



**TAWIRI - Messerli Foundation
Wildlife Veterinary Programme**



ANNUAL REPORT 2010



Report by Dr Richard Hoare



Photography by Stan Brown

One member of a 'coalition' of two male lions in Serengeti National Park (above) was reported with a poacher's wire snare around its abdomen. The combined operation to capture and treat the animal (below) involved a tourist company that had benefitted from publicity about the veterinary programme, TANAPA staff, and the veterinary team - a good example of valuable co-operation in conservation (see p. 30).

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Abbreviations

AfESG	African Elephant Specialist Group (part of IUCN -SSC)
CITES	Convention on International Trade in Endangered Species
CVL	Central Veterinary Laboratory (part of MLDF, formerly ADRI)
FZS	Frankfurt Zoological Society (International conservation NGO)
GR	Game Reserve (administered by WD)
HEC/HWC	Human-elephant conflict / Human-wildlife conflict
IUCN	International Union for Conservation of Nature
MUHAS	Muhimbili University of Health and Allied Sciences (Dar es Salaam)
NCA/ NCAA	Ngorongoro Conservation Area / Ngorongoro Conservation Area Authority
NP	National Park (administered by TANAPA)
SACIDS	Southern African Centre for Infectious Disease Surveillance (at SUA)
SNP	Serengeti National Park
SUA	Sokoine University of Agriculture, Morogoro Tanzania
SWRC	Serengeti Wildlife Research Centre – home base of this programme
TANAPA	Tanzania National Parks (responsible only for NPs, not other wildlife areas)
TAWIRI	Tanzania Wildlife Research Institute
TEMP	Tanzania Elephant Management Plan (revised 2010)
TNRF	Tanzania Natural Resources Forum (a local NGO)
WMA	Wildlife Management Area
WSPA	World Society for Protection of Animals

1 INTRODUCTION and OBJECTIVES

This document reports on progress in the TAWIRI – Messerli Foundation Wildlife Veterinary Programme during the past year, 2010. The programme (which has been operational since 1992) tries to meet the requirements for veterinary support to the wildlife sector in three main areas: (i) original research in two main areas: the epidemiology of pathogens in wildlife – investigating host-parasite relationships and the ecological significance of pathogens; and research into human-wildlife conflict; (ii) veterinary support and advisory services to wildlife research and management agencies; and (iii) a training programme for Tanzanian wildlife personnel, both our own staff and others.

The main distinction is between (i) **long-term research activities** that are complex, mainly internal and vary between years, and (ii) **routine activities** that often involve services to other projects or wildlife authorities and remain similar between years. Disease research concentrates on conditions that can be associated with both wildlife and livestock or are important zoonoses. Human-wildlife conflict research and advisory work concentrates on human-elephant conflict in Tanzania, but assists both investigative and management aspects of the problem.

The recent research and routine work has been carried out mostly by Dr Richard Hoare and Dr Bugwesa Zablun but Dr Robert Fyumagwa has contributed part-time to some aspects of the programme. A well-trained laboratory technician and two non-professional staff based at SWRC support the work of the veterinarians.

2 LONG-TERM DISEASE RESEARCH AND SURVEILLANCE

Only 2010 updates are given here. Space does not permit detailed explanations about the aetiology and complex epidemiology of these conditions. But through the long history of our investigations these details are all available in previous reports. The conditions are reported in alphabetical order and the current year's outputs (which are effectively the references) are listed in section 5 below.

African Swine Fever (ASF)

The data that was obtained from sero-surveillance of warthogs in the Serengeti ecosystem and subsequent testing at the ASF world reference laboratory in Spain was collated, prepared for publication and submitted.

Anthrax

In 2010 very good use was made of the data and experience we gathered from an outbreak of Anthrax that we diagnosed in Maswa Game Reserve in 2009, which killed mainly buffalo. Drs Hoare and Fyumagwa compiled a non-scientific 'generic' report on dealing with Anthrax outbreaks in wildlife situations, with extensive advice covering human safety concerns (see section 5). We distributed the report to personnel across the wildlife sector and it has been well received by wildlife authorities, tourism operators and research projects. Two collaborative scientific publications partly using our long-term Anthrax data are also at an advanced stage (see section 5) and represent new frontiers in the science of Anthrax diagnosis and control in wildlife situations – namely sero-surveillance and predictability.

Dr Bugwesa Zablun assisted the CVL and Wildlife Division to diagnose an Anthrax outbreak in Hippos in the Rufiji River in Selous Game Reserve. At that stage around 40 hippos had died, but we received later reports that mortality had risen to around 150 animals. The Wildlife Division was supplied with the above report on Anthrax to assist their controls.

Brucellosis

Two publications were finalized (see section 5) that summarize our current knowledge based on wildlife samples inside protected areas and cattle samples taken just adjacent to the boundary of the Serengeti ecosystem. An epidemiologist at the University of Zurich was consulted about the number of further samples that need to be taken in cattle further away from the PA boundaries and also about sampling the fetal membranes of wildebeest at calving time in the coming year, in an attempt to isolate the bacterium.

Due to recent collaboration with medical professionals (as a result of Sian Brown being diagnosed with a chronic infection) we are now in a position to offer some advice on the zoonotic aspects of *Brucella*, which is becoming a wider medical problem, especially in pastoralist areas of in Tanzania.

Foot and Mouth Disease (FMD)

No outbreaks were dealt with but in collaboration with a nationwide four year project on FMD, we started the process of buffalo capture in Serengeti to test the specialized ('probang') sampling procedure in the throat. This was done on three occasions in 2010: firstly with virologists from the FMD world reference laboratory in Pirbright, UK attending, on another occasion with Sokoine University students, and finally as a routine exercise with the FMD project and veterinary teams. Samples were rapidly transferred to liquid Nitrogen for preservation of wild virus strains that will be sent via the CVL to Pirbright and eventually be used to improve FMD vaccines for livestock in East Africa.

Dr Fyumagwa, Maulidi Mdaki and CVL personnel attended a buffalo capture in Katavi National Park in which a commercial wildlife capture operator from South Africa was employed in a SADC project. They obtained duplicate samples for our sample bank from the 30 animals that were sampled for FMD. Original samples have already reached Pirbright, UK for viral typing.

Rabies

No clinical or sample cases were diagnosed but laboratory technician Maulidi Mdaki is now able to do rapid and effective Rabies diagnosis in our laboratory using the new DRIT test – an essential tool if there is human exposure. He tested a batch of archive samples from carnivores in 2010 that had previously known positive or negative status, in order to keep the test reagents and procedure up to date.

Rift Valley Fever (RVF)

Dr Fyumagwa developed a comprehensive research proposal to investigate this complex viral condition and succeeded in getting funds for the work.

Tick-borne disease

Dr Fyumagwa checked up on the burning programme that controls tick numbers in the Ngorongoro crater to ensure that it is being adhered to in the long-term strategy to keep tick-borne disease in resident wildlife under control.

Treponema infection

This long-term investigation nears completion of its first publication (see section 5). A classic clinical case in a very sick baboon was seen in SNP and the animal was captured and fully sampled after euthanasia. Photographs of the case were sent to our collaborators in Germany.

Trypanosomiasis

We expressed concern to those involved in the black rhino re-introduction to SNP that trypanosomiasis could present a danger to these valuable animals whose immunity might be very low. In preparation for the introduction we met with visiting foreign and local glossinologists who explained the complexities of tsetse fly control using insecticide-treated cloth targets. Tsetse fly control targets were deployed in the rhino release area and the rhino were given pre-release prophylactic drug injections.

Domestic horses kept by safari operator Singita-Grumeti Reserves Ltd in Serengeti continue to have trypanosome infection problems and another four died in 2010 despite treatment. In recent years some cases of initial blood infection appear to have progressed slowly into a fatal neurological form, the pathogenesis of which is unknown. A collaborator at Glasgow University in UK is examining tissue samples to try to type the trypanosome species and strain responsible in these cases. We are also conducting investigations into possible shortfalls of the prophylactic drug regime in use.

Tuberculosis

No clinical or sample cases were diagnosed but this is to be a new research focus (see section 4.3).

Wildlife Sample Bank

Sample collection and storage in a bank has been a major routine activity since the veterinary programme began in 1992. Much of the long-term disease research revolves around the wildlife sample bank. Unfortunately there are much fewer samples remaining from the period 1992-1997 but the collection of well-preserved biological material is continuous and complete for the last 13 years (1998-2010 inclusive). This is thus a very valuable archive collection.

In 2010 we registered the acquisition of 1019 samples from 15 wild and two domestic animal species into the sample collection. From the five black rhino introduced into SNP we unfortunately only received samples from one animal. This was due to relying on personnel outside our project who had local political problems and as a result neglected the procedure. These are extremely important reference samples that are furthermore mandated in the CITES export-import agreement. The responsibility will in future not be left to others.

Other researchers increasingly used our laboratory for initial processing of their own samples, for example hormones extracted from faeces. In this way the laboratory provides an increasingly valuable service to the research community.

Other disease conditions

Cattle that were blood sampled on the boundary of SNP (principally for *Brucella* serology) also had faecal samples taken. In 2010 these were gradually scanned for the presence of *Cryptosporidia* - a zoonotic condition causing enteritis. Low levels of the parasite have so far been detected but the investigation is not yet complete.

Lions in Ngorongoro crater periodically suffer from a skin condition of unknown cause. Some cases were looked at in 2010 but no lions were immobilized for sampling because the animals remain in good condition and the occurrence has been sporadic both in number of cases and over time.

Eight mature elephants died in Tarangire National Park and we were consulted. The history was suggestive of Anthrax, but we will consult with TANAPA who apparently were able to do a preliminary investigation.



2. LONG TERM DISEASE RESEARCH & SURVEILLANCE

A buffalo staggering under the effects of an immobilizing drug (above). We started the process of capturing young buffalo to test the specialized ('probang') sampling procedure in the throat (below). Samples were rapidly transferred into liquid nitrogen for preservation of wild virus strains that will be analysed at the Foot and Mouth Disease world reference laboratory in Pirbright, UK and eventually be used to improve FMD vaccines for livestock in East Africa.



2. LONG TERM DISEASE RESEARCH & SURVEILLANCE

Lions in Ngorongoro crater periodically suffer from a skin condition of unknown cause. No lions were immobilized for sampling since the few animals affected remain in good condition and the occurrence has been sporadic. The condition is being monitored in case it spreads or becomes severe.

Bottom photos, clockwise from left, show progression of lesions from inflamed to almost healed.



2. LONG TERM DISEASE RESEARCH & SURVEILLANCE

A classic clinical case of the genital infection caused by *Treponema* bacteria was seen in a very sick Olive Baboon in SNP. The animal was captured and fully sampled after euthanasia (during the annual vet students' practical course). Photographs were sent to our collaborators in Germany who are finalizing publication of the disease condition.



2. LONG TERM DISEASE RESEARCH & SURVEILLANCE

Valuable wildlife samples are constantly taken at any opportunity to increase the archive collection now consisting of over 13 years of material. Continual advances in laboratory bio-technology mean that the collection becomes increasingly valuable. Samples are taken either opportunistically, especially in rare species e.g. from an Aardwolf killed on the road (above) or more often systematically, e.g. when animals are temporarily immobilized like this Topi antelope (below).

3 LONG-TERM INVESTIGATIVE AND ADVISORY WORK

Human – Elephant Conflict (HEC) Research and Management - individual research project of Dr Richard Hoare

Background

The study of HEC in Tanzania has been following a plan since 2006 (Hoare 2007a,b), supported by the IUCN African Elephant Specialist Group (IUCN–AfESG) of which I am a member and co-chairman of the Human-Elephant Conflict Working Group for Africa. Tanzania, being one of the most important elephant range states, has become a focus country for how to integrate the efforts of those involved in this problem at all levels – from rural subsistence farmers right up to centralized authorities (Dublin & Hoare 2004, Parker *et al* 2007a,b). Having helped set up and regularly assisted many of the site-based HEC research projects in Tanzania since 2003, the main objective of my own research has now shifted more towards management issues at national level: (i) to provide wildlife managers with information that can improve practical measures to control problem animals (Hoare 2001) and (ii) to provide administrators and politicians with information to replace flawed short-term interventions with more sustainable long-term measures that strengthen community conservation initiatives.

2010 was a very significant year for positive developments in HEC mitigation in Tanzania. Three very important technical workshops were held at which I had a major role, and these meetings all led to progress amongst the stakeholders involved - helping to take site-level practical experience up to national management level.

3.1 Workshop 1

The first was in Dar es Salaam (TNRF / WSPA) where all the NGOs involved in HEC were able to expose the responsible authority (WD) to the scale of the problem through their research results and then show how innovative simple community-based mitigation approaches are working. My contributions were as follows:

Tanzania Natural Resources Forum (TNRF) and World Society for Protection of Animals (WSPA)

Proceedings of Human Elephant Conflict Stakeholders Workshop,

Regency Park Hotel, Dar es Salaam, 20th April 2010.

(i) Evolution and overview of HEC in East and Central Africa.

Richard Hoare, Tanzania Wildlife Research Institute, pp 3-5.

(ii) HEC mitigation strategies for Tanzania.

Richard Hoare, Tanzania Wildlife Research Institute, pp 17-19.

From this meeting the scale of the problem was put in perspective: Tanzania still has elephants in two thirds of districts but less than 20% of these districts have any support for modern methods of HEC mitigation. The very important outcome of this meeting was a proposal to set up a permanent **Human-Wildlife Conflict Forum** in this country (Chengullah 2010). This would be a body that involves representatives from all stakeholder institutions meeting periodically to agree on making and implementing problem animal control policy.

3.2 Workshop 2

The second was the four day **Tanzania Elephant Management Plan (TEMP)** final workshop in Arusha. I gave the key overview presentation on all aspects of HEC and its mitigation that has been learned from 15 years experience in many African countries as follows:

TAWIRI Workshop Report 25-28 May 2010 TANZANIA ELEPHANT MANAGEMENT PLAN Presentation Paper No. 3: New Approaches in the Study and Management of Human-Elephant Conflicts in Africa (Dr Richard Hoare – Elephant Specialist)

The paper outlined the three phases involved in mitigating conflicts – i.e. (i) developing site-level mitigation tools, (ii) using site-level mitigation tools and (iii) ‘vertical integration’ in ‘governance’; status of human-elephant conflicts in Tanzania (case of Eastern Selous); perceived and actual problem wildlife species in Africa; decision support systems for managing HEC in Africa; the role of research and traditional methods in managing elephants; the effects of killing problem elephants; community-based problem animal controls and combinations of mitigation measures (See Appendix 5).

Working group sessions comprising many different stakeholders then made relevant HEC policy recommendations for incorporation into the revised TEMP.

3.3 Workshop 3

Thirdly **TAWIRI / WSPA** held a workshop in Arusha to discuss community-based HEC mitigation proposals stemming from field trials and experience in HEC research project areas. Again several WD personnel attended and the dialogue initiated at the first workshop was reinforced. A number of important conclusions were reached: (i) local capacity to manage HEC should be scaled up since NGO-introduced mitigation may not be sustained; (ii) the chilli-based approach should be promoted because it works against elephants and it is sustainable in farming communities; (iii) the new formal process of designating wildlife corridors should be widened; (iv) the WD should set aside funds to help new PAC initiatives through district councils and DGOs.

3.4 HEC Mitigation Film

The basis of community-based HEC mitigation is centred around the so-called ‘chilli toolbox’ of simple, cheap, sustainable measures that rural subsistence farmers can use to deter elephants themselves (www.elephantpepper.org and www.african-elephant.org/hec), thus easing the burden on wildlife authorities. The problem is disseminating this critical information to where it is most needed, especially in the many districts without a relevant research project to assist HEC mitigation (67% of districts still have elephants). I wrote a proposal in 2009 and received the funds in 2010 for making a simple **Swahili film** to achieve this - via evening film shows in rural villages. In 2010 I commissioned a commercial film maker whom TNRF assisted to get the relevant visual material, and the first version of this film will be available in early 2011.

The Study and Management of Human-Elephant Conflict in Africa

carried out in partnership between:  AFESG  IUCN  IUCN /SSC  WWF

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A DECISION SUPPORT SYSTEM FOR MANAGING HUMAN-ELEPHANT CONFLICT SITUATIONS IN AFRICA
(104 pages)

version française:
UN SYSTÈME DE SOUTIEN AUX DÉCISIONS POUR LA GESTION DES SITUATIONS DE CONFLIT HOMMES-ÉLÉPHANTS EN AFRIQUE
(100 pages)



Systematic data collection on elephant damage and contextual research
8 METHOD VARIATIONS



Traditional anti-elephant methods used by local area residents
8 METHOD VARIATIONS



Disturbance of problem elephants
7 METHOD VARIATIONS



Killing problem elephants
8 METHOD VARIATIONS



Physical barriers to elephants
11 METHOD VARIATIONS



Experimental repellents and elephant alarm calls
6 METHOD VARIATIONS

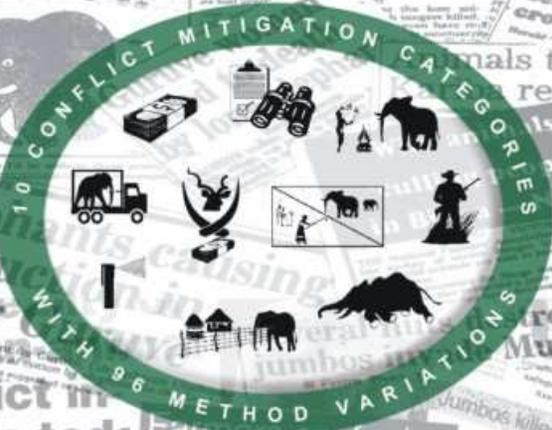
HUMAN-ELEPHANT CONFLICT (HEC): what do we know?

- WIDESPREAD AND CAN BE VERY POLITICAL
- AGRICULTURAL LOSSES AND A SOCIAL DIMENSION
- HAS DIRECT COSTS AND INTANGIBLE COSTS
- PERCEIVED PROBLEM IS NOT THE ACTUAL PROBLEM
- DISPLAYS COMPLEX SPATIAL DYNAMICS
- INDIVIDUAL BEHAVIOUR OF ELEPHANTS IMPORTANT
- AIM TO REDUCE NOT ELIMINATE THE PROBLEM
- PACKAGES OF MITIGATION MEASURES NEEDED
- LOCAL PARTICIPATION IS ESSENTIAL
- CAN BE A GOOD CONSERVATION "ENTRY POINT"

HEC MITIGATION: who makes decisions?

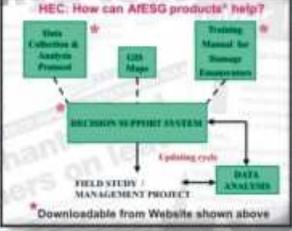


10 CONFLICT MITIGATION CATEGORIES



WITH 96 METHOD VARIATIONS

HEC: How can AFESG products* help?



* Downloadable from Website shown above

HEC MITIGATION INCORPORATED INTO NATIONAL ELEPHANT MANAGEMENT PLANS





Live capture and translocation of elephants
4 METHOD VARIATIONS



Compensation schemes for elephant damage
3 METHOD VARIATIONS



Wildlife utilization programmes returning benefit to local people
12 METHOD VARIATIONS



Land use changes to reduce spatial competition between people and elephants
15 METHOD VARIATIONS

3. LONG TERM ADVISORY WORK

This display poster attempts to condense and simplify the complex issues involved in studying and reducing human-elephant conflict in Africa. It is printed in a large format and used at meetings as an illustrative reference for participants involved in finding sustainable solutions to this problem.

4 ROUTINE ACTIVITIES

4.1 Animal Handling

Animal handling is a professional service offered under the research mandate set by TAWIRI and constitutes a routine activity every year. We specialize in immobilizing dangerous or difficult species and I do the vast majority of these cases. Cases done in 2010 (**72 in total**) classified by purpose were:

- Radio-collar deployment / removal for other research projects: **29** (Elephant, Lion, Hyaena)
- Unnatural injuries or removal of wire snares: **23** (Elephant, Lion, Zebra, Giraffe, Hyaena, Wildebeest)
- Disease sampling: **10** (Buffalo, Baboon)
- Training: **10** (various)
- Translocation: **1** (Lion)

A few of the above were combined e.g. cases for disease sampling were combined with veterinary training or radio-collar deployment.

The largest animal capture operation in 2010 involved immobilizing **17 adult elephants** for radio-collar deployment by Dr Alfred Kikoti, in Saadani National Park on the coast and Wami-Mbiki WMA inland of it. A helicopter, two aircraft and a ground team of nearly 30 people were involved for a period of around ten days.

In 2010 there was a noticeable increase in **snare removal cases** that we were called to deal with (32% of cases). Many snares caused serious injuries to animals and in two cases (an elephant calf and an adult giraffe in Serengeti) the animal's condition was so bad that it died on handling. Cases of elephant leg injuries caused by poachers' bullets were also investigated. A Serengeti cheetah with a wire snare was even photographed by a tourist, but despite the search efforts of the Serengeti cheetah research project and ourselves, it has unfortunately not been observed again.

We did not actively participate in the handling of **black rhinos** introduced into Serengeti in 2010 as veterinary experts in rhino translocation and TANAPA veterinarians were mainly involved. We attended the arrival ceremony of the animals and contributed to issues related to their health (section 2).

We were requested by TANAPA and a tourist lodge in Serengeti to assist with a **wounded lion** that had taken up refuge inside the lodge premises, very close to tourists. We darted the lion which turned out to be a sub-adult male injured in a fight. The lion research project identified the individual and established that its injuries were sustained during a female pride take-over by new males. We translocated the lion under sedation to a nearby kopje within the pride territory, and it subsequently made a full recovery.

Roadkills continue to be a problem in SNP and illustrate the continuing indiscipline shown by drivers who contravene park speed limits and rules. Most cases go unreported. The most serious case was an adult male cheetah (known to the cheetah research project) killed on the main transit road through the national park. TANAPA representatives were present when the carcass was collected for post-mortem examination and sampling.



4. ANIMAL HANDLING for approved research projects

We again assisted Tanzanian elephant researcher Dr Alfred Kikoti to expand his much-needed research efforts to another area where elephant populations and their corridors are increasingly threatened (Saadani National Park on the coast and Wami-Mbiki WMA inland of it). Seventeen adult elephants, both cows (above) and bulls (centre) were captured for radio-collar deployment in a huge operation involving a helicopter, two aircraft (below) and a ground team of nearly 30 people for a period of around ten days.

Elephants in a sitting position (as above) have to be roped and physically pulled over into lateral recumbency (as centre) so as not to compromise their respiration.



4. ANIMAL HANDLING **for** **approved** **research projects**

Of the 17 animals captured in Dr Kikoti's operation, several had man-made injuries indicating the pressure they are under. Two had old snare injuries on the trunk, with one greatly restricting normal breathing (top right). Elephant behaviour was markedly more stressed than in less disturbed populations and several animals had infected wounds from poachers' rifle bullets (left).



4. ANIMAL HANDLING - Field handling techniques

Each animal that we handle is subject to the briefest, most professional and modern capture procedures that we constantly try to refine. Drugged giraffes have to be physically roped by a team of men to bring them down (top, giraffe with neck snare) and once recumbent procedures have to be expedited to avoid blood pressure problems. During recovery from capture (below in zebra) the blindfold can be allowed to remain on for longer by attaching it to a long rope.



**4. ANIMAL
HANDLING**
- Snare removal
from
GIRAFFE

This giraffe was successfully captured but after snare removal it died in circumstances that were very distressing to witness. The neck snare was very tight and had probably seriously weakened and dehydrated the animal by restricting food and water intake, so that it had insufficient energy to rise to its feet. Afterwards we measured a very severe level of anaemia in the blood - corresponding to about 15% of the normal value. This is a very serious case that can be used to illustrate the indiscriminate, cruel and terribly wasteful consequences of illegal poaching activities for game meat in protected areas. It was a known research animal.

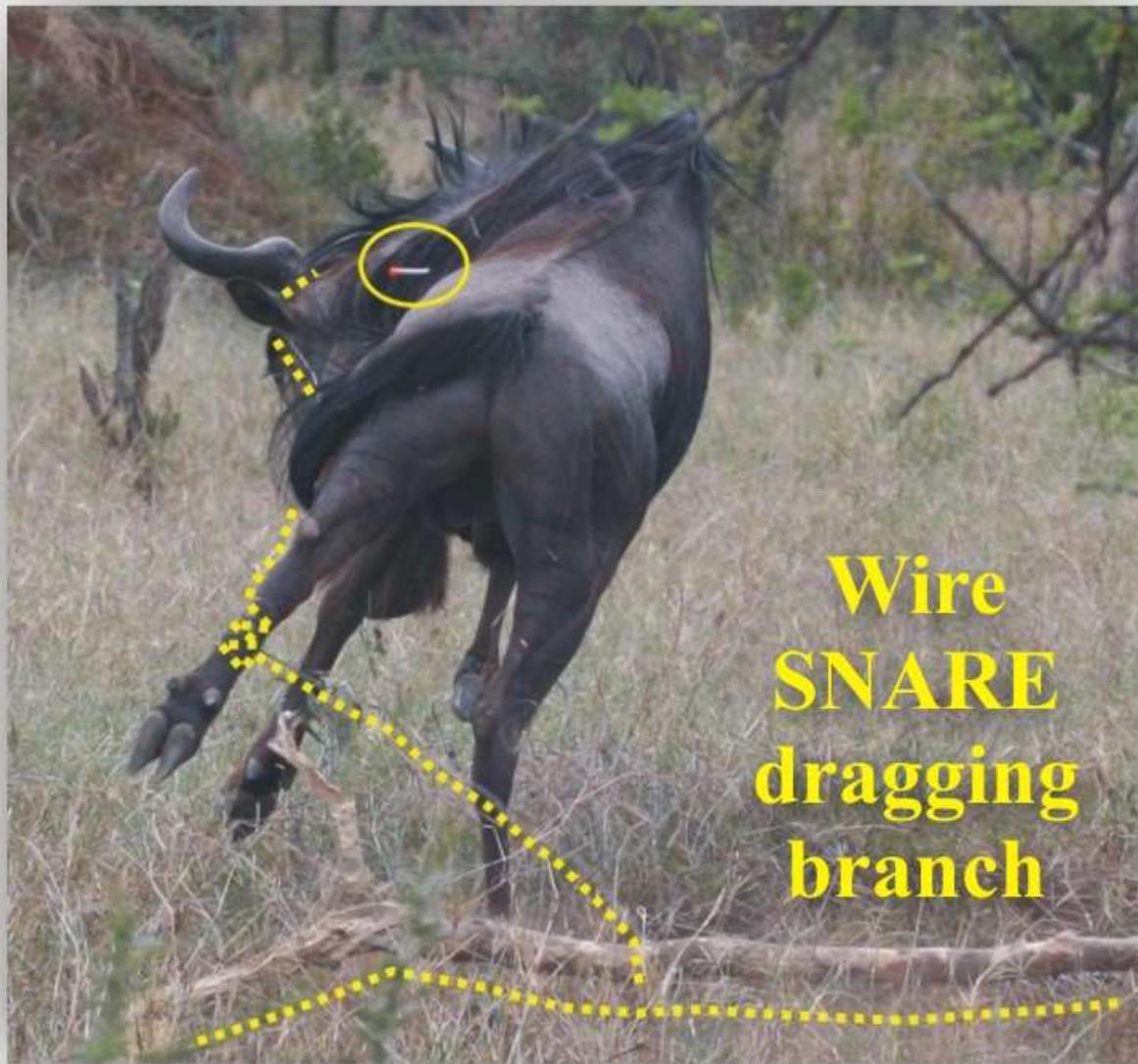


4. ANIMAL HANDLING

- Snare removal from elephant calves



Three cases of small elephant calves with bad wire snares were dealt with. This can be a tricky operation as the often very protective mother has to also be immobilized, and the rest of the elephant group are often reluctant to be chased away with vehicles from the two recumbent animals. The most severe case (above), already highly compromised nutritionally and breathing-wise from the dreadful wire cable snare around the head and trunk, very unfortunately died because its mother then fell on top of it when drugged, and the delay extracting it was too long. A very severe leg snare wound (below with cow in background) would have benefited from a second treatment, so we have ordered radio-tacking equipment to enable these cases to be relocated in future.



4. ANIMAL HANDLING

- Snare removal from wildebeest

Wildebeest die easily when caught in wire snares, but luckily this one was seen timeously and reported by a researcher. The cable snare was tangled tightly round the horns, one back leg and then a branch which was being dragged along. The animal made a full recovery.





4. ANIMAL HANDLING - Snare removal from zebra

Zebra are the most frequently seen animals with wire snares, either around the neck or in this case, the foot. If the leg tendons are not severed, as in this case, the animal recovers fully.



4. ANIMAL HANDLING Treating human caused injury

Elephant foot injuries are becoming more common and are examined if the cause is suspected to be unnatural (man-made). We could not determine the cause of the large open suppurating lesion (above) so treatment was administered. The cause of massive foot swelling (below) was known to be a poacher's bullet, but the bullet itself was embedded too deep for recovery. After antibiotic treatment this animal has subsequently been seen to have recovered significantly. We have purchased a metal detector to assist in such cases in future.



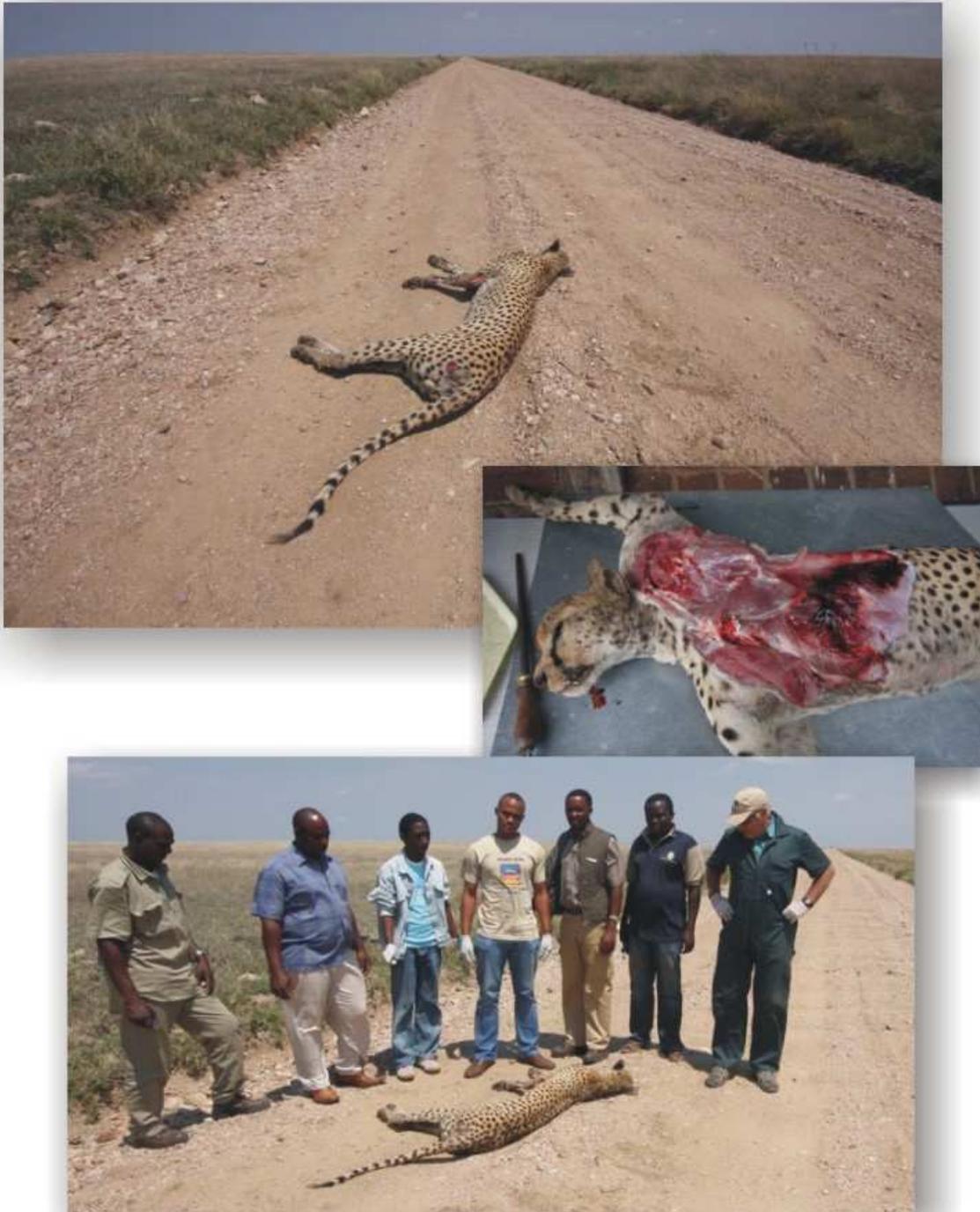
4. TECHNICAL SUPPORT FOR OTHER PROJECTS

We were kindly invited to attend the arrival of a shipment of five re-introduced black rhino to Tanzania from South Africa. These are descendants of the East African rhino sub-species that were sent to South Africa for safety in the 1960s during a time of very heavy rhino poaching. They were sedated, individually crated and airlifted in a Hercules transport aircraft to Serengeti National Park, where they were received in a large ceremony presided over by President Kikwete. They were then loaded onto trucks and released into a captive facility (boma) some distance away. After some weeks being confined and fed they were fitted with radio-transmitters and free released into the wild, closely monitored by a special ranger force.



4. ANIMAL HANDLING - Lion Translocation

We were requested by TANAPA and a tourist lodge in Serengeti to assist with a wounded lion that had taken up refuge alone inside the lodge premises, very close to tourists. Normally we don't intervene in natural injury cases but here for safety reasons the location demanded otherwise. Without vehicle access the veterinarian (and assistant to protect him with an umbrella to frighten the lion if necessary!) had to approach closely (above) and fortunately the concealed lion allowed this. It was a sub-adult male injured in a fight. The Serengeti lion research project identified the individual and established that its injuries were sustained during a female pride take-over by new males. We translocated the lion under sedation to a nearby kopje within its own pride territory, and it subsequently made a full recovery.



4. ROUTINE ACTIVITIES -Roadkill

Roadkills continue to be a problem in SNP and illustrate the continuing indiscipline shown by drivers who contravene park speed limits and rules. The most serious case was an adult male cheetah (known to the Serengeti cheetah research project) killed by a vehicle on the main transit road through the national park. It was not reported until our own project employee discovered it while driving. TANAPA representatives were present when the carcass was collected by us for post-mortem examination and sampling.

4.2 Training Activities

(i) Students

SOKOINE University of Agriculture: 2 week annual field practical course for final year BVM students (21 attended) as part of their degree curriculum. As usual this was a great success and greatly appreciated.

MWEKA College: annual lecture and demonstration of programme's work to certificate and diploma students.

PASIANSI: annual lecture and demonstration of programme's work to trainees.

Foreign students: several lectures were given to visiting groups of students from USA or Europe.

Two veterinary students from Copenhagen University, Denmark were hosted by SWRC for three weeks and attended all work undertaken by the programme in that period.

(ii) Staff

Plans for further study by Dr Bugwesa Zablon reached an advanced stage with his acceptance into a funded international programme to undertake PhD level research on TB. This is being done through SACIDS, Morogoro and MUHAS, Dar es Salaam. Simultaneously in 2010 Dr Zablon was appointed to a new permanent research post within TAWIRI and thus left the wildlife veterinary programme at the completion of the calendar year.

Dr Bugwesa Zablon attended a useful two week course entitled "Research Methodology and Proposal Writing Skills" organised by SUA and NRN Biomedical, UK.

Laboratory technician Maulidi Mdaki is enrolled at the Open University of Tanzania doing a Bachelor's degree course by distance learning.

4.3 Advisory services

One of our veterinarians represented TAWIRI at a national review meeting on Avian 'Flu preparedness

4.4 Technical support to other projects

The TAWIRI aircraft operated by the veterinary programme and flown by Dr Richard Hoare provided some vital support services for other research projects. It was extensively used on the elephant research operation in Saadani / Wami-Mbiki (see 4.1) and also used by the SNP Giraffe research project to conduct six aerial censuses in research study areas. We also assisted the start of the aerial radio-tracking programme for the newly introduced black rhino in Serengeti National Park.



4. ROUTINE ACTIVITIES - Training and Education

The SUA veterinary students attending a wildlife field practical course in SNP. This is an annual event that is part of the degree curriculum for each final year class. This year one group was fortunate to participate in the capture of this male lion that was treated for a fresh snare wound around the neck - the animal having somehow removed the wire by itself. This year students also benefited from a presentation about the introduced black rhino by FZS veterinarian Dr Peter Morkel (second right, standing).

5 REPORTING, PUBLICITY AND PUBLICATION

In 2010 more publications were produced than any other previous year. These are effectively the references for disease research (section 2 above) and animal handling (section 4 above).

5.1 Publications 2010 (JOURNALS and CONFERENCES)

Fyumagwa, R. D., Wambura P.N., Mellau, L.S.B. and Hoare, R. (2009) **Sero-prevalence of *Brucella abortus* in buffaloes and wildebeests in the Serengeti ecosystem: a threat to humans and domestic ruminants.** Tanzania Veterinary Journal 26(2): 62-67

Paul Bessell, Tiziana Lembo, Katie Hampson, Richard Hoare, Robert Fyumagwa, Sarah Cleaveland, (2010) **Geographic risk factors for Anthrax in the Serengeti ecosystem.** Poster presented at the meeting of the Society of Veterinary Epidemiology and Preventive Medicine in Nantes, France. <http://www.svepm.org.uk/conferences.php?view=8>

Harriet Auty, Neil Anderson, Kim Picozzi, Richard Hoare, Robert Fyumagwa, Sue Welburn, Sarah Cleaveland. (2010) **The role of wildlife in the ecology of human African trypanosomiasis.** Poster presented at European Wildlife Disease Association meeting, Vlieland, Netherlands.

5.2 Publications ‘in press’ 2010 (JOURNALS)

Tiziana Lembo, Katie Hampson, Harriet Auty, Cari A. Beesley, Paul Bessell, Craig Packer, Jo Halliday, Robert Fyumagwa, Richard Hoare, Eblate Ernest, Christine Mentzel, Titus Mlengeya, Karen Stamey, Patricia P. Wilkins and Sarah Cleaveland (2010) **Examining the ecology of anthrax in Tanzania through serologic surveillance.** Emerging Infectious Diseases

Robert D. Fyumagwa^{1*}, Zablun Bugwesa¹, Maulid Mdaki¹, Donald Mpanduji², Morris Kilewo³ and Richard Hoare¹ (2010) **Comparison of anaesthesia and cost of two immobilization protocols in free-ranging lions.** South African Journal of Wildlife Research

5.3 Publications submitted and in review 2010 (JOURNALS)

Katie Hampson¹, Tiziana Lembo¹, Paul Bessell¹, Harriet Auty¹, Craig Packer², Jo Halliday¹, Cari A. Beesley³, Robert Fyumagwa⁴, Richard Hoare⁴, Eblate Ernest⁴, Christine Mentzel⁵, Titus Mlengeya⁶, Karen Stamey³, Keith Roberts⁷, Patricia Wilkins³, Sarah Cleaveland. **Predictability of anthrax infection in the Serengeti, Tanzania.** Journal of Applied Ecology

Kristin N. Harper^{1*}, Sacha Knauf, Robert D. Fyumagwa², Richard Hoare², Philemon N. Wambura³, Dorian Coppenhaver⁴, Robert Sapolsky^{5,6}, Susan Alberts⁷, Jenny Tung⁷, Fabian H. Leendertz⁸, and George J. Armelagos **Treponema infection associated with genital ulceration in wild baboons.** Journal of Veterinary Pathology

Bugwesa Zablun^{1*}, Robert D. Fyumagwa¹, Maulid Mdaki¹, Arias Marisa², Gallardo Carmina² and Richard Hoare¹ **Prevalence of African Swine Fever Virus in Warthogs in the Serengeti Ecosystem, Tanzania.** Journal of Veterinary Microbiology

5.4 Publications 2010 (OTHER)

Richard Hoare and Robert Fyumagwa (2010) **Anthrax Outbreaks in Wildlife in Tanzania.** TAWIRI – Messerli Foundation Wildlife Veterinary Programme Report. 9pp.

Bugwesa Zablon^{1*}, Robert D. Fyumagwa¹, Maulid Mdaki¹, Sayel Kuya² & Richard Hoare¹. (2010) **Sero-prevalence of *Brucella abortus* in the Livestock – Wildlife Interface of the Serengeti Ecosystem.** Proceedings of the 7th TAWIRI Scientific Conference, December 2009, Arusha.

Richard Hoare and Sian Brown (2010) **Snaring, Poaching and Snare Removal from Giraffes in Serengeti, Tanzania.** Giraffa Vol. 4 (1): 24-25. [Bi-Annual Newsletter of the IUCN International Giraffe Working Group (IGWG)]

5.5 Other publicity efforts

We gave several **illustrated talks** about the work of the veterinary programme to small groups of safari guides at the request of tourist company operators. The greatest veterinary interest in the tourist sector seems to be about zoonotic diseases and snare removal techniques.

Dr Bugwesa Zablon attended the **SabaSaba show** in Dar es Salaam where he helped to man the TAWIRI information stand.

We are working on the creation of a **website** for the wildlife veterinary programme.

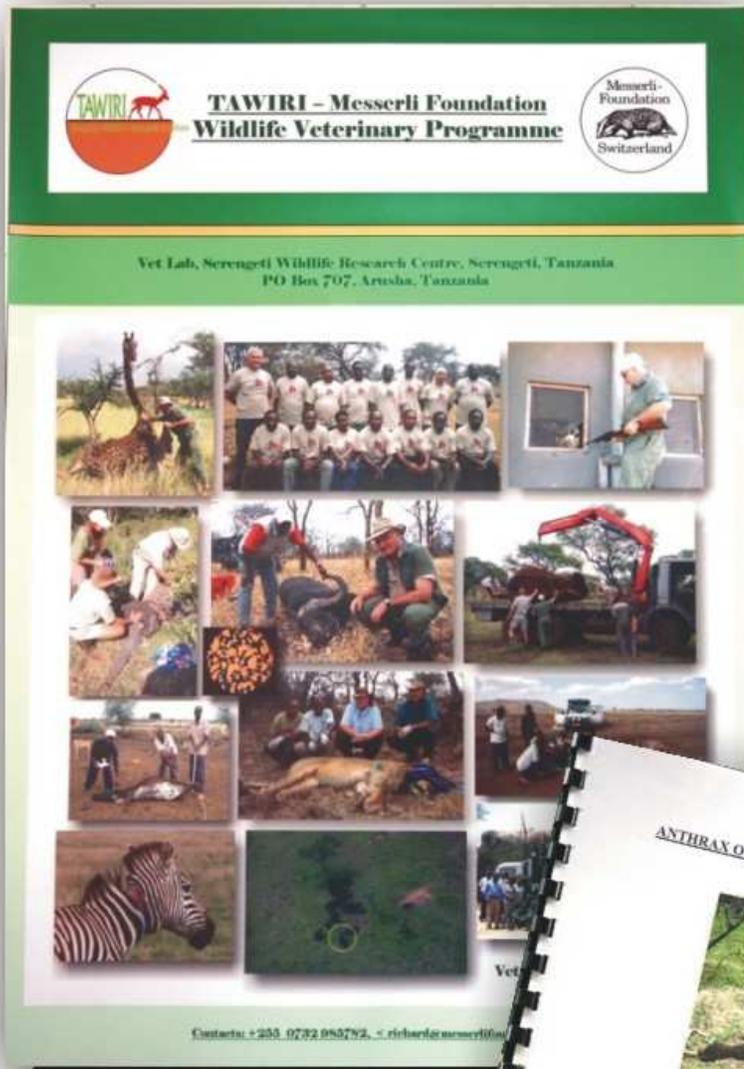
CDs with visual material were produced for other researchers as in previous years.

Sian Brown took still and video film footage of Dr Alfred Kikoti's elephant capture operation which was later used by him for important presentations on elephant conservation matters to the minister and the vice-president. During the operation she was asked by an independent national television channel to shoot an entire sequence of the capture of one elephant from the helicopter (searching, darting, radio-collaring and recovery). This was shown on the national television channel's news bulletin soon afterwards and then was to be used subsequently to make a documentary film on Dr Kikoti's elephant study in that area.

6 PROGRAMME ADMINISTRATION (routine activities are not reported)

A new 12 volt freezer was commissioned to expand storage capacity of the wildlife sample bank.

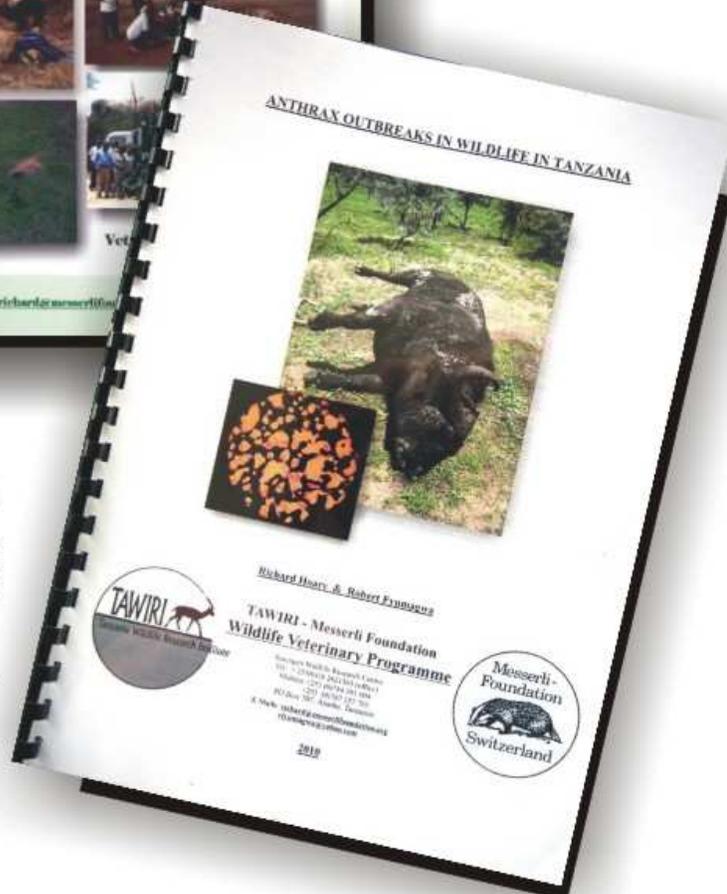
The entire veterinary laboratory building at SWRC was fitted with new roofing material.



**5. REPORTING,
PUBLICITY AND
PUBLICATIONS**

A poster depicting some practical work activities of the veterinary programme (above) was produced and first displayed at the Saba Saba show in Dar es Salaam where Dr Bugwesa Zablon assisted on the TAWIRI stand and handed out vet programme and snare leaflets to interested parties.

A small, non-scientific information booklet on Anthrax diagnosis and control (below) was also produced to assist wildlife authorities and personnel to understand the disease and deal with outbreaks affecting wildlife species.





5. REPORTING, PUBLICITY AND PUBLICATION

Dr Richard Hoare giving a presentation about the wildlife veterinary programme to safari guides (above) at the request of their tourism company (And Beyond). There is great interest from tour guides and companies in the work of wildlife research projects in Tanzania, and in our case specifically, most interest is shown in zoonotic disease conditions and snare removal from animals.

We have received very positive feedback and these talks are proving especially beneficial to conservation, as shown by an example later in the year. And Beyond staff saw a snared male lion and followed our recommended actions entirely. Employees in a vehicle stayed with the animal so it did not disappear; they telephoned us with details of the case; they also contacted the nearest TANAPA ranger post so their personnel could attend; and they arranged transport to collect the veterinary team who flew into the nearest airstrip (Kogatende, SNP).

All the participants are seen around the darted lion (below). The fresh but fortunately shallow wound was treated and we anticipated it would give no further problems. This case was also successful due to saving 85% time (half hour flight as opposed to three and a half hour drive) by the use of the TAWIRI aircraft.

Sadly it was sadly the last emergency case that the veterinary programme was able to use it for.

Such a successful combined snare operation with TANAPA rangers, and with a tourist company that had benefitted from the veterinary programme presentation is an excellent example of the valuable co-operation between different stakeholders which greatly assists conservation.



6. PROGRAMME ADMINISTRATION

The veterinary laboratory building at SWRC has been the base of the wildlife veterinary programme since its inception in 1992, and the Messerli Foundation have contributed substantial amounts to maintaining and equipping it. Due to the technical nature of the scientific and veterinary work in a very isolated location, and especially because of the value of the biological sample collection, the facility is self-sufficient in all power, water and communications needs. This year the roofing material was entirely replaced in the dry season and a ceiling was installed in one end section.

7 SUMMARY DISCUSSION

The wildlife veterinary programme has completed another very successful year in 2010. The **portfolio of research on wildlife disease** has made steady progress and we have continued to make important contributions to the gradual understanding of these complex conditions.

Human-elephant conflict research and associated advisory work is starting to really contribute to mitigating this serious problem countrywide and the reviewed national elephant management plan (TEMP) and the forthcoming formation of a HWC Forum are very significant steps to assist the government.

Our outputs at the scientific and popular level are considerable for such a small programme and reflect wide collaboration with experts worldwide. In 2010 the published outputs covering a huge variety of subjects, were more than in any preceding year. The training programme is following a path that exposes both professionals, students and the wider public to valuable new experiences.

Routine activities like animal capture, laboratory diagnostic services, sample processing and sample storage and use of the TAWIRI aircraft provided valuable support to other research or conservation projects. After three and a half years of very valuable use on the veterinary programme, staff developments at head office necessitated the aircraft be returned to TAWIRI in October 2010.

With regard to **future activities in 2011** we look forward to continuing progress on all fronts as follows:

In disease research in the coming year we hope to: (i) greatly assist **FMD** virus research efforts (ii) collect samples from gazelles for screening for **PPR** (Peste des Petits Ruminants - a virus disease of small livestock related to Rinderpest), whose expansion into East Africa is starting to raise concern and (iii) try to collect fetal membrane samples at wildebeest calving time to test for **Brucella** bacteria. We also hope to set up collaboration with experts to interpret histopathology in tissue samples.

In HEC work we look forward to the significant steps of: (i) the formation of a **forum for HEC** in Tanzania and (ii) completion of a **Swahili film on HEC** mitigation to help affected small-scale farmers.

For animal handling work we have organized two improvements for cases of **injured elephants**: (i) two simple **radio-collars** in order to relocate animals where wounds need follow-up treatment; and (ii) a **metal detector** to try to locate metal objects (e.g. bullets, arrowheads, wire) lodged in animal tissue.



REFERENCES for Human-elephant conflict text

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Within Tanzania, we express our gratitude to the following: the former Minister for Natural Resources & Tourism, the Hon. Shamsa Mwangunga (MP); the acting Director of Tanzania National Parks, Mr Edward Kishe and his staff; the Director of Wildlife Mr Erasmus Tarimo and his staff in the Wildlife Division; the Chief Park Warden of Serengeti National Park, Mr Mtango Mtahiko and his staff; the Chief Conservator of Ngorongoro Conservation Area Authority, Mr Bernard Mrunya and his staff members.

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There are many people to acknowledge so we apologize if anyone has been forgotten, and ask that they bring this to our attention.

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