

FINAL REPORT
SURVEY OF SMALL ELEPHANT POPULATIONS IN SOUTH AFRICA



Compiled by Dr M Landman and Prof GIH Kerley
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***Elephant Research in support of the
South African Elephant Research Strategy***



environmental affairs

Department:
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NELSON MANDELA
UNIVERSITY

1. PROJECT BACKGROUND AND CONTEXT

Since the early-1980s the number of fenced elephant populations on private property in South Africa has grown considerably, contributing to the challenges around elephant-relevant policy and management. The Department of Environmental Affairs (DEA) has a responsibility towards the development of evidence-based policy and legislation, and to facilitate policy-relevant research for the management of elephant in South Africa. To serve these requirements, DEA, supported by South African National Parks, developed the *South African Elephant Research Strategy*, identifying specific research fields that support the implementation of the *National Norms and Standards for the Management of Elephant in South Africa* (DEA 2008). DEA is committed to supporting this strategy, through the funding of specific research initiatives. Thus, on the basis of a Memorandum of Understanding that facilitates research between DEA and the Nelson Mandela University (NMU), DEA approached the Centre for African Conservation Ecology to undertake elephant research aligned with the priorities identified in the strategy document. To this end a Memorandum of Agreement between DEA and NMU was signed in March 2016, comprising three phases, including (1) A survey of the small elephant populations in South Africa¹, (2) Investigating the role of habitat expansion in mediating the impacts of elephant in succulent thicket in the Addo Elephant National Park, and (3) Capacity building for elephant policy development and implementation amongst stakeholders. Phases 2 and 3 are reported on in Landman et al. (2017) and Landman & Kerley (2017a), respectively.

Besides the population in the Kruger National Park (KNP, see de Flamingh et al. 2018), elephant populations in South Africa are highly fragmented and managed under various institutional arrangements, ranging from national parks to private owners (Mketeni 2012). Thus, as identified in the Elephant Research Strategy, there are many highly artificially segregated and distinct populations in small, isolated reserves. These small populations (i.e. those not in KNP) represent considerable risks and challenges to the development and implementation of elephant-related policy and legislation, given prospects of unconstrained population growth, biodiversity impacts, human-wildlife conflicts, poaching and the demand for hunting. In addition, many of the management interventions prescribed in the National Norms and Standards are being implemented (usually as part of an approved Elephant Management Plan) across these populations. It is therefore critical that DEA has a clear understanding of the locations, profiles and management of these small populations. However, as confirmed by Mketeni (2012), information on these populations is sparse, incomplete and what is available in Mketeni (2012) is now out-dated. Thus, in terms of the MoA between DEA and NMU, a Final Report that provides an analysis of the locations and characteristics of small elephant populations in South Africa is due, and this report meets that requirement.

¹ Populations comprising less than a 1000 animals (Mketeni 2012). While this number is not necessarily biologically relevant, it demarcates these smaller populations.

2. THE APPROACH

Our approach to record and characterise small elephant populations across South Africa comprised the following:

- A scan of all the available published information (Anon 1991, 1994, Hall-Martin 1992, Van Jaarsveld et al. 1999, Kerley et al. 2002, 2006, Garai et al. 2004, Cumming & Jones 2005, Blanc et al. 2007, Scholes & Mennell 2008, Mketeni 2012) dealing with surveys of small elephant populations in South Africa.
- A survey of elephant locations in South Africa consolidated as part of MammalMap (Animal Demography Unit 2018), an open-access digital database of African mammal species.
- A comprehensive online survey of all “National Parks”, “Game Reserves”, “Nature Reserves”, “Wildlife Reserves”, “Conservancies” and “Wilderness” areas that might maintain “Elephant”.
- Approaching relevant national and provincial government departments and parastatals responsible for the management of elephant, including
 - Department of Environmental Affairs (Directorates: Biodiversity and Conservation and Threatened or Protected Species and CITES)
 - South African National Parks
 - South African National Biodiversity Institute (Department: Biodiversity Research Assessment and Monitoring)
 - The Wildlife and Environment Society of South Africa
 - Eastern Cape Department of Economic Development, Environmental Affairs and Tourism
 - Eastern Cape Parks and Tourism Agency
 - Cape Nature
 - Ezemvelo KwaZulu-Natal Wildlife
 - Mpumalanga Tourism and Parks Agency
 - Limpopo Department of Economic Development, Environment & Tourism
 - North West Department of Rural, Environment and Agricultural Development
 - North West Parks and Tourism Board
 - Gauteng Department of Agriculture and Rural Development
 - Free State Department of Economic Development Tourism and Environmental Affairs
 - Northern Cape Department of Environment and Nature Conservation
- Approaching other private groups that possibly maintain information on elephant in South Africa, including
 - The Elephant Specialist Advisory Group
 - Wildlife Ranching South Africa (WRSA) – this included the placement of an advertisement in Wildlife Ranching Magazine (2016) and an e-alert to WRSA members requesting information on elephant populations in South Africa.

- Approaching organizations that are involved in the movement of elephant across South Africa, specifically Elephants, Rhinos & People.
- To confirm that all the identified properties maintain elephant populations and obtain up-to-date contact details, we contacted (via email and/or phone) each property individually.
- An online (and/or paper) survey aimed at characterizing each population in terms of its history, attributes (i.e. size, density) and ecology (i.e. vegetation resources) was formulated and circulated to all the identified properties (Landman & Kerley 2017b).
- The above database on the locations and characteristics of small elephant populations was updated as new information became available.

3. OUTCOMES

- In total, we finally located 77 small elephant populations across South Africa (Figure 1). This excludes elephants from the KNP and its Associated Private Nature Reserves (i.e. reserves without any fencing to separate them from the KNP and that are functionally part of the KNP population) and all captive populations (i.e. those offering interactions with elephant and that are accompanied by handlers).
 - Only three of the 77 populations – Addo Elephant National Park, Garden Route National Park and Tembe Elephant Park – are naturally occurring (relict) populations (Hall-Martin 1992; Carruthers et al. 2008); the remaining populations are all introduced or reintroduced.
 - One population - Mapungubwe National Park – is a naturally recruited (from outside South Africa) population after elephant were considered extinct in the area (Hall-Martin 1992; Carruthers et al. 2008).
 - Although our definition for a small population generally refers to fenced populations comprising less than a 1000 animals (Mketeni 2012), the elephant population of Madikwe Game Reserve currently exceeds this number. Also, Mapungubwe National Park is an open (or partially fenced) population whereby elephant move freely between South Africa and neighboring Botswana and Zimbabwe. Garden Route National Park is similarly unfenced, but the best evidence indicates that its elephant population comprises only a single animal.
 - The populations are generally spatially isolated, with only 19% (15 properties) sharing a common boundary. This limits the opportunity for expanding elephant range.
- Between September 2016 and December 2017 an online and/or paper survey was circulated to all the identified properties with elephant and two properties from which elephant had been removed (for a total of 79 surveys). We received detailed feedback on 57 elephant populations, for a response rate of 72%. An additional four locations indicated that they had no interest to participate in the survey.

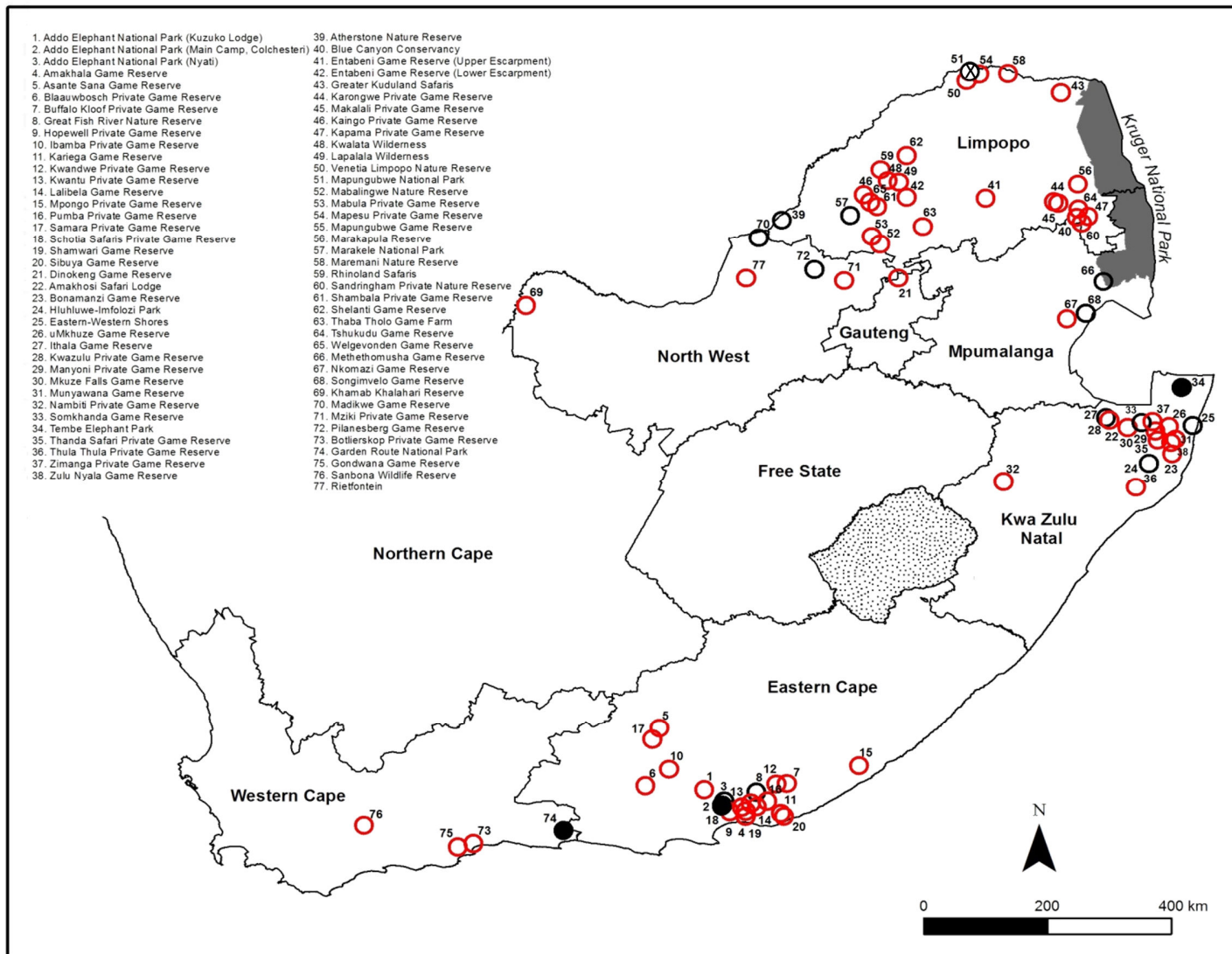


Figure 1: Locations of the 77 state (black circles) and privately (red circles) owned small elephant populations in South Africa. Included are the three naturally occurring (relict, filled circles) and a single naturally recruited (crossed circle) populations.

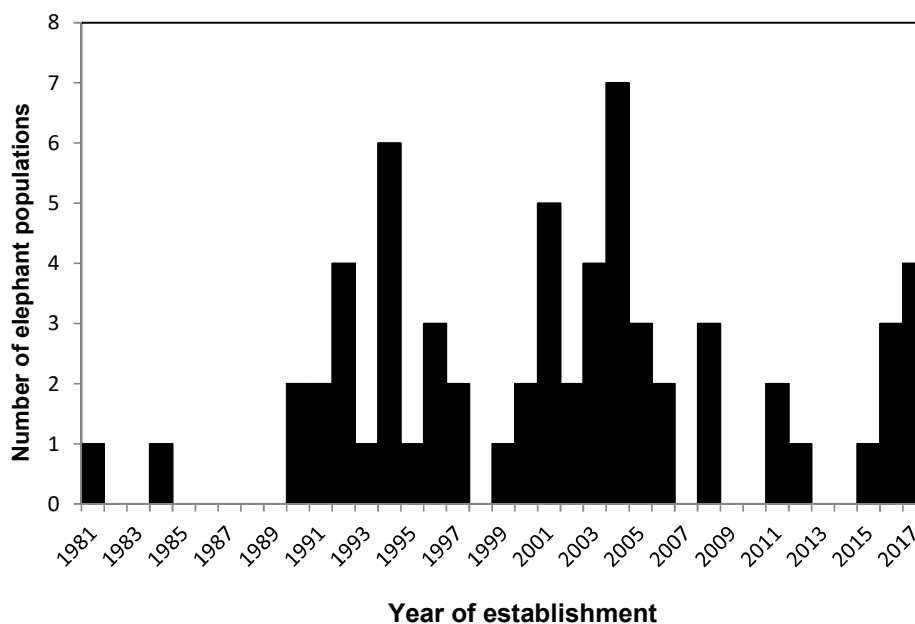


Figure 2: Pattern in the year of establishment of small elephant populations between 1981 and 2017. Prior to 1981 there were only three naturally occurring (relict) small populations (plus the Kruger National Park population) in South Africa.

- We identified 28 elephant populations that were not recorded by Mketeni (2012), with 14 of these populations (4 – Eastern Cape, 4 – KwaZulu Natal, 4 – Limpopo, 1 – Gauteng, 1 – North West) established between 2011 (post-Mketeni 2012) and 2017 (Figure 2).
 - Since the survey of Mketeni (2012), at least two privately-owned properties (but possibly up to four) no longer maintain any elephant, while five have removed their fences to form part of the Associated Private Nature Reserves of KNP.
- More than 80% of the small elephant populations have been established in the Savanna (69%) and Albany Thicket (31%) biomes of the Limpopo (42%), Eastern Cape (31%) and KwaZulu Natal (27%) provinces of South Africa (Figure 3). An additional four populations are distributed within the Fynbos and Forest biomes of the Western Cape and a single population is located in the Indian Ocean Coastal Belt biome of KwaZulu Natal. There are currently no elephants in the Grassland, Nama Karoo, Succulent Karoo and Desert biomes of the Free State and Northern Cape provinces.
- Sixty (78%) of the 77 populations have been established on privately owned properties, while 16 (21%) are state owned. Somkhanda Game Reserve (established in 2016 in KwaZulu Natal) is the first community owned reserve with elephant to be proclaimed under the Protected Areas Management Act. Dinokeng Game Reserve (Gauteng) is the only state owned property established subsequent to the survey of Mketeni (2012).

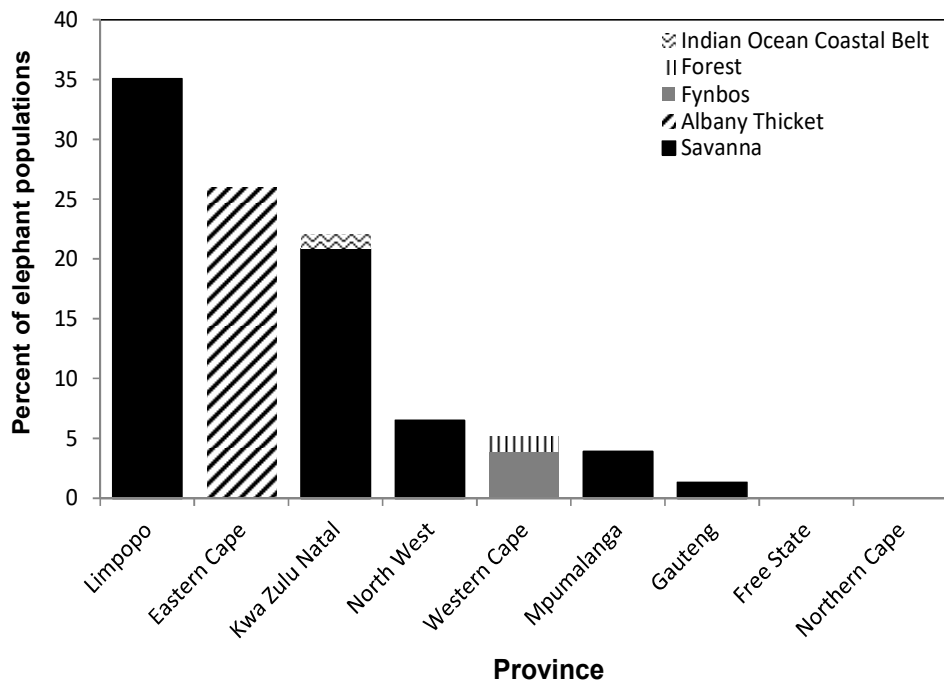


Figure 3: Distribution (%) of small elephant populations across the provinces and biomes of South Africa.

- Data on elephant population numbers and range sizes across 61 populations (covering 12 state-, 48 private- and 1 community owned property) show an estimated 5470 elephants (range across populations: 2–1169 animals) in an area of roughly 11850 km² (range across populations: 10–960 km²). This equates to about 60% of the area of the KNP and a total area of more than 31 000 km² (including the area of the KNP) with elephant across South Africa.
 - Note that these estimates exclude data from Mapungubwe National Park and Garden Route National Park, both of which are open populations.
 - While nearly 70% (~3730 animals) of the recorded elephants are owned by the state, nearly 60% (~7000 km²) of the area available to elephant is privately owned. This means that, on average, population densities range between 0.28 elephant.km⁻², for privately owned properties, and 0.79 elephant.km⁻², for state owned properties.
 - Despite the differences in elephant densities, state owned properties tended to be larger (median: 299 km², range across populations: 75–960 km²) and generally maintained larger populations of elephant (median: 190 animals, range across populations: 2–1169 animals; Figure 4). For privately owned populations, median population sizes were estimated at 18 animals (range across populations: 3–350 animals) and median area sizes at 99 km² (range across populations: 10–900 km²).

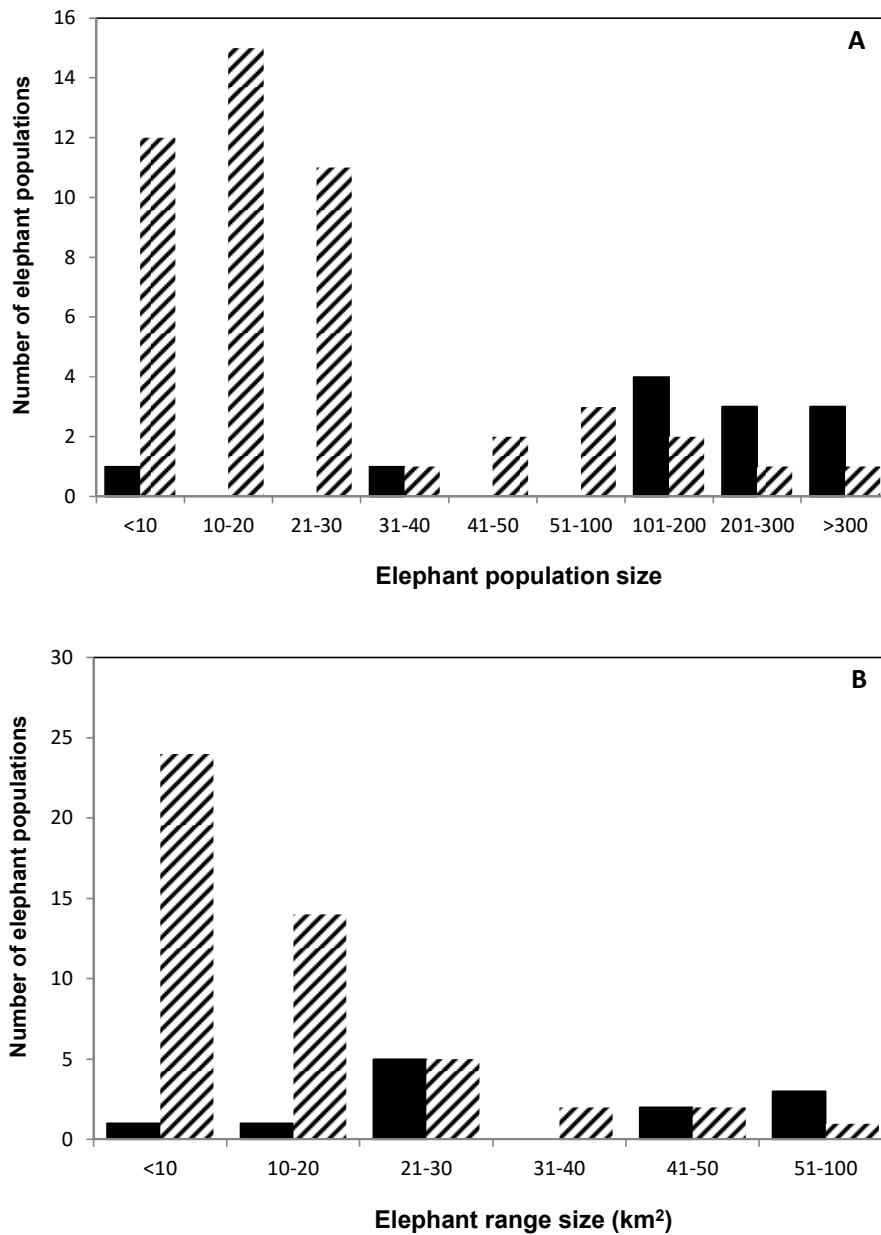


Figure 4: Distribution of elephant population numbers (A) and range sizes (B) across 61 state (black bars) and privately owned (hatched bars) small populations.

- Less than 1% of the elephants are community owned and these are maintained in an area of about 140 km².
- As expected, the majority of the small elephant populations are established for conservation and/or tourism purposes and most (57%) are established with animals from the KNP and

its Associated Private Nature Reserves (9%) populations, particularly Sabi Sands Game Reserve.

- A further 13% have been established with animals from neighboring Namibia, Botswana, Zimbabwe or Mozambique. Despite the relatively high frequency of import of elephants from these neighbors, we located only three records where elephants were exported from South Africa to Angola and Mozambique (the latter specifically to Zinave National Park as part of its restocking initiative following a protracted civil war), respectively.
- Small elephant populations in South Africa are generally dynamic as individuals are moved between locations on an ongoing basis, with more than 50% of the respondents indicating that they had either introduced more animals following the establishment of the population and/or moved animals to other locations.
 - While this outcome could suggest that these populations are diverse, comprising individuals from multiple locations, only 33% of the surveyed populations comprised the animals from two or more locations.
 - Interestingly, eight properties currently have elephants that they would like to move, and this appears to be motivated by the need to limit population numbers and reduce impacts on biological diversity.
 - Seven respondents indicated that they hunt elephant for the purposes of controlling damage causing animals, reducing population numbers, managing impacts on biodiversity and revenue generation. It is not clear how this number corresponds with the number of hunting permits issued because these data were not available for comparison.
- Given the risks to both elephants and biodiversity of maintaining elephant in small enclosed areas, it is not surprising that most of the respondents (65%) indicated that they approach elephant management by intervention (e.g. contraception, translocation, etc.), with immuno-contraceptives being the preferred strategy for limiting numbers. The remaining populations are monitored, but not manipulated in any way.
- Roughly two-thirds of the surveyed populations have an approved Elephant Management Plan, while an additional 20% are awaiting approval; 6% do not currently have a Management Plan.
- More than half (53%) of the survey respondents indicated that the National Norms and Standards for the Management of Elephant in South Africa is not an effective intervention by Government for managing elephant effects. The key challenges experienced were variable and responses that were material to this question are provided in Appendix 1.
- Given the controversies and challenges facing the management of elephant, all the study respondents indicated that there is a need for information transfer on Elephant Management in South Africa, with a specific emphasis on elephant Management, Research and Tourism.

4. CONCLUSIONS

- This survey has shown a substantial increase in the number of small elephant populations in South Africa since the survey of Mketeni (2012), which highlights the importance of continuously monitoring the establishment of such populations.
- However, obtaining and maintaining information on these small populations presents a significant challenge.
 - The dynamic way in which the populations are/or the properties are managed, with populations and individuals being introduced and moved and/or the ownership of the properties changing on a continuous basis, makes it difficult to maintain detailed information on the populations (Landman & Kerley 2016, 2017b).
 - There exists a general lack of capacity amongst landowners and managers to maintain relevant information. This is further confounded by the high turnover of relevant contact persons and the concomitant loss of institutional memory. Our exceptionally high (Connelly et al. 2003, Baruch & Holtom 2008, Dressel et al. 2015) survey response rate could only be achieved through extensive follow-up with each landowner/manager.
 - Obtaining information from landowners and managers is compromised due to survey fatigue (i.e. numerous role players approach these individuals for information). Some landowners and managers are reluctant/refuse to share information and the motivation for this is not clear and probably varied.
 - To allow for the efficient implementation of legislation and policy regarding these small elephant populations it is recommended that landowners should be required to provide regular feedback.
- Responses from government agencies are variable, indicating a lack of capacity on this issue.
 - This may reflect a need to better identify reporting and database management mechanisms with government departments and agencies.
- There exists significant scope to provide training for landowners and managers with elephant at a variety of levels. The series of capacity-building courses developed and presented as part of the MoA between DEA and NMU (Landman & Kerley 2017a) provides an excellent basis from which to build such training.

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APPENDIX 1. Summary of the key challenges experienced by elephant owners/managers with the National Norms and Standards for the Management of Elephant in South Africa.

- 1 Does not apply to open populations
- 2 Does not allow for dealing with the implications of growing populations and populations that have exceeded the desired density
- 3 No scope for the lethal removal of elephants, particularly cows
- 4 Does not account for the unpredictability inherent in elephant populations
- 5 Restrictions regarding elephants that have been moved before
- 6 No scope for selling elephant tusks
- 7 Specifications for the construction of a release boma have been inhibitory and have resulted in a delay in the introduction of additional elephant
- 8 Implementation
- 9 Too prescriptive and thereby not leaving space for differences in needs, management and ecological circumstances between reserves
- 10 Not all the issues in the N&S are clear and many are confusing (e.g. problem bull control)
- 11 Issuing of permits within the framework of the N&S
- 12 No monitoring/research without an approved management plan - specifically referring to darting of elephants for collaring purposes
- 13 Lack of recognition of other components of complex socio-ecological systems
- 14 Lack of financial support, specifically for provincial reserves, leading to non-compliance