

GENESIS OF TREPA





Why are we here?

The African Vulture Crisis - Concerns and possible Solutions

How can TREPA contribute?

André Botha
Manager - Vultures for Africa Programme, Endangered
Wildlife Trust
Co-chair IUCN SSC Vulture Specialist Group
Over-arching Coordinator CMS Vulture MsAP



ENDANGERED
WILDLIFE TRUST
Protecting forever, together.



VULTURE
Specialist Group



Vulture
MsAP

The EWT and Vulture Conservation in Africa

- Established in 1973
- Vulture Study Group - Cape Vulture
- 1990 - EWT Eskom Partnership
- 1991 - EWT Poison Working Group
- 2004 - Birds of Prey Working Group
- 2008/09 - International Vulture Awareness Day
- 2012 - Pan-African Vulture Summit - Kenya
- 2012 - IUCN SSC Vulture Specialist Group
- 2016/17 - CMS Vulture MsAP
- 2017 - Vultures for Africa Programme
- 2017 - SESYNC initiative UMD, EWT & other partners



The African Vulture Crisis

Conservation Letters

A Journal of the Society for Conservation Biology

Open Access

LETTER

Another Continental Vulture Crisis: Africa's Vultures Collapsing toward Extinction

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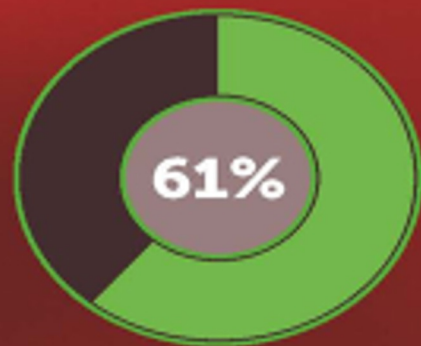
MULTI-SPECIES ACTION PLAN TO CONSERVE AFRICAN-EURASIAN VULTURES

IUCN Red list status of the Africa's vultures

	1979	1985	1994	2000	2011	2012	2015	Present
Cape Griffon	VU	Rare ¹	Rare	VU	VU	VU	EN	VU
Ruppell's Griffon					NT	EN	CR	CR
Eurasian Griffon								LC
African W-b Vulture					NT	EN	CR	CR
Hooded Vulture					EN	EN	CR	CR
Lappet-faced Vulture				VU	VU	VU	EN	EN
White-headed Vulture					VU	VU	CR	CR
Cinereous Vulture			VU	NT	NT	NT		NT
Bearded Vulture						LC (Africa?)	VU	NT
Egyptian Vulture					EN	EN	EN	EN
Palm-nut Vulture						LC		LC

WHAT THREATENS AFRICA'S VULTURES?

Percentages are only representative reasons for recorded deaths. Other important threats, as yet hard to quantify, such as habitat reduction, disturbance at nesting sites and reduced food availability are not illustrated



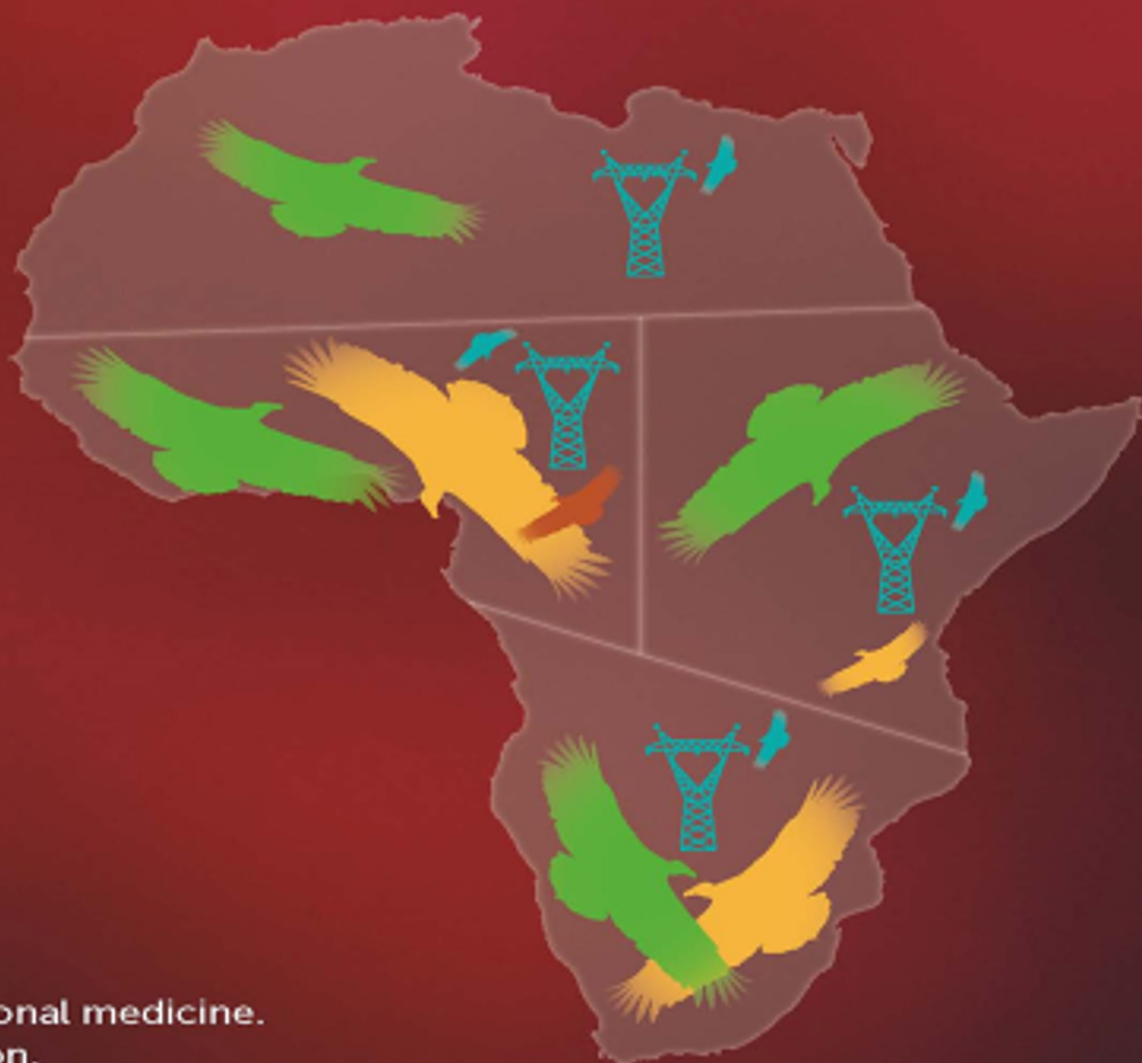
POISONING

- > Poisoning as a result of human-wildlife conflict where vultures are incidental victims.
- > Intentional poisoning by ivory poachers not wanting to be found by rangers.



PERSECUTION

- > For body parts used in traditional medicine.
- > Also involves the use of poison.



ELECTROCUTION & COLLISION

- > With poorly-planned powerlines, windfarms and roads.
- > Increasing threat with investment in development.



OTHER RECORDED KILLING

- > People are potentially eating poisoned vultures.



EWT Vulture Work in the Greater Kruger Landscape

- Vulture Study Group - 1980's
- Savanna Vulture Project - initiated 2006

The Savanna Vulture Project

André Botha
Birds of Prey Programme, Endangered Wildlife Trust
Co-chair, IUCN SSC Vulture Specialist Group

Why vultures?

- Vultures are ubiquitous indicators
- Respond to change – water, fire, herbivore biomass, elephant impact, vegetation change
- Assessing change in vultures = assessing change in ecosystem processes
- Value in terms of ecosystem services provided
- **Why tree-nesting vultures?**



Objectives

Objective 1: Determine the population status of tree-nesting vultures in South Africa.

Objective 2: Determine breeding success.

Objective 3: Understand and describe movements and behaviour to assess any potential threats.

Objective 4: Estimate survival in tree-nesting vultures.

Objective 5: Appropriate conservation interventions to benefit vultures.

Objective 6: Contribute to an international awareness campaign promoting vulture conservation.

Aerial surveys

- 2010 – Initial assessment of method
- 2011 – KNP (Marula South, Xanatseni South)
- 2012/13 – Not possible
- 2014 – KNP (Marula North)
- 2014 – Mokala & Mapungubwe NP
- 2015 – KNP (Xanatseni North)
- 2015 – Mkhuze GR, HiP, Zimanga, Magude
- 2016 – Kgalagadi TFCA
- 2016 – Northern APNR



Summary & Preliminary Analysis: KNP

Species	Projected population KNP (Pairs)	Actual active nest count (2011-2015)	Estimated National Population (Pairs) (Taylor, 2014)
African White-backed Vulture	904 (CI ± 162)	892	3675
Lappet-faced Vulture	78 (CI ± 18)	44	169
White-headed Vulture	60 (CI ± 13)	48	80

Ground-based nest monitoring

Southern KNP – 67 nests
Central KNP – 137 nests
Northern KNP – 48 nests
Mokala NP – 65 nests
Kgalagadi TFCA – 26 nests

Nest predation study – Thomas Johnson



Wing-tagging

PLEASE LOOK OUT FOR AND REPORT
COLOUR-MARKED
EAGLES & VULTURES



REPORTING INFORMATION

EAGLES

- Date
- Time
- Location (GPS coordinates or detailed description e.g. Service on the G1000 road)
- Behaviour (e.g. perched, flying, feeding)
- Physical characteristics and tag (e.g. colour and size, Right or Left, number and size)
- Photograph (Please do not send images larger than 2000x1500)

VULTURES

Please submit information on tagged individuals

ENDANGERED WILDLIFE TRUST



- Lowveld/KNP
- 2012-2016
- 34 birds mass-capture
- 46 snare-captured
- 61 nestlings
- **Total - 141**
- 5 Vulture spp
- 1121 re-sightings
- 76% re-sightings rate

Tracking until 2016/17

Species	Lowveld/ KNP	Zululand
African White- backed Vulture	18	10
Hooded Vulture	9	-
White- headed Vulture	4	3
Lappet- faced Vulture	4	12
Marabou Stork	-	4
Total	34	29




K2C Hooded Vulture Project

- Post-doc study – Dr Lindy Thompson - UKZN
- Understand breeding biology & productivity
- Movements and foraging
- Partnership – HMC, HCT, EWT





Role of vultures in anthrax life cycle?



Vultures for Africa Programme

- Promote and ensure the implementation of appropriate conservation actions as reflected in the CMS Vulture MsAP within identified gap areas in Africa.
 - Work towards reducing the impact of wildlife poisoning on wildlife in the region, i.e. focus wider than vultures only.
 - Address other and emerging threats.
 - Focus on innovative approaches to vulture conservation throughout the region.
 - Develop capacity within Africa for vulture conservation, research and monitoring.
-
- **Africans should be the Primary Custodians responsible for the Conservation of the Continent's Vultures!**

MULTI-SPECIES ACTION PLAN TO CONSERVE
AFRICAN-EURASIAN VULTURES (VULTURE MSAP)

CMS Raptors MOU Technical Publication No. 5.
CMS Technical Series No. xx



Wildlife Poisoning - Kruger NP engagement

- Initiated in July 2019-present
- Suggested interventions:
 - Recognise and prioritise the threat
 - *Establish and implement a SANParks Response Protocol*
 - Preventative measures – pro-active
 - Stakeholder and partner engagement
 - *Aerial support from The Bateleurs*
 - *Repeat of aerial survey of KNP*
 - *Wildlife Poisoning Response Training – all sections*
 - *Working Dogs*
 - *Wildlife Poisoning Response Kits – 52 issued*
 - *Assist with scene management and treatment of survivors*
- Training 456 FR's – May-Jul 2020
- Re-training 270 FR's – Oct 2021
- Training 111 EM's – Feb 2022
- Triage training SR's & Vet Services – Mar 2022
- Draft strategy
- Aerial survey Sept 2023





NATIONAL
SOCIO-ENVIRONMENTAL
SYNTHESIS CENTER

Pursuit: Saving Africa's Vultures



- A Pursuit is a collaborative team-based research project addressing a pressing socio-environmental problems.
- We are addressing the “African vulture crisis” and the decade long decline in populations of 7 of 11 vulture species that have recently been reclassified as Critically-Endangered or Endangered.
- Multiple human-caused stressors have been linked to mortality including: poisoning, directly and in association with elephant poaching and predator control; harvesting for trade in vulture parts for traditional medicine and beliefs; alteration of habitat through changes in land use; lead poisoning from game hunting and culling; drowning in farm ponds; and, collisions with and electrocutions on electrical power infrastructure.
- Our objective is to address this complex issue through a cooperative multinational partnership.
- This project will provide tools to enable policymakers, conservationists, and others to recognize and mobilize the best resources to address the complex web of threats affecting the vultures of Africa.
- <http://www.sesync.org/project/propose-a-pursuit/saving-africas-vultures>



environmental affairs
Department of
Environmental Affairs
REPUBLIC OF SOUTH AFRICA



MICHIGAN STATE
UNIVERSITY



UNIVERSITY OF
HOUSTON



Where does TREPA fit into this bigger picture?



Critical Result 11.3.

Environmental and socio-economic values of vultures are understood and promoted.

Critical Action 11.3.1.

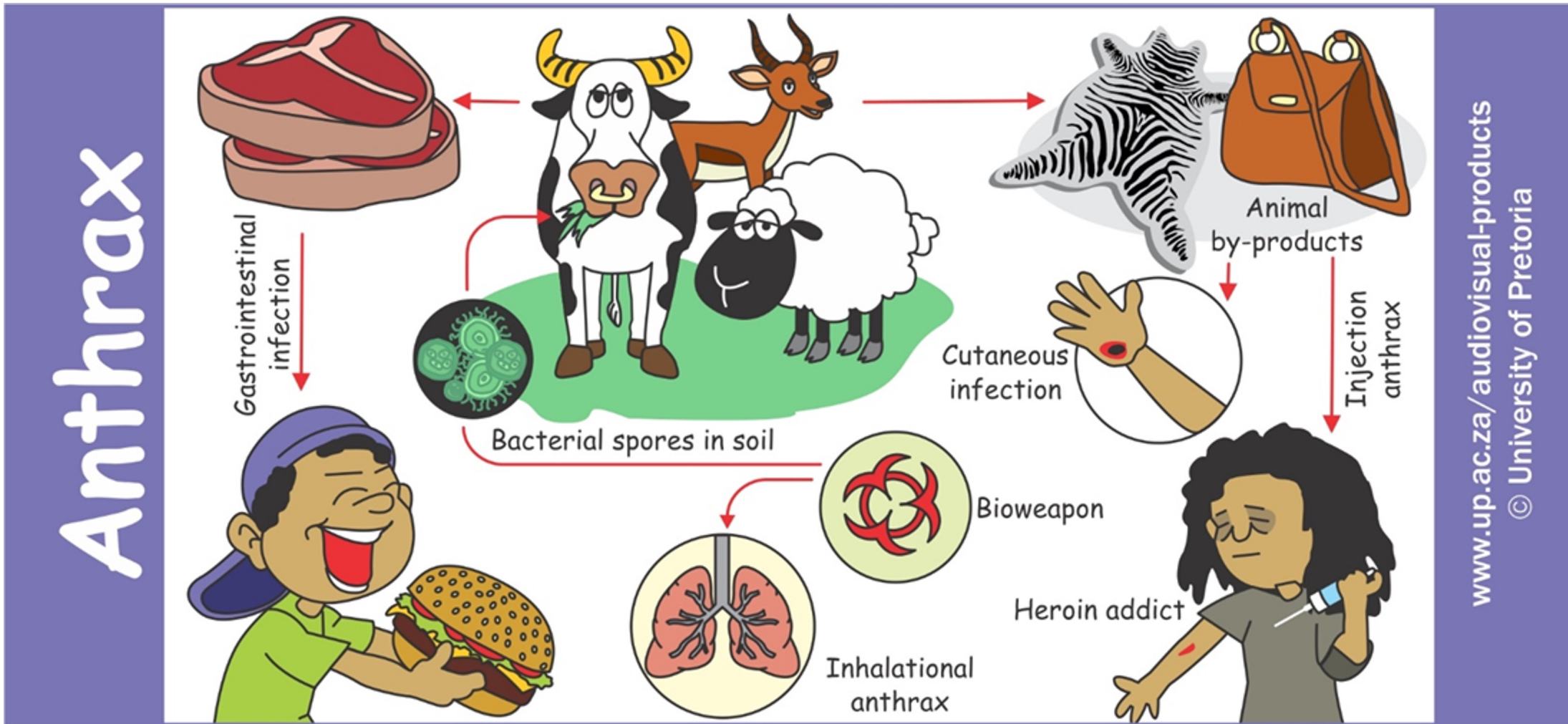
Conduct a Total Economic Value Study (TEVS) of Old World Vultures which includes their roles as ecosystem service providers.

Anthrax the role of vultures

Presented by Henriette van Heerden

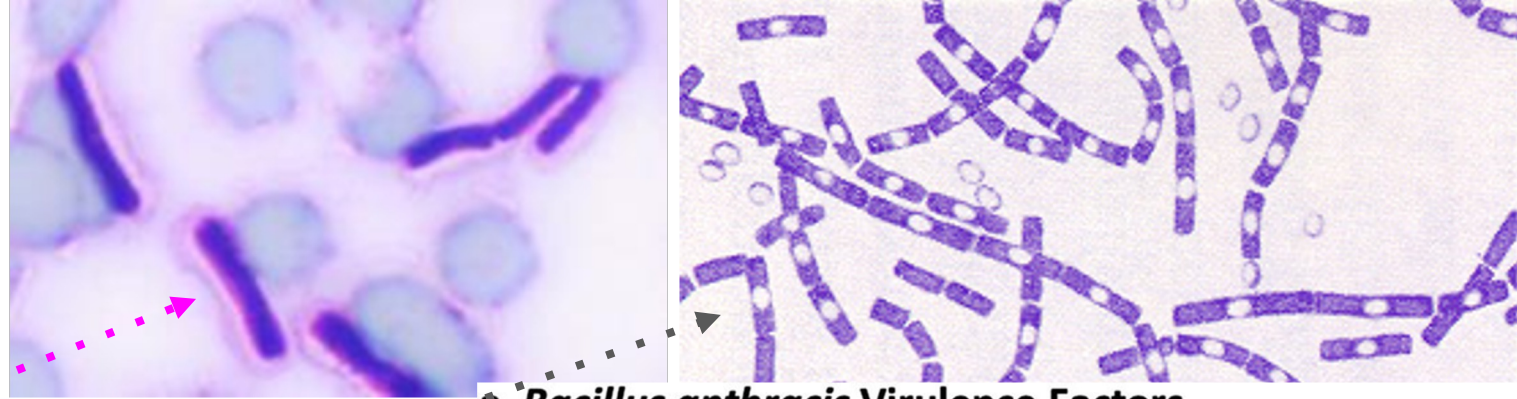


Bacillus anthracis



www.up.ac.za/audiovisual-products
© University of Pretoria

What is anthrax?



Soil borne

Gram positive (rod-shape) *Bacillus anthracis*

capsule and endospore forming

Often fatal / acute disease

Virulence factors - toxin and capsule

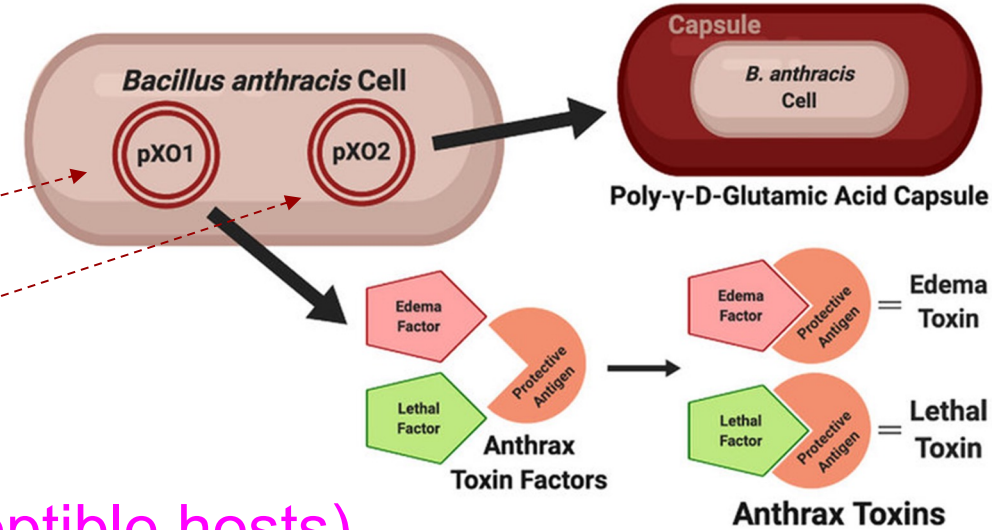
Domestic and wild animals (herbivores susceptible hosts)

Livestock disease can be controlled with Sterne spore vaccine

Humans (zoonotic BUT less susceptible host)

Fatal septicemia resulting in sudden death

***Bacillus anthracis* Virulence Factors**



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA



Susceptibility and clinical signs



- Delayed blood clotting, resulting in **bleeding**, oedema (fluid accumulation in tissues), nervous signs and ultimately, death



Susceptibility and clinical signs

Cutaneous/ skin: Formation of ischars

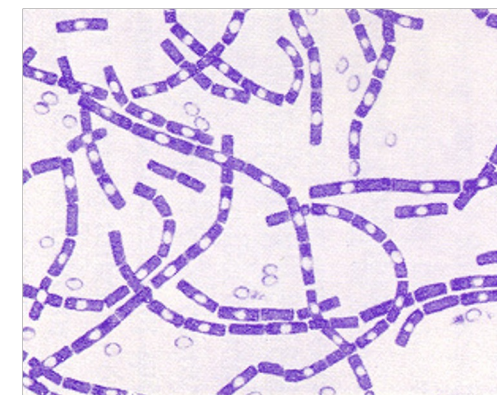
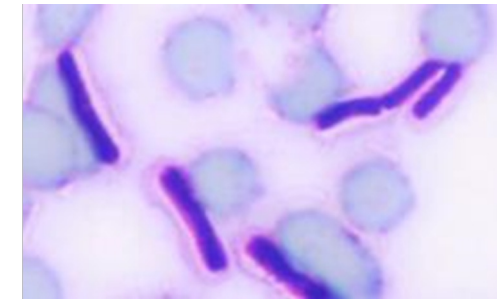
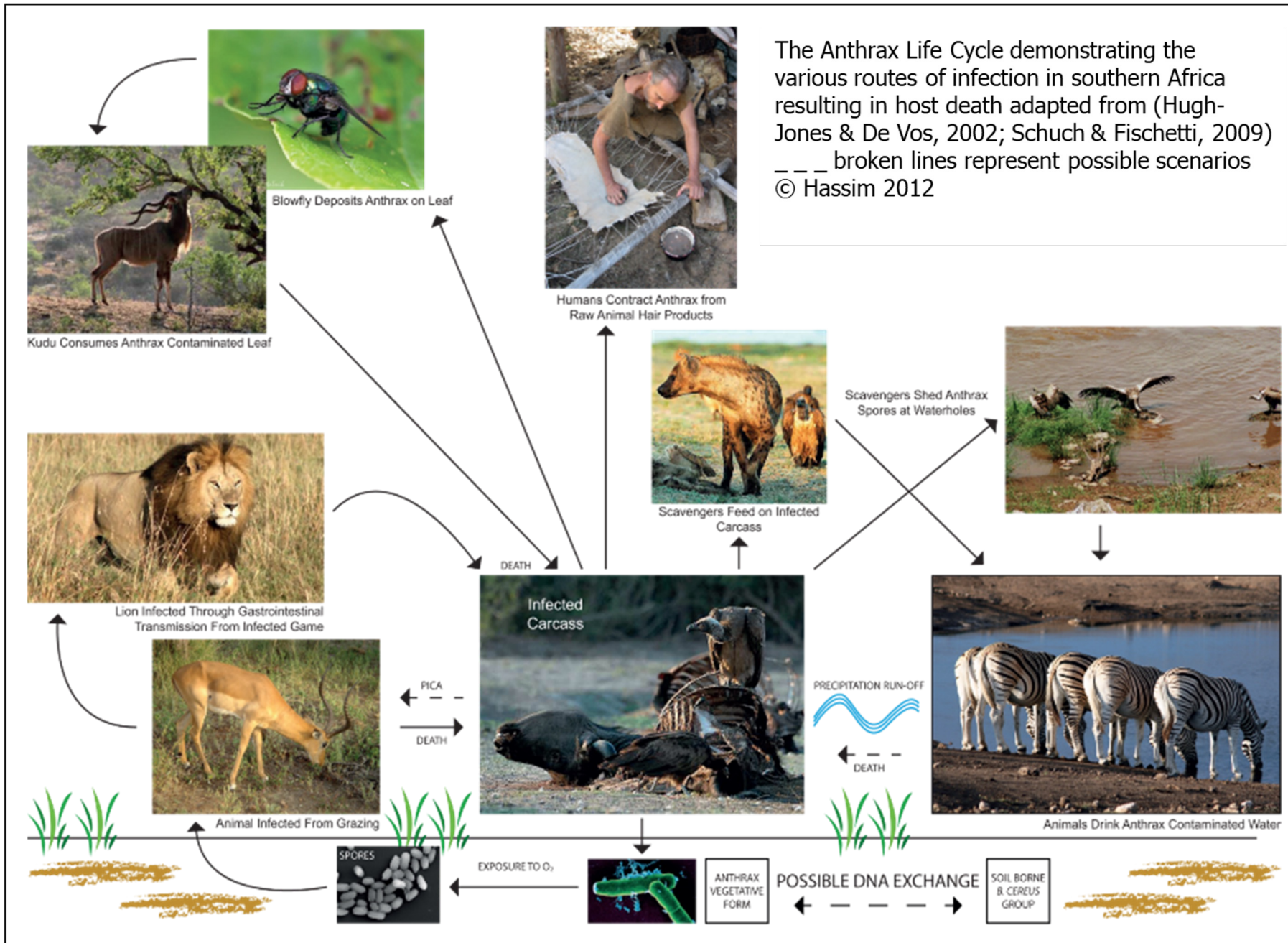
Intestinal: Ingestion

Injectional

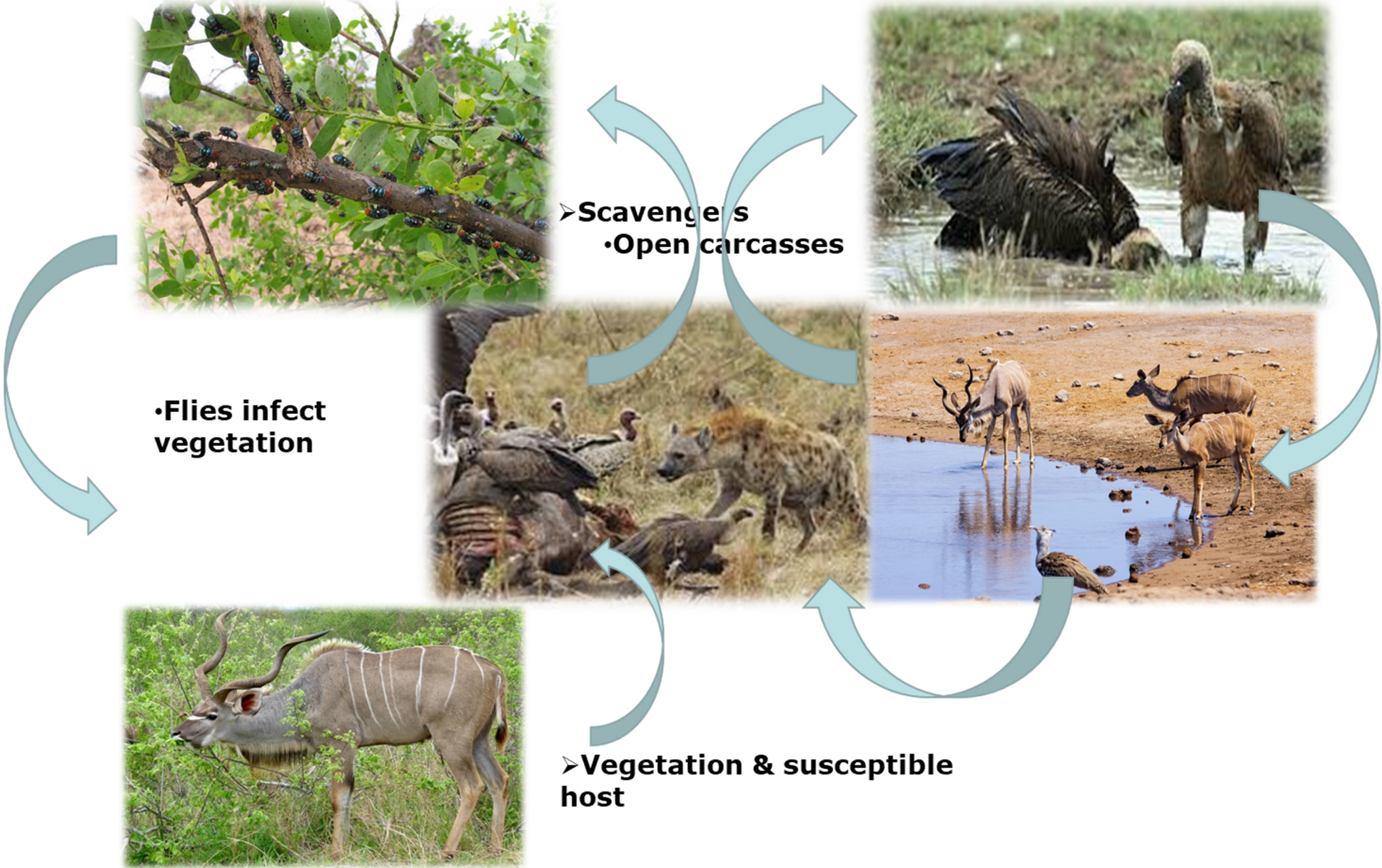
Respiratory: Inhalation



The Anthrax Life Cycle demonstrating the various routes of infection in southern Africa resulting in host death adapted from (Hugh-Jones & De Vos, 2002; Schuch & Fischetti, 2009)
___ broken lines represent possible scenarios
© Hassim 2012



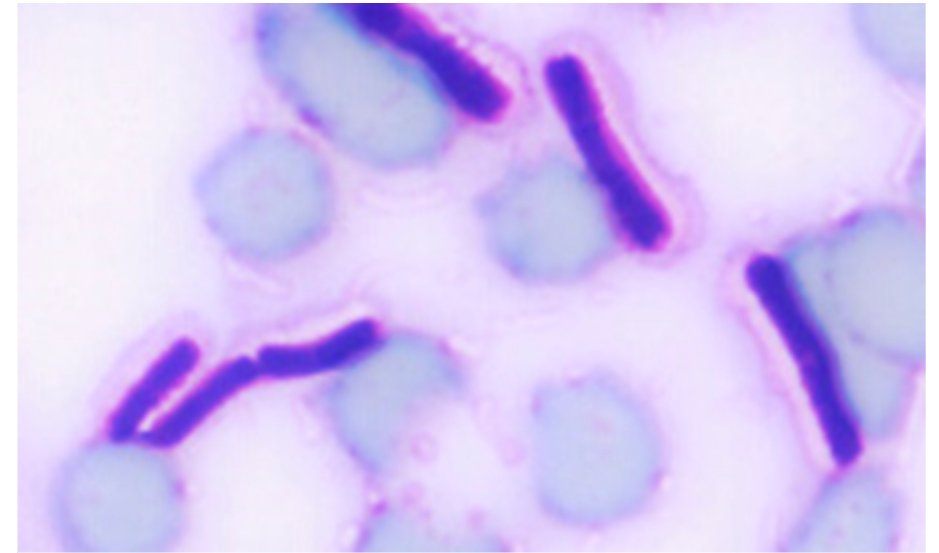
Transmission



Diagnoses

Blood smear

Encapsulated bamboo-shaped bacilli (suspect anthrax)



Confirmation of *Bacillus anthracis*

Cultur




Molecular targeting virulence factors and chromosome

If smear not possible then collect tissue or bone



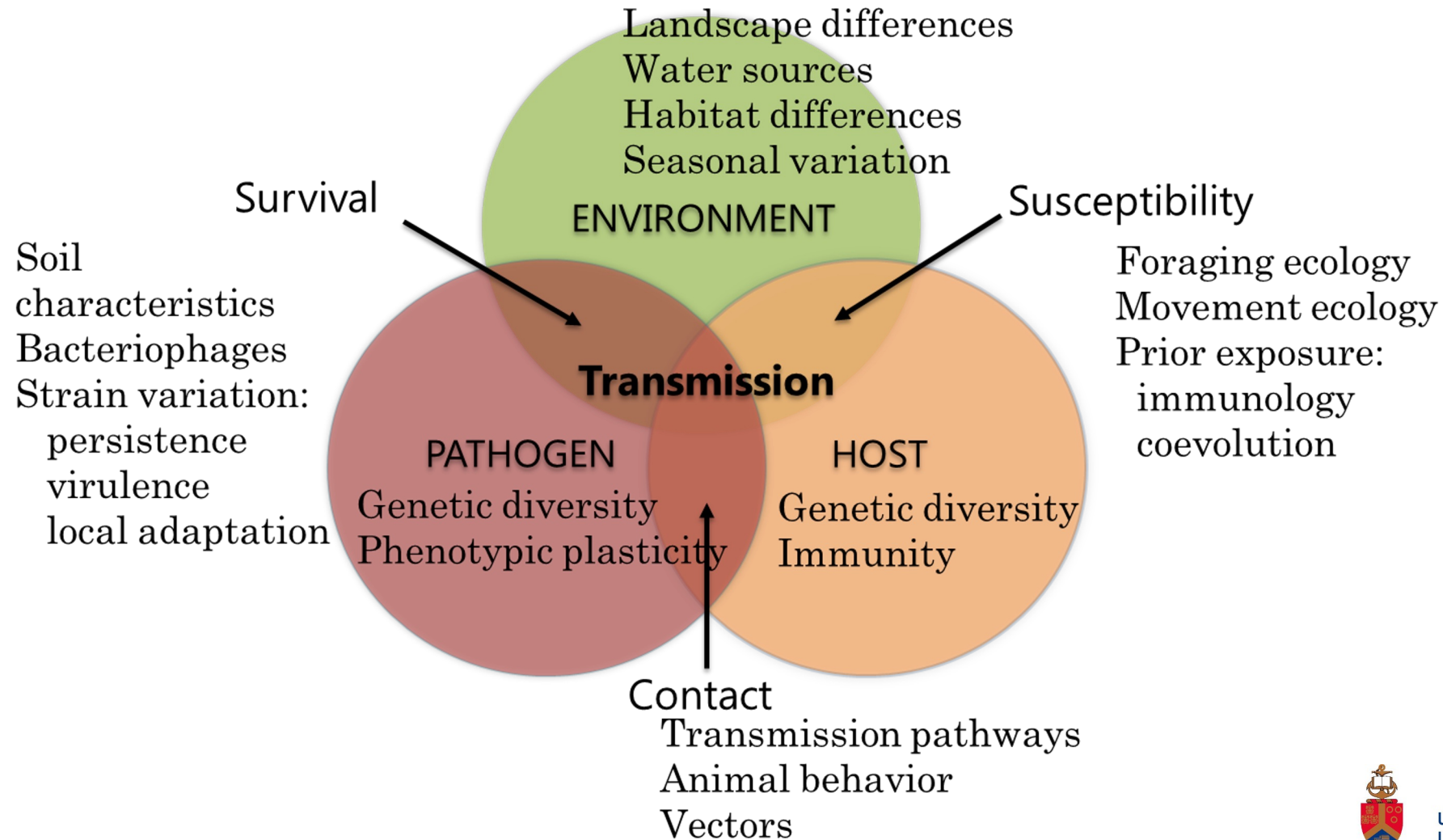
Passive surveillance sampling kit



Sampling Information Sheet		Animal:	Age of Carcass:	Predation / Scavenging
	Name of Sample collector _____	<input type="checkbox"/> Kudu <input type="checkbox"/> Zebra <input type="checkbox"/> Impala <input type="checkbox"/> Elephant <input type="checkbox"/> Roan <input type="checkbox"/> Hippopotamus <input type="checkbox"/> Buffalo	<input type="checkbox"/> Fresh <input type="checkbox"/> 1-2 days <input type="checkbox"/> > 3 days <input type="checkbox"/> > 7 days <input type="checkbox"/> 1-2 weeks	<input type="checkbox"/> Hyenas <input type="checkbox"/> Vultures <input type="checkbox"/> Lion <input type="checkbox"/> Leopard
	Date _____			
	Co-ordinates: deg.min.sec _____ decimal deg _____			
	Sample # _____			
				<div style="border: 1px solid black; padding: 5px; text-align: center;">Simple Example of Info sheet</div>



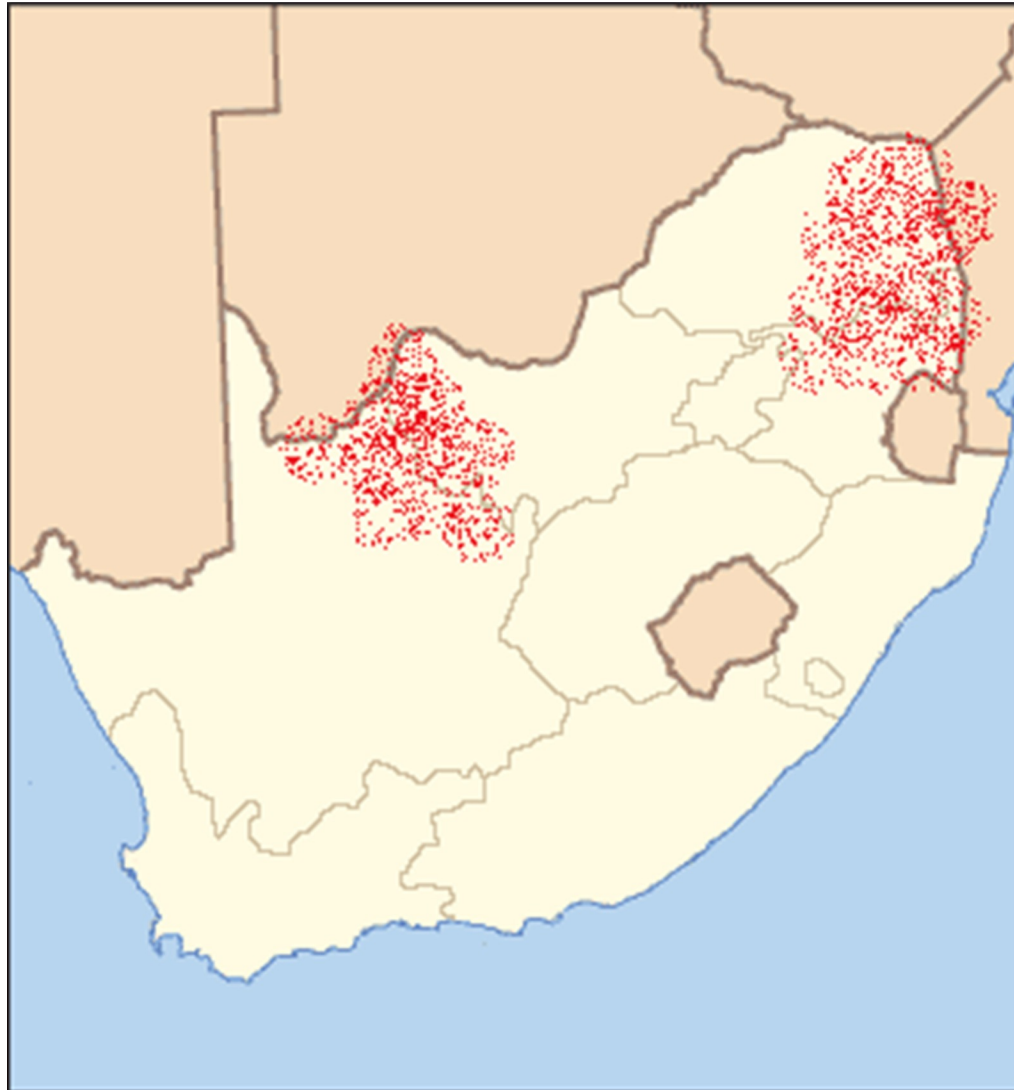
Epidemiological approach: anthrax



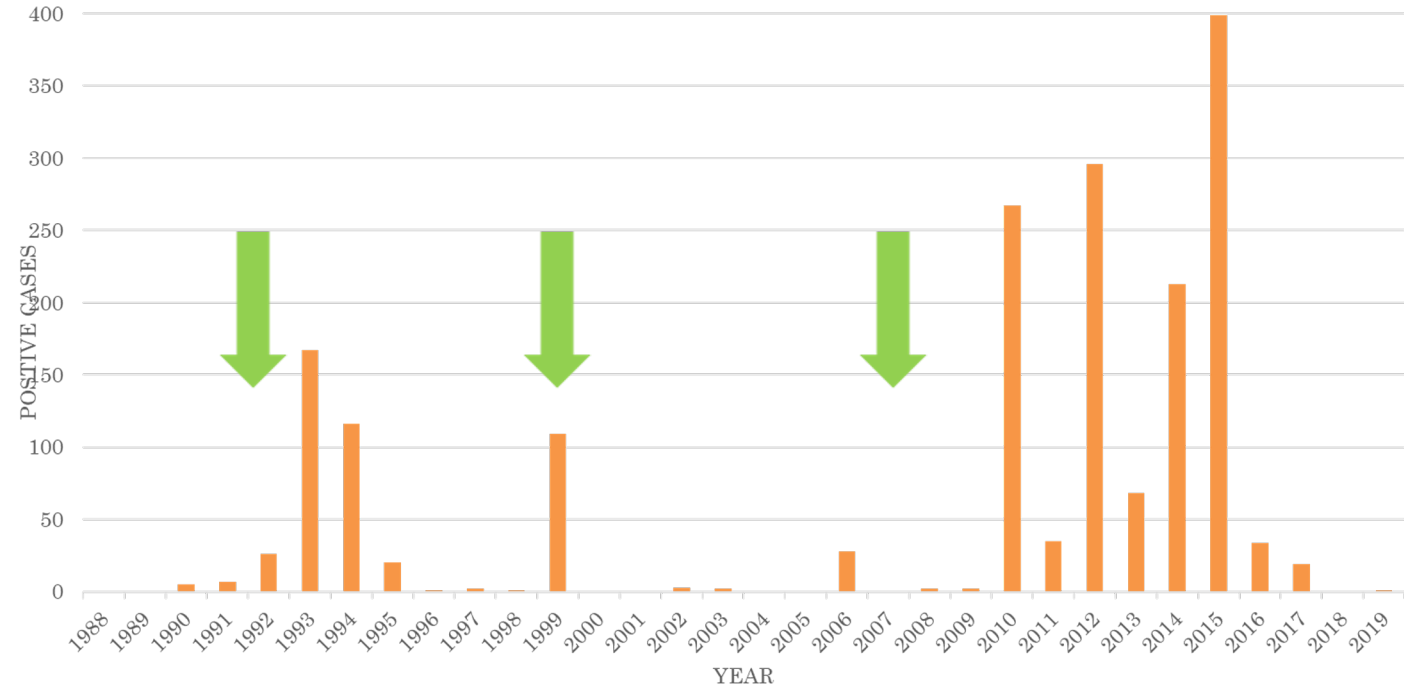
PATHOGEN - SOUTH AFRICA

KNP

NCP (Vaalbos decommission in 1997)

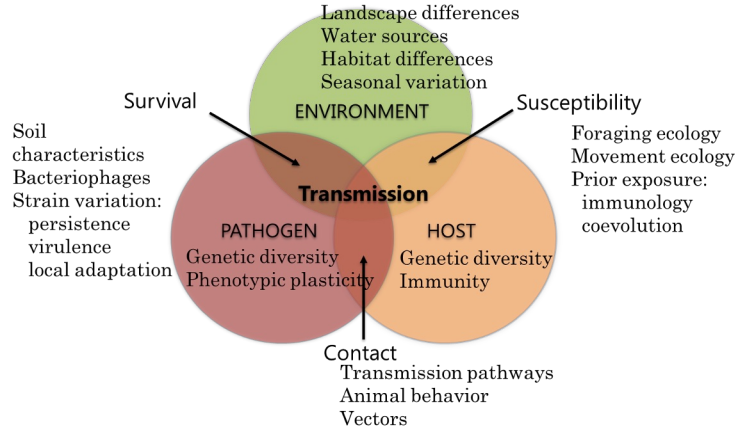
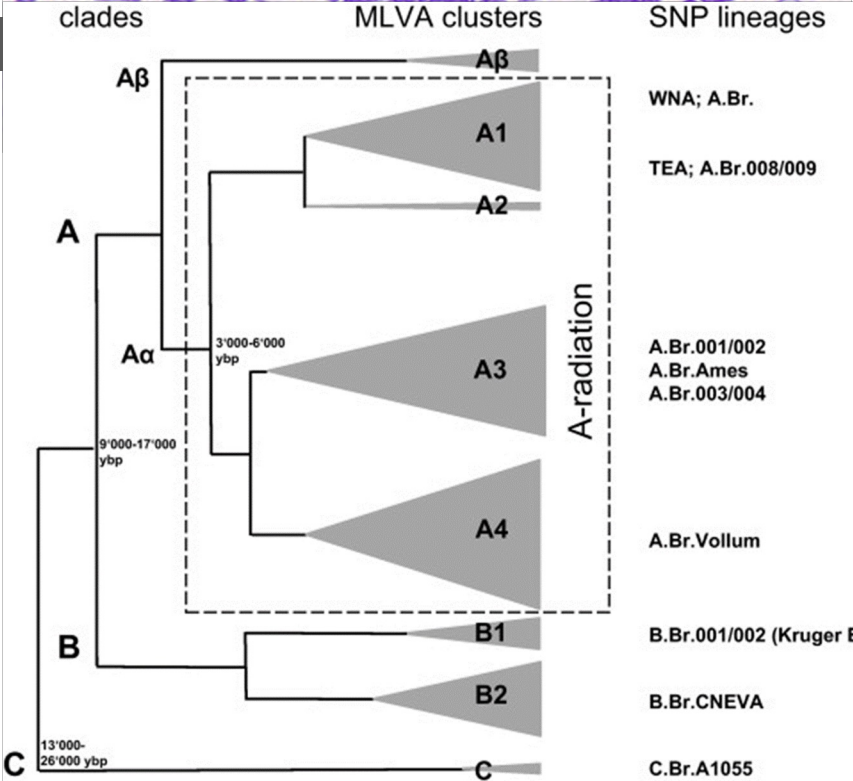
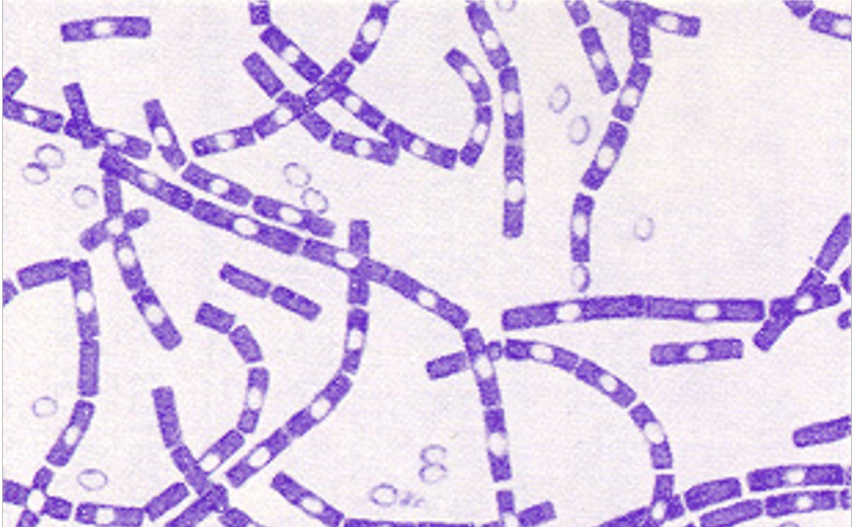


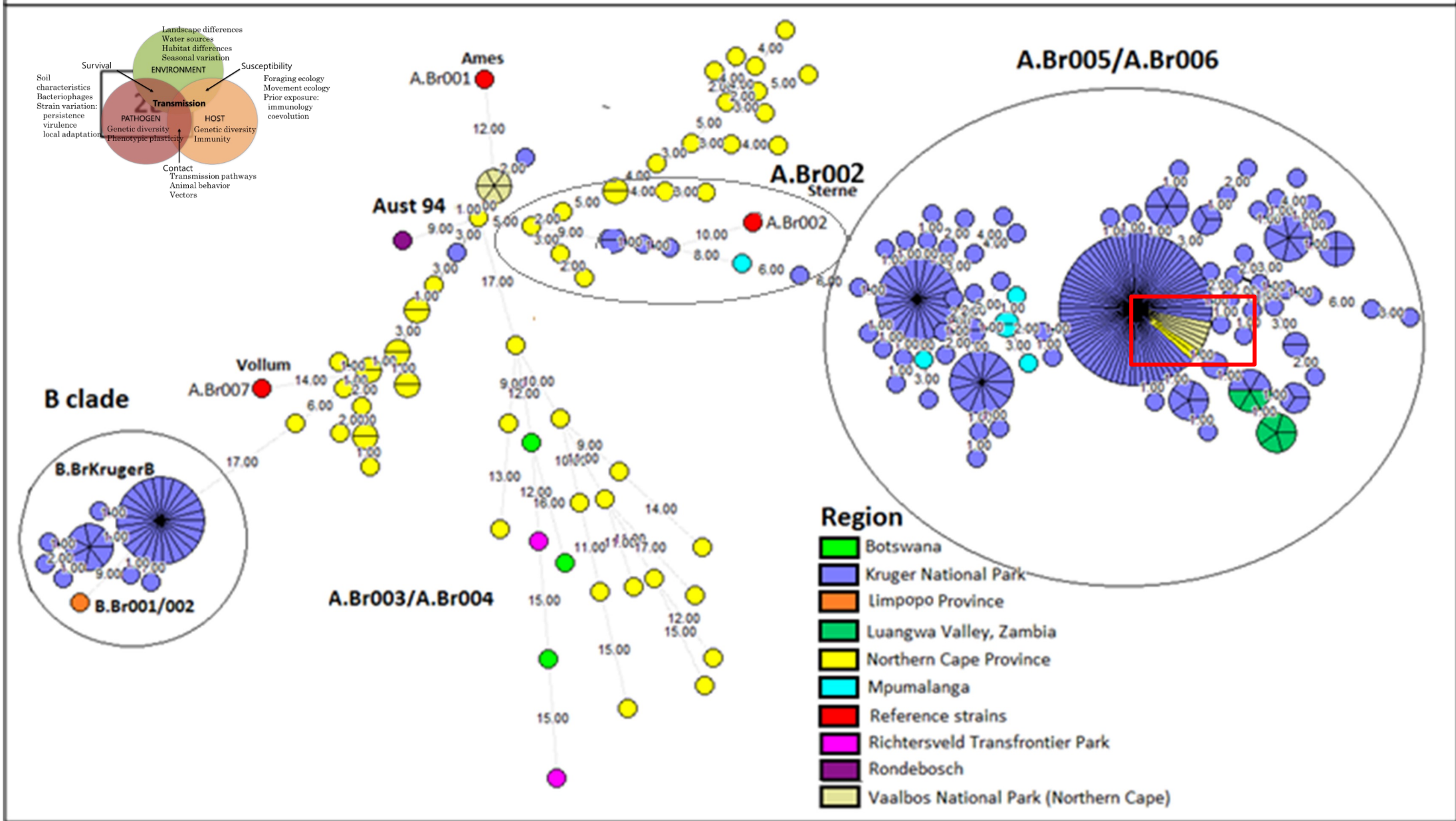
ANTHRAX POSITIVE CASES IN THE KRUGER NATIONAL PARK FROM YEAR 1988-2019



SURVIVAL: Pathogen

- *Bacillus anthracis* endospores
- Calcium-rich and neutral-to-alkaline soil
- Endospores survive harsh conditions
 - Ideal for surveillance system





SURVIVAL - Genetic diversity



SUSCEPTIBILITY - KNP

Kudu (*Tragelaphus strepsiceros*)

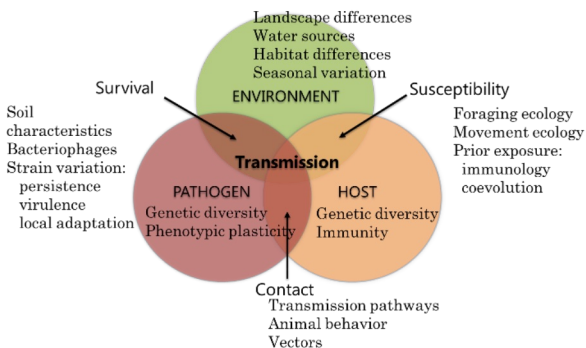
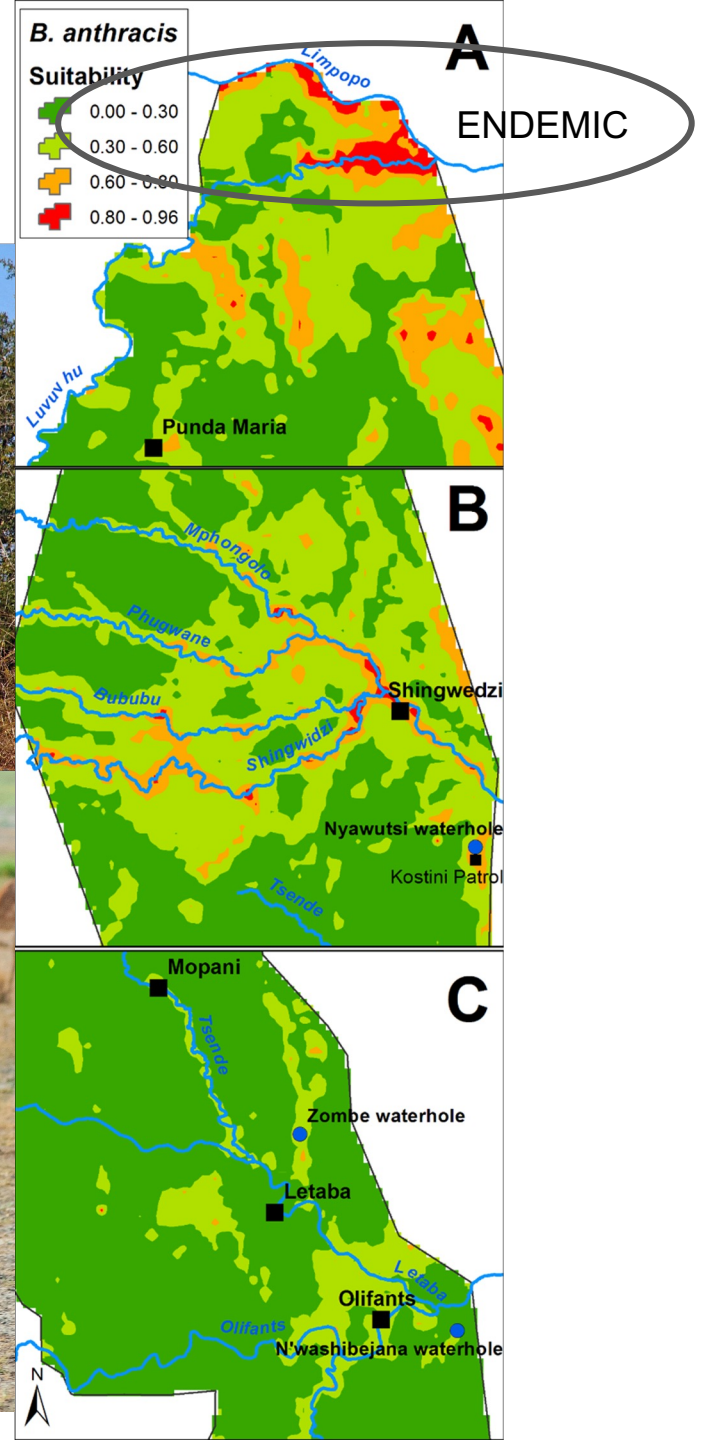
Most susceptible host < 1990

Late dry winter season (Jun-Aug)

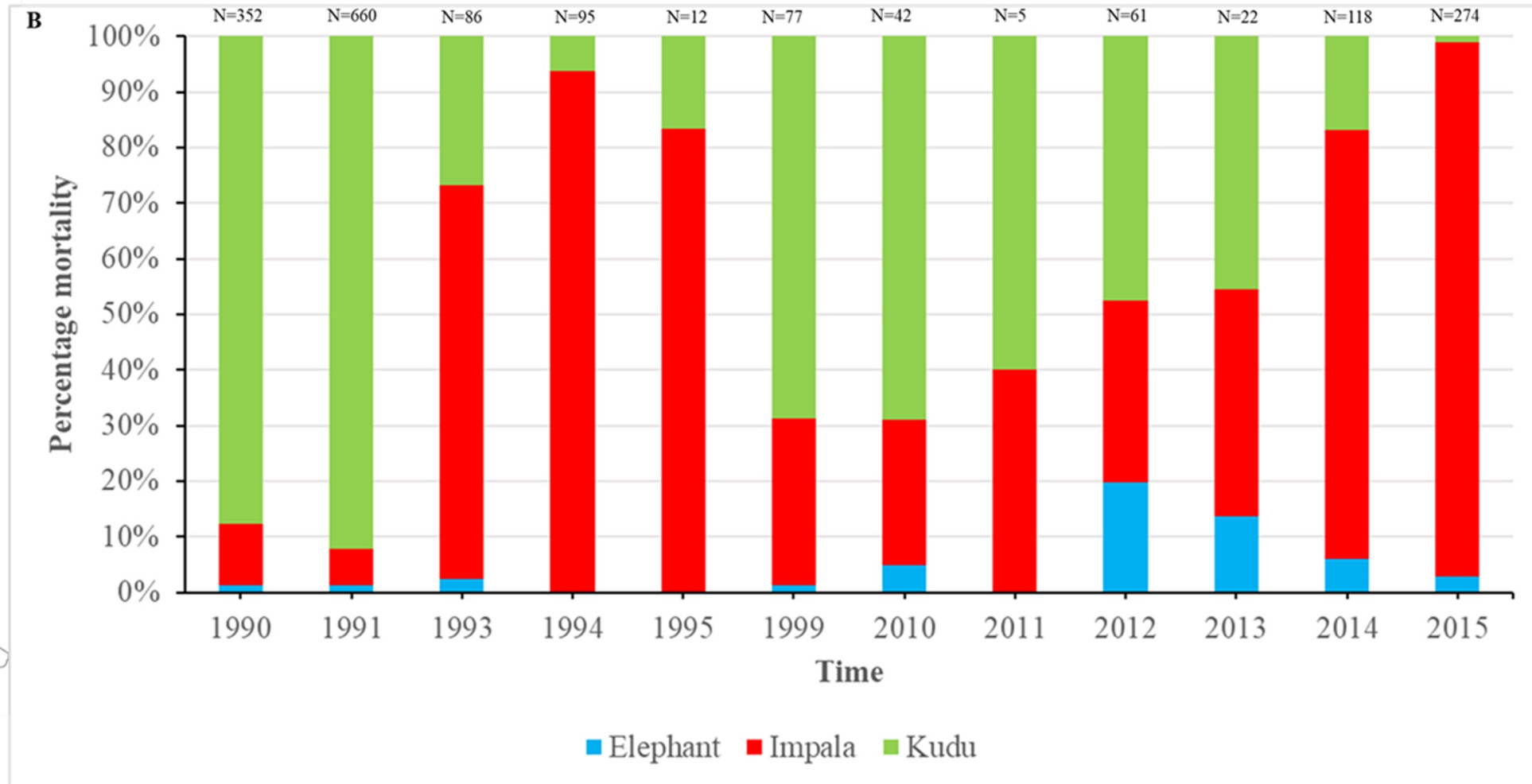
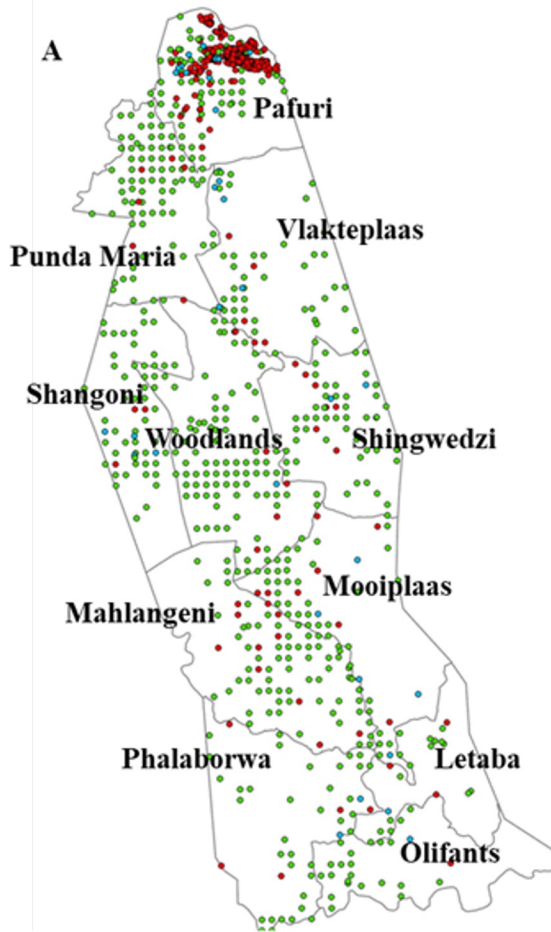
Impala (*Aepyceros melampus*)

Most susceptible host > 1990

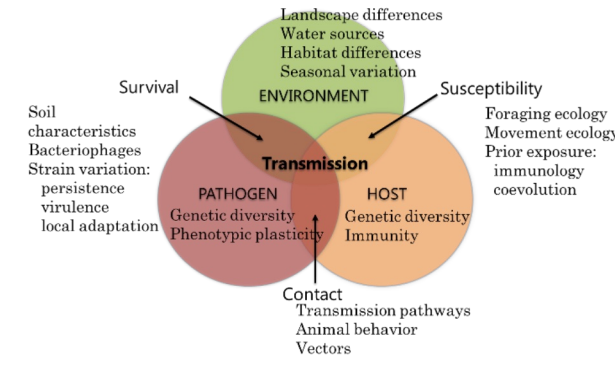
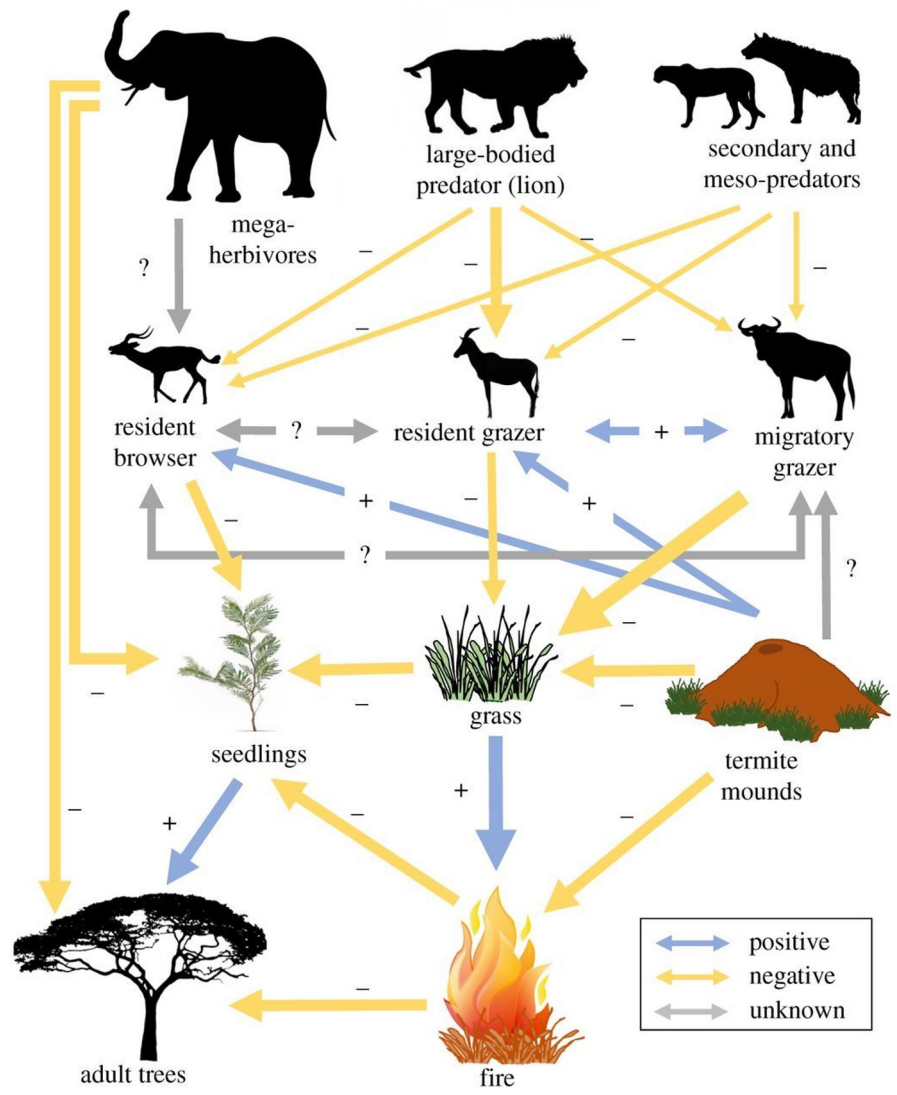
Wet summer season (Feb-Apr)



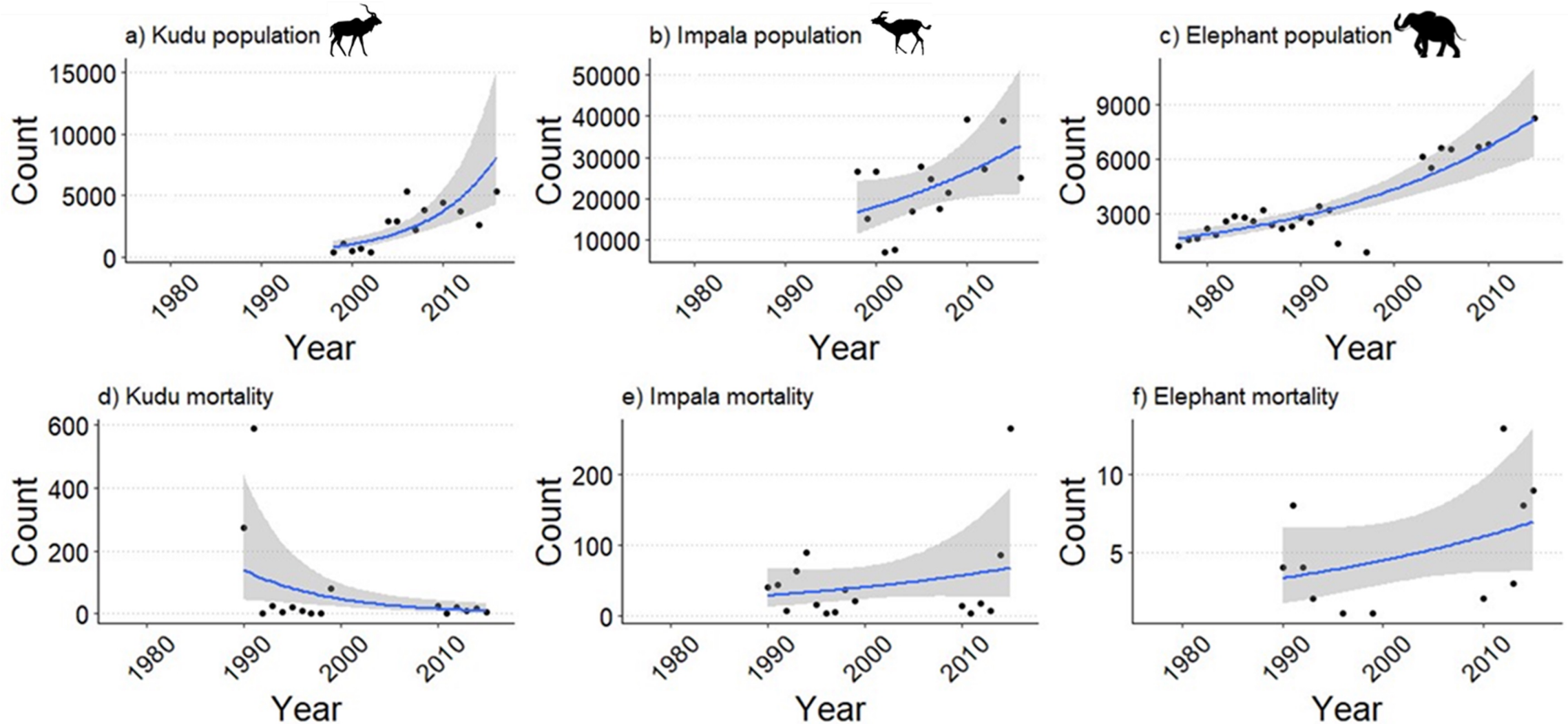
SUSCEPTIBILITY - KNP



CONTACT



CONTACT: Animal behavior





Contact: Vultures and anthrax

Preliminary study 2014

Planned to capture vulture in cage but then anthrax outbreak!

Test capture cage with vulture

Cage empty after anthrax outbreak



April 2014 (outbreak) and September 2014



Vulture nr positive for anthrax

Bacillus anthracis isolated from feathers, beak, talons cloaca

12 African white backed vultures (AWBV) captured in April 2014 in Pafuri region during anthrax outbreak

58% anthrax positive:

G33726

G33727

G7434

G7436

G7437

A195

A196

Feathers

Feathers

Feathers

Feathers, talons, cloaca

Feathers

Beak, feathers, talons cloaca

Feathers, talons

7 AWBV and 1 hooded vulture captured in September 2014 in Pafuri region

25% anthrax positive:

A210

A226

Feathers

Feathers

➤ April 2014

➤ 9 WBV

➤ September 2014

➤ 3 WBV

➤ 2 WHV

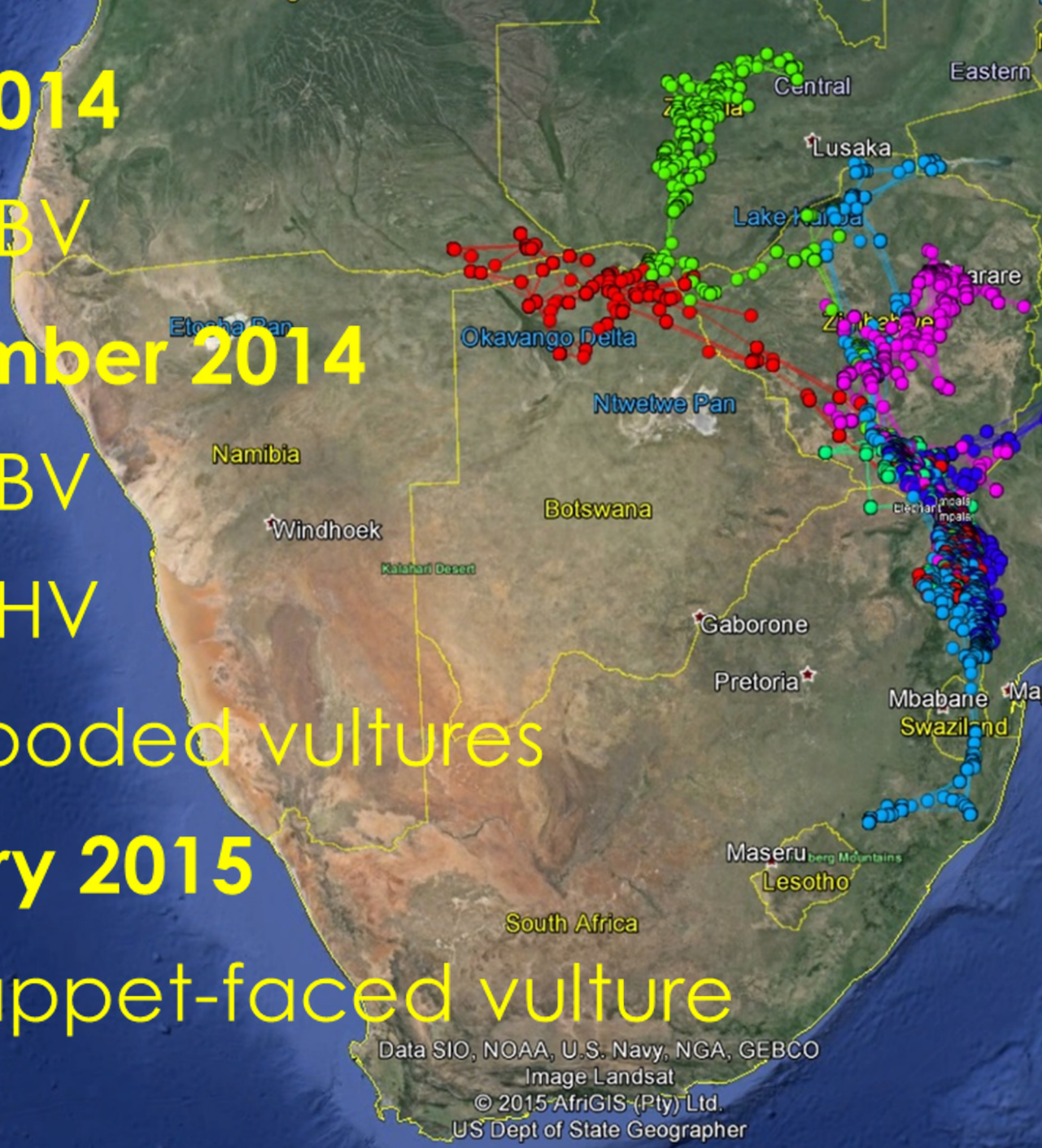
➤ 1 Hooded vultures

➤ January 2015

➤ 1 Lappet-faced vulture

1434 km

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat
© 2015 AfriGIS (Pty) Ltd.
US Dept of State Geographer



Species

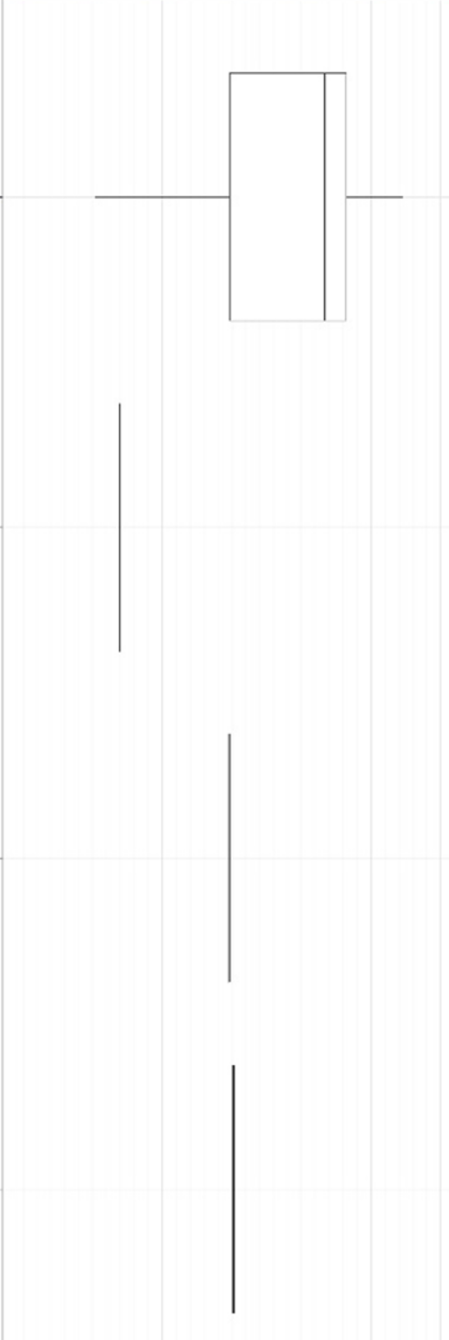
African White-backed Vulture

Hooded Vulture

Lappet-faced Vulture

White-headed Vulture

Average daily distance (km)



CONTACT: Scavengers



Contact: Role of vultures

Molecular analysis - MLVA

- 7 Vultures - 19 *B. anthracis* isolates
 - Ba isolated from feathers from vultures
 - 10 Genotypes - 1 dominant
 - 7 Unique genotypes
- Unique genotypes
 - Concrete conclusions not possible

