

SOUTHERN
TANZANIA
ELEPHANT
PROGRAM



ANNUAL REPORT 2017

Southern Tanzania Elephant Program
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WHO WE ARE

STEP is a Tanzanian-registered non-profit elephant research and conservation organization based in southern Tanzania. Believing in the importance of strong protected areas and the welfare of people living around their boundaries, we work with a range of partners towards long-term security for elephants, a critical keystone and umbrella species of the ecosystems of Ruaha-Rungwa and, Udzungwa and Selous.

VISION

Creating a long and peaceful future for elephants in southern Tanzania and for the ecosystems on which they inter-depend.

MISSION

To secure a future for elephants in southern Tanzania by supporting elephant protection, enhancing human-elephant coexistence, conducting research, and using advocacy.

OVERVIEW

This report covers STEP's activities between January and December 2017, following three programmatic areas:

1. Supporting Elephant Protection
2. Enhancing Human-Elephant Coexistence
3. Applied Monitoring and Research

MESSAGE FROM THE DIRECTOR

Dear Friends,

In the context of the last decade, 2017 has been a good year for elephants in Tanzania. Poaching for ivory has decreased, as a result of a combination of factors, especially political will from the Tanzanian Government, momentum against ivory trade globally, the gains made against traders in Tanzania by the National Task Force (NTSCIU), and hard work on the ground by both the Protected Area agencies and civil society organisations.

In southern Tanzania, STEP is proud to be a partner in the ongoing rehabilitation of the Rungwa-Kizigo-Muhesi Game Reserve complex. This stunning wilderness is one of the most important areas for elephants in Tanzania, where, after years of heavy poaching and serious decline, the shoots of recovery are beginning to appear. A multi-partner approach is improving infrastructure, communications, and other aspects of anti-poaching capacity. Working closely with the rangers, STEP flew more hours of aerial surveillance in Rungwa and Kizigo in 2017 than anywhere else, leading to greatly increased security on the ground.

Smaller areas are important for elephants too, and STEP is equally committed to supporting the Nature Reserves of the Udzungwa Mountains, and the MBOMIPA WMA, a community-managed reserve. The rangers and Village Game Scouts that we work with have among the toughest jobs on the planet and we are honoured to support them. In 2018, we have plans to increase this support.

The threat to elephants arising from conflict with Tanzania's rapidly growing human population, persists and presents arguably the greatest long-term challenge to ensuring a secure future for elephants. STEP's human-elephant coexistence program continued to grow through 2017, and we are working hard to make a success of our beehive fence projects with farmers. The microfinance schemes that we run alongside with communities affected by elephants are proving very popular and a strong incentive to coexistence. We are constantly seeking complimentary solutions to add to the 'toolbox', and for example, our trials of chilli briquettes for deterring elephants from farms at Rungwa are showing early promise. In 2018, we will be continuing to monitor and expand our efforts, and to adapt according to what truly works. Positive results are always what drive and guide our actions.

The year ended on a high note, both for elephants globally, and for STEP locally. On 31st December 2017, China officially completed the year-long process of closing down its domestic ivory markets and carving factories across the country. As the number one destination for illegal ivory in the world, this is great news. However, there is a clear danger that this may boost trade in neighbouring countries. The announcements that Hong Kong and Taiwan plan to close their ivory trade are therefore also important, but we have to all keep the pressure up, until there are no markets anywhere!

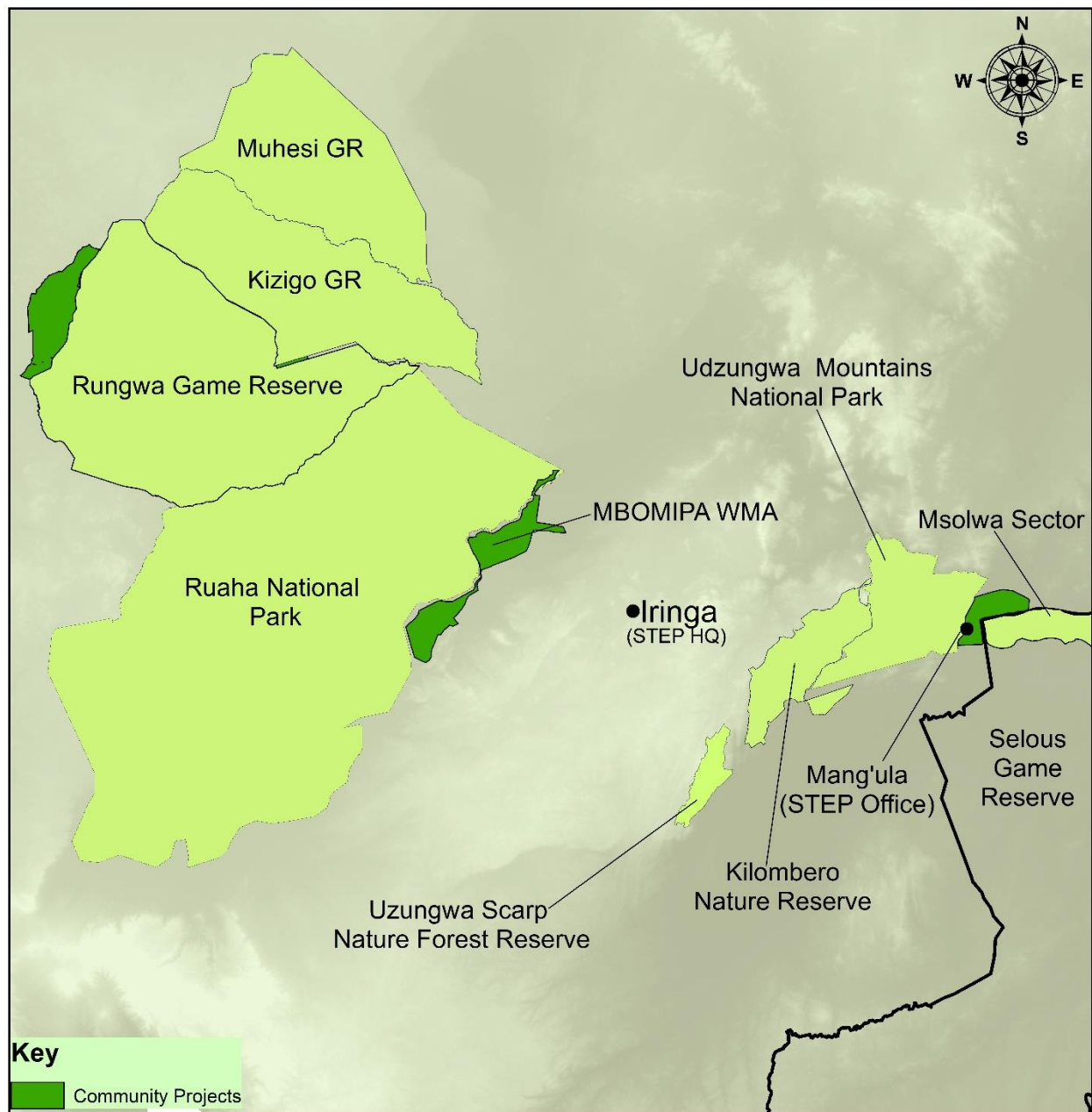
Back home in Tanzania, STEP ended the year by signing two formal agreements with the Tanzanian Government. These 5-year partnerships with the Tanzania Wildlife Management Authority (TAWA) and Tanzania Forest Services (TFS) strengthen our collaborations in and around the critically important Game Reserves and Nature Reserves of southern Tanzania to which we are dedicated to conserving. The agreements reflect STEP's holistic and long-term strategy to support both rangers in the reserves, and the people making their living around the edges.

I wish to extend a sincere thank you, on behalf of the whole STEP team, for all of your support for our work throughout 2017. Onwards and upwards!



Dr. Trevor Jones
Director, STEP

PROJECT AREAS



Map created April-2018.
 Data: STEP
 Coordinate System: GCS WGS 1984
 Projection: Transverse Mercator
 Author: Solomon J. Sembosi

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0 15 30 60 90 120 Kilometers

SOUTHERN
 TANZANIA
 ELEPHANT
 PROGRAM

STEP

1. SUPPORTING ELEPHANT PROTECTION

Working with wildlife authorities to enhance protection for elephants and key ecosystems

- 155 hours of aerial surveillance flown in 2017, increasing protection over >10,000 km² of the Ruaha-Rungwa ecosystem
- Ranger and patrol support expanded to two important Nature Reserves of the Udzungwa Mountains
- >90 rangers and protection personnel trained in use of GPS units and GIS for patrol mapping in Rungwa, Selous and Udzungwa since 2016
- >550 person-days of ranger patrols directly funded since 2016

BUILDING SECURITY FOR ELEPHANTS

Elephant conservation is a national priority in Tanzania, as this country is home to the largest population of elephants in East Africa. In addition to their important ecological role as keystone species, elephants are recognized as an important source of national income via nature and wildlife tourism in Tanzania. However, ivory poaching conducted by international organized crime networks has reduced the country's elephant population from 109,000 in 2009 to an estimated 50,000 individuals in 2015. Poaching on such an industrial scale represents a huge challenge to the managers of Tanzania's elephant strongholds. Long-term, dedicated anti-poaching and intelligence efforts are required to combat the network of poachers and ivory traders that have decimated many populations over the last ten years. STEP supports protection efforts by providing aerial surveillance and by building capacity for law enforcement in key elephant habitats in southern Tanzania.

1.1 Ruaha-Rungwa Aerial Program

STEP has provided over 450 hours of aerial support in the Ruaha-Rungwa ecosystem since 2014, improving elephant protection and supporting anti-poaching operations.

Throughout 2017, our aerial team continued to respond wherever there was need and wherever we were asked to provide aerial support in remote parts of Ruaha-Rungwa. Using STEP's highly economical 2-seater Zenith Sky Jeep light aircraft, we fly slow and low over the bush, affording maximum visibility and detectability of illegal activity and carcasses, as well as live elephants and other wildlife. Working in coordination with mobile ranger units stationed at the bush airstrips enables rapid response on the ground. In 2017, we flew intensive surveillance operations over 6 months totalling 155 hours and covering more than 10,000 km².

These flights have proven vital for locating and reducing poaching activity, especially in Rungwa and Kizigo Game Reserves, and MBOMIPA WMA. Observations from the air include poachers' camps and trails, elephant carcasses, timber cutting, mining sites, livestock, and encroachment. Successes have included several arrests of poachers; closure of poaching and timber cutting camps, and illegal mines; seizure of illegally grazed cattle; and removal of illegal farms and temporary settlements. Ruaha National Park is also covered by the plane, and here special flights with Park staff have assisted with major ranger operations and surveillance of boundaries.

With pilot Charles Nagy and observer Anne Yeoman taking some time out in 2017, our aerial team was headed by the highly experienced South African bush pilot Ferdi Koekemoer, and we recruited Tanzania pilot Ahmed Dahal (known to his friends as Eddie). Eddie had previous light aircraft and microlight anti-poaching flying experience with PAMS Foundation in the Selous-

Niassa Corridor and began flying regularly with us in July 2017. Prior to that, we funded Eddie's travel to South Africa for training and conversion to our plane under the tutelage of our regular aircraft engineer, Richard Nicholson. By the end of 2017, Eddie had flown over seventy hours in the Sky Jeep, and we are delighted to have him on board.



STEP aircraft with a member of the Rapid Response Team at Makwasa airstrip, Rungwa GR, April 2017

1.2 Supporting rangers and patrols in the Rungwa Game Reserve complex, MBOMIPA WMA, and Kilombero Nature Reserve

A key goal of STEP is to empower rangers in their work protecting elephants and ecosystems in southern Tanzania by facilitating ranger patrols and providing technical training and support for patrol mapping and strategizing. In 2017, we continued to train rangers in the use of GPS units for recording patrols and assist protection departments with rapid mapping of ranger patrols and operations to analyse patrol outcomes and effectiveness and adapt law enforcement strategy accordingly. And, as mentioned above, our support for and coordination with rangers stationed at the bush airstrips out of which our aerial team are operating is critical to the success of all our aerial work.

In 2017, we continued working with the rangers of Rungwa and Kizigo Game Reserves, including taking members of the Rapid Response Team up in the aircraft as observers and data collectors. In MBOMIPA Wildlife Management Area, we funded responsive patrols by Village Game Scouts of the WMA and members of the Iringa regional ranger force (KDU), and provided the vehicle and driver to assist with operations. In the Kilombero Nature Reserve (KNR), we funded 100 person-days of foot patrols in the precious montane forests of the Udzungwa Mountains.

Also this year, our team was boosted by the addition of Solomon Sembosi M.Sc., a GIS expert who, as our number of sites within our ranger support program has increased, has enhanced our ability to process spatial data from patrols and rapidly produce high-quality maps of illegal activity and elephant distribution for use by our Protected Area partners.



Confiscated bushmeat and poachers' bicycle in Rungwa Game Reserve

1.3 New: Uzungwa Scarp Protection Project (USPP)

In 2017, STEP began a new long-term collaborative project with Tanzania Forest Services (TFS) to extend our model of ranger support developed in KNR to the extraordinarily biodiverse but highly threatened and Uzungwa Scarp Nature Reserve (USNR). USNR officially became a Nature Reserve of 328 km² in 2016 in recognition of its importance for endangered and endemic species including a high diversity of rare primates, forest antelopes and birds, and over 20 endangered amphibian species. However, human pressure is high and resources for protection are low, and timber cutting and overhunting especially of monkeys have been well documented over the last decade. The last elephants were probably hunted out in the 1980s, however there is access from the adjacent Kilombero Nature Reserve and we hope that with sustained increased protection of the forest, one day the elephants will return.



With the support of Whitley Wildlife Conservation Trust, UK and the MUSE Science Museum of Trento, Italy, the project began in September 2017 with the recruitment of Godfrey Nyangaresi as Forest Protection Coordinator. Joining forces with the STEP GIS team, Godfrey organised three days of training for 17 rangers and Village Game Scouts of USNR in technical skills to enhance patrol effectiveness: use of GPS, GIS, data collection and analysis. After a handover of vital patrol equipment requested by TFS in November, we began supporting monthly patrols of the forest and its boundaries. By December 2017, we had supported 80 person-days of patrols in USNR.



Handing over patrol gear for USNR rangers to Mr. Florian Mkeya, Sectional Manager of TFS (2nd from left), and the USNR Conservator Mr. Elimoo Mkiramweni (left), November 2017

These patrols have had an immediate impact on illegal activities in the forest. The TFS rangers, working closely with Godfrey, regional rangers, local Village Game Scouts and the village communities, have been closing down farms within the Reserve, shutting down timber camps, removing snares, and apprehending bushmeat poachers. We are grateful to all our partners on this new project and looking forward to wildlife populations recovering as the impact of these patrols grows over time.



Village Game Scouts learn how to use GPS units to collect data on patrol (left); Timber cutting camp closed down on one of the monthly patrols in USNR (right)

1.4 Monitoring Wildlife Crime Cases in Southern Tanzania

In collaboration with Ruaha Catholic University (Iringa) and Jordan University College (Morogoro) and supported by USAID-PROTECT, STEP has been monitoring wildlife crime cases in southern Tanzania with the aim of analysing trends in wildlife trafficking and elephant poaching cases. By the end of 2017, we had collected data on over 300 cases. STEP shares these data with TRAFFIC and other partners for the development of a national database on wildlife crime cases, and we plan to complete a joint report providing results and recommendations in 2018.



STEP's aircraft in action

1.5 Visit to Big Life Foundation

In December 2017, STEP's Protection Team paid a working visit to the Headquarters of Big Life Foundation in Amboseli, Kenya. Big Life run a very successful conservation program in southern Kenya, and we wanted to learn from their experience. Over three days, the STEP team exchanged ideas with Big Life staff on a range of topics including ranger training, coordination and support; community support programs; and tackling human-elephant conflict; and discussed differing conservation contexts and challenges in Kenya and Tanzania. The visit was educational and inspiring, and the experience gained has already been useful for the team in planning a major new STEP project in 2018 coordinating anti-poaching in MBOMIPA WMA. We are very grateful to Big Life for generously agreeing to host us.



STEP's protection team in the operations room at Big Life

2. ENHANCING HUMAN-ELEPHANT COEXISTENCE

Working with communities to reduce negative impacts of elephants and enhance rural incomes

- One new farmers' group and beehive fence project established adjacent to Rungwa Game Reserve in 2017, and ongoing support for four farmers groups in Udzungwa, Selous, and Rungwa
- Branding and marketing of elephant-friendly honey
- Five Village Savings and Loans Associations established by farmers' groups issued more than 140 loans worth over TSH 17,000,000 (\$7,400)
- Ongoing community monitoring of elephants on village lands

PEOPLE AND ELEPHANTS: ENHANCING COEXISTENCE

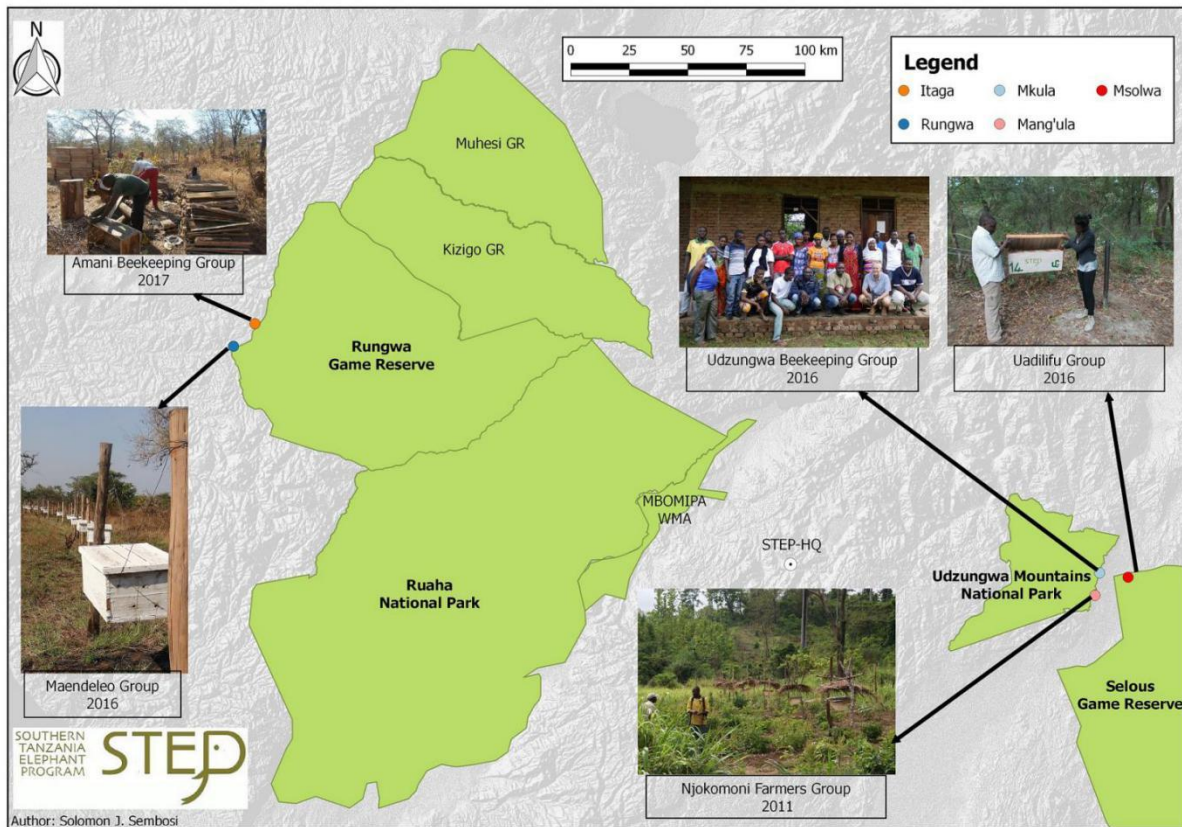
One of the major challenges to coexistence between people and elephants is elephant use of food crops. Crop losses to elephants threaten the livelihoods, food security and well-being of rural communities. In turn, elephant forays into farmland sometimes result in retaliatory and legal killings of elephants under Problem Animal Control laws. For people and elephants to thrive in the long-term, it's important to find ways to mitigate the impact of the animal on people's lives and livelihoods, and vice versa. STEP's work with farmers' groups in southern Tanzania aims to enhance coexistence between people and elephants by empowering farmers to protect their farms and by linking local livelihoods to elephant conservation.

2.1 Community beehive fence projects and elephant-friendly honey

In 2017, STEP supported the establishment of one new community beehive fence project with 30 farmers in Rungwa village bordering Rungwa Game Reserve. The farmers' group responsible for managing the beehive fence was successfully registered as a Community-Based Organization and built a 1.2 km beehive fence to protect village farmland. We also continued to provide technical support to four other farmers groups in Udzungwa and Selous, including refresher training in beekeeping and consultations with professional beekeepers on methods for increasing hive occupancy, strengthening bee colonies, and harvesting, processing and packaging of honey.



Amani Farmers' Group at the Itaga beehive fence in Rungwa (left); Farmers in Msolwa Station during beekeeping training and packaged honey from Njokomoni beehive fence (right)



STEP's current beehive fence projects with farmers' groups

To help farmers market their elephant-friendly honey, STEP enlisted the help of Tanzanian advertising agency Right Here Ltd to design labels and marketing materials. The agency designed a brand for the honey (*Tamu Tamu*, meaning sweet in Kiswahili) and created beautiful labels which tell the story of how this honey helps to improve livelihoods and create harmony between elephants and people. STEP is also supporting farmers groups and other beekeepers in the Kilombero valley to professionalize their honey production and packaging through the establishment of a honey collection centre in Mang'ula B village, which will open in 2018. This centre will create a central place for farmers groups to process, package, label and store honey for the *Tamu Tamu* brand.



Labels designed for elephant-friendly honey

2.2 Village Savings and Loans Associations

To help buffer farmers financially from crop losses to elephants, we encourage farmers' groups to run community-based loans and insurance disbursement programs known as Village Savings and Loans Associations (VSLAs). VSLAs provide group members with an opportunity for investment and loans, as well as access to a group-run insurance fund in rural areas not served by formal financial institutions. In 2017, five farmers' groups operated VSLAs and raised TSH 17,796,000 (\$7,909). VSLAs disbursed more than 140 loans to members to start small businesses such as chicken-rearing, tailoring, small restaurants and shops, and to assist with household cash flow.



Farmers attend weekly VSLA meetings to purchase shares and to apply for loans and insurance

2.3 Community Monitoring of Elephants on Village Lands

STEP involves communities in studying elephant use of village lands via a community elephant monitoring network for reporting elephant crop damage movements. In 2017, we continued to work with five local elephant monitors selected by their fellow villagers to serve as point of contact for all elephant incidents and to survey farms twice a week. Monitors use standardized data sheets and record the location of all crop losses using a GPS unit. Through this initiative, village communities are building valuable datasets on human-elephant interactions which help to plan and evaluate intervention strategies.

2.4 Supporting Ranger Protection of Farms and Elephants

Challenges for human-elephant coexistence arise when elephants wander out of protected areas and into farmland, which may be because of seasonal lack of water or food, or because elephants are moving along traditional corridor routes that have become blocked. STEP works in collaboration with Wildlife Division's regional anti-poaching ranger force known as KDU (Kikosi Dhidi ya Ujangili) to help push elephants out of farms and back into protected areas during the crop harvesting season, keeping both the elephants and people safe. In 2017, we supported four of these operations in the Iringa area with vehicles, drivers, and fuel.

2.5 Chilli Briquette Trial

In 2017 we conducted our first trial of chilli briquettes as a low-cost elephant deterrent method with farmers in Rungwa village. Chilli briquettes are made of a mixture chilli and elephant dung, which when lit release a chilli smoke that is an irritant to elephants. Previous trials by one of STEP's Scientific Advisors (Dr. Rocio Pozo) in Botswana showed that burning chilli briquettes made from elephant dung and chilli powder has a repellent effect on elephants, but chilli briquettes had not previously been tested as a method for deterring elephants from settlements and food stores.

In November, we ran a preliminary trial of chilli briquettes on a major elephant trail into Rungwa village. Ten farmers were trained in chilli briquette production, which involved drying fresh chillies, pounding the chillies into a powder, mixing the chilli with elephant dung and water, and shaping and drying the briquettes using specialized moulds. Farmers and local elephant monitors were also trained in lighting chilli briquettes and recording data for the trial. The trial was run every evening for ten days. In this period, elephants came out of the reserve on three occasions using the trail with the briquettes. However, when the elephants came within 10-20m of the lit briquettes, they left the trail and moved to alternative parallel paths. This first trial suggests that the chilli briquettes repel elephants at short distances and show promise as a method for managing elephant movements through village land. We plan to continue trials of this method in 2018.



Drying of chillies (left) and completed chilli briquettes (right)

2.5 Education

Inspiring younger generations to value and conserve wildlife and ecosystems is an important part of securing a future for Tanzania's elephants. In 2017, STEP's Research and Education Officers conducted conservation outreach and awareness-raising at nine schools, engaging over 2,800 students. Students learned about the intrinsic value of elephants, their importance to Tanzania's ecosystems and economy, as well as the threats to elephants from ivory poaching and human-elephant conflict. Students were also taught about different ways to engage in conservation and were given guidance on conservation careers. STEP also hosted six Tanzanian volunteers and students in 2017 to enable them to gain practical experience in elephant conservation and research.

3. ELEPHANT MONITORING AND RESEARCH

Monitoring of elephants in Ruaha and Udzungwa, assessing wildlife corridors

- Over 150 days of elephant monitoring conducted in Ruaha National Park and 48 days in Udzungwa Mountains National Park in 2017
- Over 1,700 elephants identified in STEP's Ruaha Elephant ID Database
- Two new MSc and PhD studies
- Continuing long-term study of elephant crop use and beehive fences in Udzungwa

APPLIED RESEARCH FOR ELEPHANT CONSERVATION

Scientific monitoring is crucial for understanding the status and conservation needs of elephant populations. STEP's scientific monitoring programs provide important data on elephant distribution, seasonal movements, and corridors, and help to identify habitat threats and elephant poaching hotspots. We are also documenting the consequences of poaching on elephant populations. This information provides the foundation for the formulation of meaningful and realistic conservation strategies, leading to more focused and effective law enforcement interventions.

3.1 Ruaha Elephant Monitoring Program

STEP's elephant monitoring program in Ruaha National Park aims to collect long-term data on elephant population structure and reproduction, tusklessness, and ecological and social dynamics. This systematic, ongoing study of elephants is designed to inform management decisions and contribute to the basic understanding of elephants and conservation needs in Ruaha-Rungwa. This work also contributes to elephant protection through increased researcher and ranger presence, and we have designed our elephant monitoring program to cover some of Ruaha's most remote regions.

In 2017, our research teams conducted over 150 days of elephant monitoring and 70 vehicle transects throughout Ruaha's major rivers and habitats. We used our vehicle transect data to create seasonal distribution maps of elephants in Ruaha, which we shared with Park managers on a quarterly basis. We also analyzed our elephant dung data to identify 'hotspots' of elephant use to help us understand which areas are particularly important to elephants in Ruaha. We found that elephant hotspots tended to be along sand rivers and in areas with important food resources, as well as near tourist camps and ranger posts (Smit et al. 2017b).

We also continued to update STEP's Ruaha Elephant ID Database, which includes over 1,700 individually identified elephants. This database allows us to monitor indicators of population health over time, including population structure, breeding success, and prevalence of tusklessness. The database also helps us study home ranges and seasonal movements – information which is vital for focusing protection efforts on key elephant range and resources. We also use the database to educate the public about Ruaha's elephants through sharing photos and stories of named elephants on our social media accounts.

In 2017, STEP collaborated with an MSc student from the University of Oxford (Penny Banham) on a study to map home ranges of known bulls and cow-calf groups in Ruaha National Park. Penny and her team operated out of a temporary research camp in Tungamalenga village just outside the Park and documented over 500 elephant sightings in October to December 2017. While the size of Ruaha makes this study quite challenging, we are learning exciting things about elephants' seasonal movements between the Great Ruaha, Mwangusi and Mdonya Rivers.



Bushnell

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A camera trap captures a cow-calf group leaving a drinking point in the Great Ruaha River where elephants dig for water in the dry season

Also in 2017, STEP's Josephine Smit began her PhD at the University of Stirling (UK) to study elephant responses to human-mediated risks. As part of this research, we are using camera traps to study elephant visitation patterns at water sources in areas that experiences differential levels of poaching risk. This study is ongoing but preliminary results suggest that elephants have become more nocturnal in areas where they experienced poaching and primarily visit water sources at night.

STEP continues to be part of a citizen science collaboration with Ruaha Carnivore Project (RCP), North Carolina Zoo, and tourist lodges in Ruaha. This citizen science program enables tour guides to collect data on carnivores, elephants, and vultures using tablets and cameras. Guides submitted over 600 elephant sightings in 2015-2017 which have helped us grow our understanding of elephants' seasonal movements in Ruaha. We are grateful to all the tour guides who share their knowledge and observations with us and support our efforts to learn more about Ruaha's elephant population.



Elephant monitoring team at the Mzombe River (left); STEP's Field Manager monitoring elephants (right)

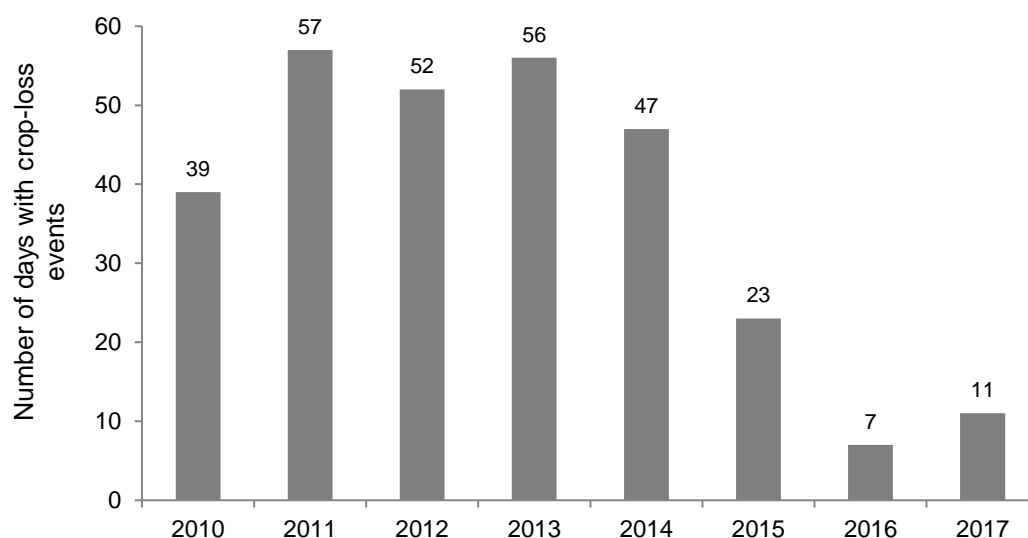
3.2 Udzungwa Elephant Monitoring Program

STEP and Udzungwa Mountains National Park (UMNP) began a joint monitoring program in 2015 using dung transects to study elephant distribution in Mwanihana forest and to assess the impacts of disturbances such as poaching and logging on the elephant population. Our monitoring has shown that Mwanihana forest continues to provide important habitat for elephants, though elephant use of the forest varies seasonally and continues to be affected by human pressures.



Bull elephant captured on camera trap (left); Elephant Officers on transect in Mwanihana forest (right)

We also continued data collection for a long-term study on elephant crop use and the effectiveness of beehive fences for reducing crop losses to elephants in farmland adjacent to Udzungwa Mountains National Park. Analysis of our long-term data shows that the daily probability of an elephant visit to farmland decreased by 50% from 0.23 before the fence was installed to 0.11 with the fence present (Scheijen et al. in press). We have seen the number of days with an elephant crop-loss incident decline from over 50 per year in 2011-2013 to 11 in 2017. We also found that not all the beehives in the fence had to be occupied by bees for the fence to have this effect. We think elephants learn to associate the hives with bees such that even empty or 'dummy' hives can help to deter elephants – a neat result since dummy hives are much cheaper to produce and could help to bring down the cost of beehive fences.



The number of days with elephant crop-loss incidents has declined in farmland in eastern Udzungwa

3.3 Reports, Articles and Publications

Jones T, Cusack J, Rocio P, Smit J, Mkuburo L, Baran P, Lobora A, Mduma S & Foley C. 2018. Age structure as an indicator of poaching pressure: Insights from rapid assessments of elephant populations across space and time. *Ecological Indicators*, 88, 115-125.

Smit J, Pozo R, Cusack J, Nowak K & Jones T. 2017a. Using camera-traps to study the age-sex structure and behaviour of crop-using elephants in Udzungwa Mountains National Park, Tanzania. *Oryx* <https://doi.org/10.1017/S0030605317000345>

Smit J, Mkuburo L, Lihwa F, Sembosi S, Banham P & Jones T. 2017b. Using Hotspot Analysis to Investigate Seasonal and Sex-Based Differences in the Distribution of Elephants (*Loxodonta africana*) in Ruaha National Park, Tanzania. *Proceedings of the 11th Tanzania Wildlife Research Institute (TAWIRI) Conference, Arusha, in press*

Smit J, Mkuburo L, Lihwa F, Sembosi S, Banham P & Jones T. 2017c. Ecological and Demographic Monitoring of Elephants in Ruaha National Park. *Presentation to 11th TAWIRI Scientific Conference, Arusha, 7 December 2017.*

Smit J, Mwaviko K, John R, Mboya J, Lihwa F, Shaw H, Maisonneuve S & Jones T. 2017d. A survey of human-elephant interactions around the Ruaha-Rungwa ecosystem. *Poster presented at the 11th TAWIRI Scientific Conference, Arusha, 6-8 December 2017.*

Scheijen C., Richards S., **Smit J., Jones, T. & Nowak K.** Efficacy of beehive fences as barriers to African elephants: a case study in Tanzania. *Oryx*, in press

Banham P. 2017. The density of the African elephant in Ruaha National Park, Tanzania and the implications for conservation management. *MSc thesis, University of Oxford*

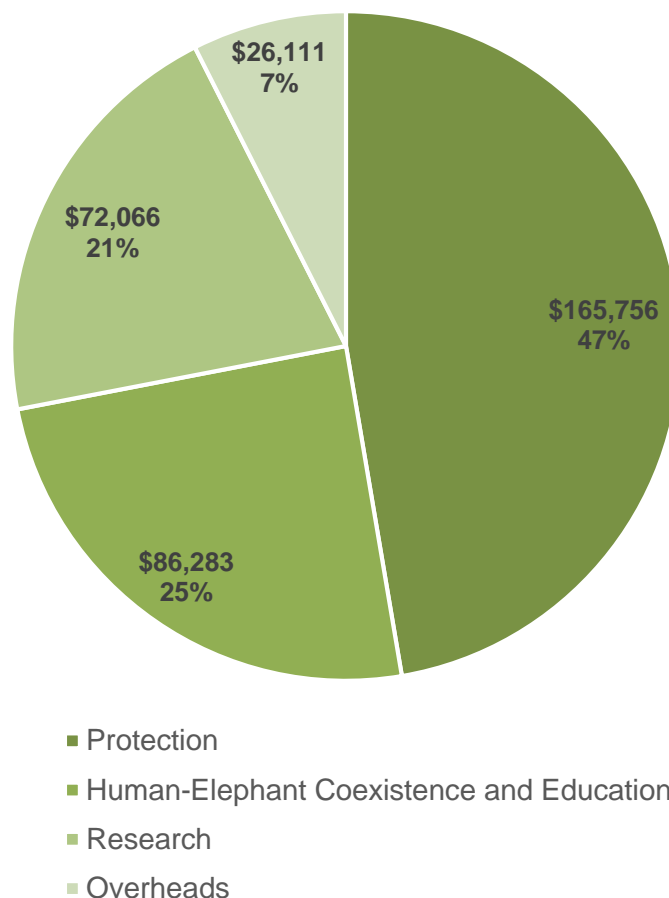
Beale CM, Hauenstein S, Mduma S, Frederick H, **Jones T**, Bracebridge C, Maliti H, Kija H & Kohi EM. 2017. Spatial analysis of aerial survey data reveals correlates of elephant carcasses within a heavily poached ecosystem. *Biological Conservation*.

Rovero F, Owen N, **Jones T**, Canteri E, lemma A, Tattoni C. 2017. Camera trapping surveys of forest mammal communities in the Eastern Arc Mountains reveal generalized habitat and human disturbance responses. *Biodiversity and Conservation* 26(5):1103-19.



4. FINANCIAL SUMMARY

In 2017, STEP's total expenditure was USD 350,216 (compared to \$226,421 in 2016 and \$107,870 in 2015). The largest share (47%) was spent on elephant protection, including STEP's aerial program, ranger capacity building, patrol funding, provision of patrol equipment, and monitoring of wildlife crime cases. STEP's human-elephant coexistence work amounted to 25% of expenditure and included support for five farmers' groups implementing beehive fences and other interventions, monitoring of human-elephant interactions in project villages, and education and awareness-raising activities. Our elephant research and monitoring programs in Ruaha and Udzungwa constituted 21% of total expenditure. Our overheads accounted for only 7% of expenditure.



Note: The expenditure per program includes the costs of fieldwork and operations, equipment, and associated staff salaries.

5. OUR TEAM

Arafat Mtui	Honorary Chair
Dr. Trevor Jones	Director
Josephine Smit	Associate Researcher
Nelson David	Finance and Administration Officer
Frank Lihwa	Conservation Technology Manager
Lameck Mkuburo	Field Manager
Maria Mbata	Human-Elephant Coexistence Manager
Godfrey Nyangaresi	Forest Protection Coordinator
Solomon Sembosi	Conservation Technology Officer
Athumani Mndeme	Udzungwa Manager
Jenipha Mboya	Research & Education Officer
Emmanuel Stephens	Research & Education Officer
Paulo Mndeme	Elephant Officer
Joseph Kidibule	Assistant Elephant Officer
Kephania Mwaviko	Human-Elephant Coexistence Officer
Ferdinand Koekemoer	Pilot Team
Ahmed Dahal	Pilot Team
Anne Yeoman	Pilot Team
Charles Nagy	Pilot Team
Dr. Katarzyna Nowak	Scientific Advisor
Dr. Jeremy Cusack	Scientific Advisor
Dr. Rocio Pozo	Scientific Advisor
Mohamed Ngwira	Office Guard
Hamisi Mbisa	Office Guard
Abasi Lipongola	Office Guard
Amina Mndeme	Office Caretaker



6. ACKNOWLEDGEMENTS

6.1 Donors

Our work relies on support from and collaborations with other organisations. We are deeply grateful for the generous support of the following organisations who have supported our work in 2017:



6.2 Partners



6.3 Supporters and Contributors

Thank you to Peter Mtyana, Kelvin Madege, Penny Banham, Richard Nicholson, Hannah Hilton, Lucy Read, Ciska Scheijen, Ajit Tambay, Alpha Mfiringe, Samson Hamis, Davis Joshua, Royness Sawani, and Fauster Sanga for their valuable contributions to our work. We also thank Penny Banham for giving us permission to use her photos in this report.

We are hugely grateful to everyone who supported us in 2017:

Ailsa Boswell, Katie Boswell & Neil Baker
Jacobsson family
Helen Pearson & Nat Comber
Joel Steed
Nik & Jo Harris
Lady Amelie Klingspor
Allan Carlson
Sheridan Johnson family
Heike Altenstein
Susan Baetz
Allan Thornton
Dave Currey & Gary Hodges
Valentina van Dijk & family
Anthony Jarrett & Kathryn Edwards
Belia Klaassen, Ype Smit & Eva Smit
Tom Hilton
Liz de Leyser
Brittany Hilton
Nick McWilliam
Harvey Coxell
Mike Rowell
Nick Crane
Johanna Bond
Britta Schumacher
Marsha Richins
Daniel Winkworth
Peter Phillips
Nele Eble
Nicolas Smets
Rebecca Harrison
David Harper
Steve Brenner
Alex Benekritis
Marieke Rowland
Barrington Brown
Britt Beerens
Bet Tickner
Iris Nijmeijer
Lindsay Brown
Allegra Trento
Warrick Thomas
Chris Bracebridge
Carol Bracebridge
Jo, Tom & Family Russell
Jennifer Ince
Martina Kolvenbach
Joanne South

Joshua Pelletimu
Sarah de Vlieger
Hanif & Debra Abdulrasul
Wiebke & Stephan Schlaeger
Swen Driessen
Ann-Kristin Leder
Corinna Schulz
Gabi Hölter
Bruce Westlund
Petra Fritz
Helen Banham
Daniel Kelm
Robert Turland
Smo Sienkiewicz, Sustentio
Hong Kong Sweaters, Knits & Woven Team
(Tommy Hilfiger)

Technical and Field Support

Said Kabanda
Patrick Kutondolana
Elia Mndeme
Elimoo Mkiramweni
Alphonse Msigwa
Dr. Christopher Timbuka
Dr. Halima Kiwango
Dr. Alex Epaphras Muse
Professor Phyllis Lee
Professor Hannah Buchanan-Smith
Dr. Lucy King
Malcolm Ryen, Micol Farina, Rebecca Phillips
& Andrea Pompele, Mdonya Old River Camp
Noelle Herzog & Andrew Molinari, Kichaka
Expeditions
Mark & Chloe Sheridan-Johnson, Ikuka Safari
Camp
Thomas Zachmeier
Dr. Andy Bowkett
Dr. Francesco Rovero
Sue Stolberger & Robert Glen
Dr. Andrew Perkin & Nike Daggart
Dr. Andrew Marshall
Richard Laizzer
Richard, Victoria & James Phillips
David Moyer
Tommy Gwilliams
Paulo Urío

In Remembrance

In 2017, we were deeply saddened to lose four extraordinary conservationists in Tanzania. Our thoughts and love remain with all of their friends and family.

Liz Baker (1949-2017)

Liz was a remarkable ornithologist, conservationist, and friend, who was best known for her life's work on birds and phenomenal knowledge of Tanzania's wildlife and ecology. In 1985, Liz and her husband Neil began the Tanzania Bird Atlas, an ambitious effort to collect geo-referenced records of birds from volunteer observers all over the country. This incredible project greatly advanced scientific understanding of the distribution, behaviour, and conservation needs of birds in Tanzania. During her lifetime, Liz trained and inspired countless Tanzanian researchers and wildlife lovers, many of whom are passionate scientists, conservationists, and politicians today. Liz also made a monumental contribution to elephant conservation. In the 1980s, Liz and Neil worked with Tanzania's Director of Wildlife, Mr. Costa Mlay, and elephant scientists to develop Tanzania's seminal proposal to CITES to ban all international trade in elephant ivory. The proposal passed at the CITES conference in 1989, and the trade ban came into effect in 1990. This amazing effort led to the recovery of elephant populations in Africa for the next 15 years. We remember Liz for these achievements and for showing us how much richer a human life is when lived in connection with the natural world.

Wayne Lotter (1965-2017)

Wayne was killed in Dar es Salaam in August 2017. As the Co-Director of PAMS Foundation, Wayne was a fearless protector of Tanzanian wildlife who gave his life to the cause he believed in. Amongst many other achievements, through supporting and working closely with the National and Transnational Serious Crimes Investigation Unit (NTSCIU), Wayne played a major role in reducing elephant poaching throughout Tanzania. We are sure his legacy will live on and grow.

Dr. Alfred Kikoti (2017)

In October 2017, we lost Dr. Alfred Kikoti, a dedicated champion and defender of elephants in Tanzania. Through his extensive work collaring elephants, Alfred mapped their movements and increased our knowledge of remaining wildlife corridors. He was the driving force behind the establishment and protection of the Kitendeni corridor in northern Tanzania. After this success, Alfred founded TEPS (Tanzania Elephant Protection Society) and became increasingly focused on drawing attention to, and seeking solutions for, the latest poaching crisis. Alfred loved elephants, and his tragic death at such a young age is a sad loss for Tanzanian conservation.

Nicola Colangelo (1943-2017)

In July 2017, Nicola Colangelo passed away from cancer. Nicola made a great contribution to wildlife conservation in Tanzania. Through his Coastal Aviation company, and several camps around the country, Nicola brought millions of people into the wilderness areas of Tanzania. This presence of tourists has been vital to protecting some of the most stunning and important wildlife areas in the world. Nicola was also incredibly generous in supporting Tanzanian conservation organisations, including STEP. Thank you for all you did, Nicola.

