

**REPORT OF THE MEETING OF THE OIE WORKING GROUP  
ON WILDLIFE DISEASES****Paris, 20 – 23 February 2006**

The meeting of the OIE Working Group on Wildlife Diseases was held from 20 to 23 February, 2006 at the OIE Headquarters in Paris. The second day of the meeting was devoted to a special session on Avian Influenza and the role of wild birds. The Working Group was joined by 13 invited experts from a variety of disciplines. The symposium was opened by Dr Bernard Vallat, Director General of the OIE. He emphasised the growing importance of wildlife and their diseases internationally, and the steps taken by OIE to assist member countries to improve wildlife disease surveillance and reporting. He thanked the Working Group for their increasing involvement in addressing wildlife related animal disease issues and emerging zoonoses and urged Member Countries to continue to supply the Working Group with relevant wildlife disease information. Dr Vallat indicated that the current Avian Influenza epizootic had become a major international issue, and that OIE was under pressure to provide information on management of the disease in poultry and wild birds. It is for this purpose that provision was made to reserve the second day of the meeting of the Working Group for dedicated discussions with invited experts on the role of wildlife in the epidemiology of Avian Influenza. He emphasised two main objectives for the Working Group namely the improvement of information flow on the worldwide situation of Avian Influenza in wildlife of all species, and how to reduce the risk linked to wildlife for transmission of Avian Influenza to domestic animals.

The meeting was chaired by Dr Roy Bengis and Dr Ted Leighton was appointed as Rapporteur.

The agenda and list of participants for the Wildlife Disease Working Group meeting and the Agenda and the List of Participants for the Special session on Avian Influenza are given in Appendices I – IV.

**1. Global disease situation in wildlife in 2005**

One of the missions of the OIE Working Group on Wildlife Diseases is the collection, analysis and dissemination of vital information regarding diseases in wildlife, including those that cross the interface between wildlife, domestic animals and humans. Emerging diseases, such as those caused by the current highly pathogenic avian influenza H5N1 lineage, illustrate the importance of communicating this wildlife information to OIE, Member Countries, and institutions working with wildlife, domestic animal and public health

Although the global distribution of reports received has never been uniform, the quality and coverage of reporting from several regions has been excellent. There is however a need to improve reporting from several regions, including South America, Asia, the Middle East and the western and equatorial regions of Sub – Saharan Africa. This suggests that the CVO's of certain Member Countries may not be appointing wildlife disease contact persons and that reporting wildlife diseases to OIE Wildlife Working Group has not been afforded the priority required to be effective. The Working Group on Wildlife Diseases urges that a contact person be clearly designated for each Member Country as soon as possible. The Working Group also requests the inclusion in the Wildlife Disease Questionnaire of all of the Listed Diseases that may have occurred in wildlife and which may have already have been reported to OIE Central Bureau during that year.

Response to the request for the reporting of diseases in wildlife species to the OIE, continued to be unsatisfactory with information from large geographic areas not being reflected in the questionnaire of the OIE Wildlife Disease Working Group. Reports were received from 65 of the 167 OIE Member Countries while there were 864 reported cases of diseases in wildlife. The report is attached as Appendix VI.

### 1.1. OIE Listed diseases reported

#### *African swine fever (ASF)*

An outbreak of ASF in domestic pigs was reported from the Adjumani district of Uganda, where more than 2000 pigs died within a period of 2 weeks. The original source of infection was probably infected tsetse flies (*Ornithodoros porcinus*), or pigs scavenging on carcasses of warthogs (*Phacochoerus africanus*) or giant forest hogs (*Hylochoerus meinertzhageni*) followed by horizontal pig-to-pig transmission.

#### *Anaplasmosis*

In Zambia, anaplasmosis was detected in bushbuck (*Tragelaphus scriptus*), puku (*Kobus vardoni*) and lechwe (*Kobus leche*).

*Ehrlichia phagocytophilum* was reported in France for the first time in a 10-day old chamois (*Rupicapra pyrenaica*), found dead in massif du Bazès (Hautes Pyrénées).

#### *Anthrax*

A significant outbreak of anthrax in hippopotami (*Hippopotamus amphibius*) occurred in the Queen Elizabeth National Park, Uganda. This outbreak started in July 2004 but continued to smoulder well into 2005. It was reported that in excess of 10% of the Park's 2,700 hippos succumbed to the disease. A secondary peak of anthrax cases, this time involving mainly buffalo (*Syncerus caffer*) was reported later. A major anthrax vaccination campaign for all livestock bordering on the Park was successfully completed.

Anthrax is reported every year from certain areas of Namibia, which are endemically infected with this disease. In 2005, anthrax was confirmed in 9 wildebeest (*Connochaetes taurinus*), 15 zebra (*Equus burchelli*), 7 springbok (*Antidorcas marsupialis*), 6 gemsbok (*Oryx gazella*), 5 elephants (*Loxodonta africana*), 2 cheetahs (*Acinonyx jubatus*), 1 red hartebeest (*Alcelaphus buselaphus*), 1 black rhinoceros (*Diceros bicornis*), 1 greater kudu (*Tragelaphus strepsiceros*), 1 African wild cat (*Felis sylvestris*) and 1 ostrich (*Struthio camelus*).

Outbreaks of anthrax in chimpanzees (*Pan troglodytes*) in Ivory Coast as well chimpanzees and gorillas (*Gorilla gorilla*) in Cameroon were reported and confirmed. It is the first time the disease has been detected in these unusual victims, and the origin of the infection is unknown. A recent publication indicates that the anthrax strains involved in these tropical west African outbreaks are novel, with significantly different nucleotide sequences when compared to the ubiquitous A strain and southern African B strain. These 2 new strains have been designated CI and CA.

In Mozambique, anthrax is suspected as the cause of a cluster of mortalities in bushbuck (*Tragelaphus scriptus*) in Gorongosa National Park

An outbreak of anthrax involving mainly cattle was reported from the Bikita area of Masvingo Province in Zimbabwe. At least 3 human deaths have been recorded during the current outbreak. Sporadic cases were also reported in impala (*Aepyceros melampus*), giraffe (*Giraffa camelopardalis*) and wildebeest in the area. This area, the adjoining Save River Conservancy and Malilangwe Wildlife Reserve also recorded significant outbreaks of anthrax in cattle and wildlife in 2004.

An outbreak of anthrax involving cattle, donkeys, camels, greater kudu and the rare and endangered Grevy's zebra (*Equus grevyi*), in the area of the Samburu, Buffalo Springs and Shaba, in the northern districts of Kenya is still under investigation. To date, 43 Grevy's zebra have succumbed to the disease. Several human fatalities have also been recorded. A major vaccination campaign of the endangered Grevy's zebra as well as livestock is underway.

Anthrax was also reported in hippopotami in Zambia

### ***Avian cholera***

In Canada, a major epidemic of avian cholera occurred in 2005 at a large nesting colony of double-crested cormorants (*Phalacrocorax auritus*) in Saskatchewan, with total mortality in the range of 20-50% of the colony (>2000 birds). Avian cholera also occurred in common eider (*Somateria mollissima*) on nesting colonies in the St. Lawrence estuary of Quebec and at several locations on northeastern Hudson's Bay.

Avian cholera was also reported in 12 flamingoes (*Phoeniconaiasis spp*) in Kenya

### ***Avian influenza***

(See also summary report of meeting held on 21 February 2006, para. 7 page 15)

In 2005, Canada carried out a nation-wide survey for influenza A viruses in healthy wild ducks, in order to better understand the strains and prevalence of benign infections in wild birds. Cloacal swabs were taken during routine banding operations across six major migration corridors and assessed initially by PCR for the presence, first, of any influenza A viruses and then, if present, for H5 and H7 strains. The H5 strains thus discovered were immediately analysed at Canada's National Centre for Foreign Animal Diseases to determine pathogenicity and genetic relatedness to other known strains. Overall, 4409 samples were analysed and 1604 (36%) were found to contain one or more influenza A viruses. Of these 1604, 254 included H5 strains and these H5s were found to be low pathogenicity strains of North American origin. No H7 strains were confirmed in these samples. Influenza A viruses also were detected in wild birds found dead and examined in Canada's national wildlife disease surveillance program. Again, all H5 strains were found to be of low pathogenicity and of North American origin, and no H7 strains were detected.

Avian influenza viruses have been isolated in New Zealand, all have been low pathogenic avian influenza from clinically healthy Mallard Ducks. All isolations have been in wild waterfowl.

New Caledonia surveyed 588 waders with negative results.

In Australia virology in 2005 (>1200 waders) has not resulted in any significant viral isolations. However serology does reveal influenza A antibodies in wild birds, with prevalence varying widely from survey to survey. This suggests that AI viruses are circulating endemically in wild birds in Australia.

Singapore tested 508 birds for avian influenza with uniformly negative results. Tested species included plovers, kingfishers, sandpipers, and others

In Ireland, more than 1,000 wild birds have been tested since 2003. No isolates of subtype H5 or H7, no evidence of illness or large scale die offs have been detected, although 12 low pathogenic viruses were isolated.

In South Africa, sampling of migratory *Charadriiformes* such as little stints (*Calidris minuta*) and white winged terns (*Chlidonias leucopterus*) in the Northern Cape Province, gave negative results.

The investigation of a mortality cluster involving mainly European swallows (*Hirundo rustica*) in Malawi failed to find any indication that HPAI was involved.

Control appears to have been achieved of the H5N2 outbreak in farmed ostriches (*Struthio camelus*) in the Eastern and Western Cape Provinces of South Africa,

More recently, another outbreak involving the H5N2 strain has been reported in farmed ostriches in Zimbabwe. Mortality was low and the disease has been contained to two infected farm units, which carry a total of approximately 200 birds.

The OIE Central Bureau received the following reports in 2005 of confirmed highly pathogenic avian influenza H5N1 outbreaks in wildlife:

- China – bar-headed geese (*Anser indicus*), black-headed gull (*Larus ridibundus*), brown-headed gull (*Larus brunicephalus*), ruddy shelduck (*Tadorna ferruginea*), great cormorant (*Phalacrocorax carbo*)
- Hong Kong – Peregrine falcon (*Falco peregrinus*), Oriental magpie robin (*Copsychus saularis*), Chinese pond heron (*Ardeola bacchus*)
- Mongolia – bar-headed goose, whooper swans (*Cygnus cygnus*)
- Croatia – “swan”
- Cambodia – “wild birds”

The outbreaks of HPAI involving poultry in Egypt and Nigeria, is reason for concern. These are the first documented spread of the pandemic H5N1 strain onto the African continent. The Group also expressed concerns regarding the inconsistent identification of wild birds in which HPAI has been recorded and strongly encourages proper identification, including scientific names, for affected species.

### ***Bluetongue***

Bluetongue virus type-1 was isolated in late 2004 in the United States from a wild white-tailed deer (*Odocoileus virginianus*) in Louisiana in which orbiviral hemorrhagic disease was suspected. This is the first isolation of BTV-1 in North America and the origin is undetermined. Surveillance of cattle and wild deer in the area is underway to determine the distribution of the virus.

### ***Brucellosis***

*Brucella* infection (unspecified) was detected in 28 lechwe in Zambia

Bovine brucellosis remains endemic in the United States in wild wapiti (*Cervus elaphus*) and bison (*Bison bison*) in the Greater Yellowstone Area. Several management strategies, including vaccination of wapiti, test and slaughter, elimination of artificial winter feeding, and population reductions are being evaluated or are under consideration.

Bovine brucellosis remains endemic in free-roaming herds of wood bison (*Bison bison* subsp. *athabascae*) in and around Wood Buffalo National Park in northern Canada. A bison management plan is in place that includes no-bison buffer zones, killing of stray bison, and other measures to minimize risk of disease spread to healthy wild bison, farmed bison or cattle.

Rangiferine brucellosis (*B. suis* biovar 4) remains endemic in major herds of free-roaming caribou from Alaska to Hudson Bay, but not east of Hudson Bay, in northern Canada. Movement controls are in place to prevent the translocation of these species from endemic areas to any other place in Canada.

Rangiferine brucellosis also remains endemic in a free-roaming herd of reindeer near Tuktoyaktuk in the Northwest Territories in extreme northern Canada. Movement controls are in place to prevent the translocation of these species from endemic area to any other place in Canada.

### ***Classical swine fever***

For the first time since 1918, classical swine fever has been re-introduced into South Africa. A stamping out policy has been adopted and appears to have been successful in eradicating the disease in the Western Cape Province. Eradication of CSF in communal free-ranging pigs in the Eastern Cape Province has proved much more challenging, and is possibly complicated by the presence of feral pigs and indigenous

bushpigs (*Potamochoerus larvatus*) in the area. The susceptibility of warthogs and bush pigs to CSF virus, and their potential role in the epidemiological maintenance of the disease will be studied under controlled conditions, this year.

In Europe, no more circulation of the virus among wild boars (*Sus scrofa*) was registered in Eifel, Luxemburg and Mosel since 2004, active surveillance is ongoing. The focus in the Rhinany Palatinate/Vosges du Nord is still active; vaccination is ongoing since spring/summer 2004 in Germany and France. Up to one half million vaccine baits have been distributed solely in France. Up to 80% of adults and only 50% of juveniles have seroconverted. Unfortunately the virus continued moving south in 2005 up to the Highway 4, which was an efficient barrier during the previous outbreak from 1992-2002. Apparently the vaccination did not stop progression in wild boars in France despite a significant decrease in the number of cases.

### ***Cysticercosis***

Cysticercosis was reported in six Arabian oryx (*Oryx leucoryx*) in Saudi Arabia and in an African buffalo in Kenya.

### ***Echinococcosis***

A high prevalence of *Echinococcus granulosus* infection was found in necropsied lions (*Panthera leo*) in the Kruger National Park in South Africa.

Hydatid disease was reported in a single sable antelope (*Hippotragus niger*) in Zimbabwe, in 2 buffalo (*Syncerus caffer*) in Zambia and a chimpanzee (*Pan troglodytes*) in Kenya

In Switzerland, *Echinococcus multilocularis* infection occurs focally in beaver (*Castor fiber*).

### ***Foot and mouth disease (FMD)***

In South Africa, 206 African buffalo were sampled in the Kruger National Park. Most buffalo older than 10 months of age were sero-positive, and several SAT 1 and SAT 2 viral topotypes were isolated from probang samples.

FMD virus infection was also detected in 8 buffalo and 60 lechwe in Zambia.

### ***Leptospirosis***

Leptospirosis was reported in 17 captive pumas (*Felis concolor*) in Taiwan.

### ***Lumpy skin disease***

Lumpy skin disease was reported in impala (*Aepyceros melampus*) in Zambia.

### ***Newcastle disease***

Newcastle disease in farmed ostriches was reported and confirmed in five different localities in South Africa.

In Ethiopia, Newcastle disease was responsible for multifocal clusters of deaths involving non migratory local doves and pigeons (*Columbidae*).

In the United States, Newcastle disease was diagnosed in 13 double-crested cormorant fledglings at a national wildlife refuge in Nevada. Genetic characterization indicated strong homology to NDV strains from cormorants in the USA since 1992, but no relationship to the outbreak strain in poultry in California, Nevada, and Texas in 2002-2003.

Singapore tested 508 birds for Newcastle Disease virus with uniformly negative results. Tested species included plovers, kingfishers, sandpipers, and others.

In July 2005, an outbreak of ND has been recorded in Loire Atlantique (France) in more than 300 farmed pheasants and partridges (species not given). Soon after the suspicion all birds were culled and no further cases were recorded.

### ***Paratuberculosis***

Focal clusters are present in Austria, Belgium, France, Ireland, Italy, and the United Kingdom in roe deer (*Capreolus capreolus*), red deer (*Cervus elaphus*), chamois (*Rupicapra rupicapra*), fallow deer (*Dama dama*), mufflon (*Ovis musimon*), ibex (*Capra ibex*), red fox (*Vulpes vulpes*), marmot (*Marmota marmota*), and red grouse (*Lagopus lagopus scoticus*).

### ***Q Fever***

Q fever was reported in three Arabian oryx (*Oryx leucoryx*) in Saudi Arabia.

### ***Rabies***

In South Africa sporadic cases of rabies involving the viverrid biotype were confirmed in 22 yellow mongoose (*Cynictus penicillata*), 2 slender mongoose (*Herpestes sanguinea*), 1 Selous mongoose (*Paracynictus selousi*), 2 small spotted cats (*Felis nigripes*) and 2 common genet (*Genetta genetta*). Also in South Africa, cases of rabies involving the canid biotype were diagnosed in 14 bat-eared foxes (*Otocyon megalotis*), 3 black backed jackals (*Canis mesomelas*) 2 side striped jackals (*Canis adustus*) 3 aardwolves (*Proteles cristata*) and an African civet (*Civettictus civetta*).

In Namibia, rabies was reported in 24 greater kudu, 14 black backed jackal, 1 aardwolf, 1 suricate (*Suricata suricata*), 1 eland (*Taurotragus oryx*), 1 Cape fox (*Vulpes chama*), 1 wild dog (*Lycaon pictus*) and 1 common duiker (*Syvicapra grimmia*).

Once again, significant mortalities were reported in the endangered Ethiopian wolves (*Canis simensis*) in the Bale mountains of Ethiopia. In spite of the fact that 35000 domestic dogs in the region were vaccinated, over 70 cases of rabies were still reported in domestic dogs. Oral bait vaccination of the wolves is being considered.

In Zimbabwe, rabies was reported in 2 groups of wild dogs in the Bube region, and also in 7 jackals and a single buffalo.

In Zambia, rabies was reported in a single mongoose and 6 wild dogs.

In Morocco, rabies was reported in red fox (*Vulpes vulpes*)

In the United Kingdom, surveillance of free-living species in 2005 yielded negative results for all 966 animals tested.

Sporadic focal outbreaks of rabies in Israel were reported in foxes (*Vulpes sp*), wolves (*Canis lupus*), badgers (*Meles meles*) and stray dogs (*Canis familiaris*). Some spillover into domestic dogs and cattle occurred. The molecular RNA of the rabies strains in Israel is said to be similar to strains encountered in Syria. Oral vaccination is practiced for canines.

In Iran, rabies was reported in 27 foxes (*Vulpes sp*) jackals (*Canis aureus*), squirrel (*Sciurus anomalous*), mink (*Mustela spp*), and wild boar (*Sus scrofa*). Rabies also was reported in domestic cattle, buffalo, sheep, goats, dogs, cats and donkeys.

### ***Trichinosis***

In Russia, human cases occurred following consumption of meat from wild animals including bear and badger. In another case, European hunters became clinically infected after consuming bear meat in Canada.

A *Trichinella* parasite was found infesting a wolf (*Canis lupus*) in Italy.

### ***Tuberculosis (Mycobacterium bovis)***

#### North America:

In Canada, *Mycobacterium bovis* infection remains endemic in free-roaming herds of bison (*Bison bison*) in and around Wood Buffalo National Park (WBNP) in northern Canada. A bison management plan is in place that includes no-bison buffer zones, killing of stray bison and other measures, to minimize risk of disease spread to healthy wild bison, farmed bison or cattle.

Six cases of bovine tuberculosis (BTB) were confirmed in 2005 in a wild bison conservation project established in 1996 through the capture of neonatal wild calves from an infected wild herd. Disease surfaced in the project herd despite numerous negative tests for bovine tuberculosis during the preceding eight years.

Bovine tuberculosis was confirmed in two white-tailed deer and five wapiti in and around Riding Mountain National Park in Manitoba through a hunter-harvest surveillance program outside the park and a capture and test program inside the park. A substantial research program is now underway to establish basic epidemiological parameters such as herd prevalence and distribution in wildlife hosts in this region in order to inform the design of a long-term control program, with the goal of eliminating the infection from wildlife.

In the United States endemic BTB has been recognized in wild white-tailed deer in the northeastern portion of the lower peninsula of Michigan since the late 1990s, and spillover to wild wapiti, several carnivorous and omnivorous wildlife species, and more than 30 cattle herds has been documented. Management strategies include bans on baiting and artificial feeding of deer in the affected area as well as reduction of deer population densities. An additional strategy of capture, test, and removal of positive deer is under evaluation. In Minnesota, a single wild white-tailed deer cultured positive for *Mycobacterium bovis* in an area in the northwestern portion of the state where five infected cattle herds were found. The positive deer was one of more than 400 animals that were examined after cattle infections were recognized. Additional results are pending and continued surveillance of wild deer is underway to determine the extent of infection.

#### Europe

BTB is widespread and endemic in badger (*Meles meles*) in Ireland and the United Kingdom. In some clusters up to 50% of the local population may be infected. Bovine TB is also seen in both domestic and wild deer and also in the domestic cattle population. In Ireland BTB has been diagnosed in farmed Alpaca. In the UK it was observed in wild and park deer, as well as in two otters.

In France the focus of BTB infection in the Bretonne forest is growing despite attempt to control the infection in Red deer and wild boars.

#### Africa

BTB in buffalo has now spread throughout the Kruger National Park (KNP) in South Africa, with clinical cases finally being detected in the far north, close to the Zimbabwe border. A buffalo BTB survey involving 206 animals from the southern region of the Park, detected a macroscopic prevalence of 32%. Also in the Kruger National Park, terminal cases of bovine tuberculosis were confirmed in 11 lions (*Panthera leo*), a kudu (*Tragelaphus strepsiceros*) and a warthog during 2005.

In the Hluhluwe / Imfolosi Park in South Africa, a capture, test and slaughter technique is being used to manage BTB in buffalo.

*Mycobacterium tuberculosis* infection has been confirmed to be circulating in a meerkat (*Suricata suricata*) population in the Kalahari district of Northern Cape Province in South Africa. More recently a case of suspected *M. bovis* infection was detected in this same population. The situation is being intensively monitored.

BTB continues to smoulder in the Kafue / Lochinvar region of Zambia, and during 2005, 33 cases were reported in buffalo, 37 cases in lechwe (*Kobus leche*) and a single impala.

In the Queen Elizabeth National Park in Uganda, BTB continues to cycle in buffalo and warthog.

Also in east Africa, BTB has been detected opportunistically in the Serengeti ecosystem, where passive surveillance is being carried out.

### ***Tularemia***

In Canada, a large epidemic of tularemia (type B) occurred in deer mice (*Peromyscus maniculatus*) in western Saskatchewan in the spring of 2005. This was preceded by an unprecedented abrupt rise in deer mouse populations in the region in the fall and winter of 2004-05. Mouse populations were estimated at 1000 per hectare over an area of approximately 22,000 km<sup>2</sup>. Massive abrupt mortality of these mice occurred in April-May 2005 and tularemia was determined to be widespread among the dying mice. No occurrences of tularemia in humans are known to have occurred in association with this epidemic.

## **1.2. Wildlife listed diseases (mammals)**

### ***Arboviruses (Alphavirus / Togavirus)***

A focal outbreak of eastern equine encephalitis occurred in the United States in wild white-tailed deer in Michigan during the summer.

### ***Babesiosis***

Babesia parasites were detected in blood smears from white rhinoceros (*Ceratotherium simum*) in South Africa, and in zebra and giraffe in Zimbabwe. Babesiosis was also reported in a giraffe in Kenya.

### ***Bat lyssaviruses***

Australian bat lyssavirus was reported in Black flying-fox (*Pteropus alecto*) and Grey-headed flying fox (*Pteropus poliocephalus*) in 2005. It was previously considered to be endemic in many populations of Australian flying foxes (*Pteropus* sp.) and some other bat species. However, modelling suggests infection may not be endemic in all flying fox populations continuously, but rather maintained in a dynamic spatial and temporal mosaic in sub-populations within the greater metapopulation. On-going investigation of the dynamics of Australian Lyssavirus virus infection in flying foxes suggest seroprevalence in wild-caught, healthy individuals less than 0.5% with incidence in sick and injured bats about 6%.)

### ***Ebola hemorrhagic fever***

An outbreak of Ebola hemorrhagic fever in the Cuvette–Ouest region of the Republic of Congo occurred in April and June 2005 and resulted in human death. There was a striking temporal correlation with the detection of carcasses of gorillas, chimpanzees and monkeys (unspecified) in the same geographical region. The virus has been isolated from both human and non-human primate victims. Recent studies involving the sampling of more than 1000 small vertebrates in the Ebola outbreak areas found evidence of asymptomatic infection in 3 species of frugivorous bats.

### ***Feline immunodeficiency virus infection***

A high sero-prevalence was found in free-ranging lions in the Kruger National Park, South Africa, and a moderate sero-prevalence was found in lions in Zimbabwe.

### ***Large liver flukes***

Significant infection with large liver flukes (unspecified) were reported in Kafue lechwe in Zambia.

### ***Marburg hemorrhagic fever***

The worst outbreak of Marburg hemorrhagic fever in recorded history occurred in northern Uige Province in northern Angola in April – June, 2005. The initial human cases were thought to have become infected during hunting or butchering of small primates of the species *Cercopithecus*, and thereafter, horizontal human to human spread of infection via highly infective secretions and excretions resulted in a regional epidemic.

### ***Pestivirus***

Multifocal outbreaks of infection of Pyrenean chamois (*Rupicapra pyrenaica*) occurred in the central and eastern Pyrenees (Andora, France and Spain); unpublished studies revealed that infections have occurred since at least 1995. The strain is close but different of BVD as well as CSF.

### ***Salmonellosis***

*Salmonella dublin* infections in fallow deer (*Dama dama*) affected approximately 30 fallow does from a herd of approximately 1000 animals in 350 acres of private parkland. Salmonellosis due to *S. dublin* infection is seen sporadically in wildlife, and the UK has reported single isolations from a fox (*Vulpes vulpes*) and an otter (*Lutra lutra*).

Salmonellosis was diagnosed in 60 collared peccary (*Peccary angulatus*) in the southwestern United States.

### ***Sarcoptic mange***

Severe sarcoptic mange is endemic in many Common Wombat (*Vombatus ursinus*) populations in Australia. Disease now is spreading in areas of South Australia where previously it was unreported (anecdotal reports of up to 80% mortality in localised areas). New Zealand reported sarcoptic mange in nine lesser short-tailed bats (*Mystacina tuberculata*).

In Pakistan, sarcoptic mange was found to be present in a flock of ~ 1500 wild Blue sheep (*Pseudois nayaur*) in the Khunjerab National Park, Northern Area.

Kenya reported sarcoptic mange in 2 cheetahs.

### ***Sylvatic plague***

Human deaths occurred in the district of Ituri in the northern part of the Democratic Republic of Congo. Most of the victims were workers in a newly re-opened diamond mine at Zobia. The outbreak appears to be related to unsanitary overcrowded conditions at the mine, with initial rodent / flea source of infection resulting in the bubonic form of the disease. Pneumonic complications of these primary cases appear to have accelerated human to human transmission, because the pneumonic form may be directly contagious.

### ***Toxoplasmosis***

A high sero-prevalence was found in lions in Zimbabwe.

### ***Transmissible spongiform encephalopathy - Chronic wasting disease***

The known range of chronic wasting disease (CWD) in wild deer in Canada expanded considerably in 2005. The range was extended westward into the province of Alberta and eastward into the eastern half of the province of Saskatchewan. These range expansions in wild deer involved both Mule Deer (*Odocoileus hemionus*) and white-tailed deer. Despite the apparent low prevalence of CWD in affected wild deer populations (2% or less), members of the public observed three deer with clinical signs of disease that subsequently were confirmed to be CWD. In October 2005, Canada's federal, provincial and territorial Ministers with resource portfolios endorsed a *National Chronic Wasting Disease Control Strategy* for Canada. It is hoped that this plan can be implemented in 2006.

In the United States, natural CWD infection was detected for the first time in a single wild moose (*Alces alces*) in Colorado. New foci of CWD were found in wild white-tailed deer in New York (two wild deer in an area where CWD was found in two small captive herds of white-tailed deer) and in West Virginia (a total five positive animals of more than 1,000 tested in Hampshire County).

### ***West Nile virus***

West Nile virus was active across much of central Canada in summer 2005. The amplification cycle among mosquitoes and birds and the subsequent period of risk of infection for humans and other mammals both occurred several weeks later in 2005 than in 2004 and previous years. Nonetheless, there was substantial virus activity and human health risk from Quebec to Alberta. No West Nile virus activity was detected on the Atlantic or Pacific coastal provinces.

In the United States, WNV activity continued in wild birds across the country and was confirmed in a white-tailed deer in the Southeast. Mortality of more than 4,600 American white pelicans (*Pelicanus erythrorhynchos*) due to WNV infection was observed in six upper Midwestern and western states.

Surveillance for WNV in wild birds and free-living game birds 2001 – 2005 in England, Wales and Scotland yielded negative results in all 295 birds tested.

## **1.3. Wildlife listed diseases (birds)**

### ***Avian pox***

Avian pox was reported in 9 canaries (*Serinus canaria*) in Namibia, from a number of native bird species in Australia and in 13 McQueens bustards (*Otis mcqueeni*) in Saudi Arabia.

### ***Circovirus***

In Australia, circovirus infection is common and was reported from a number of native bird species. A threat abatement plan (*Psittacine Circoviral beak and feather disease affecting endangered psittacine species*) for Australia is currently being finalised.

### ***Finch oesophagitis (Trichomoniasis ??)***

Several groups independently reported what was considered to be a novel disease in garden greenfinches (*Carduelis chloris*) and chaffinches (*Fringilla coelebs*) in Britain in 2005. Oesophageal lesions in affected birds similar to those seen in garden bird salmonellosis were noted. Salmonellae were not cultured and trichomonas parasites were found associated with the lesions. The precise nature of the disease is still being investigated, but at present it appears that risks of infection are probably confined to bird species. This garden bird condition may be less seasonal than salmonellosis.

#### 1.4. Wildlife listed diseases (reptiles)

##### *Crocodile pox*

In excess of 500 cases of crocodile pox were reported in farmed crocodiles (*Crocodylus niloticus*) in Zimbabwe.

##### *Trichinosis in crocodiles*

*Trichinella zimbabwensis* infection is still present on a few non-exporting crocodile farms in Zimbabwe, and has also been detected in free-ranging monitor lizards (*Varanus niloticus*) adjacent to these farms.

#### 1.5. Wildlife listed diseases (amphibians)

The known distribution of chytrid fungus in Australia includes most areas of Australia. Infected frogs have been found from 46 Australian species, including 9 of 15 (60%) threatened and 6 of 12 (50%) vulnerable species. However, of the negative species, none appear to have had a survey of any size to statistically detect prevalence under 50%. A threat abatement plan for *Chytridiomycosis* for Australia is currently being prepared.

*Chytridiomycosis* exists in two species of frog (*Litoria aurea* and *Litoria reniformis*) in New Zealand.

In Britain the fungal pathogen was found for the first time in free-living amphibians in a population of introduced North American Bullfrogs (*Rana catesbeiana*). It did not appear to be causing disease in these animals. The investigators also reported that it had not been found in examinations of 170 native amphibians from Southern England.

#### 1.6. Unlisted diseases

##### *Devil facial tumour*

A syndrome referred to as *Devil Facial Tumour Disease - DFTD*, which affects Tasmanian Devils (*Sarcophilus harrisii*) is under intensive investigation in Tasmania. The disease has been recorded over 65 per cent of the State and is almost certainly present in a larger area. There are now likely to be only a third to about half the wild Devil numbers compared to 10 years ago. Immunohistochemistry has shown that the most consistent tumour type is of neuroendocrine origin. Cytogenetics work has established the normal Tasmanian Devil karyotype and the chromosome rearrangements of the tumour. It appears that the tumour is an allograft that is passed directly from animal to animal by implantation of the cell line during fighting and biting.

##### *Lassa fever in West Africa*

Human outbreaks of Lassa fever occurred in Kenema in Sierra Leone and Ekpoma in Nigeria. Lassa fever is a zoonotic infection caused by an *arena* virus that circulates amongst rodents, particularly those of the genus *Mastomys*. Direct or indirect contact with infected rodents or their excretions are usually responsible for the index cases, frequently followed by human to human horizontal transmission.

##### *Primate T-lymphotropic viruses 3 & 4 in humans in Cameroon*

Two new retroviruses, never before seen in humans, have turned up in people who regularly hunt monkeys in Cameroon. Other known human T-lymphotropic viruses (1 & 2) are also thought to have originally arisen from non-human primates, followed by secondary human to human horizontal spread. These viruses have been linked to various lympho-proliferative disorders in humans.

### ***Kyasanur forest disease***

In India, Monkey fever was reported in January 2005 in Karnataka. Five monkeys were found dead and humans cases were reported. The finding of dead monkeys frequently presages an outbreak of the human disease. Local wild reservoirs include black-faced langurs (*Prebytis entullus*), macaques (*Macaca radiata*), shrews (*Suncus murinus*) rats (*Rattus wroughtoni*), birds, squirrels and bats. The principal vector is the tick *Haemaphysalis spinigera*.

### ***Mycobacteriosis***

Two cases of Mycobacterium ulcerans infection were reported in Mountain Brushtail Possums (*Trichosurus caninus*) from Orbost in Victoria, Australia. Both cases were found in the same area where a case in a long-footed potoroo (*Potorous longipes*) was previously diagnosed. *M. ulcerans* causes the Buruli or Bairnsdale ulcer in humans. Previous cases have been reported in koalas, and ringtail possums, but these have all been in the same coastal areas where human cases occur.

## **1.7. Non-transmissible diseases and significant mortality/morbidity events reported in wildlife**

### ***Cyanobacterial intoxication***

Cyanobacterial intoxication due to algal blooms involving *Microcystis spp.* was confirmed in the vicinity of two man-made water impoundments in the south eastern Kruger National Park in South Africa. These algal blooms appear to have been associated with excessive eutrophication during a very dry period, with decreasing water levels, and increased hippo densities. The carcasses of several different species including wildebeest, zebra, white rhino, buffalo, hippo, giraffe, warthog, lion and cheetahs were found in a typical point source pattern around these water points. The diagnosis was confirmed by histopathology, algal identification and mouse toxicity tests.

### ***Kangaroo mortality***

Mass mortality of red kangaroos (*Macropus rufus*) in West Australia in February. Multiple remote locations centered in an ellipse around Meekatharra, West Australia. (Total length axis North-South approximately 600 Km; East-West axis approximately 400 Km.) Reasonable intelligence suggests a confirmed minimum of 3,000 animals from a population estimated at 10,000 animals. Autopsies, although difficult to execute all showed changes that could be ascribed to inanition associated with prolonged drought.

### ***Flying fox mortality in Australia***

With 41°C heat on Christmas Eve, and 44°C heat on New Year's Eve, many thousands of grey headed flying foxes (*Pteropus policephalus*) were found dead along Australia's eastern seaboard, from Melbourne in the South to Townsville in the North, a distance of approximately 2000 kms. Most of the dead animals were neonates, but some aged animals were also found dead.

These events deserve further study, particularly more accurate census data, given the potential impact of global warming on the population status of this threatened species. A questionnaire is being prepared to send to wildlife rehabilitators to obtain additional information from this event and future events.

## 2. Emerging wildlife related zoonoses and diseases of public health concern

Dr M. Woodford represented the Group at the first meeting of the *Ad hoc* Group on Emerging Zoonoses which took place from 29–31 March 2005. He presented the report of that meeting. The Wildlife Disease Working Group conveyed their congratulations to the *Ad hoc* Group on Emerging Zoonoses for their excellent work, and noted that there were significant areas of interest overlap between the two groups as is evident from the following wildlife related emerging diseases included in this report:

- Ebola haemorrhagic fever in the Republic of Congo
- Marburg virus infection in Angola.
- Sylvatic plague in Democratic Republic of Congo
- Lassa fever in Sierra Leone
- Avian influenza in south east Asia.
- West Nile virus infection in Canada and the USA.
- Kyasanur forest disease in India.
- Tularaemia in Canada
- Trichinosis in Russia and Canada

Co-operation with this *Ad hoc* Working Group is therefore strongly encouraged because it would be in the interests of both Groups to benefit from each others strengths.

## 3. New OIE consultative program with WHO and FAO

The Working Group was informed by the Central Bureau that:

- An animal counterpart for the WHO public health network has been set up within OIE.
- An OIE/FAO network of avian influenza expertise (OFFLU) has been assembled and can be found at [www.offlu.net](http://www.offlu.net).
- The first combined OIE/FAO reference laboratory for one disease (FMD) has been set up.

## 4. Emergency preparedness for diseases in wild animals

The Working Group reviewed the report presented by Dr Chris Bunn. The group concluded that the initial intention of this report was to serve as a guide to Member Countries in view of outbreaks of disease in wildlife. The Group recommended that the report be modified in the following way:

- Focus on pathogen rather than on the disease.
- Indicate that these are diseases associated with wildlife rather than true wildlife diseases.
- Not to over-emphasise the emergency concept but to keep a balance with other relevant issues.

The group also noted that the definition of livestock in Australia differs from that in many other parts of the world and the group decided to use the *Code* definition for *animal*.

It was also noted that control of diseases in wildlife could be implemented by control in domestic animals where these are the source.

Vector control and biosecurity should be added to the Table 1 as control mechanisms. It was also agreed that this is not just a preparedness document but that disease prevention should also be included.

It was also decided in view of the rapidly changing *Terrestrial Animal Health Code* that the issue of preparedness should probably be approached on two levels. Initially by means of a publication for the OIE *Scientific and Technical Review*, followed at a later stage by a chapter to be written and incorporated into the *Code* as a set of guidelines for Member Countries.

#### 4.1. Wildlife disease surveillance

In 2005, the Group was requested by the International Committee to prepare a draft of additional information specifically with respect to wildlife that might be added to the *Terrestrial Animal Health Code* (General surveillance guidelines). During that same year, the *Code* underwent substantial revision, and the material prepared by the Group is no longer compatible with the new edition of the *Code*. The content remains fully relevant however, and is presented as Appendix V to this report. During 2006, the Group will revise this material to be compatible with the new outlay and format of the *Code*.

#### 4.2. Zoning and compartmentalisation

In the current draft of the “*Zoning and compartmentalisation*” (Chapter 1.3.5) of the *Terrestrial Code*, zoning and compartmentalisation are described as procedures implemented by a country with a view to defining *subpopulations* of different *animal health status* within its territory for the purpose of disease control and / or *international trade*. Compartmentalisation applies to a sub-population when management systems related to biosecurity are applied, while zoning applies when a subpopulation is defined on a geographical basis. Thus, compartmentalisation may allow safe trade due to functional separation of a subpopulation from other domestic *or wild animals* through biosecurity measures, which a zone (through geographical separation alone) would not achieve.

Separate requirements would need to be developed for different disease categories for which the application of zoning or compartmentalisation is considered appropriate. Each zone would need its geographical limits defined and each compartment would need the biosecurity or husbandry practices defined.

These concepts and descriptions are in harmony with the Group’s previous positions on zoning and compartmentalisation, published in their reports tabled at the General Session of the OIE in 1999 and 2002. Examples are given to reiterate the views of the Working Group:

- 1) Regarding wildlife, the group recognised that certain diseases lend themselves to geographic zoning as a result of natural or human erected geographical barriers, and the presence and distribution of definitive sylvatic hosts. E.g. African buffaloes as long term carriers of SAT group FMD viruses in African savannah ecosystems. Areas may be zoned as FMD-free where buffaloes are excluded by barrier fences, or do not naturally occur, due to unsuitable conditions such as high altitude or arid environments.
- 2) Regarding compartmentalisation, the group concluded that:
  - One generalised OIE position is not appropriate to address all OIE listed diseases with wildlife involvement.
  - There should be a general procedure to address the potential significance of wildlife involvement with OIE listed diseases.
  - There should be specific guidelines for assessing the risk represented by wildlife involvement with respect to each disease.

Consequently, the Working Group recognised the impossibility of compartmentalisation of highly infectious diseases when there is a diffuse interface between livestock / poultry and infected wildlife. However, when an enterprise is managed to preclude introduction of diseases from wildlife, as may be the case with highly secured production facilities that block the wildlife / domestic animal interface, it may be possible to maintain disease-free status in the domestic animal compartment. This status will be based on thorough knowledge of the disease epidemiology, particularly regarding wildlife, and demonstration that all risks have been successfully mitigated.

As examples, the Working Group confirmed its previous positions regarding compartmentalisation of the domestic animal enterprises and maintenance or establishment of disease-free status when Newcastle disease virus is present in wild birds or classical swine fever virus is present in wild suids.

## 5. Suitability of some diagnostic tests for use in wild animals

This is an ongoing process and the list of diseases for which diagnostic tests are evaluated will be supplemented every year. For 2005, the diagnostic tests for avian botulism, avian influenza, West Nile virus and Nipah and Hendra virus were evaluated.

**Table 1. - Suitability of some diagnostic tests for use in wild animals**

(for general recommendations regarding these tests when applied to domestic species, please refer to the OIE *Manual of diagnostic tests and vaccines for Terrestrial Animals*)

Disease/pathogen	Host species to be tested	Type of Test	Test	Suitability in wild animals
Avian botulism	Avian species	Test for toxin	Live animal Ag Capture ELISA	Yes (a, w)
Avian Influenza	Avian species	Virus Identification	Virus isolation PCR	Yes (h)
West Nile virus	Avian species and horses	Virus Identification	Haemagglutination inhibition	Yes (x)
			Virus isolation	Yes
		Serology	PCR	Yes (h)
VecTest (antigen test Birdside capture Elisa)	Yes (x)			
Nipah & Hendra	Bats	Virus Identification	Plaque neutralisation test	Yes (z)
			Electron microscopy	Yes (g, A)
		Serology	Immunohistochemistry	Yes (h, B)
			PCR	Yes (h)
			Serum (virus) neutralisation tests	Yes (g, C)
		Elisa	Yes (D)	

- a. Sub-optimal sensitivity and specificity in all species
- g. requires high biosecurity laboratory facilities
- h. Enables diagnosis in the absence of living infectious agent
- w. A new commercial assay is apparently under development
- x. Suboptimal sensitivity in some species
- z. Good sensitivity and specificity
- A. Viruses have distinct ultrastructural characteristics
- B. Submit a wide range of tissues
- C. Due to cross reaction between Nipah and Hendra a single VNT using either virus does not provide definitive identification. Some identification can be done by comparing homologous with heterologous virus.
- D. Problem with non-specific reactions and poor sensitivity have been encountered.

## 6. Other matters

### 6.1. Mortality of *Gyps sp.* vultures in the Indian Subcontinent

The Working Group on Wildlife Diseases noted with great concern that the long-billed (*Gyps indicus*), the slender-billed (*Gyps tenuirostris*) and the white-rumped (*Gyps bengalensis*) vultures, endemic in South East Asia, have declined by approximately 95% during the last ten years.

This decline is among the most rapid ever recorded for wild bird species. The Working Group noted that available evidence regarding this massive die off is almost certainly linked to exposure of vultures to the non-steroidal anti-inflammatory drug (NSAID), diclofenac, present in discarded livestock carcasses that had been treated with this drug prior to death.

An alternative and equally effective veterinary analgesic, meloxicam, has recently been proposed as a substitute for diclofenac. Unfortunately, meloxicam currently costs twice as much as diclofenac but this may change if commercial production is increased. Results of testing meloxicam in African white-

backed vultures (*Gyps africanus*), a species which is not endangered and equally sensitive to diclofenac as the *Gyps sp.* vultures in the Indian subcontinent, have shown no ill effects when given at the maximum likely dose to be consumed in the wild.

The Working Group cautioned that the dramatic decline of these important scavenger vultures species throughout South East Asia may create conditions under which other competitive scavenger species such as feral dogs, jackals, rats, cats, etc., may increase in number and density due to the availability and abundance of carrion formerly consumed by vultures. These unstable populations may pose increased disease risks, such as rabies, to both humans and animals.

The OIE Working Group for Wildlife Diseases supports international conservation organisations in their urging of governments in SE Asian countries to ban the use of diclofenac as a veterinary analgesic and encourage the use of meloxicam as a substitute.

## 6.2 Some discussion points for the meeting of the Working Group in 2007

- Linking databases of animal health, human health and environmental health (conservation) in order to improve communication and utilisation of these resources for health management
- Wildlife addendum for the proposed chapter on Surveillance in the *Terrestrial Animal Health Code*.
- Watching brief on avian influenza.
- Global review of the impact of paratuberculosis on wildlife
- Taxonomic tools for improving the accuracy of disease reporting in wildlife, and to avoid confusing of wildlife species involved in reported disease events.
- Future composition of the Wildlife Disease Working Group (gender, race and regional representation.)

## 7. Summary of the discussions on avian influenza and wild birds during a special meeting of the Wildlife Working Group on 21 February with an invited group of experts

### 7.1. Background

Avian Influenza (AI) viruses are a very large group of different strains of Influenza A viruses that infect birds. Some of these strains also can infect mammals, including humans. Wild birds are the ultimate global reservoir of total gene pool of AI viruses. Various wild bird species, especially water birds, are infected with a huge variety of AI strains. Wild ducks (*Anatini*), in particular, maintain many AI virus strains. However, the strains found naturally in wild birds are not known to cause disease in wild birds or in *poultry*. These are low-pathogenicity (LP) strains that are maintained in wild bird populations but cause little or not actual disease.

Low pathogenicity AI viruses from wild birds can infect *poultry*. When this happens, the AI strain may die out in *poultry*, persist as an LP strain by transmission among *poultry* or undergo genetic changes that sometimes result in AI strains that can cause important disease in *poultry*. AI strains that can cause important disease in *poultry* (chicken) are called High Pathogenicity (HP) strains. HP strains develop within *poultry* populations but can also infect wild birds if wild birds are exposed to HPAI-infected *poultry* environments.

AI viruses are grouped into large general taxons (categories) on the basis of two surface proteins on each virus - an H protein (hemagglutinin) and an N-protein (neuraminidase). There are 16 different H proteins and 9 different N proteins, and thus there are  $16 \times 9 = 144$  different combinations of H and N proteins which designate 144 different general groups of AI viruses (H1N5, H3N8, etc.). The H and N

classification does not indicate whether or not the virus strain is LP or HP. All of the HP strains thus far recognised in *poultry* have had either of the H5 or the H7 form H proteins. However, many AI strains with H5 and H7 proteins cause no disease at all (LP)

In 1997 in Hong Kong, an HPAI strain of the H5N1 group was recognised in *poultry*. It was directly transmitted to humans from infected birds, and caused severe disease in humans. It did not transmit from infected people to non-infected people, however. A similar H5N1 virus appeared again in China in 2003 and has since developed into a wide-spread epidemic in *poultry* of China, SE Asia, and, in 2005-06 to central Asia, Europe and parts of Africa. It has caused huge losses in commercial and non-commercial *poultry* and has caused fatal disease in people. Virological studies indicate that this H5N1 viruses (actually a small group of very similar viruses) developed within *poultry* through genetic change in an LP virus strain. The change of and PL strain into an HP strain within *poultry* populations appears most often to be a gradual process requiring several months of cumulative genetic change.

This HP strain of H5N1 AI also has affected wildlife. It has caused fatal disease in a range of waterbird species in China, SE Asia, Mongolia, Russia, Europe and Africa. It also has killed tigers in a zoo and cats experimentally. Infected *poultry* and infected wild birds often have occurred in the same general locations. It remains unknown whether the spread of this HP virus across Asia to Europe and to Africa has occurred primarily through human agency (movement of *poultry* or infected materials), to the movement of wild birds or some combination of both. It also is not known which wild species may be capable of carrying the virus over large or small distances. Evidence to date suggests that at least some of the movement of the HP H5N1 could be due to movement of wild birds and thus precise knowledge of wild bird movements has become a key concern in assessing the risk to *poultry* of this HP virus strain.

There are different scales of movement of wild birds in nature. Some bird species are essentially sedentary and move only over small local areas. Some are nomadic, moving over a larger area, perhaps up to several hundred kilometres, for various reasons including food availability and weather. Some species are migratory and move regularly over large distances on a regular schedule based on seasons, often nesting in one area and spending another part of the year at a distant location. Migration distances vary from one hundred kilometres or less to a nearly pole-to-pole migration between northern and southern hemispheres.

Co-location of *poultry* and wild birds infected with the same HPAI H5N1 strain is evidence that there can be transmission between these groups. Thus the presence of infection in either group represents a risk or disease in the other. That risk will depend on the opportunities that may exist for interaction between infected wild birds and *poultry*, which includes both direct contact and a range of indirect means, such as contamination of environments or fomites, by which virus transmission might occur.

## **7.2. Recommendations of the Working Group on Wildlife Diseases following the consultation with an invited group of experts**

RECOGNISING THAT:

Understanding the interaction between humans, domestic and wild animals is very important for managing emerging diseases,

There are gaps in our knowledge regarding sources and transmission of pathogens shared among these three groups of vertebrate hosts,

There is a long evolutionary relationship among Influenza A viruses and wild birds

Highly Pathogenic Avian Influenza (HPAI) virus strains have developed within *poultry*, and now H5N1 HPAI strains threaten both *poultry* and wild birds.

Wild birds and their movements potentially have roles in the epidemiology of HPAI strains

It is neither feasible nor effective to control of HPAI by population reduction in wild birds

THE WORKING GROUP ON WILDLIFE DISEASES RECOMMENDS THAT:

1. The control of HPAI should be focussed primarily on *poultry* populations and their husbandry.
2. To improve management of Influenza A in *poultry*, risk factors related to the role of wild birds in the epidemiology of Avian Influenza should be identified through both field and experimental studies. For example:
  - Surveillance for avian influenza viruses in wild birds should be encouraged and intensified
  - Movement patterns of wild birds should be clarified
  - The susceptibility of wild species to influenza A virus strains of concern should be established.
  - Assessment of opportunities for transmission of Influenza A viruses between wild and domestic birds on the basis of local *poultry* husbandry practices, including the release of captive-raised birds.
3. Rapid international sharing of surveillance, virus identification and genetic sequence data to improve understanding of the global epidemiology of Influenza A viruses is strongly encouraged; for example, through:
  - Public display of positive and negative surveillance data for wild birds (e.g. websites)
  - Placement of gene sequence data in GenBank or similar open-access public repository
  - Reporting of detection of exceptional epidemiological events (e.g. HPAI in wildlife)
4. The Biological Standards Commission of the OIE should review and establish definitive standards for test methods to be used to detect and identify influenza A viruses in wild birds that can be applied under a range of circumstances and field conditions
5. The OIE should establish procedures to ensure that all reporting and records of avian influenza and other diseases in wildlife include the correct taxonomic designation (including *Latin* name) of the affected species.
6. International organisations such as OIE, WHO, FAO, and IUCN should urgently request CITES and IATA to allow dispensation for the international movement of samples from CITES-listed and other species for diagnostic purposes in accordance with the International Biological Convention and the International Health Regulations of the World Health Organisation.
7. The OIE should establish guidelines for the safe and effective use of vaccination against Influenza A viruses in zoos and other captive collections of wildlife species. Member countries are encouraged to establish guidelines for such use of vaccines under their particular conditions.

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.../Appendices

**MEETING OF THE OIE WORKING GROUP ON WILDLIFE DISEASES**  
**Paris, 20 - 23 February 2006**

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**Agenda**

1. Global disease situation in wildlife in 2005
    - 1.1. Revitalisation of the OIE Network for Reporting of Wildlife Diseases
    - 1.2. OIE List Diseases
    - 1.3. Wildlife list diseases – Multiple species
    - 1.4. Wildlife list diseases – Mammals
    - 1.6. Wildlife list diseases – Birds
    - 1.7. Wildlife list diseases – Reptiles
    - 1.8. Wildlife list diseases – Amphibians
    - 1.9. Miscellaneous diseases reported in wildlife species
  2. Emerging wildlife related zoonoses and diseases of public health concern.
  3. New OIE Consultative Program with WHO and FAO
  4. Emergency preparedness for diseases in wild animals
    - 4.1. Wildlife Disease Surveillance: General guidelines for improving disease and pathogen surveillance in wild animals - Appendix to the OIE *Terrestrial Animal Health Code*
    - 4.2. Zoning and Compartmentalisation
  5. Suitability of some diagnostic tests for use in wild animals
  6. Other matters
    - 6.1. Mortality of *Gyps sp.* Vultures in the Indian Subcontinent
    - 6.2. Discussion Points for 2007 Meeting of the Working Group
  7. Summary of the discussions on avian influenza and wild birds during a special meeting of the Wildlife Working Group on 22 February with an invited group of experts
    - 7.1. Background
    - 7.2. Recommendations of the Working Group on Wildlife Diseases following the consultation with an invited group of experts
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## MEETING OF THE OIE WORKING GROUP ON WILDLIFE DISEASES

Paris, 20 - 23 February 2006

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**THE ROLE OF WILDLIFE IN AVIAN INFLUENZA  
MEETING OF THE OIE WORKING GROUP ON WILDLIFE DISEASES**

**Paris, 21 February 2006**

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**Agenda**

**9.00 a.m. Opening and Welcome**

Three presentations of 15 minutes, 15 minutes discussion

1. Vincent Munster: data on wild life surveillance
2. William Karesh: role of wildlife in transmission of the virus, migratory routes
3. Ward Hagemeijer: role of wildlife in transmission of the virus and migratory routes

**10.30 Break**

**11.00 Two presentations of 15 minutes, 15 minutes discussion**

4. Representative of OFFLU: validity of tests
5. Albert Osterhaus: major knowledge gaps

**12.00 Discussion**

**12.30-14.00 Lunch**

**14.00 Discussion**

- The role of wild birds in transmission of avian influenza
- The migrations of wild birds and the transmission risks
- AI surveillance in wild birds: models
- Global collation and analysis of wild bird influenza results
- Vaccination of wild birds in zoos and private collections
- Validity of tests for wild birds
- Appropriateness of using population reduction of wild birds as part of avian influenza control actions
- What are the major knowledge gaps concerning avian influenza and wild birds

**15.45 Break**

**16.15 Conclusions, recommendations**

**17.00 Closure**

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**THE ROLE OF WILDLIFE IN AVIAN INFLUENZA  
MEETING OF THE OIE WORKING GROUP ON WILDLIFE DISEASES**

**Paris, 21 February 2006**

**List of participants**

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**Draft of additional information with respect to wildlife that might be added to the  
*Terrestrial Animal Health Code* (General guidelines for surveillance)  
proposed by the Working Group**

**Introduction**

As part of their evaluation of the health and disease status of farms, veterinary services must also assure themselves that the natural environment is not itself a disease risk factor. Pathogens can be transmitted between wild and domestic animals, in both directions. Thus, veterinary services must assure themselves that such transmission of pathogens will not result in outbreaks of notifiable diseases in domestic herds.

“Wildlife” is understood here to include free-living vertebrate animals (excluding fish, which are covered in the *Aquatic Animal Health Code*) as well as non-domestic species kept in captivity. The term ‘vector’ here refers to any invertebrate animal which has an ecological relationship with a vertebrate host such that it is able to transmit a pathogen to that host.

The health of free-living wild animals can not be assessed to the same degree of detail as is required for domestic animals in commercial production. Clinical signs of disease may be difficult or impossible to observe in wildlife. Therefore, epidemiological approaches must be adapted and utilize a range of data that can provide valid estimates of the risk of transmission of the pathogens of concern. To obtain such data and risk estimates, veterinary services must collaborate with other professionals who are capable of estimating wildlife populations and obtaining samples from wild animals; they should identify one or more groups with such expertise to assist in this work.

**Agent surveillance and monitoring**

Several pathogens are immediately notifiable in wildlife as well as in domestic animals. Others must be notified annually, while still others may require notification as *emerging diseases* when they first are recognised or change in epidemiological pattern.

When pathogens that caused listed diseases are found in wildlife by direct detection, they may constitute a risk of infection for domestic animals. When evidence of their occurrence in wildlife is only indirect, it may serve as a trigger for a surveillance program of domestic populations exposed to the affected wild animals.

It is recommended that countries also report, on a voluntary basis, the occurrence of parasites, diseases and pathogens in wild animals which can affect the conservation, management or welfare of wild or domestic.

Diagnostic tests used to identify pathogens or exposure to pathogens in wild animals must be fully validated as sensitive and specific in the targeted wild species by recognised reference laboratories.

**Description of host population characteristics**

A number of host population factors affect disease transmission, maintenance, dispersal and rate of spread. Such as:

1. *Population distribution and density* — can affect contact rates between susceptible and infective animals. Pathogen maintenance and transmission often are enhanced at higher host animal densities, while the distribution of wildlife can determine the area over which a disease or pathogen is likely to occur.

2. *Habitat requirements* (including food requirements, refuges and denning sites) — can be directly linked to the density and distribution of wildlife hosts.
3. *Social organisation* — group sizes and dominance hierarchies may affect disease transmission and maintenance. Herding versus solitary behaviour can affect the ability to detect disease within a population, while changes to social organisation at particular times of the year (e.g. breeding) can cause increases in contact rates and transmission.
4. *Reproductive status and seasonality* — normal breeding and seasonal behaviours will lead to variability of contact rates, range size, nutritional condition and population density.
5. *Age structure of population* — disease dynamics can differ among populations with different age distributions, longevity and turnover rates (e.g. diseases with a long latent period might be detected only in older animals).
6. *Home range* — can determine the geographic distribution of a pathogen that infects only one or a small number of species.
7. *Movements and distances traveled* — there may be sex and seasonal as well as other effects on animal movements. Some species undergo yearly periods of dispersal during which they can travel long distances in a short time.
8. *Barriers to dispersal* — some natural or artificial barriers will restrict movements of animals and hence the rate or direction of pathogen transmission. These can also be used as boundaries to control operations.

Interactions between wildlife species and domestic stock — Certain factors can affect the rate of contact between wild and domestic animals. For example, water sources, mineral licks and rich food resources (including artificial baiting and feeding).

#### **Environmental factors**

Surveillance of diseases in wild animals also requires attention to physical, biological and human economic activities.

*Physical factors* such as topographic, soil and mineral characteristics, sources and quality of fresh water and climate each can affect the distribution and prevalence of diseases in wildlife.

A wider range of *biological factors* need to be considered with respect to wild animals as compared to domestic animals. Vegetation characteristics, a wide range of invertebrate disease vectors and the presence, distribution and density of other susceptible animal species can affect pathogen occurrence and prevalence.

*Ancillary animal related activities and industries as well as human economic factors* that may affect the distribution of diseases in wildlife and their risks to human health and trade must be considered. These include hunting and commercial uses of wild animals and animal products, such as legal and illegal sale and transportation of live animals for the pet trade, zoos and game farms.

## Reports were received from OIE Member Countries

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Albania	Rabies	Red fox ( <i>Vulpes vulpes</i> )	Yes	2	
Andorra	Bovine tuberculosis	<i>Sus scrofa</i>	No		
Andorra	Trichomoniasis	<i>Accipiter gentilis</i> , <i>Falco tinnunculus</i>	No		
Andorra	Brucellosis	<i>Capreolus capreolus</i>	No	1/15 seropositive	
Andorra	Avian chlamydiosis	<i>Columba sp.</i>	Yes	3/13 (23%)	
Andorra	Contagious ecthyma	<i>Ovis musimon</i>	No		
Andorra	Cysticercosis	<i>Ovis musimon</i> , <i>Rupicapra pyr. Pyrenaica</i>	Yes	39/205 (19%)	
Andorra	Pasteurellosis	<i>Ovis musimon</i> , <i>Rupicapra pyr. pyrenaica</i>	Yes	3/205 (1.46%)	
Andorra	Pestiviruses	<i>Rupicapra pyrenaica pyrenaica</i>	Yes	1/46 (2.1%)	
Andorra	Trichinellosis	<i>Sus scrofa</i>	Yes	> 10%	
Andorra	Sarcoptic mange	<i>Vulpes vulpes</i>	Yes	> 25%	
Angola	Marburg haemorrhagic fever	Not given			
Australia	Avian chlamydiosis	Considered endemic in wild psittacine birds in Australia	Yes		
Australia	Trichomoniasis	<i>Accipiter fasciatus</i> , <i>Eudiptula minor novaehollandiae</i>	Endemic	2	
Australia	Avian chlamydiosis	<i>Alisterus scapularis</i> , <i>Platycercus elegans</i> , <i>Platycercus eximius</i> , <i>Columba livia</i> , <i>Calyptorhynchus latirostris</i> , <i>Cacatua galerita</i> .	Yes	11	
Australia	Circoviruses	<i>Alisterus scapularis</i> , <i>Streptopelia senegalensis</i> , <i>Platycercus zonarius</i> , <i>Trichoglossus haematodus</i> , <i>Cacatua galerita</i>	Yes	20	
Australia	Avian tuberculosis	<i>Grus rubicundus</i> , <i>Macropygia amboinensis</i> , <i>Phaps elegans</i> , <i>Lonchura castaneothorax</i> , <i>Neophema elegans</i> , <i>Chloebia gouldiae</i> , <i>Eudiptula minor novaehollandiae</i> , <i>Aplonis metallica</i> , <i>Tumix varia</i> , <i>Ducula spilorrhoa</i> , <i>Neochmia temporalis</i> , <i>Lathamus discolor</i> , <i>Lonchura malacca malacca</i> , <i>Hirundo neoxena</i> , <i>Gallicolumba jobiensis</i> , <i>Columba leucomela</i> , <i>Poephila guttata</i> , <i>Phascogale tapoatafa</i> , <i>Macropus rufus</i> , <i>Macropus fuliginosus</i> .	Yes	36	
Australia	Avian pox	<i>Gymnorhina tibicen</i> , <i>Eopsaltria australis</i> , <i>Anthochaera carunculata</i> , <i>Zosterops lateralis</i> , <i>Columba palumbus</i> .	Endemic	32	
Australia	<i>Echinococcus granulosus</i>	<i>Macropodidae sp.</i>	Yes	1	
Australia	Inclusion body disease	<i>Morelia amethystina</i> , <i>Morelia spilotes variegata</i> , <i>Morelia bredli</i> , <i>Morelia spilotes spilotes</i> .	Yes	7	
Australia	Myxomatosis	<i>Oryctolagus cuniculus</i>	Yes	Endemic wild rabbits	
Australia	Rabbit haemorrhagic disease	<i>Oryctolagus cuniculus</i>	Yes	Endemic wild rabbits	
Australia	Bat Lyssaviruses	<i>Pteropus alecto</i> , <i>Pteropus poliocephalus</i>	Yes	3	
Australia	Sarcoptic mange	<i>Vombatus ursinus</i>	Yes	2	
Australia	Paramyxoviruses (Bat, Canine, Cetacean, Phocine)	<i>Vulpes vulpes</i>	No	1 <sup>b</sup>	
Argentina	Brucellosis	<i>Lepus europeans</i>	Si	1	
Argentina	Myxomatosis	Conejo	Si	5	
Argentina	Rabies	Zorro	Si	1	
Argentina	Rabies	<i>Eptesicus Brasiliensis</i>	Si	1	
Argentina	Rabies	<i>Myotis</i>	Si	1	
Argentina	Triquinelosis	<i>Sus crofa</i>	Si	2	
Argentina	Paramixovirus 1	<i>Spheniscus magellanicus</i>	Si	54 de 91	
Argentina	Paramixovirus 2	<i>Spheniscus magellanicus</i>	Si	50 de 91	
Argentina	Paramixovirus 3	<i>Spheniscus magellanicus</i>	Si	67 de 91	
Argentina	<i>Clamydophila psittaci</i>	<i>Spheniscus magellanicus</i>	Si	63 de 91	
Argentina	Salmonellosis	<i>Spheniscus magellanicus</i>	Si	74 de 91	
Argentina	Avian influenza	Patos	No	28*	
Argentina	Avian influenza	Loros	No	28*	
Argentina	Avian influenza	<i>Spheniscus magellanicus</i>	No	0 de 91*	
Argentina	Avian influenza	<i>Phalacrocorax albiventer</i>	No	31**	
Argentina	Avian influenza	Aves ornamentales	No	28*	
Argentina	Lengua azul	<i>Lama guanicoe</i>	No	126**	
Argentina	Fiebre aftosa	<i>Lama guanicoe</i>	No	126**	
Argentina	Newcastle disease	Patos	No	28*	
Argentina	Newcastle disease	Loros	No	28*	
Argentina	Newcastle disease	Aves ornamentales	No	28*	
Argentina	Brucellosis	<i>Lama guanicoe</i>	No	126**	

Appendix VI (contd)

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Argentina	Leptospirosis	<i>Lama guanicoe</i>	No	126**	
Argentina	Leptospirosis	<i>Caiman latirostris</i> , <i>Caiman jacare</i>	No	97**	
Argentina	Myxomatosis	Conejo	No	1*	
Argentina	Paratuberculosis	<i>Lama guanicoe</i>	No	126**	
Argentina	Rinotraqueitis bovina	<i>Lama guanicoe</i>	No	126**	
Argentina	Pestivirus - Peste porcina clasica	<i>Sus crofa</i>	No	45*	
Argentina	Toxoplasmosis	<i>Lama guanicoe</i>	No	126**	
Argentina	Leucocis bovina	<i>Lama guanicoe</i>	No	126*	
Argentina	Diarrea viral bovina	<i>Lama guanicoe</i>	No	126**	
Argentina	Calicivirus de los mamíferos marinos	<i>Mirounga Leonina</i>	No	4**	
Argentina	Herpesvirus canino	<i>Mirounga Leonina</i>	No	4**	
Argentina	Morbilivirus delfines	<i>Mirounga Leonina</i>	No	4**	
Argentina	Morbilivirus fócidos	<i>Mirounga Leonina</i>	No	4**	
Argentina	Morbivirus marsopas	<i>Mirounga Leonina</i>	No	4**	
Argentina	Venzuelan equine encefalitis	<i>Caiman latirostris</i>	No	97**	
Argentina	Venzuelan equine encefalitis	<i>Caiman jacaré</i>	No	97**	
Argentina	Eastern equine encefalitis	<i>Caiman latirostris</i>	No	97**	
Argentina	Eastern equine encefalitis	<i>Caiman jacaré</i>	No	97**	
Argentina	Reovirus	<i>Spheniscus magellanicus</i>	No	0 de 91*	
Argentina	Laringotraqueitis aviar	<i>Spheniscus magellanicus</i>	No	0 de 91*	
Austria	Rabbit haemorrhagic disease	<i>Oryctolagus cuniculi</i>	Yes	3	
Austria	Rabies	Red fox ( <i>Vulpes vulpes</i> )	No		
Austria	Avian chlamydiosis	<i>Columba livia</i>	Yes	1	
Austria	Brucellosis	<i>Lepus europaeus</i>	Yes	1	
Austria	<i>Echinococcus multilocularis</i>	<i>Vulpes vulpes</i>	Yes	2	
Austria	Avian tuberculosis	Red deer ( <i>Cervus elaphus</i> )	Yes	1	
Austria	Malignant catharral fever	<i>Bison bonasus</i>	Yes	2	
Austria	Paratuberculosis	Roe deer ( <i>Capreolus capreolus</i> )	Yes	1	
Austria	Paratuberculosis	Ibex ( <i>Capra ibex</i> )	Yes	1	
Austria	Tularemia	<i>Lepus europaeus</i>	Yes	8	
Austria	Contagious ecthyma	Mouflon ( <i>Ovis musimon</i> )	Yes	1	
Austria	European brown hare syndrome	<i>Lepus europaeus</i>	Yes	8	
Austria	Listeriosis	chamois ( <i>Rupicapra rupicapra</i> )	Yes	1	
Austria	Paramyxoviruses	<i>Corvus</i> sp	Yes	1	
Austria	Paramyxoviruses	<i>Falco</i> sp	Yes	1	
Austria	Paramyxoviruses	<i>Cygnus cygnus</i>	Yes	1	
Austria	Paramyxoviruses (Bat, Canine, Cetacean, Phocine)	<i>Meles meles</i> , <i>Martes foina</i>	Yes	20	
Austria	Pasteurellosis	<i>Lepus europaeus</i> , <i>Cricetus cricetus</i>	Yes	2	
Austria	Trichomoniasis	<i>Streptopelia decaocto</i>	Yes	5	
Austria	Pseudotuberculosis	<i>Lepus europaeus</i>	Yes	9	
Austria	Salmonellosis	<i>Sus scrofa</i>	Yes, S. cholerae suis	2	
Austria	Sarcoptic mange	<i>Rupicapra rupicapra</i> , <i>Vulpes vulpes</i>	Yes	endemic	
Benin	No diseases reported in wildlife			No	
Bolivia	No diseases reported in wildlife			No	
Botswana	No report		No		
Bosnia Herzegovina	Rabies	<i>Vulpes vulpes</i>	Yes	29	
Bosnia Herzegovina	Trichinellosis	<i>Sus scrofa</i>	Yes	12	
Brazil	Rabies	Quiróptero	Si	103	
Brazil	Rabies	Raposa	Si	39	
Brazil	Rabies	<i>Canideo selvagem</i>		2	
Brazil	Rabies	Guaxinim	Si	1	
Brazil	Rabies	Primata	Si	5	
Brunei				No report	
Bulgaria	Classical swine fever	Wild boar, ( <i>Sus scrofa</i> )	Yes	19	
Bulgaria	Aujesky's disease	Wild boar, ( <i>Sus scrofa</i> )	Yes	1	
Bulgaria	Rabies	Red fox ( <i>Vulpes vulpes</i> )	Yes	5	
Bulgaria	Rabies	Roe deer ( <i>Capreolus capreolus</i> )	Yes	1	
Bulgaria	Tularemia	Rabbit ( <i>Oryctolagus cuniculus</i> )		1	
Canada	Avian cholera	<i>Phalacrocorax auritus</i>	Yes	>2000	
Canada	Avian Influenza (low pathogenicity)	<i>Anas discors</i>	Yes	1620'	
Canada	Avian Influenza (low pathogenicity)	<i>Anas crecca</i>	Yes	Yes	
Canada	Avian Influenza (low pathogenicity)	<i>Anas platyrhynchos</i>	Yes	Yes	
Canada	Avian Influenza (low pathogenicity)	<i>Anas acuta</i>	Yes	Yes	

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Canada	Avian Influenza (low pathogenicity)	<i>Anas rubripes</i>	Yes	Yes	
Canada	Avian Influenza (low pathogenicity)	<i>Aythya americana</i>	Yes	Yes	
Canada	Avian Influenza (low pathogenicity)	<i>Corvus brachyrhynchos</i>	Yes	Yes	
Canada	Avian Influenza (low pathogenicity)	<i>Branta canadensis</i>	Yes	Yes	
Canada	Brucecellosis	<i>Bison bison</i> , <i>C. elaphus</i>	Yes	Endemic	
Canada	Paratuberculosis	<i>Rangifer tarandus</i>	Yes	1	
Canada	Rabies	<i>Ursus americanus</i>	Yes	1	
Canada	Rabies	Family <i>Vespertilionidae</i> (Bats)	Yes	94	
Canada	Rabies	<i>Mephitis mephitis</i>	Yes	94	
Canada	Rabies	<i>Procyon lotor</i>	Yes	3	
Canada	Rabies	<i>Canis lupus</i>	Yes	4	
Canada	Rabies	<i>Vulpes vulpes</i>	Yes	18	
Canada	Transmissible spongiform encephalopathies (CWD)	<i>Odocoileus virginians</i>	Yes	15	
Canada	Trichinellosis		Yes		
Canada	Tuberculosis bovine	<i>Bison bison</i>	Yes	Endemic	
Canada	Tuberculosis bovine	<i>Odocoileus virginians</i>	Yes	Endemic	
Canada	Tuberculosis bovine	<i>Cervus elaphus</i>	Yes	Endemic	
Canada	Tularemia	<i>Peromyscus maniculatus</i>	Yes	>1000	
Canada	Botulism (Type C)	<i>Larus californicus</i>	Yes	1	
Canada	Botulism (Type C)	<i>Larus marinus</i>	Yes	1	
Canada	Botulism (Type C)	<i>Anas platyrhynchos</i>	Yes	1	
Canada	Botulism (Type E)	<i>Phalacrocorax auritus</i>	Yes	4	
Canada	Botulism (Type E)	<i>Melanitta fusca</i>	Yes	1	
Canada	Botulism (Type E)	<i>Larus argentatus</i>	Yes	1	
Canada	Botulism (Type E)	<i>Gavia immer</i>	Yes	1	
Canada	Botulism (Type E)	<i>Clangula hyemalis</i>	Yes	1	
Canada	Avian tuberculosis	<i>Bubo virginianus</i>	Yes	1	
Canada	Botulism (Type C)	<i>Larus delawarensis</i>	Yes	2	
Canada	Salmonellosis ( <i>typhimurium</i> sp.)	<i>Passer domesticus</i>	Yes	3	
Canada	Salmonellosis ( <i>typhimurium</i> sp.)	<i>Pinicola enucleator</i>	Yes	2	
Canada	Salmonellosis ( <i>typhimurium</i> sp.)	<i>Larus delawarensis</i>	Yes	2	
Canada	Salmonellosis ( <i>typhimurium</i> sp.)	<i>Melospiza melodia</i>	Yes	1	
Canada	Salmonellosis ( <i>typhimurium</i> sp.)	<i>Carduelis flareroe</i>	Yes	3	
Canada	Salmonellosis ( <i>typhimurium</i> sp.)	<i>Carpodacus</i> sp.	Yes	5	
Canada	Salmonellosis ( <i>typhimurium</i> sp.)	<i>Coccythraustes vesperinus</i>	Yes	1	
Canada	West Nile virus	<i>Corvus brachyrhynchos</i>	Yes	331	
Canada	West Nile virus	<i>Pica pica</i>	Yes	1	
Canada	West Nile virus	<i>Cyanocitta cristata</i>	Yes	115	
Canada	West Nile virus	<i>Passer domesticus</i>	Yes	8	
Canada	West Nile virus	<i>Haliaeetus leucocephalus</i>	Yes	1	
Canada	West Nile virus	<i>Buteo swainsoni</i>	Yes	1	
Canada	West Nile virus	<i>Buteo jamaicensis</i>	Yes	1	
Canada	West Nile virus	<i>Accipiter striatus</i>	Yes	1	
Canada	West Nile virus	<i>Accipiter gentilis</i>	Yes	1	
Canada	West Nile virus	<i>Falco columbarius</i>	Yes	1	
Canada	West Nile virus	<i>Bubo virginianus</i>	Yes	4	
Canada	<i>Baylisascaris</i> spp.	<i>Marmota monax</i>	Yes	3	
Canada	<i>Baylisascaris</i> spp.	<i>Glaucocmys sabrinus</i>	Yes	1	
Canada	<i>Baylisascaris</i> spp.	<i>Procyon lotor</i>	Yes	1	
Canada	<i>Baylisascaris</i> spp.	<i>Sciurus carolinensis</i>	Yes	1	
Canada	Meningeal worms of cervides	<i>Alces alces</i>	Yes	2	
Canada	Meningeal worms of cervides	<i>Cervus elaphus</i>	Yes	2	
Canada	Paramyxoviruses (Bat, Canine, Cetacean, Phocine)	<i>Procyon lotor</i>	Yes	1	
Canada	Sarcoptic Mange	<i>Vulpes vulpes</i>	Yes	3	
Canada	Sarcoptic Mange	<i>Canis latrans</i>	Yes	1	
Canada	Sarcoptic Mange	<i>Canis lupus</i>	Yes	3	
Canada	Transmissible spongiform encephalopathies (CWD)	<i>Odocoileus virginians</i>	Yes	15	
Canada	Avian pox	<i>Passer domesticus</i>	Yes	1	
Canada	Avian pox	<i>Pica pica</i>	Yes	1	
Canada	Avian pox	<i>Columba livia</i>	Yes	1	
Canada	Avian pox	<i>Corvus brachyrhynchos</i>	Yes	2	
Canada	Avian pox	<i>Accipiter cooperi</i>	Yes	1	
Canada	Avian pox	<i>Cyanocitta cristata</i>	Yes	1	
Canada	Avian pox	<i>Pipilo maculatus</i>	Yes	1	
Canada	Circoviruses	<i>Larus delawarensis</i>	Yes	1	
Canada	Paramyxoviruses	Family <i>Anatidae</i>	Yes	4	

Appendix VI (contd)

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Canada	Trichomoniasis	<i>Zenaida macroura</i>	Yes	2	
Chile	Rabies	<i>Tadarida brasiliensis</i>		Yes	
Chile	Botulism	Waterfowl		Yes	
Chile	West Nile virus	Birds		Yes	
Congo	Ebola Virus Hemorrhagic Fever (EVHF)	Not given		Not given	
Congo	Sylvatic plague	Not given		Not given	
Cook islands				No report	
Côte d'Ivoire	Anthrax	Not given		Not given	
Cyprus	No diseases reported in wildlife			No	
Czech Rep.	Myxomatosis	Rabbit ( <i>Oryctolagus cuniculus</i> )	Yes	22	
Czech Rep.	Bat lyssavirus	Bat	Yes	1	
Czech Rep.	Botulism	Ducks	Yes	5	
Czech Rep.	<i>Echinococcus multilocularis</i>	Red fox ( <i>Vulpes vulpes</i> )	Yes	173	
Czech Rep.	Listeriosis	Badger ( <i>Meles meles</i> )	Yes	1	
Czech Rep.	Listeriosis	Brown Hare ( <i>Lepus europeaus</i> )	Yes	3	
Czech Rep.	Pseudotuberculosis	Brown Hare ( <i>Lepus europeaus</i> )	Yes	10	
Czech Rep.	Tularemia	Brown Hare ( <i>Lepus europeaus</i> )	Yes	28	
Czech Rep.	Paramyxovirus	Feral pigeon ( <i>Columba livia</i> )	Yes	1	
Denmark	No report				
Estonia	Cysticercosis	Wild boar	Yes	1	
Estonia	Rabies	<i>Vulpes vulpes</i> , <i>Procyonides nycterrectes</i>	Yes	229	
Estonia	Trichinellosis	Lynx ( <i>Lynx lynx</i> )	Yes	5	
Estonia	Trichinellosis	Brown bear ( <i>Urus arctos</i> )	Yes	4	
Estonia	Trichinellosis	Wild boar ( <i>Sus scrofa</i> )	Yes	3	
Estonia	Trichinellosis	Wolf ( <i>Canis lupus</i> )	Yes	1	
Estonia	Paramyxoviruses type 6	Wild birds	Yes	3	
Ethopia	Newcastle disease	Not given		Not given	
Ethopia	Rabies	Not given		Not given	
Finland	No report				
France	Anaplasmosse	<i>Capreolus capreolus</i>	oui	5	PCR et/ou IF à <i>Ehrlichia phagocytophilum</i>
France	Anaplasmosse	<i>Rupicapra pyrenaica pyrenaica</i>	non	5	
France	Arthrite/encéphalite caprine		non		
France	Brucellose à <i>B. suis</i> biovar 2	<i>Lepus europaeus</i>	oui	3	bacteriologie / dép 39, 48, 57
France	Brucellose à <i>B. suis</i> biovar 2	<i>Sus scrofa</i>	oui	1	bacteriologie / dép 27
France	Brucellose à <i>Brucella</i> sp	<i>Phocoena phocoena</i>	oui	1	bacteriologie sur mammifère marin/dép 50
France	Brucellose	<i>Rupicapra rupicapra</i> ; <i>Capra ibex</i> ; <i>Ovis musimon</i>			sur 60 sérologies
France	Chlamydie aviaire	<i>Streptopelia decaocto</i>	oui	4	test Clearview
France	Chlamydie aviaire	<i>Anas platyrhynchos</i>	oui	2	ELISA Ag
France	Chlamydie aviaire	<i>Circus pygargus</i>	non	2	test indirect
France	Chlamydie aviaire	<i>Streptopelia turtur</i>	non	2	test indirect
France	Choléra aviaire	<i>Columba palumbus</i>	oui	3	<i>Pasteurella</i> sp.
France	Choléra aviaire	<i>Phasianus</i> sp.	oui	1	
France	Choléra aviaire	<i>Streptopelia decaocto</i>	non	2	<i>Pasteurella</i> sp.
France	Cysticercose	<i>Rupicapra rupicapra</i> et <i>pyrenaica</i>	oui	8	
France	Cysticercose	<i>Capreolus capreolus</i>	oui	3	
France	Cysticercose	<i>Oryctolagus cuniculus</i>	oui	3	
France	Cysticercose	<i>Lepus europaeus</i>	non	1	
France	Cysticercose	<i>Ovis ammon musimon</i>	non	1	
France	Cysticercose	<i>Capra ibex</i>	non	2	
France	Cysticercose	<i>Sus scrofa</i>	oui	1	
France	Échinococcose ( <i>E. granulosus</i> , <i>E. multilocularis</i> )	<i>Vulpes vulpes</i>	oui	6	<i>E. multilocularis</i>
France	Échinococcose ( <i>E. granulosus</i> , <i>E. multilocularis</i> )	<i>Sus scrofa</i>	non	1	<i>Echinococcus</i> sp.
France	Échinococcose ( <i>E. granulosus</i> , <i>E. multilocularis</i> )	<i>Capreolus capreolus</i>	oui	1	<i>Echinococcus</i> sp.
France	Fièvre Q	<i>Rupicapra rupicapra</i> ; <i>Capra ibex</i> ; <i>Ovis musimon</i>			sur 60 sérologies
France	Herpèsvirus bovin	<i>Rupicapra rupicapra</i> ; <i>Capra ibex</i> ; <i>Ovis musimon</i>			sur 60 sérologies
France	Influenza aviaire à H5 N1 hp	diverses	non		surveillance active sur 682 oiseaux capturés
France	Influenza aviaire à H5 N1 hp	diverses	non		surveillance passive sur oiseaux trouvés morts (41 épisodes de mortalités)
France	Influenza aviaire à souches fp	<i>Anas crecca</i> , <i>Anas clypeata</i> , <i>Passer domesticus</i>	non	9	surveillance active sur 682 oiseaux capturés
France	Leptospirose	rongeurs aquatiques	oui		serologie
France	Leptospirose	mustélidés	non	300	serologie sur 475 visons, martre, putois, fouine et genette testés dans sud-ouest France entre 2000 et 2003
France	Maedi/visna	<i>Rupicapra rupicapra</i> ; <i>Capra ibex</i> ; <i>Ovis musimon</i>		oui	sur 60 sérologies CAEV Visna
France	Maladie de Newcastle	pigeons d'élevage de chair	non	300	dans élevage de 8500 pigeons, dép 35

Country	Disease	Animal species	Dis. seen 2005	# of animals	
France	Maladie de Newcastle	faisans et perdrix d'élevage d'élevage de chair	non	> 300	dans élevages des dép 44 et 62
France	Maladie hémorragique du lapin	<i>Oryctolagus cuniculus</i>	oui	111	ELISA Ag
France	Myxomatose	<i>Oryctolagus cuniculus</i>	oui	3	2 par Immunoprécipitation en milieu gélosé, 1 par histo
France	Paratuberculose	<i>Capreolus capreolus</i>	oui	5	2 confirmés par PCR, 3 par coloration de Ziehl
France	Paratuberculose	<i>Capra ibex</i>		1	PCR sur valvule iléocaecale
France	Peste porcine classique	<i>Sus scrofa</i>	oui	3415	sur 6612 sérologies, dép 57 et 67 (vaccination en cours dans les Vosges)
France	Peste porcine classique	<i>Sus scrofa</i>	oui	28	positifs en isolement viral sur 8252 animaux testés, dép 57 et 67 (screening PCR et confirmation par isolement sur PCR +)
France	Trichinellose	<i>Sus scrofa</i>	oui	7017	test digestion pepsique barreau magnétique
France	Trichinellose	<i>Vulpes vulpes</i>	non	75	test digestion pepsique barreau magnétique
France	Tuberculose (bovine et humaine)	<i>Sus scrofa</i>	oui	6	isolement <i>M. bovis</i> dans les dép 76, 64 et 21 (concerne la saison de chasse 2004-2005)
France	Tuberculose (bovine et humaine)	<i>Cervus elaphus</i>	oui	27	isolement <i>M. bovis</i> dans le dép 76 (concerne la saison de chasse 2004-2005)
France	Tuberculose aviaire	<i>Anas platyrhynchos</i>		1	anapath et Ziehl
France	Tuberculose aviaire	<i>Capreolus capreolus</i>	non	1	isolement <i>M. avium</i> dans le dép 24
France	Tularémie	<i>Lepus europaeus</i>	oui	48	bactériologie et/ou PCR sur 111 lièvres examinés dans les dép 01,10, 16, 23, 37, 38, 54, 61, 62, 64, 68, 72, 79, 80, 83, 85, 86
France	Botulisme	<i>Anas platyrhynchos</i>	oui	17	type C
France	Botulisme	<i>Phasianus</i>	oui	1	type C
France	Botulisme	<i>Fulica atra</i>	oui	2	type C
France	Listériose	<i>Capreolus capreolus</i>	oui	3	<i>L. monocytogenes</i>
France	Listériose	<i>Capreolus capreolus</i>	oui	1	<i>L. ivanovii</i>
France	Listériose	<i>Capreolus capreolus</i>	oui	1	<i>L. seeligeri</i>
France	Listériose	<i>Lepus europaeus</i>	non	1	<i>L. monocytogenes</i>
France	Pasteurellose	<i>Rupicapra rupicapra</i>	oui	5	<i>M. haemolytica</i>
France	Pasteurellose	<i>Rupicapra rupicapra</i>	oui	5	<i>P. multocida</i>
France	Pasteurellose	<i>Rupicapra rupicapra</i>	oui	19	<i>Pasteurella</i> sp.
France	Pasteurellose	<i>Capra ibex</i>	oui	3	<i>Pasteurella</i> sp.
France	Pasteurellose	<i>Capreolus capreolus</i>	oui	16	<i>M. haemolytica</i>
France	Pasteurellose	<i>Capreolus capreolus</i>	oui	1	<i>P. aerogenes</i>
France	Pasteurellose	<i>Capreolus capreolus</i>	oui	16	<i>P. multocida</i>
France	Pasteurellose	<i>Capreolus capreolus</i>	oui	7	<i>Pasteurella</i> sp.
France	Pasteurellose	<i>Sciurus vulgaris</i>	non	1	<i>P. multocida</i>
France	Pasteurellose	<i>Martes foina</i>	non	1	<i>P. pneumotropica</i>
France	Pasteurellose	<i>Oryctolagus cuniculus</i>	oui	3	<i>P. multocida</i>
France	Pasteurellose	<i>Oryctolagus cuniculus</i>	oui	1	<i>P. pneumotropica</i>
France	Pasteurellose	<i>Lepus europaeus</i>	oui	54	<i>M. haemolytica</i>
France	Pasteurellose	<i>Lepus europaeus</i>	oui	1	<i>P. caballi</i>
France	Pasteurellose	<i>Lepus europaeus</i>	oui	40	<i>P. multocida</i>
France	Pasteurellose	<i>Lepus europaeus</i>	oui	8	<i>P. pneumotropica</i>
France	Pasteurellose	<i>Lepus europaeus</i>	oui	21	<i>Pasteurella</i> sp.
France	Pasteurellose	<i>Canis lupus</i>	non	1	<i>P. multocida</i>
France	Pasteurellose	<i>Canis lupus</i>	non	1	<i>Pasteurella</i> sp.
France	Pasteurellose	<i>Ovis ammon musimon</i>	non	1	<i>M. haemolytica</i>
France	Pasteurellose	<i>Ovis ammon musimon</i>	non	1	<i>Pasteurella</i> sp.
France	Pasteurellose	<i>Vulpes vulpes</i>	oui	1	<i>P. multocida</i>
France	Pasteurellose	<i>Sus scrofa</i>	oui	1	<i>M. haemolytica</i>
France	Pasteurellose	<i>Sus scrofa</i>	oui	1	<i>P. aerogenes</i>
France	Pasteurellose	<i>Sus scrofa</i>	oui	11	<i>P. multocida</i>
France	Pasteurellose	<i>Sus scrofa</i>	oui	1	<i>P. pneumotropica</i>
France	Pasteurellose	<i>Sus scrofa</i>	oui	3	<i>Pasteurella</i> sp.
France	Pseudotuberculose	<i>Lepus europaeus</i>	oui	157	<i>Yersinia pseudotuberculosis</i>
France	Pseudotuberculose	<i>Capreolus capreolus</i>	oui	1	<i>Yersinia pseudotuberculosis</i>
France	Pseudotuberculose	<i>Rupicapra rupicapra</i>	oui	10	<i>Corynebacterium pseudotuberculosis</i>
France	Pseudotuberculose	<i>Sus scrofa</i>	oui	2	<i>Corynebacterium pseudotuberculosis</i>
France	Pseudotuberculose	<i>Capra ibex</i>	non	1	<i>Corynebacterium pseudotuberculosis</i>
France	Salmonellose	<i>Aquila chrysaetos</i>	non	2	<i>Salmonella</i> sp.
France	Salmonellose	<i>Meles meles</i>	non	1	<i>S. enteritidis</i>
France	Salmonellose	<i>Capreolus capreolus</i>	non	1	<i>S. arizonae</i>
France	Salmonellose	<i>Capreolus capreolus</i>	non	1	<i>S. typhimurium</i>
France	Salmonellose	<i>Capreolus capreolus</i>	non	2	<i>Salmonella</i> sp.
France	Salmonellose	<i>Ardea cinerea</i>	oui	1	<i>Salmonella</i> sp.
France	Salmonellose	<i>Lepus europaeus</i>	oui	1	<i>S. arizonae</i>

Appendix VI (contd)

Country	Disease	Animal species	Dis. seen 2005	# of animals	
France	Salmonellose	<i>Lepus europaeus</i>	oui	1	<i>S. enteritidis</i>
France	Salmonellose	<i>Passer domesticus</i>	non	2	<i>S. typhimurium</i>
France	Salmonellose	<i>Larus sp</i>	oui	1	<i>S. typhimurium</i>
France	Salmonellose	<i>Alectoris sp</i>	oui	1	<i>S. typhimurium</i>
France	Salmonellose	<i>Columba palumbus</i>	oui	1	<i>Salmonella sp.</i>
France	Salmonellose	<i>Columba sp.</i>	oui	5	<i>S. typhimurium</i>
France	Salmonellose	<i>Erithacus rubecula</i>	non	3	<i>S. pullorum</i>
France	Salmonellose	<i>Sus scrofa</i>	non	1	<i>Salmonella sp.</i>
France	Salmonellose	<i>Carduelis chloris</i>	non	2	<i>S. typhimurium</i>
France	Salmonellose	<i>Rupicapra rupicapra</i>	non	1	1 isolement en bacteriologie salmonella 4,12:-: chez le chamois
France	Salmonellose	<i>Capra ibex</i>	non	3	3 s. <i>abortus ovis</i> en sérologies
France	Lyssavirus des chiroptères	<i>Eptesicus serotinus</i>	oui	4	immunofluorescence et inoculation aux cellules
France	Lyssavirus des chiroptères	chauve souris non précisée	oui	1	ELISA Ag et PCR
France	Ecthyma contagieux	<i>Rupicapra rupicapra</i>	oui	27	clinique + microscopie électronique
France	Ecthyma contagieux	<i>Ovis ammon musimon</i>	oui	1	microscopie électronique
France	Ecthyma contagieux	<i>Capra ibex</i>	oui	1	
France	Syndrome du lièvre européen	<i>Lepus europaeus</i>	oui	517	EBHS par ELISA Ag
France	Hantavirus	<i>Clethrionomys glareolus</i> (campagnol roussatre)	oui	213	ELISA puis confirmation par IFA
France	Grande douve du foie ( <i>Fasciola hepatica</i> )	<i>Capreolus capreolus</i>	<i>F. hepatica</i>	oui	remarque MET: <i>Fasciola hepatica</i> seulement ! Pas de <i>magna</i> ni de <i>gigantica</i> !
France	Pestivirus	<i>Rupicapra pyrenaica pyrenaica</i>	oui	?	
France	Pestivirus	<i>Rupicapra rupicapra</i>	non	7	sérologie Ac
France	Pestivirus	<i>Capra ibex</i>	non	1	sérologie Ac
France	Gale psoroptique	<i>Vulpes vulpes</i>	oui	1	
France	Gale sarcoptique	<i>Martes foina</i>	oui	1	
France	Gale sarcoptique	<i>Vulpes vulpes</i>	oui	20	
France	Gale sarcoptique	<i>Sus scrofa</i>	oui	2	
France	Variole aviaire	<i>Columba palumbus</i>	oui	2	confirmation par histologie
France	Histomonose	<i>Columba palumbus</i>	oui	1	
France	Histomonose	<i>Anas platyrhynchos</i>	oui	1	
France	Trichomonose	<i>Columba palumbus</i>	oui	9	
France	Trichomonose	<i>Corvus sp</i>	non	1	
Germany	No report				
Greece	No diseases reported in wildlife				
Guatemala	No report				
Guinea Bissau	No diseases reported in wildlife				
Iceland	No diseases reported in wildlife				
India	No report				
Iran	Rabies	Fox, wolf, jackal, squirrel, mink, hog	Yes	27	
Ireland	Bovine tuberculosis	Fallow deer, <i>Dama dama</i>	Yes	Not given	
Ireland	Bovine tuberculosis	Badger, <i>Meles meles</i>	Yes	Not given	
Ireland	Salmonellosis ( <i>S. typhimurium</i> )	Rodents and wild birds	Yes	Not given	
Ireland	Myxomatosis	Rabbit ( <i>Oryctolagus cuniculus</i> )	Yes	Not given	
Israel	Rabies	Badger	Yes	1	
Israel	Rabies	Wolf	Yes	1	
Israel	Rabies	Red fox	Yes	2	
Israel	Botulism	Sea gull	Yes	10	
Italy	Aujeszky's disease	<i>Sus scrofa</i>	Yes	232	
Italy	Avian cholera	<i>Falco tinnunculus</i>	Yes	1	
Italy	Avian tuberculosis	<i>Buteo buteo</i>	Yes	1	
Italy	Avian tuberculosis	<i>Larus cachinnans</i>	Yes	10	
Italy	Avian tuberculosis	<i>Circus aeruginosus</i>	Yes	4	
Italy	Brucellosis	<i>Capreolus capreolus</i>	Yes	1	
Italy	Brucellosis	<i>Ursus arctos</i>	Yes	1	
Italy	Brucellosis	<i>Rupicapra rupicapra</i>	Yes	2	
Italy	Brucellosis	<i>Vulpes vulpes</i>	Yes	8	
Italy	Brucellosis	<i>Cervus elaphus</i>	Yes	9	
Italy	Brucellosis	<i>Sus scrofa</i>	Yes	133	
Italy	Classical swine fever	<i>Sus scrofa</i>	Yes	1	
Italy	Contagious ecthyma,	<i>Capra ibex</i>	Yes	1	
Italy	Contagious ecthyma	<i>Rupicapra rupicapra</i>	Yes	12	
Italy	Cysticercosis ( <i>C.tenuicollis</i> )	<i>Rupicapra rupicapra</i>	Yes	25	
Italy	European brown hare syndrome (EBHS)	<i>Lepus europaeus</i>	Yes	242	
Italy	Leishmaniasis	<i>Vulpes vulpes</i>	Yes	1	
Italy	Leptospirosis	<i>Sus scrofa</i>	Yes	52	
Italy	Leptospirosis	<i>Capreolus capreolus</i>	Yes	?	

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Italy	Malignant catharral fever	<i>Cervus elaphus</i>	Yes	2	
Italy	Paratuberculosis	<i>Rupicapra rupicapra</i>	Yes	3	
Italy	Paratuberculosis	<i>Vulpes vulpes</i>	Yes	3	
Italy	Paratuberculosis	<i>Capreolus capreolus</i>	Yes	17	
Italy	Paratuberculosis	<i>Cervus elaphus</i>	Yes	41	
Italy	Pasteurellosis	<i>Athene noctua</i>	Yes	1	
Italy	Pasteurellosis	<i>Falco tinnunculus</i>	Yes	1	
Italy	Pasteurellosis	<i>Capreolus capreolus</i>	Yes	2	
Italy	Pasteurellosis	<i>Rupicapra rupicapra</i>	Yes	8	
Italy	Pasteurellosis	<i>Phasianus colchicus</i>	Yes	10	
Italy	Pasteurellosis	<i>Lepus europaeus</i>	Yes	17	
Italy	Pseudotuberculosis	<i>Lepus europaeus</i>	Yes	5	
Italy	Pseudotuberculosis	<i>Rupicapra rupicapra</i>	Yes	9	
Italy	Q-fever	<i>Cervus elaphus</i>	Yes	2	
Italy	<i>S. anatum</i>	<i>Corvus corone cornix</i>	Yes	1	
Italy	<i>S. arizonae</i>	<i>Sus scrofa</i>	Yes	1	
Italy	<i>S. enterica</i> subsp. <i>Houtenae</i>	<i>Emys orbicularis</i>	Yes	1	
Italy	<i>S. enterica</i> subsp. <i>diarizonae</i>	<i>Python reticulatus</i>	Yes	2	
Italy	<i>S. give</i>	<i>Passer italiae</i>	Yes	1	
Italy	<i>S. johannesburg</i>	<i>Uromastix</i>	Yes	1	
Italy	<i>S. kapemba</i>	<i>Larus ridibundus</i>	Yes	2	
Italy	<i>S. litchfield</i>	<i>Emys orbicularis</i>	Yes	1	
Italy	<i>S. mango</i>	<i>Emys orbicularis</i>	Yes	1	
Italy	<i>S. minnesota</i>	<i>Emys orbicularis</i>	Yes	1	
Italy	<i>S. muenchen</i>	<i>Python reticulatus</i>	Yes	1	
Italy	<i>S. napolii</i>	<i>Strix aluco</i>	Yes	1	
Italy	<i>S. newport</i>	<i>Emys orbicularis</i>	Yes	2	
Italy	<i>S. poona</i>	<i>Python reticulatus</i>	Yes	1	
Italy	<i>S. sandiego</i>	<i>Emys orbicularis</i>	Yes	1	
Italy	<i>S. schwarzengrund</i>	<i>Passer italiae</i>	Yes	1	
Italy	<i>S. souza</i>	<i>Emys orbicularis</i>	Yes	1	
Italy	<i>S. thompson</i>	<i>Sus scrofa</i>	Yes	1	
Italy	<i>S. typhimurium</i>	<i>Ciconia ciconia</i>	Yes	1	
Italy	<i>S. typhimurium</i>	<i>Pernis apivorus</i>	Yes	1	
Italy	<i>S. typhimurium</i>	<i>Fulica atra</i>	Yes	1	
Italy	<i>S. typhimurium</i>	<i>Lepus europaeus</i>	Yes	1	
Italy	<i>S. typhimurium</i>	<i>Panthera uncia</i>	Yes	1	
Italy	<i>S. typhimurium</i>	<i>Buteo buteo</i>	Yes	1	
Italy	<i>S. typhimurium</i>	<i>Larus ridibundus</i>	Yes	2	
Italy	<i>S. typhimurium</i>	<i>Passer italiae</i>	Yes	3	
Italy	<i>S. typhimurium</i>	<i>Columba livia</i>	Yes	11	
Italy	<i>S. umbilo</i>	<i>Corvus corone cornix</i>	Yes	1	
Italy	<i>S. umbilo</i>	<i>Passer italiae</i>	Yes	1	
Italy	<i>S. virchow</i>	<i>Emys orbicularis</i>	Yes	2	
Italy	<i>S. vitkin</i>	<i>Emys orbicularis</i>	Yes	1	
Italy	<i>S. enteritidis</i>	<i>Emys orbicularis</i>	Yes	1	
Italy	Salmonellosi	Snake	Yes	1	
Italy	Salmonellosi	<i>Lepus europaeus</i>	Yes	1	
Italy	Salmonellosi	<i>Vulpes vulpes</i>	Yes	4	
Italy	Salmonellosis (please state species and type)		Yes	0	
Italy	Sarcoptic mange	<i>Capra ibex</i>	Yes	9	
Italy	Sarcoptic mange	<i>Vulpes vulpes</i>	Yes	20	
Italy	Sarcoptic mange	<i>Rupicapra rupicapra</i>	Yes	216	
Italy	Toxoplasmosis	<i>Lepus europaeus</i>	Yes	1	
Italy	Trichinellosis	<i>Martes foina</i>	Yes	2	
Italy	Trichinellosis	<i>Canis lupus</i>	Yes	9	
Italy	Trichinellosis	<i>Vulpes vulpes</i>	Yes	9	
Italy	Trichomoniasis	<i>Streptopelia decaocto</i>	Yes	4	
Italy	Tuberculosis ( <i>Mycobacterium</i> sp.)	<i>Sus scrofa</i>	Yes	7	
Italy	Tuberculosis avian	<i>Sus scrofa</i>	Yes	2	
Italy	Tuberculosis bovine	<i>Cervus elaphus</i>	Yes	1	
Italy	Tuberculosis bovine	<i>Capreolus capreolus</i>	Yes	1	
Italy	Tuberculosis bovine	<i>Sus scrofa</i>	Yes	3	
Italy	Tularemia	<i>Lepus europaeus</i>	Yes	15	
Japan	<i>Echinococcus multilocularis</i>	Not given	Yes	Yes	
Japan	Leptospirosis	Not given	Yes	Yes	
Kenya	Avian cholera	Not given		Not given	
Kenya	Cysticercos	Not given		Not given	

## Appendix VI (contd)

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Kenya	Echinococcus	Not given		Not given	
Kenya	Anthrax	Not given		Not given	
Kenya	Babesiosis	Not given		Not given	
Kenya	Sarcoptic mange	Not given		Not given	
Latvia	Rabies	Red fox ( <i>Vulpes vulpes</i> )	Yes	176	
Latvia	Rabies	Raccoon dog ( <i>Nyctereutes procyonoides</i> )	Yes	137	
Latvia	Rabies	Badger ( <i>Meles meles</i> )	Yes	13	
Latvia	Rabies	Pine marten ( <i>Martes martes</i> )	Yes	9	
Latvia	Rabies	Roe deer ( <i>Capreolus capreolus</i> )	Yes	7	
Latvia	Rabies	Polecat ( <i>Mustela putorius</i> )	Yes	5	
Latvia	Rabies	Beaver ( <i>Castor fiber</i> )	Yes	2	
Latvia	Rabies	Moose ( <i>Alces alces</i> )	Yes	3	
Latvia	Rabies	Mink ( <i>Mustela lutreola</i> )	Yes	1	
Latvia	Trichinellosis	Wild boar ( <i>Sus scrofa</i> )	Yes	16	
Lesotho	No diseases reported in wildlife			No	
Lithuania	Rabies	Red fox, <i>Vulpes vulpes</i>	Yes	533	
Lithuania	Rabies	Raccoon dog, <i>N. procyonides</i>	Yes	599	
Lithuania	Rabies	Polecat ( <i>Mustela putorius</i> )	Yes	43	
Lithuania	Rabies	Badger, <i>M. meles</i>	Yes	8	
Lithuania	Rabies	Marten ( <i>Martes foina</i> )	Yes	114	
Lithuania	Rabies	Beaver, <i>Castor fiber</i>	Yes	5	
Lithuania	Rabies	Otter, <i>Lutra lutra</i>	Yes	2	
Lithuania	Rabies	Roe deer ( <i>Capreolus capreolus</i> )	Yes	4	
Lithuania	Rabies	Mink ( <i>Mustela lutreola</i> )	Yes	3	
Lithuania	Rabies	Squirrel ( <i>Sqirus vulgaris</i> )	Yes	1	
Lithuania	Trichinellosis	Wild boar, <i>Sus scrofa</i>	Yes	46	
Lithuania	Trichinellosis	Red fox, <i>Vulpes vulpes</i>	Yes	11	
Luxembourg	No report				
Madagascar	No report				
Mauritius	No diseases reported in wildlife			No	
Moldavia	No diseases reported in wildlife			No	
Morocco	Rabies	Not given		Not given	
Mozambique	Anthrax	<i>Syncerus caffer</i>	Yes	Not given	
Myanmar	Bovine tuberculosis	Giraffe	Yes	1	
Myanmar	Fasciolides	Takin	Yes	1	
Namibia	Anthrax	<i>Acinonyx jubatus</i>	Yes	2	
Namibia	Anthrax	<i>Tragelaphus strepsiceros</i>	Yes	1	
Namibia	Anthrax	<i>Alcephalus busephalus</i>	Yes	1	
Namibia	Anthrax	<i>Oryx gaxella</i>	Yes	4	
Namibia	Anthrax	<i>Connochaetes taurinus</i>	Yes	9	
Namibia	Anthrax	<i>Antidorcas marsupialis</i>	Yes	7	
Namibia	Anthrax	<i>Loxodonta africana</i>	Yes	5	
Namibia	Anthrax	<i>Struthio camelus</i>	Yes	1	
Namibia	Anthrax	<i>Equus burchelli</i>	Yes	15	
Namibia	Anthrax	<i>Diceros bocornis</i>	Yes	1	
Namibia	Anthrax	<i>Felis sylvestrus</i> (Afr wildcat)	Yes	1	
Namibia	Rabies	<i>Proteles cristatus</i> (aardwolf)	Yes	1	
Namibia	Rabies	Duiker	Yes	1	
Namibia	Rabies	<i>Taurotragus oryx</i> (Eland)	Yes	1	
Namibia	Rabies	<i>Tragelaphus strepsiceros</i> (kudu)	Yes	24	
Namibia	Rabies	<i>Suricata surucatta</i>	Yes	1	
Namibia	Rabies	<i>Vulpes chama</i> (bat-eared fox)	Yes	1	
Namibia	Rabies	<i>Lyacon pictus</i>	Yes	1	
Namibia	Botulism	<i>Struthio camelus</i>	Yes	1	
Namibia	Avian pox	<i>Serinus canaria</i>	Yes	9	
Netherlands	Myxomatosis	<i>Oryctolagus cuniculus</i> (p.m. findings, histology)	Yes	Endemic	
Netherlands	Avian influenza	<i>Anser</i> sp. (virus isolation)	No	0 of 14	
Netherlands	Avian influenza	<i>Stumus vulgaris</i> (virus isolation)	No	0 of 4	
Netherlands	Avian influenza	<i>Cygnus cygnus</i> (virus isolation)	No	0 of 24	
Netherlands	Avian influenza	<i>Anas</i> spp. (virus isolation)	No	0 of 48	
Netherlands	Avian influenza	various bird spp. (virus isolation)	No	0 of 33	
Netherlands	Avian influenza	<i>Branta leucopsis</i> (real-time RT-PCR)	only LPAI	71 of 79	
Netherlands	Avian influenza	<i>Branta canadensis</i> (real-time RT-PCR)	No	0 of 14	
Netherlands	Avian influenza	<i>Anser anser</i> (real-time RT-PCR)	only LPAI	1 of 108	
Netherlands	Avian influenza	<i>Alopochen aegyptiaca</i> (real-time RT-PCR)	No	0 of 45	
Netherlands	Avian influenza	<i>Anser albifrons</i> (real-time RT-PCR)	only LPAI	4 of 95	
Netherlands	Avian influenza	<i>Branta bernicla</i> (real-time RT-PCR)	only LPAI	1 of 20	
Netherlands	Avian influenza	<i>Anser brachyrhynchus</i> (real-time RT-PCR)	No	0 of 69	
Netherlands	Avian influenza	<i>Cygnus olor</i> (real-time RT-PCR)	only LPAI	1 of 9	

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Netherlands	Avian influenza	<i>Cygnus columbianus bewickii</i> (real-time RT-PCR)	No	3 of 26	
Netherlands	Avian influenza	<i>Anas platyrhynchos</i> (real-time RT-PCR)	only LPAI	140 of 1289	
Netherlands	Avian influenza	<i>Anas crecca</i> (real-time RT-PCR)	only LPAI	41 of 211	
Netherlands	Avian influenza	<i>Anas penelope</i> (real-time RT-PCR)	only LPAI	51 of 400	
Netherlands	Avian influenza	<i>Aythya fuligula</i> (real-time RT-PCR)	No	0 of 6	
Netherlands	Avian influenza	<i>Aythya ferina</i> (real-time RT-PCR)	No	0 of 1	
Netherlands	Avian influenza	<i>Anas strepera</i> (real-time RT-PCR)	only LPAI	5 of 59	
Netherlands	Avian influenza	<i>Anas acuta</i> (real-time RT-PCR)	only LPAI	3 of 14	
Netherlands	Avian influenza	<i>Anas clypeata</i> (real-time RT-PCR)	only LPAI	3 of 29	
Netherlands	Avian influenza	<i>Vanellus vanellus</i> (real-time RT-PCR)	No	0 of 4	
Netherlands	Avian influenza	<i>Philomachus pugnax</i> (real-time RT-PCR)	No	0 of 4	
Netherlands	Avian influenza	<i>Larus ridibundus</i> (real-time RT-PCR)	only LPAI	1 of 97	
Netherlands	Avian influenza	<i>Larus canus</i> (real-time RT-PCR +/- virus isolation)	No	0 of 9	
Netherlands	Avian influenza	<i>Larus argentatus</i> (real-time RT-PCR)	No	0 of 3	
Netherlands	Avian influenza	<i>Larus fuscus</i> (real-time RT-PCR)	No	0 of 1	
Netherlands	Avian influenza	<i>Fulica atra</i> (real-time RT-PCR or virus isolation)	No	0 of 20	
Netherlands	Avian influenza	<i>Gallinula chloropus</i> (real-time RT-PCR)	No	0 of 6	
Netherlands	Avian influenza	<i>Corvus corone</i> (real-time RT-PCR)	No	0 of 2	
Netherlands	Avian influenza	<i>Ardea cinerea</i> (real-time RT-PCR)	No	0 of 2	
Netherlands	Avian influenza	<i>Calidris canutus</i> (real-time RT-PCR)	No	0 of 45	
Netherlands	Avian influenza	<i>Arenaria interpres</i> (real-time RT-PCR)	No	0 of 17	
Netherlands	Avian influenza	<i>Limosa lapponica</i> (real-time RT-PCR)	No	0 of 5	
Netherlands	Avian influenza	<i>Tringa nebularia</i> (real-time RT-PCR)	No	0 of 5	
Netherlands	Avian influenza	<i>Tringa totanus</i> (real-time RT-PCR)	No	0 of 3	
Netherlands	Avian influenza	<i>Calidris alpina</i> (real-time RT-PCR)	No	0 of 1	
Netherlands	Avian influenza	<i>Pluvialis apricaria</i> (real-time RT-PCR)	No	0 of 1	
Netherlands	Avian influenza	<i>Gallinago media</i> (real-time RT-PCR)	No	0 of 3	
Netherlands	Avian influenza	<i>Tringa ochropus</i> (real-time RT-PCR)	No	0 of 7	
Netherlands	Avian influenza	<i>Pluvialis squatarola</i> (real-time RT-PCR)	No	0 of 3	
Netherlands	Avian influenza	<i>Charadrius dubius</i> (real-time RT-PCR)	No	0 of 1	
Netherlands	Avian influenza	<i>Porzana porzana</i> (real-time RT-PCR)	No	0 of 2	
Netherlands	Avian influenza	<i>Numenius phaeopus</i> (real-time RT-PCR)	No	0 of 3	
Netherlands	Avian influenza	<i>Tringa glareola</i> (RT-PCR)	No	0 of 1	
Netherlands	Avian influenza	<i>Anser</i> sp. (necropsy & ZN)	Yes	1 of 3	
Netherlands	<i>Echinococcus multilocularis</i>	<i>Vulpes vulpes</i> (microscopy)	Yes	3 of 45	
Netherlands	Rabbit haemorrhagic disease	<i>Oryctolagus cuniculus</i> (RT-PCR & sequencing)	Yes	2 of 76	
Netherlands	Rabies	Bats (FAT; see bat lyssa virus for detail)	Yes	4 of 92	
Netherlands	Trichinellosis	<i>Sus scrofa</i> (ELISA)	Yes	1 of 366	
Netherlands	Pseudotuberculosis	<i>Lepus</i> sp. (necropsy & culture)	Yes	1 of 1	
Netherlands	Salmonellosis ( <i>S. typhimurium</i> )	<i>Anas</i> sp. (necropsy & culture)	Yes	1 of 1	
Netherlands	Salmonellosis ( <i>S. Saint paul</i> )	<i>Anas</i> sp. (necropsy & culture)	Yes	1 of 1	
Netherlands	Salmonellosis (Group C)	<i>Anas</i> sp. (necropsy & culture)	Yes	2 of 2	
Netherlands	Bat Lyssaviruses	<i>Eptesicus serotoninus</i> (FAT)	Yes	4 of 23	
Netherlands	Trichomoniasis	<i>Columba</i> sp (gross necropsy & microscopy)	Yes	1 of 1	
New Caledonia	No diseases reported in wildlife			No	
New Zealand	Sarcoptic Mange	<i>Mystaciina tuberculata</i>	Yes	9	
New Zealand	Avian pox	<i>Haematopus</i>	Yes	2	
New Zealand	Avian pox	<i>Petroica australis australis</i>	Yes	2	
New Zealand	Avian pox	<i>Thinornis novaseelandiae</i>	Yes	2	
New Zealand	Avian malaria	<i>Megadyptes antipodes</i>	Yes	2	
New Zealand	Avian malaria	<i>Eudiptula minor</i>	Yes	2	
New Zealand	Circoviruses	<i>Cacatua galerita</i>	Yes	Endemic	
New Zealand	Circoviruses	<i>Platycercus eximius</i>	Yes	>10	
Niger	No diseases reported in wildlife			0	
Norway	Cysticercosis	<i>Rangifer tarandus platyrhynchus</i>	Yes	1	
Norway	Cysticercosis	<i>Alces alces</i>	Yes	1	
Norway	Malignant catharral fever	<i>Alces alces</i>	Yes	2	
Norway	Pasteurellosis	<i>Sula bassana</i>	Yes	1	
Norway	Pasteurellosis	<i>Columba livia</i>	Yes	1	
Norway	Pasteurellosis	<i>Rangifer tarandus</i> (semidomesticated)	Yes	Appr. 25	
Norway	Pseudotuberculosis	<i>Lepus timidus</i>	Yes	1	
Norway	Salmonellosis ( <i>S. typhimurium</i> )	<i>Pyrrhula pyrrhula</i>	Yes	4	
Norway	Salmonellosis ( <i>S. typhimurium</i> )	<i>Carduelis flammea</i>	Yes	1	
Norway	Salmonellosis ( <i>S. typhimurium</i> )	<i>Columba livia</i>	Yes	1	
Norway	Toxoplasmosis	<i>Lepus timidus</i>	Yes	1	
Norway	Meningeal worms of cervides	<i>Alces alces</i>	Yes	3	
Norway	Meningeal worms of cervides	<i>Cervus elaphus</i>	Yes	7	
Norway	Sarcoptic mange	<i>Vulpes vulpes</i>	Yes	6	

## Appendix VI (contd)

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Norway	Circoviruses	<i>Columba livia</i>	Yes	1	
Norway	Trichomoniasis	<i>Columba livia</i>	Yes	Appr. 30	
Peru	Pasteurellosis	<i>Amazona achorocephala</i>	Yes	3	
Peru	Pasteurellosis	<i>Nannopsithaca dachillae</i>	Yes	3	
Peru	Bat Lyssaviruses	<i>Desmodus rotunus</i>	Yes	Not given	
Peru	<i>Fasciola hepatica</i>	<i>Vicuna vicuna</i>	Yes	Not given	
Peru	Psoroptic Mange	<i>Saimiri Sciureus</i>	Yes	Not given	
Peru	Psoroptic Mange	<i>Trematerus ornatus</i>	Yes	Not given	
Peru	Psoroptic Mange	<i>Vicuna vicuna</i>	Yes	Not given	
Peru	Sarcoptic Mange	<i>Trematerus ornatus</i>	Yes	Not given	
Peru	Sarcoptic Mange	<i>Vicuna vicuna</i>	Yes	Not given	
Peru	Sarcoptic Mange	<i>Ateles paricus</i>	Yes	Not given	
Peru	Sarcoptic Mange	<i>Choloptus didacilus</i>	Yes	Not given	
Phillipines	Haematoproteus	Scoops owl ( <i>Otus megalotis</i> )	Yes	10	
Poland	Trichinellosis	Wild boar, <i>Sus scrofa</i>	Yes	171	
Poland	<i>Echinococcus granulosus</i>	Wild boar, <i>Sus scrofa</i>	Yes	2	
Poland	<i>Echinococcus multilocularis</i>	Wild boar, <i>Sus scrofa</i>	Yes	28	
Poland	Rabies	Red fox	Yes	84	
Poland	Rabies	Raccoon dog ( <i>Nyctereutes procyonoides</i> )	Yes	10	
Poland	Rabies	Badger, <i>M. meles</i>	Yes	3	
Poland	Rabies	Marten ( <i>Martes martes</i> )	Yes	1	
Poland	Rabies	Bats - Chiroptera	Yes	2	
Poland	Rabies	<i>Plecotus auritus</i>	Yes	2	
Quatar	No report		Yes		
Romania	Classical swine fever	In swine, but figures for wild boar not given	?	?	
Romania	Rabies	Fox, wolf, mink, marten, lynx, wild car, wild boar	Yes	379	
Saudi Arabia	Bluetongue	<i>Oryx leucoryx</i>	Yes	Not given	
Saudi Arabia	PPR	<i>gazella gazella</i> (on farm)	Yes	Not given	
Saudi Arabia	Avian chlamydiosis	juvenile houbaras	Yes	Not given	
Saudi Arabia	Avian tuberculosis	avian		Not given	
Saudi Arabia	Brucellosis	<i>gazella subgutterosa</i>	Yes	Not given	
Saudi Arabia	Cysticercosis	<i>gazella gazella</i> ; <i>gazella subgutterosa</i> ; <i>gazella dorcas</i> ; <i>Oryx leucoryx</i>	Yes	Not given	
Saudi Arabia	Tuberculosis	<i>Oryx leucoryx</i> ; <i>gazella gazella</i> ; <i>gazella subgutterosa</i> ; <i>axis axis</i>	Yes	Not given	
Sierra Leone	Lassa fever	Not given			
Slovak Rep.	Classical swine fever	<i>Sus scrofa</i>	Yes	6	
Slovak Rep.	<i>Echinococcus multilocularis</i>	<i>Vulpes vulpes</i>	Yes	108	
Slovak Rep.	<i>Echinococcus multilocularis</i>	<i>Canis lupus</i>	Yes	1	
Slovak Rep.	Rabies	<i>Vulpes vulpes</i>	Yes	44	
Slovak Rep.	Rabies	<i>Mus musculus</i>	Yes	1	
Slovak Rep.	Rabies	<i>Cricetus cricetus</i>	Yes	1	
Slovak Rep.	Trichinellosis	<i>Vulpes vulpes</i>	Yes	40	
Slovak Rep.	Trichinellosis	<i>Sus scrofa</i>	Yes	13	
Slovak Rep.	Trichinellosis	<i>Ursus arctos</i>	Yes	1	
Slovak Rep.	Trichinellosis	<i>Martes martes</i>	Yes	2	
Slovak Rep.	Lyme borreliosis	<i>Sciurus vulgaris</i>	Yes	1	
Slovak Rep.	Lyme borreliosis	<i>Erinaceus europaeus</i>	Yes	2	
Slovak Rep.	Lyme borreliosis	<i>Apodemus flavicollis</i>	Yes	3	
Slovak Rep.	Paramyxoviruses	<i>Columba livia</i>	Yes	88	
Slovenia	Brucellosis	Hare ( <i>Lepus europeaus</i> )	Yes	1	
Slovenia	Cysticercosis	Red deer ( )	Yes	2	
Slovenia	<i>Echinococcus multilocularis</i>	Fox ( <i>Vulpes vulpes</i> )	Yes	4	
Slovenia	Rabies	Fox ( <i>Vulpes vulpes</i> )	Yes	3	
Slovenia	Pasteurellosis	Hare ( <i>Lepus europeaus</i> )	Yes	1	
Slovenia	Contagious ecthyma	Chamois ( <i>Rupicapra rupicapra</i> )	Yes	2	
Slovenia	European brown hare syndrome (EBHS)	Hare ( <i>Lepus europeaus</i> )	Yes	3	
Slovenia	Sarcoptic mange	Chamois ( <i>Rupicapra rupicapra</i> )	Yes	13	
Slovenia	Sarcoptic mange	Red fox ( <i>Vulpes vulpes</i> )	Yes	75	
South Africa	African horse sickness	Zebra	Yes	Endemic	
South Africa	African swine fever	Warthogs	Yes	Endemic	
South Africa	Anthrax	Multispecies	No	Endemic	
South Africa	Avian malaria	Jackass penguin	Yes	unknown	
South Africa	Babesiosis	Zebra, White rhinoceros	Yes	Endemic	
South Africa	Besnoitiosis	Wildebeest	No	Endemic	
South Africa	Bluetongue	Antibodies in many wild ruminants	Yes	Endemic	
South Africa	Cysticercosis	Buffalo and impala	Yes	Endemic	
South Africa	<i>Echinococcus granulosus</i>	Lions, leopards and hyaenas	Yes	Endemic	

Country	Disease	Animal species	Dis. seen 2005	# of animals	
South Africa	Elephant Herpesvirus	Elephants	Yes	Endemic	
South Africa	Immunodeficiency viruses (Feline, Simian)	Lions	Yes -positive serology	Endemic	
South Africa	Large liver flukes	Hippopotamus	No	Endemic	
South Africa	Leptospirosis	Multispecies	No	Endemic	
South Africa	Malignant catharral fever	Wildebesset	Yes	Endemic	
South Africa	Sarcoptic mange	Lions, leopards, jackal and wildebeest	Yes	Endemic	
South Africa	Trichinellosis	Lions, leopards and hyaenas	No	Endemic	
South Africa	Trichomoniasis	Columbidae and raptors	No	Endemic	
South Africa	Tuberculosis bovine	Buffalo, Lions, leopards, kudu, warthog	Yes	Endemic	
South Africa	Foot and mouth disease	Buffalo	Yes	206	
South Africa	Rabies	Multispecies	Yes	60	
South Africa	Brucellosis	African buffalo	Yes	48	
South Africa	Psoroptic mange	Buffalo	Yes	31	
South Africa	Rift Valley Fever	African buffalo	Yes	20	
South Africa	Newcastle disease	Farmed ostriches	Yes	6	
South Africa	Paramyxoviruses, Newcastle disease	Farmed ostriches	Yes	6	
Spain	Aujeszky's disease	Wild boar, <i>Sus scrofa</i>	Yes	475	
Spain	Avian tuberculosis	Golden eagle, <i>A. chrysaetos</i>	Yes	16	
Spain	Bovine tuberculosis	Red deer, <i>C. elaphus</i> , fallow deer	Yes	60	
Spain	Bovine tuberculosis	Red fox	Yes	1	
Spain	Bovine tuberculosis	Wild boar, <i>Sus scrofa</i>	Yes	31	
Spain	Brucellosis	Red deer, fallow deer, ibex, roe deer, fox, wild boar	Yes	202	
Spain	Cysticercosis	<i>Lepus granatensis</i>	Yes	6	
Spain	Myxomatosis	Rabbit, <i>Oryctolagus cuniculi</i>	Yes	Yes	
Spain	Paratuberculosis	Fallow deer, <i>Dama dama</i>	Yes	70	
Spain	Rabbit haemorrhagic disease (RHD)	Rabbit, <i>Oryctolagus cuniculi</i>	Yes	14	
Spain	Trichinellosis	Wild boar, <i>Sus scrofa</i>	Yes	21	
Spain	Listeriosis	<i>Capreolus capreolus</i>	Yes	2	
Spain	Pestiviruses	<i>Rupicapra pyrenaica</i>	Yes	Yes	
Spain	Sarcoptic mange	Red fox, <i>Vulpes vulpes</i>		2	
Sri Lanka	No report				
Sudan	No report				
Sweden	Avian pox	Great tit ( <i>Parus major</i> )	Yes	Endemic	
Sweden	Avian tuberculosis	Golden eagle ( <i>Aquila chrysaetos</i> )	Yes	1	
Sweden	Botulism	Mallard ( <i>Anas platyrhynchos</i> )	Yes	1	
Sweden	Botulism	Herring gull ( <i>Larus argentatus</i> )	Yes	Endemic	
Sweden	Botulism	Jackdaw ( <i>Corvus monedula</i> )	Yes	1	
Sweden	Cysticercosis	Roe deer ( <i>Capreolus capreolus</i> )	Yes	1	
Sweden	European brown hare syndrome (EBHS)	Brown hare, ( <i>Lepus europaeus</i> )	Yes	Endemic	
Sweden	Listeriosis	Fallow deer ( <i>Dama dama</i> )	Yes	2	
Sweden	Listeriosis	<i>Columba livia</i>	Yes	1	
Sweden	Meningeal worms of cervides	Moose ( <i>Alces alces</i> )	Yes	1	
Sweden	Myxomatosis	Rabbit ( <i>Oryctolagus cuniculi</i> )	Yes	Endemic	
Sweden	Paramyxoviruses	<i>Columba livia</i>	Yes	1	
Sweden	Pseudotuberculosis	Brown hare, ( <i>Lepus europaeus</i> )	Yes	2	
Sweden	Pseudotuberculosis	Mountain hare ( <i>Lepus timidus</i> )	Yes	1	
Sweden	Pseudotuberculosis	Jackdaw ( <i>Corvus monedula</i> )	Yes	1	
Sweden	Rabbit haemorrhagic disease (RHD)	Rabbit ( <i>Oryctolagus cuniculi</i> )	Yes	Endemic	
Sweden	Salmonellosis, <i>S typhimurium</i>	Bullfinch, ( <i>Pyrrhula pyrrhula</i> )	Yes	8	
Sweden	Salmonellosis, <i>S typhimurium</i>	Arctic poll ( <i>Carduelis</i> sp)	Yes	3	
Sweden	Salmonellosis, <i>S typhimurium</i>	Green siskin ( <i>Carduelis</i> sp)	Yes	1	
Sweden	Salmonellosis, <i>S typhimurium</i>	Waxwing ( <i>Bombycilla garrulus</i> )	Yes	1	
Sweden	Salmonellosis, <i>S typhimurium</i>	Black-backed gull ( <i>Larus ridibundus</i> )	Yes	5	
Sweden	Salmonellosis, <i>S typhimurium</i>	Herring gull, ( <i>Larus argentatus</i> )	Yes	1	
Sweden	Sarcoptic mange	Red fox ( <i>Vulpes vulpes</i> )	Yes	Endemic	
Sweden	Sarcoptic mange	Lynx ( <i>Lynx lynx</i> )	Yes	15	
Sweden	Sarcoptic mange	Wolf ( <i>Canis lupus</i> )	Yes	1	
Sweden	Toxoplasmosis	Brown hare, ( <i>Lepus europaeus</i> )	Yes	4	
Sweden	Trichinellosis	Wild boar ( <i>Sus scrofa</i> )	Yes	3	
Sweden	Trichinellosis	Red fox ( <i>Vulpes vulpes</i> )	Yes	~4% of foxes	
Sweden	Trichinellosis	Wolf ( <i>Canis lupus</i> )	Yes	1	
Sweden	Trichinellosis	Lynx ( <i>Lynx lynx</i> )	Yes	sporadic	
Sweden	Trichomoniasis	<i>Columba palumbus</i>	Yes	Endemic	
Sweden	Tularemia	Brown hare, ( <i>Lepus europaeus</i> )	Yes	6	

## Appendix VI (contd)

Country	Disease	Animal species	Dis. seen 2005	# of animals	
Switzerland	No report				
Taipei China	Leptospirosis	puma	Yes	Not given	
Tanzania	No report				
Thailand	Avian cholera	<i>Columba livia</i>	Yes	2	
Thailand	Brucellosis	<i>Cervus</i> spp.	Yes	2	
Thailand	Rabies	Asian elephant ( <i>Elaphus maximus</i> )	Yes	1	
Thailand	Toxoplasmosis	<i>Panthera tigris</i>	Yes	3	
Thailand	Toxoplasmosis	<i>Prionailurus viverrinus</i>	Yes	1	
Thailand	Toxoplasmosis	<i>Prionailurus planiceps</i>	Yes	1	
Thailand	Toxoplasmosis	<i>Panthera pardus</i>	Yes	1	
Thailand	Toxoplasmosis	<i>Prionailurus bengalensis</i>	Yes	1	
Thailand	Toxoplasmosis	<i>Neofebis nebulosa</i>	Yes	2	
Thailand	Feline leukemia (FLV)	<i>Prionailurus viverrinus</i>	Yes	9	
Thailand	Feline leukemia (FLV)	<i>Prionailurus planiceps</i>	Yes	1	
Thailand	Feline leukemia (FLV)	<i>Panthera pardus</i>	Yes	4	
Thailand	Feline leukemia (FLV)	<i>Prionailurus bengalensis</i>	Yes	4	
Thailand	Feline leukemia (FLV)	<i>Neofebis nebulosa</i>	Yes	1	
Thailand	Feline Immunodeficiency Virus (FIV)	<i>Prionailurus viverrinus</i>	Yes	2	
Thailand	FIV	<i>Prionailurus planiceps</i>	Yes	2	
Thailand	FIV	<i>Panthera pardus</i>	Yes	1	
Thailand	FIV	<i>Prionailurus bengalensis</i>	Yes	6	
Thailand	FIV	<i>Neofebis nebulosa</i>	Yes	2	
Thailand	Avian pox	<i>Agapornis personata</i>	Yes	6	
Thailand	Cricovirus	<i>Columba livia</i>	Yes	1	
Thailand	Cricovirus	<i>Psittacine</i>	Yes	30	
Thailand	Cricovirus	<i>Cacathua sulphurea</i>	Yes	9	
Thailand	Cricovirus	<i>Psittacus erithacus</i>	Yes	6	
Thailand	Cricovirus	<i>Electus rotarus macgillivrayi</i>	Yes	10	
Thailand	Cricovirus	<i>Agapornis</i> spp.	Yes	1	
Thailand	<i>Histomoniasis</i> sp.	<i>Phasianus colchicu</i>	Yes	1	
Tunisia	No diseases reported in wildlife				
Turkey	Avian Cholera	Pheasant	Yes		
Turkey	Rabies	Fox, Wolf, W.pig	Yes		
Turkey	Avian tuberculosis	Pheasant/Pigeon	No		
Turkey	Leptospirosis	rodent			
Uganda	Anthrax	Not given			
Uganda	Bovine tuberculosis	Not given			
Uganda	African swine fever	Not given			
Ukraine	Avian influenza	Birds - not stated wild or domestic	Yes	29 872	
Ukraine	Avian cholera	Birds - not stated wild or domestic	Yes	369	
Ukraine	Avian tuberculosis	Birds - not stated wild or domestic	Yes	62	
Ukraine	Rabies	Wild animals	Yes	932	
UK	Avian chlamydiosis	Feral pigeon ( <i>Columba livia</i> )	Yes	1	
UK	Avian cholera	Mute swan ( <i>Cygnus olor</i> )	Yes	1	
UK	Avian tuberculosis	Red deer ( <i>Cervus elaphus</i> )		3	
UK	Avian tuberculosis	Fallow deer ( <i>Dama dama</i> )		1	
UK	Avian tuberculosis	Roe deer ( <i>Capreolus capreolus</i> )		3	
UK	Avian tuberculosis	Greylag goose ( <i>Anser anser</i> )		1	
UK	Avian tuberculosis	Pink footed goose ( <i>Anser brachyrhynchus</i> )		1	
UK	Avian tuberculosis	Mallard ( <i>Anas platyrhynchos</i> )		6	
UK	Avian tuberculosis	Pochard ( <i>Aythya ferina</i> )		1	
UK	Avian tuberculosis	Shelduck ( <i>Tadorna tadorna</i> )		2	
UK	Avian tuberculosis	Teal ( <i>Anas crecca</i> )		2	
UK	Avian tuberculosis	Mute swan ( <i>Cygnus olor</i> )		2	
UK	Avian tuberculosis	Whooper swan ( <i>Cygnus cygnus</i> )		1	
UK	Avian tuberculosis	Coot ( <i>Fulica atra</i> ) x 4		4	
UK	Avian tuberculosis	Moorhen ( <i>Gallinula chloropus</i> )		6	
UK	Duck plague (DVE)	Canada Goose ( <i>Branta canadensis</i> )	Yes	2	
UK	Myxomatosis	Rabbits ( <i>Oryctolagus cuniculus</i> )	Yes	Endemic	
UK	Rabbit haemorrhagic disease (RHD)	Rabbits ( <i>Oryctolagus cuniculus</i> )	No	Endemic	
UK	Tuberculosis bovine	Badger ( <i>Meles meles</i> )	Yes	124	
UK	Tuberculosis bovine	red deer ( <i>Cervus elaphus</i> )		20	
UK	Tuberculosis bovine	Fallow deer ( <i>Dama dama</i> )		6	
UK	Tuberculosis bovine	Roe deer ( <i>Capreolus capreolus</i> )		3	
UK	Botulism	Gull species	Yes	67	
UK	Listeriosis	Red squirrel ( <i>Sciurus vulgaris</i> )	Yes	1	
UK	Listeriosis	Fallow deer ( <i>Dama dama</i> )		1	

Country	Disease	Animal species	Dis. seen 2005	# of animals	
UK	Pseudotuberculosis	Brown Hare ( <i>Lepus europeus</i> )	Yes	Endemic	
UK	Pseudotuberculosis	Roe deer ( <i>Capreolus capreolus</i> )		1	
UK	<i>Salmonella typhimurium</i> PT 40,56, 56 variant	Garden passerines	Yes	Garden passerines - <i>Salmonella typhimurium</i> PT 40, 56, 56 variant x multiple incidents. Fallow deer - <i>Salmonella dublin</i> x 30 deaths. Otter - <i>Salmonella dublin</i> x1. Badger . Please see tables	
UK	<i>Salmonella dublin</i>	Fallow deer ( <i>Dama dama</i> )		30	
UK	<i>Salmonella dublin</i>	Otter ( <i>Lutra lutra</i> )	Yes	1	
UK	<i>Salmonella ajjibo</i>	Badger ( <i>Meles meles</i> )	Yes	1	
UK	Toxoplasmosis	Red squirrel ( <i>Sciurus vulgaris</i> )	Yes	1	
UK	Sarcoptic mange	Fox ( <i>Vulpes vulpes</i> )	Yes	6	
UK	Red squirrel pox virus	Red squirrel ( <i>Sciurus vulgaris</i> )	Yes	15	
UK	Avian pox	Dunnock ( <i>Prunella modularis</i> ) x 1	Yes		
UK	Avian pox	House sparrow ( <i>Passer domesticus</i> )	Yes	1	
UK	Avian pox	Magpie ( <i>Pica pica</i> )	Yes	1	
UK	Avian pox	Woodpigeon	Yes	1	
UK	Paramyxoviruses	Feral pigeons ( <i>Columba livia</i> )	Yes	6	
UK	Paramyxoviruses	Collared doves	Yes	Yes	
UK	Paramyxoviruses	Woodpigeons ( <i>Columba palumbus</i> )	Yes	Yes	
UK	Trichomoniasis	Woodpigeons ( <i>Columba palumbus</i> )	Yes	38	
UK	Trichomoniasis	collared doves.		29	
UK	Viral papillomatosis	House sparrow	Yes	2.	
UK	Necrotic enteritis (Clostridial infection)	Mute swan ( <i>Cygnus olor</i> )	Yes	40	
UK	Necrotic enteritis (Clostridial infection)	Whooper swans ( <i>Cygnus cygnus</i> )	Yes	15	
UK	Necrotic enteritis (Clostridial infection)	Jackdaw ( <i>Corvus</i> )		1	
UK	Finch trichomonad oesophagitis - New disease	Greenfinches ( <i>Chloris chloris</i> )	Yes	>100	
UK	Finch trichomonad oesophagitis - New disease	Chaffinches ( <i>Fringilla coelebes</i> )	Yes	>100	
UK	Chytridiomycosis	Introduced North American Bull frogs	Yes	Several	
UK	Iridovirus diseases	Common frog ( <i>Rana temporalis</i> )	Yes	1	
USA	Aujeszky's disease	<i>Sus scrofa</i>	Yes	endemic	
USA	Avian cholera	Waterfowl - sporadic	Yes	endemic	
USA	Avian influenza	waterfowl, shorebirds	subclinical infection	endemic	
USA	Avian pox	numerous species	Yes	endemic	
USA	Avian tuberculosis	birds and mammals	Yes	endemic	
USA	Avian vacuolar myelinopathy	<i>Fulica americana</i>	Yes	Endemic	
USA	Avian vacuolar myelinopathy	<i>Haliaeetus leucocephalus</i>	Yes	Endemic	
USA	Avian vacuolar myelinopathy	<i>Branta canadensis</i>	Yes	Endemic	
USA	Babesiosis		subclinical	endemic	
USA	<i>Baylisascaris</i> spp.	wild furbearers	Yes	endemic	
USA	Bluetongue	White-Tailed deer ( <i>Odocoileus virginianus</i> )	nov-04	1 in LA	
USA	Bluetongue	White-Tailed deer ( <i>Odocoileus virginianus</i> )	Yes	1 in LA	
USA	Bluetongue	White-Tailed deer ( <i>Odocoileus virginianus</i> )	Yes	1 in TX	
USA	Botulism	waterfowl Types C & E	Yes	endemic	
USA	Brucellosis	<i>Rangifer tarandus</i>	Yes	4 in AK	
USA	Brucellosis	<i>Sus scrofa</i>	Yes	endemic	
USA	Brucellosis	<i>Cervus elaphus</i> , <i>Bison bison</i>	Yes	endemic	
USA	Canine distemper	Procyonids and canids	Yes	endemic	
USA	Chytridiomycosis	<i>Rana castesbeiana</i>	Yes	endemic	
USA	Chytridiomycosis	<i>Bufo boreas boreas</i>	Yes	Endemic	
USA	CWD	<i>Alces alces</i>	Yes in CO	1	
USA	CWD	<i>C. elaphus</i>	Yes	endemic	
USA	CWD	<i>O. hemionus</i>	Yes	endemic	
USA	CWD	White-Tailed deer ( <i>Odocoileus virginianus</i> )	new foci	endemic	
USA	Duck plague (DVE)	Waterfowl	Yes	sporadic	
USA	<i>Echinococcus granulosus</i>	<i>Canis lupus</i>	Yes	endemic	
USA	<i>Echinococcus multilocularis</i>	Wild furbearers	subclinical infection	endemic	
USA	Epizootic haemorrhagic disease (EHD)	White-Tailed deer ( <i>Odocoileus virginianus</i> )	Yes - endemic	endemic	
USA	Feline Leukaemia (FLV)	<i>Felis concolor</i> (Florida panther)		sporadic	
USA	Fibropapillomatosis in sea turtles	<i>Chelonia mydas</i>	Yes	endemic	
USA	Hantaviruses	Wild rodents	Yes	endemic	
USA	Histomoniasis	<i>Meleagris gallopova</i>	Yes	endemic	

Appendix VI (contd)

Country	Disease	Animal species	Dis. seen 2005	# of animals	
USA	Iridovirus diseases	<i>Rana pipens</i>	Yes	endemic	
USA	Large liver flukes	White-Tailed deer ( <i>Odocoileus virginianus</i> )	Yes	endemic	
USA	Leptospirosis	Wild furbearers	subclinical infection	endemic	
USA	Lyme borreliosis	<i>Peromyscus maniculatus</i>	Yes	endemic	
USA	Meningeal worms of cervides	White-Tailed deer ( <i>Odocoileus virginianus</i> )	Yes	endemic	
USA	Newcastle disease	Phalacrocorax auritus	Yes	30 - NV	
USA	Paramyxoviruses	waterfowl APV-1		endemic	
USA	Paratuberculosis	White-Tailed deer ( <i>Odocoileus virginianus</i> )	Florida Keys	endemic	
USA	Rabies	Bats and carnivores	endemic	endemic	
USA	<i>Salmonella typhimurium</i>	<i>Carduelis pinus</i> , <i>C. flammea</i>	Yes	~8,000	
USA	Salmonellosis (please state species and type)	Peccary	Yes	60	
USA	Salmonellosis (please state species and type)	Passerine birds	Yes	endemic	
USA	Sarcoptic mange	<i>Vulpes vulpes</i>	Yes	endemic	
USA	Sarcoptic mange	<i>Canis latrans</i>	Yes	endemic	
USA	Sylvatic plague	Wild rodents	Yes	endemic	
USA	Trichomoniasis	columbids and raptors	Yes - endemic	endemic	
USA	Tuberculosis bovine	<i>C. elaphus</i>	endemic Michigan	~25	
USA	Tuberculosis bovine	White-Tailed deer ( <i>Odocoileus virginianus</i> )	Minnesota	~25	
USA	Tularemia	<i>Sylvilagus</i> spp	endemic	endemic	
USA	Tularemia	<i>Castor canadensis</i>	endemic	endemic	
USA	Tularemia	<i>Ondatra zibethicus</i>	endemic	endemic	
USA	West Nile virus	Numerous birds	endemic	5266	
Zambia	Bovine tuberculosis	Not given	Yes	Not given	
Zambia	Anaplasmosis	Not given	Yes	Not given	
Zambia	Anthrax	Not given	Yes	Not given	
Zambia	Brucellosis	Not given	Yes	Not given	
Zambia	Echinococcosis	Not given	Yes	Not given	
Zambia	FMD	Not given	Yes	Not given	
Zambia	Lumpy skin disease	Not given	Yes	Not given	
Zambia	Large liver flukes	Not given	Yes	Not given	
Zambia	Rabies	Not given	Yes	Not given	
Zimbabwe	Avian influenza H5N2	Not given	Yes	Not given	
Zimbabwe	Rabies	Not given	Yes	Not given	
Zimbabwe	Anthrax	Not given	Yes	Not given	
Zimbabwe	Babesiosis	Not given	Yes	Not given	
Zimbabwe	Chlamydiosis	<i>C. niloticus</i>	Yes	Not given	
Zimbabwe	FIV	Not given	Yes	Not given	
Zimbabwe	Papillomatosis in crocodiles POX ??	<i>C. niloticus</i>	Yes	Not given	
Zimbabwe	Trichinellosis	<i>C. niloticus</i> + <i>Varanus niloticus</i>	Yes	Not given	

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