REPORT OF THE MEETING
OF THE OIE AD HOC GROUP ON WILDLIFE DISEASES
(with the participation of the World Health Organisation)

Paris, 2 - 4 February 1994

The second meeting of the Group was held on 2-4 February 1994 at the headquarters of the OIE. It was opened by Dr J. Blancou, Director General of the OIE, who welcomed the participants (listed in Appendix I). Dr M.H. Woodford was elected chairman of the meeting, and Drs M. Artois and R. Bengis were elected as rapporteurs. The agenda (Appendix II) was approved. The main objective of the Ad Hoc Group on Wildlife Diseases at this meeting was to review the results achieved and progress made in the preceding year for the collection and reporting of wildlife diseases of concern to the Member Countries.

1. Regional review of wildlife diseases

Reports from Group members covered highlights from the home region of each. Some were only for the year since the previous meeting while others included data from years past to give some background regarding regional disease occurrences. Data from years prior to 1993-94 are so indicated. The genus/species of animals mentioned in this report are given in Appendix III.

LIST A

Foot and mouth disease

Focal clinical outbreaks due to virus type SAT2 occurred in impala in the Kruger National Park, South Africa, in 1993. Historical outbreaks dating back to the 1950s were described in Russia in reindeer (Archangelsk region), saiga antelope (Kalmykia) and moose, red deer, and wild boar (Central Russia).

Rinderpest

Russia was free of this disease from 1929 to 1990 but an outbreak occurred in 1991 in southern Russia (Tuva), primarily involving domestic yak but also reindeer and moose.
**Lumpy skin disease**

Natural clinical cases were diagnosed in giraffe in Zimbabwe.

**Hog cholera (classical swine fever)**

Outbreaks were reported in wild boars in Ruhuna National Park, Sri Lanka, in 1989, and in the endangered Chacoan peccary in Northern and Western Paraguay in the late 1980s. Several outbreaks occurred or continued in wild boar in Germany, France and the Baltic countries. Periodic epizootics were reported in central Russia and Siberia in wild boar at 3-4 year intervals.

**Newcastle disease**

Velogenic strains caused mortality in black-necked cranes and common cranes overwintering in China; the source was an outbreak in adjacent domestic poultry. The disease was diagnosed for the first time in farmed ostriches in South Africa and was spread among farms by movement of ostriches. The velogenic neurotropic virus caused disease in double-crested cormorants in 1992 over large areas of Canada and the United States from which the disease spread to one commercial turkey farm. The disease also occurred in double-crested cormorants, gulls and pelicans in 1990 in Western Canada. The disease is reported to be common in game-farm waterfowl in Russia.

**List B**

**Anthrax**

Historically, this has affected moose, red deer, other wild ruminants and wild boar in Russia; it has killed tens of thousands of wild reindeer on the Taymir Peninsula. An epidemic occurred in central Kruger National Park, South Africa, in September to December 1993 with 209 confirmed cases involving 14 species; 50% were kudu, although this species makes up only about 3% of local ungulates. Endemic anthrax occurred in the north of the Park where 70% of affected animals were impala. Endemic anthrax in Etosha National Park, Namibia, affected elephants primarily, and another outbreak in elephants was suspected in Botswana.

**Aujeszky's disease**

This is reported to occur in some parts of Russia in wild boar. It is also endemic in some wild swine in 12 States of the United States of America (USA).

**Echinococcosis/hydatidosis**

*Echinococcus granulosus* occurs widely in Russia, particularly in the north in wild carnivores and reindeer. In Europe, *Echinococcus multilocularis* in red foxes has been found as far north as northern Germany and seems to be extending its range northward. The range of *E. multilocularis* has been extending from the northern great plains basin into the mid-western USA in red foxes and coyotes.

**Rabies**

In South Africa, 691 cases were diagnosed in animals in 1993; 149 cases were in wildlife, predominantly in black backed jackals and yellow mongooses. In Botswana, 15% of rabies cases were in wildlife and in Namibia 24%, predominantly in jackals and yellow mongooses.

Oral vaccination of foxes has dramatically reduced the occurrence of rabies in terrestrial wildlife species and as a consequence in domestic animals, in large areas of Western and, to a lesser extent Central Europe. Isolated cases still occur within the vaccinated areas. Fox rabies was reported in Israel and the Arabian Peninsula. Recently published data indicate that bat rabies is endemic in the serotine bat in the Netherlands. Fox rabies continues to occur in eastern Europe. Rabies in arctic foxes occurs in northern Russia and Siberia in 3-4 year cycles. High mortality in reindeer was reported during some epidemics. An instance of rabies translocation occurred over a distance of ± 1,000 km from the southwestern USA.
(Texas) to the southeast (Alabama) when coyotes were translocated for hunting purposes. This event had the potential to establish the Texas coyote-dog strain of rabies virus in a new location among coyotes and unvaccinated dogs in the southeast. An oral vaccination program for raccoons in southern New Jersey (USA) was started in April 1992 in order to prevent spread of rabies into the Cape May Peninsula. The epidemic had reached the edge of the vaccinated zone in April 1993.

**Bovine tuberculosis**

This disease continues to affect African buffalo and warthogs in Queen Elizabeth National Park, Uganda. Twenty-seven percent of 76 African buffaloes autopsied in the Kruger National Park (South Africa) in 1993 had macroscopic lesions. The disease is widespread and endemic in brush-tailed possums in New Zealand. The disease continues to appear among captive/farmed deer in the United States. Since January 1991, 23 herds of deer and an additional 27 herds of cattle and American bison exposed to those deer have been found to be infected. Llamas on nine premises also were exposed. Infected farmed deer in the United Kingdom, Ireland, Germany, Denmark and Sweden also have been detected. The disease has been reported widely elsewhere in the world in farmed deer. It is also reported to have occurred in moose, red deer, fallow deer and wild boar in Russia and in Italy.

**Mange**

Sarcoptic mange has been responsible for severe mortality in chamois in the eastern Alps and in Slovenia, in ibex in Spain, in young capybara in Argentina, in the hyrax in Tanzania, and wild canids in Scandinavia and Canada. Otodectic mange has eliminated arctic foxes from one of the Komandor Islands, Siberia.

**Trichinella**

This is widespread in Russian wildlife: 60-70% of brown bears on the Kamchatka Peninsula are infected and are an important source of human infections. Thirty percent of polar bears are infected in north east Greenland.

**Duck plague (Duck virus enteritis)**

Small outbreaks continue to occur in the USA and Canada that are associated with semi-domesticated and Muscovy ducks.

**Avian cholera**

Outbreaks continue regularly among waterfowl populations in North America and Russia.

**Psittacosis-ornithosis**

This has been observed in many parts of Russia in a wide range of bird species. There have been several outbreaks among captive mallards raised for release for hunting in Sweden.

**Tularaemia**

Is reported to be common in Central Russia and Siberia.

**Viral haemorrhagic disease of rabbits**

This disease is now widespread in farmed rabbits in Russia, having first been detected in 1986 in the Khabarovsk region. It is present throughout the range of the wild rabbit in Europe but populations of rabbits remain high in many areas affected by the disease.
OTHER DISEASE OCCURRENCES NOTED

Keratoconjunctivitis in chamois

Continues to occur in the French Alps. Its infectious nature has been confirmed but its cause remains unknown.

Diseases of cetaceans

Parasitic pneumonia and parasitic cholangitis were reported in harbour porpoises in Canada. Poxvirus and herpesvirus infections were reported in a variety of Pacific dolphin species.

_Crassicauda boopsis_

This giant renal nematode of baleen whales has caused some concern regarding the health and population recovery of some whale species.

Phocine distemper

This disease, which killed a large number of harbour and grey seals in the North Sea (Europe), seals in Lake Baikal (Siberia) and striped dolphins in the Mediterranean, appears to have ceased to be epidemic. Affected seal populations are now near the pre-epidemic levels.

Avian tuberculosis

This disease is widespread in the endangered whooping crane and threatens captive breeding efforts to increase this species for release into the wild.

Bubonic plague

This zoonotic disease remains endemic in wild rodents in the western USA and central Asia and occasionally affects humans.

_Brucella suis_ biotype 4

This disease is common in reindeer and caribou in Canada and Siberia. It does not occur in reindeer in Scandinavia or adjacent Russia.

Omsk haemorrhagic fever

This tick-borne virus disease is reported to cause large-scale mortality in muskrats in Siberia. The muskrat is not native to Asia.

Avian botulism

This environmental food poisoning continues to kill large numbers of water birds in North America and Russia on frequent occasions.

Hookworm in fur seals

Mass mortality of 40% of fur seal pups was reported on the Komondor Islands (Russia), caused by _Uncinaria lucasi_.

Epizootic haemorrhagic disease virus

This virus was responsible for limited mortality of white-tailed deer in West Virginia during 1993.
NEW DISEASES

Hantavirus in the south-western USA

Fatal disease in several humans occurred in the States of Arizona, Colorado, New Mexico and Utah due to a previously unknown hantavirus. Wild rodents are the reservoir species. Intensive investigations are being conducted by the Centers for Disease Control and Prevention in the USA. A related zoonotic disease (haemorrhagic fever) occurs in Europe caused by the Puumala strains of hantavirus. The reservoir rodent species is the bank vole. The associated incidence of human disease has risen in north-eastern France.

Adenovirus in deer in California

Die-offs of black-tailed and mule deer occurred in north and central California (USA) in August-October 1993. This disease has been tentatively attributed to adenovirus-like particles which were found associated with lesions, particularly in the endothelium. No similar disease is known to have occurred in native North American cervids. The significance of this apparently new disease is unknown at present.

Ehrlichia chaffeensis

This is a newly described tick-borne rickettsia that produces febrile disease in humans. The vector tick is thought to be Amblyomma americanum. The epidemiology of this new disease, including potential wildlife reservoirs (white-tailed deer) and other mammals, is under study. The disease has been reported in humans in 24 States of the USA.

Wasting disease in Swedish moose

A wasting disease, unrelated to the spongiform encephalopathies, has been recognised in Sweden over the past decade. Recently, a retrovirus has been isolated from affected moose and its role as a cause of this disease is currently being tested.

New syndromes in African elephants

Acute deaths of unknown cause, associated with non-suppurative myocarditis, were observed in elephants in the Kruger National Park, South Africa. Twenty-two carcasses were found. The possibility of encephalitis/myocarditis virus being involved is being investigated.

Pododermatitis with foot sole separation was also seen in nine adult bull elephants in the Kruger National Park. The aetiology is as yet unknown.

2. Wildlife disease surveillance, reporting, classification and data banks

The Group noted that there are many different systems for wildlife disease investigation among countries and the agencies involved have different jurisdictions and relationships with official Veterinary Services. The Group proposed that the Chief Veterinary Officer of each country should assign a person in the Veterinary Service to facilitate wildlife disease surveillance and reporting (if this has not already been done). This person's responsibilities would include:

a) Liaison with individuals and institutions involved with wildlife in the country to gather information and coordinate their activities with officers and institutions under Veterinary Service direction.

b) Informing concerned Veterinary Service staff of the disease information obtained from wildlife agencies and informing wildlife agencies of official disease information.

c) Reporting this information to the Chief Veterinary Officer, for programme use and for reporting to the OIE.
In order to enhance wildlife disease reporting it is also proposed to ask the Director General to name, on a pilot basis, OIE regional coordinators. These would enlist the active cooperation of national specialists in their regions to report any epidemiologically significant event affecting wildlife. Such information reported to the OIE Central Bureau would be communicated to the Delegates of the countries involved for their information and correction or addition of significant details for publication by the OIE.

The Group urges Member Countries to investigate and report diseases that occur in wildlife to the OIE. It was recognised that the reporting of OIE listed diseases that occur in wildlife may result in a problem for Veterinary Services due to the potential effect on a country's listed disease-status. The Group recommended that countries should not be penalised regarding export of their animals or products for reporting OIE listed diseases in wildlife, when domestic flocks or herds are kept free from these diseases. The Group feels that countries which carry out intensive disease surveillance, including in wildlife populations, are those more likely to maintain domestic animals free of disease. The Group requests the appropriate Specialist Commissions and Working Groups to consider this problem.

The Group endorsed the co-initiative of the Federation of American Scientists and the World Health Organisation (WHO) to establish an International Programme for Monitoring Emerging Diseases (ProMED). The goal of ProMED is to expand and improve global monitoring of infectious human, animal and plant diseases, for the purposes of early detection of and response to emerging (and re-emerging) diseases. The assistance of three international organisations, Food and Agriculture Organisation of the United Nations (FAO), WHO and OIE was solicited in support of these aims.

The Group reviewed the initial report of the ProMED Working Group on Global Monitoring of Emerging Animal and Zoonotic Diseases and proposed that wildlife aspects, evidently important to both emerging animal and human disease, be given greater emphasis in this document. The OIE Group felt that its list of consultants might be useful in this respect. Chairpersons of the Working Group, both present at this Group meeting, agreed to this proposal.

3. Wildlife disease consultants list

The Group compiled a list of wildlife disease consultants. This list is intended to provide a key contact person on a regional or disease specific basis, who is able to:

a) Answer pertinent wildlife disease related questions within their own specialised field of expertise

b) Channel wildlife disease related questions to an appropriate specialist in their region

c) Provide active technical assistance or identify specialists in their region who would be able to provide such assistance when called upon by OIE Member Countries in the event of a disease emergency in wildlife

d) Advise on measures to prevent, control or where appropriate treat such diseases.

The provisional list is given in Appendix IV. It should be noted that the persons listed must still be approached for their consent to serve in the above capacities.

4. Transport and translocation problems

There has been a gradual decrease of small urban zoos and an increase of more extensive rural safari parks. As a consequence, these units can no longer be regarded as adequately isolated quarantine stations and a higher risk for the two-way transmission of diseases between wild and domestic animals thus exists. Many parts of the world are involved, viz., Europe, North America, Southern Africa, Pacific and South-East Asia.

The transport of wild (some partially domesticated) animals for these activities often involves larger numbers of animals, compared with the former situation when mostly small numbers of zoo animals were moved. These movements are becoming more widely known and are attracting the attention of recently formed controlling organisations like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Due to improved forms of transportation, large numbers of animals can be moved from one continent to another, thus increasing the disease risks considerably.
As a general rule, the official Veterinary Services and the veterinary profession of Member Countries are well aware of the domestic animal diseases. However, they are often less informed of the disease implications posed by wild animals in captivity. There is a dangerous temptation to avoid the problems of disease control in wild animal movements by ignoring them. Thus, there is a need to disseminate information regarding the existence of diagnostic tests (and their interpretation) which can be carried out on captive wild animals prior to their translocation.

One of the most alarming disease problems in wildlife importation is bovine tuberculosis, especially in farmed deer. With a few exceptions, no country's deer farm industry is uninfected by this disease which is widespread in Europe, North America, the Pacific region, South-East Asia and the Far East. Many species of deer are involved, both temperate (red deer, wapiti or elk, fallow deer, temperate sika, etc.) and tropical (sambar, rusa, tropical sika, etc.). At present the tests that are available often result in a number of false positives due to a lack of specificity and/or false negatives due to a lack of sensitivity. Nevertheless, this difficulty should not inhibit the responsible authorities from carrying out the tests in the best possible manner. The technology of the intradermal skin tests in deer is now well known and available, particularly in New Zealand, United Kingdom, USA, etc. Combined with the blood tests, the skin tests give an acceptable indication of the tuberculosis status when they are applied to groups or herds and not to individuals. It is clear that the tests must be done, not only on the animals to be exported, but also on an adequate sample of the herd of origin which has been isolated for a suitable period. Another important point is the handling process of the animals. Handling that minimises stress is essential for good test results since rough handling can have a marked effect on the validity of test results and can further complicate interpretation.

Another example of a disease problem associated with the relocation of wildlife is the risk of exporting heartwater (cowdriosis) from Africa to North America and Asia. There are numerous examples of African wild animals being transported abroad without adequate screening for ectoparasites and disease pathogens; for example, white rhinos and ostriches have been translocated to North America while carrying heartwater vector ticks (*Amblyomma variegatum*). African antelopes have also been introduced, without adequate disease screening, into South-East Asia where there are ticks of *Amblyomma spp.* which are potential vectors of heartwater.

5. **Diagnostic procedures for wildlife diseases**

While being aware that the majority of standardised diagnostic tests and techniques listed in the *OIE Manual of Standards* are also appropriate and sufficiently sensitive or specific for use in many wildlife species, this Group wishes to advise OIE Members that this is not universally true for all the diagnostic tests and techniques for all List A and B diseases in all susceptible wildlife diseases. Notorious inaccuracies have been encountered, for instance, in the application and interpretation of various tests used for bovine tuberculosis diagnosis and certification in cervids, elephants, hippopotami, rhinoceroses and African buffaloes. Another problematic aspect is assessing the significance of measurable humoral antibody titres to (a) African horse sickness in African elephants and rhinoceroses, (b) to bluetongue and Rift Valley fever in wild ungulates, or (c) Newcastle disease in migratory birds. Furthermore, the sera of some wildlife species have been found to be anti-complementary during the execution of complement fixation tests.

This Group recommends that the potential for inappropriate use and faulty interpretation of such standardised tests in certain wildlife species should be highlighted for Member Countries, and should be incorporated as amendments or additions in a separate chapter of the *OIE Manual of Standards*.

If this recommendation is accepted, this Group will undertake to propose a list of known diagnostic test idiosyncracies, and update it when necessary for incorporation into this added chapter of the *Manual of Standards*. The Group agreed that, between now and the 1995 meeting, it would compile a list of these diagnostic problems.
6. Vaccines and vaccination

Vaccination of wildlife for disease prevention or control is being used in an increasing number of countries. A few programmes are large-scale in size, but many more vaccines are being evaluated or are being used on a limited basis. The most notable vaccination programmes in wildlife are against rabies in wild mammals in Europe, Canada and the USA, where oral vaccines are being delivered to wild populations. More limited use of inactivated rabies vaccines has been a standard practice in zoological collections for many years.

There are several small- or medium-scale wildlife vaccination programmes such as the use of anthrax spore vaccine in Africa to protect free-ranging herbivores. In this case, the vaccine has been delivered by remote injection. Experimental trials have been conducted using injectable vaccines for rabies in raccoons and skunks, canine distemper in black-footed ferrets, *Brucella abortus* in elk, fowl cholera in Aleutian geese, and rinderpest in African buffalo and impala.

Zoos are also using vaccines against bovine virus diarrhoea, equine rhinopneumonitis, Eastern equine encephalomyelitis, canine distemper, feline panleucopaenia and calicivirus, etc., on specific animals in their collections. In addition, a few commercial deer farming enterprises are using vaccines such as BCG (vaccin Bilié de Calmette et Guérin) for tuberculosis.

Many more vaccination programmes have been proposed for use in wildlife. A few examples include BCG against tuberculosis in badgers, hog cholera vaccine in wild boar in Europe, and Aujeszky's disease (recombinant) and *Brucella neotomae* vaccines in wild swine in the United States. In addition to vaccines against disease, there is a substantial effort being made to produce immunocontraceptive vaccines for use in wildlife population control.

Oral delivery of vaccines appears to be the most practical method for use in wildlife. The best example of the feasibility of oral vaccination has been the rabies programme. A drastic decline in the incidence of rabies has been reported in large areas of western Europe following the regular application of the oral vaccination technique using various live virus vaccine types over 5 to 10 years to immunise foxes (and to a lesser extent raccoon dogs). Encouraging results have also been obtained in foxes in Ontario, Canada, using a modified live virus vaccine, and in some limited areas in the USA, using a recombinant rabies vaccine in raccoons. The Group considers the technique potentially useful for controlling the disease in other reservoir species in other countries. Release of the vaccine in the environment should always be preceded by efficacy and safety trials in major non-target species living in the area. An evaluation of the bait and bait delivery system should also be conducted. An assessment of the risks of direct and indirect exposure of humans to the live virus vaccine should also be carried out.

The Group took note of the report of the 4th WHO Consultation on Oral Immunisation of Dogs against Rabies, which contains recommendations applicable to wild and domestic carnivores.

The Group has proposed the following recommendations on the use of vaccines in wildlife populations:

a) The vaccine should be proven effective in preventing the disease in target animals. For non-endangered target species, challenge studies should be standard procedure for assessing vaccine efficacy. Extrapolation of data from vaccine studies in closely related species should be discouraged as a substitute for the above. A possible exception would be the use of vaccines in endangered species where extensive testing is not feasible. In these instances, closely related surrogate species can be tested but caution would still be advised.

b) If a vaccine is effective, it should be evaluated for safety in the animal populations and when deemed necessary for humans. The vaccine should be safe not only for the target species, but also for the major non-target species that may be exposed to the vaccine through ingestion of baits or predation or scavenging of target species.

c) Attenuated live vaccines or vaccine carrier organisms should not be used in wildlife populations if they are transmissible from vaccinated to non-vaccinated animals.
d) Vaccination should not be used in wildlife if such use will impede disease eradication programmes in domestic animals, humans or wildlife.

e) The decision on the use of vaccines in wildlife during a disease emergency should be based upon comparative risk analyses where every effort is made to choose the option that poses the least risk to wildlife populations.

In recent years, proposals have been made to develop oral contraceptive vaccines that would be transmissible from animal to animal in wildlife populations. Although such vaccines represent the ideal method to control unwanted wildlife, the vaccines actually represent newly developed infectious reproductive diseases. Therefore, and after considering the recommendations of the WHO informal Consultation on reproductive control of carnivores, Geneva, 16 June 1993 (document reference WHO/CDS/VPH/93.124), the Group discourages this approach to wildlife population control since it would place numerous desirable wildlife populations at risk. Furthermore, the Group strongly discourages contraceptive vaccines that are not species specific or that cause a risk to non-target species. Considering the risk of interfering with closely related species, it is recommended that only immunocontraceptive vaccines using species-specific epitopes should be used.

7. Relations with wildlife organisations

The Group considered the reply to the Director General of the OIE from the Deputy Secretary General of CITES, concerning the Group's request for CITES officially to permit the transport of bona fide veterinary diagnostic specimens from animals listed on CITES (Schedules 1 and 2) across international borders en route to wildlife disease laboratories. In view of the unsatisfactory nature of the CITES response, the Group asked its chairman to arrange a meeting with the CITES representatives in Washington D.C. to discuss the matter further.

8. Functioning of the Ad hoc Group

The Group decided to ask the Director General of the OIE to propose to the International Committee that the Ad Hoc Group on Wildlife Disease be recognised as a full Working Group of the OIE.

The Group agreed that June 1995 would a suitable time for its next meeting.

9. Other business

The Group considered the proposed 1996 issue of the OIE Scientific and Technical Review, which is to be devoted to the problems of Wildlife husbandry and diseases. It was able to suggest the names of several possible coordinators.

The Group is concerned at the uncontrolled exportation of wild animals from Russia and the Commonwealth of Independent States, which allow movement without any import permits or disease screening.

.../Appendices
Appendix I

OIE AD HOC GROUP ON WILDLIFE DISEASES
Paris, 2 - 4 February 1994

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OIE AD HOC GROUP ON WILDLIFE DISEASES

Paris, 2-4 February 1994

Agenda

1. Regional review of wildlife disease
   Dr Bengis Africa
   Dr Nettles Americas
   Dr Berezin Asia, Commonwealth Independent States countries
   Dr Mörner Northern and Central Europe
   Dr Artois Southern Europe, Mediterranean and Middle East
   Dr Woodford All other; International Union for the Conservation of Nature and Natural Resources Species Survival Commission (IUCN SSC) Veterinary Group survey results

2. Wildlife disease surveillance reporting, classification and data banks

3. Wildlife disease consultants list

4. Transport and translocation problems

5. Diagnostic procedures for wildlife diseases

6. Vaccines and vaccination

7. Relations with wildlife organisations

8. Functioning of the Ad hoc Group

9. Other business
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<thead>
<tr>
<th>GENUS/SPECIES OF THE WILD ANIMALS MENTIONED IN THE REPORT</th>
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buffle d’Afrique
éléphant d’Afrique
renard polaire
blaireau
campagnol roussâtre
bison américain
cerf à queue noire
furet à pattes noires
grale à cou noir
baleine bleue
ours brun
phalanger renard
cabai
pécari Chacó
chamois
grue cendrée
coyote
cormoran à aigrettes
wapiti
chat forestier
daim
otarie à fourrure
girafe
phoque gris
goëland
marsouin
phoque veau marin
hippopotame
damans
bouquetin
impala
chacal à chabraque
grand koudou
Appendix III (contd)

llama (*Lama lama*)
mallard (*Anas platyrhynchos*)
moose, or European elk (*Alces alces*)
mule deer (*Odocoileus hemionus*)
Muscovy duck (*Cairina moschata*)
muskrat (*Ondatra zibethicus*)
ostrich (*Struthio camelus*)
pelicans (*Pelecanidae*)
polar bear (*Thalarctos maritimus*)
rabbit (*Oryctolagus cuniculus*)
raccoon dog (*Nyctereutes procyonoides*)
red deer (*Cervus elaphus*)
red fox (*Vulpes vulpes*)
reindeer/caribou (*Rangifer tarandus*)
roe deer (*Capreolus capreolus*)
rusa deer (*Cervus timorensis*)
saiga (antelope) (*Saiga tatarica*)
sambir (*Cervus unicolor*)
serotine (*Eptesicus spp.*)
sika deer (*Cervus nippon*)
spotted skunk (*Spilogale putorius*)
striped dolphin (*Stenella coeruleoalba*)
striped skunk (*Mephitis mephitis*)
warthog (*Phacochoerus aethiopicus*)
white rhinoceros (*Ceratotherium simum*)
white-tailed deer (*Odocoileus virginianus*)
whooping crane (*Grus americana*)
wild boar (*Sus scrofa*)
wild dog (*Lycaon pictus*)
yak (domestic) (*Bos mutus*)
yellow mongoose (*Cynictis penicillata*)
zebra (*Equus burchelli*)

lama
colvert
cerf mulet
canard de Barbarie
rat musqué
autruche
pélicans
ours blanc
lapin de garenne
chien viverrin
cerf élaphe
renard roux
renne
chevreuil
cerf rusa
antilope saïga
sambar
mouffette tachetée
dauphin de Thétis
mouffette rayée
phacochère
rhinocéros blanc
cerf de Virginie
grue blanche d'amérique
sanglier
lycaon
yack
mangouste fauve
zèbre de Burchell
## Provisional List of Wildlife Disease Consultants

<table>
<thead>
<tr>
<th>Name and address</th>
<th>Field of expertise</th>
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</thead>
<tbody>
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<td>Fax: (1) 416 832 7149</td>
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<tr>
<td>Bears</td>
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<td>Moose</td>
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<td>Fur bears</td>
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<tr>
<td>Canada</td>
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<td>Tel: (1) 303 48 46 267 (Home)</td>
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<tr>
<td>Marine turtles</td>
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<tr>
<td>Central America</td>
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<tr>
<td><strong>Dr M. Artois</strong></td>
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<tr>
<td>Laboratoire d'études sur la rage</td>
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<td>et la pathologie des animaux sauvages</td>
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<td>Fax: (33) 83 29 33 13</td>
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<tr>
<td>Rabies</td>
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<td>European fauna</td>
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<tr>
<td><strong>Dr B.J.H. Barnard</strong></td>
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<tr>
<td>Onderstepoort Veterinary Institute</td>
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<td>Fax: (27) 12 55.6573</td>
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<tr>
<td>African horse sickness</td>
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<td>Malignant catarrhal fever</td>
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<td>Rabies</td>
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<td>Rift Valley fever</td>
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<td>Southern Africa</td>
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<tr>
<td><strong>Prof. J.A. Bakulov</strong></td>
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<tr>
<td>Institute of Veterinary Virology and Microbiology</td>
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<tr>
<td>Pokrov, Vladmir Region</td>
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<td>RUSSIA</td>
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<td>Viruses of marine mammals</td>
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<td>Russia</td>
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<tr>
<td><strong>Dr M.D. Beccaceci</strong></td>
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<td>Mariano Boedo 90</td>
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<td>Florida, C.P. 1602, Buenos Aires</td>
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<td>Tel: (54) 1 79 72 251 (Home)</td>
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<tr>
<td>South American fauna</td>
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<td><strong>Dr R.G. Bengis</strong></td>
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<tr>
<td>Disease epidemiology</td>
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</tbody>
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Appendix IV (contd)

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Wildlife diseases/February 1994 19
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Avian diseases
Feline diseases
Australian fauna

Tularaemia
European fauna

Wildlife diseases
Southeastern United States

West African fauna

Contact for Italy
Alpine fauna

Mid-West
USA fauna

Contact for New Zealand
New Zealand fauna

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Brucellose  
Faune d'Amérique du Nord

Fièvre charbonneuse  
Mammifères marins

Fièvre charbonneuse  
Techniques de vaccination à distance

Commission pour la survie des espèces de l'Union internationale pour la conservation de la nature et des ressources naturelles  
IUCN/SSC  
Relations avec le Groupe vétérinaire

Faune de l'Europe du Nord

Virologie  
Amérique du Nord et Amérique centrale

Faune arctique