# Activities of the Research Platform Production and Conservation in partnership (RP-PCP) on wildlife-livestock interface in the SE lowveld of Zimbabwe: an overview and updates on disease prevalence and contacts between wild and domestic ungulates


M. de Garine-Wichatitsky, A. Caron, A. Murwira, F. Zengeya, M. Zvidzai, T. Dube, D. Pfukenyi, P. Zisadza

# RP-PCP: Research Platform "Production and Conservation in Partnership"

**Collaborative platform conducting applied research on socio-ecological systems (launched in 2007)**

**4 main scientific partners**

**UZ (Vet. Faculty, CASS, GeoES, TREP), NUST (Forest and Wild managt), CNRS (Lyon, CEBC), CIRAD (AGIRs, System)**

**Several partners/beneficiaries**

**NPWMA (Gonarezhou, Hwange), Zim Veterinary Services...**

**EU, French Embassy, ANR**

**20 post-graduate students (8 PhD and 12 Masters), U.Z, NUST, U.Pretoria, U. Lyon1, U.Wageningen, U.Montpellier2, …**

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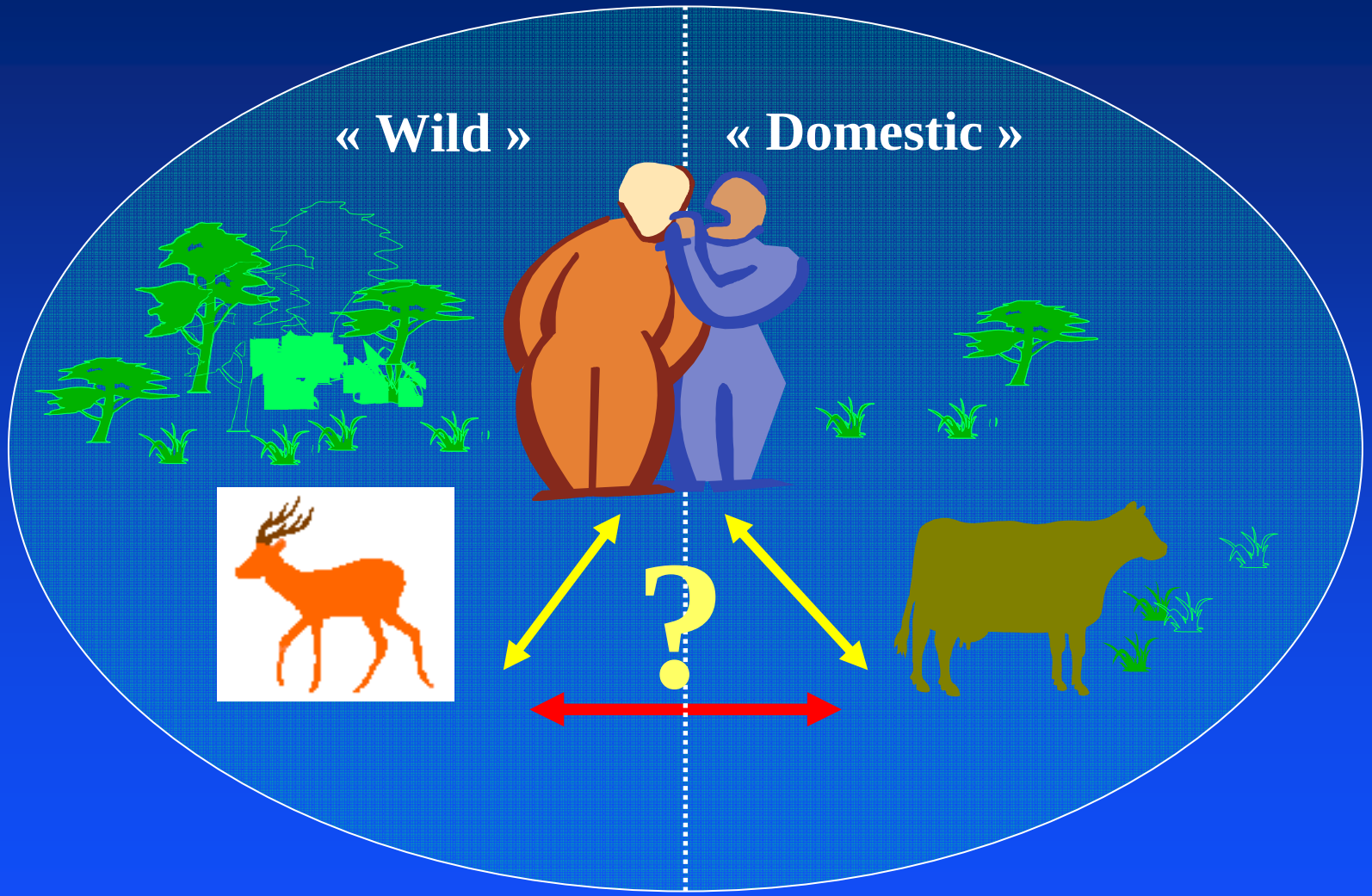
# RP-PCP: 4 thematic fields ("Petals")

**4 thematic fields: Animal health, Ecology, Governance CA**

**Multidisciplinary approach on Crosscutting issues**

**3 main sites: Hwange NP and periphery, Mid-Zambezi and GLTFCA**

# RP-PCP: 1 object of research “Wild-domestic interfaces”




*Presentation focuses on main results of AHE & Ecology studies in SEL*

# Animal health at the livestock-wildlife interface of the SEL of Zimbabwe

**Hypothesis: diseases of livestock mainly influenced by**

1) **Composition and dynamics of wild/domestic ungulate communities**

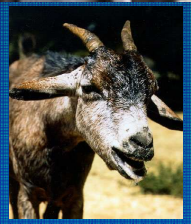
2) **Frequency and intensity of contacts between wild/domestic ungulates**

*A. Caron et al. 2010. AHEAD oral presentation*

*A. Caron et al. 2009. Infection, Genetics and Evolution*





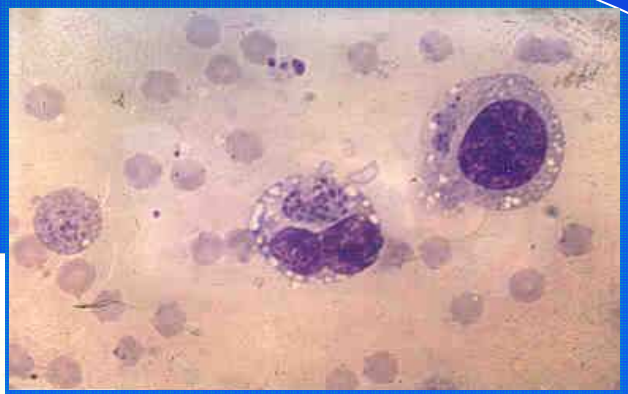



**Communities of wild and domestic ungulates**

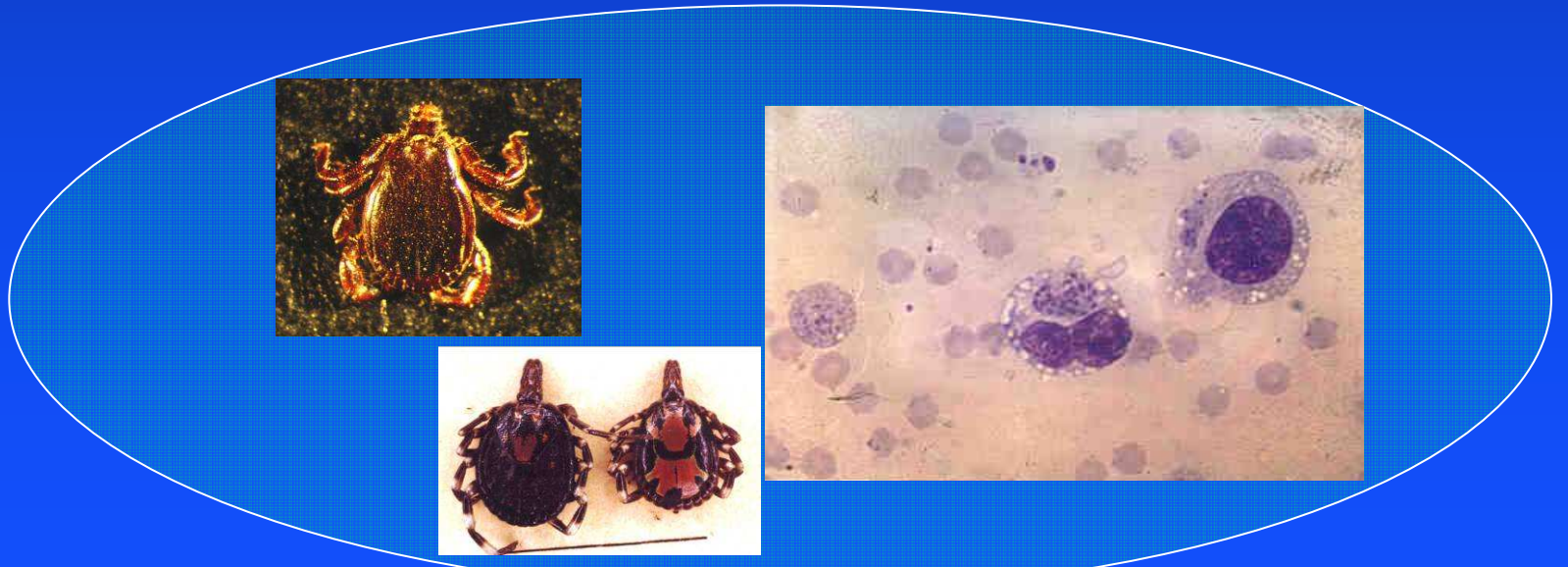
?

**Communities of pathogens**



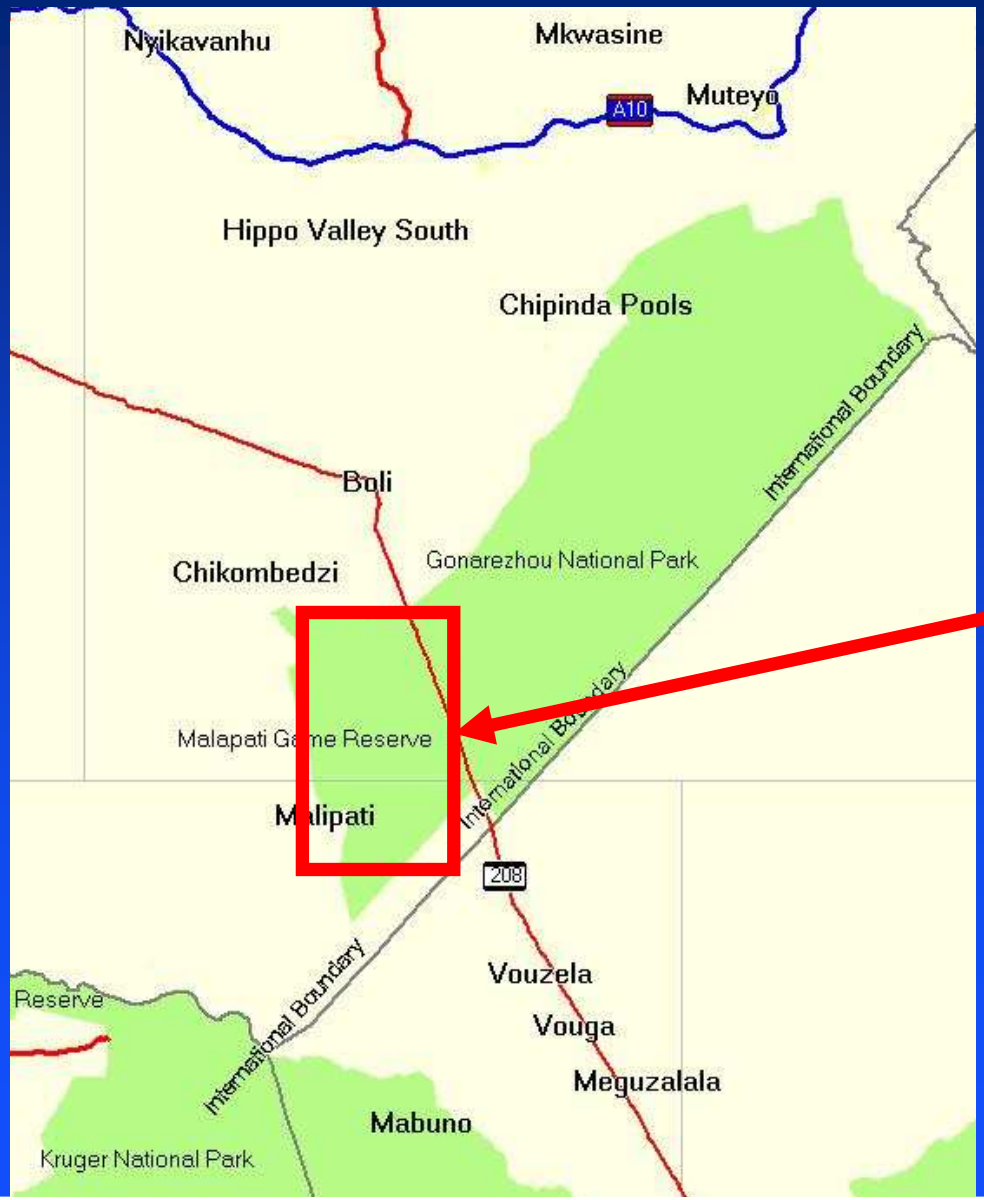


## Multi-host/Multipathogen approach



# Study sites and design

## South-East Lowveld of Zimbabwe

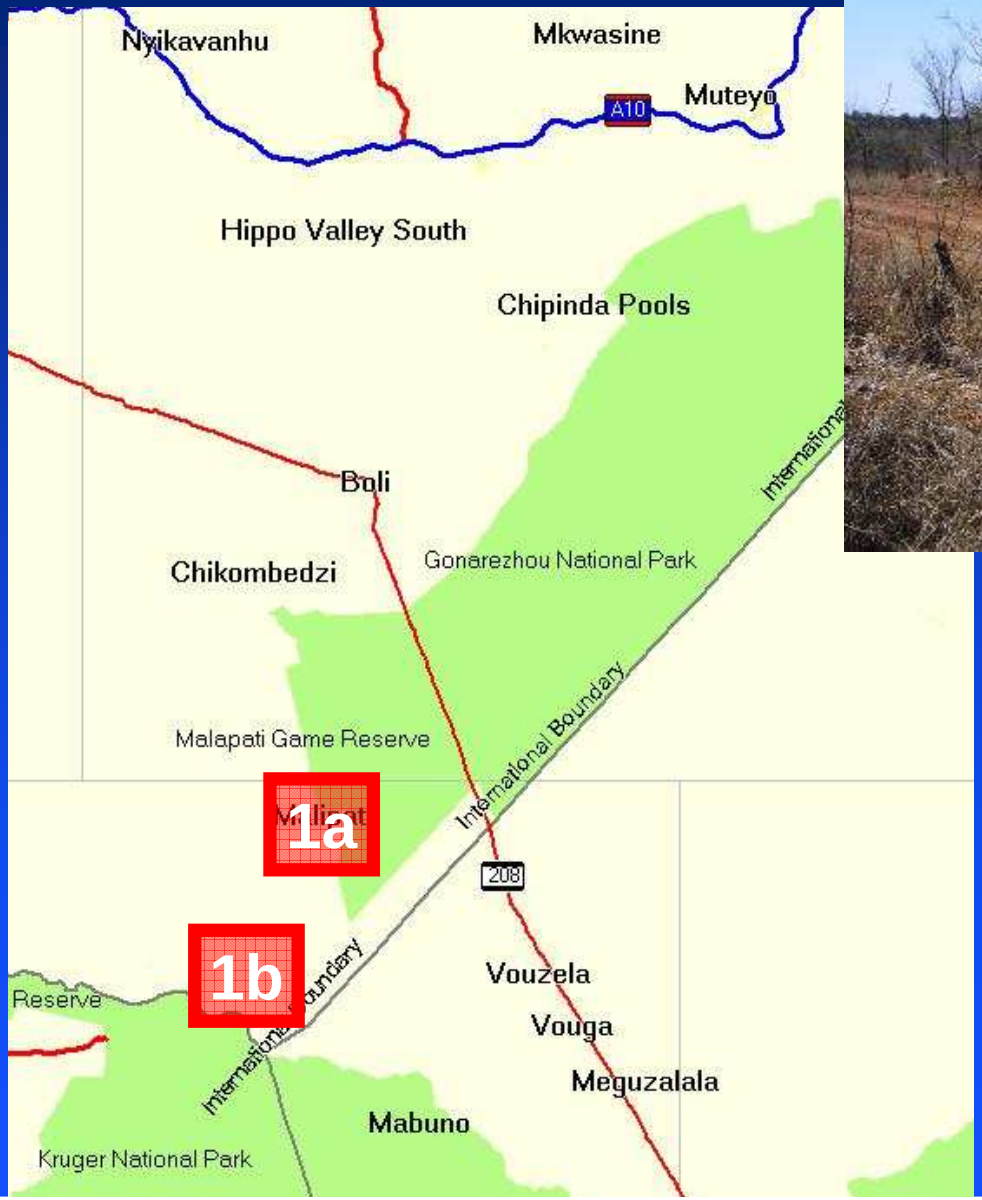


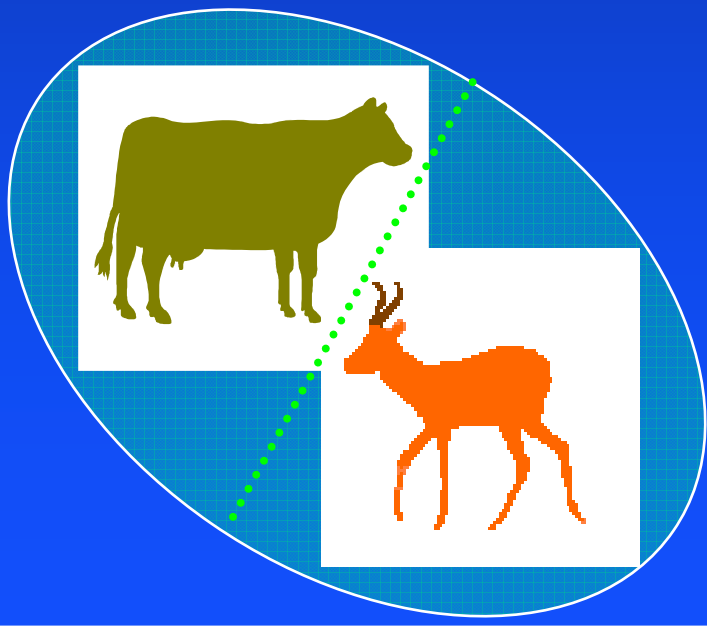

**Gonarezhou National Park**

**Mabalauta area**

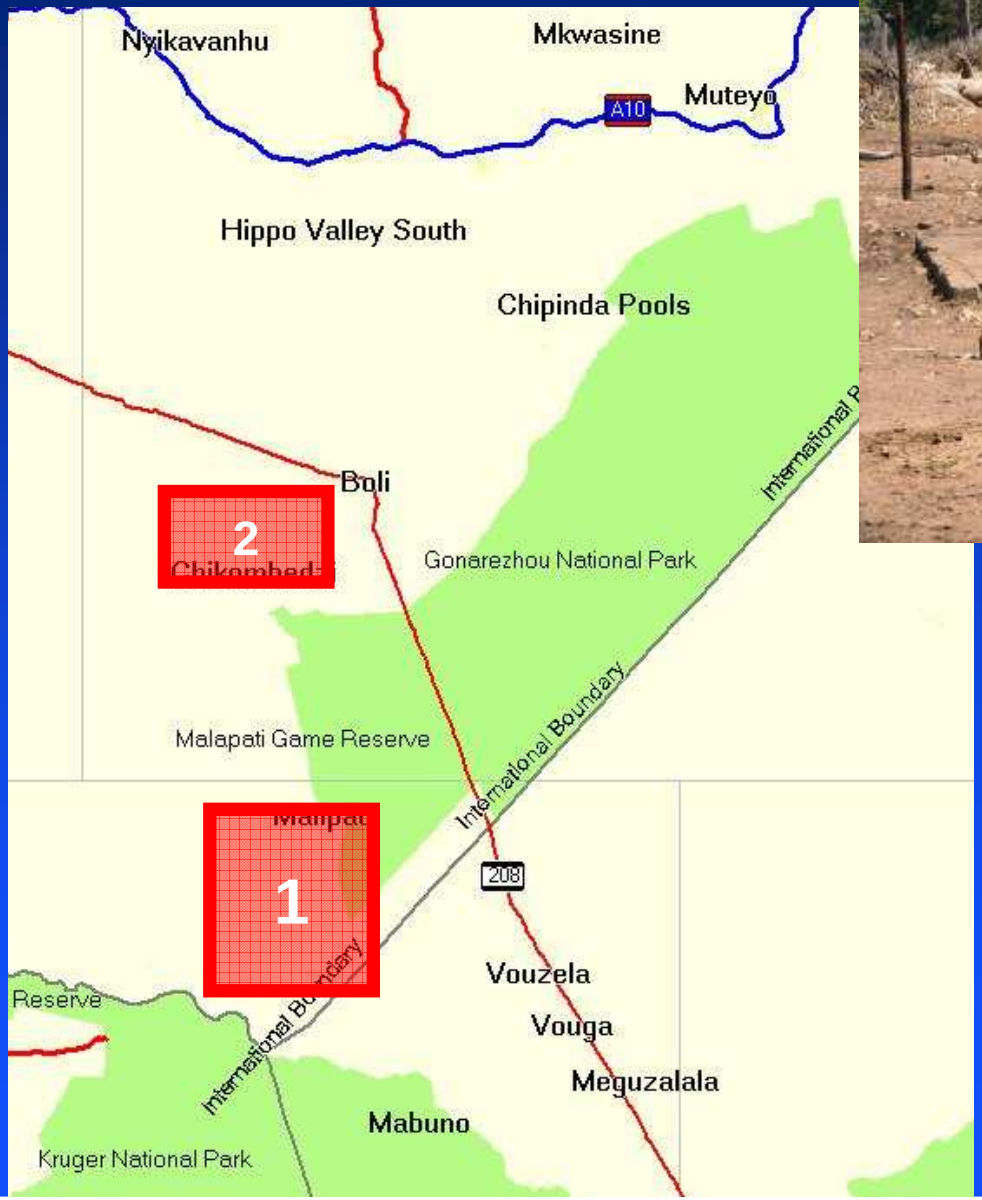
## Site 1: 1a) Malipati

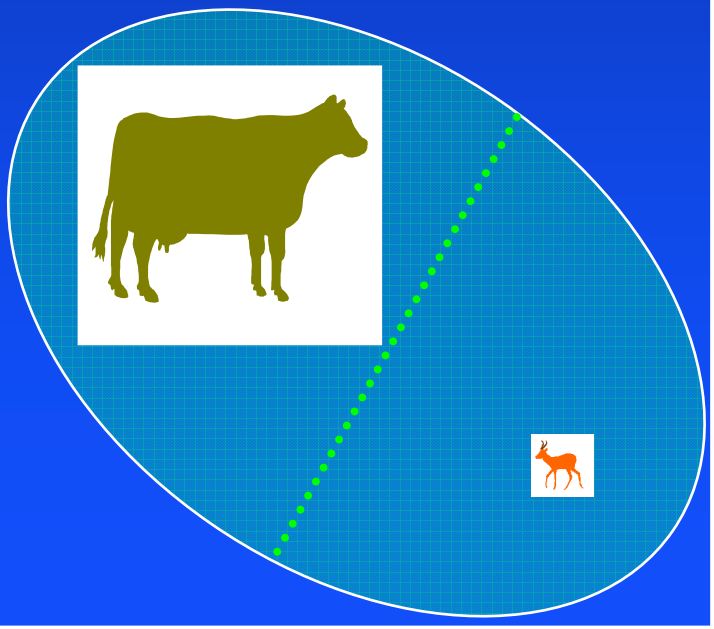
## 1b) Pesvi



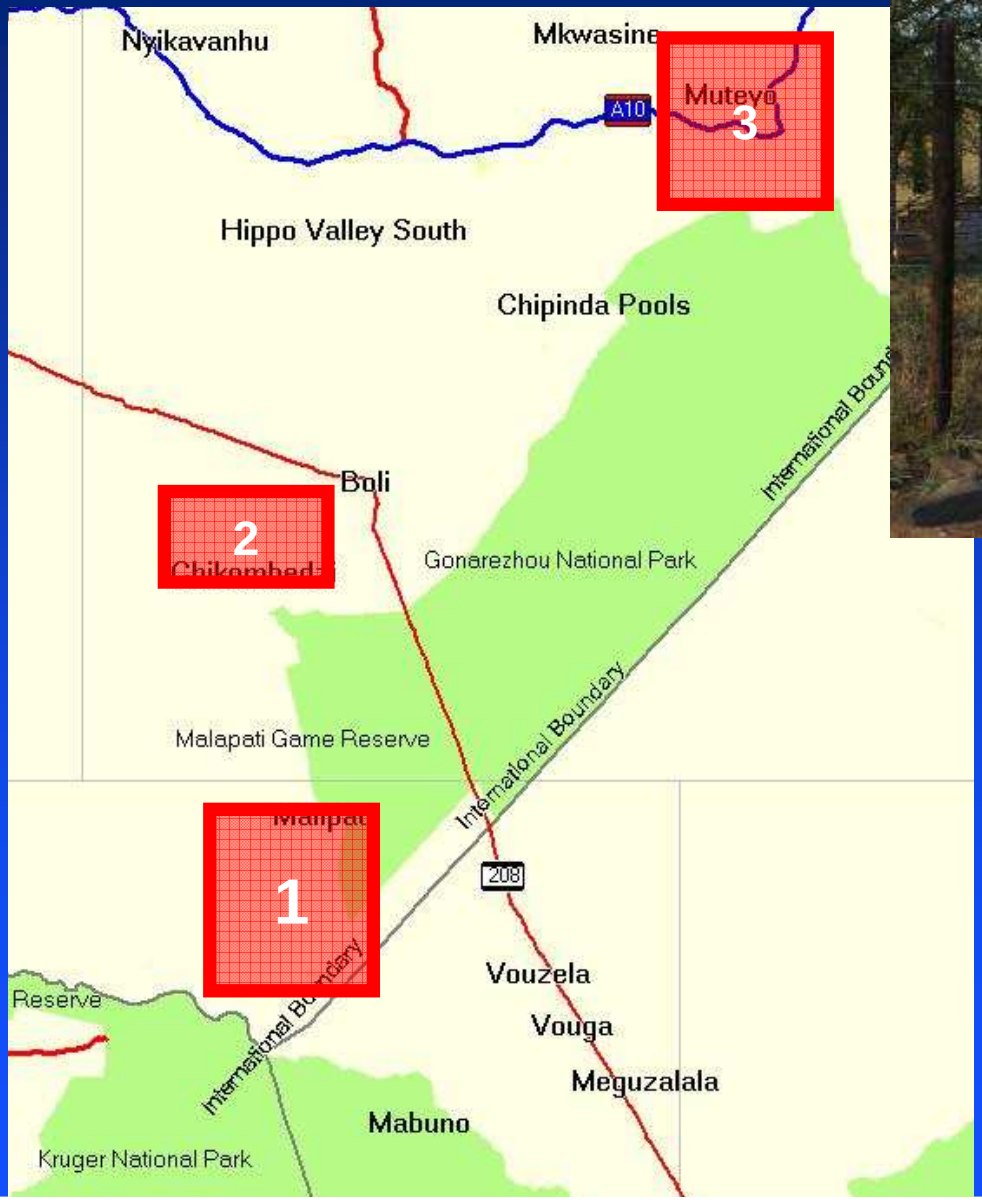



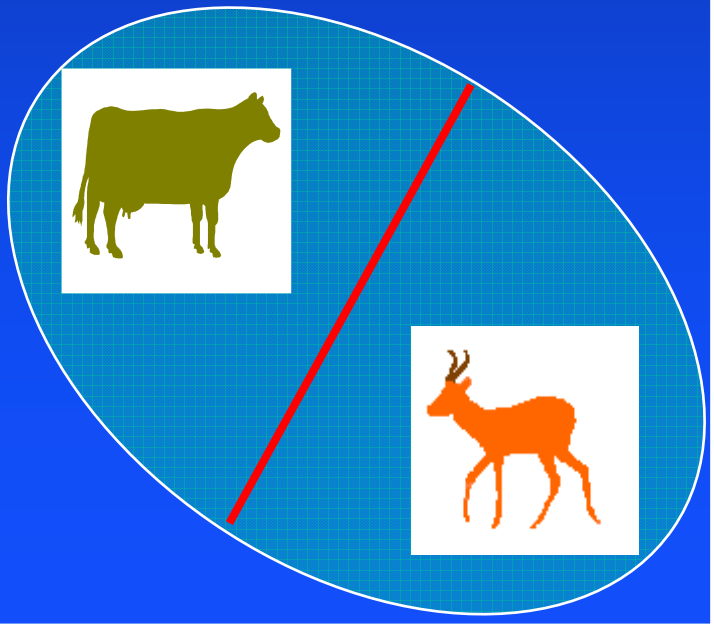
- Site 1: Malipati/Pesvi
- Site 2: Chikombedzi



## - Site 3: Chizvirizvi/Malilangwe



# Results: BTb

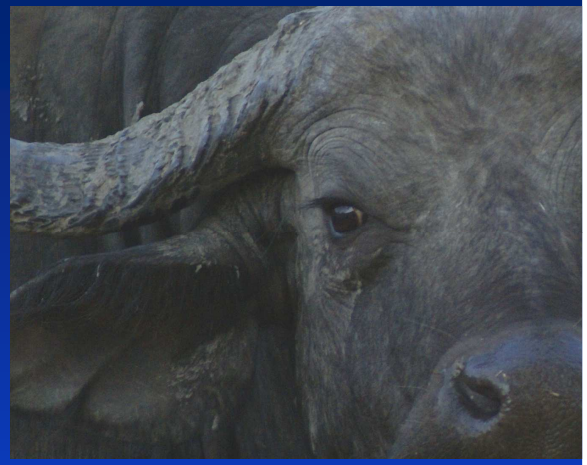
**Wildlife (October 2008)**

**Buffalo:** **4/38 positive GIF (10.5%, 2 different herds)**

**2 slaughtered; histopathology +; culture +**

**Typing of strain: similar to KNP Buffalo**

**Kudus:** **0/22 positive GIF**



*M. de Garine-Wichatitsky et al. in press. Emerging Infectious Diseases*

**Wildlife (November 2009)**

**Buffalo:** **1/10 positive GIF + 2 suspect (1 herd)**

**the 3 animals tested negative GIF in October 2009**

# Results: BTb

**Cattle (2008-2009)**

**Malipati:** **4/193 positive CITT (2.1%)**

**Confirmation: *2 GIF negative***

**Culture & histopathology *(1 negative)***

**Pesvi:** **3/176 positive CITT (1.7%)**

**Confirmation: GIF *(1 negative)***

**Chikombedzi: 1/60 positive CITT (1.7%)**

**Chizvirizvi: 0/60 positive CITT (0%)**

**No confirmation of BTB infection in cattle**

*Gomo et al. MPhil thesis in prep*

# Results: Brucellosis

**Wildlife**

| | | |
|---|---|---|
| **Buffalos:** | **0/47 positive RBT/CFT;** | **0/47 positive c-ELISA** |
| **Kudus:** | **0/16 positive RBT/CFT;** | **0/16 positive c-ELISA** |
| **Impala:** | **0/33 positive RBT/CFT;** | **0/33 positive c-ELISA** |
| **Giraffe:** | **1/1 positive RBT/CFT;** | **1/1 positive c-ELISA** |

**Cattle**

**1135 cattle sampled in 2008/2009**

**Sero-prevalence between 5 and 12 % depending on sites (mean 9.9%)**

*Gomo et al. 2010. AHEAD poster*

# Results: RVF

**Wildlife**

**Buffalo:** **2/38 positive I-ELISA (5.3%, 0 doubtful)**

**Kudus:** **0/22 positive I-ELISA (0%, 0 doubtful)**

**Impala:** **0/23 positive I-ELISA (0%, 0 doubtful)**

**Cattle**

**1a) Malipati:** **13/69 positive I-ELISA (18.8%, 7 doubtful)**

**2) Chikombedzi:** **1/27 positive I-ELISA (3.7%, 0 doubtful)**

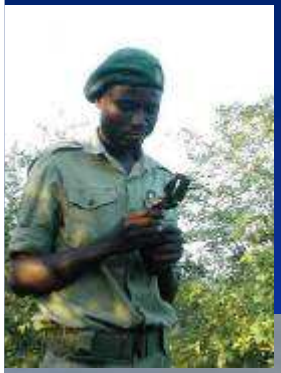
**3) Chizvirizvi:** **1/28 positive I-ELISA (3.6%, 3 doubtful)**

**No clinical case recorded, but serological evidence that RV virus is circulating**

*M. de Garine-Wichatitsky et al. 2009. ISVEE oral communication*


## Wildlife/livestock direct or indirect interactions?

# Results: Road counts

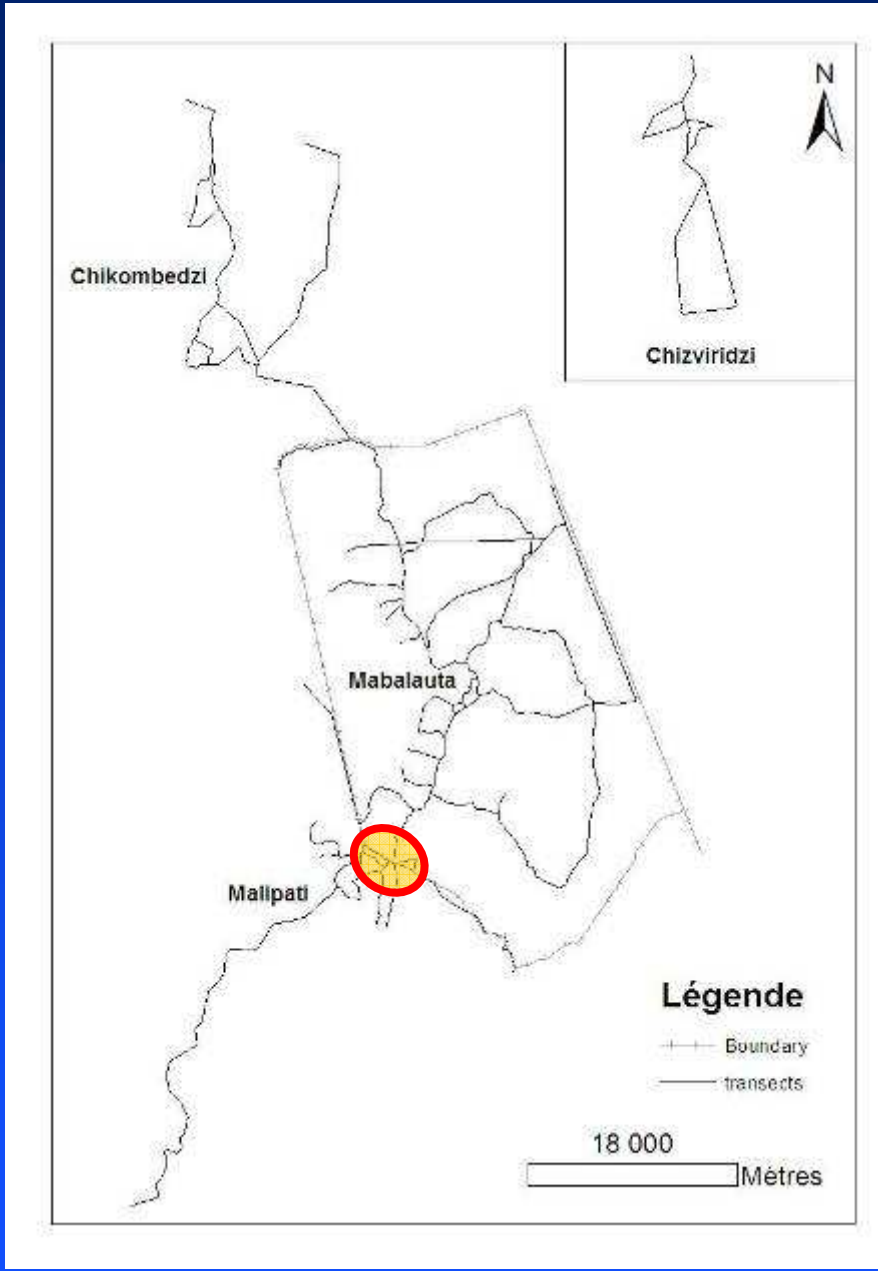


**Line transect, 3 times in 2009**

**4 sites: GNP, Malipati, Chikombedzi, Chizvirizvi**

**Very few records of wildlife/livestock occurrence on same transects**

**Suggested localised (direct or indirect) interactions (Malipati)**



# Results: Monitoring wildlife/livestock movements across fences

**Spoors counts**

**Mabalauta/Pahlela/Malipati/Dumisa**

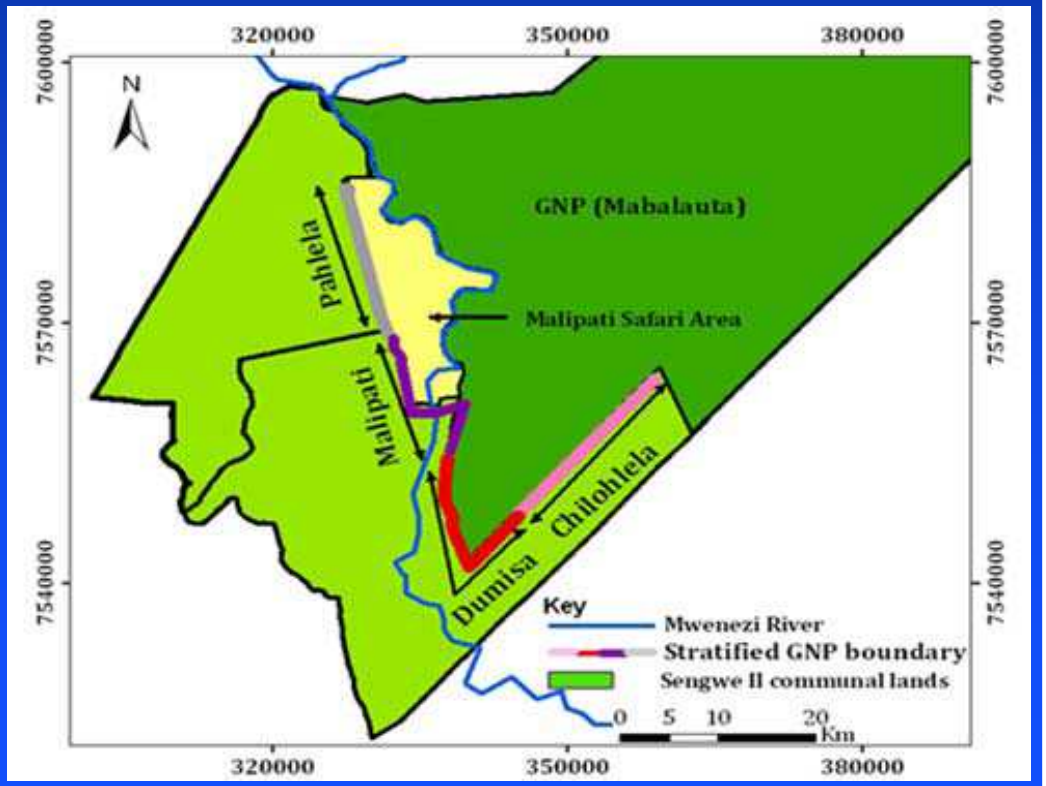
**Wet and dry seasons 2009**

**Survey on permeability/condition of FMD fence**

**Wildlife/livestock movements across (damaged/undamaged) sections of the fence**

**Determinants of movements**

*T. Dube. MPhil tesis in prep*



# Results: Water holes surveys

**Direct visual observations**

**Sunrise to sunset**

**5 water holes**

**Malipati/Mabalauta**

**Wet and dry seasons 2009**

**Wildlife/livestock co-occurrence limited to water hole situated at the boundary between GNP and Malipati communal land**

**Suggested temporal segregation (time of day)**

*Zvidzai et al. 2010. AHEAD poster*

# Results: Radiotracking cattle

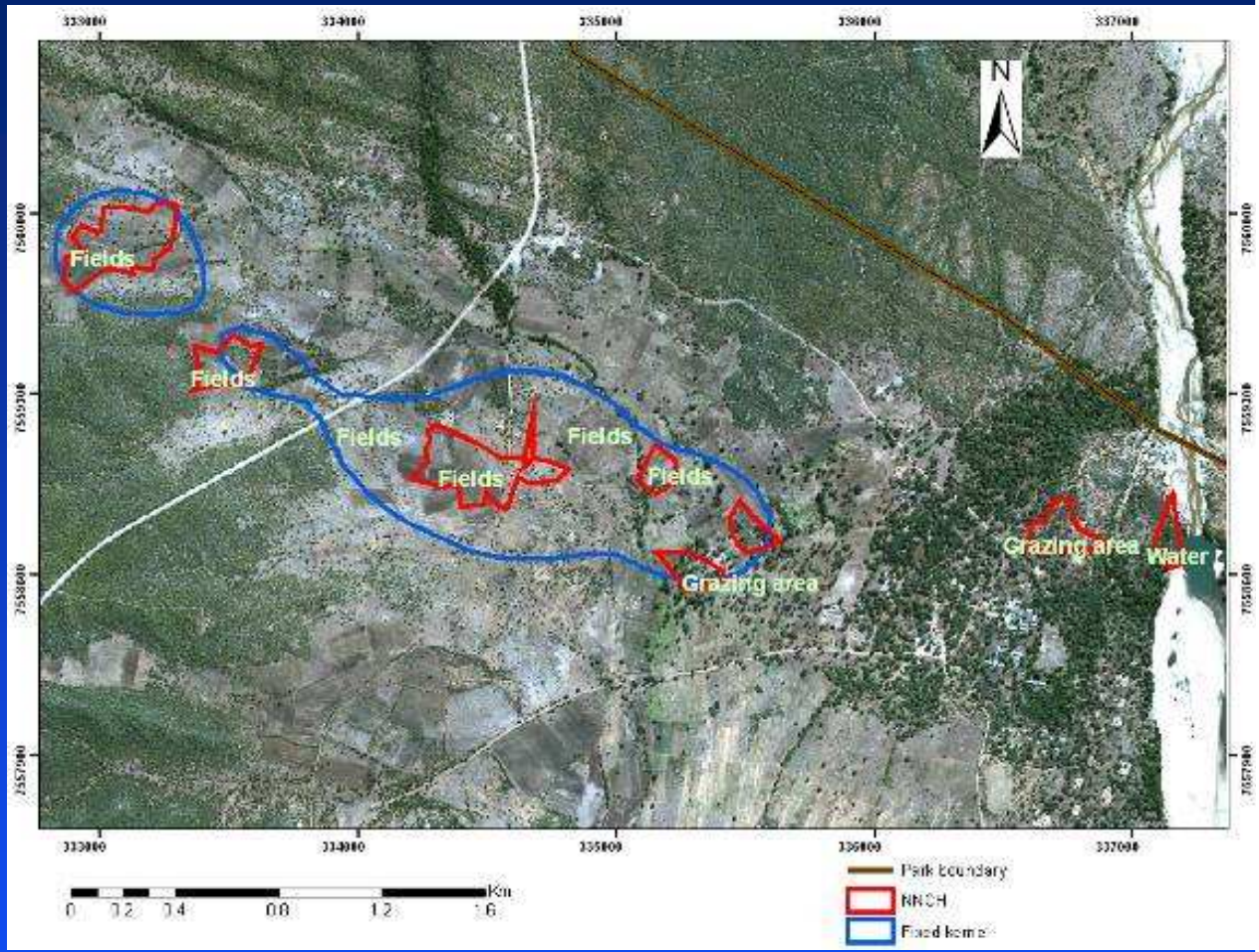
**“sentinel herds” in Malipati**

**12 herds (120 individuals) Sep 2008-Nov 2009**

**1 adult cow/herd equipped with GPS collar**

# Results: Radiotracking cattle

**Identifying determinants of cattle movements (access to grazing, water, influence of herders, …) in Malipati communal land adjacent to GNP**




*Zengeya et al. submitted to IJRS*

*Zengeya et al. 2010. AHEAD poster*

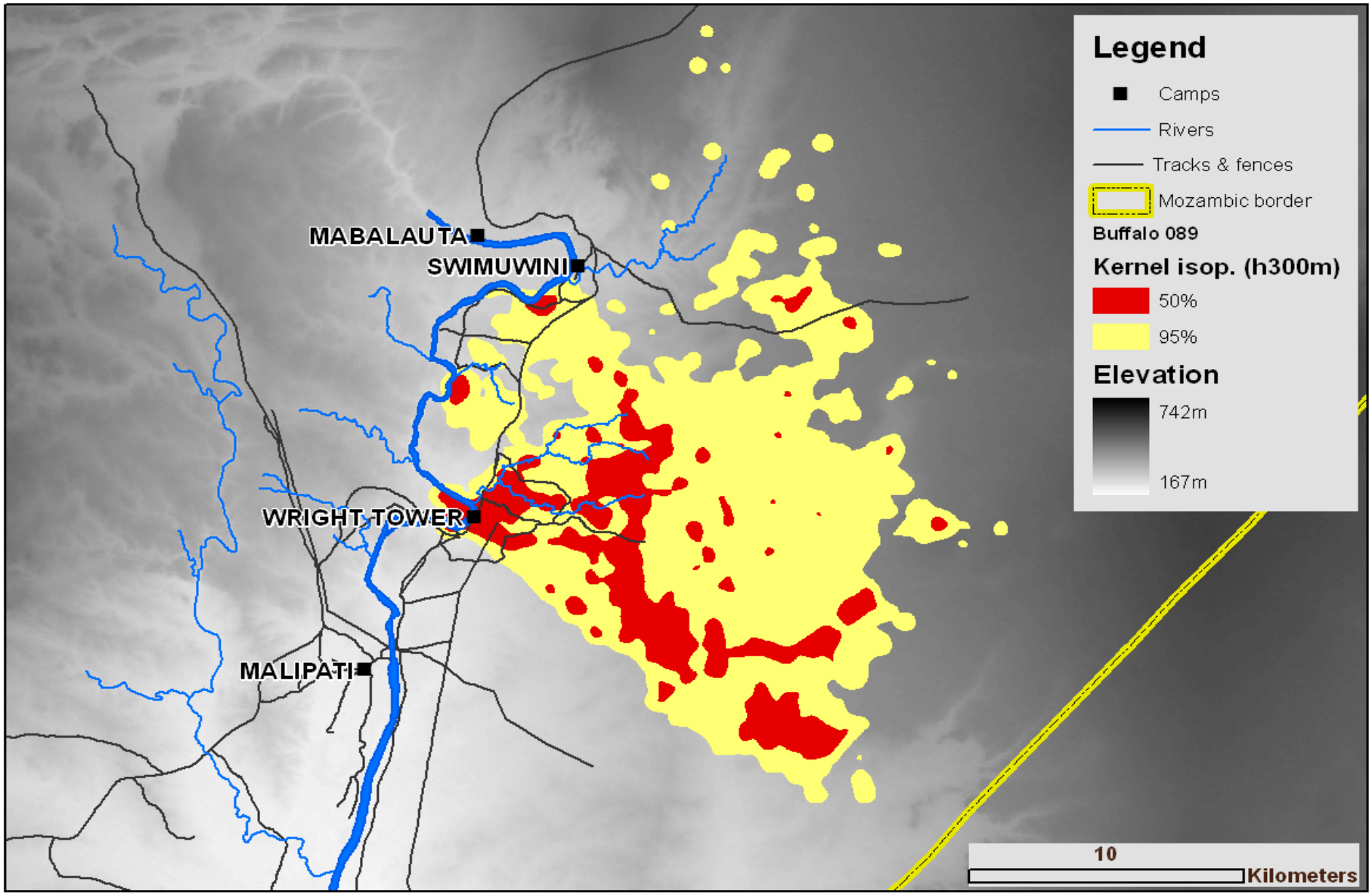
# Results Radiotracking

**Buffalos captured in Mabalauta**

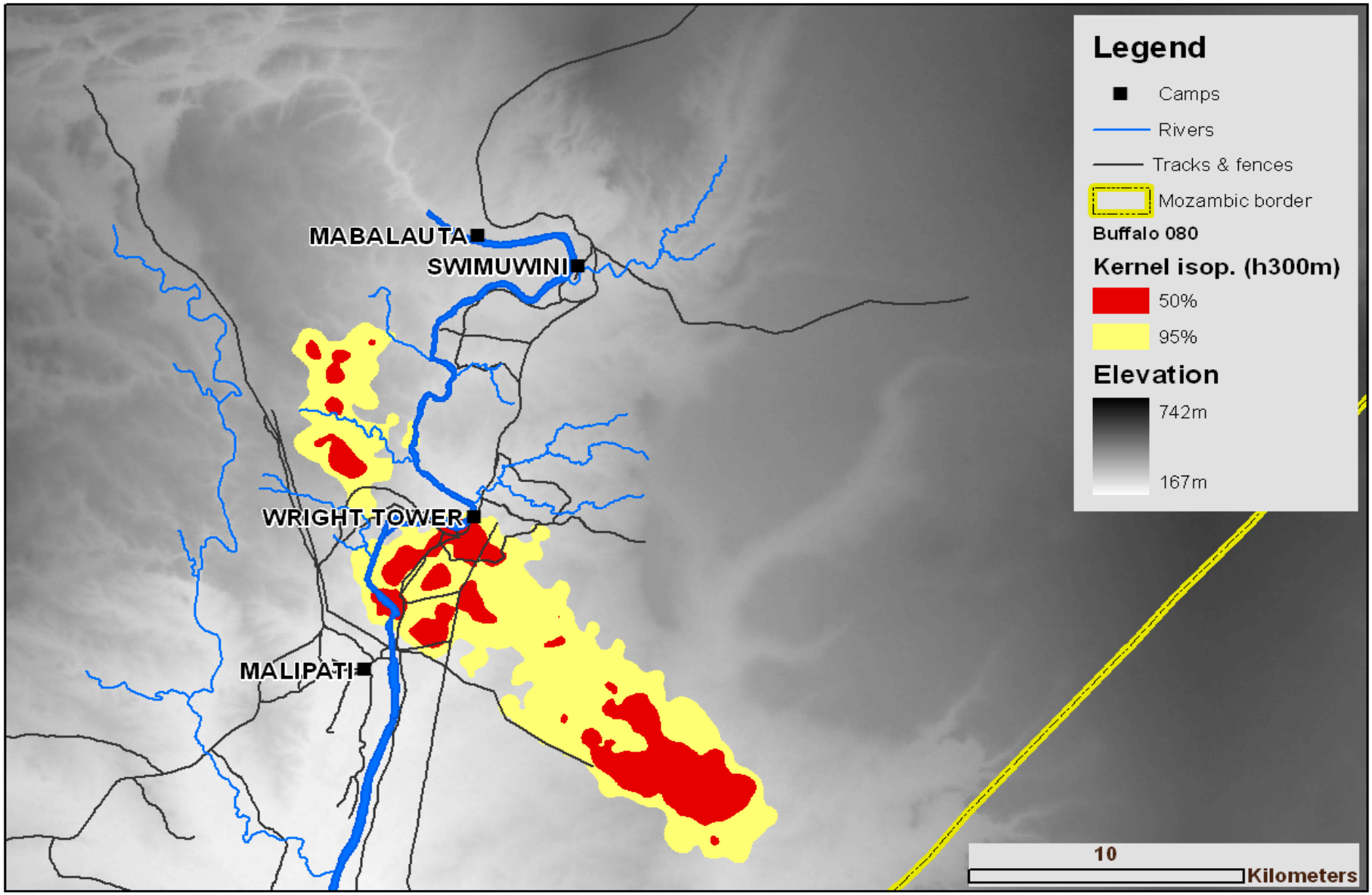
**4 herds (38 individuals sampled)**

**12 adult females equipped with GPS collar**


# HERD NORTH – Annual home range – Kernel density estimation - buffalo cow 089

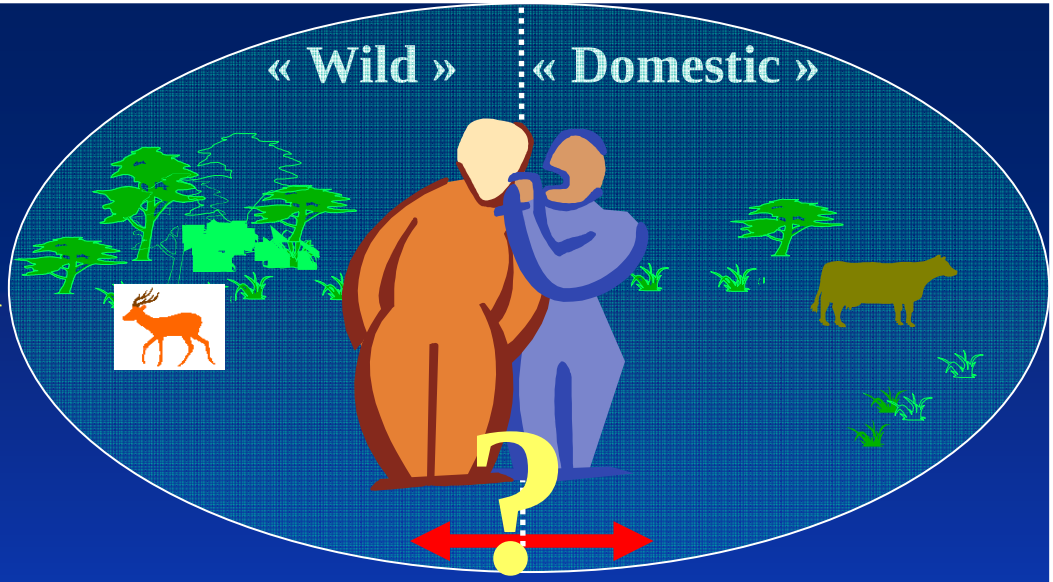


# HERD SOUTH – Annual home range – Kernel density estimation - buffalo cow 080




Legend
Camps
River
Tracks & fences
Herd South
Kernel isop. (h300m)
50%
95%
Cattle herds
GPS Id's
MABALAUTA
SWIMUWINI
WRIGHT TOWER
MALIPATI

# Human dimension

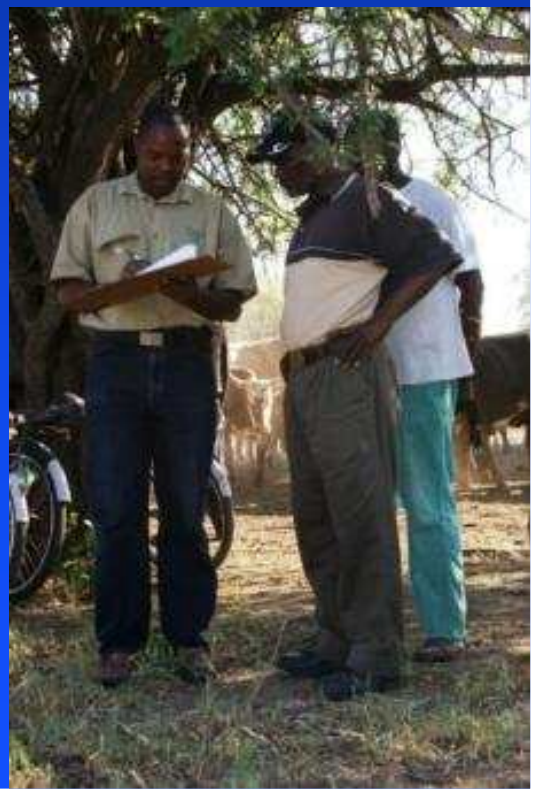



**Perception of constraints to livestock production and problems/hopes associated with GLTFCA (*A. Caron et al submitted*)**

**Perception of livestock diseases and epidemiological role of wildlife (*M. de Garine-Wichatitsky et al in prep*)**

**Scenario planning and Iterative Assessment in selected communities in Beitbridge (*F. Marimira & L. Mugabe, MPhil thesis 2009*, CBNRM#2)**

**Zimbabwe component of AHEAD funded "Pathogens, Parks and People" by Cameron, Geogeghan et al (AHE#5, L. Mugabe, B. Mukamuri et al)**



# Way forward

**Preliminary results of ongoing studies, … further analysis required!**

**Further projects:**

1) **PhD E. Miguel, Pathogen transmission wildlife-livestock in Hwange and GNP and peripheries**

2) **Transboundary movements of buffaloes across GLTFCA**


**Objective: Monitor movements and potential spread of pathogens by buffalo herds located close to borders in northern KNP, northern LNP and SC**

**Partners: coordination by CIRAD, in collaboration with Zim DVS/WVU, Zim NPWMA, SANParks, U.Pretoria/MRI, Moz Parks and VS, UEM**

**Proposal submitted to GLTFCA Feb 2010, to Zim NPWMA Jan 2010 and SANParks Feb 2010**

## *Acknowledgements*

- UZ/Vet Faculty (Pr Hove, L. Jomane)
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- OVI/U. Pretoria (Dr Michel, T. Hlokwe et al)
- NPWMA/Zim (Dr Madzikanda, staff GNP)
- SANParks (Dr Hofmeyr)

## *Supported by*

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- ANR, CIRAD and CNRS


# And thank you for your attention!!