who knew him, including me.





PHOTO: SHANKAR C. LUITEL

# Bahundangi Village, Nepal: A Landscape-level Elephant Conservation Success Story

Tina L. Chiarelli, PhD, FRGS

University of Central Florida and EMA Conservation Committee

**N**epal is one of 13 range countries in Southeast Asia that remains a stronghold for endangered Asian elephants (Sukumar, 2003). Landlocked between Tibet in the North and India at its southern, eastern, and western borders, Nepal is a relatively small country covering just 147,516 km<sup>2</sup> (56,956 sq mi), measuring ~800 km (500 mi) East to West and ~200 km (120 mi) North to South (MoFSC, 2014). For comparison, this

would be equivalent to the land area of the US state of Iowa (Nations Online Project, 2024). Nepal's landscape is extremely diverse, with tropical forests, fertile plains, and wetlands along the Nepal-India border in the south, centrally located subalpine hills, and eight of the world's tallest mountains, including the iconic Mt. Everest, to the north in the Himalaya (Sharma, 1974; MoFSC, 2014; DFRS, 2015).

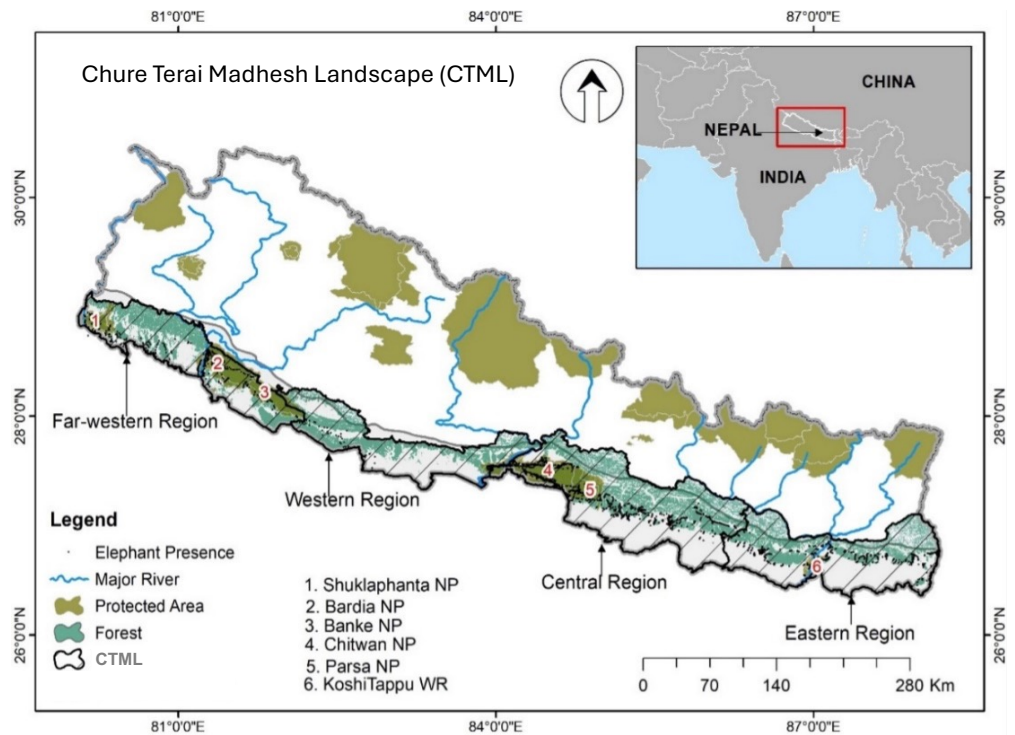


FIGURE 1: Chure Terai Madhesh Landscape, modified from Ram et al. (2021b).

For millennia, elephants have been worshipped and revered as symbols of strength and power. For Hindus, the elephant is represented as the god Ganesha, deity of wisdom and remover of obstacles. Within Indian mythology, white elephant Airāvata carries the Hindu god Indra and is believed to have the power to produce rain. For Buddhists, a grey elephant signifies learning, while a white elephant a controlled mind (Cheeran, 2013). Even today, traveling throughout Nepal, whether in the bazaars or temples, elephants are found everywhere.

It is estimated that the historic population of elephants in Nepal exceeded 1,000 (Jerdon, 1874; Smith and Mishra, 1992). Thick tropical forests created a continuous migratory route through India and Nepal, forming the Terai Arc Landscape (TAL) (MoFSC, 2004). Within Nepal, the TAL is part of the larger Chure Terai Madhesh Landscape (CTML) which extends from the westernmost to easternmost boundaries along the southern Indo-Nepal border (Figure 1) (GoN/PCTMCDB, 2017; Ram et al., 2021b). The CTML was once one of the most biodiverse places in the world (Chaudhary et al., 2019; Subedi et al., 2021). Land resettlement programs in the 1970s caused a significant increase in the local population and depletion of natural resources, forever altering the environment (Kansakar, 1979; Soeftestad et al., 2021).

Like their African counterparts, in the last century, Asian elephants have experienced a 95% decrease in their historic range (Sukumar, 2006). Rapid development of linear infrastructure including railways, electric transmission lines, highways, irrigation canals, and mineral mining

have significantly disrupted migratory pathways and destroyed habitat (Leimgruber et al., 2003; Goswami, 2017; Mandal, 2020; Dodd et al., 2024). Asian elephants prefer dense expansive jungles (Sukumar, 1989). Fragmentation of suitable forests forces migratory species like elephants to move between habitable territories, at times through heavily populated villages (Ghimire, 2017; Fahrig et al., 2019; Ram et al., 2021b; de Silva et al., 2023). Due to this, human-elephant encounters occur more frequently. Unfortunately, many interactions end in conflict (Jadhav & Barua, 2012). Attributable to habitat loss, poaching, and human-elephant Conflict (HEC), Nepal's total elephant population fell to just 100 individuals in the 1990s, with a complete extirpation in one of the largest National Parks, Bardia, in the west (Pradhan et al., 2007; Pradhan et al., 2011). Fortunately, a local repopulation occurred in the early 2000s, with elephants from India immigrating into Nepal to reestablish a longterm population (Pradhan et al., 2011). At present, the Banke-Bardia National Parks areas are home to the largest number of elephants within Nepal at 100-113 resident animals (Shrestha and Shrestha, 2021). Current total elephant population estimates in Nepal are 200-220 wild and 190 captive individuals with the possibility of an additional 150-200 elephants visiting seasonally from India during times of harvests (Shaffer et al., 2019; Ram et al., 2022). Elephant distributions can be found in Table 1 (Shrestha and Shrestha, 2021).

Due to the loss of suitable habitat and forest fragmentation, Nepal's elephants are now distributed into two isolated populations: in the west from Kapilbasta

TABLE 1: Elephant population estimates within nepal, from Shrestha and Shrestha (2021).

| Location                     | Elephant population |
|------------------------------|---------------------|
| Banke-Bardia National Parks  | 100 to 113          |
| Shuklaphanta National Park   | 25 to 30            |
| Chitwan-Pars Parks           | 45 to 50            |
| Koshi Tappu Wildlife Reserve | 17                  |
| Jhapa District               | 15 to 20            |
| Sindhali                     | 8                   |

to Kanchpur Districts including the Banke, Bardia, and Shuklaphanta National Parks and in the east from Jhapa District to Chitwan including Chitwan and Parsa National Parks and the Koshi Tappu Wildlife Reserve (Ram et al., 2021b; Ram et al., 2022). Of the current population, it is still largely unknown how many are permanent residents of Nepal or migrate daily/seasonally from India (Shaffer et al., 2019). This further highlights the need for cross-border collaboration and cooperation on conservation strategies. Environmental changes in either Nepal or India could drastically impact elephant movement, resulting in an increase in the potential for HEC (Baidya, 2010; Chakraborty & Mondal, 2012; Mitra, 2013; Joshi, 2016).

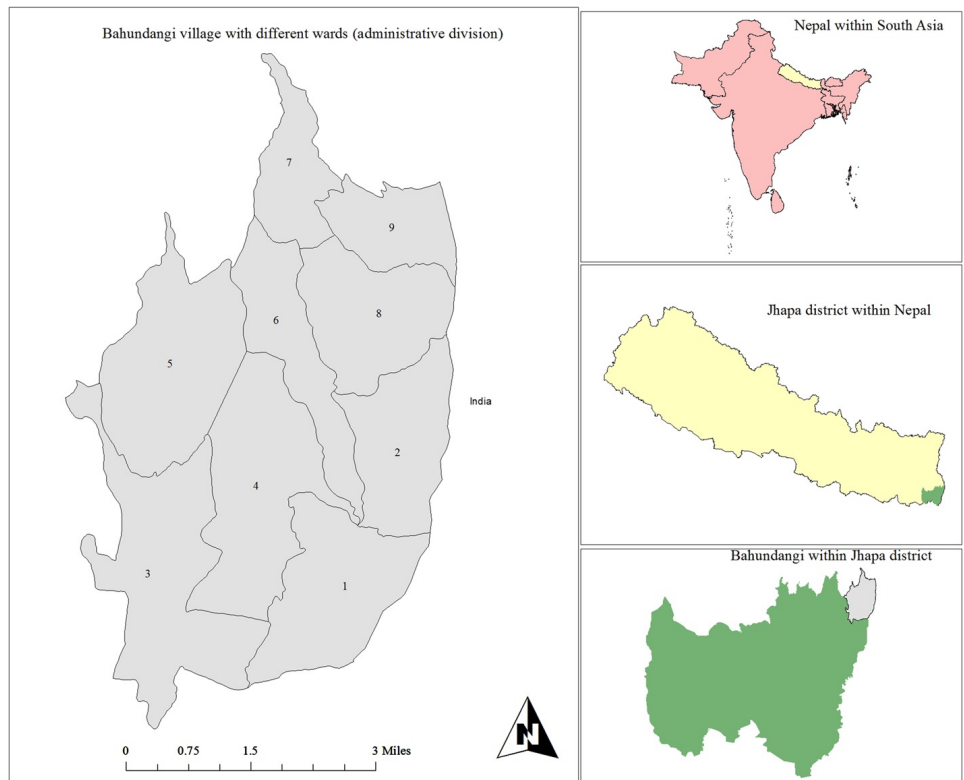
HEC continues to be one of the most significant threats to elephant survival (Acharya et al., 2016). Due to catastrophic habitat loss over the last century, Asian elephants, are now confined to just 5% of their historical territory (Sukumar, 2007; CSS-AeSGN, 2024). Ever-increasing human populations require more space for homes and agricultural practices. Unfortunately, some of the most fertile lands found in range countries are located within suitable elephant habitat (Aulestia, 2019). Human encroachment into ecologically important areas push animals and people closer together, forcing negative interactions that often result in loss of crops, property damage, threat to livelihoods, bodily injury, and/or death, and retaliatory elephant killings (Shrestha et al., 2007; Neupane et al., 2014; Archarya et al., 2017). Thus, a primary driver of HEC is expanding human settlements impinging into elephant habitat, influencing historical elephant migratory routes forcing them into communities and farms (Buchholtz et al., 2020). Modern conservation goals attempting to separate humans from elephants completely is not feasible and typically results in exacerbated HEC. Social, ecological, and economic interactions between humans and elephants are still not well understood (Baral & Heinzen, 2007; Dickman, 2010; Barua et al., 2013).

Marginalized communities living in buffer zones

surrounding forests are most vulnerable to HEC (Bennett & Mulongoy, 2006; Buchholtz et al., 2020). In 2021, Ram and colleagues identified landscape-level predictors of HEC within the CTML in Nepal. Since 1998, HEC has been recorded in 20 of the 24 districts. How closely individuals live near a forest, their education level, socio-economic status, dependency on forest resources, water availability, and the production and/or use of alcohol were all factors associated with an increased risk (Ram et al., 2021a; Ram et al., 2022). Over the last 25 years, the Government of Nepal (GoN) has developed conservation initiatives to promote the preservation of habitat, restoration of forests, and establishment of wildlife corridors in the hope to alleviate HEC (DNPWC/MoFSC/GoN, 2009). However, success of these initiatives have been wrought with complications due to a lack of funding, landscape-level support, and inclusivity of local communities and/or indigenous peoples in the development and implementation of mitigation strategies (Ram et al., 2021a).

Despite a current elephant population of just 220 individuals, documented cases of HEC in Nepal are on the rise (Pant et al., 2015; Ram et al., 2022). As the human population increases and suitable elephant habitat shrinks, there are more chances for negative interactions (CBS, 2022). It is unknown exactly when HEC became commonplace in Nepal as documentation of incidences only began in 1998 (Shaffer et al., 2019; Ram et al., 2022). From 2000 to 2020 there have been 10,798 incidences of HEC, with 274 human fatalities and 138 injuries (Ram et al., 2021a; Ram et al., 2022). From just 2018 to 2023, there have been 83 human deaths, 26 elephant deaths, and 3,080 total reports of property damage (CSS-AeSGN, 2024). Interestingly, nearly 50% of all HEC has been associated with two areas in eastern Nepal, the Koshi Tappu Wildlife Reserve and Jhapa District (Ram et al., 2021a; Ram et al., 2022).

The most prevalent area in Nepal suffering from HEC is Jhapa, the southeasternmost district (Ram et



**FIGURE 2:** Distribution of Wards within Bahundangi Village located within Jhapa District, eastern Nepal. From Dhakal & Thapa (2019).

al., 2022). Although Jhapa has less than 15 resident elephants, there are an estimated 100 individuals that visit during harvests in May to August and November to December from Assam and West Bengal, India (Ram, 2014; Shrestha and Shrestha, 2021). Previously acknowledged by the GoN and partnering non-governmental organizations (NGOs) as an area of concern, conservation measures implemented to mitigate such conflict have, at times, fallen short (Neupane et al., 2018).

Within Jhapa, the village of Bahundangi spans across wards 1-4 of the Mechinagar Municipality (Figure 2) (Dhakal and Thapa, 2019). It is part of the transboundary Kangchenjunga Landscape that includes parts of Nepal, India, and Bhutan. Located on the western banks of the Mechi River, the village consists of 1,800 households with most livelihoods dependent on subsistence farming (CBS, 2022). Like elsewhere in the CTML, settlements began in the early 1970s. People originating from the hillier districts of Nepal moved into Bahundangi for the fertile lands and sparse habitation (Kansakar, 1979; Soefstetad et al., 2021). Early on, settlers did not regularly see elephants in their village. As this was a time when suitable habitat was still found in both India and Nepal, continuous forests allowed elephants to safely migrate through their historical route into Jhapa on their way to the Koshi Tappu Wildlife Reserve, 133 km away, and even further to Chitwan National Park, 515 km from the eastern Indo-Nepal border. Unfortunately, environmental changes occurred rapidly from the

1970s through the 1990s causing forest fragmentation and disruption of the natural wildlife corridor; thus, conflict was born (Chaudhary et al., 2016; Acharya et al., 2017). The expansion of human settlements and conversion of forests for infrastructure, agriculture, and tea plantations in India and Nepal have resulted in a loss of natural resources for elephants, pushing them into maize and paddy fields growing in Bahundangi (Adikari and Dhungana, 2010; Betts et al., 2017; Chaudhary et al., 2019). As the war raged on, human and elephant casualties increased significantly. From 2001 to 2020, Jhapa had 3,172 incidences including 41 human deaths, 25 human injuries, and 13 elephants killed in retaliation, more than any other area in Nepal (Neupane, 2011; Dhakal & Thapa, 2019; Ram et al., 2021a).

In 2015, the World Bank donated funds to erect an 18-km non-lethal, solar-powered fence running parallel to the village border and Mechi River. Elephants leaving India cross the Mechi River to enter Bahundangi (World Bank, 2016). Initially, incidences of HEC declined rapidly, by 96.13%, after the fence construction (Neupane et al., 2018). However, several unforeseen issues quickly arose. It was unspecified whose job it was to maintain the fence. The Municipality leaders assumed this task would fall on individuals within the community. Without the proper tools, training, or time, villagers were unable to ensure the fence remained in good working order (Dhakal and Thapa, 2019). One resident I spoke with stated the solar batteries



◀ Elephant-friendly Farmers Group in Bahundangi, Nepal. Photo: Sandeep Luitel.

quickly became nonfunctional and wires were disconnected or stolen. Further, Bahundangi is an important access point for people commuting between India and Nepal daily for work or goods. During the building of the fence, several gates were put in place to allow passage. Although these entry points are meant to stay open only during the day, at times, they are opened when unintended, allowing elephants to unexpectedly enter the village. Moreover, and most importantly, the fence transects a historic elephant migratory route. Elephants are highly intelligent animals capable of advanced problem-solving. It doesn't take long for them to formulate a plan regarding how to overcome a new obstacle. Elephant tusks do not conduct electricity. For tuskers, they simply apply force to the fence wire, and it snaps. For females with calves, they will either travel the length of the fence until they find the end or simply push fence posts down and step over (Sukumar, 1991). Where there is an elephant will, there is an elephant way. Alas, the fence has only slowed HEC but not prevented it (personal correspondence, Shankar Luitel).

Although the situation seems to be in dire straits, for one Village Ward, Mechinager-4, the elephants appear to have a champion in Shankar Luitel. Working for over two decades to better understand the elephants of Bahundangi and educate others on their plight, Shankar has helped shape his community into a model of elephant conservation.

Known throughout Nepal as the Elephant Whisperer and “Hatti baba” (Elephant Father), Shankar Luitel is an elephant conservationist and subsistence farmer who, until 25 years ago, wanted nothing to do with elephants.

The megaherbivores posed a great risk to his farm and family. In 2001, he woke to find an elephant giving birth in his fields. That changed everything! He saw this new arrival as a divine sign that he needed to help protect these magnificent creatures. Since that time, he has voluntarily campaigned for coexistence and the management of HEC. At times, his crusade has caused him to be criticized by his friends and neighbors. However, he never gave up. Because of his persistence, the mindset of local peoples slowly changed. There is now a better understanding that living in harmony with elephants comes with sacrifices and requires patience, but also with the potential to increase the local economy with the development of ecotourism opportunities.

Although he does not hold a formal degree in ecology or conservation, Shankar is wealth of knowledge. He understands better than anyone the elephants in this area and the nuances of human–elephant interactions, making him an authority on HEC. In fact, many doctoral students have completed work in Bahundangi and researchers, like me, travel from all corners of the globe to meet with Shankar to learn about Nepal's elephants firsthand. Proficient in understanding elephant behavior, GPS tracking, and scientific documentation, he has been instrumental in the development of community-level mitigation strategies and education programs. Shankar is the epitome of a citizen scientist.

Every morning at 4:00am and every evening at sunset, Shankar makes his way via motorbike to the Mechi River. This is the main entry point for elephants traveling from India into eastern Nepal. During the dry season, he

looks for elephant dung piles and footprints in the sand of the river basin. From years of experience, he can tell the direction the elephants are traveling, approximate age and sex, if they are alone or with a herd, and basic information regarding diet. He meticulously records all the day's findings in his notebook. Regarding diets, Shankar has noticed a disconcerting trend that elephants have an increasing amount of plastic in their feces, a sign that elephants are rummaging through garbage and a sad reminder of the effect humans have made in their ecosystem.

Individual elephant personalities are unique. Dependent on physiological state, elephants can be calm, avoidance prone, inquisitive, or annoyed. Much like humans, an elephant's mood can also be influenced by their environment and those around them. There are currently 12 resident elephants in Bahundangi. Over the two decades, Shankar has documented every interaction he has witnessed with these elephants. He has named and photographed them and knows each elephant's overall demeanor. As such, he can predict which cheeky males tend to be problematic and who will avoid conflict at all costs. To help educate his community, he shares his knowledge on elephant identification methods and behavior. It is his hope to secure funding to turn this information regarding Bahundangi's elephants into a booklet to be distributed throughout Mechinager Municipality.

When HEC occurs, it is Shankar that visits the homes to interview farmers and record the damage. The GoN offers monetary compensation for those people who have suffered loss because of HEC; however, the filing process is not easy to navigate. Once again, it is Shankar who helps his neighbors complete the required paperwork, at times traveling to the local Forest Office to submit applications on their behalf. When retaliatory elephant killings or poaching events happen, it is Shankar that also documents the scene, methodically taking notes and pictures to share with authorities, all the while mourning his lost friend. Keep in mind, what Shankar does is all volunteer work.

For his efforts, in 2023, Shankar was awarded the WWF Nepal Conservation Award given to individuals at the grassroots level who have made significant contributions to protect Nepal's Biodiversity. Recently, he was featured in a documentary '*Ganesh – Elephant Maximus*' that garnered an incredible reception at the Kathmandu International Mountain Film Festival. Although he hails from a tiny village in Nepal, Shankar is internationally recognized and renowned.

In the early 2000s, HEC in Bahundangi was at an all-time high. Lone bulls would destroy crops and damage property while trying to access grain stores. Frustration quickly turned into anger. Farmers attempting to scare elephants from their fields put themselves in great danger,

forcing elephants to react aggressively or run away. Sadly, these incidences commonly resulted in human injury or death, and a growing number of retaliatory elephant killings (Neupane, 2011; Dhakal & Thapa, 2019; Ram et al., 2021a).

At the beginning, Shankar's encouragement for a peaceful coexistence was met with the same aggressive opposition and resentment people had toward elephants. Within his community, villagers simply could not understand how anyone would side with the very animals that were destroying their livelihoods and threatening the health and safety of their families. Shankar remembers receiving physical threats and rocks thrown at him. Regardless, he pressed on, feeling obligated to see in elephants what others could not and to raise awareness of their importance.

Over time, people's perception of elephants began to change. They realized that Shankar wasn't prioritizing elephants over humans but simply helping members of his community understand that a peaceful coexistence was the only way forward. Soon, neighbors were asking questions, seeking Shankar's advice on how to minimize unwanted interactions with elephants. As the years passed, with the support of the villagers and Mechinagar-4 Ward President, Mr. Arjun Kumar Karki, Bahundangi began the development of their own HEC mitigation strategies, education initiatives, and ecotourism opportunities.

There is not a one-size-fits-all approach to HEC mitigation. Depending on location and time of year, a blending of multiple techniques and vigilance seems to be the most successful strategy. An understanding of how elephants utilize their everchanging environment and how that usage overlaps with humans is instrumental in the prevention of unwanted negative interactions. To use an old African adage, "It takes a village..." and in Shankar's part of Bahundangi, nobody does it better than his community.

Building on earlier cellphone application technology, the Luna app is an innovative idea to quickly disseminate information regarding elephant movement by alerting the community when elephants are nearby. A siren installed in the newly established Elephant Arrival Information Technology Center, located in front of Bahundangi Market, sounds when a message has been received, warning people to find a safe place. Supported by International Union for Conservation of Nature (IUCN) member and NGO, Bright Nepal, Bahundangi is the first place to receive this technology to assuage HEC. During times of harvest, it is not uncommon to see several dozen elephants traveling through the area daily. Reported elephant sightings through the app allow people to avoid unwanted confrontations when an elephant passes through the village. Community members with cellphones can even report



Multigenerational elephant group passing through the Mechi River bed to Bahundangi, Nepal, from West Bengal, India. Photo: Shankar C. Luitel.

elephant sightings themselves, but individuals do not need access to a phone to hear the alarm. Thus, everyone in the village benefits regardless of socioeconomic status.

For subsistence farmers, their livelihoods depend on biannual harvests. The crops they grow are what sustains their family. Unfortunately, these same crops are commonly consumed by migrating elephants. Recognizing this, community members have switched to growing alternative cash crops or dairy farming that is not at direct risk from HEC. Traditionally, farmers grew maize, rice, bananas, and sugarcane, all of which elephants find delectable. Switching to non-palatable crops such as betel nut, citrus, tea, and mint deters elephants from entering farms as there is nothing to eat. Further, using a tiered cultivation system planting non-palatable crops in two outer concentric circles and a desired crop such as maize within the innermost circle still allows the farmer a harvest for his own consumption. It should be recognized that cash crops are dependent on local market value. Further, it's not to say elephants simply walking through farms still have the potential to damage crops by trampling plants; however, this typically doesn't occur unless they are chased into a field. Although agricultural subsidies and crop insurance schemes are not readily available, they are actively being discussed at the Municipality Main Office. Similarly, api-

culture and aquaculture programs as alternatives to traditional farming are also being investigated and in the early stages of development.

Throughout range countries, it is important for native peoples to understand the potential value of their wildlife through ecotourism. In Mechinager-4, the establishment of the Hatti Maitri (Elephant Friendly) Community Homestay, and those similar, help boost the local economy while allowing visitors the chance to experience authentic Nepal. Homestays throughout the country offer guests a comfortable room, delicious local cuisine, and great conversation. During their visit, tourists can also partake in dance classes, crafting workshops, safaris, bike tours, hiking, tea plantation visits, and cultural programs. These activities allow local peoples to share their incredible heritage and pass along traditional knowledge. In addition, such entrepreneurial opportunities empower women by helping them earn a living wage and develop transferrable business skills while serving as community ambassadors.

The development of educational programs to better understand elephant and human behavior are needed in schools and communities. Interviews conducted with individuals that were either injured by elephants or who had an immediate family member injured or killed during an HEC event exposed the extent which human reactions to

elephants is the primary determinant of deadly outcomes. This is further confirmed through research conducted by Dr. Ashok Ram and colleagues. Of the total human deaths recorded beginning in 1998, 60 to 70% occurred when human confrontations forced the elephant into fight or flight mode, by chasing the animal, attempting to injure the animal, or a false sense of bravery when alcohol was being consumed (Ram et al., 2021a). Further, being aware of the time and place when elephants are most active in forests, buffer zones, or within corridors can prevent unanticipated human-elephant interactions. (Ram et al., 2022).

Using data collected through science-based research, the creation of community engagement activities has been instrumental in positively changing human understanding of elephants. Mechinagar-4 Ward President Karki works tirelessly to make his community safe while promoting a peaceful coexistence. President Karki recognizes the overall wellbeing of villagers is closely related to how willing they are to actively participate in elephant conservation. Within Mechinagar-4, he has developed wellness programs to improve quality of life. While in Bahundangi, I attended a community event hosted by President Karki at a local home. Showing a video on HEC facilitated an open discussion with his constituents. Mr. Karki listened to concerns and addressed misinformation. Along with Shankar, Arjun has played a key role in helping people see the value in elephants economically through ecotourism and from an environmental perspective by their contributions to the overall biodiversity of the area.

Beginning in 2023, Mechinagar-4 has held an annual community celebration on World Elephant Day, 12 August. The goal for the festivities is to support the participation of local communities in conservation and strengthen cross-border coordination and cooperation with Indian colleagues. As President Karki shared, “community involvement is the most crucial component to conservation.” On World Elephant Day, school-aged children can participate in an elephant painting competition and conservation song contest. The community holds a Mothers Football Tournament to highlight the importance of women’s inclusion in HEC mitigation. Lectures from experts regarding the historic, religious, and ecological importance of elephants is also offered. A highlight of the 2024 celebration was the distribution of accident insurance policies to the brave members of the Rapid Response Team (RRT).

Data from several studies reveal the best way to prevent HEC resulting in human injury and/or death is to avoid interactions with elephants entirely; however, at times, this is not possible. There are situations where it is necessary for humans to help persuade elephants to move away from communities to minimize conflict or damage.

Human settlements located close to wildlife corridors are at an increased risk for wildlife confrontations. When passing elephants show an interest in dwellings, they do so in search of food. It is common practice after a harvest to store maize and rice inside homes. Elephants have a keen sense of smell and can easily locate hidden food items. Allowing them to linger in one spot could lead to a complete loss of livelihood through consumption of foodstuffs and/or destruction of property. Anger and frustration put farmers in the direct path of agitated and fearful elephants, most of which can be very dangerous.

To serve as HEC mitigation mediators, 15 young men of Mechingar-4 established a Rapid Response Team (RRT). Led by Newton Karki, the RRT leads nightly patrols to alert people to the presence of elephants while deterring the animals from entering settlements helping to safeguard crops and homes. Riding motorcycles and armed with nothing but flashlights and horns, they put their conflict resolution training to the test by placing themselves safely between the elephants and their community. Participation on the RRT is voluntary and self-funded. In addition to the inherent risks, there is limited governmental or local administrative support. Further, the group is in constant need of basic supplies such as headlamps, raingear, a 4x4 vehicle, and fuel. Despite many obstacles, members of the RRT are honored to serve their community through selfless altruism. They are true role models and heroes!

Due to a lack of emergency services in Bahundangi, the RRT also responds to other urgent situations such as house fires, illness or injuries, and wildlife rescues. Working with President Karki, the team facilitate educational opportunities within schools and their community, sharing information regarding how to appropriately react when elephants are nearby. To best manage elephants migrating across the Mechi river, the Bahundangi RRT collaborate with Indian RRT colleagues to share news regarding elephant movement. Depending on the season, they could be tracking a single elephant or dozens. Evidence of the team’s hard work and dedication is evident on both sides of the border. Since 2022, there has been a significant decrease in elephant-related damage, human casualties, and retaliatory elephant killings. A win-win for all!

HEC is a complex issue to mitigate. As humans continue to settle in or around historic elephant migration routes, confrontations are inevitable. To tackle this problem, conservation strategies must be comprehensive to promote a clear understanding of the causes of HEC and prevention of conflict. Landscape-level programs fostering open discussion between the Government of Nepal and local municipalities, advancement of stakeholder partnerships, development of long-term solutions instead of problem maintenance, coupled with ownership and lo-



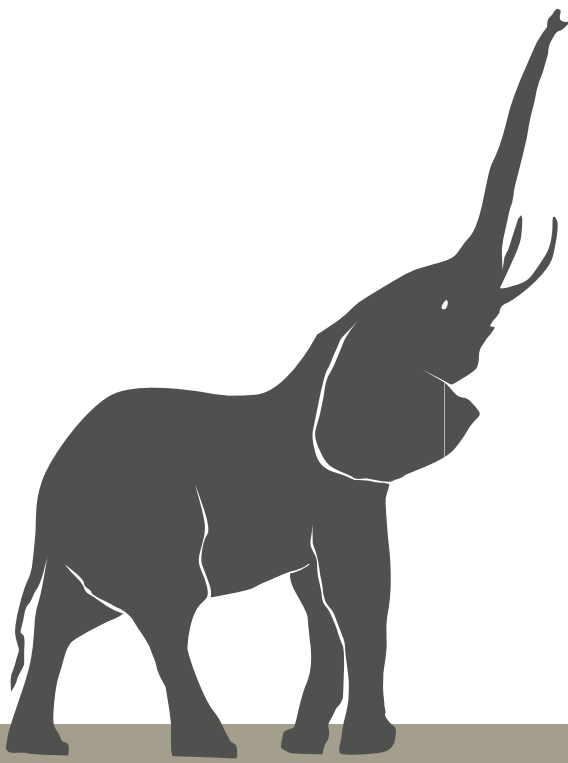
cal government support are necessary for a respectful co-existence. Leading the charge for change in Mechinagar-4 is Shankar Luitel, President Arjun Karki, and the courageous members of the RRT. Working with members in their community, they have developed a multifaceted conservation model proving what is possible through knowledge and patience.

If you would like to know more about the elephants of Bahundangi or are interested in fundraising opportunities to support the Bahundangi RRT, please contact [Mr. Shankar C. Luitel](#) or [Tina Chiarelli](#) for further information. If you would like to follow Shankar and the elephants, you can find them on Instagram @the\_elephant-whisperer or Facebook at Shankar C Luitel.

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# ELEPHANT MANAGERS ASSOCIATION

## Small Grants Program

*Updates from  
April Yoder, Grant Coordinator*

As the 2024 grant cycle wraps up, it is time to introduce our winners. We had a couple of interesting twists this year. As usual, the EMA awarded one grant to a project in Asia and one in Africa. But this year looks a lot like 2022! We are proud to continue our support for Dr. Sanjoy Deb and Gwendoline Angwa, who were both winners in 2022. But in another twist, we were able to support a third project this year! Both of our grantees requested below the maximum amount, so we are also able to support Rabin Bahadur K.C. We would like to sincerely thank all of the EMA members! It is your membership dues that provide the funding for these projects. This year we received 42 proposals and while we wish we could fund them all, we are thrilled to be able to support three dedicated organizations in their work to conserve elephants.

Because the need is so great, next year we would like to go *above and beyond* by *doubling* the approved funding level and supporting even more projects! Please consider donating to the EMA Small Grant Program! [Click here](#) to find the donation page on the EMA website. Comments or questions? Email us at [grants@elephantmanagers.com](mailto:grants@elephantmanagers.com)

Now let's meet the 2024 grantees!

Our grantee from Asia is **Dr. Sanjoy Deb**, a professor at the Bannari Amman Institute of Technology in Tamil Nadu, India. In collaboration with the forest department, NGOs, and individuals, Dr. Deb and his colleagues have developed several technologies over the years to address HEC. They have developed, field tested, and installed several systems including elephant early warning, crop safety, and personal safety devices across India. In 2022, the EMA supported Dr. Deb's project to design and install SMS operated electronic signage. Their current project entitled "Minimizing Elephant Electrocution Death by Equipping Forest Guards with Solar Fence Inspection Stick" will enable authorities to safely identify illegal electrical fences and promptly take legal action against offenders.

Solar fences are used extensively throughout India to defend against wild animal encroachment. In a desperate attempt to protect their crops and in some cases their lives, some farmers will resort to illegal methods to prevent elephants from raiding their crops. This includes connecting 200-volt AC to an existing 12-volt solar fence.

According to recent data from the Ministry of Forest and Environment, there have been 348 elephant deaths attributed to electrocution over the last five years. This surpasses the number of train accidents (80) and poaching (41) during the same time period. Within the Sathyamangalam Tiger Reserve (STR) alone, there have been more than five elephant deaths due to

electrocution reported in the last year. In the adjacent BRT Tiger Reserve (BRT-TR), live electric fences have been the cause of 63% of elephant deaths in a span of two years. A similar pattern has been seen in the Coimbatore Forest Division (CFD).

In response, Dr. Deb and his colleagues have developed a waterproof, lightweight and portable tool that can detect AC current flow from several meters away. It includes a built-in light for nighttime operation, a buzzer and light indicator, an integrated battery and circuit, and it is compatible with solar panel charging. This device was field tested on a small scale by the Dharmapuri Forest Division in Tamil Nadu and initial results were positive. With funding from the EMA, they will distribute 30 of the SFIS to the forest officials in the STR, BRT-TR, and CFD. Each forest section will receive 10 devices along with training in the proper use of the tool.

Our grantee from Africa is **Gwendoline Angwa**, Project Coordinator for Action for the Conservation of Endangered Species (ACES) in Cameroon, Africa. ACES was established in 2019 to address the root causes of species loss and habitat degradation. Their mission is to strengthen community involvement in conservation while also supporting local economic development. In 2022 the EMA supported their project to understand the perception of the local community toward elephants, establish environmental clubs in five schools, and create an awareness campaign for students. This new project entitled “Building Stewards of Biodiversity and Engaging Youths in the Conservation of Elephants in the Deng Deng National Park” is an extension of the original project and will continue to focus on the conservation of the critically endangered African forest elephants and western lowland gorillas.

This project will establish an additional five environmental clubs in schools surrounding the Deng Deng National Park. An additional 60 t-shirts will be printed and distributed to club members to encourage participation and increase visibility for the project. The importance of hands-on activities cannot be underestimated, so there will be three outdoor activities and a field trip for the club members. To keep the environmental club members, as well as other students engaged, they will create conservation-based games and host friendly competitions.

Our third grantee is **Rabin Bahadur K.C.**, a Program Associate for the Biodiversity Conservation Society-Nepal (BIOCOS) in Lumbini Province, Nepal. BIOCOS was established in 2008 with the belief that the local people are the real guardians of the local flora and fauna. This organization promotes local participation in conservation through science-based awareness programs in the community and schools. They have developed programs in the buffer zones to reduce human-wildlife conflict, replace traditional agricultural patterns with alternative crops, design low-cost predator proof corrals, and have built more than 40 km of electric fencing. They have also mobilized the youth to form Community Based Anti-Poaching Units (CBAPU), which has been replicated in other areas.

With an increase in the elephant population in Bardiya National Park, human-elephant conflict has become a major issue. This project, entitled “Living with Giants: Training of Trainers Workshop for Educators to Promote Human-Elephant Co-existence in Bardiya National Park”, is designed to facilitate coexistence between the community and the elephants. This project has three major objectives:

1. To conduct a Training of Trainers (TOT) workshop in Bardiya National Park. Ten youth that are involved with the CBAPUs in the local community will be selected to attend a two-day workshop. During the workshop they will learn about the elephant population in BNP, the ecology and behavior of elephants, safety measures to avoid elephant attacks, and safe methods for handling elephant encounters. While also cultivating a more positive attitude toward elephant conservation.
2. To publish awareness material for the educators and people in the community. 2000 posters containing information about elephants and human–elephant coexistence will be published and distributed in schools, eco-clubs, to community leaders, and to the people in the community.
3. To conduct awareness sessions in the schools and in the community on human–elephant conflict and coexistence. Each of the 10 trainees from the TOT workshop will conduct at least 4 sessions with a minimum of 20 people within their communities.



# The Unsolved Puzzle of Human–Elephant Coexistence in the Selous-Niassa Wildlife Corridor

Philipo Jacob Mtweve, Felician Ezekiel,  
Kaberege David, Agnes Mwahilima, and  
Denis Mng'ong'o

Environmental Conservation for Wildlife and Community Enterprise (Ecowice)

**T**he Selous-Niassa Wildlife Corridor (SNC) faces significant challenges in maintaining human–wildlife coexistence due to the complex interplay of climate change, population growth, agricultural expansion, deforestation, and annual forest fires. These factors, along with shifting wildlife behavior and vegetation dynamics, present formidable obstacles to conservation efforts within the Selous Game Reserve/Nyerere National Park (50,000 km<sup>2</sup>) and the Niassa Reserve in Mozambique (42,000 km<sup>2</sup>) (Baldus & Hahn, 2003). The partially protected corridor, spanning 10,000 km<sup>2</sup> and surrounded by 43 villages, plays a crucial role in the survival and genetic diversity of transboundary migratory endangered species, including black rhinos, African savanna elephants, and African wild dogs, all of which are experiencing population declines in these key protected areas (Malley & Gorenflo, 2023; Linuma et al., 2022).

The rapid expansion of human populations and agricultural activities, particularly in the critical wetlands of the SNC, poses substantial challenges to achieving harmonious human–elephant coexistence (Malley & Gorenf-

lo, 2023). Climate variability exacerbates these challenges, making the goal of coexistence increasingly elusive (Montero Botey et al., 2022). As human settlements continue to encroach on traditional elephant habitats, conflicts between humans and elephants have intensified, resulting in more frequent and severe incidents (Kideghesho et al., 2013; Hoare, 2000).

Despite various mitigation strategies, elephants—renowned for their intelligence and complex social behaviors—have adapted to many of these interventions (Plotnik & de Waal, 2014), often outsmarting the measures implemented by communities and conservation organizations. Crop raiding, in particular, is on the rise, with elephants frequently damaging community property in their search for food and water. Recent reports indicate an increase in crop raiding as elephants have begun targeting crops that were previously unappealing to them, such as puddy and peas (Jacob, 2014; Yeshey et al., 2023). Notably, incidents in Tunduru have highlighted this growing tension, with elephants destroying 380 acres of crops and causing eight human fatalities between January and September of this

year (Jacob, 2014). These events not only result in significant economic losses for local communities but also fuel hostility toward both wildlife and conservation efforts, complicating initiatives aimed at fostering coexistence (Nyhus, 2016; Ravenelle & Nyhus, 2017).

The urgency of finding a solution is underscored by the projected growth of human populations and the ongoing encroachment into elephant habitats. Climate change compounds these pressures by altering both protected areas and community lands, intensifying competition for resources (Ayalew & Melese, 2022). As elephants continue to raid crops and damage property, economic hardship deepens for local residents, further straining the relationship between humans and wildlife.

### Drivers of Change within the Niassa Wildlife Corridor (2010 to 2020)

From 2001 to 2020, an average of 3,160 km<sup>2</sup> of land has been burned annually, accounting for 0.25% of the corridor's total area, as indicated by the MODIS/006/MCD64A1 dataset (*Hansen Global Forest Change v1.11 (2000-2023) | Earth Engine Data Catalog*). Additionally, approximately 17 km<sup>2</sup> of forest cover has been lost yearly during this period, according to the UMD/Hansen Global Forest Change dataset (2023). Furthermore, 1 to 2 hectares are converted to settlements each year, as shown in the MODIS/006/MCD12Q1 dataset, with various sizes of land being repurposed for cropland.

These land-use dynamics are significant contributors to increased human-wildlife conflict in the SNC, particularly affecting elephant populations (Kaswamila et al., 2007; Socioeconomic Perspective of Human-Wildlife Conflict (HWC) and Api-Tourism in Southern Tanzania – TAWIRI). As habitats are destroyed and fragmented due to burning and deforestation, elephants are often forced into closer proximity with human settlements. This encroachment leads to competition for resources, crop damage, and potential danger to both communities and wildlife. The ongoing conversion of land for agriculture and urban development further exacerbates these tensions, highlighting the urgent need for conflict mitigation strategies that balance human needs with wildlife conservation.

The ongoing unpredictability of rainfall and extended dry seasons present formidable challenges for human–elephant interactions and other wildlife in the region. As



communities strive to improve their livelihoods, many are migrating to cultivate wetlands—a vital feeding ground for elephants and other wildlife. This encroachment complicates efforts to foster coexistence, creating a significant dilemma.

Intensified interactions in these wetlands have led to a surge in crop raiding. In response, communities are forced to vigilantly guard their fields, dedicating 10 to 12 hours a day, seven days a week, to protect their crops. This relentless effort transforms farming into a grueling struggle, overshadowing its agricultural benefits.

The repercussions are profound. As communities encroach further into wildlife habitats, they face escalating crop damage, human injuries, and even fatalities. Meanwhile, wildlife, particularly elephants, are adapting their raiding behaviors, targeting crops they previously ignored. Disturbances from human activities have shifted their raiding patterns to nighttime or early morning, exacerbat-

ing the conflict.

This situation is not just a challenge but a crisis, with irreversible consequences threatening both human safety and wildlife survival. Immediate and effective strategies are needed to address this escalating conflict and ensure a sustainable future for both communities and wildlife.

## What Steps are we doing to Address these Challenges?

With the support of the International Elephant Foundation (IEF), we are working to foster coexistence through several key initiatives:

- 1. Monitoring Elephant Movements:** We are tracking elephants within designated corridors to better understand their spatial and temporal distribution. This effort is crucial as their populations fluctuate based on the surrounding protected areas.
- 2. Behavioral Observation:** We are observing elephants' behaviors, including their feeding habits and aggressiveness. Notably, we have seen a shift in their diet, with elephants now consuming crops like green peas, citrus fruits, and cassava, which were previously avoided. This change is significant as these crops were introduced as a means to reduce crop raiding.
- 3. Community Education:** We provide educational programs to local communities, including lessons in twelve primary and two secondary schools. Additionally, we host night cinema screenings to share solutions from other regions dealing with similar challenges. We aim to empower youth through environmental clubs and engage in village meetings to collaboratively seek solutions for enhancing human-elephant coexistence.
- 4. Piloting Coexistence Strategies:** We are testing strategies such as beehive fences, which, while not always highly effective, help protect forests and provide income through honey collection. We are also training communities in mushroom farming as a sustainable alternative to extensive agriculture and now we are giving a try on the sesame farming.

Despite these efforts, the situation requires ongoing attention. As community populations grow, agricultural expansion increases, and rainfall patterns become more unpredictable, both humans and elephants are increasingly drawn to wetland areas in search of resources.

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# THANK YOU

The Elephant Managers Association would like to extend sincere appreciation to our institutional members.

PHOTO: ANDREW SHEK

## IVORY MEMBERS



## GOLD MEMBERS



## INSTITUTIONAL MEMBERS





# CONSERVATION ON TAP *at Tulsa Zoo*

This past May, the Tulsa Zoo held its sixth annual Conservation on Tap event, benefiting Asian Elephant conservation through our partners at the International Elephant Foundation (IEF), AZA Asian Elephant SAFE program, and the International Union for Conservation of Nature's Species Survival Commission (IUCN-SSC) Asian Elephant Specialist Group (AsESG).

This year's event not only highlighted the in-situ conservation programs the Tulsa Zoo supports but also showcased our dedicated elephant staff and our state-of-the-art Oxley Family Elephant Experience and Preserve, which opened earlier this year.

Conservation on Tap has consistently proven to be one of our most popular events, raising a substantial amount of conservation funds in just a few hours. The city of Tulsa and surrounding communities see it as a premier beer-tasting event, featuring unlimited 2-ounce samples from over thirty local breweries, distributors, and home brewers who generously donate their craft beer and time for the event.

In addition to the wide beer selection, patrons enjoy live music, food, yard games, fun activities, and animal encounters, thanks to our amazing ambassador animals and volunteers. VIP guests can access the festivities early, receive food vouchers, and enjoy a special collector's 16 oz. aluminum conservation cup, themed with our Asian elephant event logo. For those who prefer not to drink beer, the event offers various ciders, wine, and non-alcoholic and gluten-free options. A Designated Driver ticket option is also available for those who wish to enjoy the food and festivities without drinking.

This event is truly spectacular, selling out every year and enjoying strong community support. It has become one of the most impactful conservation fundraisers for the Tulsa Zoo, consistently raising an unprecedented amount of funds in just a few hours. Conservation on Tap never disappoints!

*—Richard Kotarsky,  
Curator of Conservation & Scientific Advancement at the Tulsa Zoo*





# Protection for Elephants and Community in the Arabuko Sokoke Ecosystem, Kilifi County, Kenya

Jessica Carey

CEO, Friends of Arabuko-Sokoke Forest

**T**he migration routes of elephants from Tsavo East to the Arabuko Sokoke ecosystem are evolving; this is a narrative of a landscape steeping in history, challenges, and hope. Imagine, if you will, a time long before human footprints marked the soil, when elephants roamed freely across vast expanses, guided by instinct, memory, and the subtle changes in their environment. These ancient routes, etched into the heart of

southeastern Kenya, are more than mere pathways. They are lifelines, fostering genetic diversity, ensuring access to vital resources, and maintaining the ecological balance that sustains both flora and fauna.

The Tsavo East National Park, renowned for its breathtaking landscapes and rich biodiversity, serves as a starting point for this odyssey. Here, amidst the rolling savannas and sparse woodlands, the elephants embark



on their journey towards the coastal forests of Arabuko Sokoke.

This forest, a remnant of the once vast East African Dry Coastal forest, stands as a testament to nature's resilience and diversity, used to stretch from Somalia to Mozambique has been reduced to a mere 416 square kilometer patch, forming part of the Malindi-Watamu-Arabuko-Sokoke Biosphere Reserve, designated by UNESCO.

Friends of Arabuko Sokoke Forest, in partnership with Kenya Forest Service and Kenya Wildlife Service, stands at the forefront of protecting Arabuko Sokoke Forest from illegal resource extraction.

Arabuko Sokoke is not merely a forest; it is a sanctuary, harboring six globally threatened species of birds and three endangered mammals, including the elusive Ader's Duiker and the Golden-rumped Sengi. Within this haven,

approximately 200 elephants find refuge, their presence a symbol of continuity and adaptation.

Arabuko Sokoke Forest was fenced in 2006 to reduce human-wildlife conflict and to protect the threatened, endemic, and endangered wildlife and plant species within the forest. Together with our partners, Kenya Wildlife Service and Kenya Forest Service, Friends of Arabuko Sokoke Forest work tirelessly to prevent and mitigate forest destruction mostly due to logging for firewood, charcoal, and building poles as well as poaching of endemic, endangered, and threatened wildlife.

The narrative of these migration routes is not one of unbroken peace. As human populations expanded, agriculture flourished, and infrastructure developed, these ancient corridors faced unprecedented disruptions. The colonial era brought land use policies that fragmented habitats. Post-independence agricultural expansion and recent urbanization trends further encroached upon these vital pathways, posing severe challenges to the elephants' survival.

The most poignant chapter in this story, however, is written by the climate crisis. Recent droughts have intensified the struggle for resources, driving elephants from the Tsavo Conservation Area back towards Arabuko Sokoke. This movement has ignited fierce human-elephant conflict, with over 500 incidents reported since 2022. Crops destroyed, water sources depleted, and tragically, human lives lost.

In the face of these challenges, the resilience of both elephants and communities shines through. Friends of Arabuko Sokoke Forest addresses some of these challenges through law enforcement, community engagement, capacity building, and environmental education; we strive to foster a harmonious coexistence. We want to express our deepest gratitude to our donors; without you our work would not be possible: The African Fund for Endangered Wildlife, The Minara Foundation, International Elephant Foundation, Elephant Cooperation, Elephant Crisis Fund, Save the Elephants, Indianapolis Zoo, Captain Andy's, Botanical Gardens Conservation International, and Thin Green Line.

Public barazas and targeted training sessions empower communities with the knowledge and tools to protect their livelihoods while safeguarding the elephants. In six primary schools, we engage children in environmental education, nurturing a generation that understands the in-

trinsic value of natural resources and the importance of cohabitation with wildlife.

Our efforts, though significant, are but a part of a larger tapestry of conservation initiatives. The establishment of wildlife dispersal areas, community conservancies, and land-use planning reforms are crucial steps towards the evolution of these migration routes. These endeavors underscore a profound truth: the wellbeing of elephants and the health of our ecosystems are inextricably linked to our own survival and prosperity.

As we reflect on the past and navigate the present, we must envision a future where elephants roam freely, unburdened by the specters of conflict and fragmentation.

It is a future where human development harmonizes with ecological integrity, where conservation is not a solitary endeavor but a collective journey.

In closing, let us draw inspiration from the elephants themselves—symbols of strength, wisdom, and endurance.

Their journey from Tsavo East to Arabuko Sokoke is not merely a migration; it is a testament to the resilience of nature and the power of unity. Together, we can ensure that these ancient pathways remain open while evolving to protect elephants and communities; that the story of the elephants continues to unfold, and that our shared vision of conservation triumphs.



# Seedlings of Change: Community-led Wildlife and Environmental Conservation

Amos Gwema

Bhejane Trust

**B**hejane Trust, a non-profit organization, has expanded its conservation efforts to protect elephants and their habitats in Zimbabwe's national parks and surrounding areas. In partnership with Amos Gwema, a community-focused conservationist, the trust leverages community engagement to combat poaching and human-wildlife conflict.

Our conservation philosophy is rooted in community-based conservation, recognizing the community as the first line of defense for effective wildlife conservation. We adopt a holistic approach, addressing the needs of both wildlife and communities, to foster a harmonious coexistence. Our approach values a collaborative approach with other wildlife conservation organizations, and we believe that working together is crucial for effective conservation.

## Key Components

### I. Community Engagement

- Engage with community members, listen to their concerns, and address them to close the communication gap.
- This approach has led to the recovery of elephant tusks, rifles, and bush meat, making it difficult for poachers to hide.

### II. Community Development

- Support community development initiatives, such as

organic gardens and domestic water provision, emphasizing the connection to wildlife conservation.

- Help communities understand the value of conservation and become active participants.

### III. Conservation Ambassadors

- Utilize former wildlife convicts as conservation ambassadors to share their stories and experiences, educating communities about the consequences of wildlife crime.
- This approach has proven effective in deterring wildlife crime and promoting conservation.

### IV. Environmental Education

- Support school environmental education programs by donating books, reading solar lights, and other equipment, emphasizing the importance of wildlife conservation.
- Our conservation teachings are derived from our book, accepted locally and internationally, which serves as a valuable resource.

### V. Collaboration with Wildlife Law Enforcement

- Facilitate meetings between community members and wildlife law enforcement officials to promote open communication and trust.

- Sponsored sports events encourage interaction and reporting of wildlife crime.

## VI. Judiciary Engagement

- Facilitate joint workshops between wildlife law enforcement officials and the Judiciary to close communication gaps and promote a professional working relationship.
- Ensure fair and transparent sentencing for wildlife offenders, maintaining morale among community members and law enforcement officials.

## Collaboration with Other Wildlife Conservation Organizations and Government

We believe that working together with other wildlife conservation organizations and Government departments is crucial for effective conservation. We collaborate with local and international organizations to share knowledge, resources, and expertise, ensuring a unified approach to wildlife conservation.

## Empowering Communities, Wildlife Law Enforcement, and the Judiciary

By adopting this comprehensive approach, we empower communities, wildlife law enforcement officials, and the Judiciary to work together towards effective wildlife conservation. Our collaborative approach ensures that we are stronger together in the fight against wildlife crime and the protection of wildlife and their habitats.

## Conservation Efforts

- **Game Water Supply:** Bhejane Trust provides critical water supplies to Hwange, Zambezi, and Kazuma National Parks, benefiting elephants and other wildlife. In Hwange National Park, a water-scarce area, the trust pumps 1,500,000 liters of water daily through solar-powered boreholes.
- **Community-led Conservation:** Bhejane Trust engages local communities in wildlife conservation and law enforcement, resulting in successful arrests, convictions, and seizures of elephant tusks and other wildlife products.

## Community Support

- **Potable Water Access:** Bhejane Trust provides access to potable water through borehole drilling, enhancing community livelihoods and fostering ownership in conservation efforts.
- **Intelligence Gathering:** The community provides valuable information on poaching activities, leading



to successful arrests and convictions. This collaborative approach ensures that poachers have nowhere to hide, and their illegal activities are brought to justice.

- **Education and Development:** The trust also supports local school children through donations of books, computers, toys, and first aid kits, promoting education and development in the community.

## Challenges

- **Funding Constraints:** Despite successes, Bhejane Trust faces significant funding constraints, hindering its ability to fully achieve its conservation objectives. Donor support is crucial to sustaining and expanding its initiatives.
- **Wildlife Injuries:** Elephants are often injured through wire snares, requiring costly darting and removal procedures.

## Appeal

Community Action for Wildlife Conservation Trust (Bhejane Trust) appeals for any form of donation, including but not limited to

- **Educational Materials:** Books, computers, toys, and first aid kits for school children
- **Fencing Materials:** For community gardens to protect crops from wildlife
- **Seedlings:** For community gardens to promote sustainable livelihoods
- **Laptops and Satchels:** For education and conservation efforts

Every donation, big or small, makes a significant difference in the trust's conservation efforts.

Bhejane Trust's community-focused approach demonstrates the power of collaborative efforts in protecting wildlife and their habitats. By empowering local communities and providing essential resources, the trust contributes significantly to the long-term survival of elephant populations in Zimbabwe.

# EMA Membership Information

New membership levels effective September 2017. Existing members should renew their membership [online](#).

## Individual Members

- Access to digital publications: *Journal of the Elephant Managers Association* and *Gray Matters*
- Access to Members-Only content on EMA website
- Eligible for discounted rate to annual conference

### Professional \$45 USD

Individuals who provide care for or manage elephants on a daily basis. Additional benefits:

- Eligible to hold an office on the Board of Directors and/or as a committee chairperson
- Voting privileges for Board of Directors elections and other EMA business

### Contributing Professional \$45 USD

Individuals who dedicate their careers to elephant management, research, conservation, and/or veterinary medicine. Additional benefits:

- Eligible to hold an office on the Board of Directors and/or as a committee chairperson
- Voting privileges for Board of Directors elections and other EMA business

### Affiliate \$40 USD

Other animal care staff, docents, volunteers, and enthusiasts of elephant management. Additional benefit:

- Eligible to be a committee member and/or hold office as a committee chairperson

### Student \$30 USD

Students currently enrolled in a degree-seeking institution (university or technical college) who desire to pursue a career in elephant management. **A copy of your student ID may be requested.** Additional benefit:

- Eligible to be a committee member.

## Institutional/Corporate Members

- Access to digital publications: *Journal of the Elephant Managers Association* and *Gray Matters*
- Access to Members-Only content on EMA website
- Eligible for discounted rate to annual conference
- Institutional plaque given annually to display your support to the EMA

### Institutional/Corporate Member \$75 USD

Institutions that manage elephants or corporations that provide products or services for elephant management.

### Gold Institutional/Corporate Member \$250 USD

Gold Members are organizations that wish to provide additional support to the EMA. Additional benefit:

- Half-page advertisement in an issue of JEMA

### Ivory Institutional/Corporate Member \$500 USD

Ivory Members are organizations that wish to provide additional support to the EMA. Additional benefits:

- Full-page advertisement in an issue of JEMA
- Complimentary individual EMA membership for a staff member. The designated person must apply for and be approved in the appropriate membership level to receive individual benefits.

All membership applications and renewals are processed online at:

[www.elephantmanagers.org](http://www.elephantmanagers.org)

For more information, please contact [membership@elephantmanagers.com](mailto:membership@elephantmanagers.com)



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