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**REPORT OF THE MEETING OF THE OIE WORKING GROUP
ON WILDLIFE DISEASES
Paris, 14 – 16 February 2005**

The meeting of the OIE Working Group on Wildlife Diseases was held from 14 to 16 February 2005 at the OIE Headquarters, Paris. In his welcome address, Dr Bernard Vallat, the OIE Director General explained the growing interest in wildlife diseases and the appreciation expressed by OIE Delegates for the contributions of the Working Group. He indicated that transparency in reporting wildlife diseases is increasing, some 80 Member Countries having nominated experts on wildlife diseases to act as contact points for reporting wildlife diseases to the OIE while many Delegates have accepted to act as contact points themselves.

He congratulated the Group for their increasing involvement in emerging zoonoses of wildlife and announced the creation of a new Ad hoc Group to address emerging zoonoses. This Group will be chaired by Professor Lonnie King, one of the new Directors of the 'Centres for Disease Control', Atlanta, United States of America. It is expected that the Ad hoc Group will work in close collaboration with the Working Group on wildlife diseases in view of the proven expertise of its members on emerging diseases.

He welcomed the intention of the Group to provide guidance for Member Countries on 'Emergency preparedness involving wildlife diseases' and thanked them for their willingness to propose a new Appendix for the OIE *Terrestrial Animal Health Code* on 'General guidelines on the surveillance of wildlife diseases' based on the *Code* Chapter 1.3.6 on 'Surveillance and monitoring of animal health'.

In his reply, Dr Roy Bengis, Chairman of the Working Group, thanked Dr Vallat for the trust placed in the work being carried out by the Group and for his continuous support and encouragement during the past five years. He also congratulated Dr Vallat for the excellent work carried out at the OIE under his able leadership and expressed the wish of the Group for continued fruitful collaborations.

The meeting was chaired by Dr R. Bengis and Drs Ted Leighton and Marc Artois were appointed rapporteurs.

The agenda and list of participants are given in [Appendices I](#) and [II](#) respectively.

1. Global wildlife disease situation in 2004

Report on wildlife diseases

An increasing number of Questionnaires for 2004 were received. Most countries did report using the Excel file, which made the work of summarising the information much easier.

Sixty-two countries reported back to OIE. In seven countries no diseases in wildlife were observed. A total of 869 different cases of disease or events were reported.

A total of 32 incidences of list A disease were noted in different species of wildlife – Classical Swine Fever, African Swine Fever, Foot and Mouth Disease, Bluetongue, Peste de Petit Ruminants and Newcastle Disease.

Among List B diseases a total of 464 cases of disease were reported. Rabies, Anthrax, Trichinellosis, Bovine Tuberculosis, Tularemia and Avian Tuberculosis were the most frequent List B diseases observed in wildlife.

405 Wildlife List diseases were reported. Of these events Sarcoptic mange, Salmonellosis, European Brown Hare Syndrome, Pseudotuberculosis, Avian Pox and Trichomoniasis were most frequently observed.

List A diseases

Avian influenza

On 18 Oct 2004, customs officials at Brussels airport (Zaventem) prevented two birds of prey from Thailand being introduced into Belgium. A passenger had concealed two mountain hawk eagles (*Spizaetus nipalensis*) in his luggage. The raptors were taken to the airport customs inspection centre (PIF), where they were examined by an official veterinarian of the Federal Agency for Food Chain Safety (AFSCA), which is the competent authority for controlling live animal imports. The two birds did not show any clinical signs. In view of the illegal nature of the importation, they were euthanized and transferred to CERVA, the Belgian diagnostic and reference laboratory for avian influenza, for further tests. The two birds were found to be positive for avian influenza virus. The strain detected was type H5N1, identical to the strain circulating in South-East Asia. In view of the fact that the two infected birds did not leave accredited quarantine centres, this diagnosis has no effect on the sanitary status of the Belgian poultry population.

Avian influenza virus infection was found in free-living avian species in the Netherlands, but only low pathogenic avian influenza virus was isolated from investigated mallards (*Anas platyrhynchos*).

In August 2004, an outbreak of avian influenza was detected in farmed ostriches (*Struthio camelus*), in the Blue Crane Route Municipal area of the Eastern Cape Province of South Africa. The causal virus was isolated and characterised as strain H5N2, at the Onderstepoort Veterinary Institute as well as at Weybridge in the UK. The mortality rate on the two farms of initial detection was approximately 30%. Heightened surveillance detected three additional infected farms within close proximity. Forward and backward tracing as well as extensive serological testing detected three additional infected farms in the Grahamstown Municipal area, 160 km distant from the initial detection properties. Area-wide and later, nation-wide sampling and testing of ostriches was initiated, and as a result, H5N2 virus infection was detected in farmed ostriches on three additional farms in the Camdeboo Municipal area and later on an additional farm in the Ikwezi Municipal area of the Eastern Cape Province.

Bluetongue

In the United States of America (USA), bluetongue virus (BTV-17) was isolated from 3 wild white-tailed deer (*Odocoileus virginianus*) and mule deer (*O. hemionus*) in Idaho. Bluetongue was also reported from red deer in Italy and Spain, and in camels (*Camelus dromedaries*, *C. bactrianus*) and Moufflon sheep (*Ovis musimon*) in Italy. Five cases of bluetongue were diagnosed in Arabian Oryx (*Oryx leucoryx*) at the National Wildlife Research Centre (NWRC), Taif, Saudi Arabia.

Classical swine fever (CSF)

An outbreak of classical swine fever (CSF) occurred in 2004 in wild boar (*Sus scrofa*) in North-eastern Bulgaria. Classical Swine Fever was also found in wild boar in France, Germany, Italy, Luxembourg and the Slovak republic.

Foot and mouth disease (FMD)

In South Africa, an outbreak of foot and mouth disease in cattle in the FMD Control Zone of Limpopo Province was linked to a group of vagrant buffalo (*Syncerus caffer*) that had exited the greater Kruger National Park through breaks in the fence that had been caused by elephants. To date, cattle at 38 dip tanks (the epidemiological unit in communal farming areas) have become infected, but mass vaccination plus booster vaccination has successfully reduced the infection rate. There have been an estimated 4,500 clinical cases of disease out of a susceptible population of approximately 40,000. Eradication of infection appears in sight as no new clinical cases have been detected over the past 42 days.

In Botswana, during opportunistic sampling, serological evidence of infection with SAT 1 type FMD virus was found in 1/5 free ranging buffalo.

In Zimbabwe, opportunistic sampling revealed serological evidence of FMD infection in buffalo, kudu, bushbuck, eland and sable antelope (*Hippotragus niger*).

A serological survey for foot-and mouth disease, swine vesicular disease and classical swine fever in 291 free-living wild boar (*Sus scrofa*) in the Netherlands gave only negative results, though it should be noted that one sample is still under investigation for swine vesicular disease.

African swine fever (ASF)

In Namibia, an outbreak of African swine fever occurred near the town of Osona, in the Okahandja district. 185 domestic pigs died or were destroyed during this outbreak. Shortly afterwards, a second outbreak was reported from Otjozondjupa district in which 60 domestic pigs died or were destroyed. Both outbreaks were linked to contact with infected warthogs (*Phacochoerus africanus*) and ticks (*Ornithodoros porcinus*).

In South Africa, an outbreak of African swine fever was also detected involving two European wild boar (*Sus scrofa*) that had been illegally translocated to a game farm adjoining the Kruger National Park. Once again, this outbreak was linked to contact with infected warthogs and ticks.

In Tanzania, several outbreaks of African swine fever occurred in domestic swine in the Arusha, Kasulu and Kigoma and Rungwe districts during this reporting period. These outbreaks probably started with exposure to infected ticks / warthog products, whereafter direct contagious pig to pig transmission occurred. The most recent outbreak involving nearly 500 pigs, was reported from the Lake city of Mwanza in the Nyamagana district, with a high mortality rate. This outbreak appeared to be linked to the feeding of swill containing infected pig products.

Peste des petits ruminants (PPR)

An outbreak of PPR occurred on a private farm in Saudi Arabia. The farm held herds of several antelope and gazelle species. However, only gazelles (*Gazella gazella*) were affected and 70 died.

List B diseases

Anthrax

2004 will definitely be recorded as being the year of increased anthrax activity in southern and eastern Africa. Certain climatic, environmental, or population factors were ideal for focal and multicentric outbreaks of anthrax in sub-Saharan Africa this year, and documenting and studying these factors should be attempted because they may have some predictive value for future outbreaks.

Zimbabwe

Two major outbreaks of anthrax were reported in free-ranging wildlife in the Save Valley Conservancy and Malilangwe in the Chiredzi District of Zimbabwe. These outbreaks were well monitored and documented:

- In the Save river conservancy, a total of 1913 carcasses were detected. Greater kudu made up the majority (75,95%) of the victims. Bushbuck (5,49%), Warthog (4,18%), bushpig (3,03%) and impala (3,97%) were also significantly affected. There were also sporadic cases in a wide range of species, including aardvark, baboons, buffalo, cheetah, civet, eland, elephant, genet, giraffe, jackal, leopard, mongoose, nyala, sable antelope, waterbuck, wilddog, wildebeest, klipspringer and zebra.
- In Malilangwe, a total of 811 carcasses were detected, and once again greater kudu were most severely affected, making up 64,5% of the victims. Also significantly affected were buffalo (10,1%), bushbuck (6,4%), waterbuck (4,3%) and nyala (4,06 %) of confirmed infected carcasses found respectively. More significantly, in this Malilangwe outbreak, population impacts on certain species were quite devastating, with 95% of the kudu, 66% of the nyala, 46% of the bushbuck, 43% of the waterbuck and 42% of the roan populations lost to anthrax.
- Sporadic cases were also detected in wild dog, hippopotamus, reedbuck, eland, bushpig, giraffe, leopard, zebra, warthog, sable antelope, klipspringer and impala, in this Malilangwe outbreak.

Uganda

A significant outbreak of anthrax occurred in hippopotami (*Hippopotamus amphibius*) in the Queen Elizabeth National Park in Uganda in 2004. The deaths of more than 220 hippos were recorded during this outbreak. Thereafter, a secondary peak of anthrax involving mainly buffalo was also reported in Queen Elizabeth National Park. Cause for concern was the lack of diagnostic infrastructure during this outbreak.

The various options for more rapid diagnosis were discussed, as were the disease risks posed by the floating and decomposing carcasses. Options for sanitary management of these carcasses also were discussed.

Mozambique

A focally clustered outbreak of anthrax involving elephant (*Loxodonta africana*) and buffalo was reported from Niassa Reserve in the Niassa Province of Mozambique.

Botswana

An outbreak of anthrax was reported from the northern section of Chobe National Park in September during which the deaths of 68 buffaloes and one elephant were recorded. A second broader wave of infection hit the more central area of the Park in November / December. At the conclusion of the outbreak, a total of 723 buffaloes and 76 elephants had been disposed of by burning or burying. During this outbreak, anthrax was also confirmed in an undisclosed number of greater kudu, hippopotamus, impala, zebra, lechwe (*Kobus leche*), puku, warthog and lion. Parts of the Chobe National Park were closed to tourism during certain periods of the outbreak. An unrelated focal outbreak of anthrax, involving 3 cheetahs and a red hartebeest (*Alcelaphus buselaphus*) was also recorded in a private game park in Jwaneng, approximately 900 km distant from the Chobe outbreak. As a result of the high anthrax vaccination coverage of cattle in most areas of Botswana, no spill over of infection occurred in livestock.

Namibia

Spill over of the anthrax outbreak in Botswana into the Caprivi Region of Namibia was reported. Mortalities were reported in 27 buffaloes. In the anthrax-endemic Etosha National Park, mortalities were reported in 1 zebra (*Equus burchelli*), 1 eland (*Taurotragus oryx*), 16 gemsbok (*Oryx gazelle*) and 1 cheetah (*Acinonyx jubatus*).

Other countries

In South Africa, anthrax was confirmed in 2 greater kudu in the Northern Cape Province. In the Democratic Republic of Congo, anthrax was reported in hippopotami, and 4 people died and several were hospitalised after consuming the meat of these dead hippo's. Anthrax was responsible for the death of at least one wild elephant (*Elaphas maximus*) in June 2004 in Chittagong Hill Tracts, Bangladesh. This area holds approximately 400 wild elephants including about 100 that are believed to have moved in from the nearby forests of Myanmar and India. Wild Asian elephants are said to respond well to vaccination with Sterne vaccine applied by dart gun.

Contagious caprine pleuropneumonia

An outbreak of contagious caprine pleuropneumonia was confirmed in a wildlife preservation centre in Qatar. The species affected included gerenuk (*Litocranius walleri*), Laristan moufflon, wild goat and Nubian ibex (*Capra ibex*). The victims showed acute respiratory signs and there was significant mortality.

Avian cholera

An outbreak of avian cholera involving mainly Cape cormorants occurred for the 4th consecutive year on Dyers Island on the southern Cape coast of South Africa. Dyers Island is a small (20 ha) breeding island for seabirds east of Gansbaai. More than 8000 birds died in this outbreak, which is being contained and controlled by destroying sick birds and incinerating all the dead birds. It would appear that these repeated outbreaks are population density driven, with competition and stress as a result of declining fish stocks and human disturbances triggering outbreaks of disease.

Bovine tuberculosis (BTB)

Bovine tuberculosis continues to spread northwards through the buffalo herds in the Kruger National Park (KNP) in South Africa. For the first time, the disease was detected and confirmed in the far north of the Park, which effectively means that buffalo herds in 93% of the surface area of Kruger are now probably infected. A BTB prevalence monitoring survey is planned for 2005.

A buffalo BCG vaccination trial, which has been running since the beginning of 2004, was completed in November. All the research animals were slaughtered and necropsied at the Skukuza abattoir. Preliminary results, based on the presence and appearance of macro- lesions, were disappointing. There was no statistical difference in infection rate or lesion score between vaccinated buffalo and unvaccinated controls.

In Kruger National park BTB was also confirmed in 34 lions (*Panthera leo*) and 3 leopards (*Panthera pardus*) in 2004.

BTB was also confirmed in 2 impala (*Aepyceros melampus*) from a private game ranch adjoining the KNP.

BTB was once again confirmed in buffalo in the Hluhluwe / Imfolosi Park in 2004. Management of BTB in this Park, by capture, test and slaughter is ongoing and still being evaluated.

BTB continues to smoulder in lechwe (*Kobus leche*) in the Kafue / Lochinvar region of Zambia, and in buffalo and warthogs in the Queen Elizabeth National Park in Uganda.

BTB has also been detected opportunistically in wildlife in the Serengeti ecosystem

Bovine tuberculosis is said to have been introduced into captive herds of Arabian oryx, gazelles and Axis deer (*Cervus axis*) at the King Khaled Wildlife Research Centre (KKWRC), Taif, Saudi Arabia, by an introduced group of fallow deer (*Dama dama*). During 2004 BTB was diagnosed in seven Arabian oryx, eleven *Gazella gazella* and five *Gazella subgutturosa* and about 30 fallow deer. This disease is now believed to have been eradicated from the herds.

The occurrence of Bovine tuberculosis in UK wildlife is the subject of much research and publicity. The 2004 Report shows no obvious new disease patterns. A large project looking at prevalence of infection in wild mammals, other than badgers, in the South West of England finished in early 2004

Bovine TB is widespread and endemic in the badger (*Meles meles*) population in Ireland where 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. During 2004 Bovine TB has been diagnosed in farmed Alpaca and also in a small number of domestic sheep. A project to develop a TB vaccine for use in badgers is being actively pursued in an effort to reduce inter-species transmission of this disease.

Bovine tuberculosis was reported from both wild boar and red deer from four different foci in France. The disease was also reported from wild boar in Andorra, chimpanzee (*Pan paniscus*) in Congo (as well as a case of infection with *M. tuberculosis*), buffaloes in the Ivory Coast and in a bear in Myanmar.

Bovine tuberculosis remains endemic in free-roaming herds of bison 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.

Bovine tuberculosis was confirmed in three white-tailed deer and five elk 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 in wildlife hosts in this region in order to inform the design of a long-term control program.

In the USA, BTB is endemic in white-tailed deer in the north-eastern portion of Michigan's Lower Peninsula. BTB has been confirmed in more than 500 wild white-tailed deer and wapiti from 1994-2004. Apparent spill over to other wildlife species including raccoon (*Procyon lotor*), coyote (*Canis latrans*), black bear (*Ursus americanus*), and bobcat (*Felis rufus*) has been documented, but these species are not regarded as significant in TB epidemiology in the area. Reduction of the deer population density and restrictions on baiting and supplemental feeding of deer were implemented in order to eliminate bovine TB from the state in the late 1990s.

The first case of bovine TB infection in a human in Michigan directly linked to contact with a tuberculous deer occurred when a hunter cut himself while field dressing an infected deer in October 2004. The localised cutaneous infection that developed is expected to resolve with appropriate therapy.

Brucellosis

Bovine Brucellosis (*B. abortus*) remains endemic in free-roaming herds of wood bison in and around Wood Buffalo National Park in northern Canada. A bison management plan 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.

Brucella abortus is endemic in wapiti (*Cervus elaphus*) and bison (*Bison bison*) in the Greater Yellowstone Area in the western USA. Apparent spill over from infected wapiti occurred in Wyoming where a small number of infected cattle herds were detected in late 2003 and early 2004.

Brucella suis type 2 is commonly found in wild boar in France and also in 2004 was isolated from eight European brown hares (*Lepus europaeus*) in France and in brown hares from the Czech Republic. In Austria an outbreak of porcine brucellosis occurred in domestic pigs and occurrence of brucellosis was also noted in European brown hares in that area.

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 the endemic areas to any other place in Canada.

Rangiferine brucellosis (*B. suis biovar 4*) 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.

Brucella melitensis in farmed Sable antelope

An outbreak of brucellosis was detected in sable antelope (*Hippotragus niger*) on a game ranch in the Graaff – Reinet district of Eastern Cape Province of South Africa. *Brucella melitensis* biotype 3 was isolated and 8/50 sable antelope on the farm were reactor positive. Clinical signs included abortion with retained placentas, staring hair coats that lightened in colour, general ill thrift and carpal hygromas. A single bull had unilateral orchitis.

Thus in sable, over and above the reproductive manifestations of this disease, there appears to be a definite systemic disease component. There was also evidence of vertical or pseudo-vertical transmission as several calves born to infected dams were also positive.

The ranch was placed under quarantine, and the disease was controlled by isolation, repeat testing and slaughter of positive individuals.

This appears to be the first documentation of *Brucella melitensis* infection in sable antelope, and represents the first isolation of biotype 3 in South Africa. In an attempt to identify the source of infection, other wild ruminants as well as small stock (sheep and goats) on the infected property and surrounding farms were bled and tested, all with negative results.

The rare antelope breeding industry in South Africa is very fluid and animals originating from outside of the FMD control area, and the high-risk bovine tuberculosis areas, are frequently sold on auctions or exchanged between breeders. However, trace-back efforts to farms that had supplied sable to this infected game ranch also gave negative results and the origin of this infection remains a mystery. Trace forward efforts, however, did detect infection on a second game ranch, which had earlier bought in 5 sable antelope from the initial infected farm. A single positive adult cow was identified, and she had also aborted and had severe inflammation of synovial structures. The farm was placed under strict quarantine, and once again, isolation, repeat testing and slaughter of positive individuals is being carried out.

Rabies and related Lyssavirus infections

Rabies was recorded in a large range of “terrestrial” mammals across the world (18 countries reported cases). The disease is subject to cyclical or sporadic outbreaks among a community of susceptible hosts. Usually bats or carnivores are the reservoir host; spill over can occur in a large spectrum of susceptible animals and humans.

The disease can affect large carnivores like wolves (*Canis lupus*) or brown bears (*Ursus arctos*); these animals can possibly attack humans with fatal results. In a village in Ukraine in January 2005, a rabid wolf attacked and bit four persons. In October 2004, an infected brown bear killed two men and injured six others in Romania.

Several different strains can cycle simultaneously in an area: in South Africa for instance the viverrid biotype was confirmed in 2004 in several species of mongooses (*Herpestes* sp. *Cynictus* sp. *Rynchogale* sp. *Suricata*) while the canid biotype were diagnosed in wild canid species of the genus *Otocyon*, *Canis*, *Proteles* spp.

In rare circumstances, the virus can circulate for some time, in a population of “unusual” hosts. For instance in 2004 the canid biotype was observed in an outbreak involving Greater kudu in Namibia.

Spill over of infection can occasionally occur in other species, which can be considered as occasional victims. These include domestic stock, felid or mustelid species. Rodent species are rarely affected due to their relatively small size, they are usually killed by a rabid predator instead of becoming infected.

In Austria during an emergency vaccination campaign, a red fox (*Vulpes vulpes*) cub (approximately three months old) was found infected. It was deemed highly unlikely that this animal had reached the area from a rabies-infected zone on its own, since the nearest rabies focus was over 75 km away. The fox brain sample together with the oral

vaccine strain used during the vaccination campaign in 2003/2004 were analysed by means of RT-PCR. Subsequent sequencing of the 900 bp long PCR products showed that the virus strain from the rabid fox was related very closely to the oral vaccine strain. The present case confirmed that infection of a young fox with an attenuated rabies virus is possible. Nevertheless, this must be considered a rare event.

European Bat Lyssavirus

Bats were trapped in Scotland and northern and southern England. Blood and saliva samples were collected before release. Results showed a seroprevalence estimate of 2-8 %, depending on location. All bats tested so far by PCR have been negative, giving rise to the possibility that bats could be seropositive without excreting virus in saliva.

Australian Bat Lyssavirus

Four positive cases were detected in flying foxes (*Pteropus sp.*). This virus was previously considered to be endemic in many populations of Australian flying foxes and in some other *Microchiroptera* species. However, preliminary 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 investigations of the dynamics of Australian Lyssavirus virus infection in flying foxes suggests a seroprevalence in wild-caught, healthy individuals of less than 0.5%. The incidence in sick and injured individuals is about 6%.

Wildlife list diseases

Avian vacuolar myelinopathy

Avian vacuolar myelinopathy (AVM) continues to occur in a low number of reservoirs in the south-eastern USA. Through early 2005, AVM has been suspected or confirmed in the deaths of more than 100 bald eagles (*Haliaeetus leucocephalus*) and has been confirmed in a total of seven other wild bird species, primarily water-associated birds such as coots (*Fulica americana*), ducks, and geese. The cause of AVM and its source remain unknown despite extensive field and laboratory research. The disease has been reproduced experimentally in red-tailed hawks (*Buteo jamaicensis*) and domestic chickens by feeding them tissues from American coots (*Fulica americana*) with AVM. Additionally, chickens that ingested submerged vegetation collected from a lake during an AVM outbreak developed brain lesions while those that consumed submerged vegetation collected from a lake without AVM did not develop lesions. The predominant submerged vegetation species was identical at both locations, suggesting that the cause of AVM is present in materials associated with the vegetation rather than the vegetation itself.

Sarcoptic mange

Sarcoptic mange is one of the most frequently reported diseases in wildlife. Sarcoptic mange is known to cause mass mortality and have a great impact on wildlife populations. Good examples are the sarcoptic mange epizootics in red foxes in Scandinavia and Finland and in chamois (*Rupicapra rupicapra*) and ibex (*Capra ibex*) in the Alps and Pyrenees. In 2004 sarcoptic mange was reported in Common Wombat (*Vombatus ursinus*) in Australia, in carnivores in Saudi Arabia, Finland, Sweden, France, Myanmar, Andorra, Denmark, Austria, Canada, Italy, Spain, UK, USA and Switzerland, in wild boar in France, New Zealand and Italy and in ungulates in Italy, France, Spain, Austria and Namibia.

Ebola Virus infection

An outbreak of Ebola haemorrhagic fever was detected and reported in humans from the town of Yambio in Western Equatoria Province in southern Sudan, The virus involved was the Sudanese genotype, which historically is slightly less virulent than the Congolese genotype. There were seventeen confirmed cases of which seven were fatal.

In the Democratic Republic of Congo, deaths from Ebola virus infection were reported in about 20 chimpanzees (*Pan paniscus*).

Botulism

An outbreak of botulism was reported in waterfowl in Century City's Blouville near Cape Town, South Africa. The carcasses of 130 birds, mainly sacred ibises and coots have been found, and are being collected and incinerated. The source of toxicosis has not yet been determined.

In Namibia, botulism was reported to have been the cause of death of 30 springbok (*Antidorcas marsupialis*).

Death of thousands of birds on a lake on the outskirts of Greece's 2nd city, Salonika, was due to a botulism outbreak [30 Sep 2004]. The outbreak at Lake Koronia was associated with extensive draining of the lake for farming purposes as *Clostridium botulinum* develops in stagnant or polluted waters. Lake Koronia has lost 1/3 of its surface area in the last 30 years.

Avian botulism occurs relatively frequently in the UK and may cause significant mortality in waterbirds in particular (see 2002 OIE Report, pages 1-2). The 2004 incidents were unusual because one species predominantly was affected, and mortality occurred over a short period of time. Avian botulism was also noted in several duck species in France, and in mallards (*Anas platyrhynchos*), pochard (*Aythya ferina*), herring gull (*Larus argentatus*) and jackdaw (*Corvus monedula*) in Sweden.

In North America type E botulism in wild birds spread eastward into eastern Lake Ontario in 2004 and continued to cause substantial mortality of loons (*Gavia* sp.), mergansers (*Mergus merganser*), and other fish-eating birds on southern Lake Huron, all of Lake Erie and most of Lake Ontario. Double-crested cormorants (*Phalacrocorax auritus*) on Lake Ontario were affected in very high numbers for the first time. In addition, diving ducks, especially Long-tailed Ducks (*Clangula hyemalis*), feeding on mussels, also died in large numbers. Disease in mussel-feeding ducks is a new phenomenon in the evolving epidemic of avian botulism on the Great Lakes, and is not readily explained on the basis of previously understood mechanisms of botulism poisoning. This epidemic began in 2000, and has been continuous each year since then. Current research on this epidemic is concentrating on mechanisms by which the toxin is formed and the relationship of the epidemic to the sweeping changes in Great Lakes ecology caused by arrival and vast population expansions of alien species of mussels and fish.

Chronic wasting disease

In the USA, surveillance continues for chronic wasting disease (CWD) in free-ranging and captive cervids. Tests have been conducted on approximately 240,000 wild deer and elk during the period from 2002-2004. Additional states with foci of infected wild animals were not found in 2004, although additional positive animals were found in and surrounding most areas previously recognised to be affected. In Nebraska, a single infected wild deer was found approximately 300 KM east of the area in the western part of the state where CWD is considered endemic. Among captive cervids, CWD continues to be found in low numbers of herds of privately owned wapiti and white-tailed deer.

In Saskatchewan, Canada, Chronic Wasting Disease was identified in 21 Mule Deer and one White-tailed Deer in 2004. All these animals are from areas in which the disease had been recognized previously. However, at least one of these areas, in southern Saskatchewan, appears to be expanding in size. An inter-agency program to control CWD in wild deer is being planned for implementation in 2005.

Chronic Wasting Disease has not been reported in Europe but surveillance projects have started in several countries including UK, Germany and Sweden. In a UK study 189 roe deer (*Capreolus capreolus*), 22 red deer, 66 fallow deer (*Dama dama*), 13 muntjacs (*Muntiacus muntjac*) and 14 animals of unknown species were tested.

Tissues were examined using monoclonal antibody P89. A positive CWD control supplied by the US Department of Agriculture was incorporated into the study. There was no evidence of prion disease in the material examined.

Haemorrhagic disease in deer

Orbiviral hemorrhagic disease activity was relatively quiet in the USA in 2004 with low numbers of cases confirmed in white-tailed deer in Illinois and Kansas. The majority of isolates were epizootic hemorrhagic disease virus type 2.

Giant liver fluke – *Fascioloides magna*

The prevalence and abundance of Giant Liver Flukes in red deer and roe deer in the alluvial forests of the Danube River east of Vienna in Austria were reported to decrease. The reason for this is not clear but anthelmintic treatment as well as weather conditions have been suggested. Nevertheless there may be a northward spread along the river March, which is the frontier to Slovakia and flows into the Danube.

Avian chlamydiosis

A large study concerning infection with *Chlamydia* in wild birds in UK was performed during the last few years. This infection is probably more common in wild birds than previously assumed. This disease was recorded sporadically and was found for example in rooks (*Corvus frugilegus*). Pigeon strains of the causative organism (*Chlamydia*) are potentially zoonotic. Strains deriving from other wild birds are also possibly zoonotic although this has not been established with certainty.

Avian paramyxovirus 1

Avian paramyxovirus was reported from Sweden, France, Ireland, Poland, New Zealand, India, Canada, Austria and UK. In Wales (UK), two cases were seen in feral pigeons (*Columba livia*) in Swansea city where the disease may be endemic, and a further case in a feral pigeon was seen in the North of England. In England, the disease was also diagnosed in a Woodpigeon (*Columba palumbus*), and a Collared dove (*Streptopelia decaocto*).

Ophidian paramyxovirus – OPMV

Presumptive diagnoses of OPMV, based on clinical history and histological grounds have now been made in several snake collections in Queensland, New South Wales and South Australia. Attempts to isolate OPMV from three live cases were unsuccessful and OPMV like viruses were not seen on electron microscopy of selected tissues from the affected snakes. However, a panel of 25 sera from snakes in various collections in New South Wales was assembled and sent to VLA Weybridge UK where they were examined in two separate hemagglutination inhibition tests. One test used an avian paramyxovirus antigen and the other test an OPMV isolate. The results showed that 9 of 25 snakes were positive for antibodies to OPMV-1 and 7 of 25 to OPMV-7. Seven snakes were positive in both tests. This appears to be the first confirmation of Paramyxoviral infection in captive snakes in Australia. Another outbreak has now been confirmed in South Australia and so far only captive snakes have been affected.

A retrospective survey is being conducted of inclusion body disease and ophidian paramyxovirus in Australian snakes. Preliminary results of this survey suggest that a number of different viruses are associated with inclusions in Australian snakes (Retrovirus-like, Reovirus-like, Adenovirus-like, Herpesvirus-like).

M i s c e l l a n e o u s d i s e a s e s

West Nile and related arbovirus

The geographic distribution of West Nile virus (WNV) has progressively spread since the virus was first recognised in the USA in 1999, and the resulting morbidity and mortality associated with human, equine, and wildlife infections in 2002 and 2003 will go on record as being the largest recognized human arboviral meningoencephalitis epidemic in the Western Hemisphere and the largest WNV meningoencephalitis epidemic ever recorded. However, reported West Nile virus activity was much lower in 2004.

For 2004, a total of 2470 human cases with 88 deaths had been reported from 40 states and the District of Columbia as compared to 9,122 human cases of WNV infection with 223 deaths in 2003. Arizona, California, and Texas accounted for approximately half of the fatal and nonfatal cases.

Many states continue to use surveillance of dead wild birds, mosquitoes, or sentinel animals, either singly or in combination, to detect WNV. Numbers of infected wild birds also were reduced in 2004 compared to previous years, as were cases in horses.

Intensified surveillance of wild birds and mosquitoes in recent years has yielded additional arbovirus isolations, such as eastern equine encephalitis virus, Highlands J virus, Cache Valley virus, Flanders virus, Keystone virus, and Potosi virus.

West Nile virus continued to affect a wide range of Canadian wild bird species in very large numbers in 2004. While members of the crow family are used as indicators of virus activity for public health programs, a wide range of other species, including owls, hawks, eagles and one rare species of Galliforme bird, the Sage Grouse, suffer illness and mortality from this virus.

Several countries in North America and in Europe continue to use surveillance in wild birds, mosquitoes, or sentinel animals, either singly or in combination, to detect WNV.

No evidence of West Nile virus infection has been found from surveillance in UK, to date. In contrast, an early detection of the circulation of WNV was obtained in France, Camargue area, by antibody surveillance among 300 sentinel mallards or poultry, distributed in 30 different locations. It was then possible to signal the propagation of the virus in July and August 2004, before an outbreak of 33 clinical cases in horses, including seven fatalities.

Usutu virus has been affecting Austria's blackbirds (*Turdus merula*) for the last three years and is threatening to spread to bird populations in central Europe. In 2004, the virus has spread across the entire east of the country and probably as far as Slovakia and Hungary. Owls, sparrows, swallows, thrushes and other passerine birds are also dying, but blackbirds have been accounted for 95 percent of the deaths.

Flamingo die-off in Lake Manyara National Park, Tanzania

The death of more than 10,000 flamingos has been reported from Lake Manyara in Tanzania. The cause of this mass mortality has not yet been determined. Previous similar mass mortalities in East African alkaline lakes were attributed to blue-green algal (*Cyanophyta*) blooms as well as avian tuberculosis.

Mass mortality of fulmars

Very high mortality of fulmars (*Fulmarus glacialis*) was observed in the UK over a 6-week period during March 2004. This was recorded not only on UK beaches but also on the beaches of other North Sea countries. Published accounts listed in this Report indicate that a complex sequence of events may have been responsible and a summary is provided in the VLA Wildlife Quarterly Report (WQR), 6.1. It is interesting to note that similar fulmar mortality was reported in populations of this species in the Pacific Ocean, however a link between this and the Atlantic/North Sea mortality is not apparent.

Parapox virus

Infection with parapox virus in the red squirrel (*Sciurus vulgaris*) is of great conservation importance and is currently threatening the English and Welsh populations of the red squirrel in these countries. The poxvirus is carried by the expanding population of the otherwise healthy grey squirrels (*Sciurus carolinensis*). Mountainous areas in the North of England had been considered as physical barriers to the northerly movement of grey squirrels however the population has managed to get over, or around, these areas in the last 5 years, and predictably pox disease in red squirrels has followed in the wake of the appearance of the greys. Incidents of parapox were identified in reds from several new areas across the North of England during 2004. It is anticipated that the first red squirrel pox disease in Scotland will soon occur. Examinations at VLA suggest that affected red squirrels die from secondary bacterial septicaemia, however occasional sero-positive animals have been found. It is assumed that these animals have had the disease and recovered, but were left in such a poor condition that they quickly succumbed to other diseases.

Kyasanur forest disease (Monkey fever)

An outbreak of Kyasanur forest disease (Monkey fever) was reported during April 2004 in the Indian state of Karnataka. The causative agent, Kyasanur Forest Virus, is a tick borne alphavirus (genus Alphavirus, family Togaviridae). The virus was first isolated in 1957 during a fatal epizootic affecting free-living monkeys (species not fully known) in the region of India formerly known as Mysore (Now Karnataka). Human infection has occurred frequently among forest workers with a mortality rate reaching 10 percent. The principal tick vector species is *Haemaphysalis spinigera*. An effective inactivated vaccine is available for protection of those at risk and for post-exposure treatment to moderate the course of the disease.

Hendra virus

Hendra virus re-emerged in horses and humans in two north Queensland locations in 2004. Investigation of the dynamics of Hendra virus infection and excretion in flying foxes (*Pteropus* spp) suggests a high crude seroprevalence (about 40% but varying with species) in Australia. However, on-going studies still unable to isolate virus from wild caught individuals (n > 500).

Chytridiomycosis

The known distribution of chytrid in Australia includes many areas of eastern Queensland between Brisbane and Cooktown, Eastern New South Wales, central highlands of Victoria, Adelaide and Perth. This distribution may be a reflection of searching intensity. 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%. Data on the species found infected with the amphibian chytrid and their locations are available at the Amphibian Disease Home Page at <http://www.jcu.edu.au/school/phtm/PHTM/frogs/chyspec.htm>. A threat abatement plan for Chytridiomycosis for Australia is currently being prepared (Department of Environment and Heritage).

Chytridiomycosis was reported in Tasmania – an extension of its range. Initial surveys suggest that it appears to be well established in free-living populations of Tasmanian frogs, particularly in suburban and peri-urban areas (Chytrid fungus was also detected at one remote alpine location). The tadpole stages of four species of frog have shown visible lesions of chytridiomycosis confirmed by PCR and histology (Brown Tree Frogs - *Litoria ewingii*; Eastern Banjo Frogs - *Limnodynastes dumerilii*; Spotted Marsh Frog - *Limnodynastes tasmaniensis*; Tasmanian Froglet - *Crinia tasmaniensis*).

Devil Facial Tumour Disease - DFTD

A syndrome referred to as DFTD, which affects Tasmanian Devils (*Sarcophilus harrisii*, a marsupial mammal predator) is currently being investigated in Tasmania (Australia). The disease has now been recorded in over 65 per cent of the State and is almost certainly present in a larger area. It is estimated that there are now likely to be a third to about half the wild Devil numbers in the State compared to 10 years ago. Assessment for DFTD is hampered by a lack of understanding of the aetiology and thus a diagnostic test. A case definition has yet to be developed. 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. This has led to the hypothesis that DFTD may be directly passed from animal to animal by implantation of the cell line during fighting and biting. Further testing of this hypothesis is planned. The results of transmission electron microscopy of tumour tissue for the presence of virus particles have so far been negative. A tissue culture laboratory was established in July 2004 and cultures made of tumour cells. The role of environmental intoxicants in the aetiology of the condition has now been proposed and is under development.

Tawny frogmouth (*Podargus strigoides*) – *Angiostrongylus cantonensis*. A parasitic disease affecting the central nervous system of wild tawny frogmouths emerged around Sydney (NSW) in early March 2004. The signs included: weakness, inability to perch or fly and eventual loss of the righting reflex. The disease is usually progressive and potentially fatal.

The causative parasite was identified as *Angiostrongylus cantonensis* by worm recovery at necropsy and/or histological evidence in the brains and spinal cords of the affected birds. *Angiostrongylus cantonensis* is the lungworm of wild rats, which must develop into third stage larvae, mainly in slugs and snails, before they can become infectious. Upon ingestion of these intermediate hosts, the larvae have been shown to migrate to the bird's spinal cords and brains and cause the clinical disease described above. Hosts, other than the rat are considered as accidental hosts, and can only contract the disease by ingesting the third stage that form in the intermediate hosts. *Angiostrongylus cantonensis* has also occurred in other wild life species including flying foxes, possums and macropods, as well as in domestic animals and humans.

Between March and June 2004, 13/22 tawny frogmouths necropsied were positive for cerebrospinal angiostrongylosis identified mostly from the northern suburb areas of Sydney. This range of cases indicates an increase in the prevalence of *A. cantonensis* in tawny frogmouths in the wider Sydney area, and possibly represent a sentinel species for this parasite in other animals and humans.

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

The Group reviewed the implications of Resolution XXIX on 'Emerging and re-emerging zoonoses' adopted during the 72nd General Session. It noted that, in accordance with that resolution, the OIE had already created a new Ad hoc Group on Emerging and Re-Emerging Zoonoses that will be inter-disciplinary in membership. The deliberations of the Ad hoc Group will help to advise on sustainable agriculture development that does not increase the occurrence of emerging and re-emerging zoonoses and on surveillance systems that cover the wildlife, domestic animal, and human continuum. The Ad hoc group will also assist in the education of OIE Member Countries. It will work in collaboration with the existing OIE Working Groups on Wildlife Diseases and Animal Food Production Safety and the Ad hoc Group on Epidemiology and other relevant bodies or experts, in particular OIE Reference Laboratories and Collaborating Centres. It is also expected that in the event of serious outbreaks of zoonotic diseases that transcend national borders, the OIE will demonstrate leadership in providing guidance on disease control strategies at the animal production levels and will support the communication efforts of public health agencies in addressing human impacts. In this respect, the OIE will work in close association with sister organisations such as FAO and WHO. Members of the Working Group on wildlife diseases will participate actively in these activities of the OIE as and when requested. It was felt that the expertise of members of the Working Group on emerging wildlife zoonoses as evidenced by the work described in several articles of the OIE Scientific and Technical Review would be most beneficial to the new Ad hoc Group.

The Working Group also noted that the OIE and FAO have proposed a joint OIE/FAO Network on avian influenza expertise for the benefit of Member Countries especially those in the developing world. One of the major objectives of the network is to collaborate with the WHO network on influenza for the Human-Animal Interface. This will entail exchange of scientific information, pathological samples and virus isolates for further analysis. The virus isolates from animals may be used to prepare vaccines for human use in case of a possible human influenza pandemic.

Dr Pierre Formenty of the WHO made a presentation on the role of the WHO in disseminating information on specific zoonoses and their prevention. He stressed the importance of the existing collaboration between WHO and OIE in the sharing of information on zoonoses. He explained how this synergism will be further improved with the 'Global Early Warning System'(GLEWS) being developed jointly by the two organisations. He provided additional information on a few specific zoonoses such as Nipah virus infection, Rift Valley Fever and Ebola virus infection, pointing out the tremendous efforts that are being deployed by WHO in Africa with respect to the latter disease and the benefits they have experienced from working closely with conservation-oriented non-government groups.

3. Emergency Preparedness for Diseases in Wild Animals

The Working Group reviewed its 2004 report on national preparedness and discussed what further work it might undertake that would be most useful to CVOs and the International Committee. It was decided that the Working Group will prepare a briefing document for CVOs on national preparedness to respond to important disease outbreaks that may involve wild animals. The purpose of the document will be to provide information useful to CVOs who may engage in planning responses to animal disease outbreaks, and who want to ensure that wild animals are included appropriately in their planning process.

The document will expand on the Working Group's 2004 report on national preparedness, and will include assessment of national vulnerability and risk of socio-economic impacts from diseases in wild animals, quantifying wild animal populations, key elements of disease surveillance in wildlife, disease management and response plans and options for interventions in wild animal diseases, communication planning, education requirements for outbreak response personnel, and the inter-agency collaborations that often are required to achieve disease management objectives in wild animal populations.

It is intended that this document will be ready by February 2006.

4. Avian Influenza

A highly pathogenic avian influenza (HPAI) virus (H5N1) was reported in 2004 among poultry in southeastern Asian countries. Associated with this outbreak have been a few reports of HPAI mortality in wild birds, which have raised questions relating to both direct wild bird mortality and the possibility that wild birds could be involved in the maintenance or transmission of this virus.

Wild birds, particularly numerous species in the orders *Anseriformes* (ducks, geese, and swans) and *Charadriiformes* (shorebirds, gulls, and terns), are reservoirs of influenza A viruses, and the epidemiology of these viruses in wild birds is complex. However, HPAI H5 and H7 viruses are very rarely found in wild birds. Of the thousands of influenza viruses isolated from wild birds worldwide, only one previously had been associated with either domestic or wild bird mortality. This H5N3 virus was responsible for mortality in common terns in South Africa in 1961. Thus, recent reports of HPAI H5N1 causing wild bird mortality in southeastern Asia are unusual and a potential cause for concern. Fortunately, there are no reports of direct transmission of any avian Influenza viruses from wild birds to humans, including in the current situation. Nonetheless, these unfolding events underscore the need to better understand the epidemiology of avian Influenza viruses in wild bird populations and to identify mechanisms of interspecies transmission and the emergence of HPAI viruses.

The Working Group noted that, while strains of avian influenza highly pathogenic to poultry (chickens) invariably have evolved within the poultry compartment from virus strains of low pathogenicity, wild birds are potential sources of influenza genes and whole viruses of low pathogenicity that may contribute to the evolution of strains highly pathogenic to poultry once adapted to these domestic birds. Where possible, countries should carry out some level of surveillance for influenza viruses in wild birds. Such surveillance is justified in order to determine what Influenza A viruses occur in wild birds, to characterize those viruses sufficiently that it will be possible to determine whether or not Influenza A viruses highly pathogenic for humans or domestic animals, that may be recognized in the future, have arisen in whole or in part from Influenza A viruses transmitted to humans or domestic animals from wild birds, and to monitor wild bird populations for the presence of particular Influenza A viruses, or their genetic components, which are of national or international concern to human or animal health. The Working Group also considers it essential to effective international disease management that the results of such surveillance in wild birds be shared with the international community.

The Working Group also took note of the OIE's definition of animal compartments: "one or more establishments under a common biosecurity management system containing an animal subpopulation with a distinct health status with respect to a specific disease or specific diseases for which required surveillance, control and biosecurity measures have been applied for the purpose of international trade." It is clear from this definition that wild birds and poultry can be regarded as not being in the same compartment and that the detection of influenza A viruses in wild birds, even of H5 and H7 subtypes, should not trigger trade sanctions against countries undertaking such surveillance and reporting the results in a transparent manner.

The following information on occurrence of avian influenza has been summarized from recognized sources:

- **Russia:** On several occasions H5N1 avian influenza viruses were isolated from migrating birds in the Novosibirsk region of Russia during the past 4 years. In 2003, an H5 avian influenza virus was isolated and sequenced by the Laboratory to Investigate and Monitor Emerging Zoonotic Diseases (Novosibirsk, Russia) from a wild mallard duck on Lake Chany in the south of Western Siberia. However, it was determined that the A/mallard/Chany/9/03 avian influenza virus is not the same virus as the Asian H5N1.
- **Cambodia:** H5N1 was also isolated in two outbreaks involving non-poultry avian species. A large variety of captive birds as well as free-flying crows were affected in the outbreak at Tamao Zoo, Kandal province. The disease appeared first in raptors such as grey headed fish eagle, serpent eagles, hawk eagles, spotted wood owls, brown fish owl, spot bellied eagle owl and buffy fish owls in the first two to three days. The raptors were fed chicken meat or carcasses obtained from the Kandal Market in central Phnom Penh. Herons, egrets and cranes were subsequently affected suggesting respiratory transmission or mediated through free or wild birds such as crows which frequent the aviary areas. Psittacines were affected in a further outbreak.

Clinical signs, primarily lethargy and inappetence, were also evident in zoo cats (tiger and Leopard) - all have recovered.

- **Egypt:** In Damietta, avian influenza virus (H10N7) was isolated from 5 wild duck samples.
- **Japan:** Crows found dead at an infected farm and within a movement control area (Tanba town), tested positive to H5N1.
- **Thailand:** Dead birds found at Dusit Zoo, early lab tests detected the H5 strain in crows.

5. Surveillance for Diseases in Wild Animals

In its discussion of emerging zoonotic diseases and of the important role sometimes played by wild animals in this domain, the Working Group identified surveillance for diseases specifically in wild animals as a topic for which clear documentation is minimal in current OIE publications and standards. From discussions with OIE and WHO staff, it was made clear that these two international disease management organizations, together with FAO and IUCN, are working together in new ways to establish coordinated and collaborative approaches to reduce suffering and economic loss from outbreaks of diseases. Effective surveillance for diseases in wild animals is essential to the success of these disease management programs. The power of effective wildlife disease surveillance was made clear to the Working Group by a presentation by Dr. Staubach on surveillance for classical swine fever in wild boar in Europe.

The Working Group discussed what it could do to collaborate in these actions being taken toward more effective international disease management. It was decided that the Working Group should focus on surveillance and prepare a detailed Appendix on surveillance of diseases specifically in wild animal populations for inclusion, through the usual channels of review and approval, in the OIE *Terrestrial Animal Health Code*. This Appendix will be written in reference to the current Code chapter on disease surveillance, and will include a rationale for surveillance of diseases in wild animals, and aspects of field methods, specimen access, laboratory issues and information management issues peculiar to surveillance in wild animal species and populations.

6. Suitability of Widely-Used Diagnostic Tests on Samples Derived from Wild Animal Species

For several years, the Working Group has been concerned that diagnostic tests validated for use on samples from particular species of domestic animals are too often used on samples from wild animal species for which those tests have not been validated. The results from such tests can pose problems of interpretation as they may be radically inaccurate and replete with false positive or false negative information. In 2004, the Group undertook a preliminary analysis of the suitability for use on wild animal species of tests used for the diagnosis of diseases of particular importance to the OIE. The results of this preliminary analysis are presented in the table below.

The methods used in some tests assure that results obtained are not adversely affected by differences in the animal species to which the tests are applied. Many of the standard tests to identify infectious agents are in this category - culture for bacteria and viruses, and PCR for example. Other test methods only can be applied to one or a small number of species. Examples are all Indirect ELISA tests, in which an antibody that reacts with the immunoglobulin molecules of the host animal species is required within the test. Thus, unless such host species-specific antibodies have been developed, the results of these tests are not valid and will be highly misleading if applied to samples from other species of animals. On the other hand, competitive and blocking ELISA tests and the Fluorescence Polarization Assay do not require host species specific antibodies and thus can be applied to samples from any species of animal.

The Working Group hopes that the preliminary analysis presented below will serve as a useful guide to CVOs and diagnostic laboratories who wish to test wild animals for diseases. The Working Group also hopes that the relevant OIE Commissions and Reference Laboratories will recognize the growing importance of surveillance and diagnosis of important diseases in wild animals and work to develop and implement more and better tests that are not limited in the range of host species to which each can be applied.

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		
African Horse Sickness	Wild Equidae, Rhinoceroses, Elephants	Virus Identification	Virus Isolation	yes (d)		
			PCR	yes (q)		
			Immunohisto-chemistry	yes (h,i)		
					Antigen-capture ELISA	Limited (a)
			Serology	Indirect ELISA	No (c)	
				Virus Neutralization	yes (r,q)	
				CFT	Limited (b)	
African Swine Fever	wild suids (Suidae)	Virus Identification	virus Isolation	yes (d, g)		
			PCR	yes (h,i)		
			Direct Immunofluorescence	yes (b,h)		
			Immunodiffusion	Limited (a, k)		
			CFT	Limited (a, k)		
				RIA	Limited (a, k)	
				Immunohistochemistry	yes (j)	
			Serology	Direct ELISA	yes	
				Immunodiffusion	Limited (k)	
		Immunofluorescence	Limited (a)			
Bluetongue/ Epizootic Hemorrhagic Disease	Wild Ruminants	Virus Identification	Virus Isolation + virus Neutralisation	yes (d)		
			PCR	yes (h)		
		Serology	Agar Gel Immuno-diffusion	yes (j)		
			Virus Neutralization	yes		
Classical Swine Fever	Wild Suids (Suidae)	Virus Identification	Virus Isolation	yes(d,g,l,o)		
			Direct FAT	yes (l)		
			RT-PCR	yes (h)		
			Antigen-Capture ELISA	yes (j)		
			Indirect Fluorescence	yes (m)		
			Serology	ELISA	yes (n)	
		Virus neutralisation	yes (d,o)			

Disease/Pathogen	Host Species to be Tested	Type of Test	Test	Suitability in Wild Animals			
Foot and Mouth Disease	Multiple Species	Virus Identification	Virus Isolation	yes (g,d)			
			Probang/Virus Isolation	Limited (g,o,p)			
			PCR	yes			
		Serology	CFT	No (a,e)			
			Blocking ELISA	yes (n)			
			ABC ELISA	No (c)			
Newcastle Disease	All Bird Species	Virus Identification	Virus Isolation	yes (d)			
			PCR	yes (h)			
		Serology	Hemagglutination Inhibition	yes			
			Peste des Petits Ruminants	Multiple Species of Wild Ungulates	Virus Identification	Virus Isolation	yes (g)
						Immuno-staining	yes (l)
PCR	yes						
Serology	Agar Gel Immuno-Diffusion	yes (l)					
	Counter Immunoelectrophoresis	yes (l)					
	Virus Neutralization	yes					
Rabies	Multiple Species	Virus Identification	FAT	yes (g,m)			
			Rapid Enzyme Immunodiagnosis	yes (p)			
			RT-PCR	yes (h,q)			
		Serology	Virus Isolation	yes (d,g)			
			Virus Neutralization	yes (g,r,s)			
			ELISA with Protein G	yes (a,r)			
Rinderpest	Multiple Species	Virus Identification	FA Virus Neutralization (FAVN)	yes (r)			
			Rapid Fluorescent Focus Inhibition (RAFFIT)	yes (r)			
			Virus culture	yes (g)			
			Immuno-staining	yes (l)			
			PCR	yes			
Vesicular Stomatitis	Multiple Species	Virus Identification	Agar Gel Immuno-Diffusion	yes (l)			
			Differential Immunocapture ELISA	yes			
			ELISA - Indirect	No (c)			
		Serology	ELISA - Competitive (Blocking)	yes			
			Virus Neutralization	yes (g)			
			Competitive ELISA	yes			
Anthrax	Multiple Species	Bacterium Identification	Virus Isolation	yes (g)			
			ELISA	yes			
			CFT	Limited (e)			
			PCR	yes			
			Virus Neutralization	yes			
Bovine Tuberculosis	Multiple Species	Bacterium Identification	Immunochromo-graphic Strips	Limited (n,v)			
			Culture	yes (g,d)			
			PCR	yes (g)			
			Immunohisto-chemistry	yes (i)			
		Serology	ELISA	No (a,f,t)			

Disease/Pathogen	Host Species to be Tested	Type of Test	Test	Suitability in Wild Animals
		Other Indirect	-Interferon test	No (a,f,t)
			Intradermal Tuberculin Tests	No (a,f,t,u)
Chlamydia	Multiple Species	Bacterium Identification	Culture	yes (g,p)
			Immunohisto-chemistry	yes
			PCR	yes (p)
			ELISA	Limited (n)
		Serology	CFT	Limited (e,j,l)
			Indirect Immunofluorescence	yes (l)
Rabbit Haemorrhagic Disease	<i>Oryctolagus cuniculus</i>	Virus Identification	ELISA	yes (c,l)
			Western Blot	yes (c,l)
			Immunohisto-chemistry	yes
			PCR	yes
			Hemagglutination	yes
		Serology	Competitive ELISA	yes (l)
			Hemagglutination Inhibition	yes
Tularemia	Multiple Species	Bacterium Identification	Culture	yes (d,g)
			Mouse Inoculation	yes (d,g)
			PCR	yes
			Immunohistochemistry	yes
		Serology	Tube Agglutination	yes
			Indirect ELISA	Limited (c)
Trichinellosis	Multiple Species	Nematode Identification	Trypsin Digest	yes (a,d)
			Tissue Compression	Limited (a)
		Serology	Indirect ELISA	No (c)

- a. Sub-optimal sensitivity and specificity in all species
- b. Sensitivity decreases with time post-infection in all species
- c. Requires host species-specific anti-immunoglobulin
- d. Gold Standard for specificity, with variable sensitivity in all species
- e. Unuseable with anti-complementary sera or other anti-complement factors, in all species
- f. Poor sensitivity in anergic individuals in all species
- g. requires high biosecurity laboratory facilities
- h. Enables diagnosis in the absence of living infectious agent
- i. Enables diagnosis in formalin-fixed tissues
- j. Can be used for rapid screening during outbreaks (false positives likely) in all species
- k. The antigen is specific only for the group of infectious agent, not for the individual strain
- l. Requires monoclonal antibodies for accurate identification
- m. Requires high-quality conjugates
- n. Rapid test that may have sub-optimal specificity
- o. Slow and labour-intensive
- p. Only detects subset of strains or genotypes
- q. Useful for distinguishing among strains and genotypes
- r. Can not distinguish between antibodies produced by natural infection versus vaccination
- s. International Standard
- t. Only validated in certain wildlife species
- u. Unsuitable for Pachyderms
- v. Commercial kits are not generally available.

7. Mortality of *Gyps* sp. Vultures in the Indian Sub-Continent

Conservation of *Gyps* species of vultures in South and South-East Asia

The Working Group on Wildlife Diseases noted with concern that the Long-billed (*Gyps indicus*), slender-billed (*Gyps tenuirostris*) and white rumped (*Gyps bengalensis*) vultures, endemic to South-East Asia, have declined by more than 97% during the last 10 years. These vulture species are an integral part of the cultures in all South Asian countries and play an important ecological role in the disposal of animal carcasses.

IUCN /World Conservation Union lists these species as critically endangered (IUCN Red List 2004). The Working Group also noted that recent studies published in the Journal *Nature*, show that the massive decline in the population of vultures in South Asia is mainly due to exposure to the non-steroid anti inflammation drug (NSAID) diclofenac in livestock carcasses (*Nature*, 427, 630-633, Feb 2004). The Working Group recognizes that secondary factors, such as loss of nesting sites, use of pesticides, and other factors, also may be important on a local scale. The dramatic loss of these important scavenger species creates conditions under which other scavenger species such as feral dogs, jackals, rats, cats and others, may increase in number and density due to the abundance of carrion formerly consumed by vultures. These expanded populations may pose new disease threats to humans and animals, such as increased risk of rabies, in affected regions.

The IUCN-WCV has called on the Governments of India, Pakistan and Nepal to institute an immediate ban on the veterinary use of diclofenac and to search for a safe alternative to this drug. The Working Group agrees that all possible measures to halt the mortality of these vultures should immediately be applied.

The Working Group also recognizes that the information generally available on vulture populations and mortality events associated with diclofenac and other causes appears to be incomplete or not fully available to the broad scientific community. The Working Groups requests that delegates in affected countries ensure that complete information on this important ecological event is made available to the scientific community.

8. OIE Collaborating Centres on Wild Animal Diseases

Due to the growing concern for wildlife diseases and the potential for emergency wild animal disease situations, the Working Group supported, in 2003, the establishment by OIE of Collaborating Centres on wildlife diseases. Such Collaborating Centres are needed to assist with wildlife disease programs around the world. The Working Group also proposed criteria on which the OIE might base its selection of applications for Collaborating Centres it might receive (Working Group Report 72SG/13/GT; February 2004; p.24-25). The Group advises the Delegates from countries with appropriate expertise or institutions to apply.

9. Other Matters

a) Genetically Modified Organisms (GMO)

The Working Group discussed a case study, prepared in Australia, which was a risk analysis of the use of a genetically modified myxoma virus vaccine in wildlife. This case study provides insights into the range of issues that surround the use of genetically modified organisms in wildlife disease management and in other applications to wild animals. The Group now awaits the results of a currently circulating OIE questionnaire on the application of biotechnology to livestock and animal health products before making any further review of the GMO issue. In the meantime, the case study will be reviewed by Working Group members. The Working Group will retain the GMO issue as an active agenda item for future meetings.

b) OIE Website Pages of the Working Group on Wildlife Diseases

Dr Daniel Chaisemartin, OIE Chargé de Mission, presented and explained the Wildlife Disease Working Group web pages. The current site includes a Group home page which provides access to additional pages relevant information: the mandate of the Working Group, a list of its members, reports from previous years, technical items, and useful related links. The group discussed and agreed on new content to be placed on these web pages. Certain important items from previous annual reports will be placed on the “Technical items” page. The tables of reported disease occurrences compiled each year will be placed on the “Reports” page. Some relevant wildlife disease organisations and institutions will be added to the “Links” page.

The Group’s annual Questionnaire on occurrences of wildlife diseases around the world will be placed on a new page to be available for direct download. Delegates can visit the Working Group’s pages at <http://www.oie.int/wildlife/eng/en_wildlife.htm>. Suggestions for improvements would be welcomed by the Group

.../Appendix

**REPORT OF THE MEETING OF THE OIE WORKING GROUP
ON WILDLIFE DISEASES**

Paris, 14 – 16 February 2005

Agenda

1. Matters arising from the report of 2004 *Roy Bengis*
 2. Matters arising from the report presented to the International Committee *Marc Artois*
 3. Emerging Wildlife related zoonoses and diseases of public health concern. Development of a multi organizational approach to improve surveillance, detection and reporting *Roy Bengis, Ted Leighton & Pierre Formenty (WHO)*
 4. Disease Preparedness for transboundary animal disease incursions - Holistic and disease -specific strategies - concentrating on livestock diseases of economic importance *Chris Bunn, John Fisher & Ted Leighton*
 5. Avian Influenza - current position in farmed poultry, wildfowl vectors, mixing hosts and zoonotic implications *Chris Bunn, Torsten Morner
Marc Artois, John Fischer & OIE
Central Bureau*
 6. Sensitivity and specificity of available diagnostic tests for wildlife *All members*
 7. Global wildlife disease situation as revealed by the questionnaire responses (regional reports) *All members*
 8. Gyps vulture die-off. Latest developments and ideas *Mike Woodford*
 9. Collaborating Centres *Marc Artois*
 10. Other matters
 - Mortality in hippopotamus in Uganda
 - Risk Analysis of the Use of a genetically modified organism (GMO) in wildlife — a case study
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MEETING OF THE OIE WORKING GROUP ON WILDLIFE DISEASES

Paris, 14 - 16 February 2005

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Sorted by countries

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Andorra	Avian Chlamydiosis	Several exotic birds	yes	2	
B	Andorra	Bovine tuberculosis	Sus scrofa	no		
B	Andorra	Trichinellosis	Sus scrofa	yes	3/45 (66 %)	
W	Andorra	Contagious Ecthyma,	Ovis musimon	no		
W	Andorra	Pestiviruses	Rupicapra pyrenaica pyrenaica	no		
W	Andorra	Sarcoptic Mange	Vulpes vulpes	yes	7 / 26 (26.9 %)	
W	Andorra	Trichomoniasis	Columba palombus	yes	4/5 (80 %)	
B	Australia	Avian chlamydiosis	Considered endemic in wild psittacine birds in Australia	yes	26	
B	Australia	Avian cholera		no		
B	Australia	Avian tuberculosis	Known to occur in many native Australian birds and mammals	yes	9	
B	Australia	Brucellosis	feral pigs seals?	no		
B	Australia	Caprine arthritis/encephalitis (CAE	Incidence low and sporadic in feral goats	no		
B	Australia	Echinococcus granulosus	Wild dog(Canis familiaris familiaris X Canis lupus dingo), Red Fox (Vulpes vulpes). Common Wombats (Vombatus ursinus), feral pigs (Sus scrofa)	no		
B	Australia	Echinococcus multilocularis		no		
B	Australia	Leishmaniasis (likely a new species)	Macropus rufus	no		
B	Australia	Leptospirosis	feral pigs (sus scrofa) recorded in various Australian native wildlife species	yes		
B	Australia	Myxomatosis	Oryctolagus cuniculus	yes		
B	Australia	Paratuberculosis	Macropus eugenii (Thought not true infection but environmental exposure)	no		
W	Australia	Arboviruses	various	no		
W	Australia	Avian malaria	Endemic in some species of Australian native birds	no		
W	Australia	Avian pox	Sulphur crested cockatoo (Cacatua galerita), Gang gang cockatoo (Callocephalon fimbriatum), Australian king parrot (Alisterus scapularis), Galah (C. roseicapilla), Little corella (C. pastinator). Crimson Rosella (Platycercus elegans), Pied Currawong (Graculina versicolor), Sulphur Crested Cockatoo (C. galerita)	yes	9	
W	Australia	Bat lyssavirus	Pteropus alecto and Pteropus policephalus	yes	3	
W	Australia	botulism	usually waterfowl	yes		
W	Australia	Chytridiomycosis	from 46 Australian species	yes		
W	Australia	Circoviruses	Endemic in many species of Australian birds	yes	3	
W	Australia	feline leukaemia	Serological evidence in feral cats (Felis catus	no		
W	Australia	Feline panleucopenia	Serological evidence in feral cats (Felis catus	no		
W	Australia	Immunodeficiency virus	Serological evidence in feral cats (Felis catus			

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	Australia	Listeriosis	Previously reported in Sugar gliders (<i>Petaurus breviceps</i>) in Australia			
W	Australia	Paramyxoviruses	fruit bats	yes		
W	Australia	Salmonellosis	pelican, diamond and olive pytons	yes	3	
W	Australia	Sarcoptic mange	Endemic in many Common Wombat (<i>Vombatus ursinus</i>) populations	yes	2	
W	Australia	Toxoplasmosis	Common Wombat (<i>Vombatus ursinus</i>) and endemic in many species of Australian native animals.	yes	1	
W	Australia	Trichomoniasis	Endemic in many Australian species	yes	1	
B	Austria	Avian Infectious Bronchitis	only in poultry	no		
B	Austria	Rabbit Haemorrhagic Disease (RHD)	<i>Oryctolagus cuniculi</i>	yes	24	
B	Austria	Rabies	<i>Vulpes vulpes</i>	yes	1	
B	Austria	Avian Chlamydiosis	only in pet birds	no		
B	Austria	Brucellosis	<i>Lepus europaeus</i>	yes	3	
B	Austria	<i>Echinococcus multilocularis</i>	<i>Vulpes vulpes</i>	yes	7	
B	Austria	Equine Herpesvirus	only in horses	no		
B	Austria	Leptospirosis	only in farm animals	no		
B	Austria	Malignant Catharral Fever	only in cattle			
B	Austria	Paratuberculosis	only in cattle			
B	Austria	Trichinellosis	<i>Vulpes vulpes</i>	yes	24	
B	Austria	Tularemia	<i>Lepus europaeus</i>	yes	16	
W	Austria	Contagious Ecthyma,	<i>Rupicapra rupicapra</i>	no		
W	Austria	European Brown Hare Syndrome (EBHS)	<i>Lepus europaeus</i>	yes	19	
W	Austria	Feline Leukaemia (FLV)	only in pets			
W	Austria	Feline Panleucopenia,	only in pets			
W	Austria	Large Liver Flukes => Giant liver Fluke	<i>Cervus elaphus</i> , <i>Capreolus capreolus</i>	yes	2,1	
W	Austria	Listeriosis	<i>Cervus elaphus</i> , <i>Dama dama</i>	no		
W	Austria	Paramyxoviruses	wild pigeon	yes	aprox. 200	
W	Austria	Paramyxoviruses (Bat, Canine, Cetacean, Phocine)	<i>Meles meles</i> , <i>Martes foina</i>	yes	6,1	
W	Austria	Pasteurellosis	<i>Lepus europaeus</i> , <i>Cricetus cricetus</i>	yes	2	
W	Austria	Pestiviruses	only in cattle and domestic pigs			
W	Austria	Pseudotuberculosis	<i>Lepus europaeus</i>	yes	14	
W	Austria	Salmonellosis	<i>Sus scrofa</i>	yes, <i>S. cholerae suis</i>	8	
W	Austria	Sarcoptic Mange	<i>Rupicapra rupicapra</i> , <i>Vulpes vulpes</i>	yes	1, 6	
	Benin	No diseases reported in wildlife				
B	Botswana	Avian Cholera	—	no	—	
B	Botswana	Rabies	<i>Genetta felina</i>	yes	1	
B	Botswana	Rabies	Black backed jackal (<i>Canis mesomelas</i>)	yes	1	
B	Botswana	Anaplasmosis		no	—	
B	Botswana	Anthrax	<i>Alcelaphus buselaphus</i>	yes	1	
B	Botswana	Anthrax	<i>Acinonyx jubatus</i>	yes	3	
B	Botswana	Anthrax	<i>Loxodonta africana</i>	yes	see notes	
B	Botswana	Anthrax	<i>Syncerus caffer</i>	yes	see notes	
B	Botswana	Brucellosis	<i>Syncerus caffer</i>	no	—	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Botswana	Foot and Mouth Disease	<i>Syncerus caffer</i>	no	1	
B	Botswana	Malignant Catharral Fever	<i>Connochaetes taurinus</i>	no	—	
W	Botswana	Babesiosis		no	—	
B	Brazil	Rabies	QUIRÓPTERO	yes	44	
B	Brazil	Rabies	RAPOSA	yes	16	
B	Brazil	Rabies	GUAXINIM	yes	2	
B	Brazil	Rabies	PRIMATA	yes	2	
A	Brunei	newcastle disease	avian	yes	not recorded	
A	Brunei	sheep/goat pox	caprine	not recorded		
B	Brunei	avian cholera	avian	yes	not recorded	
	Brunei Darussalam	No diseases reported in wildlife				
A	Bulgaria	Classical Swine Fever	Wild boar, <i>S. Scrofa</i>		9	
B	Bulgaria	Rabies	Red fox		4	
B	Bulgaria	Rabies	Wild cat		1	
B	Canada	Avian Cholera		no		
B	Canada	Anthrax		no		
B	Canada	Avian Chlamydiosis		no		
B	Canada	Avian Tuberculosis		no		
B	Canada	Bovine tuberculosis	<i>Bison bison</i>	yes	endemic at one location	
B	Canada	Bovine tuberculosis	<i>Cervus elaphus</i>	yes	5 (one location)	
B	Canada	Bovine tuberculosis	<i>Odocoileus virginianus</i>	yes	3 (one location)	
B	Canada	Brucellosis	<i>Rangifer tarandus</i> (Caribou)	yes, B. suis biovar 4	130 (endemic)	
B	Canada	Brucellosis	<i>Rangifer tarandus</i> (Reindeer)	yes, B. suis biovar 4	43, endemic at one location	
B	Canada	Brucellosis	<i>Bison bison</i>	yes, endemic in one herd, B. abortus		
B	Canada	Brucellosis	<i>Monodon monoceros</i> (<i>Brucella pinnipedae</i>)	yes	1	
B	Canada	Duck Plague (DVE)		no		
B	Canada	<i>Echinococcus granulosus</i>	<i>Alces alces</i>	yes	3	
B	Canada	<i>Echinococcus multilocularis</i>				
B	Canada	Leptospirosis	<i>Zalophus californianus</i>	yes	10-100, not counted	
B	Canada	Paratuberculosis		yes		
B	Canada	Rabies	Bats (several species)	yes	74	
B	Canada	Rabies	<i>Mephitis mephitis</i>	yes	84	
B	Canada	Rabies	Fox	yes	8	
B	Canada	Rabies	<i>Canis lupus</i>	yes	3	
B	Canada	Rabies	<i>Procyon lotor</i>	yes	5	
B	Canada	Trichinellosis		no		
B	Canada	Tularemia		no		
w	Canada	Avian Malaria		no		
w	Canada	Avian Pox	<i>Pica pica</i>	yes	2	
w	Canada	Bat Lyssaviruses				
w	Canada	<i>Baylisascaris</i> spp.	<i>Marmota monax</i>	yes	1	
w	Canada	<i>Baylisascaris</i> spp.	<i>Procyon lotor</i>	yes	1	

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
w	Canada	Baylisascaris spp.	Marmota monax	yes	2	
w	Canada	Baylisascaris spp.	Sciurus carolinensis	yes	3	
w	Canada	Besnoitiosis	Rangifer tarandus	yes, endemic	not counted	
W	Canada	Chytridiomycosis	Rana sp	no		
w	Canada	Circoviruses	Columba livia	yes	1	
w	Canada	Contagious Ecthyma,		no		
w	Canada	Feline Panleucopenia,	Procyon lotor	yes	20	
w	Canada	Hantaviruses	Peromyscus maniculatus	no		
w	Canada	Histomoniasis	Meleagris gallopavo	no		
w	Canada	Inclusion Body Hepatitis	Falconiformes	no		
W	Canada	Iridovirus diseases	Ambystoma tigrinum	no		
w	Canada	Large Liver Flukes	Odocoileus virginianus	yes	1	
w	Canada	Meningeal worms of cervides	Alces alces	yes	2	
w	Canada	Meningeal worms of cervides	Cervus elaphus	yes	1	
w	Canada	Paramyxoviruses	Phalacrocorax auritus	yes	1	
w	Canada	Paramyxoviruses (Bat, Canine, Cetacean, Phocine)				
w	Canada	Sarcoptic Mange	Vulpes vulpes	yes	4	
w	Canada	Sarcoptic Mange	Canis latrans	yes	2	
w	Canada	Sarcoptic Mange	Canis lupus	yes	3	
w	Canada	Sylvatic Plague		no		
w	Canada	Transmissible Spongiform Encephalopathies (TSE, CWD)	Odocoileus hemionus	yes	21	
w	Canada	Trichomoniasis	Zenaida macroura	yes	3	
w	Canada	Tyzzler's Disease		no		
w	Canada	West Nile Virus	Many species	yes	450	
A	Congo	Classical Swine Fever	porcs	yes	des milliers	
A	Congo	Newcastle Disease	volailles	yes	des milliers	
A	Congo	Peste des petits ruminants	ovins et caprins	yes	une centaine	
B	Congo	Anthrax	Hippopotami (Hippopotamus amphibius)	yes	several	
B	Congo	Avian infectious bronchitis	volailles	yes	des milliers	
B	Congo	Avian Tuberculosis	volailles	yes	une centaine	
B	Congo	Bovine tuberculosis	Chimpanzee (pan paniscus)	yes	une centaine	
B	Congo	Rabies	chiens	yes	cinquante	
B	Congo	Tuberculosis humane	Chimpanzee (pan paniscus)	yes	20	
W	Congo	Ebola Virus Hemorrhagic Fever (EVHF)	pan paniscus	yes	20	
	Cook islands	No wildlife diseases reported			return recorded no diseases	
A	Cyprus	Bluetongue	Sheep, goat, Cattle	no		
B	Cyprus	Rabbit Haemorrhagic Disease (RHD)	Rabbits		NK	
W	Cyprus	Trichomoniasis	Partridges, Pigeons			
B	Czech Rep.	Myxomatosis	cun	yes	...	
B	Czech Rep.	Rabbit Haemorrhagic Disease (RHD)	cun	yes	...	
B	Czech Rep.	Avian Tuberculosis	AVI	yes	105	
B	Czech Rep.	Bovine Herpesvirus (IBR)	bos	yes	295	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Czech Rep.	Brucellosis	lep	yes	40	
B	Czech Rep.	Echinococcus multilocularis	fau	yes	...	
B	Czech Rep.	Leishmaniasis	can	yes	...	
B	Czech Rep.	Leptospirosis	fau, can	yes	...	
B	Czech Rep.	Maedi/Visna	ovi	yes	3	
B	Czech Rep.	Paratuberculosis	bos, fau, ovi	yes	68	
B	Czech Rep.	Tularemia	lep	yes	111	
W	Czech Rep.	Circoviruses	parrots	yes	3	
W	Czech Rep.	European Brown Hare Syndrome (EBHS)	lep	yes	3	
W	Czech Rep.	Feline Leukaemia (FLV)	fel	yes	...	
W	Czech Rep.	Feline Panleucopenia,	fel	yes	...	
W	Czech Rep.	Histomoniasis	turkey	yes	500	
W	Czech Rep.	Inclusion Body Disease,		yes	...	
W	Czech Rep.	Meningeal worms of cervides		yes	...	
W	Czech Rep.	Psoroptic Mange	fau	yes	...	
W	Czech Rep.	Sarcoptic Mange	fau	yes	...	
W	Czech Rep.	Trichomoniasis	geese	yes	5000	
B	Denmark	Avian Cholera	Haematopus ostralegus, Mergus serrator	yes	2	
W	Denmark	Listeriosis	Capreolus capreolus	yes	1	
W	Denmark	Listeriosis	Phasianus sp.	yes	1	
W	Denmark	Paramyxoviruses (Bat, Canine, Cetacean, Phocine)	Meles meles	yes	1	
W	Denmark	Pasteurellosis	Capreolus capreolus, Mustela putorius	yes	2	
W	Denmark	Salmonellosis	Vulpes vulpes og Erinaceus europaeus	yes	7	
W	Denmark	Sarcoptic Mange	Vulpes vulpes	yes	7	
A	Estonia	Classical Swine Fever	Sui	no		
A	Estonia	Foot and Mouth Disease	Bos	no		
A	Estonia	Newcastle Disease	Avi	no		
B	Estonia	Anthrax	bov,cap,equ,ovi,sui	no		
B	Estonia	Avian Cholera	avi	no		
B	Estonia	Avian Tuberculosis	avi	no		
B	Estonia	Bovine Herpesvirus (IBR)	bov	yes	172 antibody positive cattle	
B	Estonia	Bovine tuberculosis	bov	no		
B	Estonia	Brucellosis	bov,sui	no		
B	Estonia	Duck Hepatitis	avi	no		
B	Estonia	Leptospirosis	bov,sui	yes	1 cattle, 1 swine	
B	Estonia	Maedi/Visna	ovi	yes	22 antibody positive sheep	
B	Estonia	Rabies	bov,can,cap,equ,fau	yes	314 pos: 255 wild 59 domestic	
B	Estonia	Trichinellosis	fau	yes	8 wild boars, 2 lynxes, 1 bear	
W	Estonia	Malignant Catharral Fever	bov	no		
B	Finland	Echinococcosis	Moose	yes	2	
B	Finland	Echinococcosis	Wolf	yes	2	

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Finland	Trichinellosis	Wolverine	yes	1	
B	Finland	Trichinellosis	Lynx	yes	40	
B	Finland	Trichinellosis	Brown bear	yes	1	
B	Finland	Trichinellosis	red fox	yes	61	
B	Finland	Trichinellosis	badger	yes	1	
B	Finland	Trichinellosis	Pine marten	yes	3	
B	Finland	Trichinellosis	Otter	yes	1	
B	Finland	Trichinellosis	Raccoon dog	yes	48	
B	Finland	Trichinellosis	Wolf	yes	12	
B	Finland	Tularemia	Mountain hare	yes	12	
B	Finland	Tularemia	Brown hare	yes	3	
W	Finland	Avian pox	Blue tit	yes	1	
W	Finland	Avian pox	Great tit	yes	1	
W	Finland	Avian tuberculosis	Mallard	yes	1	
W	Finland	Cysticercosis	Moose	yes	1	
W	Finland	Encephalitis; S. Hessarek	Lynx	yes	1	
W	Finland	European Brown Hare Syndrome	Mountain hare	yes	9	
W	Finland	European Brown Hare Syndrome	Brown hare	yes	3	
W	Finland	Listeriosis	Brown hare	yes	1	
W	Finland	Pasteurellosis	Mountain hare	yes	5	
W	Finland	Pasteurellosis	Brown hare	yes	4	
W	Finland	Pasteurellosis	Woodcock	yes	1	
W	Finland	Pasteurellosis	Woodpecker	yes	1	
W	Finland	Pseudotuberculosis	Mountain hare	yes	1	
W	Finland	Pseudotuberculosis	Brown hare	yes	3	
W	Finland	Pseudotuberculosis	räystäspääsky	yes	1	
W	Finland	S. Brandenburg	Black backed gull	yes	1	
W	Finland	S. Typhimurium 40	Black headed gull	yes	2	
W	Finland	S. Typhimurium 40	Siskin	yes	3	
W	Finland	S. Typhimurium 40, S. Typhimurium U277	Bullfinch	yes	7	
W	Finland	S. Typhimurium 1, S. Typhimurium U277, S. Enteritidis 20	Hedgehog	yes	13	
W	Finland	S. Typhimurium 41	Common gull	yes	1	
W	Finland	Sarcoptic mange	Lynx	yes	2	
W	Finland	Sarcoptic mange	Wolf	yes	1	
W	Finland	Sarcoptic mange	red fox	yes	8	
W	Finland	Sarcoptic mange	Raccoon dog	yes	8	
W	Finland	Sepsis; S. Typhimurium 40	Mountain hare	yes	1	
W	Finland	Sepsis; S. Typhimurium 40	Brown hare	yes	1	
W	Finland	Toxoplasmosis	Mountain hare	yes	3	
W	Finland	Toxoplasmosis	Brown hare	yes	17	
A	France	Classical Swine Fever	Sus scrofa	yes	6	isolement viral sur 3686 testés
A	France	Classical Swine Fever	Sus scrofa	yes	651	sérologie ELISA + Séroneutralisation sur 3125 testés
B	France	Aujeszky's Disease	Sus scrofa	yes	36	sérologie sur 1450 testés
B	France	avian chlamydiosis	Alectoris rufa	yes	1	ELISA Ag

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	France	Avian cholera	Cygnus sp.	yes	1	bactériologie
B	France	Avian cholera	Cygnus olor	yes	1	bactériologie
B	France	Avian cholera	Columba palumbus	yes	1	bactériologie
B	France	Avian cholera	Alectoris sp.	yes	1	bactériologie
B	France	Avian cholera	Phasianus sp.	yes	5	bactériologie
B	France	avian tuberculosis	Columba palumbus	yes	1	bactériologie
B	France	avian tuberculosis	Sus scrofa	yes	8	bactériologie
B	France	Bovine tuberculosis	Cervus elaphus	yes	13	bactériologie
B	France	Bovine tuberculosis	Sus scrofa	yes	17	bactériologie
B	France	Bovine tuberculosis	Sus scrofa	yes	6	PCR positives
B	France	brucellosis	Lepus europaeus	yes	8 (B. suis 2)	bactériologie
B	France	brucellosis	Sus scrofa	yes	23 (B. suis 2)	bactériologie sur 101 testés
B	France	brucellosis	Sus scrofa	yes	681	sérologie sur 1685 testés
B	France	Caprine Arthritis/Encephalitis (CAE)	Rupicapra rupicapra	yes	1	sérologie
B	France	cysticercose	Rupicaprae rupicaprae	yes	5	
B	France	cysticercose	Capreolus capreolus	yes	1	
B	France	cysticercose	Oryctolagus cuniculus	yes	2	
B	France	cysticercose	Sus scrofa	yes	1	
B	France	Echinococcus granulosus	Capreolus capreolus	yes	1	examen ana-path
B	France	Echinococcus multilocularis	Vulpes vulpes	yes	11	technique de sédimentation et comptage (WHO/OIE, 2001)
B	France	Myxomatosis	Oryctolagus cuniculus	yes	2	diagnostic lésionnel
B	France	Paratuberculosis	Capreolus capreolus	yes	3	1 par PCR, 2 par bactério classique
B	France	Rabbit Haemorrhagic Disease (RHD)	Oryctolagus cuniculus	yes	117	ELISA Ag
B	France	Rabbit Haemorrhagic Disease (RHD)	Oryctolagus cuniculus	yes	46	diagnostic lésionnel
B	France	Trichinellosis	Sus scrofa	yes	1	trichinoscopie sur 5634 testés en France
B	France	Trichinellosis	Sus scrofa	yes	51	sérologie ELISA sur 1684 testés en France
B	France	Trichinellosis	Vulpes vulpes	yes	1	trichinoscopie sur 77 testés
B	France	Tularemia	Lepus europaeus	yes	58	bactériologie
B	France	Tularemia	Lepus europaeus	yes	7	diagnostic lésionnel seulement
W	France	Babésiosis	Capreolus capreolus	yes	237	sérologie sur 409 testés
W	France	Babésiosis (Babesia capreoli)	Capreolus capreolus	?	plusieurs	parasitologie
W	France	Botulism	Egretta sp.	yes	1	diagnostic lésionnel
W	France	Botulism	Gallinago gallinago	yes	2	diagnostic lésionnel
W	France	Botulism	Anas sp.	yes	1	diagnostic lésionnel
W	France	Botulism	Anas acuta	yes	1	diagnostic lésionnel
W	France	Botulism	Philomachus pugnax	yes	1	diagnostic lésionnel
W	France	Botulism	Anas platyrhynchos	yes	8	diagnostic lésionnel
W	France	Botulism	Fulica atra	yes	1	diagnostic lésionnel
W	France	Botulism	Anas sp.	yes	1	diagnostic lésionnel
W	France	Botulism	Anas crecca	yes	7	diagnostic lésionnel
W	France	botulism C ou D	Anas platyrhynchos	yes	3	confirmé par IPL
W	France	botulism C ou D	Anas sp.	yes	2	confirmé par IPL
W	France	Contagious ecthyma	Rupicaprae rupicaprae	yes	1	virologie
W	France	Contagious ecthyma	Rupicaprae rupicaprae	yes	1	diagnostic lésionnel
W	France	European Brown Hare Syndrome	Lepus europaeus	yes	57	ELISA Ag

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	France	European Brown Hare Syndrome	Lepus europaeus	yes	124	diagnostic lésionnel
W	France	Hantavirus	Clethrionomys glareolus	yes	10	ELISA - IFA
W	France	Histomoniasis	Phasianus sp.	yes	4	diagnostic lésionnel
W	France	Histomoniasis	Perdix perdix	yes	1	diagnostic lésionnel
W	France	Histomoniasis	Anas platyrhynchos	yes	1	parasitologie
W	France	Histomoniasis	Columba palumbus	yes	1	parasitologie
W	France	Large liver fluke (Fasciola hepatica)	Capreolus capreolus	yes	3	
W	France	listériose (Listeria ivanovi)	Capreolus capreolus	yes	1	
W	France	listériose (Listeria ivanovi)	Oryctolagus cuniculus	yes	1	
W	France	listériose (Listeria ivanovi)	Sus scrofa	yes	1	
W	France	listériose (Listeria monocytogenes)	Capreolus capreolus	yes	3	
W	France	listériose (Listeria monocytogenes)	Oryctolagus cuniculus	yes	1	
W	France	listériose (Listeria monocytogenes)	Perdix perdix	yes	1	
W	France	lyssavirus des chiroptères	Eptesicus serotinus	yes	4	2 Techniques de référence : IF, inoculation aux cellules
W	France	pasteurellose à Mannheimia haemolytica	Capreolus capreolus	yes	5	
W	France	pasteurellose à Mannheimia haemolytica	Oryctolagus cuniculus	yes	1	
W	France	pasteurellose à Mannheimia haemolytica	Lepus europaeus	yes	19	
W	France	pasteurellose à Pasteurella multocida	Meles meles	yes	1	
W	France	pasteurellose à Pasteurella multocida	Felis sylvestris	yes	1	
W	France	pasteurellose à Pasteurella multocida	Capreolus capreolus	yes	2	
W	France	pasteurellose à Pasteurella multocida	Oryctolagus cuniculus	yes	1	
W	France	pasteurellose à Pasteurella multocida	Lepus europaeus	yes	20	
W	France	pasteurellose à Pasteurella multocida	Alectoris sp.	yes	1	
W	France	pasteurellose à Pasteurella multocida	Sus scrofa	yes	11	
W	France	pasteurellose à Pasteurella pneumotropica	Oryctolagus cuniculus	yes	1	
W	France	pasteurellose à Pasteurella pneumotropica	Lepus europaeus	yes	3	
W	France	pasteurellose à Pasteurella pneumotropica	Sus scrofa	yes	1	
W	France	pasteurellose à Pasteurella sp.	Rupicapra rupicaprae	yes	20	
W	France	pasteurellose à Pasteurella sp.	Capreolus capreolus	yes	6	
W	France	pasteurellose à Pasteurella sp.	Phasianus sp.	yes	1	
W	France	pasteurellose à Pasteurella sp.	Lepus europaeus	yes	7	
W	France	Pestivirus	Capreolus capreolus	yes	1	ELISA Ag et IF
W	France	Pestivirus	Rupicapra rupicapra pyrenaica	yes	1	isolement viral
W	France	Pestivirus	Ovis ammon musimon	yes	1 (Hérault)	antigénémie
W	France	Pestivirus	Rupicapra rupicapra	yes	16 (Savoie)	sérologie
W	France	pseudotuberculose (Yersinia pseudotuberculose)	Capreolus capreolus	yes	1	
W	France	pseudotuberculose (Yersinia pseudotuberculose)	Oryctolagus cuniculus	yes	5	
W	France	pseudotuberculose (Yersinia pseudotuberculose)	Lepus europaeus	yes	106	
W	France	pseudotuberculose (Yersinia pseudotuberculose)	Columba palumbus	yes	1	
W	France	Psoroptoc mange	Sus scrofa	yes	1	parasitologie
W	France	salmonellose à Salmonella arizonae	Lepus europaeus	yes	1	
W	France	salmonellose à Salmonella sp.	Ardea cinerea	yes	1	
W	France	salmonellose à Salmonella sp.	Columba palumbus	yes	1	
W	France	salmonellose à Salmonella typhimurium	Columba sp.	yes	5	
W	France	salmonellose à Salmonella typhimurium	Alectoris sp.	yes	2	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	France	salmonellose à <i>Salmonella typhimurium</i>	<i>Larus</i> sp.	yes	1	
W	France	Sarcoptic mange	<i>Vulpes vulpes</i>	yes	8	parasitologie
W	France	Sarcoptic mange	<i>Sus scrofa</i>	yes	2	parasitologie
W	France	Sarcoptic mange	<i>Vulpes vulpes</i>	yes	8	parasitologie
W	France	Sarcoptic mange	<i>Sus scrofa</i>	yes	3	parasitologie
W	France	Trichomoniasis	<i>Columba palumbus</i>	yes	19	diagnostic lésionnel
W	France	Trichomoniasis	<i>Streptopelia decaocto</i>	yes	7	diagnostic lésionnel
W	France	Trichomoniasis	<i>Phasianus</i> sp.	yes	3	parasitologie
W	France	Trichomoniasis	<i>Columba livia</i>	yes	1	parasitologie
W	France	Trichomoniasis	<i>Columba palumbus</i>	yes	2	parasitologie
W	France	Trichomoniasis	<i>Streptopelia</i> sp.	yes	2	parasitologie
W	France	Trichomoniasis	<i>Cygnus</i> sp.	yes	2	parasitologie
W	France	Variolè aviaire	<i>Columba palumbus</i>	no	4	diagnostic lésionnel
W	France	West Nile Virus	<i>Pica pica</i>	no	1	isolement viral
W	France	West Nile Virus	<i>Passer domesticus</i>	no	1	isolement viral
W	France	West Nile Virus	<i>Anas platyrhynchos</i>	no	4	sérologies ELISA sur 270 testés (oiseaux sentinelles)
A	Germany	Avian Influenza	<i>Anas platyrhynchos</i>	no		
A	Germany	Avian Influenza	<i>Anas crecca</i>	no		
A	Germany	Avian Influenza	<i>Gallinula chloropus</i>	no		
A	Germany	Avian Influenza	Laridae	no		
A	Germany	Avian Influenza	<i>Corvus monedula</i>	no		
A	Germany	Classical Swine Fever	<i>Sus scrofa</i>	yes	3	
B	Germany	Aujeszky's Disease	pig,dog	no		
B	Germany	Aujeszky's Disease	<i>Sus scrofa</i>	yes	unknown	
B	Germany	Avian Chlamydiosis	<i>Phasianus colchicus</i>	yes	2	
B	Germany	Avian Chlamydiosis	<i>Fulica atra</i>	yes	1	
B	Germany	Avian Chlamydiosis	Spheniscidae	yes	1	
B	Germany	Avian Chlamydiosis	<i>Struthio camelus</i>	yes	1	
B	Germany	Avian Chlamydiosis	Coliidae	yes	1	
B	Germany	Avian Chlamydiosis	Picidae	yes	2	
B	Germany	Avian Chlamydiosis	Turdidae	yes	2	
B	Germany	Avian Chlamydiosis	Motacillidae	yes	1	
B	Germany	Avian Chlamydiosis	Sturnidae	yes	1	
B	Germany	Avian Chlamydiosis	Plocidae	yes	1	
B	Germany	Avian Chlamydiosis	Estrildidae	yes	1	
B	Germany	Avian Tuberculosis	<i>Phasianus colchicus</i>	yes	1	
B	Germany	Avian Tuberculosis	Tetraonidae	yes	1	
B	Germany	Avian Tuberculosis	Meleagrididae	yes	2	
B	Germany	Avian Tuberculosis	<i>Mergus albellus/ Mergus merganser</i>	yes	2	
B	Germany	Avian Tuberculosis	<i>Ardea cinerea</i>	yes	2	
B	Germany	Avian Tuberculosis	<i>Fulica atra</i>	yes	1	
B	Germany	Avian Tuberculosis	<i>Struthio camelus</i>	yes	1	
B	Germany	Avian Tuberculosis	Threskiornithidae	yes	1	
B	Germany	Avian Tuberculosis	Cathartidae	yes	1	
B	Germany	Avian Tuberculosis	Charadriidae	yes	2	

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Germany	Avian Tuberculosis	Glareolidae	yes	2	
B	Germany	Avian Tuberculosis	Cuculidae	yes	2	
B	Germany	Avian Tuberculosis	Coliidae	yes	1	
B	Germany	Avian Tuberculosis	Alcedinidae	yes	1	
B	Germany	Avian Tuberculosis	Picidae	yes	1	
B	Germany	Avian Tuberculosis	Turdidae	yes	2	
B	Germany	Avian Tuberculosis	Motacillidae	yes	1	
B	Germany	Avian Tuberculosis	Paridae	yes	1	
B	Germany	Avian Tuberculosis	Sturnidae	yes	1	
B	Germany	Avian Tuberculosis	Fringillidae	yes	1	
B	Germany	Avian Tuberculosis	Ploceidae	yes	1	
B	Germany	Bovine Herpesvirus (IBR)	cattle	yes	66	
B	Germany	Bovine Spongiform Encephalopathy (BSE)	cattle	yes	65	
B	Germany	Bovine tuberculosis	cattle	yes	10	
B	Germany	Brucellosis	pig,sheep	yes	2	
B	Germany	Classical Swine Fever	wildboar	yes	3	
B	Germany	Echinococcus multilocularis	Vulpes vulpes	yes	unknown	
B	Germany	Echinococcus multilocularis	Nyctereutes procyonoides	yes	unknown	
B	Germany	Leptospirosis	cattle,pigs,cat,dog	yes	277 *)	
B	Germany	Leptospirosis	other zoo animal	yes	1	
B	Germany	Maedi/Visna	sheep,goats	yes	43 *)	
B	Germany	Malignant Catharral Fever	Bovidae (zoo animal)	yes	1	
B	Germany	Paratuberculosis	cattle	yes	270	
B	Germany	Q-fever	cattle,sheep,goats	yes	150 *)	
B	Germany	Q-fever	Bovidae (zoo animal)	yes	11	
B	Germany	Q-fever	Primates	yes	3	
B	Germany	Q-fever	other zoo animal	yes	1	
B	Germany	Rabies	fox,cat,dog,cattle	yes	47	
B	Germany	Rabies	Vulpes vulpes	yes	27	
B	Germany	Rabies	Meles meles	yes	2	
B	Germany	Rabies	Capreolus capreolus	yes	3	
B	Germany	Rabies	Martes martes/ Martes foina	yes	1	
B	Germany	Scrapie	sheep	yes	42	
B	Germany	Tularemia		no	*)	
W	Germany	Bat Lyssaviruses	Microchiroptera	yes	14	
W	Germany	Baylisascaris spp.	Procyon lotor	yes	unknown	
W	Germany	Hantaviruses	Clethrionomys glareolus	no		
W	Germany	Hantaviruses	Microtus arvalis	no		
W	Germany	Hantaviruses	Microtus agrestis	no		
W	Germany	Hantaviruses	Apodemus agrarius	no		
W	Germany	Hantaviruses	Apodemus flavicollis	no		
W	Germany	Pestiviruses	Bovidae (zoo animal)	yes	2	
A	Greece	Avian Influenza	Wild Birds	no	166	
W	Greece	European Brown Hare Syndrome (EBHS)	HARES	yes	5	
A	Guatemala	Classical Swine Fever	Porcina	no	0	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
A	Guatemala	Trichomoniasis	Porcina		37	
A	Guatemala	Trichomoniasis	Equina		0	
A	Guatemala	Vesicular Stomatitis	Bovina	yes	53	
B	Guatemala	Anaplasmosis	Bovina	yes	2	
B	Guatemala	Anthrax	Bovina	yes	11	
B	Guatemala	Avian cholera	Aves	yes	2	
B	Guatemala	Avian infectious bronchitis	Aves	yes	2	
B	Guatemala	Bovine Herpesvirus (IBR)	Bovina	yes	265	
B	Guatemala	Bovine tuberculosis	Bovina	no		
B	Guatemala	Brucellosis	Bovina	yes	511	
B	Guatemala	Fasciola hepática	Bovina	no		
B	Guatemala	Leishmaniasis	Canina	no		
B	Guatemala	Leptospirosis	Roedor	no		
B	Guatemala	Psoroptic Mange	Cunicula	no		
B	Guatemala	Rabies	Canina	yes	66	
B	Guatemala	Trichomoniasis	Buteo sp	no		
B	Guatemala	Trichomoniasis	Bufalina	yes	15	
B	Guatemala	Trichomoniasis	Equina	yes	6	
B	Guatemala	Trichomoniasis	Bovina	yes	6	
B	Guatemala	Trichomoniasis	Felina	yes	2	
B	Guatemala	Trichomoniasis	Ovina	yes	1	
B	Guatemala	Tuberculosis Human	Humana	no		
B	Guatemala	Viruela aviar	Faisan	no		
W	Guatemala	Feline Leukaemia (FLV)	Pantera tigris	no		
W	Guatemala	Immunodeficiency viruses (Feline, Simian)	Pantera leo	no		
	Iceland	No diseases reported in wildlife				
A	India	bluetongue	ovine	yes		
A	India	classical swine fever	swine	yes		
A	India	Foot and Mouth	buffalo, bovine, caprine, swine, ovine	yes		
A	India	newcastle disease	avian	yes		
A	India	Peste des Petits	ovine, caprine	yes		
A	India	sheep/goat pox	ovine /caprine	yes		
B	India	anaplasmosis	bovine	yes		
B	India	anthrax	bovine, buffalo, ovine, caprine	yes		
B	India	avian cholera	avian	yes		
B	India	avian infectious bronchitis	avian	no		
B	India	avian tuberculosis	avian	no		
B	India	bovine herpesvirus (IBR)	bovine	yes		
B	India	Brucellosis	bovine, buffalo, swine	yes	bovine, buffalo	
B	India	duck plague	avian	yes		
B	India	equine herpesvirus	equine	yes		
B	India	Leptospirosis	bovine, swine	yes	bovine, swine	
B	India	Paratuberculosis	bovine, ovine, caprine	yes	bovine	
B	India	Rabies	bovine, buffalo, ovine, caprine, canine, equine	yes		
W	India	avian malaria	Ploceus philippinus	no		

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	India	avian pox	Columba liva and Coturnix coturnix japonica	no		
W	India	Contagious ecthyma		no		
W	India	immunodeficiency viruses	langur, wild herbivores	no		
W	India	Paramyxoviruses	Columba liva; Gallus gallus; Chrysolophus pictus; Aquilegia coerulea	no		
W	India	sylvatic plague	tetera indica	no		
W	India	tyzzer's disease	NZ white rabbit	no		
B	Ireland	Avian Infectious Bronchitis	Avian	yes	Enzootic	
B	Ireland	Myxomatosis	Laprine	no		
B	Ireland	Rabbit Haemorrhagic Disease (RHD)	Laprine	yes	2	
B	Ireland	Aujesky's Disease	Porcine (Domestic)	yes	33 Herds	
B	Ireland	Avian Tuberculosis	Avian	yes -enzootic	1 domestic fowl	
B	Ireland	Bovine Herpesvirus (IBR)	Bovine	yes	Enzootic	
B	Ireland	Bovine tuberculosis	Badger - meles meles	yes - enzootic	Enzootic	
B	Ireland	Caprine Arthritis/Encephalitis (CAE)	Caprine (Domestic)	yes	2 herds	
B	Ireland	Duck Hepatitis	Avian	no		
B	Ireland	Equine Herpesvirus	Equine	yes	Enzootic	
B	Ireland	Malignant Catharral Fever	Bovine	yes	Enzootic	
W	Ireland	Avian Pox	Avian	no		
W	Ireland	Calicivirus Marine Mammals	Phocine	no		
W	Ireland	European Brown Hare Syndrome (EBHS)	Lepus spp	no		
W	Ireland	Paramyxoviruses	Avian	yes	1 loft	
B	Israel	Rabies	fox	+	20	
B	Israel	Rabies	jackal	+	1	
B	Israel	Rabies	bufallo	+	1	
B	Israel	Scrapie				
B	Israel	Trichinellosis	wild hogs	+	14	
B	Israel	Trichinellosis	foxes	+	2	
B	Israel	Trichinellosis	jackals	+	12	
A	Italy	African swine fever	Sus scrofa	yes	30	
A	Italy	Avian Influenza	Pigeon	yes	1	
A	Italy	Bluetongue	Camelus bactrianus	yes	84	
A	Italy	Bluetongue	Cervus elaphus	yes		
A	Italy	Bluetongue	Ovis musimom	yes		
A	Italy	Bluetongue	Cervus elaphus corsicanus	yes		
A	Italy	Bluetongue	Camelus dromedarius	yes		
A	Italy	Classical Swine Fever	Sus scrofa	yes	13	
A	Italy	NDV	Phasianus colchicus	yes	4	
A	Italy	NDV	Pigeon, Vultures	yes	2	
B	Italy	Aujeszkys disease	Sus scrofa	yes	359	
B	Italy	Avian Chlamydiosis	Alectoris rufa	yes	2	
B	Italy	Avian Chlamydiosis	Pigeon, Corvus corone cornix	yes	10	
B	Italy	Avian cholea	Phasianus colchicus	yes	5	
B	Italy	Avian cholera	Falco tinniculus	no		
B	Italy	Avian Tuberculosis	Sus scrofa	yes	5	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Italy	Avian Tuberculosis	Pica pica	no	1	
B	Italy	Avian Tuberculosis	Accipiter nisus	no	1	
B	Italy	Avian Tuberculosis	Phalacrocorax Carbo	no	1	
B	Italy	Avian Tuberculosis	Larus argentatus			
B	Italy	Avian Tuberculosis	Larus cachinnans	no	14	
B	Italy	Avian Tuberculosis	Ardea cinerea	no	1	
B	Italy	Avian Tuberculosis	Circus aeruginosus	no	1	
B	Italy	Avian Tuberculosis	Sus scrofa	yes	142	
B	Italy	Avian Tuberculosis	Vulpes vulpes	no	5	
B	Italy	Brucellosis	Capra ibex	yes	5	
B	Italy	Brucellosis	Cervus elaphus	yes	1	
B	Italy	Brucellosis	Sus scrofa	yes	184	
B	Italy	Brucellosis	Vulpes vulpes	yes	7	
B	Italy	Brucellosis	Erinaceus europaeus	no	1	
B	Italy	Brucellosis	Cervus elaphus corsicanus, Ovis ammon musimon, Ursus arctos, Sus scrofa			
B	Italy	Caprine Arthritis/Encephalitis (CAE)	Ovis ammon musimon	yes	2	
B	Italy	Echinococcus multilocularis	Vulpes vulpes	yes	3	
B	Italy	Leishmaniosis	Vulpes vulpes	yes	2	
B	Italy	Leptospirosis	Myocastor Coypus	yes	2	
B	Italy	Leptospirosis	Sus scrofa	yes	46	
B	Italy	Leptospirosis	Vulpes vulpes		3	
B	Italy	Leptospirosis	Cervus elaphus		1	
B	Italy	Maedi/visna	Ovis musimom	yes	2	
B	Italy	Myxomatosis	Oryctolagus cuniculus	yes	3	
B	Italy	Paratuberculose	Cervus elaphus	yes	25	
B	Italy	Paratuberculose	Capreolus capreolus	yes	21	
B	Italy	Paratuberculose	Rupicapra rupicapra	yes	1	
B	Italy	Paratuberculose	Vulpes vulpes	yes	3	
B	Italy	Paratuberculose	Ovis ammon musimon, Capreolus capreolus, Cervus elaphus, Rupicapra rupicapra	yes	57	
B	Italy	Q Fever	Ovis musimom	yes	1	
B	Italy	Q Fever	Dama dama, Ovis ammon musimon	yes	6	
B	Italy	Trichinellosis	Vulpes vulpes	yes	1	
B	Italy	Trichinellosis	Canis lupus	yes	3	
B	Italy	Trichinellosis	Sus scrofa			
B	Italy	Trichinellosis	Sus scrofa, Vulpes vulpes, Martes foina, Canis lupus	yes	8	
B	Italy	Tularémia	Lepus capensis	yes	1	
B	Italy	Tularémia	Myocastor Coypus	no	1	
B	Italy	Tularémia	Lepus europaeus	yes	1	
W	Italy	Avian Pox	Serinus Spp	yes	2	
W	Italy	Avian Pox	Phasianus colchicus	yes	10	
W	Italy	Contagious Ecthyma,	Rupicapra rupicapra	yes	19	
W	Italy	Contagious Ecthyma,	Ovis musimom	no	1	
W	Italy	European Brown Hare Syndrome (EBHS)	Lepus europaeus	yes	530	

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	Italy	European Brown Hare Syndrome (EBHS)	Lepus capensis	yes	9	
W	Italy	Histomoniasis	Perdix	no	1	
W	Italy	Meningeal worms of cervides	Cervus elaphus	no	1	
W	Italy	Paramyxovirus	Rupicapra rupicapra, Meles meles	yes	5	
W	Italy	Pestivirus	Cervus elaphus	no	2	
W	Italy	Pestivirus	Rupicapra rupicapra	no	23	
W	Italy	Pestivirus	Rupicapra rupicapra, Sus scrofa	yes	8	
W	Italy	Salmonellosis	Vulpes vulpes	no		
W	Italy	Salmonellosis	Columba livia	yes		
W	Italy	Sarcoptic Mange	vulpes vulpes	yes	50	
W	Italy	Sarcoptic Mange	Rupicapra rupicapra	yes	77	
W	Italy	Sarcoptic Mange	Capra ibex	yes	10	
W	Italy	Sarcoptic Mange	Ovis musimon	yes	1	
W	Italy	Sarcoptic Mange	Capra ibex, Vulpes vulpes, Sus scrofa, Rupicapra rupicapra	yes	202	
W	Italy	Trichomoniasis	Pigeon	yes	5	
A	Ivory coast	Contagious pleuropneumonia	Bos.taurus; B.indicus	yes	277	
A	Ivory coast	Peste des petits ruminants	Ovis sp	yes	195	
B	Ivory coast	Bovine tuberculosis	Bos.taurus; B.indicus	yes	150	
B	Ivory coast	Brucellosis	Ovis. sp	no		
B	Ivory coast	Rabies	Canis.sp	yes	2	
A	Japan	avian influenza	crow	yes	9	
B	Japan	Echinococcus multilocularis	Vulpes vulpes	yes	36 from 188	
B	Japan	Leptospirosis				
B	Latvia	Rabies	Red fox (Vulpes Vulpes)	yes	181	
B	Latvia	Rabies	Raccoon dog (Nyctereutes Procyroides)	yes	143	
B	Latvia	Rabies	Roe (Capriolus Capriolus)	yes	8	
B	Latvia	Rabies	Badger (Meles Meles)	yes	10	
B	Latvia	Rabies	Pine marten ((Martes)	yes	3	
B	Latvia	Rabies	Beaver (Castor Fiber)	yes	1	
B	Latvia	Rabies	Mouse (Mus musculus)	yes	1	
B	Latvia	Rabies	Polecat (Mustela Putorius)	yes	3	
B	Latvia	Scrapie				
B	Latvia	Trichinellosis	Wild boar (Suis Scropha Vulgaris)	yes	12	
B	Lithuania	Rabies	Red fox, Vulpes vulpes		197	
B	Lithuania	Rabies	Raccoon dog, N procyonides		161	
B	Lithuania	Rabies	Wolf, Canis lupus		1	
B	Lithuania	Rabies	Badger, M meles		1	
B	Lithuania	Rabies	Martes foina		30	
B	Lithuania	Rabies	Beaver, Castor fiber		2	
B	Lithuania	Rabies	Otter, Lutra lutra		1	
B	Lithuania	Rabies	Polecat, Mustela putoris		13	
B	Lithuania	Rabies	Hedgehog, Erinaceus europeus		1	
B	Lithuania	Rabies	Wild boar, S. Scrofa		1	
B	Lithuania	Trichinellosis	Wild boar, S. Scrofa		12	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Lithuania	Trichinellosis	Red fox, <i>Vulpes vulpes</i>		7	
B	Lithuania	Trichinellosis	Raccoon dog, <i>N. procyonides</i>		2	
B	Luxembourg	<i>Echinococcus granulosus</i>	Red fox - <i>V. Vulpes</i>		6	
A	Luxembourg	Classical Swine Fever	Wild boar, <i>S. scrofa</i>		4	
A	Madagascar	African Swine Fever	swine		1998	
A	Madagascar	Classical Swine Fever	swine		957	
A	Madagascar	Lumpy Skin Disease	bovine		3253	
A	Madagascar	Newcastle Disease	birds		21797	
B	Madagascar	Avian Cholera	birds		29910	
B	Madagascar	Bovine tuberculosis	bovines		13	
B	Madagascar	Rabies	carnivores, bovine		48	
B	Marocco	Rabies	Red fox, <i>Vulpes vulpes</i>		2	
	Mauritius	No diseases reported in wildlife				
B	Mozambique	Anthrax	<i>Syncerus cafer</i> and	yes	17	
B	Mozambique	Aujesky's Disease	<i>Loxodonta africana</i>	yes	2	
B	Myanmar	anthrax	hog deer	yes	5	
B	Myanmar	Anthrax	Hog deer		5	
B	Myanmar	bovine tuberculosis	bear	yes	1	
B	Myanmar	Bovine tuberculosis	Bear		1	
W	Myanmar	Sarcoptic mange	brown bear and common palm civet	yes		
W	Myanmar	Sarcoptic Mange	Bear		1	
W	Myanmar	Sarcoptic Mange	Civet		1	
A	Namibia	African swine fever	Warthogs (<i>Phacochoerus africanus</i>)		endemic	
A	Namibia	African swine fever	Tampans (<i>Ornithodoros porcinus</i>)		endemic	
B	Namibia	Anthrax	Buffalo (<i>Syncerus caffer</i>)	yes	27	
B	Namibia	Anthrax	Zebra (<i>Equus burchelli</i>)	yes	1	
B	Namibia	Anthrax	Eland (<i>Taurotragus oryx</i>)	yes	1	
B	Namibia	Anthrax	Gemsbock (<i>Oryx gazelle</i>)	yes	16	
B	Namibia	Anthrax	Cheetah (<i>Acinonyx jubatus</i>)	yes	1	
B	Namibia	Rabies	Greater Kudu (<i>Tragelaphus strepsiceros</i>)	yes	29	
B	Namibia	Rabies	Black-backed jackal (<i>Canis mesomelas</i>)	yes	9	
B	Namibia	Rabies	Bat eared foxes (<i>Otocyon megalotis</i>)	yes	4	
B	Namibia	Rabies	Eland (<i>Taurotragus oryx</i>)	yes	5	
B	Namibia	Rabies	Honey badger (<i>Mellivora capensis</i>)	yes	1	
W	Namibia	Botulism	Springbok (<i>Antedorcas marsupalis</i>)	yes	30	
W	Namibia	Sarcoptic mange	Sable antelope (<i>Hippotragus niger</i>)	yes	1	
B	Netherlands	Myxomatosis	<i>Oryctolagus cuniculus</i> (p.m. findings, histology)	yes	1/1	
B	Netherlands	Rabbit Haemorrhagic Disease (RHD)	<i>Oryctolagus cuniculus</i> (RT-PCR)	yes	3/3	
B	Netherlands	Trichinellosis	<i>Sus scrofa</i> (serology)	yes	17/252 (**)	
W	Netherlands	Bat lyssavirus	<i>Eptesicus serotinus</i> (IFT)	yes	13/30	
	New Caledonia	No diseases reported in wildlife				
W	New Zealand	Rabbit Haemorrhagic Disease (RHD)	<i>Oryctolagus cuniculus cuniculus</i>	yes	3	
W	New Zealand	Avian Chlamydiosis	<i>Cacatua galerita</i>	no		

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	New Zealand	Avian Malaria	Mohoua ochrocephala, Megadyptes antipodes, Charadrius obscurus, Eudyptula minor, Philesturnus carunculatus	yes	3	
W	New Zealand	Avian Pox	Thinornis novaeseelandiae, Petroica traversi, Haematopus, Zosterops lateralis, Hemiphaga novaeseelandiae, Petroica australis longipes, Diomedea epomophora epomophora, Turdus philomelos, Passer domesticus, Platycercus eximus.	yes	3	
W	New Zealand	Avian Tuberculosis	Cyanoramphus unicolor, Circus approximans, Anas aucklandica chlorotis, Mustela furo.	no		
W	New Zealand	Babesiosis	Apteryx mantelli	no		
W	New Zealand	Bovine tuberculosis	Bos taurus, Cervus elaphus scoticus, Trichosurus vulpecula, Erinaceus europaeus occidentalis, Mustela furo, Erinaceus europaeus occidentalis, Sus scrofa	yes	2	
W	New Zealand	Chytridiomycosis	Litoria aureus, Litoris raniculata, Leiopelma archeyi, Leiopelma hochstetteri	yes	2	
W	New Zealand	Circoviruses	Larus dominicanus, Cacatua galerita	yes	40	
W	New Zealand	Contagious Ecthyma,	Capra hircus, Ovis aries	no		
W	New Zealand	Equine Herpesvirus	Equus caballus	no		
W	New Zealand	Feline Leukaemia (FLV)	Felis catis	no		
W	New Zealand	Feline Panleucopenia,	Felis catis	no		
W	New Zealand	Histomoniasis	Phasianus colchicus	no		
W	New Zealand	Immunodeficiency viruses (Feline, Simian)	Felis catis	no		
W	New Zealand	Inclusion Body Hepatitis	Columbidae	no		
W	New Zealand	Leptospirosis	Cervus elaphus scoticus, Trichosurus vulpechula, Rattus rattus, Rattus norvegicus, Erinaceus europaeus occidentalis, Sus scrofa.	yes	2	
W	New Zealand	Malignant Catharral Fever	Bos taurus, Cervus elaphus scoticus.	yes	2	
W	New Zealand	Paramyxoviruses	Anas platyrhynchos	no		
W	New Zealand	Paratuberculosis	Bos taurus, Cervus elaphus scoticus, Caprus hircus, Ovis aries	yes	30	
W	New Zealand	Pestiviruses	Bos taurus	no		
W	New Zealand	Sarcoptic Mange	Sus scrofa	no		
W	New Zealand	Trichinellosis	Rattus exulans, Rattus norvegicus, Rattus rattus	no		
W	New Zealand	Tyzzers Disease	Equus caballus, Felis catis	no		
	Niger	No diseases reported in wildlife				
B	Norway	Avian Tuberculosis	wild birds, Capreolus capreolus	yes	1 Capreolus capreolus	
B	Norway	Malignant Catharral Fever	wild cervids	yes	4	
B	Norway	Trichinellosis	Vulpes vulpes	yes	6	
B	Norway	Tularemia	Lepus timidus	yes	5	
W	Norway	Contagious Ecthyma,	Ovibos moschatus	yes	16	
W	Norway	Meningeal worms of cervides	Cervids	yes	9	
W	Norway	Pasteurellosis	Various species	yes	1 Alces alces	
W	Norway	Salmonellosis (S. typhimurium)	Passeriformes	yes	4	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	Norway	Sarcoptic Mange	Vulpes vulpes+ other carnivores	yes	10 Vulpes vulpes + 1 Martes martes	
B	Poland	Avian Chlamydiosis	Pigeons, Columbae		6	
B	Poland	Bovine tuberculosis	Taurotragus oryx		1	
B	Poland	Echinococcus multilocularis	Wild boar, S. Scrofa		2	
B	Poland	Rabies	Red fox		86	
B	Poland	Rabies	Raccoon dog		13	
B	Poland	Rabies	Mustelidae		2	
B	Poland	Rabies	Roe deer		1	
B	Poland	Rabies	Wolf, C. Lupus		1	
B	Poland	Rabies	Badger, M. meles		1	
W	Poland	Avian Pox	Grebe, Podiceps cristatus		1	
W	Poland	Avian Pox	Columbae		30	
W	Poland	Babesiosis	Cheetah	zoo	4	
W	Poland	Bat Lyssaviruses	Eptesicus serotinus		10	
W	Poland	Histomoniasis	Phasianus colchinus		1	
W	Poland	Paramyxoviruses	Columba livia		130	
W	Poland	Sarcoptic Mange	Ailurus fulgens		2	
W	Poland	Sarcoptic Mange	Unica unica		1	
W	Poland	Trichomoniasis	Columba livia		1000	
W	Poland	Trichomoniasis	Magpie, Pica pica			
B	Quatar	Rabbit Haemorrhagic Disease (RHD)	lep (Rabbits)	yes	12	
B	Quatar	Contagious Caprine Pleuropneumonia	Gerenuk (Litocranius walleri)	yes	several	
B	Quatar	Contagious Caprine Pleuropneumonia	Laristan moufflon	yes	several	
B	Quatar	Contagious Caprine Pleuropneumonia	Nubian ibex (Capra ibex)	yes	several	
A	Romania	Classical Swine Fever		suine	yes	6 mistreti
B	Romania	Rabies	2 pisici salbatice; 1 caprioara; 1 lup; 1 urs; 1 jder; 2 bursuci; 102 vulpi			
B	Romania	Trichinellosis	1 urs, 5 mistreti			1 urs, 5 mistreti
A	saudi arabia	bluetongue	Oryx leucoryx	yes	5	
A	saudi arabia	PPR	gazella gazella (on farm)	yes	hand written report	
B	saudi arabia	avian chlamydiosis	juvenile houbaras	yes		
B	saudi arabia	avian tuberculosis	avian			
B	saudi arabia	brucellosis	gazella subgutterosa	yes	1	
B	saudi arabia	cysticercosis	gazella gazella; gazella subgutterosa; gazella dorcas; Oryx leucoryx	yes	20;15;17;5	
B	saudi arabia	tuberculosis	Oryx leucoryx; gazella gazella; gazella subgutterosa; axis axis	yes	7;11;5;30	
B	Schweiz	Anaplasmosis	Rupicapra rupicapra	Y		
B	Schweiz	Avian Chlamydiosis	Agapornis sp. Melopsittacus undulatus, Deropstius accipitrinus (private)	Y (private)	3	
B	Schweiz	Avian Pox	Serinus canaria (private)	Y (private)	1	
B	Schweiz	Avian Tuberculosis	4x Melopsittacus undulatus (private), 1x Platycersus eximius (private), 1y Aythya fuligula (zoo)	Y (private)	6	
B	Schweiz	Brucellosis	Sus scrofa	no		
B	Schweiz	Chytridiomycosis	Dyscophus antonjili (Zoo)	yes (zoo)	1	

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Schweiz	Echinococcus granulosus		Not reported		
B	Schweiz	Echinococcus multilocularis		Not reported		
B	Schweiz	Inclusion Body Disease,	Boa constrictor (private)	Y (private)	3	
B	Schweiz	Malignant Catharral Fever	Cervus; Dama dama (private)	Y		
B	Schweiz	Sarcoptic Mange	Vulpes vulpes	Y		
B	Schweiz	Trichinellosis	Sus scrofa, Lynx lynx	Y		
B	Schweiz	Trichomoniasis	Melopsittacus undulatus (private)	Y (private)	2	
A	Slovak Rep.	Classical Swine Fever	wild boars	yes	15 340/11	
B	Slovak Rep.	Rabies	Wild Boar	yes	11/1	
B	Slovak Rep.	Rabies	Marten	yes	21/3	
B	Slovak Rep.	Rabies	Wild Cat	yes	1/1	
B	Slovak Rep.	Rabies	Lynx	yes	1/1	
B	Slovak Rep.	Rabies	Red Fox	yes	1563/54	
B	Slovak Rep.	Echinococcus multilocularis	Red Fox	yes	145/20	
B	Slovak Rep.	Trichinellosis		yes		
B	Slovak Rep.	Tularemia	Wild Hare	yes	14/1	
A	South Africa	African swine fever	Wild boar (Sus scrofa)	yes	2	
A	South Africa	Avian influenza	Ostriches (Struthio camelus)	yes	farmed birds	
A	South Africa	Foot and Mouth Disease	Buffalo (Syncerus caffer)	yes	seropos	
B	South Africa	Anthrax	Greater Kudu (Tragelaphus strepsiceros)	yes	2	
B	South Africa	Avian Cholera	Cape cormorant	yes	8000	
B	South Africa	Bovine tuberculosis	Buffalo (Syncerus caffer)	yes	Common	
B	South Africa	Bovine tuberculosis	Lion (Panthera leo)	yes	18	
B	South Africa	Bovine tuberculosis	Impala antelope (Aepyceros melampus)	yes	2	
B	South Africa	Brucellosis	Sable antelope (Hippotragus niger)	yes	8	
B	South Africa	Rabies	Mongoose (several species)	yes	35	
B	South Africa	Rabies	Suricates (Suricata suricata)	yes	3	
B	South Africa	Rabies	Cape ground squirrel (Geosciurus inauris)	yes	1	
B	South Africa	Rabies	Bat eared foxes (Otocyon megalotis)	yes	14	
B	South Africa	Rabies	Black-backed jackal (Canis mesomelas)	yes	2	
B	South Africa	Rabies	Aarwolf (Proteles cristata)	yes	1	
B	South Africa	Rabies	African wild cat (Felis lybica)	yes	1	
B	South Africa	Rabies	Striped polecat (Poecilogate albinucha)	yes	1	
W	South Africa	Botulism	Ibis, coots	yes	130	
A	Spain	Bluetongue	Red deer, C. elaphus		1	
B	Spain	Anaplasmosis	Red deer, C. elaphus		>100	
B	Spain	Aujeszky's Disease	Wild boar, S. Scrofa		>100	
B	Spain	Avian Tuberculosis	Golden eagle, A. chrysaetos		1	
B	Spain	Bovine tuberculosis	Red deer, C. elaphus		>100	
B	Spain	Bovine tuberculosis	Fallow deer, Dama dama		>100	
B	Spain	Bovine tuberculosis	Wild boar, S. Scrofa		>100	
B	Spain	Brucellosis	Red deer, C. elaphus		>50	
B	Spain	Brucellosis	Fallow deer, Dama dama		>50	
B	Spain	Brucellosis	Wild boar, S. Scrofa		>50	
B	Spain	Echinococcus granulosus	Wild boar, S. Scrofa		1	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Spain	Myxomatosis	Rabbit, <i>Oryctolagus cuniculi</i>		>100	
B	Spain	Paratuberculosis	Fallow deer, <i>Dama dama</i>		3	
B	Spain	Paratuberculosis	Wild boar, <i>S. Scrofa</i>		1	
B	Spain	Rabbit Haemorrhagic Disease (RHD)	Rabbit, <i>Oryctolagus cuniculi</i>		>100	
B	Spain	Trichinellosis	Wild boar, <i>S. Scrofa</i>		25	
W	Spain	Avian Pox	Tetrax tetrax	yes	1	
W	Spain	Babesiosis	Ibex, <i>Capra pyrenaica</i>		17	
W	Spain	Contagious Ecthyma,	<i>Ovis gmelini</i>		>10	
W	Spain	Meningeal worms of cervides	Red deer, <i>C. elaphus</i>		>100	
W	Spain	Others: Keratoconjunctivitis	<i>Rupicapra pyrenaica</i>	yes	7	
W	Spain	Pestiviruses	<i>Rupicapra pyrenaica</i>	yes	2	Serology (capture Ag ELISA)
W	Spain	Sarcoptic Mange	Red fox, <i>Vulpes vulpes</i>		>100	
W	Spain	Sarcoptic Mange	Chamois, <i>Rupicapra rubicapra</i>		>100	
W	Spain	Trichomoniasis	<i>Columba palumbus</i>		>100	
A	Sri Lanka	African swine fever	Porcine	no		
A	Sri Lanka	Foot and Mouth	Bovine, Porcine Probocides?	yes	4-5 herds	
B	Sri Lanka	Feline Leukaemia	Feline	?	about 50	
W	Sudan	Ebola haemorrhagic ever	humans	yes	17	
B	Sweden	Avian Cholera	Mute swan, <i>Cygnus olor</i>	yes	1	
B	Sweden	<i>Echinococcus granulosus</i>	moose, <i>Alces alces</i>	yes	1	
B	Sweden	Myxomatosis	Rabbit, <i>Oryctolagus cuniculi</i>	yes	present	
B	Sweden	Rabbit Haemorrhagic Disease (RHD)	Rabbit, <i>Oryctolagus cuniculi</i>	yes	present	
B	Sweden	Trichinellosis	Wild boar, <i>S. Scrofa</i>	yes	5	
B	Sweden	Trichinellosis	Red fox, <i>Vulpes vulpes</i>	yes	18	
B	Sweden	Trichinellosis	Wolf, <i>Canis lupus</i>	yes	2	
B	Sweden	Trichinellosis	Lynx, <i>Felis lynx</i>	yes	1	
B	Sweden	Tularemia	Brown hare, <i>Lepus europaeus</i>	yes	1	
W	Sweden	Avian Pox	Great tit	yes	2	
W	Sweden	Avian Pox	House sparrow	yes	4	
W	Sweden	Botulism	Mallard	yes	3	
W	Sweden	Botulism	<i>Aythya ferlingua</i>	yes	3	
W	Sweden	Botulism	Herring gull, <i>Lars argentatus</i>	yes	11	
W	Sweden	Botulism	Jackdaw	yes	2	
W	Sweden	European Brown Hare Syndrome (EBHS)	Brown hare, <i>Lepus europaeus</i>	yes	1	
W	Sweden	Meningeal worms of cervides	Moose, <i>Alces alces</i>	yes	1	
W	Sweden	Paramyxoviruses	<i>Columba livia</i>	yes	5	
W	Sweden	Pseudotuberculosis	Brown hare, <i>Lepus europaeus</i>	yes	1	
W	Sweden	Pseudotuberculosis	Mountain hare, <i>L timidus</i>	yes	2	
W	Sweden	Pseudotuberculosis	Fallow deer, <i>Dama dama</i>	yes	2	
W	Sweden	Salmonellosis, <i>S enteridis</i>	Hedgehog	yes	1	
W	Sweden	Salmonellosis, <i>S typhimurium</i>	Bullfinch, <i>P pyrrhula</i>	yes	3	
W	Sweden	Sarcoptic Mange	Red fox, <i>Vulpes vulpes</i>	yes	8	
W	Sweden	Sarcoptic Mange	Lynx, <i>Felis lynx</i>	yes	10	
W	Sweden	Trichomoniasis	<i>Columba palumbus</i>	yes	present	
B	Taipei China	Avian Tuberculosis	Parret	yes	1	

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
B	Taipei China	Leptospirosis	Puma	yes	1	
W	Taipei China	Histomoniasis	Peafowl	yes	3	
A	Tanzania	African swine fever	Warthogs (<i>Phacochoerus africanus</i>)		endemic	
A	Tanzania	African swine fever	Tampans (<i>Ornithodoros porcinus</i>)		endemic	
W	Tunisia	Theileriosis	Red deer, <i>Cervus elaphus</i>		1	
B	Turkey	Avian Cholera	Pheasant	yes	10	
B	Turkey	Rabies	Fox, Wolf, W.pig	yes	1 Wolf, 8 Fox	
B	Turkey	Avian Tuberculosis	Pheasant/Pigeon	no		
B	Turkey	Leptospirosis	rodent			
B	Uganda	Anthrax	Hippopotami (<i>Hippopotamus amphibius</i>)	yes	220	
B	Uganda	Anthrax	Hippopotami (<i>Hippopotamus amphibius</i>)	yes	several	
B	UK	Anaplasmosis	<i>A. phagocytophilia</i> in roe deer (<i>Capreolus capreolus</i>), bank voles (<i>Clethrionomys glareolus</i>), field voles (<i>Microtus agrestis</i>) and wood mice (<i>Apodemus sylvaticus</i>)	reported in 2004	several see main report for prevalences	
B	UK	Avian Chlamydiosis	Robin (<i>Erithacus rubecula</i>), collared dove (<i>Streptopelia decaocto</i>)	yes	Robin x 1, Collared dove x 2	
B	UK	Avian Cholera	various species, often infected from cat bites	yes	Blackbird (<i>Turdus meula</i>) x 1, chaffinch (<i>Fringilla coelebs</i>) x 1 and Dunnock (<i>Prunella modularis</i>) x1	
B	UK	Avian Tuberculosis	various waterbirds, pigeons, deer	yes	27	
B	UK	Bovine tuberculosis	Badger (<i>Meles meles</i>), red deer (<i>Cervus elaphus</i>), fallow deer (<i>Dama dama</i>), roe deer and wood mouse	yes	Badger (<i>Meles meles</i>) x 143, red deer (<i>Cervus elaphus</i>) x 28, fallow deer (<i>Dama dama</i>) x 12, roe deer x 1 and wood mouse x 1	
B	UK	<i>Echinococcus granulosus</i>	fox (<i>Vulpes vulpes</i>), deer, rabbit (<i>Oryctolagus cuniculus</i>) and domesticated animals	no		
B	UK	Leptospirosis	rodents, fox	no		
B	UK	Maedi/Visna	not in wildlife			
B	UK	Malignant Catharral Fever	red deer	no		
B	UK	Myxomatosis	rabbits (<i>Oryctolagus cuniculus</i>)	yes	Endemic - estimated >1000	
B	UK	Paratuberculosis	deer	no		
B	UK	Rabbit Haemorrhagic Disease (RHD)	rabbits	yes	20	
W	UK	Adiaspiromycosis	Badger	yes	1	
W	UK	Avian botulism	Common gull (<i>Larus canus</i>)	yes	987 bodies collected over 5 days at one location	
W	UK	Avian Pox	various, house sparrow (<i>Passer domesticus</i>) in 2004	yes	2	
W	UK	Babesiosis	<i>Babesia microti</i> in field voles	see attached Report page 31		
W	UK	Calicivirus Marine Mammals	grey seal (<i>Halichoerus grypus</i>)	no		
W	UK	Coccidiosis and <i>Yersinia pseudotuberculosis</i> (concurrent)	brown hare (<i>Lepus europeus</i>)	yes	2 outbreaks	

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	UK	Cryptosporidiosis	Hedgehog (<i>Erinaceus europaeus</i>)	yes	several	
W	UK	Enteritis due to attaching and effacing E coli	Roe deer	yes	6 fawns	
W	UK	European Brown Hare Syndrome (EBHS)	brown hare (<i>Lepus europeus</i>)	no		
W	UK	Histomoniasis	game bird species	no		
W	UK	Iridovirus diseases	common frog (<i>Rana temporaria</i>)	suspect case	several	
W	UK	Paramyxoviruses	feral pigeons (<i>Columba livia</i>), collared doves and woodpigeons (<i>Columba palumbus</i>)	yes	4 reported	
W	UK	Pestiviruses	deer species	no		
W	UK	Sarcoptic Mange	fox (<i>Vulpes vulpes</i>)	yes	several	
W	UK	Squirrel parapox virus infection	Red Squirrel (<i>Sciurus vulgaris</i>)	yes	4	
W	UK	Trichomoniasis	wood pigeons, collared doves	yes	>100, Many small outbreaks	
A	USA	Bluetongue, BTV-17	<i>Odocoileus virginianus</i> &	Idaho	3	
A	USA	Bluetongue, BTV-17	<i>O. hemionus</i>			
B	USA	Avian Cholera	Waterfowl	Large, sporadic outbreaks		
B	USA	Rabies	Carnivores, bat	Endemic		
B	USA	Aujeszky's Disease	Feral swine (<i>Sus scrofa</i>)	Endemic in several states		
B	USA	Bovine tuberculosis	<i>O. virginianus</i> and	Endemic in part of NE Michigan		
B	USA	Bovine tuberculosis	<i>Cervus elaphus</i>			
B	USA	Brucellosis	Feral swine	Endemic in several states		
B	USA	Brucellosis	Bison bison, <i>C. elaphus</i>	Endemic in Greater Yellowstone		
B	USA	Tularemia	<i>Sylvilagus</i> spp., <i>Castor</i>	Endemic		
B	USA	Tularemia	<i>Castor canadensis</i> , <i>Ondatra zibethicus</i>			
B	USA	Tularemia	<i>zibethicus</i>			
W	USA	Avian Vacuolar Myelinopathy	<i>Haliaeetus leucocephalus</i> ,	Georgia/South Carolina	2	
W	USA	Avian Vacuolar Myelinopathy	<i>Fulica americana</i> ,		low numbers	
W	USA	Avian Vacuolar Myelinopathy	<i>Bubo virginianus</i>		1	
W	USA	Epizootic Haemorrhagic Disease (EHD)	<i>O. virginianus</i>	Very low activity	IL, KS (few deer)	
W	USA	Histomoniasis	<i>Meleagris gallopavo</i>	Endemic		
W	USA	Transmissible Spongiform Encephalopathies (TSE, CWD)	<i>O. hemionus</i> , <i>O. virginianus</i>		Endemic in CO,	
W	USA	Transmissible Spongiform Encephalopathies (TSE, CWD)	<i>C. elaphus</i>		ID, IL, NE, NM,	
B	Zambia	Bovine tuberculosis	Lechwe (<i>Kobu leche</i>)	yes		
A	Zimbabwe	Foot and Mouth Disease	buffalo, kudu, bushbuck, eland, sable antelope	yes	seropos	
B	Zimbabwe	Rabies	<i>C. mesomelas/adustus</i> , mongoose (not speciated), hyaena (probably <i>C. crocuta</i>)			
B	Zimbabwe	Anthrax	see table in other doc	yes	3000	
B	Zimbabwe	Trichinellosis				

Appendix III (contd)

List	Country	Disease	Animal species	Dis. seen 2004	# of animals	Comments
W	Zimbabwe	Babesiosis	Zebra, giraffe	yes	1 each	
W	Zimbabwe	Chlamydiosis	C niloticus	yes	1 farm	
W	Zimbabwe	Immunodeficiency viruses (Feline, Simian)	lion	yes - see other doc	serosurvey pos	
W	Zimbabwe	Inclusion Body Disease Croc adeno-virus,	C niloticus	yes	3 farms	
W	Zimbabwe	Papillomatosis in crocodiles POX ??	C niloticus	yes	500	
W	Zimbabwe	Trichinellosis	C niloticus + Varanus niloticus	yes	4 farms; V.n. wild	

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