

KAZA ANIMAL HEALTH

Sample sharing, Diagnostics and Communications

Utility of a KAZA-focused Laboratory

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Pertinent Points with respect to Animal Disease in KAZA

- Significant interface between wildlife, livestock and people, both urban and rural. Therefore great potential for interface and zoonotic diseases
- Very few fences, international or internal
- Veterinary Services are in place, but often 'stretched' in terms of coverage and resources; variation between countries
- Central Government Veterinary Laboratories are absent in KAZA
- Wildlife Management Agencies are often poorly resourced and usually have little interaction with Vet Services
- Most livestock production is small-scale: individual animals are 'important'. If treated as such by governments, conservation may follow
- Almost no commercial wildlife or production in KAZA, (except crocodile farming); the state 'owns' almost all of it

TRANS-BOUNDARY ANIMAL 'DISEASES' – with potential impact in KAZA (from Penrith and Thomson)		
DISEASE	PRIORITY	REASON FOR INCLUSION
Anthrax	✓ ✓ ✓	High mortality in some wildlife spp., incl. rare species; zoonosis; cheap but ignored vaccine; <i>CONFUSED WITH POISONING</i>
CBPP	✓ ✓ ✓	TFCA may increase likelihood of spread; massive economic impact from mortality and control measures
FMD	✓ ✓ ✓	Buffalo herds reservoirs of FMD viruses; possible transmission to cattle. Massive impact on trade, though little mortality
Rabies	✓ ✓ ✓	Feared and fatal zoonosis; threat to wildlife, eg. wild dogs, kudu; high cost of control and often not efficiently carried out
Tuberculosis	✓ ✓ ✓	Bovine TB present in cattle and wildlife in some areas; localized mongoose TB; TB in elephant is a potential problem
Malicious poisoning	✓ ✓ ✓	Threat to wildlife populations (vultures, rhino, elephant, lions); danger to humans; environmental impact; confusion with anthrax
Tryps (& Tsetse)	✓ ✓	Tsetse fly absent in much of the TFCA; but severe impact in cattle where they occur; tsetse-free areas maybe at risk
African Swine fever	✓ ✓	Virus widespread in warthog, and warthog ticks; highly fatal to pigs but low pig population with few commercial piggeries
Brucellosis	✓ ✓	Zoonosis with human infection occurring mainly through milk; possible buffalo reservoir of Brucella abortus
Newcastle disease	✓ ✓	Widespread and endemic; massive mortality can occur if (rural) chickens are not vaccinated, threatening livelihoods
Rift Valley Fever	✓ ✓	Widespread abortion in ruminant stock, and possibly in wildlife; zoonosis which can be fatal; vaccine rarely applied
Theileriosis	✓ ✓	Corridor disease occurs where buffalo and cattle mix; East Coast Fever is present in Zambia and could spread within TFCA
Trypanosomiasis	✓ ✓	Tsetse fly absent in much of the TFCA; but severe impact in cattle where they occur

DISEASE	PRIORITY	REASON FOR INCLUSION
African horsesickness	✓	Serious virus disease of horses with zebra (+ donkey) reservoir; low horse population but horse-based tourism is popular
Avian Influenza H1, H5 and H7 (HPAI)	✓	Sporadic outbreaks possible with high mortality; high wildfowl population as potential reservoir; pigeon paramyxovirus present,
Bluetongue	✓	Can cause significant mortality in sheep, but no events of concern reported
Canine distemper	✓	Outbreaks in domestic dogs occur; threat to wild carnivores (some evidence in Okavango delta?); vaccine expensive
Dermatophilosis (Senkobo disease)	✓	Widespread, chronic, skin disease of domestic livestock in areas of the TFCA; role of wildlife unknown; ticks can transmit infection
Lumpy Skin disease	✓	Widespread in cattle with economic loss; vaccine expensive and little used
PPR	✓	High mortality in small ruminants; could spread into TFCA
Epizootic Ulcerative Syndrome in fish	✓	Economically important fungus disease of farmed (and wild) fish; confirmed in Zambezi river and probably spreading



The **Victoria Falls Wildlife Trust's mission** is to advance and promote environmental conservation in Southern Africa through wildlife research; management of a wildlife **veterinary diagnostic laboratory** and **rehabilitation** facility; input into a Community **Animal Health facility**; human/wildlife **conflict mitigation**; **education** and empowerment of local population in conservation values



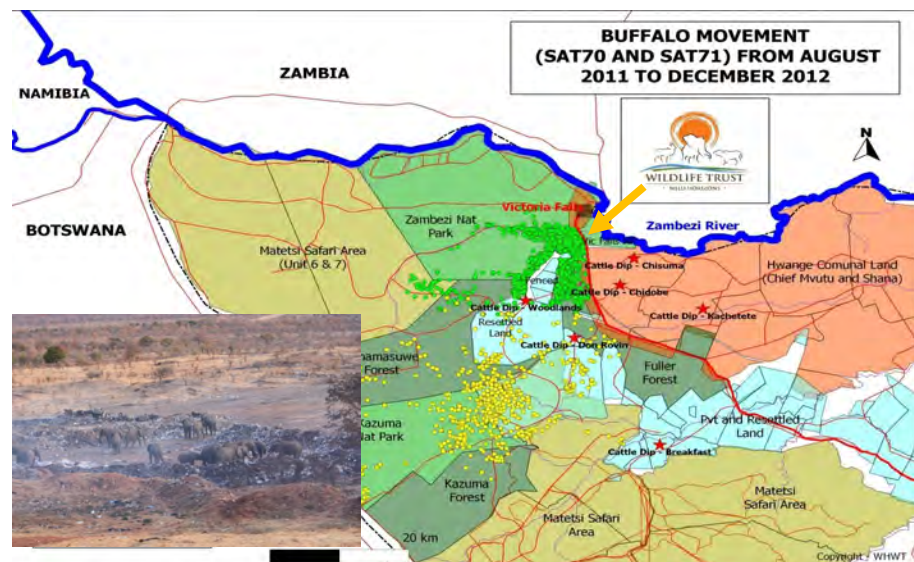


VFWT Laboratory



Ntabayenge Animal Health Centre (VAWZ & VFWT)

VFWT Lab and Disease Interface



Scope of Victoria Falls Wildlife Trust Laboratory diagnostic activities (Laboratory is registered with Zimbabwe DVS)

- Pathology: post mortem and histopathology
- Haematology, cytology, blood chemistry and basic parasitology (includes tick identification)
- ELISA serology + ELISA-based faecal hormone analysis
- Some other serology (eg Brucella)
- Some basic toxicology
- PCR pathogen identification, using basic thermocycler and gel diffusion with UV sensor

No bacteriology or virus isolation

Diagnostics in KAZA

Examples:

- Rabies (lion, painted dog, honey badger and hyaena; plus dogs)
- Canine distemper (dogs) – differentiate from rabies
- Anthrax (elephant, buffalo, hippo) – differentiate from poisoning
- Poisoning (elephant, vultures, wildfowl, cattle) - cyanide, pesticide, plant (Albizia, Dichapetalum etc)
- Foot-and-Mouth disease – cattle and antelope (sudden death from myocarditis)
- Brucellosis wildlife (buffalo)
- Theileriosis (cattle/ buffalo and antelope)
- Babesiosis (elephant, pangolin, mongoose)
- TB (mongoose, lion, elephant ?)
- Avian paramyxovirus infection (wild doves, poultry)
- Crocodile diseases and assessment of stress

Most important is the initial assessment / preliminary diagnosis of wildlife and livestock mortality and differentiation of infectious and non-infectious causes.



Some problems of diagnosis and suggested mitigation

<u>Problem</u>	<u>Mitigation</u>
Poor veterinary coverage	Redirect Government prioritization / funding; use non-government, veterinary expertise
Lack of awareness by wildlife managers	Train field managers to recognize and react to disease (including poisoning)
Lack of resources to collect, store and submit samples	Provide sampling kits, refrigeration and packaging materials; NGOs could assist
Slow transport of specimens	Use informal, but reliable, means of transport
Inadequate laboratory facilities (national, regional and local)	Redirect Government prioritization / funding; use NGO facilities
Restrictions on sending samples out of FMD control zones	Use Lab within FMD control zone, even if in another country
Delays in diagnosis and reporting results	Supervision / SOPs, and 'agitation' from field; use Social Media communications
Excessive bureaucratic barriers to international shipping of samples	KAZA-specific protocol (between capacitated Labs in KAZA)



Anthrax 'samples'



Practising making blood smears



Anthrax sampling kit



'What samples should I take' ?

“ A shift in perceptions is required “

1. KAZA should be treated as an epidemiological unit, with different sub-units associated with land-use
2. Acceptance of KAZA-based veterinary diagnostics is required, including for (some) specified diseases, which is de-centralized from, but obviously with oversight by, the government central diagnostic facilities of the KAZA nations
3. If animals can move rapidly between countries in the absence of fences, then perhaps safely-packaged / recorded samples could also move quickly across internal KAZA borders, to registered laboratory(s); with government oversight
4. Bureaucratic requirements and delays should be minimized; KAZA samples could, like tourists, also have a KAZA-sample 'UNI-VISA' system. There is a precedent from GL-TFCA
5. Rapid communications between government and non-government veterinary personnel, and between veterinary, wildlife and law-enforcement personnel should be facilitated; without prior reference to central authorities if necessary

Conclusions

The formation of KAZA has heightened the risk of Trans-boundary Animal diseases and, therefore, there is a need for rapid disease diagnosis and surveillance throughout KAZA. **This includes forensic samples**

There is often a lack of coverage by veterinary personnel, as well as wildlife and law-enforcement personnel, who usually have little knowledge about animal diseases

Primary referral to Central Government Laboratory facilities (in the capital cities) may not be the most efficient course of action for rapid diagnosis

Non-government Laboratories can assist in training and diagnosis, with appropriate oversight from Competent Authorities of KAZA countries

Victoria Falls Wildlife Trust Laboratory is willing to become a KAZA Animal Disease Laboratory

A change in outlook by KAZA Veterinary Authorities concerning the use of such a Laboratory, as well as facilitating cross-border transfer of samples, would be a big 'step in the right direction'.



Camera trap photo of moths feeding on a kudu eye, taken at the VFWT Laboratory



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