



Project Proposal to the African Elephant Fund (AEF)

COVID 19 related evaluation criteria:

1. The project should address priority objectives 1, 2 or 3 as set out in the African Elephant Action Plan (AEAP);
2. The project should start its activities within 3 months of its approval by the steering committee and completed in no more than 12 months from its inception;
3. The project should be subject to at least one or many of the following criteria:
 - a) Secure small / vulnerable populations that are faced with an immediate threat;
 - b) Address prosecution and criminal investigations;
 - c) Prevent immediate human-elephant conflicts;
 - d) Address a site that is experiencing an escalation in poaching;
 - e) Address a site that is experiencing a decline in law enforcement capacity.
4. Funding request should not exceed 50,000 USD.

1.1: Country: South Africa

1.2: Project title: Reducing Covid-19 Related Threats to Elephant Populations in South Africa

1.3: Project location: Far northern Kruger National Park portion of the Great Limpopo Transfrontier Conservation Area (refer to map below).

1.4: Overall project cost (USD):

Amount Requested from African Elephant Fund (USD): 49,983.36

Co-funding source and amount (if applicable) in USD: 28,939.39

1.5: Project duration: 12 months

1.6: Project proponent: South African National Parks (SANParks)

Other project partners (if any) (*please submit or attach an endorsement letter from national government entity responsible for wildlife*):

Please refer to endorsement letter from the Department of Environment, Forestry and Fisheries (DEFF).

The project embeds within the existing Transfrontier Agreements of South Africa, Zimbabwe and Mozambique.

1.7: Name and institution of project supervisor: Dr. Luthando Dziba, Managing Executive: Conservation Services, SANParks

1.8: Address of project supervisor: 643 Leyds Street, Muckleneuk, Pretoria

1.9: Telephone number: +27 (0) 83 200 7518

1.10: Email: luthando.dziba@sanparks.org

1.11: Date of submission: 6 July 2020



2.0: Project summary (overall rationale, objectives of the project, expected outputs and expected results maximum 1 page) (*How is this project addressing COVID 19 related challenges that are hampering elephant conservation?*)

The project responds to increased incidences of snares affecting elephant populations in the far northern Kruger National Park (KNP) at the heart of the Great Limpopo Transfrontier Conservation Area (GLTFCA) - one of Africa's remaining elephant strongholds, where populations are increasing compared to most of the rest of Africaⁱ. The project area overlaps parts of three protected areas at the intersection of South Africa, Zimbabwe and Mozambique: 1) the Makuleke Contractual Park (land owned by the Makuleke Community); 2) the Makuya Nature Reserve (land owned by the Makuya Community); and 3) Pafuri Section of KNP. This area falls within the Luvuvhu River catchment. Few economic opportunities result in few jobs and overall low family income, as well as high dependence on ecosystem services and natural resources for livelihoodsⁱⁱ. Communities share key resources with a growing population of elephantsⁱⁱⁱ that seasonally move in search of food, water, comfort and security^{iv}.

Although relative low rates of elephant poaching prevail in the target area, snaring for game and bush meat places elephants at risk. Although this causes considerable harm to individual elephants with some dying, an additional element is that compromised elephants may resort to seasonal crops^v. At the same time, injured and compromised elephants carry higher levels of aggression and may pose different threats to people's lives^{vi}. Incidental snaring of elephants thus poses a silent and pervasive threat to elephants and people alike.

The regional impact of Covid-19 has engendered new risks for families and created new opportunities for criminal elements. The expected Covid-19 peak in the next months corresponds to the 2020 dry season, increasing risks to elephants. Already, since South Africa went into lockdown in March 2020, observed human incursions into the project target area have doubled.

The project GOAL is to "reduce immediate and future threats to elephant populations in the KNP portion of the GLTFCA." Project OBJECTIVES are to:

1. Respond systematically to growing numbers of elephant snaring incidences through introduction of mobile veterinary services in a remote part of the GLTFCA.
2. Respond opportunistically to elephant snaring and help to prevent it before it happens through regular ground sweeping measures that mobilise community and ranger resources.
3. Strengthen management planning, decision making & risk assessment by gathering intelligence about elephant snaring and effects of predictive & mitigation strategies.

These objectives are achieved by the delivery of three OUTPUTS, namely:

Op1: Focal de-snaring services using KNP and provincial veterinary capacities deployed via helicopter.

Op 2: Opportunistic de-snaring and prevention, conducted by KNP Rangers and community Environmental Monitors, who undertake ground sweeping and record snaring patterns, frequencies and hotspots.

Op 3: Evidence gathered to baseline, predict and mitigate elephant snaring so that available resources are utilised efficiently and effectively, during and post Covid-19.

EXPECTED RESULTS:

- 1) Decreased observed incidences of snared elephants in the December 2020-July 2021 wet season.
- 2) New evidence, scientific capability and enhanced participation by young scientists through mentoring by senior ecologists, to mitigate the effects of elephant snaring developed within the GLTFCA.



3.0: Which priority objectives, strategies and activities of the project (there may be more than one) are related to the African Elephant Action Plan (AEAP)?

The project responds to the following AEAP objectives:

Objective 1: Reduce illegal killing of elephants:

Illegal snaring targeting wildlife incidentally injures elephants that may lead to death. These incidences combined with poaching and habitat change can influence elephant populations. The project helps to secure a strategic set of three protected areas in the GLTFCA that are important to elephant conservation – it is a node where elephants find refuge during the dry season in the area, which has good food, abundant water, large expanses of shade for comfort and relative safety from poaching. De-snaring (Op 1) will reduce injury and morbidity in a remote area with logistical challenges in a systematic manner; while ground sweeping (Op2) is an on-going, opportunistic intervention that also mitigates harm to elephants and helps to prevent snaring before it happens. Evidence gathering (Op3) will reduce elephant injury and morbidity by monitoring and assessing an approach that provides new capacities for Protected Area management authorities to predict and respond to elephant snaring.

Objective 3: Reduce Human Elephant Conflict (HEC):

In this instance, HEC derives firstly from the needs of people living next to protected areas and sharing space with elephants. The response to the COVID-19 pandemic forces communities facing acute food insecurity to use illegal snares to capture game and bush meat. Criminal elements pose more threats through organized snaring. Elephants are the unintended victims of this practice. Secondly, intensified HEC also derives from injured and compromised elephants seeking easily accessible resources like crops. The project (in particular Op3) will strengthen the capacity of Protected Areas management authorities to predict snaring within the targeted seasonal node for elephants, which in turn informs the planning of future targeted operations and forms the basis of improved community engagement to mitigate and prevent HEC for both people and elephants.

4.0: Project Rationale

Securing an Important Elephant Population

Elephants collared with satellite transmitters indicate substantial use of the project focal area by elephants from outside the area including populations moving from Limpopo National Park (regular) and Gonarezhou National Park (irregular), as well as from the South within KNP itself^{vii}. Game census and monitoring information indicates that the total elephant population existing in the project area is between 4600-5000 in 2020, inclusive of observed net movements into KNP. Net movements dictate trends particularly in recent years; for example as elephants move from drought stricken areas outside KNP into southern KNP. Elephants also move in response to emerging poaching hotspots in the region.

Beyond the numbers of elephants that will benefit from the proposed project, there is a broader need to develop better measures and understanding for securing cross-border elephant nodes, of which there are many in SADC. These nodes are significant connectors of elephant rangelands that are characterised by varying degrees of HEC. They are also characterised by intensified use by elephants, particularly in the dry season (August-November).

This intensification creates challenges as well as opportunities. On the one hand, snaring can disrupt the ways in which elephants move across and use landscapes, how they breed and how they survive. This impacts land management, ecosystems and fauna. On the other hand, the known concentration of elephant numbers makes it possible to 1) de-snare in a planned and



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systematic manner; 2) introduce complementary mitigation measures; and 3) rapidly measure whether expected results are in fact realised in the six months (wet season) immediately following de-snaring interventions.

Developing measures to mitigate snaring in priority conservation nodes that have logistical challenges helps to ensure that populations and landscapes do not fragment, so that elephants are able to thrive. Increasing knowledge and other capacities that help prevent snaring conveys an anti-poaching dividend for other endangered and critical species that are the intended targets of both organised and opportunistic snaring.

Contribution to Elephant Management in southern Africa

The project is strategic because it is embedded in a much broader elephant conservation initiative on a regional scale. Testing and monitoring the results of new measures to mitigate snaring makes a contribution to the full operationalisation of the GLTFCA, which is an on-going challenge due to resource and capacity limitations, constrained transboundary approaches as well as transparent land and resource use planning that adequately incorporates wildlife and the well-being of people.

Trialling new measures and testing their effectiveness based on evidence is also relevant to the broader Southern African Development Community (SADC), which is looking for mitigation and proactive management solutions that are effective and scalable. SADC Member States often refer to South Africa for best practice in relation to 1) policy (e.g. National Norms and Standards for Elephant Management); 2) planning (e.g. the KNP Elephant Management Plan, 2013-2022) and 3) implementation. The project thus responds to expressed need for support within SADC. It further complements other SADC-level initiatives including a planned GEF 7 project that aims to reduce Human Wildlife Conflict (HWC), in particular HEC, through a region-wide integrated approach to planning and the evidence base. The project also embeds within the present development of a National Elephant Strategy for South Africa as well as the present development of a GLTFCA Elephant Management Strategy.

Towards Reduced HEC and Community Benefit

While the project is located in a TFCA, it is anchored to two communities with a direct stake in the wildlife economy:

1) Makuleke, a rural community of some 12,000 people (58% women and approximately 60% youth) that carries remarkable geological, natural and cultural heritage, including a 20,000 Ha community Big 5 reserve (Makuleke Contractual Park) established through post-apartheid land restitution. This Contractual Park comprises significant wildlife resources as well established tourism products and infrastructure. The Makuleke community faces chronic unemployment, poor service delivery and has a high dependence on social grants and remittances. Food insecurity is a problem amplified by the COVID-19 pandemic response. Makuleke people are highly dependent on ecosystem services and natural resources including wildlife.

2) The Makuya community, numbering approximately 28,000 people (58% women and 70% youth), own the Makuya Reserve which shares a borderless fence with the KNP, and is home to several ecotourism camps that cater to Big 5 tourists and birding enthusiasts. Like Makuleke, Makuya people are faced with pressing social and economic challenges exacerbated by the public health response to the COVID-19 pandemic.

Reducing HEC in the long term requires reaching consensus between different stakeholders including protected areas authorities and local people on how to integrate and achieve different expectations – socio-economic well-being of people and the needs of elephants – which is a long-term driver that lies outside the scope of the proposed short-term project. The project does however help to mobilise community members to join the collective effort to conserve elephant



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populations by employing community members (especially youth and women) as Environmental Monitors to work alongside rangers to locate and remove snares on a daily basis; and by securing elephant populations that are vital to mainstay economic sectors like ecotourism and hunting (Makuya).

Covid-19 Response

There is an urgent need in southern Africa for countries to pool strategies and resources to combat the Covid-19 pandemic from both a public health and a social-economic fallout perspective. Covid-19 is a transboundary crisis that has decimated local economies most especially in rural areas that depend on nature based tourism and the wildlife economy. The Covid-19 response amplifies existing poverty and exacerbates food insecurity; it also puts further pressure on ecosystems and biodiversity as people turn to wildlife and bush meat as coping strategies. Snaring is a major and growing part of this picture as snares are a simple technology that is highly effective, and thus pervasive.

KNP is spearheading a “Great Kruger Covid-19 Partnership” that mobilises public, private and community stakeholders from a range of sectors to 1) combat the immediate effects of the pandemic and national lockdown; 2) map a common road to recovery; and 3) ensure that communities as well as wildlife are less (and not more) vulnerable in a post Covid-19 world. SANParks has delivered more than 8500 food parcels and water tanks to communities neighbouring national parks, including the KNP. It was observed during the food distribution project that child headed households and those where there is no one employed in the household are hardest hit by the impacts of Covid-19. The current project can contribute to an effective response by mobilising new resources to safeguard elephant populations that support job opportunities in tourism and other wildlife-dependent sectors and their local supply chains.



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5.0: Detailed Proposal – including activities to be carried out, anticipated milestones), timelines, reporting channels and procedures, etc. (3 pages maximum).

5.1.1: Planning

Statement of the objectives	Activities	Time-frame (*assume project commences in September 2020)	Anticipated milestones	Indicators	Channels or process Consultation with stakeholders/partners
1) Respond systematically to growing numbers of elephant snaring incidences through introduction of mobile veterinary services in a remote part of the KNP.	1.1 Plan logistics of obtaining helicopters and accommodation in remote project focal area	Months 1-3	One operational plan for two-week deployment completed in Month 1 Additional operational plan for two-week deployment completed in Month 3	2 operational plans completed	SANParks veterinary services liaising with section rangers, provincial authorities and state veterinarians using existing forums; and with Protected Areas management authorities in Zimbabwe and Mozambique through existing GLTFCA structures.
	1.2 Implement de-snaring missions via helicopter	Months 2 and 4	De-snaring report format completed in Month 1 De-snaring report completed in Month 2 Additional de-snaring report completed in Month 4.	2 aerial de-snaring missions executed over 28 days total	SANParks veterinary services liaising with section rangers, provincial authorities and state veterinarians using existing forums; and with Protected Areas management authorities in Zimbabwe and Mozambique through existing GLTFCA structures.
	1.3 Implement and record incidences of de-snaring as well as observations of elephants with old snare wounds.	Months 2-5 (dry season)	Monthly monitoring reports completed in Months 2, 3, 4 and 5.	4 monitoring reports completed.	SANParks veterinary services liaising with section rangers, provincial authorities and state veterinarians using existing forums.
2) Respond to opportunistically to elephant snaring and help prevent it before it happens through regular ground sweeping measures that	2.1 Liaise with SANParks staff in 3 operational areas about ground implementation and participation.	Month 1	Mapping of ground implementation areas in Month 1 Ground implementation plan completed end of Month 1.	1 ground implementation plan completed.	SANParks ranger services liaising with scientific services, provincial authorities and state veterinarians, using existing forums.
	2.2 Plan and execute bi-monthly operations and	Months 3-12	Bi-monthly ground operations reports completed in Months 4,	5 ground operations	SANParks ranger services liaising with scientific services, provincial authorities and



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Statement of the objectives	Activities	Time-frame (*assume project commences in September 2020)	Anticipated milestones	Indicators	Channels or process Consultation with stakeholders/partners
mobilise community resources.	reporting integrated across all 3 operational areas		6, 8, 10 and 12.	completed.	state veterinarians, using existing forums.
	2.3 Record incidences of snaring, de-snaring and old snare wounds.	Months 3-12	Monthly intelligence bulletins completed in Months 4, 6, 8, 10 and 12.	5 intelligence bulletins completed.	SANParks ranger services liaising with scientific services
3) Strengthen elephant planning and decision making and risk assessment by gathering evidence about elephant snaring and the effects of predictive mitigation measures adopted.	3.1 Set-up monitoring systems	Month 1	Modelling system completed in Month 1.	1 modelling system completed.	SANParks scientific services
	3.2 Consolidate information collected by rangers, Environmental Monitors and vets implementing Objective 2.	Months 3-12	Quarterly reports completed in Months 6, 9 and 12.	3 quarterly reports completed.	SANParks scientific services
	3.3. Analyse and evaluate collected intelligence and build forecasting recommendations as part of final reporting.	Months 3-12	Forecasting guidance notes delivered in Months 6 and 12.	2 forecasting guidance notes completed.	SANParks scientific services
	3.4 Share project results and recommendations with Protected Areas management authorities i Zimbabwe and Mozambique, provincial counterpart institutions in South Africa and the SADC Secretariat.	Month 11-12	Draft summary report and dissemination plan including stakeholder feedback mechanism completed in Month 11 Summary report including analysis of results completed and disseminated in M 12.	Report disseminated to at least 10 key institutions	Existing communications forums comprising GLTFCA Protected Areas management authorities in Mozambique, South Africa and Zimbabwe; and through existing channels to SADC Secretariat.



5.1.2: Procurement (goods, services, equipment, travel, workshop, accommodation etc.)

The helicopter used for de-snaring operations is a SANParks-owned piece of equipment. The grant will cover the cost of fuel and maintenance as well as accommodation for personnel in a far remote area (as necessary) and supplies and equipment for de-snaring operations.

3: Implementation: activity plan, timeline

**We assume that the project will commence in September 2020*

Activities	Outputs	Delivery Date
1.1 Plan logistics of obtaining helicopters and accommodation in remote project focal area	2 x operational plans	September-November 2020
1.2 Implement de-snaring missions via helicopter	2 x two week de-snaring missions 2 x de-snaring reports	October and December 2020
1.3 Implement and record incidences of de-snaring as well as observations of elephants with old snare wounds.	4 x monthly monitoring reports	September-December 2020
2.1 Liaise with SANParks staff in 3 operational areas about ground implementation and participation.	1 x ground implementation plan	September 2020
2.2 Plan and execute bi-monthly operations and reporting integrated across all 3 operational areas	5 x ground operations 5 x ground operation reports	November 2020 – August 2021
2.3 Record incidences of snaring, de-snaring and old snare wounds.	5 x intelligence bulletins	November 2020 – August 2021
3.1 Set-up monitoring systems	1 x modelling system	September 2020
3.2 Consolidate information collected by rangers, Environmental Monitors and vets implementing Obj. 2.	3 x quarterly reports	November 2020 – August 2021
3.3 Analyse and evaluate collected intelligence and build forecasting recommendations as part of final reporting.	2 x forecasting guidance notes	February 2021 August 2021
3.4 Share project results and recommendations with Protected Areas management authorities i Zimbabwe and Mozambique, provincial counterpart institutions in South Africa and the SADC Secretariat.	1 x summary report with recommendations 1 x dissemination report	July – August 2021

5.1.4: Monitoring and evaluation measures of the project

The project design has a strong M&E component as part of implementation (capture, consolidate, analyse and use field intelligence). The activities driving Expected Result #1 are structured so that the project hypothesis, namely that intensive de-snaring activities conducted in the first half of the project/dry season will reduce observed incidences of snaring in the second half of the project/wet season. The result will be measured by comparing monitoring data for 2021 to wet season baseline information



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held by SANParks for 2020 and 2019. A 2019-2021 analysis creates an opportunity to evaluate the extent to which Covid-19 is in fact causing an increase in snaring activity.

Expected result #2 will be measured by a survey to determine the extent to which targeted stakeholders and beneficiaries report that they have acquired new capacities as a result of the project.

Progress towards the Expected Results will be documented through monthly progress reports, an interim project report as well as a final project report with recommendations for efficient elephant de-snaring in future.

5.1.5: Technical and financial reporting

SANParks as the implementing agency is responsible for preparing and submitting interim and final reports. SANParks is a state entity that is audited by the Auditor General of South Africa. There is a strong financial management system that includes internally and externally audited financial statements. The project can be independently audited at the request of the funder. Sam Ferreira (SANParks Large Mammal Ecologist) is the project manager stationed in KNP. Luthando Dziba (SANParks Managing Executive: Conservation Services) plays an oversight role. Both have extensive experience reporting to funders and stakeholders.

6.0: Please explain long term measures to ensure sustainability of the project.

The project contributes to the normal work stream of SANParks. Objective 3 and in particular 3.3 will embed project results in existing/improved forecasting and risk assessment processes. Activity 3.4 shares project results with counterpart Protected Areas management authorities in Zimbabwe and Mozambique, which creates a similar knowledge transfer and capacity embedding opportunity in the Great GLTFCA.

7.0: Will this project receive any other funding other than AEF? Give all relevant details (for example, amount in USD, source of funds, any restrictions? Please specify.

SANParks will provide USD 28,939.39 co-funding in the form of staff time as well as project administration costs on an in-kind basis.

7.1: Please provide a detailed proposed activity-based budget for this project (in USD) as per table below:

(N/B: Expenses that fall under incidental procurement which amounts to 20,000\$ or above, or 15% of the total budget (whichever is lower), will require that the implementing partner be subject to the UN procurement assessment.)*

**Incidental procurement: equipment, vehicles, travel, furniture, supplies, commodities and materials.*

This is not applicable. The helicopter used for the project is owned by SANParks.



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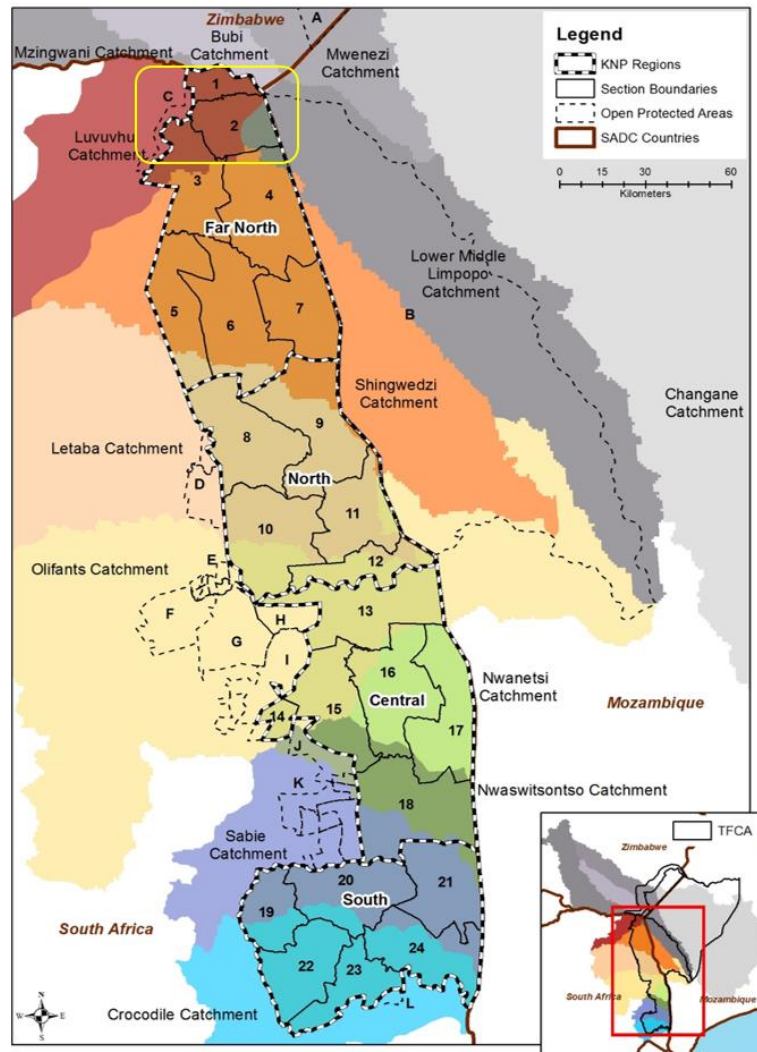


Activity	Quantity	Unit	Unit cost USD	Total cost USD	AEF budget	Co-funding
1.1 Plan logistics of obtaining helicopters and accommodation in remote project focal area						
Salaries	7	day	185.19	1296.30	0	1296.30
Local transport costs	50	km	0.25	12.61	12.61	0
Communication costs	7	day	6.06	42.42	42.42	0
Sub-total				1351.33	55.03	1296.30
1.2 Implement de-snaring missions via helicopter						
Helicopter (fuel and maintenance)	55	hour	727.27	40000.00	40000.00	0
S&T for SANParks and state veterinary personnel operating in far remote area	28	pp/pday	84.85	2375.76	2375.76	0
Veterinary supplies	50	elephant	60.61	3030.30	3030.30	0
Local transport costs	1000	km	0.25	252.12	252.12	0
Communication costs	10	days	6.06	60.61	60.61	0
				45718.79	45718.79	0.00
1.3 Implement and record incidences of de-snaring as well as observations of elephants with old snare wounds.						
SANParks personnel	5	day	50.51	252.53	0.00	252.53
Local transport costs	34	km	0.25	8.57	8.57	0.00
Communication costs	5	day	6.06	30.30	30.30	0.00
				291.40	38.88	252.53
2.1 Liaise with SANParks staff in 3 operational areas about ground implementation and participation.						
SANParks personnel	28	day	84.18	2356.90	0.00	2356.90
Local transport costs	200	km	0.25	50.42	50.42	0.00
Communication costs	28	day	6.06	169.70	169.70	0
				2577.02	220.12	2356.90
2.2 Plan and execute bi-monthly operations and reporting integrated across all 3 operational areas						
SANParks personnel	35	days	454.55	15909.09	0.00	15909.09
Environmental Monitors	35	days	161.62	5656.57	0.00	5656.57
Local transport costs	600	km	0.25	151.27	151.27	0
Communication costs	35	days	6.06	212.12	212.12	0
				21929.05	363.39	21565.66
2.3 Record incidences of snaring, de-snaring and old snare wound.						
SANParks personnel	10	day	50.51	505.05	0.00	505.05
Helicopter (fuel and maintenance)	3	hour	727.27	2181.82	2181.82	0
Veterinary supplies	10	elephant	60.61	606.06	606.06	0
Local transport costs	1500	km	0.25	378.18	378.18	0.00
Communication costs	10	day	6.06	60.61	60.61	0.00
				3731.72	3226.67	505.05
3.1 Set-up monitoring systems						
SANParks personnel	7	day	134.68	942.76	0	942.76
Local transport costs	50	km	0.25	12.61	12.61	0
Communication costs	7	day	6.06	42.42	42.42	0
				997.79	55.03	942.76
3.2 Consolidated information collected by rangers, Environmental monitors and vets implementing Objective 2						
SANParks personnel	10	day	50.51	505.05	0.00	505.05
Local transport costs	50	km	0.25	12.61	12.61	0.00
Communication costs	10	day	6.06	60.61	60.61	0.00
				578.26	73.21	505.05
3.3 Analyse and evaluate collected intelligence and build forecasting recommendations as part of final reporting.						
SANParks personnel	20	day	50.51	1010.10	0.00	1010.10
Local transport costs	100	km	0.25	25.21	25.21	0.00
Communication costs	20	day	6.06	121.21	121.21	0.00
				1156.53	146.42	1010.10
3.4 Share project results and recommendations with Protected Areas management authorities i Zimbabwe and Mozambique, provincial counterpart institutions in South Africa and the SADC Secretariat.						
SANParks personnel	10	day	50.51	505.05	0.00	505.05
Local transport costs	100	km	0.25	25.21	25.21	0.00
Communication costs	10	day	6.06	60.61	60.61	0.00
				590.87	85.82	505.05
				TOTAL	78922.75	49983.36
						28939.39



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ⁱ Chase, M.J., Schlossberg, S., Griffin, C.R., Bouché, P.J., Djene, S.W., Elkan, P.W., Ferreira, S., Grossman, F., Kohi, E.M., Landen, K. and Omondi, P., 2016. Continent-wide survey reveals massive decline in African savannah elephants. *PeerJ*, 4, p.e2354.

ⁱⁱ Muzeza, D., 2013. *The Impact of Institutions of Governance on Communities' Livelihoods and Sustainable Conservation in the Great Limpopo Transfrontier Park (GLTP): The Study of Makuleke and Sengwe Communities* (Doctoral dissertation, Cape Peninsula University of Technology).

ⁱⁱⁱ Ferreira, S.M., Greaver, C. and Simms, C., 2017. Elephant population growth in Kruger National Park, South Africa, under a landscape management approach. *Koedoe*, 59(1), pp.1-6.

^{iv} Ferreira, S.M., Cawthorn, D., Greaver, C. & Simms, C. 2020. Beating around a bigger bush: Elephant movements influence population trends in Kruger National Park, South Africa. Unpublished report submitted to *Ecological Solutions and Evidence*.

^v Ntumi, C.P., 2012. *A landscape approach to elephant conservation in Mozambique* (Doctoral dissertation, University of Pretoria).

^{vi} Das, S.K. and Chattopadhyay, S., 2011. Human fatalities from wild elephant attacks—a study of fourteen cases. *Journal of forensic and legal medicine*, 18(4), pp.154-157.

^{vii} Cook, R.M., Henley, M.D. and Parrini, F., 2015. Elephant movement patterns in relation to human inhabitants in and around the Great Limpopo Transfrontier Park. *Koedoe*, 57(1), pp.1-7.