



## **Seminar on Ecohealth and Wildlife Health for Kabul University and Kabul Zoo Students and Staff**

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### **Summary**

The health interface team from Wildlife Conservation Society - Afghanistan organized a one-day seminar on wildlife and ecosystem health in Afghanistan, in collaboration with Kabul University’s Faculty of Veterinary Science and the Kabul Zoo. A total of 46 people (39 males and 7 females) attended the event which focused on health of wildlife within the holistic framework of “One Health”. Results of the post-seminar test taken by 42 participants revealed that 75.8% of the responses were accurate, vs. only a 30.1% accuracy rate on the test before the training. 33 Dari and 13 Pashtu booklets on wildlife diseases in Afghanistan published in 2011 by USAID/WCS were also distributed to the participants.

### **Introduction**

In 2006 WCS established an office in Afghanistan and has been working since to protect threatened wildlife species and landscapes. Wildlife health is just one of its many components. It specifically works to decrease the risk of disease at the interface between livestock, wildlife and humans by reducing health risks and inspiring Afghan health professionals through education. The goal of this seminar was to introduce to the (38) veterinary students completing their degree to a group of four faculty members from Kabul University, and four senior staff from the Kabul zoo (Appendix 1) the concept of ecohealth (also known as environmental health) and the role of wildlife in the ecology of infectious agents through a variety of lectures (Refer to appendix 2). The participants were also introduced to specific examples of a number of peripheral topics, including ecotoxicology and wildlife tranquilization.

### **Background Information on the Ecohealth Program Seminar**

On November 11, 2013, Dr. Ali Madad “Rajabi” gave a lecture on the concept of ecohealth and how WCS applies it across its projects worldwide. The Wildlife Conservation Society has a vibrant zoological health program at its zoos in New York City; Bronx, Central Park, Brooklyn and Queens; and its Aquarium, and is a leader at improving zoological health standards across the world. Globally WCS is also working in numerous countries across Asia, America and Africa, and operates more than 60 wildlife health projects in more than 30



Plate 1: Dr. Ali Madad “Rajabi”, WCS resident veterinarian, gives a presentation on disease risk at wildlife/livestock interface to final-year veterinary students of Kabul University and Faculty members, November 11, 2013, Kabul Zoo conference hall.

countries. WCS supports, develops and improves ecohealth initiatives and environmental conditions in an equitable and sustainable manner.

### **Topics presented**

***The disease risk at wildlife/livestock interface*** - Dr. Ali Madad “Rajabi” also gave a lecture on disease risk at wildlife/livestock interface and discussed disease transmission mechanisms between species. He illustrated his lecture with three recent cases of disease outbreak in Central Asia. In northern Pakistan, blue sheep (*Pseudois nayaur*) were affected and died of mange, possibly transmitted by domestic sheep and goats from 1996 - 2006. In southern Tajikistan in 2010, markhors (*Capra falconeri*) died in large numbers because of *Mycoplasma capricolum* transmitted by domestic goats sharing the same habitat. The role played by Mongolian gazelles (*Procapra gutturosa*) in the foot and mouth disease (FMD) outbreaks affecting livestock populations of the Eastern Steppes of Mongolia was extensively discussed in light of recent publications. As a local example, the participants were briefed on the benefits of a large-scale FMD vaccination campaign of cattle and domestic yaks in Wakhan District. These campaigns decrease the number of clinically sick animals and the risk of dissemination of FMD virus across the landscape to susceptible wildlife hosts. The ecological coherence of this operation compared to other livestock vaccinations (eg. against enterotoxemia) is that it decreases the risk of a FMD outbreak in wildlife, improves dairy production to reduce human

malnutrition in the area, yet without increasing significantly livestock numbers, which is a cause of overgrazing, range degradation and wildlife disappearance.

***An overview of WCS ecohealth activities in Afghanistan*** - Dr. Hafizullah “Noori” gave a presentation on the principles of ecosystem health using as concrete examples the activities and achievements of the WCS Health Interface Team (HIT) in Afghanistan.

In Badakhshan Province, HIT worked exclusively in the impoverished and isolated Wakhan District. A large part of the work involved detecting (through questionnaire surveys, clinical examinations and laboratory investigations on collected biological samples) the presence of endemic or epidemic diseases prevailing in livestock sharing habitat with valuable wildlife species. An important discovery was the endemic presence of FMD in the area, and the selection of an appropriate vaccine that was used very successfully in mass vaccination campaigns of cattle and yak between 2009 and 2013.

Another important finding allowing the team to better understand the spatial distribution of diseases in Afghanistan was the very low prevalence, or lack of a number of infectious diseases allegedly common in this part of the world, such as brucellosis, bovine tuberculosis or glanders. These three diseases being zoonosis, human health services present in the area were informed of these important discoveries, which allowed them to optimize their diagnostic discrimination and health services delivered to the population. An important effort was also devoted to monitor livestock numbers in upper Wakhan Valley and to learn more on their landscape utilization in connection with the habitat of the Marco Polo sheep. This initiative tried to identify the areas of highest risk of disease spill-over between livestock and wildlife.

Since 2006 HIT has been working to develop the capacity of local technical and governmental staff with varying levels of expertise. The types of training they were exposed to included surveillance of wild birds for zoonotic risk, and reservoir of emerging pathogens; principles of wildlife health; waterfowl population monitoring; wildlife immobilization; and wildlife medicine practices.

HIT also developed two long-term ecohealth monitoring projects in Kabul. The first intends to monitor the availability of veterinary diclofenac in Kabul veterinary drug retailers (diclofenac residues in dead livestock have caused the quasi-extinction of three vulture species in southern Asia) and evaluate the extent of use of this drug by veterinarians and paraveterinarians in Afghanistan. This work began in 2008 and will have been completed by the end of 2013. The other initiative consists of monitoring the birdlife trade at Ka Farushi bird market in Kabul, and the occurrence of mass mortality events.

***Diclofenac threat to vultures in Afghanistan*** - Dr. Ali Madad “Rajabi” lectured on the threat posed by diclofenac, a non-steroidal anti-inflammatory drug to vultures. Carcasses of livestock previously treated with diclofenac may hold residues of this drug that have been proven highly toxic to scavenging *Gyps* vultures. By using diclofenac on their livestock, humans attempt to treat them, yet when livestock die despite this treatment, they expose scavenging vultures to the toxicity of diclofenac residues and contribute indirectly to the destruction of a pivotal species in the ecosystem. Among other ecosystem services vultures contribute to the removal

of dead, sometimes contagious, animals from the environment. Since 2007 WCS's HIT has been monitoring the availability and use of veterinary diclofenac in Afghanistan. By raising public attention on the ecological risk posed by diclofenac, WCS tries to highlight the major health service (i.e. removal of dead infectious animal at no cost and reduction of disease propagation) provided by vultures to the society and to livestock health at large. Management of diclofenac exposure risk emphasizes the importance of an integrative approach to health across ecosystems and their human societies.

***An example of serological surveillance of livestock in Wakhan District*** - Dr. Hafizullah "Noori" lectured on the usefulness of serological surveillance of livestock as a comprehensive method to better understand disease prevalence in Afghan districts. Hence he shared updated knowledge on the exposure of livestock to bluetongue, brucellosis, bovine tuberculosis, *Peste des Petits Ruminants*, rinderpest, FMD, contagious caprine pleuropneumonia, contagious bovine pleuropneumonia, Q fever, chlamydia, toxoplasmosis and glanders in the north-east of Afghanistan. He showed to which extent these diseases were posing a risk to wildlife and humans and discussed the method useful to control their propagation in the district of Wakhan.

***Snow leopard capture and tranquilization*** - Chemical immobilization of wildlife is a topic most veterinary practitioners want to learn more about when introduced to wildlife medicine. WCS has provided this type of training to numerous Afghan veterinarians in Kabul, including staff at the Kabul Zoo, and even produced a concise document in Dari detailing the main combinations and dosages required to tranquilize most terrestrial wildlife species occurring in Afghanistan. Dr. Hafizullah "Noori" taught wildlife immobilization using the recent snow leopard captures in Wakhan as an example. Besides technical aspects of tranquilization and anesthesia monitoring, he also introduced the reasons for studying the ecology of snow leopards, and explained the basics of satellite telemetry.

### **Topic practiced**

***Preparation of anesthetic darts*** - Dr. Hafizullah "Noori" and Ali Madad "Rajabi" taught trainees the principles and usage of darting, dart preparation, and adjustment of the CO<sub>2</sub> pressure gauge according to target distance. Each trainee had the opportunity to prepare darts and to practice darting-on-target at different distances from 5 to 10 meters. This practical exercise experienced at the end of a long series of theoretical presentation was most welcomed by attendees.



Plate 2: Dr. Hafizullah “Noori”, WCS resident veterinarian, explains technical aspects of wildlife tranquilization to final-year veterinary students of Kabul University and Faculty members, November 11, 2013, Kabul Zoo conference hall.

## **Conclusion**

The topics introduced during this seminar were novel to most veterinary students (as demonstrated by the results of a pre-seminar test), and to a lesser extent to their faculty staff. Participants from the Kabul zoo also benefitted from refresher training, but also gained new knowledge on animal health. The seminar was also a chance for WCS to connect veterinary students and their teachers to the management staff of Kabul Zoo, hopefully generating future collaboration between the two groups, and to inspire others to pursue careers in this field.

The topics presented to students were well understood. On average 75.8% of the 10 questions from the post-seminar test were correctly answered by 42 trainees, versus only 30.1% to the same test before the seminar. Although this sample size (too small for females and heavily skewed towards males) did not allow for a robust statistical analysis, it seems that female students had a higher final understanding of the material shared than males, or 81.4% of correct responses to the post-seminar test versus 74.7% for males. However, the progress in understanding, as measured by the difference in correct answers between post- and pre-seminar tests, was identical between genders, at +45.7% of correct answers.

**Appendix 1:** List and affiliation of the 39 male and 7 female trainees who attended the WCS ecohealth training in Kabul Zoo, November, 11 2013.

#	Name	Affiliations	Sex	Province	Phone Number
1	Rahima	Student	Female	Samangan	0781193261
2	Nastaran	Student	Female	Nangarhar	0781560493
3	Gulaqa	Student	Male	Parwan	0788334528
4	Wagma	Student	Female	Kunduz	0790743724
5	Hamida	Student	Female	Ghazni	0798000379
6	Sayed Ahmad	Student	Male	Herat	0700445363
7	Mahmood	Student	Male	Ghazni	0784028553
8	Abdul Raof	Student	Male	Samangan	0798435074
9	Mujtaba	Student	Male	Sar-e-Pol	0795956815
10	Khaladin	Student	Male	Takhar	0799223110
11	Maliha	Student	Female	Wardak	0707078829
12	Mohammad Farid	Student	Male	Nangarhar	0787537933
13	Wahab	Student	Male	Kabul	0786333457
14	Gulrahim	Student	Male	Wardak	0777872160
15	Khawaja M. Edris	Student	Male	Kabul	0772369179
16	Mohajer	Student	Male	Wardak	0789916605
17	Mohammad Nabi	Student	Male	Ghazni	0796686466
18	Khuja Kabir	Student	Male	Kabul	0782040720
19	Sayed Hussain	Student	Male	Paktia	0771404221
20	Shabnam	Student	Female	Ghazni	0797237743
21	Naqibullah	Student	Male	Kapisa	0784181770
22	Nasratullah	Student	Male	Kapisa	0774092008
23	Sahar	Student	Femal	Kabul	0785587667
24	Muneer Ahmad	Student	Male	Takhar	0790727470
25	Sulaiman	Student	Male	Kabul	07871465875
26	ahKefayatull	Student	Male	Kapisa	0797247008
27	Shafiq Ahmad	Student	Male	Balkh	0787400780
28	Jawid	Student	Male	Panjshir	0797205486
29	Abdul Qayum	Student	Male	Ghazni	0770481036
30	Ahmad Zahid	Student	Male	Kapisa	0772727483
31	Mirwais	Student	Male	Takhar	0700738173
32	Enayatullah	Student	Male	Parwan	0772195231
33	Mohammad	Student	Male	Faryab	0777544974
34	Mohammad Arif	Student	Male	Kabul	0787282384
35	Muhammad Naman	Student	Male	Laghman	0787429813

36	Haseeb-ur-Rahman	Student	Male	Kabul	0798981335
37	Walid Mohamood	Student	Male	Kabul	0788199556
38	Abdul Qaium	Students	Male	Kabul	0773177327
39	Dr. Sayed Arif	Faculty	Male	Kabul	0793430403
40	Dr. Jahid	Faculty	Male	Ghazni	0773401378
41	Dr. Sayed Ahmad	Faculty	Male	Takhar	0700182593
42	Dr. Musa	Faculty	Male	Kabul	0798139836
43	Dr. Abdul Qadir	Kabul Zoo vet	Male	Kabul	0705071505
44	Dr. Jamshid	Kabul Zoo vet	Male	Kabul	0794444504
45	Najibullah Nazari	Education manager	Male	Kabul	0795646306
46	Mr Azizullah Saqib	Kabul Zoo Director	Male	Kabul	0700285852

## Appendix 2: Training agenda

*Attendance:* A total of 46 people attend the training, including 31 male and 7 female final-year veterinary students, 4 male faculty members of Kabul University, 2 male veterinarians, the director and the education manager of Kabul Zoo

*Topics:* Ecohealth training

*Duration:* One day (November, 11 2013)

*Main venue:* Kabul Zoo conference hall

*Trainers:* Drs. Ali Madad “Rajabi” & Hafizullah “Noori” (WCS Health Interface Team)

*Teaching language:* Dari

Time	Description	Speaker
09:00-09:10	Arrival and completion of attendance forms	
09:10-09:20	Welcome speech	Mr. Anthony Simms, WCS
09:20-09:25	Recite Holly Quran	Dr. Hafizullah “Noori”
09:25-09:35	Pre-test evaluation	
09:35-10:00	General Introduction on WCS and ecosystem health programs	Dr. Ali Madad “Rajabi”
10:00-10:30	WCS ecosystem health activities in Afghanistan	Dr. Hafizullah “Noori”
10:30-10:45	<b>Tea break</b>	
10:45-11:10	The disease risk at wildlife/livestock interface	Dr. Ali Madad “Rajabi”
11:10-11:50	Livestock disease screening results in Wakhan District	Dr. Ali Madad “Rajabi”
11:50-12:10	<b>General discussion</b>	Drs. Hafizullah “Noori” & Ali Madad “Rajabi”
12:10-01:30	<b>Lunch and Pray time</b>	
01:30-02:00	Snow leopard capture program in Wakhan	Dr. Hafizullah “Noori”
02:00-02:30	Demonstration of darting equipment and free discussions concerning wildlife tranquilization	Dr. Ali Madad “Rajabi” & Hafizullah “Noori”
02:30-02:45	<b>Tea break</b>	
02:45-03:15	The diclofenac threat to vultures in Afghanistan	Dr. Ali Madad “Rajabi”
03:15-03:45	Post-test evaluation and distribution of the Wildlife Disease field-guide to all trainees	