INGURUMA
THE LION ROARS AGAIN

CABELA FAMILY FOUNDATION

LION REINTRODUCTION PROJECT

ZAMBEZE DELTA, MOZAMBIQUE

2018

Zambeze Delta
SAFARIS "FOR THE TOTAL AFRICAN EXPERIENCE"

IN COOPERATION WITH IVAN CARTER WILDLIFE CONSERVATION ALLIANCE

Cabela's Lion Reintroduction Highlights

- *Greatest lion reintroduction project ever undertaken*
- Will become one of the largest contiguous lion populations in existence
- Adds 9,380 km^2 to the lion's range in Africa
- Potential carrying capacity of >1,800 lions
  - **representing ~10% of the global lion population**

Executive Summary

- Intact social units of free-ranging wild lions to be captured for translocation
- Lions to be loaded into disinfected containers
- Lions to be loaded in presence of Official Veterinarian
- Lions to be escorted from source to destination by a veterinarian from each country
- Lions to be secured during 15 day pre-release observation quarantine in area of destination
- Veterinary health certification:
    i. Rabies: *double-dose rabies vaccination at capture*
    ii. Bovine Tuberculosis (bTB): *single negative comparative intradermal skin test*
    iii. Feline Immunodeficiency Virus (FIV): *seronegative test*
- Both quarantine and soft-release bomas to be used at source and release sites respectively
- Bomas built to highest international standards and specifications – *lion welfare prioritised*
- Post-release monitoring via satellite collaring and tracking of all adult individuals
- Every community to be consulted and informed of the lion translocation
- Each village to receive a solar power for improvement of lifestyle
- Community upliftment assured via mutual cooperation and benefits of a restored ecosystem

For the purposes of this summary, a male lion social group is hereafter referred to as a 'coalition'*, and female social groups as a* 'pride'*.*

Contents

Executive Summary **iii**

1 Background **2**

2 Male Coalitions **3**

3 Female Prides **4**

4 Veterinary Health Certification **5**

4.1 Tuberculosis 5

4.2 Rabies 5

4.3 Puma Lentivius/Feline Immunodeficiency Virus 5

5 Quarantine and Soft-Release Bomas **6**

5.1 Boma Specifications 8

6 Timing **11**

7 Post-Release Monitoring **11**

8 Community Upliftment **12**

9 Scientific Research and Conservation Management Team **12**

10 Project Funding **13**

11 Contact **14**

List of Figures

1 Sunset lions 2

2 Male Coalition 3

3 Female Pride 4

4 Map of Mozambique and Coutadas 10, 11, 12 & 14, and Marromeu National Park 9

5 Map of Coutadas 10, 11, 12 & 14, and Marromeu National Park into which the lions will be reintroduced 10

1. Background

Entire social units of free-ranging wild lions will be captured intact for translocation, which will minimise disturbance and stress to both the individuals and the population as a whole. With regard to enhancing genetic diversity, prides and coalitions will be selected from separate areas in South Africa (Hoedspruit, Khamab, Mkuze Falls, Tembe, & Twsalu; hereafter referred to as the '*source*' areas). These source areas are spatially distinct from one another, to maintain genetic diversity – but importantly all translocated lions represent the southern and eastern African subspecies: *Panthera leo melanochaita*. Source sites are relatively geographically close to the Zambeze Delta in Mozambique (hereafter referred to as the '*destination*' area).

Figure 1: *Young lions at sunset* (photo: Dr Byron du Preez)

2. Male Coalitions

Figure 2: *A dominant coalition of lions survey their territory* (photo: Dr BdP)

Only male coalitions that have not sired currently dependent unweaned offspring will be selected for translocation, due to the territoriality and infanticidal nature of the species. Realistically, this means that the males will likely be approximately 4 years of age – independent but probably not yet mature enough to have taken over a territory, while also not too old that they cannot defend a territory and their associated prides. As male coalitions rarely exceed a total 4 individuals in the source population, the ideal scenario would include two socially distinct coalitions of 3 individuals each to be selected for translocation (though again, this may be opportunistic).

3. Female Prides

Figure 3: *A pride of lionesses taking a early morning drink* (photo: Dr BdP)

Only female prides that have no unweaned dependent offspring will be selected for translocation, and these will therefore consist of related adult females with their subadult male and female offspring. Lionesses may be considered mature adults from 4 years of age (though they may conceive younger than this). Two socially distinct prides will be selected and kept separate from one another (until such time as they naturally interact after release). These prides will ideally consist of 10 individuals each (adults and subadults inclusive), however, with the clear mandate of not capturing dependent offspring, and as free-ranging wild lions are captured opportunistically, several smaller prides may necessarily be captured and integrated within speciliased bomas, designed for the purpose, with connected compartments and opaque materials that may be remotely removed at specific stages of the program.

4. Veterinary Health Certification

Pre-transport quarantine to be determined by veterinarians pending test results, in addition to a pre-release observation of 2 weeks.

4.1 Tuberculosis

The Tuberculosis (TB) test takes 72 hours with knockdown at the start and end, so much depends on how quickly all the animals are captured to begin with. It would be preferable to synchronise knock-downs as much as possible, where the TB test is conducted at capture followed by the secondary test 3 days later. This keeps to an absolute minimum the number of immobilisations conducted, and adaptation will be managed with Acuphase [Zuclopenthixol].

4.2 Rabies

Antibody testing done in conjunction with vaccination and 15-day post transport quarantine for observation. Rabies is endemic in Mozambique. It would be reasonable to aim for:

1. Double dose rabies vaccination at capture (it is a killed vaccine so double dose is safe and would give better antibody response)
2. No signs of rabies within 7 days before and 14 days post transport

4.3 Puma Lentivius/Feline Immunodeficiency Virus

Puma Lentivirus (PLV) is the large cat equivalent of FIV – it is not a clinical disease.

5. Quarantine and Soft-Release Bomas

Quarantine (*source*) and soft-release (*destination*) bomas will be designed following the recommendations of the Global Federation of Animal Sanctuaries *Standards for Animal Care of Felids* 2012 (http://lionstigersandbears.org/wp-content/uploads/2012/07/standards-animal-care-felids.pdf) [with supporting information from the Association of Zoos and Aquariums *Lion Care Manual* 2012 (https://www.aza.org/assets/2332/lion_care_manual_20121.pdf)] and with the welfare of the lions as the main priority:

Both the quarantine and release bomas will be constructed by wildlife professionals. Each boma will be at least one hectare in size, and include the local habitat: trees for shade and open areas in which to exercise. The bomas will be constructed from sturdy wire game fencing, with electrical strands on the top and on the inside at the bottom as deterrents to premature egress. The boma fence will be partially covered by opaque sheeting and/or thatching grass along the vehicle approach section for the provision of food and water, so that during their time in the bomas the lions will be completely visually shielded from people and vehicles to the purpose that there is no possible association regarding humans as a source of food. Whilst in the bomas, the lions will be provided with water daily via a bowser, taken from surface water in the local rivers and pools nearby, and will be fed fresh unskinned carcasses of the most abundant ungulate species in the vicinity, which will likely constitute the bulk of their natural diet upon release (these being: reedbuck *Redunca arundinum*, waterbuck *Kobus ellipsiprymnus*, hartebeest *Alcelaphus buselaphus* and buffalo *Syncerus caffer*). See Section 5.1 for detailed specifications for the boma construction.

Observation of the lions will be conducted from the vehicle at a *respectable distance* from the enclosures using binoculars and cameras (both during and inbetween feedings).

Detailed records of the food consumption, body condition, physical well-being, and general behaviour of each lion will be maintained for the purpose of constructing behavioural profiles that will facilitate early detection in the unlikely event of any physiological problems (in which improbable scenario, a state vet will be immediately summoned).

Fence lines will be inspected daily (*at separate times to feeding*) using a vehicle to detect any signs of weakness and digging. The vehicle will be driven slowly and stopped at regular intervals (the lions will be able to retreat into shelter until they feel secure in the open) – this process will also promote habituation of the lions to the research vehicle, which will assist with post-release monitoring.

Male lion bomas will be adjacent to female bomas, sharing a common reinforced boundary (with periodic visual barriers), which will promote habituation to one-another, and encourage post-release association (with reduced risk of conflict). A separate boma will be constructed for each pride/coalition combination at carefully selected and spatially distinct locations along the Marromeu Floodplain (see Figure 4 & Figure 5), with one boma to be constructed in Coutada 10 (centred at: 35.666797 Longitude | -18.691211 Latitude) and the second boma in Coutada 11 (centred at: 35.679398 Longitude | -18.554358 Latitude). The selected locations each provide adequate access by road, and where ungulate (i.e. prey) density is greatest – but situated at maximum distances from human settlements.

The lions will remain in the bomas for a duration of approximately 6 weeks so as to acclimate to the sights, sounds and smells of their new surroundings, after which period the boma will be subtly opened and the lion allowed to move out by their own volition. The lion reintroductions will occur as a staggered release, where only one group will be freed at a time, and carefully monitored, before releasing the next group. Females will be released before the males.

5.1 Boma Specifications

i. Minimum area of **1 hectare** (100 m * 100 m)

ii. **Robust game fencing** of ≤9 gauge, with a maximum gap size of 0.01 m^2 (100 mm * 100 mm) [e.g. Veldspan or Bonnox]

iii. Perimeter fence erected above ground of at least **2.2 m height**

iv. Perimeter fence sunk underground to at least **50 cm depth**

v. Upright supports every **3 m**

vi. Fence energizer of at least **8,000 Volts**:

- **3 strands** of electrified wire overhanging the top of the boma fence (*to prevent climbing*)
- **1 strand** of electrified wire offset on the inside at 1 m height (*to prevent challenging the fence*)
- **1 strand** of electrified wire offset on the inside 15 cm from the ground (*to prevent digging*)
- **1 strand** of electrified wire offset on the *outside* at 1 m height (*to discourage wild lions*)

vii. **Visual barrier** to approach to the boma without being seen (*dissociation of humans with feeding*)

viii. **Double-door system** for safely contained food provision

ix. **Fresh carcasses** provided 5 days per week:

- **7 kg** meat per male per feeding
- **5 kg** meat per female/subadult per feeding

x. **Fresh water** provided 7 days per week

xi. Bomas to include **trees and dense vegetation** for shelter and **open areas** for exercise – (*no trees will be within 30 m of either side of the fence*)

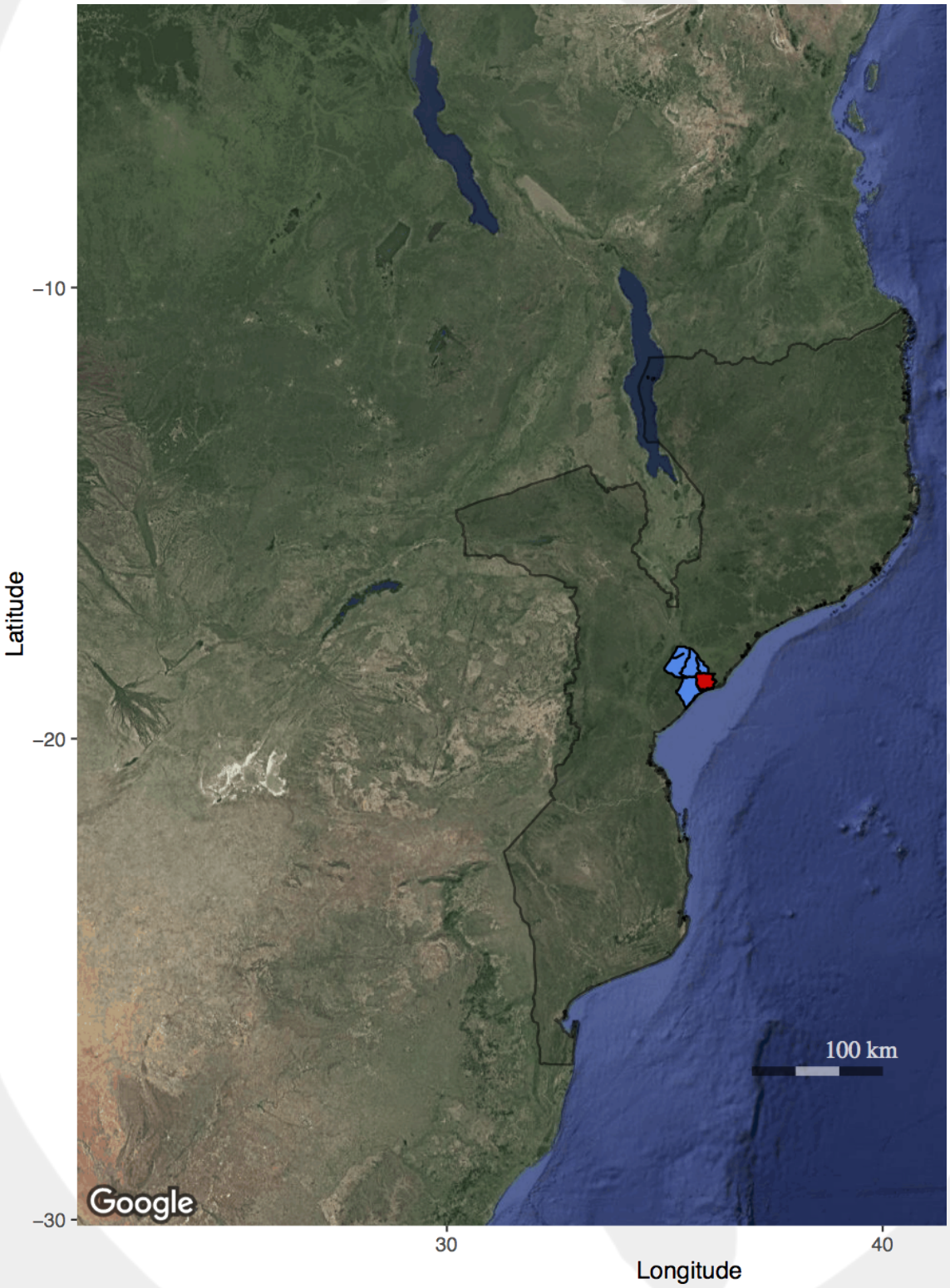

Figure 4: *Map of Mozambique* (grey), *indicating the areas of Coutadas 10, 11, 12 & 14* (blue), *and Marromeu National Park* (red) *into which the lions will be reintroduced*

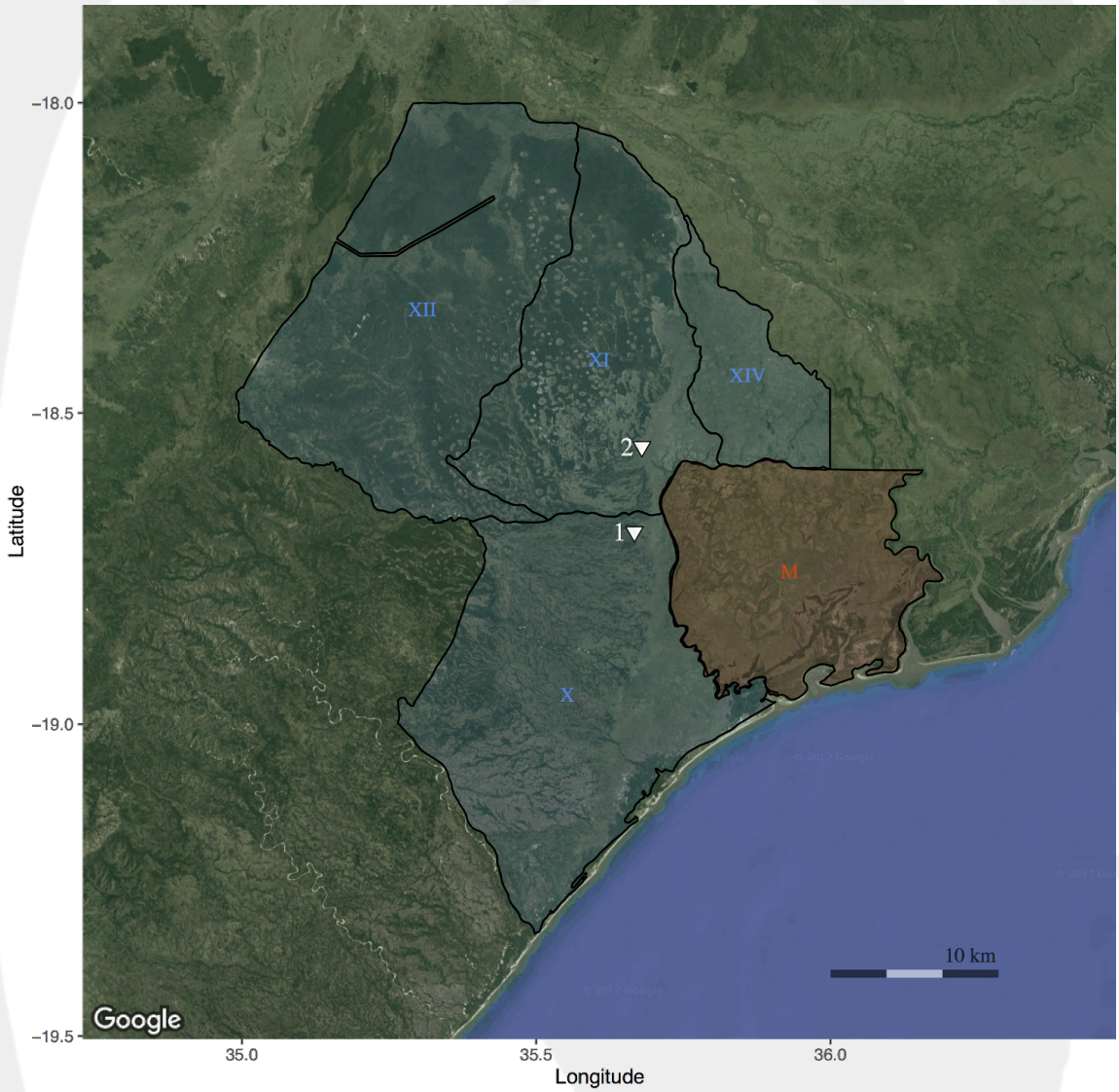

Figure 5: *Map of Coutadas 10* (X, blue [2,597 km²]), *11* (XI, blue [1,866 km²]), *12* (XII, blue [2,715 km²]) *& 14* (XIV, blue [645 km²]), *and Marromeu National Park* (M, red [1,556 km²]) *indicated in colour. Release boma sites are indicated by white triangles numbered* ***1*** (35.666797 Longitude | -18.691211 Latitude) *in Coutada 10, and* ***2*** (35.679398 Longitude | -18.554358 Latitude) *in Coutada 11; both along the Marromeu Floodplain*

The total area of Coutadas 10, 11, 12 & 14 combined is approximately 7,825 km^2 (9,380 km^2 including Marromeu National Park), which could in theory support a lion population of as many as 1,500 lions (at ~20 lion 100 km^{-2}) if the lion and their prey are properly protected from persecution. This represents nearly 10% of the extant free-ranging wild lion population in Africa. In reality, this number is likely to remain significantly lower unless a hard boudary was installed around the wildlife area.

6. Timing

The timing of the translocation and subsequent release of the lions is carefully planned to coincide with the end of the dry season, just before the first rains and calving of the ungulates that will constitute the bulk of the lion prey base; and therefore the release is scheduled to occur in the spring of 2018. It is important to bear in mind that the lions will need to be quarantined at the source sites to ensure that they all receive a clean bill of health before export – and also that they become habituated to the area via a soft-release boma at the destination sites, so as to allow the lions to familiarise themselves with the sights, sounds, and smells of their surroundings. With regard to these factors, timing is critical, and it is in the interests of everyone that the process begins immediately.

7. Post-Release Monitoring

Post-release monitoring will chiefly involve satellite tracking via biotelemetry collars, so that tagged individuals may be located every hour of the day. Thirty animals (*4 elephant*, *5 buffalo*, *5 sable*, *5 zebra*, *5 reedbuck*, *5 warthog*, and *1 eland*: https://vimeo.com/249081839) have already been collared with satellite-tracking biotelemetry units in the Delta. All of the adult female and all of the adult male lions will be fitted with satellite tracking biotelemetry collars: this may involve between 5 and 6 lioness per pride, and 5 or 6 male lions depending on the constitution of the coalitions, and therefore between 15 and 18 satellite collars will be continuously actively deployed (out of a total of between 25 and 30 individual lions reintroduced).

8. Community Upliftment

Before the lions are released, each of the communities within the vicinity of the release site, which stand to benefit from the reintroduction of the lions, will be fully consulted and educated regarding the vital role that lions, as apex predators, play in healthy ecosystem functioning, and how this will provide community upliftment, improved lifestyles and opportunities, via education, health and employment opportunities for the people themselves. When the lions are released, a celebration will be held with the communities, and hosted in honour of the momentous event in restoring lions back to a significant part of their historic range. The Coutada 11 School will be upgraded and improved (*including fresh paint, new windows, restoration of tables and chairs, as well as donating stationery and T-shirts to the children*), and a clinic will be built to modern standards – both will be freely accessible to the community. Additionally, every community will receive a solar floodlight and cell-phone charging point to as a first step and constant reminder of the direct benefits that these lions provide.

9. Scientific Research and Conservation Management Team

Post-release monitoring and reporting will be conducted by Dr Byron du Preez, who has over 10 years experience in researching lion and their impact on the ecosystem, and Dr Carlos Bento, with over 10 years experience conducting ecological research in the Mozambican destination area. The entire exercise will be supervised and facilitated by experienced professional conservationists Ivan Carter and Mark Haldane.

10. Project Funding

Funding of the entire project has been generously donated by the Cabela Family Foundation through the Ivan Carter Wildlife Conservation Alliance. This funding covers several sectors of the undertaking:

i. Salary: Dr du Preez – *big cat conservation scientist*

ii. Salary: Dr Bento – *local wildlife ecologist*

iii. Community enhancement, outside security lights in villages, clinic and school improvement

iv. Increase in anti-poaching efforts

v. Lion satellite collars

vi. Camera-traps

vii. Research vehicle

viii. Computers and research tools

ix. Soft-release bomas to be built in the Marromeu Flooplains of Coutadas 10 and 11

x. *The lions have been provided as part of a conservation partnership*

Detailed budget provided in addendum.

Zambeze Delta
SAFARIS "FOR THE TOTAL AFRICAN EXPERIENCE"

Carlos Pacheco Faria

email: promotur@tvcabo.co.mz
phone: +258 82 300 6100

Mark Haldane

email: markgha@sai.co.za
phone: +27 82 807 5110

IVAN CARTER
WILDLIFE CONSERVATION ALLIANCE

Ivan Carter

email: ivan@ivancarter.com
phone: +1 214 281 8725

Dr Byron du Preez

email: byron.d.dupreez@gmail.com
phone: +263 779 639 500