WORLD ORGANISATION FOR ANIMAL HEALTH
*Protecting animals, preserving our future*

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

**Paris (France), 10 – 13 March 2020**

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## 1. Summary

The Wildlife Working Group (the 'Working Group') met under exceptional circumstances with several members needing to return to their home countries before the end of the meeting as travel restrictions were put in place to curb the spread of the emerging COVID-19 pandemic. Although the exact source of COVID-19 and its route of introduction to the human population had not yet been established, there was evidence that the virus had emerged from a wild animal source. The emergence of this devastating pandemic and other recent spill-over events highlighted the critical importance of science-based risk management at the human-animal-ecosystems interface, and the importance of the Working Group in providing expert opinion and advice to the international community. During their meeting, the Working Group developed a high-level Statement on Wildlife Trade and Emerging Zoonoses which formed the basis for further advocacy and balanced discussions on the development of strategies to reduce the risk of future spill-over events.

Since January 2020, the Working Group had also been supporting the OIE in its response to COVID-19. The President of the Working Group was chairing the OIE advisory group on COVID-19 (which was later designated as an OIE *ad hoc* Group on COVID-19 at the human-animal interface). This group led discussions on investigating the animal source of SARS-CoV-2 and on setting research priorities to better understand the potential role of animals and to reduce risks of future spill-over events.

To ensure that the Working Group optimises its contribution to the OIE's core mission, its Terms of Reference had been updated in 2018 The Working Group addressed an agenda formulated around these Terms of Reference.

To support the OIE's core mission of transparency, and to improve comprehensive reporting of quality data about wildlife disease, the Working Group had developed technical disease cards for 26 wildlife diseases and had strengthened the criteria for listing diseases of wildlife reportable to the OIE through WAHIS. In addition, the Working Group provided comprehensive information on emerging and noteworthy wildlife issues and disease occurrences worldwide (see appendix IV). This is a unique source of information on emerging health issues in wildlife which allows the international community to develop and refine disease management strategies for both livestock and wildlife, and at the human-animal-ecosystems interface. The information also supports strategies to monitor and protect biodiversity.

The Working Group continued to provide technical input to the implementation of priority global disease control strategies where wildlife are relevant; this included the development of guidelines for the control and prevention of PPR in wildlife populations, which is essential for supporting PPR eradication.

## 2. Opening

The OIE Working Group on Wildlife (the Working Group) meeting was held from 10 to 13 March 2020 at the OIE Headquarters in Paris, France and was chaired by Dr William Karesh.

Dr Matthew Stone, Deputy Director General of the OIE, welcomed the members. In line with the new strategic plan (2021-2025) (due for the adoption at the next General Session), he highlighted the importance of leveraging mutually beneficial partnerships to ensure OIE achieved its goals. He asked the Working Group to provide advice on which international organisations (working on wildlife and biodiversity) the OIE should partner with. He highlighted the need for the Working Group to work closely with the OIE Specialist Commissions and to support the OIE's Global Strategies e.g. for ASF, PPR, or rabies. In recent years, reporting of diseases for wildlife in *WAHIS-Wild* had been disappointing and he suggested that a compelling case with respect to the benefits of the reporting system along with clear and strong criteria for reporting could help to reverse the downward trend. The recent emergence of high impact human pathogens from wild animals, including SARS and EBOV, and the suggestion that COVID-19 may have resulted from a wildlife spill-over event, demonstrated the critical need for veterinary public health risk management of wildlife food supply chains. He asked the Working Group for suggestions on guidance or standards for the wildlife trade and market systems.

## 3. Adoption of agenda and designation of rapporteur

Dr Marcela Uhart was appointed as rapporteur for the meeting. The agenda and the list of participants are provided in Appendices I and II, respectively.

## 4. Feedback from the meetings of the Specialist Commissions

### 4.1. Scientific Commission for Animal Diseases (Scientific Commission)

Dr Misheck Mulumba, member of the Scientific Commission, updated the Working Group on the relevant outcomes from the latest Scientific Commission for Animal Diseases (SCAD) meetings. This led to discussion on the following topics:

#### a) Great apes, gibbons and hepatitis B viruses

Veterinarians and zoo professionals, involved in the management of gibbon populations in member institutions of the European Association of Zoos and Aquaria, had shared their concerns with the OIE about the inclusion of gibbon hepatitis B virus in article 6.12.4. of chapter 6.12. "Zoonoses transmissible from non-human primates" of the OIE *Terrestrial Animal Health Code (Terrestrial Code)* because they considered hepatitis B to be a human disease and not a zoonosis.

The Working Group supported this view, following its review of chapter 3.9.11 of the OIE *Terrestrial Manual for diagnostic tests and vaccines for Terrestrial Animals* (*Terrestrial Manual*) in 2015, and in consultation with experts, the Working Group also concluded that hepatitis B was a human disease, based on the following rationale. Some hepadnaviridae had been identified in different non-human primates but transmission of these strains to humans had never been documented. Historically, the concern for transmission was relevant because, prior to newer diagnostic techniques, it was not possible to differentiate hepatitis B viruses circulating in non-human primates. It was now recognized that most non-human primates were not naturally infected with human hepatitis B, and great apes and gibbons were infected with different hepatitis B viruses which had never been demonstrated to infect humans. The Working Group suggests revising both Article 6.12.4 of the *Terrestrial Code* and Chapter 3.9.11 of the *Terrestrial Manual* to recommend that when great apes and gibbons are tested for hepatitis B, tests specific for human hepatitis B are used to avoid false positives from detection of other non-human primate hepadnaviruses.

**Recommendation:** revise Article 6.12.4 of the *Code* to reflect that hepatitis B is a human disease and Chapter 3.9.11 of the Manual to ensure differentiation between human hepatitis B and other hepadnaviridae

**b) Vaccination of animals of high conservation value**

The SCAD agreed that the AUSVET guidance document "Risk-based assessment of disease control options for rare and valuable animals" be used as a model to revise the paper "Vaccination of animals of high conservation value" which was drafted by the Working Group in 2017. SCAD invited the Working Group to consider that emergency vaccination of zoological animals of high conservation value may require off-label use of vaccines and that approval by Competent Authorities would be necessary.

**Recommendation:** revise paper on 'vaccination of animals of high conservation value' using AUSVET guidance and considering the approval of off-label use of vaccines.

**c) Case definitions**

The Working Group was informed about the development of case definitions for the 117 listed diseases and proposed to contribute to the case definition when wildlife is involved.

**4.2. Terrestrial Animal Health Code Commission (Code Commission)**

The Code Commission had no disagreement with a proposed change to the way wildlife diseases were named in WAHIS-*Wild*. The proposal was to change from "infection with [pathogenic agent]" to vernacular names. However, the Code Commission suggested retaining the form "infection with [pathogenic agent]" for some wildlife diseases that were listed in the *Terrestrial Code* but where an occurrence in wildlife does not meet the case definition according to the *Terrestrial Code* (e.g. low pathogenic avian influenza and Newcastle disease, where the case definition specifically refers to occurrence in poultry).

The Working Group was briefed on the conclusion of the Code Commission's discussions on some terminologies (e.g. depopulation, captive wild [animal], feral [animal] and wild [animal]), for which the Working Group had previously provided technical advice upon request (see the February 2020 Code Commission meeting report for details). The Working Group supported the latest proposed amendments to these terminologies and expressed its willingness to contribute to the work when needed.

**4.3. Biological Standards Commission**

The president of the Biological Standards Commission, Prof Couacy-Hyman, proposed that the Biological Standards Commission review information (in the technical disease cards for wild life diseases developed by the Working Group) about diagnostic methods recommended for the non-OIE listed wildlife diseases reportable to the OIE.

**Recommendation:** Biological Standards Commission review information on diagnostic methods in the wildlife technical disease cards

**4.4. Aquatic Animal Health Standards Commission**

The president of the Aquatic Animal Health Standards Commission, Dr Ingo Ernst, joined by video conference. The Working Group and Dr Ernst decided to exchange information of mutual interest after each meeting, through their respective secretariats. Specifically, this should include information on the diseases affecting aquatic animal wildlife, new standards or diagnostic manual chapters for diseases that affect wildlife, applicability of OIE Reference Laboratories or Collaborating Centres for aquatic wildlife disease diagnostics.

## 5. Disease reporting

Peter Melens and Paolo Tizzani represented the OIE World Animal Health Information and Analysis Department (WAHIAD) during the meeting.

### 5.1. Information on submitted reports on non OIE-listed diseases in wildlife and information on submitted reports on OIE- listed diseases in wildlife through WAHIS

Since 2012, there had been a downward trend in the number of reports of non OIE-listed diseases in wildlife made to the OIE. A small increase was seen in 2018 but it was too early to say whether this was significant. The quality of the information provided in the reports appeared to have improved since 2018.

OIE Member Countries appeared to have generally complied with their obligation to report information about OIE-Listed diseases in wildlife.

**Recommendation:** The Working Group suggested producing a map to show which Member Countries were actively reporting OIE-Listed and non OIE-listed diseases in wildlife to the OIE. The WAHIAD agreed to do this.

### 5.2. Criteria for including wildlife disease in the diseases notified through *WAHIS-Wild*

See Appendix III.

### 5.3. Review and validation of the new animal species to be added to WAHIS-Wild in 2019

The OIE had not received any proposals from Member Countries to add new wildlife species to WAHIS in 2019.

The WAHIAD presented work that had been done to improve the quality of data submitted to OIE by standardising and harmonizing referential data, this included:

1) cleaning of wildlife species data already reported in the current WAHIS system;
2) addition of new wildlife species (around 4000 species are now available in the new OIE-WAHIS), and;
3) creation of links between diseases and susceptible wildlife species.

The Working Group was requested to support:

1) validation of the list of wildlife species included in the OIE-WAHIS system;
2) provision of reference sources for the taxonomy of wildlife species;
3) review of the susceptible species to be linked to the non OIE-Listed diseases, and;
4) development of a process to allow WAHIAD validation of new wildlife species. Experts had already provided WAHIAD with some references for taxonomy of birds and marine mammals. WAHIAD would send the Working Group a proposed process for validation of new species added to OIE-WAHIS.

### 5.4. Fact sheets/Disease cards for Wildlife Diseases

The technical disease cards prepared by the Working Group had been shared by WAHIAD with all the OIE focal points for disease notification and wildlife and OIE Delegates. They would soon be uploaded to the OIE website. There was agreement that the work done on the disease cards by Dr Sleeman and his team was excellent and the Working Group complimented and thanked them. The main aim in preparing and publishing these technical cards was to facilitate reporting of non OIE-Listed diseases by Member Countries, by providing clear and detailed information on these diseases, especially relating to epidemiology and diagnosis.

### 5.5. Update on the OIE WAHIS project

WAHIAD provided an overview on actions taken by the Department concerning the reporting of sanitary information to the OIE, during the transition phase to the new OIE-WAHIS.

The new OIE-WAHIS system would include improved reporting functionalities and a specific module for the new OIE – WAHIS voluntary report of non OIE-Listed diseases in wildlife. The purpose of these new functionalities includes: i) facilitating the reporting of non OIE-Listed diseases, ii) improving the submission rate of the voluntary report of wildlife diseases, iii) collecting more accurate and high-quality data, iv) allowing a wider sharing and dissemination of the data provided by Member Countries.

## 6. Emerging and noteworthy wildlife issues and disease occurrences with relevance to the OIE: reports from members of the Working Group on Wildlife

A written update on emerging and noteworthy wildlife issues and disease occurrences from different regions was provided in advance of the meeting. This is a unique and valuable source of information which can inform disease control and conservation strategies.

This was reviewed and can be found in Appendix IV.

## 7. Diseases for which there is an OIE control strategy

### 7.1. Peste des Petits Ruminants (PPR)

The Peste Petits Ruminants (PPR) Global Control and Eradication Strategy (GCES) was adopted during the International Conference on PPR organised by FAO and the OIE in Abidjan, Côte d'Ivoire, in April 2015, with the aim of eradicating PPR globally by 2030. In October 2016, the Global Eradication Programme was launched, which lays the foundation for implementing the first five-year phase of the GCES. The Working Group was informed about the progress of the GCES in 2019.

This included the development of "FAO/OIE Guidelines for the control and prevention of PPR in wildlife populations" by the Working Group in collaboration with the PPR Global Research and Expertise Network (GREN). This high-level document, targeting countries' decision makers, aims to provide a conceptual framework for integrating wildlife into PPR National Strategic Plans. It clearly identifies all wildlife-related components to be considered when planning national PPR eradication activities. The Guidelines were presented and endorsed during the 1st meeting on "Controlling PPR at the livestock/wildlife interface", which was organised in Rome, Italy, in March 2019 and at the 2nd PPR GREN meeting, which was held in Nairobi, Kenya, in November 2019.

During the two meetings, the following recommendations were made:

a) Promote applied research to better understand the role of wildlife in PPR in order to develop surveillance and diagnostics systems, and effective measures for PPR eradication.

b) Identify wild ungulate populations at risk of PPR infection, through field-based research and collation of existing data, and coordinate with the national Veterinary Services to implement PPR risk mitigation programmes for these wild animal populations.

c) Formally integrate wildlife into the PPR Global Eradication Programme and GCES.

A working group on wildlife was formed within GREN to foster PPR/wildlife-related debates and propose relevant research themes beneficial for PPR GCES. The recognition of the importance of the wildlife-livestock interface in PPR eradication was recognised as an important development not only to ensure effective implementation of the strategy but also in the context of safeguarding wildlife.

**Recommendation:**

The Working Group proposed that:

- The "Guidelines for the control and prevention of PPR in wildlife populations" was revised and finalised by the Working Group. It would then be submitted to OIE management for official approval. As a next step, more specific technical appendices on different aspects, such as on wildlife diagnostics, surveillance strategies, carcasses disposal etc., would be developed.

- The OIE should appreciate the positive impact of the Working Group's involvement in the PPR GCES activities and recommended that this exercise be used as a model for supporting other disease control global strategies. The Working Group agreed to continue to provide support to the activities implemented under the PPR Global Eradication Programme and GCES.

### 7.2. African Swine Fever (ASF)

The Working Group was informed about the GF-TADs global initiative for the control of African swine fever (ASF), which had been developed by the OIE and FAO to provide a framework to tackle strategic challenges, promote partnerships, and minimise the adverse impacts of ASF.

The Working Group would provide support for proposed activities on wild pigs under the global initiative, including:

- recommendation of experts to assist with training programs on hunting biosecurity,
- mapping of wild boar population and liaison with the Wildlife Disease Association.

### 7.3. Rabies

The Working Group was updated on the implementation of the Global Strategic Plan (GSP) to end human deaths from dog-mediated rabies by 2030. The Working Group was informed that the OIE *ad hoc* Group on rabies discussed the current situation of oral rabies vaccination of dogs and provided recommendations to the OIE regarding the way forward. The outcome of this meeting was a peer reviewed paper highlighting that oral vaccines can play an important role, as a complementary tool, in the global elimination of dog-mediated human rabies deaths. However, there are challenges which need to be considered, including (i) safety, (ii) licensing, and (iii) production capacity and production costs.

Considering existing strong evidence about the ineffectiveness, ecological impacts, and counter-productivity of poisoning vampire bats to control rabies in the Americas, the Working Group recommended using alternative methods of prevention, such as vaccination of livestock.

The Working Group commended the efforts of the United States Geological Survey National Wildlife Health Center, in collaboration with academic partners at the University of Wisconsin, Madison, US and University of Glasgow, UK, in the development of an oro-topical vampire-bat rabies vaccine as a novel and ecologically sensible approach. Preliminary studies indicated poxvirus-vectored rabies vaccines, delivered orally or topically, can protect bats against the disease (Stading et al. PLoS Negl Trop Dis. 2017 Oct 4;11(10):e0005958. doi: 10.1371/journal.pntd.0005958.) and may also reduce rabies virus transmission by vampire bats vaccinated even after they have contracted rabies (Cárdenas-Canales et al. Trop Med Infect Dis. 2020 Mar 1;5(1). pii: E34. doi: 10.3390/tropicalmed5010034). The investigators believe that topical delivery of the virally-vectored vaccine to members of a vampire bat colony would promote significant transfer to other members via social grooming. Proof-of-concept studies in vampire bats, that simulated vaccine transfer among vampire bats after topical application of a biomarker in glycerin jelly, have demonstrated the feasibility of this approach (Bakker et al. Nat Ecol Evol. 2019 Dec;3(12):1697-1704. doi: 10.1038/s41559-019-1032-x.). Research is ongoing in vampire bats, with plans for limited field studies in the future.

**Recommendation:** Research continue to allow the transition to nonlethal means to control rabies in vampire bats (e.g. vaccination of livestock and oral vaccination of vampire bats).

### 7.4. Highly Pathogenic Avian Influenza

Between November 2019 and 5 March 2020, highly pathogenic avian influenza (HPAI) outbreaks had continued to cause a significant impact on animal health and production; 16 countries/territories of the Asian, African, European and Middle Eastern Regions experienced 149 new HPAI outbreaks in poultry involving subtypes H5N1, H5N2, H5N5, H5N6 and H5N8, and 6 new outbreaks in non-poultry including wild birds involving subtypes H5N6 and H5N8.

Although the number of HPAI outbreaks in poultry and wild birds had decreased compared to previous years, the Working Group emphasised the need to maintain passive surveillance in wild birds to detect incursions of HPAI viruses for early warning. Member Countries are encouraged to maintain heightened surveillance and apply high standard of biosecurity measures in poultry establishments to prevent the introduction of disease through contact with wild birds.

### 7.5. Zoonotic Tuberculosis

The Working Group was informed about a nearly completed OIE project to evaluate and calibrate potential replacements for the International Standard Bovine Tuberculin. A bovine tuberculosis (bTB) *ad hoc* Group was tasked with conducting an international collaborative study to assess two candidate tuberculins. The bTB *ad hoc* Group was also tasked with reviewing and revising the *Terrestrial Manual* Chapter 3.4.6 Bovine Tuberculosis, in the following areas: epidemiology; available diagnostic tests and vaccines, and their fitness for various purposes; guidance for manufacturing and quality control of bovine tuberculosis diagnostic tests and vaccines; and expanded guidance for diagnostic tests for use in camelids and goats. The bTB *ad hoc* Group recently filed a report with the BSC, which would be available as an annex to the BSC report from the February 2020 meeting.

The Working Group mentioned specific challenges that were encountered in managing tuberculosis in wildlife, where the available diagnostic tests for domestic animals had not been validated for wild species, and the test and cull polices that were applied for domestic livestock may not be feasible for management of tuberculosis in endangered wildlife species. The Working Group proposed a representative to participate in future discussions regarding consideration of potential alternative approaches to managing tuberculosis in domestic animals and wildlife.

### 7.6. Foot and Mouth Disease

The Working Group was updated on progress in implementation of the Global FMD Control Strategy and the activities of the joint FAO/OIE GF-TADs FMD Working Group. The Working Group noted that there were important linkages of the strategy with wildlife in areas such as outbreak investigations, identification of risk hotspots and transmission pathways which were important when developing national risk-based strategies. The Working Group was informed that the main challenges faced by Member Countries during the development of their national strategies for advancing the Progressive Control Pathway were on risk assessment and providing evidence of the socioeconomic impacts of controlling FMD including benefits related to wildlife.

The Working Group was informed about ongoing discussions to create an advisory body to share information on FMD control programmes at global level. The Working Group indicated its interest in being represented on this body to address issues related to wildlife and global FMD control.

## 8. Wildlife as a livelihood opportunity for rural communities

The Working Group discussed the issue of how it can advise the OIE World Assembly on elevating the issue of sustainable livelihoods linked to wildlife and livestock as being an opportunity for impoverished communities.

The issues raised at the previous meeting of the Working Group (December 2018) remained relevant.

The Working Group agreed that commodity-based approach to trade was permitted by the *Terrestrial Code* and that veterinary services should encourage this. The Working Group offered to look at the FMD chapter of the *Terrestrial Code* and give input for improvements to make it applicable and implementable related to commodity-based trade.

Co-existence with wildlife will only be possible from a trade and export perspective where buffalo occur if commodity-based products are produced in a way which mitigates risk of further disease spread. Wildlife remains an important livelihood source and these opportunities should not be at the expense of livestock production, i.e. livestock and wildlife coexistence needs to be accepted.

## 9. Leveraging collaboration from other international organisations on wildlife or biodiversity

### 9.1. International organisations where there is a need to update the existing agreement with the OIE

• ***Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Secretariat)***

The Convention on International Trade in Endangered Species of Wild Fauna and Flora is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

The future collaborative agreement between OIE and CITES aims to engage on issues of mutual interest, which include:

- the rapid movement of emergency diagnostic materials for wildlife, as follow up to a resolution passed in the Conference of the Parties of 2019
- to establish a framework for cooperation between the parties in fields of mutual interest.

  Such fields include but are not limited to:

  - o the animal health and welfare standards for safe legal international trade in and transport of wild animals, especially endangered species included in CITES Appendix 1,
  - o animal health and welfare standards for the killing of wild animals for subsequent international trade,
  - o prevention and control of invasive alien species and the combating of illegal trade in wildlife.

ln particular, the OIE and CITES would agree to collaborate on activities that would make a direct contribution to the achievement of their respective Strategic Plans. Such activities include:

(a) developing and disseminating relevant standards, guidelines and recommendations;

(b) supporting capacity-building activities, and

(c) facilitating collaboration with the OIE Code Commissions, OIE Working Group on Wildlife, the OIE *Ad hoc* Group on Animal Welfare, the OIE Reference Laboratories and Collaborating Centres, the CITES Animals Committee and the CITES Standing Committee as appropriate.

**Recommendation:** to update the existing agreement with CITES

### 9.2. International Organisations with whom OIE could have an agreement

***• United Nations Environment Programme***

United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. Its missions are to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and people to improve their quality of life without compromising that of future generations.

The aim of the agreement would be to establish a framework for cooperation between the parties in fields of mutual interest, according to the respective mandates of the parties and to their respective rules and regulations. In particular, the parties would agree to collaborate on activities that will make a direct contribution to the achievement of their respective strategic objectives. Such activities could include: (a) developing and disseminating relevant standards, guidelines, and recommendations; (b) supporting capacity building activities; and (c) facilitating collaboration with the Wildlife Working Group.

Since the CITES Secretariat was associated with UNEP, there may be opportunities to develop complementarity or coordination between the two agreements with the OIE.

**• Wildlife Disease Association**

Founded in 1952, the Wildlife Disease Association (WDA) is an international scientific society of wildlife professionals, veterinarians, epidemiologists, biologists, ecologists, research scientists and other individuals involved with wildlife diseases and related disciplines, promoting research, management, education, communication, consultation and collaboration. The WDA mission is to acquire, disseminate, and apply knowledge of the health and diseases of wild animals in relation to their biology, conservation, and interactions with humans and domestic animals. The WDA holds an annual scientific conference and publishes the Journal of Wildlife Diseases.

WDA, through its officers, committees and worldwide members can provide expertise to OIE upon request. Due to OIE's extensive history of involvement with international regulations and standards setting, international trade, governance and capacity building, the Working Group believe it to be likely that OIE and WDA could contribute to advancing each other's missions.

**Recommendation**: to develop and formalize agreements with UNEP and WDA

## 10. Matters of Interest for Information

### 10.1. Reports of the OIE Collaborating Centres for Wildlife

The Working Group reviewed the annual reports from the four Collaborating Centres related to Wildlife: Collaborating Centre for Wildlife Health and Biodiversity (Canada/USA), Collaborating Centre for Training in Integrated Livestock and Wildlife Health and Management (South Africa), Collaborating Centre for Bee Health in Africa (Kenya), and Collaborating Centre for Health of Marine Mammals (Italy/Spain).

### 10.2. Training of Wildlife Focal points (5$^{th}$ and 6$^{th}$ Cycle of Workshops)

The Working Group was informed about the preparation of the sixth cycle of training workshop for the OIE National Focal Points for Wildlife. The theme of this cycle would be wildlife disease surveillance and management, and a comprehensive manual would be produced to complement the workshops by the Collaborating Centre for Wildlife Health and Biodiversity (Canada/USA). A first draft would be available by end of March 2020 and the Working Group proposed to review it. The training workshops had been planned to take place in 2020 or 2021 for the following regions: Europe, Africa and Americas. However, it was likely that the evolving COVID-19 pandemic would impact on the scheduling of these events.

### 10.3. Collaborative Partnership on Sustainable Wildlife Management: update

The Working Group was updated on the Collaborative Partnership on Sustainable Wildlife Management (CPW). CPW is a voluntary partnership of 14 international organisations with substantive mandates and programmes to promote the sustainable use and conservation of wildlife resources. Dr Markus Hofmeyr agreed to continue to be the contact person for the OIE with this organisation.

### 10.4. OIE Symposium on Bee diseases during Apimondia Congress

The Working Group was informed on the OIE Symposium on Bee diseases during Apimondia Congress which was held in September 2019 in Montreal, Canada. It was informed about a presentation on Adaptive Strategies of Wild Bees in Africa to deal with Threats.

### 10.5. EBO-SURSY Project: workshop on protocols of surveillance of hemorrhagic fevers in wildlife

The Working Group was updated on the EBO-SURSY Project. Important lessons had been learned from EBO-SURSY which would inform the future OIE wildlife work programme.

## 11. Other business

### 11.1. COVID-19 – Update, including OIE informal advisory group and contribution to WHO research roadmap

The Working Group assisted OIE in mobilising an informal advisory group on COVID-19. The advisory group, which included world leading scientists and researchers and lead by the President of the Working Group, met on a regular basis from January to April 2020 via teleconference to share the latest information on research and disease events at the human-animal interface. The advisory group also provided expertise to the World Health Organisation’s Research and Development Roadmap to establish guidance on priorities for COVID-19 research and actions for WHO member countries and donor organizations.

### 11.2. Wildlife Trade and emerging zoonotic diseases

The recent emergence of potentially devastating infectious diseases at the human animal interface, including SARS, EBOV, and possible COVID-19 (although more evidence was needed to establish the source of SARS-CoV-2 and its route of introduction to the human population) highlights the need to develop strategies to reduce the risk of future spill-over events. For the purposes of clear communication on this topic, the Working Group developed a statement (see Appendix V).

**Recommendation:** for the OIE to develop guidelines and standards around wildlife trade to mitigate risks of spill-over events and to support member countries in risk mitigation

### 11.3. OIE-INTERPOL workshop on agro-crime

An overview of the joint OIE-FAO-INTERPOL “Building resilience against agro-crime and agro-terrorism” Project was provided to the Working Group. This project aims to enhance regional and interagency cooperation to build resilience against agro-terrorism and agro-crime affecting animals. As part of the project, the OIE would host a workshop on agro-crime in July 2020 to bring together the law enforcement and veterinary sectors to describe and contextualise agro-crime and map out areas of where the two sectors can support each other through the demonstration of examples. Dr Donachie explained there would be a dedicated session on wildlife-related crime and asked if the Working Group could provide suggestions for presentations in this session. The Working Group shared ideas including the testing of confiscated animal products, the application of veterinary forensics to wildlife, and suggestions of both governmental and non-governmental initiatives. The Working Group emphasised the need to ensure the session could be applicable to all OIE regions. Dr Donachie will follow up with the Chair of the Working Group and with Dr Diaz to finalise the agenda for this session. The report of the workshop will be shared at the next meeting of the Working Group for information.

### 11.4. Requests from Member Countries regarding Lassa fever

The Working Group discussed the increased number of reported Lassa fever outbreaks in Nigeria. Lassa fever was not a notifiable disease in the animal health sector. The Working Group discussed the contribution of Veterinary Services to Lassa fever and that Veterinary Services often do not have a role to play in the control of the rodent population, which acts as a reservoir for the pathogen. Lassa fever also does not cause clinical disease in rodent hosts. The Working Group agreed that Lassa fever, at this stage, should not be included as an OIE-listed disease. Although Lassa virus is not currently included in the list of diseases reportable through WAHIS-wild its inclusion should be considered. In the meantime the OIE should promote the use of the strong network of OIE National Focal Points for Wildlife in the region to share (if available) surveillance data on the rodent species involved and good practices in the control of rodent populations. In addition, the OIE can continue to promote the use of the risk communication tools developed for Lassa fever as part of the EBO-SURSY Project. The Working Group will continue to respond to OIE Member Countries requests for technical assistance and guidance on this topic.

**Recommendation:** the OIE promote the use of OIE National Focal Points for Wildlife in the region to share (if available) surveillance data on the rodent species involved and good practices in the control of rodent populations. In addition, the OIE can continue to promote the use of the risk communication tools developed for Lassa fever as part of the EBO-SURSY Project.

Explore the possibility of adding Lassa virus to the list of diseases reportable through WAHIS-wild

## 12. Strategy, work priorities setting and work programme for 2020/2021

The Working Group identified the following list of activities as priorities for its work in 2020/2021, in line with its Terms of Reference. In addition to this list, the Working Group will respond to ad hoc requests from the OIE.

- Provide science-based and technical support for OIE broadly on wildlife issues, terrestrial and aquatic species and wild bees.
- Review the training manual on surveillance and control of diseases in wildlife developed by the OIE Collaborating Centre for Wildlife in USA for the OIE National Focal Points for Wildlife.
- Communicate with the OIE Specialist Commissions regularly to ensure the Working Group responds to new and on-going priorities and needs of the OIE.
- Communicate with the OIE Collaborating Centres related to wildlife
- Assist the OIE in maintaining and developing partnerships and activities with relevant international organisations, providing contacts and insights as to OIE participation and representation.
- Support the WAHIAD department to encourage Focal Points for Wildlife to report annually on non-listed wildlife diseases including:
    - Continue further development of technical disease cards including case definitions and references to diagnostic methods appropriate for each pathogen of the non-OIE list wildlife diseases;
    - Assist in preparing information materials to be shared with the OIE National Focal Points for Wildlife;
    - Compile references to diagnostic methods appropriate for each pathogen on the non-listed wildlife pathogen and disease list;
    - Review the Terms of Reference for the OIE National Focal Points for Wildlife, to suggest a set of proposed core competencies to inform curricular content/needs for future FP training workshops.

- Work with the appropriate departments of the OIE in the development of wildlife trade standards.
- Continue to serve on the GREN wildlife group and work through OIE to seek approval for the guidelines for prevention and control of PPR in wildlife.
- Provide support to the OIE, as needed, on the diseases for which there is an OIE control strategy.
- Assist the Aquatic Animal Health Standards Commission in identifying potential candidates for Reference Laboratories for amphibian diseases.
- Contribute to 7$^{th}$ OIE strategic plan including exploration of:
    - climate change and biodiversity as related to animal health, and continue to inform the OIE about issues associated with wildlife, including emerging diseases
    - strategies to enhance or improve wildlife disease reporting through WAHIS
    - alternative options for coexistence and livelihood opportunities both through wildlife and livestock
    - wildlife health components of disaster risk reduction, preparedness and response.
- Support:
    - OIE contributions to WHO RD blueprint committee on COVID-19 and providing information to Members.
    - OIE in its work with the Collaborative Partnership on Sustainable Wildlife Management.
    - OFFLU in its efforts to gather information on surveillance for avian influenza viruses in wildlife.

## 13. Date of next meeting

The Working Group proposed the following dates for its next meeting: from Tuesday 1 to Friday 4 March 2021 or from Tuesday 2 to Friday 4 December 2020.

## 14. Adoption of report

The report was adopted by the Working Group.

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…/Appendices

Appendix I

## MEETING OF THE OIE WORKING GROUP ON WILDLIFE

## Paris (France), 10 – 13 March 2020

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### Agenda

**1. Opening**

**2. Adoption of agenda and designation of rapporteur**

2.1. Provisional list of Participants

2.2. Report of the Working Group on Wildlife, 4-7 December 2018

**3. Feedback and questions from the meetings of the Specialist Commissions**

3.1. Feedback from the Scientific Animal Diseases Commission

3.2. Feedback from the Terrestrial Animal Health Code Commission

3.3. Feedback from the Biological Standards Commission

3.4. Feedback from the Aquatic Animal Health Standard Commission

**4. Disease reporting**

4.1. Information on submitted reports on OIE-non listed diseases in wildlife through the WAHIS-Wild and Information on submitted reports on OIE- listed diseases in wildlife through the WAHIS

4.2. Criteria for including wildlife disease in the diseases notified through *WAHIS-Wild*

4.3. Review and validation of the new animal species added in 2019

4.4. Fact sheets/Disease cards for Wildlife Diseases

4.5. Update on the WAHIS+ project

**5. Emerging and noteworthy wildlife disease occurrences with relevance to the OIE: reports from members of Working Group on Wildlife Diseases**

**6. Diseases for which there is an OIE control strategy (*update on the disease and OIE strategy by OIE staff + when relevant contribution of the WGW*)**

6.1. Peste des Petits Ruminants

6.2. African Swine Fever

6.3. Rabies

6.4. Highly Pathogenic Avian Influenza

6.5. Zoonotic tuberculosis

6.6. Foot and mouth disease

**7. Wildlife as a livelihood opportunity for rural communities**

**8. International organisations on Wildlife or Biodiversity**

**9. Matters of Interest for Information**

9.1. Reports of the OIE Collaborating Centres for Wildlife

9.2. Training of Wildlife Focal points ($5^{th}$ and $6^{th}$ Cycle of Workshops)

9.3. Collaborative Partnership on Sustainable Wildlife Management: update

9.4. OIE Symposium on Bee diseases during Apimondia Congress

9.5. EBO-SURSY Project: workshop on protocols of surveillance of hemorrhagic fevers in wildlife

**10. Other business**

10.1. Coronavirus 2019-nCoV – Update, including OIE informal advisory group and contribution to WHO research roadmap

10.2. Wildlife Trade

10.3. OIE-INTERPOL workshop on agro-crime

10.4. Requests from Member Countries regarding Lassa fever

**11. Strategy, work priority setting and work programme for 2019/2020**

**12. Date of next meeting**

**13. Adoption of report**

# MEETING OF THE OIE WORKING GROUP ON WILDLIFE

**Paris (France), 10 – 13 March 2020**

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## List of participants

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## Criteria for including wildlife diseases in the list of diseases to be notified through *WAHIS-Wild*

The Working Group reviewed the principles and purpose of voluntary reporting of non-OIE listed diseases in wildlife by OIE Members.

### 1. Purpose of voluntary reporting of non-OIE listed diseases in wildlife

The purpose of voluntary reporting of non-OIE listed diseases in wildlife by OIE Members is to:

1. Document new or unexpected occurrences of infectious or non-infectious causes of mortality or morbidity in wildlife which are not reported to the OIE as an emerging disease or as an OIE listed disease to improve situational awareness and transparency;
2. Generate knowledge on the presence/absence of infectious or non-infectious agents in wildlife to identify current and potential sanitary risks.

The voluntary reporting of wildlife diseases has no implication for trade status.

### 2. Alignment with the OIE mandate

OIE works to improve animal health, animal welfare, and veterinary public health. The goals of voluntary reporting are consistent with and support the following OIE mission objectives:

1. Ensure transparency in the global animal disease situation;
2. Collect, analyse and disseminate veterinary scientific information;
3. Encourage international solidarity in the control of animal diseases;
4. Provide a better guarantee of food of animal origin and promote animal welfare through a science-based approach.

### 3. Supporting actions of OIE and its Members

Voluntary reporting:

1. Helps OIE members reduce unnecessary barriers to trade based on scientific evidence, demonstrating transparency.
2. Raises the assurance that a country´s veterinary surveillance system is working, which contributes to positive Performance of Veterinary Services and Joint External Evaluation assessments and helps Members meet international reporting obligations for other agreements such as the Global Health Security Agenda, the International Health Regulations, or the Convention on Migratory Species.
3. Makes Members aware of what is happening in neighbouring countries, which helps preparedness for potential introduction of disease.

Currently there is no other system available to Member Countries for accessing validated information on diseases in wildlife. Hence voluntary reporting provides:

1. Knowledge of disease distribution which helps identify trends that will inform risk analysis linked to OIE listing of diseases;
2. Identification of potential health threats to natural resources and biodiversity conservation, food production systems and livestock;
3. A way for OIE to become a valuable source of information for the legal, sustainable use of wildlife.

### 4 Criteria used to objectively document decisions to consider agents or conditions for voluntary reporting.

Since the purpose of the voluntary reporting is to document new or unexpected occurrences of infectious or non-infectious causes of mortality or morbidity in wildlife which are not otherwise reported to the OIE, and to generate knowledge on the presence/absence of infectious or non-infectious agents in wildlife to identify current and potential sanitary risks, the criteria for consideration of inclusion in the list for voluntary reporting is:

The disease or agent is found in wildlife AND has been shown to have, or scientific evidence indicates potential for
**a detrimental impact** on the health of wildlife or the viability of a wildlife population OR
**a detrimental impact** on the health of non-wild terrestrial or aquatic animals OR
**a detrimental impact** on the health of humans
*detrimental impact as defined by severe clinical signs, direct economic losses, morbidity or mortality

**Relationship between the voluntary reporting of non-OIE listed diseases in wildlife to the OIE Emerging Diseases list, and the OIE List.**
The voluntary reporting of diseases in wildlife supplements information reported by Members on OIE listed and emerging disease lists as described in the table below. In the past, the list of voluntary reporting of wildlife diseases has aided in the identification of new diseases to be considered for inclusion in the OIE listed diseases.

| | **OIE List (Chapter 1.2. of the OIE *Terrestrial Code*)** | **Proposed new criteria for inclusion of wildlife diseases reported on a voluntary basis** | **Emerging disease (Glossary of the OIE *Terrestrial Code*)** |
|---|---|---|---|
| CRITERIA FOR NOTIFICATION | **1.** International spread of the pathogenic agent (…)<br>**AND**<br>**2.** At least one country has demonstrated freedom (…) from the disease, infection or infestation (…)<br>**AND**<br>**3.** Reliable means of detection and diagnosis exist and a precise case definition is available (…)<br>**AND**<br>**4.** Natural transmission to humans has been proven, and human infection is associated with severe consequences.<br>**Or**<br>The disease has been shown to have a significant impact on the health of domestic *animals* at the level of a country or a *zone* taking into account the occurrence and severity of the clinical signs, including direct production losses and mortality.<br>**Or**<br>The disease has been shown to, or scientific evidence indicates that it would, have a **significant impact** on the health of wildlife (…) | The disease or agent is found in wildlife<br>**AND**<br>has been shown to have, or scientific evidence indicates potential for<br>a detrimental impact on the health of wildlife or the viability of a wildlife population<br>**OR**<br>a detrimental impact on the health of non-wild terrestrial or aquatic animals<br>**OR**<br>a detrimental impact on the health of humans<br>*detrimental impact as defined by severe clinical signs, direct economic losses, morbidity or mortality | Emerging disease means a new occurrence in an animal of a disease, infection or infestation, causing a **significant impact** on animal or public health.<br>A Member Country should report any emerging disease detected in a country, a zone or a compartment. |

## Emerging and noteworthy wildlife issues and disease occurrences with relevance to the OIE: reports from members of the Working Group on Wildlife

**AFRICA**

No significant or notifiable or emerging disease outbreaks in wildlife were reported on in 2019.

Diseases to take note of are listed below:

**Ebola** in the Democratic Republic of Congo in humans, as of 16 February 2020, 3 432 Ebola Virus Disease cases have been reported including 3 309 confirmed and 123 probable cases, of which 2 253 cases have died (overall case fatality rate 66%). Of the total confirmed and probable cases, 56% (1 923) were female, 28% (968) were children aged less than 18 years, and 5% (172) were healthcare workers.

**Lassa fever** in Nigeria in humans - In week 7 [10-16 Feb 2020], the number of new confirmed cases increased from 109 cases in week 6 [3-9 Feb 2020] to 115 cases. These were reported from 16 states (Ondo, Edo, Ebonyi, Kano, Kogi, Kaduna, Taraba, Plateau, Bauchi, Enugu, Abia, Benue, Borno, Gombe, Sokoto, and Katsina).

**Rift Valley fever** in Sudan and Libya (South east Libya , Aljouf-hai Almatar, Alkufrah, Al Kufrah), Date of start of the outbreak: 28 Jan 2020, Outbreak status: continuing (or date resolved not provided), Epidemiological unit: slaughterhouse Affected animals Species / Susceptible / Cases / Deaths / Killed and disposed of / Slaughtered Sheep, goats / 100 / 1 / 1 / 0 / 0 Sheep / 140 / 20 / 3 / 0 / 0. There will most likely be a rise of cases in livestock, humans and possibly wildlife in 2020 in North East Africa (in particular Kenya and Tanzania) due to the high rainfall experienced in the region.

**Anthrax** was reported in wildlife from Botswana (suspect between 20 and 100 elephant and buffalo cases respectively but diagnostic confirmation of each case was not made) and Namibia (suspect between 10 and 20 elephant and buffalo cases respectively but diagnostic confirmation was not made in each case). Cases in livestock (unknown numbers and mainly in cattle) were reported in Zimbabwe, Kenya and Uganda. In all the cattle cases the diagnosis was made retrospectively in livestock once human cases were diagnosed.

**Foot and Mouth Disease** was not reported in wildlife during this period except in stray buffalo (10+) that were destroyed after leaving the western boundary of the Kruger National Park. The dominant Foot and Mouth Disease (FMD) strains obtained from those buffalo were SAT 1 & 2. FMD was reported in cattle in Zimbabwe (numbers infected not reported), Botswana (numbers not reported), Namibia (numbers not reported), South Africa (in a few 100 cattle from a feedlot and auction – spread to 10 sites from Auction), Malawi and Kenya.

**Tuberculosis:** The number of wildlife species that have been diagnosed with Tuberculosis complex infections has risen to 21 in South Africa with new cases in 1 giraffe testing culture positive on post mortem, 10 cases of post-mortem confirmation in African Wild dogs in the Kruger National Park and 1 case in a free range elephant in the Kruger National Park testing positive on culture and post mortem for Tuberculosis complex infection).

**Other:** Economic pressures on the game industry in South Africa are resulted in poor game ranch management by some in the private sector, with the following consequences:

- Severe anemia and exsanguination of captive felids by fleas
- starvation in many antelope species
- *Paecilomyces* fungal infections in farmed crocodiles
- Rumenitis and nutritional myopathy in antelope that are not fed appropriate diets
- Lead toxicity in captive carnivores
- Suspected Bravecto toxicity in cheetahs.

In Zimbabwe thousands of cattle had died as a result of the re-emergence of cattle-associated theileriosis transmitted through ticks. Further investigation was recommended as the theileria related deaths did not appear to be linked to wildlife (normally they would be associated with the presence of buffalo and tick transmission after feeding off buffalo). The outbreaks could be linked to warmer winters, leading to an increased distribution of ticks that survive beyond 18 months (compared to the conventional vector that survives only for 18 months).

## ASIA

**Avian Influenza:** Although large scale outbreaks of avian influenza in wild birds have not been observed from Asian regions in 2019, there were still some occurrence in several Asian countries.

Cases of Highly Pathogenic Avian Influenza (HPAI) and Low Pathogenic Avian Influenza (LPAI) infection of wild birds were reported by India and Taiwan from January to October 2019: In India, H5N1 avian influenza virus was detected in approximately 10 dead crows (species unknown) in Patna (located in the north east of the country). In Taiwan, H5N2 virus was detected in a Grey heron (*Ardea cinerea*) in March 2019. Taiwan's first case of H5N5 avian influenza outbreak was reported on a duck farm in Cishan district in September 2019 therefore surveillance for this virus strain in wild birds is now needed.

In China, H7N9 avian influenza was detected in captive peacocks and 9 birds were consequently culled at a zoo in Liaoning province.

In South Korea, Avian Influenza virus (H5, H7N9, H7, H7N6) was detected in the feces of wild birds in January 2019. Avian influenza virus (H5) was also confirmed in excrement of wild birds in Anseong located about 80 km south of Seoul.

In Japan, field surveillance of avian influenza in wild birds had been conducted from October 2018-September 2019. As a result, LPAI virus was detected from 0.2% (14/6,976) of fecal samples and 0.2% (1/459) of dead wild birds. No HPAI virus was detected. LPAI virus was also detected in environmental samples (water) collected at roosting areas used by White-necked crane (*Grus vipio*), Hooded crane (*G. monacha*) and Common crane (*G. grus*) at the end December 2019. However, no AI infection case had been reported between December 2019 and March 2020.

**African Swine Fever** (ASF) was spreading widely in domestic pigs in China and other Asian countries including Mongolia, Vietnam, Cambodia, Hong Kong. North Korea, Laos, Philippine, Myanmar, East Timor and South Korea. However, there had been little information about ASF in wild pig or boar (belonging to Suidae) in these countries or regions. Rare cases of ASF in wild boar were reported from Baishan City, northeast China's Jilin Province in 2018, and from South Korea in 2019. From the perspective of conservation medicine, because there are some endemic/endangered suidae species such as Babiroussa (*Babyrousa babyrussa*), Bornean bearded pig (*Sus barbatus*), Philippine warty pig (*S. philippensis*), Javan warty pig (*S. verrucosus*) especially in southeast Asia, expeditious surveillance or research on these species together with prevention or control measure was needed.

In South Korea, the first confirmed case of ASF was reported on 17 September on local pig farms located in northern areas of Gyeonggi Province and Incheon adjacent to the border with North Korea. ASF virus had also been detected in wild boar carcass found inside the Korean demilitarized zone (DMZ) in October 2019, and the number of infectious cases in wild boar around the area increased to 20 by November 2019.

For more information on ASF situation in Asia (August 2018 to date), see FAO reports at (http://www.fao.org/ag/againfo/programmes/en/empres/ASF/Situation_update.html)

**Classical Swine Fever:** In Japan, following reports of an outbreak of Classical Swine Fever (CSF) in a pig farm of Gifu Prefecture in September 2018, infection had been detected in dead or live wild boar in the area. Infection in wild boars is spreading not only within the area but also to surrounding areas such as Aichi, Nagano, Fukui, Ishikawa, Toyama, Mie, Shiga, Gunma, Shizuoka, Yamanashi and Saitama Prefecture. A total of 912/ 3,084 (29.6%) dead or captured wild boar in six areas in Gifu, Aichi, Nagano, Mie, Fukui, Toyama and the other 37 prefectures were found positive for CSF by September 2019. It is suggested that contact between domestic pigs and wild boars plays and important role in the spread of CSF in Japan.

Aichi, Gifu and Shiga Prefectural Governments began vaccinating wild boars with oral bait vaccines in a selected area, where positive wild boar cases had been detected, to prevent spread of CSF. Further rounds of vaccination would be planned across several prefectures before February 2020. It was reported that the rate of CSF virus antibody titer in wild boar captured in Aichi and Gifu Prefecture two months after bait vaccine trial had risen from 50% to 70% and from 40% to 62%, respectively. The Ministry of Agriculture, Forestry and Fisheries (MAFF) had now started (in November 2019) an experimental trial dropping oral bait vaccine for wild boars from helicopters.

**EUROPE**

In 2019, various disease outbreaks were detected in wild mammals and birds in Europe, partly associated with morbidity in humans or domestic animals, underlining the need for transboundary collaboration and for a One Health approach in wildlife disease surveillance and management.

The most noteworthy events that had affected wildlife during 2019 were the discovery of first cases of chronic wasting disease in Sweden; the measures implemented to stop ASF at the Belgium/French border; and the emergence of ASF in a Polish province adjacent to the German border. Another disease that continued to require much effort in surveillance and control was brucellosis (*Brucella mellitensis*), discovered seven years ago in a population of Alpine ibex (*Capra ibex*) in a mountain massif in the French Alps.

Issues associated with disease management in wildlife (particularly control measures such as culling and fences) had resulted in conflicts among interest groups and political challenges. In France, a working group was set up a few years ago to address the problem of multi-host diseases and to communicate theoretical knowledge to managers in the hope that preparedness against future outbreaks of diseases involving wildlife would be improved (Portier et al., 2019, Multi-host disease management: the why and the how to include wildlife. BMC Veterinary Research 15:295).

With regards to zoonoses, the two most significant diseases in 2019 had been tularemia and West Nile virus (WNV) infection. Emerging diseases such as WNV and Usutuvirus (USUV) infections had continued to cause the death of numerous birds and USUV was newly detected in Sweden. It was hypothesized that the unusually early start and late end in case occurrence of WNV/USUV infections observed in 2018, as well as the increasing geographical range of these viruses, might have been associated with environmental and climatic conditions favourable for an early upsurge as well as a prolonged activity of the vector populations. In accordance with this, the tiger mosquito (*Aedes albopictus*, which is native to the tropical and subtropical areas of Southeast Asia but had spread to many countries in the past few decades through the transport of goods and international travel) had also expanded its range in recent years in Europe. Additional information on the mentioned diseases and other mortality events in wildlife is listed below:

**Chronic wasting disease** had continued to be a serious issue since its first detection in a free-ranging reindeer and a moose in Norway in 2016; this had led to intensive surveillance efforts not only in Norway but also in Sweden, Finland, Iceland, the Baltic countries, and Poland. At the end of 2018 an additional CWD case was detected in a moose (*Alces alces*) in Norway, after a long period without any positive case in Fennoscandia (incl. >26,000 tested cervids in Norway). In March 2019, the first case of CWD was detected in northern Sweden, followed by another case in May in the same county (both old females with neurological signs and wasting); sampling of hunted moose and slaughtered semi-domesticated reindeer in this area was initiated in September, and the same month a third case was found (apparently healthy old female). In 2019, CWD was also found in an apparently healthy old female moose in mid-Norway, in a location close to two similar cases detected in 2016.

**African Swine Fever:** In 2018 the number of cases of ASF reported in wild boar and domestic pigs in Europe had further increased and the disease had progressed westwards, jumping to Belgium, from where it progressively extended towards the French border. Control measures and intensified surveillance were quickly implemented on both sides of the border, implying a close collaboration of the veterinary and hunting services of both countries. To date, no case had been detected in France. However, mid-November 2019, the Polish State Veterinary Institute confirmed the occurrence of a second case of ASF in wild boar in the Lubuskie province, just about 70-100 km away from the German border. The number of ASF-confirmed wild boar in this area had risen to 20 in just a few days, after active search for carcasses was initiated.

**Edema disease** (*Escherichia coli*) had caused abnormal mortality in wild boar since June 2019 in an area in southeastern France, not far from the first outbreak in 2013 (since then, the disease has regularly been diagnosed in France).

**Tularemia** (*Francisella tularensis*) had been observed in European brown hares (*Lepus europeus*) in the Netherlands, Finland and Switzerland in several, partly new locations and – when the information was mentioned – mainly in spring-summer. This trend was similar to the observations in previous years. By contrast, Norway and Sweden reported a major outbreak each. One started unusually early (May) and occurred in southern Norway, with over 150 human cases in the same period; the other one started in July in north-eastern Sweden and spread to the central and southern parts of the country, with over 800 human cases in this period.

**Rabbit hemorrhagic disease** caused several outbreaks associated with high mortality in European rabbits (*Oryctolagus cuniculus*) in North England, nine years after the first local report. Increased mortality was also observed in European brown hares on the English territory in 2018-19, and Rabbit hemorrhagic disease was found there for the first time in hares; however, the cause of mortality was believed to be multifactorial. The disease was also detected in wild rabbits in North Italy.

An **unknown etiology** had caused unusually high mortality (more than 900 adult deaths) in a large breeding colony of arctic sterns (*Sterna paradisaea*) in England. Considered causes included botulism and pasteurellosis (including a new type called "Bisgaard taxon 40", which was recognized as a primary cause of death in sea birds in North America in 2016 and again in 2017). Investigations were still on-going.

**Distemper** (Canine Distemper Virus) had spread across borders in western Europe for more than 10 years (Yon et al. 2019, Recent changes in infectious diseases in European wildlife. Journal of Wildlife Diseases 55:3–43) and continued to be diagnosed in free-ranging wild carnivores in North Italy and in Switzerland, where it had progressively spread from east to west since 2009, to finally reach areas close to the French border a few years ago. As far as it was known from the responsible French agencies, in 2019 distemper was detected for the first time as a clinical disease in wild carnivores in France, with all cases found in areas close to either Italy or Switzerland and infected with strains affiliated to those found in these two neighboring countries.

**Usutuvirus (USUV) infection** had caused very high mortality in several European countries in 2018, mainly in blackbirds (*Turdus merula)*. Cases were reported again in 2019, mainly from France but also again from the Netherlands, Belgium, Switzerland and Northern Italy; however, cases appeared to be fewer than in 2018. The first two cases of Usutuvirus positive birds in Sweden were found in 2019 in the framework of targeted investigations for Usutuvirus and West Nile Virus in birds that were found dead and submitted to post-mortem investigation as a contribution to the Swedish general health surveillance programme.

**West Nile virus infection** had recurrently caused severe mortality in wild birds in Greece (mainly Eurasian magpies (*Pica pica*) and hooded crows (*Corvus corone cornix*)) and fatal infections in humans in Greece and other European countries since 2010. In 2018 the situation became dramatic in Greece, with over 300 confirmed human cases, the majority of which presented with neurological signs. Various criteria were established by the Greek Ministry of Health and National Blood Donation Centre for the classification of a municipality as 'affected' or 'unaffected' by West Nile virus, including domestic and wild bird surveillance indicating presence or absence of continued West Nile virus circulation in the area. Candidate blood donors who travelled and stayed for at least one night in one of the affected areas were not allowed to offer blood for 28 days, unless their blood was examined by molecular analysis; this regulation resulted in a lack of blood available for transfusions in Greek hospitals. The same year, cases in birds and/or humans were also reported from Austria, Italy, Germany, and other countries further east. In 2019, West Nile virus was repeatedly detected during summertime in birds in Northern Italy, mainly in magpies and crows (targeted active surveillance in birds and insects and passive surveillance in birds from rehabilitation centres). Over 400 human cases including 44 deaths were recorded in the European Union; human cases were found for the first time in Germany and Slovakia, while there had been earlier cases in the other affected countries.

**Salmonellosis** outbreaks had caused important mortality in birds. In Sweden, *Salmonella* Hessarek was identified in the framework of a mortality event affecting 100-200 jackdaws (*Corvus monedula*) in January, while *Salmonella* Typhimurium was found as the etiological agent of outbreaks in passerine birds in January-February, with 150 domestic cats confirmed as infected with the same strain during the first month. A major outbreak caused by *Salmonella* Hessarek had also been observed in starlings (*Sturnus vulgaris*) in North Italy in November 2018. It had already caused numerous outbreaks in this bird species in central Italy and in other European countries in earlier years.

**Chlamydiosis** (*Chlamydia psittaci*) was diagnosed in over 60 human patients in Sweden. As they were assumed to be associated with bird feeders, a targeted surveillance programme in wild passerine birds was set up to start in 2019.

**Pigeon paramyxovirus infections** caused at least two mass mortality events in Swiss cities, one in early 2019, the second one in the autumn.

The **(Asian) tiger mosquito** (*Aedes albopictus / Stegomyia albopicta*), which is an important vector of many viral pathogens (including those causing yellow fever, dengue fever, Chikungunya fever) and of several filarial nematodes, such as *Dirofilaria immitis,* and is also considered a potential vector of Zika virus among humans, had expanded its range in Europe, covering vast areas of France and occurring in the Italian part of Switzerland (Ticino) since 2003. Although the vector species was not known for these specific cases, heart worm disease had emerged in dogs in Ticino, and *D. immitis* was detected for the first time in a diseased free-ranging grey wolf (*Canis lupus*) in 2018. In September 2019, the mosquito was newly detected in the south-western part of Switzerland (Geneva).

**OCEANIA**

**Nidovirus identified in neurological syndrome in Tasmanian brushtail possums:** Wobbly possum disease virus was first discovered in brushtail possums (*Trichosurus vulpecula*) in New Zealand (NZ). The aetiological agent of the disease in NZ had been confirmed to be a novel Nidovirus (wobbly possum disease virus; WPDV), most closely related to the family Arteriviridae. The virus was considered unique to NZ possums; recent evidence suggests involvement of a similar nidovirus in a cluster of wobbly possum cases (n>20) in 2019 in Tasmania, Australia. The virus was also detected in archived samples from brushtail possums cases in 2015 and 2016. For more information, see the Tasmanian Government website and the WHA Fact Sheet (PDF).

**Skin disease in free-living Eastern water dragons in Southeast Queensland:** An outbreak of severe, proliferative skin disease detected in free-living Eastern water dragons (*Intellagama lesueurii*) in Southeast Queensland. The diagnosis had been based on skin changes and confirmed by PCR and culture, with the causative organism identified as belonging to the genus Nannizziopsis. Until recently, reports of infection with Nannizziopsis had been restricted to captive animals in Australia. For more information, see the WHA website.

**Mortality event in grey-headed and black flying-foxes:** A significant number (hundreds) of sick and dead grey-headed (*Pteropus poliocephalus*) and black (*Pteropus alecto*) flying-foxes were found along the coast of New South Wales and Queensland. The cause was believed to be a starvation event due to a food shortage associated with ongoing drought conditions. For more information, see the WHA website.

**Other:**

**Australian Wildlife Health Institute:** A workshop was held to examine a proposal for the establishment of a new Australian institute for applied wildlife health science, the Australian Wildlife Health Institute. A steering committee would be formed to progress the idea.

**National guidelines in Australia:** Two sets of national guidelines were produced: National Wildlife Biosecurity Guidelines and Emergency Wildlife Disease Response Guidelines. Development of wildlife disease management guidelines commenced with a first draft which was due for release towards the end of 2019 – 2020.

**Priority List of Exotic Environmental Pests and Diseases (the List):** An interim national list of priority pests and diseases was released for Australia. The List covered eight thematic groups and identified exotic pests and diseases that posed the highest risk to Australia's environment and public spaces. One of the lists was for native animal diseases and their pathogens.

**WHA Annual Report:** A summary of some other wildlife health activities in Australia is presented in the WHA annual report.

**SOUTH AMERICA**

**Yellow fever outbreak, Brazil:** An epidemic of YFV occurred between late 2016 and mid 2019 in southeastern Brazil, reaching areas close to the fragile Atlantic rain forest. The outbreak was the largest observed in the country in decades (about 80 years). Between 2016-2017, there were 1,412 nonhuman primates (NHP) and 777 YF human confirmed cases and 261 human deaths. In 2017-2018, confirmed cases were 864 NHP and 1,376 humans and 483 human deaths. The epidemic persisted in 2018- 2019 and accounted for 1,883 NHP notified cases (20 were confirmed) and 12 human confirmed cases, including 5 deaths. Because the outbreak occurred outside of the endemic Amazon areas, the impact on NHP populations was dramatic. With mortality rates reaching 90 % in some of the NHP species affected (including howler monkeys), the YFV outbreak added to losses previously caused by Zika (estimated at 2,500 NHP deaths). Eleven of the 15 NHP species affected by YFV were under some threat of extinction, including the endangered lion tamarin and critically endangered muriqui (woolly spider monkey). Brazil's Ministry of Health reported 4,575 suspected monkey deaths from YFV between May 2017 and July 2018, with 732 confirmed cases. Conservationists estimate that only 5 % of all monkeys that perish from yellow fever were collected and registered (as most die out of sight in the forests), which implies official numbers were a major undercount.

**Hantavirus outbreak -human to human transmission, Argentina:** Between November 2, 2018, and February 7, 2019, there were 34 Hantavirus pulmonary syndrome (HPS) confirmed human cases and 12 deaths. The outbreak, of unprecedented magnitude, began in Epuyén, province of Chubut, in the Patagonia Andes region of Argentina. Other cases were later reported in the neighboring province of Río Negro and one exported case occurred in Chile (Palena city). Andes virus (ANDV, genus Orthohantavirus, family Hantaviridae) was confirmed as the etiological agent. Its most common reservoir is the long-tailed pygmy rice rat (*Oligoryzomys* spp.). Phylogenetic analysis performed by the Argentina reference lab (INEI, ANLIS) showed that the analyzed variants belong to the "Southern" Andes virus, closely related to the strain "Andes virus AH-1". The level of variation observed among the sequences obtained from the outbreak was minimal (99.9%), as might be expected from human-to-human transmission. Moreover, because the 11 complete genomes analyzed were obtained from well-established linked cases and based also on the low abundance of rodents detected in the area at the time of the outbreak, an event of super-infecting rodents (super-spreader) was ruled out. The Epuyén strain was more closely related to the one isolated from an outbreak in neighboring El Bolsón in 1996, when human to human transmission was postulated for the first time. Changes found in the genome of the Epuyén strain might have facilitated dispersal. Also, the Epuyén outbreak was not self-limited like the 1996 outbreak and instead required strict quarantine measures to stop transmission.

**Arenavirus outbreak and others, Bolivia:** In May and June 2019, human cases of hemorrhagic fever were reported for the first time in Los Yungas in the department of La Paz, municipality of Caranavi, Bolivia. The virus, which caused the death of one farmer and two doctors and sickened two other people (a farmer from Caranavi and a doctor from the city of La Paz), was identified as Chapare arenavirus. The vector of Chapare virus was unknown, although it was suspected to be a wild rodent of the genus *Calomys* sp. Only one previous Chapare virus hemorrhagic fever outbreak had been previously reported, in the Chapare region of Bolivia, in 2003. Only one case had ever been clinically described, so very little was known about the disease. Symptoms mimicked other South American hemorrhagic fevers, inducing fever, headache, vomiting and joint and muscle pain.

In January 2019, the National Agricultural Health and Food Safety Service (SENASAG) confirmed the presence of the giant African snail (*Achatina fulica*) in the city of Santa Cruz and in March the species was reported in the Cochabamba tropics. This species may be a vector for nematodes that affect humans, and was a known pest of various crops, as well as competition for native snail species. The snail was first detected in 2015 on the border with Brazil.

**Infection with *Sarcoptes scabiei*, several countries:** Mange infections in wild South American camelids, vicuña (*Vicugna vicugna*) and guanaco (*Lama guanicoe*) continued to be reported in Chile, Argentina, Bolivia and Peru in 2019. In countries where vicuña were live-sheared for wool (e.g. Bolivia and Peru), mange infections were causing significant negative socio-economic and livelihoods impacts. Prevalences as high as 37% were reported in some Peruvian vicuña herds in 2019 (San Antonio de Tanta). In Bolivia, prevalences ranging from 5 to nearly 10% were reported in some managed herds in Potosí and La Paz, respectively.

Mange infections were also increasingly reported in foxes and other small mammals in Chile and Argentina and investigations were ongoing to establish the species range and distribution of infections. Transmission between wildlife and domestic animals is suspected.

## NORTH AMERICA

**Chronic Wasting Disease** (CWD) is a fatal, prion-associated disease of cervids. To date, it had been detected in 26 US states in free-ranging cervids and/or commercial captive cervid facilities. CWD had been detected in free-ranging cervids in 24 states and in captive cervid facilities in 17 states. From January 2018 through October 2019, the documented distribution of CWD expanded in the US. In 2018 new detections of CWD in free-ranging cervids occurred in 51 counties from 16 states. In 2019, CWD had been detected in free-ranging cervids in an additional 10 counties from six states. The distribution of CWD in captive cervid facilities had also expanded, with 14 new facilities in five states in 2018 and 15 additional facilities in six states in 2019. First detections of CWD in 2018 and 2019 included Illinois (first captive reindeer (*Rangifer tarandus*) in North America, and the first CWD-positive captive facility in the state), Mississippi (free-ranging white-tailed deer (*Odocoileus virginianus*), Montana (free-ranging white-tailed deer and mule deer (*Odocoileus hemionus*), and Tennessee (free-ranging white-tailed deer). 2018 also marked the first time a single state documented over 1,000 CWD positive samples (free-ranging) from a single sampling year (Wisconsin; 1,063 positives).

Distribution of Chronic Wasting Disease in North America.

**White-nose Syndrome Diagnostic Harmonization:** White-nose syndrome (WNS) in bats is caused by the fungal pathogen *Pseudogymnoascus destructans* (Pd). Since its initial discovery the pathogen has spread rapidly and caused staggering population-level impacts on many species of hibernating North American bats. Managers depend on consistent laboratory results to make decisions, but diagnostic testing for Pd was conducted by multiple agencies and institutions that lacked a shared governance for setting testing standards and overseeing reporting. Scientists at the United States Geological Survey (USGS) National Wildlife Health Center, in cooperation with the WNS National Response Team Diagnostic Working Group, the U.S. Fish and Wildlife Service (USFWS), and State and Federal resource managers, were building consensus around how Pd diagnostic tests should be conducted, and how results should be interpreted and communicated. To date, this effort had involved coordinating voluntary participation in assay performance testing, collating and analyzing the testing data, and facilitating Working Group conversations regarding common language for classifying Pd qPCR results that would be incorporated into a revised WNS case definition. Additional steps would further formalize a WNS Diagnostic Laboratory Network by initiating voluntary Pd qPCR proficiency testing (first round to take place in the Spring of 2020) and compiling newly agreed-upon testing and communication standards into a WNS Laboratory Best Practices Handbook that would be available publicly. Whether for people, domestic animals, or wildlife, confidence in diagnostic results is a cornerstone of disease management. The Working Group hoped that this work would improve the confidence of management agencies in reported Pd diagnostics, while also serving as an example of national diagnostic coordination for other, non-reportable, wildlife diseases.

**Updates from the 2018/2019 White-nose Syndrome Surveillance Season:** The USGS National Wildlife Health Center continued to play a central role in surveillance for white-nose syndrome (WNS) and the causative fungus, *Pseudogymnoascus destructans* (Pd). Since 2008, NWHC had tested samples from over 13,000 bats and 5,300 environmental substrates nationwide for the presence of WNS or Pd. The total number of states with confirmed cases of WNS, 33, remained unchanged from the previous year, while the number of states reporting Pd in the absence of clinical disease was now five (California, Mississippi, North Dakota, Texas, and Wyoming).

For the 2018/2019 surveillance season, NWHC evaluated samples collected from 2,633 bats and 967 environmental substrates in 27 states. In all, 2,537 live bats and 72 dead or euthanized bats were tested. WNS was confirmed or suspected in a total of 28 bats while Pd was detected in another 41 bats from a total of 15 sites in 11 states. Tested bats belonged to eight species, with tri-colored bats (*Perimyotis subflavus*) and little brown bats (*Myotis lucifugus*) comprising 80% of all positive detections during the past season.

Additionally, Pd was identified in one or more environmental samples from three hibernacula in three states (North Carolina, Oklahoma, and Kansas); two sites of which also had bats that concurrently tested positive for Pd. Although environmental samples continued to comprise only a small fraction of new Pd detections, during the surveillance season all environmental detections originated from environmental swabs rather than sediment samples, which differed from the pattern observed in previous years.

For the 2018/2019 surveillance season, WNS was confirmed for the first time in a western long-eared bat (*Myotis evotis*), increasing the total number of North American bat species confirmed with the disease to twelve. Furthermore, WNS was suspected in a fringed myotis (*Myotis thysanodes*) that demonstrated characteristic fluorescence under long-wave ultraviolet light and tested positive for Pd by PCR.

Since its 2016 emergence in Washington state, WNS was detected for the first time east of the Cascade Mountains in Kittitas County. The fungus was also detected for the first time in North Dakota (Mercer County) on a single little brown bat captured on the landscape in late May with no signs of disease, and Pd was suspected on bats at two *Myotis* spp. summer roosts in northern California (Plumas County). Significant spread of Pd was also reported this past surveillance season in multiple counties in central and southern Texas.

White-nose syndrome occurrence map.

**Update on 2019 Orbiviral Hemorrhagic Disease Activity in Wild Ruminants:** Orbiviral hemorrhagic disease (HD), caused by epizootic hemorrhagic disease virus (EHDV) and bluetongue virus (BTV), was the most significant viral disease of white-tailed deer in the United States. These viruses also impact other wild and domestic ruminant species. For the past 25 years, the Southeastern Cooperative Wildlife Disease Study (SCWDS; University of Georgia) had performed annual diagnostic testing on tissue samples collected from wild ruminants with suspected HD from throughout the United States. Samples were initially screened by serogroup-specific RT-PCR and for samples that test positive, virus isolation was attempted. Virus isolates were identified to serotype. Samples with no virus isolate were not further typed.

Results of SCWDS diagnostics for the 2019 transmission season were reported here. As of November 20, 2019, 194 viruses had been detected from 362 tissue samples. A total of 140 viruses were isolated, including EHDV-2 (n=137), EHDV-1 (n=1), BTV-2 (n=1), and BTV-13 (n=1). Additionally, 41 EHDV-positive and 13 BTV-positive samples had been detected by RT-PCR but no viruses were isolated in cell culture. EHDV-2 was detected in Alabama, Arkansas, Idaho, Indiana, Kansas, Kentucky, Louisiana, Maryland, Missouri, North Carolina, North Dakota, Virginia, Wisconsin, and West Virginia. Single isolations were made of EHDV-1 (Georgia), BTV-2 (Georgia), and BTV-13 (Florida). All viruses were isolated from white-tailed deer (*Odocoileus virginianus*), except for EHDV-2 from a pronghorn antelope (*Antilocapra americana*) in Idaho and EHDV-2 from a domestic cow in West Virginia. Virus detections in Pennsylvania and Nebraska were limited to positive RT-PCR results and no viruses were isolated.

The activity observed during the year was consistent with two regional trends that deserve attention: 1) HD was being detected in more northerly locations, and 2) HD was being detected more frequently in states where HD outbreaks were historically rare. For example, HD was confirmed in Minnesota (diagnosed by US Department of Agriculture), Wisconsin, and North Dakota during the year. Further, deer mortality from HD had now been confirmed in West Virginia for four consecutive years (2016-2019), an abrupt change from the 3-5 year cycle historically observed in the state. These findings were consistent with the continued northern expansion of HD in the upper Midwest and Northeast of the United States.

**Update on Asian Longhorned Tick (*Haemaphysalis longicornis*):** The Asian longhorned tick (ALHT; *Haemaphysalis longicornis*) is an ixodid tick native to northeast Asia that was established for a century or more in Australia and New Zealand, as well as other western Pacific Rim Islands. In these areas, ALHT had a broad host range and was capable of transmitting multiple human and animal pathogens. In November 2017, a severe *H. longicornis* infestation was confirmed on a domestic sheep ewe in Hunterdon County, New Jersey. Since that time, numerous researchers and state and federal wildlife, agricultural, and public health agency personnel were actively engaged in surveillance activities. Through these efforts, it became clear that *H. longicornis* was widely distributed in the eastern United States. Further, re-examination of archived ticks at the US Department of Agriculture (USDA)

National Veterinary Services Laboratories revealed that *H. longicornis* had been present in the United States since at least 2010 after it was recovered from a white-tailed deer (*Odocoileus virginianus*; in West Virginia and originally mis-identified as *H. leporispalustris*). As of November 2019, *H. longicornis* had been reported in 92 counties across 12 states. *H. longicornis* had been documented on numerous domestic animal hosts in the United States, including dog, cat, cattle, horse, sheep, goat, and chicken.

*Haemaphysalis longicornis* had also been documented on numerous wildlife hosts in the US. In cooperation with the USDA, the Southeastern Cooperative Wildlife Disease Study (University of Georgia) has worked with numerous states, federal and private groups to conduct tick surveys of free-ranging wildlife. Methods have included 1) live animal trapping in localized areas where *H. longicornis* had been documented, 2) passive regional surveillance by wildlife agency personnel, and 3) tick collections from wildlife presented to wildlife rehabilitation facilities in areas where *H. longicornis* had been documented. As of October 2019, these collaborative surveys resulted in the collection of ticks from ~1600 individual wild animals representing 53 species from 21 states resulting in numerous new states, county, and host records. Although the situation was dynamic, to date, these surveys had detected *H. longicornis* in seven states (New Jersey, Maryland, West Virginia, Virginia, North Carolina, Kentucky, and Pennsylvania) on white-tailed deer, raccoons (*Procyon lotor*), Virginia opossum (*Didelphis virginiana),* elk (*Cervus canadensis*), woodchuck (*Marmota monax*), red fox (*Vuples vulpes*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), eastern cottontail rabbit (*Sylvìlagus floridanus),* and red-tailed hawk (*Buteo jamaicensis*). Additional wildlife hosts confirmed by other organizations included a Canada goose (*Branta canadensis*) and a striped skunk (*Mephitis mephitis*). Numerous independent and collaborative surveillance projects were ongoing.

Map of the eastern United States showing county level reports of *Haemaphysalis longicornis* detections from the environment, domestic animals, wildlife, and humans.

## Wildlife Trade and Emerging Zoonotic Diseases

The majority of recently-emerging infectious diseases have wildlife origins, among them Lassa, Monkeypox, Marburg, Nipah and numerous other viral diseases. Within the coronavirus family, zoonotic viruses have been linked to the Severe Acute Respiratory Syndrome (SARS) epidemic in 2003 and the Middle East Respiratory Syndrome (MERS) first detected in 2012. The COVID-19 pandemic stemmed from introduction of a novel coronavirus ("SARS-CoV-2") into human populations. While the specific mechanism of SARS-CoV-2 emergence has not been definitively identified, at some point or over time interactions occurred that allowed for cross - and perhaps multiple - species pathogen transmission. The OIE recognizes the repeated emergence of zoonotic diseases and the linkages of some of these along the value chain of the wildlife trade. SARS and Ebola virus disease are recent examples of diseases that have resulted in severe socio-economic crises as a consequence of the poorly regulated wildlife trade.

The wildlife trade poses threats to animal health and welfare, causes impoverishment of biodiversity, and may result in serious public health problems. The trade has resulted in severe detrimental effects on biodiversity, species conservation and depletion of Member country national resources. The OIE acknowledges that the wildlife trade is an important source of protein, income and livelihoods for many local or rural communities. However, this must be balanced with the aforementioned risks. Thus, there is a need to support legal, sustainable and responsible wildlife use by providing sound guidance, standards, and risk assessment and risk management tools.

The OIE is developing guidelines or standards for trade in wildlife based on sound governance and regulatory principles that reduce health risks, and support animal welfare and biodiversity conservation. These standards will result in sustainable and responsible practices in legal trade, transportation, capture, farming, marketing, and consumption of wildlife. The OIE is also focused on the creation of a set of tools for Members to ensure best practices regarding risk assessments and disease management associated with the value chain for the wildlife trade. This includes strengthening scientific networks to increase sustained Member country capacity for early threat detection, wildlife disease surveillance, information management, risk assessment, prevention of spill-over events, and implementation of mitigation measures. The OIE is also committed to communicate risk and prevention measures to stakeholders to increase knowledge and awareness of Veterinary Services' role in reducing spill-over events, and to inform at-risk populations of the risks and reduction strategies, to effect appropriate behaviour change.

The OIE believes adoption of such measures will help prevent future pandemics, protect natural resources, contribute to species conservation and allow economic activities to flourish.