Berlin, Germany, 26 August 2016

6th Meeting of the

EWDA Network

for Wildlife Health Surveillance in Europe

Programme & Abstract book

One-day meeting organised by the EWDA Network committee
in collaboration with the IZW (Leibniz Institute for Zoo and Wildlife Research)

Editing & layout: Marie-Pierre Ryser-Degiorgis Centre for Fish and Wildlife Health, University of Bern, Switzerland

6th Meeting of the EWDA Network for Wildlife Health Surveillance in Europe

Objectives of the 6th EWDA Network meeting:

To define the next steps towards the goals of the network, which are: to improve exchange of information among wildlife health surveillance programmes in Europe; to develop standard operating procedures for diagnostic investigation; to develop common criteria for diagnosis of wildlife disease; to share specialist expertise; and to provide training opportunities for wildlife health surveillance.

Meeting location:

Leibniz Institute for Zoo and Wildlife Research (IZW), Alfred-Kowalke-Str. 17, 10315 Berlin

Current EWDA Network committee:

- Prof. Thijs Kuiken (chair), Department of Virology, Erasmus Medical Centre, Rotterdam, The Netherlands
- PD Dr. Marie-Pierre Ryser-Degiorgis, Centre for Fish and Wildlife Health (FIWI), Vetsuisse Faculty, University of Bern, Switzerland
- Prof. Dolores Gavier-Widén, National Veterinary Institute, Uppsala, Sweden
- Prof. Christian Gortazar-Schmidt, National Wildlife Research Institute IREC, Ciudad Real, Spain
- Prof. Ezio Ferroglio Università degli Studi di Torino, Dipartimento di Scienze Veterinarie, Grugliasco, Italy
- Dr. Paul Tavernier, WILDPAD, St-Lievens-Houtem, Belgium

Past meetings of the EWDA Network:

- Brussels, Belgium, 2009 (inaugural meeting, joint with the annual meeting of the Belgium Wildlife Disease Society)
- Vlieland, The Netherlands, 2010 (joint with the 9th EWDA biannual conference)
- Lyon, France, 2012 (joint with the 10th biannual EWDA conference and 61th WDA annual conference)
- Brescia, Italy, 2013 (1st APHAEA consultation workshop)
- Utrecht, The Netherlands, 2015 (Final APHAEA consultation workshop, joint with the 3rd International One Health Congress)

Meeting Programme

Time	Presentation	Speaker
09:00	Opening	Thijs Kuiken
09:10	Google group for EWDA wildlife health surveillance network	Thijs Kuiken
09:20	EWDA/APHAEA Cards: present status and future plans	Ezio Ferroglio
09:30	Training in wildlife population health: development of residency programs recognized by the European College of Zoological Medicine	Marie-Pierre Ryser
09:45	Wildlife rescue centres and wildlife disease surveillance in France	Philippe Gourlay
09:55	Workshop on evidence-based design of national wildlife health programmes	Paul Duff
10:05	Understanding and combating African Swine Fever in Europe (ASF-STOP), a COST Action network	Dolores Gavier-Widén
10:30	**COFFEE BREAK**	
11:00	Linking wildlife health surveillance and management: EU perspectives	Marc Artois
11:25	How technology can help to overcome wildlife health intelligence challenges	Kevin Brown Jolianne Rijks
12:15	**LUNCH BREAK**	
14:00	How singular necropsies performed throughout France may institute a syndromic surveillance system : the French revolution	Anouk Decors Dominique Gauthier
15:00	*General discussion on pathology databases*	Thijs Kuiken (moderator)
15:20	EFSA requirement of collecting and sharing data on wildlife populations and diseases: steps towards an integrated monitoring across Europe	Joaquin Vicente
15:50	**COFFEE BREAK**	
16:20	Of wildlife experts' lists, project partners' lists and network members' list: where do we want to go?	Marie-Pierre Ryser Paul Duff
16:40	New structure for the EWDA wildlife health surveillance network	Thijs Kuiken
17:30	Conclusions	Thijs Kuiken
18:00	Closure	Thijs Kuiken

Google group for EWDA wildlife health surveillance network

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Keywords: communication, Europe, Google, surveillance, website, wildlife health

Frequent communication among people involved in wildlife health surveillance in Europe does not always occur, despite the variety of modern and traditional options. Therefore, an "EWDA wildlife health surveillance network" website was set up within Google groups. This website allows members to rapidly share information and exchange views on wildlife disease surveillance issues, in particular the detection of outbreaks, disease expansion or new syndromes, and questions regarding diagnostic issues. EWDA members and non-members who are involved in or want to start up a wildlife disease surveillance scheme in Europe may apply for membership of this Google group by visiting the website: http://groups.google.com/group/ewda-network.

By June 2016, the list counted 173 members from at least 27 European countries (Andorra, Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Macedonia, the Netherlands, Norway, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, the U.K.) as well as Canada and the U.S.A. Subjects discussed in the past year included *Mannheimia granulomatis* infection and tularemia in hares, Zika virus infection in animals, Usutu virus outbreaks in wild birds, risk of pathogen transmission from mute swans to domestic animals and emergence of chronic wasting disease in Norwegian wildlife.

EWDA/APHAEA Cards: present status and future plans

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Keywords: APHAEA, method harmonization, population abundance, disease diagnostics, cards, wildlife health, surveillance, Europe

One of the goals of the EWDA network for wildlife health surveillance in Europe (or alternatively: European Network for Wildlife Health, ENWH) initiated in Brussels in 2009 was to promote methodical harmonization in wildlife health surveillance among European countries (see abstract by Kuiken et al., p. 24). To address this goal, the ENWH committee proposed producing EWDA Diagnosis Cards, consisting of fact sheets focusing on diagnostic methods for diseases in free-ranging European wildlife. The survey on the level of wildlife health surveillance in European countries carried out before the first ENWH meeting in Brussels had identified diseases of highest importance for wildlife health surveillance (see summary of data presented at the inaugural meeting: https://sites.google.com/ site/ewdawebsite/ewda-network; or Kuiken et al. 2011, Rev. Sci. Tech. Off. Int. Epiz. 30(3):755-761); these were the diseases prioritized for the first Diagnostic Cards. In the course of the following years, a card template was proposed, experts were invited to draft cards, and these first cards were published on the EWDA website.

In 2011, an EMIDA ERA-Net project named APHAEA (harmonized Approaches in monitoring wildlife Population Health, And Ecology and Abundance) was launched by members of the ENWH. The APHAEA project had three main goals: (1) to develop tools enabling harmonization of wildlife population and wildlife disease monitoring in Europe; (2) to test the practicality of these tools on a number of case studies; (3) to further develop the ENWH. To achieve the first goal, the consortium decided to build on the EWDA Diagnostic Cards. For population monitoring methods, several key hosts were selected and "Species Cards" were developed. For sampling and diagnostic methods, several key diseases were identified, and more "Disease Cards" were produced.

Species Cards include a brief presentation of selected species considered as important hosts of disease agents in Europe and a review of existing methods for population monitoring for these species. Importantly, they give information on the reliability of each method and the expected

costs. Disease Cards were prepared for selected diseases identified as relevant by a preceding EU research grant (WILDTECH; http://www.wildtechproject.com/wildtech/). These cards provide concise and updated information on etiology, host range and epidemiology. The most important sections refer to diagnostic criteria and techniques and to the samples to target in each host species. A particularity of the APHAEA/EWDA Species Cards and Disease Cards is the section called “APHAEA protocol”. This APHAEA protocol corresponds to the method(s) considered most practicable for harmonization purposes, i.e. it should deliver an acceptable result for comparisons at large scale, with a minimal effort at minimal costs. The "APHAEA protocol" aims at roughly documenting the situation at population level (rather than at accurate diagnosis at individual level). If the APHAEA protocol differs from the method selected for a given study, it should ideally be applied additionally to this method, to ensure that one method would be common to all future studies and thus enable reliable comparisons at European scale.

Cards are drafted by one or more experts invited by the ENWH committee or APHAEA consortium. Each draft is then reviewed by other experts from other institutions, also on invitation, in a kind of peer-review procedure. After eventual corrections by the authors, the cards are edited for format and are subsequently displayed on a restricted internet site accessible only to APHAEA partners. Feed-back from the partners are collated, sent back to the authors, and after eventual changes to the initial draft by the authors and last editorial check, each card is finally displayed on the public site of the APHAEA website (www.aphaea.eu). All cards indicate the authors’ and the reviewers’ names along with their addresses, in order to facilitate further feed-back and discussion. The cards are dynamic, meaning that new tools and insights, for instance regarding new diagnostic methods or new density estimation tools, will be included through periodic update.

Thanks to the engagement of numerous experts from many countries in and outside Europe, 21 Diagnosis Cards and 8 Species Cards are now publicly available on the APHAEA website. Additional cards are still in preparation. The APHAEA website will be continued to be taken care of at least until 2018. Nevertheless, to allow for a smooth transition, all final cards have now been also uploaded on the EWDA website (www.ewda.org). The old EWDA Diagnosis Cards were replaced by the new EWDA/APHAEA versions, and a new section for Species Cards was added to the EWDA website menu. From now on, the EWHN committee will be in charge of the procedure for the development of new cards and updates of existing cards. Technical issues relevant to the card review process will need to be addressed in collaboration with the Friedrich-Loeffler-Institut, which hosts the APHAEA website, and the EWDA board, which is in charge of the EWDA website.

People involved in monitoring the health and size of wildlife populations in Europe are invited to use and widely spread the cards, in order to actively promote method harmonization. Feedbacks on the existing cards are very welcome to ensure the acceptance of the harmonized protocols and regular updates of the cards.

Training in wildlife population health: development of residency programs recognized by the European College of Zoological Medicine

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Keywords: Europe, European college, residency requirements, training, wildlife population health

The European College of Zoological Medicine (ECZM) is a European Veterinary Specialist College formed under the auspices of the European Board of Veterinary Specialisation. The European College of Zoological Medicine was established to make further progress in research and practice to benefit the health and well-being of free-ranging and captive non-domesticated animals. The ECZM invests efforts to establish and maintain high standards of training that will lead to recognition as a European Veterinary Specialist in Zoological Medicine. The ECZM evolved from the European College of Avian Medicine and Surgery (ECAMS), which was founded in 1993. In 2009, the following new Specialist areas were provisionally recognized by the EBVS: Herpetological Medicine, Small Mammal Medicine and Wildlife Population Health, and in 2012, Zoo Health Management. The Specialist areas run parallel to, and separate from, each other.

The Wildlife Population Health (WPH) specialty called for applications for the *de facto* diplomate status until April 2014. Currently, the specialty counts 62 active specialists from 16 European countries (Austria, Belgium, Croatia, Czech Republic, Denmark, France, Germany, Italy, Norway, The Netherlands, Romania, Slovenia, Spain, Sweden, Switzerland and United Kingdom) plus Australia and Chile, including two specialists having acquired their diploma by exam. According to the newest ECZM requirements, a registered specialist shall spend at least 60% (i.e. > 24 hours/week) working at the specialist level in the relevant specialty. The registration ceases by default when the specialty has not been practiced for two continuous years or the equivalent of two years during a period of 5 years. Thus, ECZM specialists are required to remain active in their specialty and have to re-credential every 5 years to keep their status of "European Specialist in Wildlife Population Health".

The WPH specialists' main task is now to develop residency programs and associated training activities, based on the WPH Policies and Procedures (P&P) document. The P&P sets the requirements for the residency programs and for the selection of residents. In contrast to taxon-oriented specialties, the WPH specialty is not clinically-oriented. It emphasizes ecosystem health and wildlife population medicine, including disease management and prevention, health surveillance, outbreak investigation, epidemiology (with consideration of population estimates, habitat use, landscape structure and other ecological factors), assessment of causes of wildlife population declines, and management measures.

Applicants to a WPH residency program need to have graduated from an officially approved veterinary school and to have a satisfactory moral and ethical standing in the profession. Residents are required to have undertaken a broad training and acquired experience in clinical veterinary medicine and surgery and their supporting disciplines with a range of taxa prior to the residency. Standard residency programs last 3 years. Alternative programs, approved prior to their commencement and of longer duration, may be considered for veterinarians unable to participate in a standard program.

The general objectives of the WPH training program include:

- To instill theoretical knowledge, applied practical skills and an ethical attitude in the practice of wildlife population health.
- To provide the resident with the opportunity to pursue career goals in teaching, research, service, and/or specialty practice.

The WPH training covers 5 sections of knowledge, with at least 15% of the resident's time to be spent on each of the first four sections and at least 20% on the firth section:

i) Wildlife population and ecosystem health (epidemiological concepts, importance of host life history in disease epidemiology, disease transmission at human (domestic animal/wildlife interface, disease emergence, risk analysis, toxicology, environmental health, disease modelling, diseases of invertebrates, fish, amphibians, reptiles, birds and mammals).

ii) Wildlife pathology and disease investigation (necropsy techniques, laboratory tests, human safety, appropriate sampling techniques).

iii) Wildlife disease surveillance and preventive medicine (design of preventive medicine program for rehabilitation or translocation, IUCN guidelines, sustainable use of wildlife resources, zoonotic and foodborne risks to humans, biosecurity, disease surveillance systems).

iv) Wildlife medicine (incl. host anatomy and physiology, impact of wildlife management on disease control, understanding of diagnostic tests in wildlife, legislation, capture, restraint and anesthesia, diagnostic procedures in live animals, ethics).

v) Research (project design, basic statistics, data collection and interpretation, result dissemination).

So far, seven programs in five countries have been recognized by ECZM. Six residents are currently being trained and an additional one will start in October 2016:

- Faculty of Veterinary Medicine, Ghent University, Department of Pathology, Bacteriology and Avian Diseases. Division of Poultry, Exotic Animals and Laboratory Animals, Merelbeke, Belgium (Director: An Martel; 1 resident)

- Institute of Zoology, Zoological Society of London, London, and Royal Veterinary College, London, United Kingdom (Director: Andrew Cunningham; 1 resident)
- Institute for Terrestrial and Aquatic Wildlife Research; University of Veterinary Medicine Hannover, Hannover, Germany (Director: Ursula Siebert)
- Clinic for Birds, Reptiles, Amphibians and Fish, Justus-Liebig- University Giessen, Giessen, Germany (Director: Michael Lierz; 2 residents)
- Department of Veterinary Economics and Epidemiology, Veterinary Faculty University of Zagreb, Zagreb, Croatia (Director: Dean Konjević, 1 resident starting in October)
- Centre for Fish and Wildlife Health (FIWI); Institute for Animal Pathology, Vetsuisse Faculty Bern, Bern, Switzerland (Director: Marie-Pierre Ryser-Degiorgis; 1 resident)
- University of Liverpool, United Kingdom, International Livestock Research Institute, Nairobi, Kenya and Institute of Zoology, London, United Kingdom (Director: Andrew Cunningham; 1 alternative resident).

Since the topics to be covered by the residency program are very diverse, additional institutions contribute to the residency training. Despite the overall common goals and depending on the areas of activities and geographical location of the institutions offering residency programs, these programs vary in structure and practical content. For example, the program run in Hannover includes work with marine mammals, the one in Giessen has its strength in avian medicine, and the one in Bern offers training with Alpine mammals, fish and bees.

The P&P brochure, WPH reading list, WPH specialists' register and additional information on the college can be found on the ECZM website: www.eczm.eu.

Wildlife rescue centres and wildlife disease surveillance in France

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Keywords: Disease, France, rescue centre, surveillance, wildlife

The fast growing urbanisation increasing contacts between wildlife, humans and domestic animals on the one hand, and the public awareness of biodiversity conservation on the other hand lead to the always more solicitation and the development of wildlife rescue centres (WRCs) worldwide. Their main purpose is to release back into the wild injured, diseased or orphaned wild native animals after appropriate medical cares. In addition, education programs are often developed in those centres for volunteers, children and the general public. In developed countries, research is also performed to improve care protocols and assess post-release survival. Finally, some centres are involved in wildlife disease surveillance programs.

In mainland France, more than 60 WRCs currently provide care to wild birds and mammals across the country. Among them, the Wildlife Health Centre of the Oniris National Veterinary School in Nantes (Fr: *Centre Vétérinaire de la Faune Sauvage et des Ecosystèmes des Pays de la Loire* - CVFSE) has been in operation in North-West France for decades. One of the main scientific purposes of the CVFSE is to develop the capacity of French WRCs for wildlife disease surveillance in addition to the national SAGIR network. To do so, studies have been made by the CVFSE and colleagues showing that French WRCs enable the detection of emerging diseases in protected passerines birds and hedgehogs and represent a valuable opportunity to monitor endemic diseases of wildlife species, mainly protected ones. However, to realise this great potential to contribute to wildlife disease surveillance programs, the diagnostic capabilities of the French WRCs have to be enhanced. For this purpose and also to improve medical care in general, a training course on wildlife rehabilitation has been built up by the CVFSE in 2013. Open each year since then to French-speaking diplomate veterinarians, 6 modules (2-3 days each) have been provided until now (regulation, medical stabilisation, nursing care / main diseases in wild birds and mammals admitted to WRCs / medical imaging / anaesthesia, surgery / lab tests / oiled wildlife rehabilitation)*. This training program has now to be further developed to introduce wildlife population health topics to trained veterinary practitioners in connection with the WRCs and to use this network for wildlife disease surveillance purposes.

* see http://www.oniris-nantes.fr/professionnels/formation-continue/catalogue-veterinaire/certifaune-europe-rehabilitation-faune-sauvage/ for more information (in French).

Workshop on evidence-based design of national wildlife health programmes

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Keywords: health surveillance, national programme, objectives, resources, wildlife, workshop

A workshop co-organized by Jonathan Sleeman (USGS National Wildlife Health Centre) and Craig Stephen (Canadian Wildlife Health Cooperative) and sponsored by the Wildlife Disease Association was held at Greek Peak, New York State, USA, on 6 August 2016. The workshop objectives were: to use available evidence and expertise to define the essential functions of a National Wildlife Health Programme (NWHP); to list the types of resources, including basic infrastructure, personnel, information systems, and governance to provide a reliable and robust programme; to provide guidance on the essentials for delivering disease surveillance, diagnostic services and epidemiological investigation on a national scale. This type of information may assist countries or organizations to justify, design, or explain critical capacities and resources needed for effective national programs.

Representatives from 12 countries attended (North America 2, South America 1, Europe 4, Asia 3 and Australia 2). More countries and continents than those attending have or are developing NWHPs, and it was explained that there would be opportunities for wider dialogues and participation in the future.

After the introduction by Jonathan Sleeman and Craig Stephen, there were 10 minute presentations from representatives on their existing national programmes. These focused on functions, structure, successes, and challenges. The discussion then broadened to small groups which discussed: (1) essential functions, (2) capabilities and competencies, and (3) the level of resource (including measurable resources) required to meet NWHP objectives. Following further discussions, each attendee attempted to describe what characterised a NWHP by use of a few bullet points.

NWHP structure, governance, and experiences differed widely, partly due to variation in the length of existence of NWHPs, the size of the geographical area covered, and the embedding of the NWHPs within each country's own paradigm. Importantly, a need to refine measurable outputs and outcomes of NWHP was identified.

An overview of these and other points from the workshop discussions will be captured in a report. On the basis of this report, a decision may be taken on whether to write a peer reviewed publication that summarises the opinions expressed. The intent of this publication would be to describe a road map for providing some definitions, address delivery of services, inform assessments and planning, and outline policies related to wildlife health. The participants of this first inaugural meeting found sharing experiences beneficial, and there was a definite will to develop a communication platform for coordinators of national wildlife health programs.

Understanding and combating African Swine Fever in Europe (ASF-STOP), a COST Action network

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Keywords: African Swine Fever, epidemiology, network, pig, wild boar

African swine fever (ASF), a devastating viral haemorrhagic disease of suids, was re-introduced into the EU in 2014 affecting Poland, Estonia, Lithuania and Latvia. The first detection in all of these countries was in wild boar (*Sus scrofa*) found dead.

ASF-STOP is a four-years-COST (European Cooperation in Science and Technology) Action, which started in May 2016 and is formed by a network of participants from 28 European countries. It includes also scientists from outside Europe and international organizations, NGOs representing trade, pig production, wildlife management and professional associations, SMEs and policy making partners. In accordance with COST inclusiveness policy, special efforts are made to involve less research intensive countries, to obtain a good gender balance and to promote early career investigators.

ASF-STOP tackles the main challenge of stopping ASF from further spread in Europe and protecting the pig industry. The European wild boar has a key role in the epidemiology of ASF and its exponential population growth in Europe is of great concern.

The ASF problem is complex and needs to be solved with combined contribution from multiple disciplines, comprising wild boar ecology, behaviour and management, epidemiology of infection in wild boar and domestic pigs, vaccinology, molecular biology, biosecurity, pig production, surveillance, diagnostics, contingency planning, communications and policy making. ASF-STOP is a truly multidisciplinary network fostering international cooperation.

ASF-STOP is organized into 5 working groups (WG): WG1: ASF-virus and vaccines, WG2: ASF in wild boar, WG3: ASF in domestic pigs-pig industry, WG4: ASF infection dynamics and control and WG5: communication. Short Term Scientific Missions are technology transfer and training activities for young researchers. The Management Committee of the Action is formed by representatives from each of the 28 participating COST countries. The network will be expanded as the Action progresses, and this expansion will be encouraged.

Acknowledgement: This abstract is based upon work from COST Action (ASF-STOP, CA15116), supported by COST (European Cooperation in Science and Technology)

Linking wildlife health surveillance and management: EU perspectives

ARTOIS MARC and colleagues (WildTech project, 7th Framework PRTD, grant agreement no. 222633; and ASA: Animal Société et Aliment, http://www.asa-spv.asso.fr/; see contributors' list below)

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Keywords: Communicable diseases, crisis management, regulation, risk analysis

In western societies, a need to live in harmony with the natural elements and preserve biodiversity may enter in conflict with the protection of human health or the growth of economical profits, as far as communicable diseases may be transferred from wild animals toward humans, pets or livestock. Then, decisions conducting to the protection of populations exposed to the disease must be based as much on science as on a risk evaluation and on the evaluation of impact of control measures.

This communication will present the relevant conclusions gained by several work packages of the WildTech project about the frame of surveillance data, and a tentative generic action plan in case of incursion of a wildlife pathogen in the EU. In line with this last project, a group of international experts was gathered by the ASA association to propose to the French Agriculture Ministry a methodology to face outbreaks of relevant infections in wildlife. The purpose of this group was to draw plans on how to react when an infection of a wildlife population is threatening a group of people or a livestock production.

Important aspects of both surveillance and management have been organized by EU regulations, more specifically by the EU "hygiene package" (2006): [http://ec.europa.eu/food/safety/biosafety/food_hygiene/legislation/index_en.htm] and the EU "animal health law" (2016): [http://ec.europa.eu/food/animals/health/regulation/index_en.htm].In the context of an EU wild animal health surveillance scheme, two difficulties to overcome will be the translation from different languages and different conceptions of what is surveillance. Nevertheless, different targeted programs of surveillance in several countries may constitute a relevant source of data for event based surveillance at the scale of the Union. In this context, a simple frame of basic data routinely collected may feed a common data base sufficient to record trends and detect emergences of unusual events.

Management of health events in wildlife, at the scale of the Union, will result of compromises between scientific knowledge, prediction of the issues, level of coercion put on EU citizens, animal welfare, threats to biodiversity, public acceptance and finally feasibility. Based on expert advices, a general methodology considering the available management options ordered by proximity with the "victim" population of a disease may help to choose the best compromise among divergent options.

Surveillance and management of wildlife health are disciplines in infancy. References, norms and standards are still to be produced, and then expertise of professionals remains necessary for guiding decision makers and wildlife managers. The question of evaluation and recognition of such experts is nevertheless still open.

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How technology can help to overcome wildlife health intelligence challenges

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Keywords: Database, Health Intelligence, technology, epidemiology, wildlife health

For the last 20 years, the Canadian Wildlife Health Cooperative (CWHC) has maintained a centralized national database which records mortality and diseases in wild animals. The evolution of this system has paralleled the growing need to generate and share wildlife health information across jurisdictions and disciplines. The CWHC database is used by several organizations including the CWHC, the Dutch Wildlife Health Centre (DWHC), and the Northeast Wildlife Disease Cooperative (NWDC), based in the north eastern United States, to deliver wildlife health programs to various stakeholders in their respective countries. This presentation will provide an overview of the history of the development of this system, a case study in its use by a wildlife health centre operating in Europe (the DWHC) and a preview of a major rebuild of this system to improve its capacity to answer strategic questions and provide timely feedback to stakeholders within a Health Intelligence context.

How singular necropsies performed throughout France may institute a syndromic surveillance system: the French revolution

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Keywords: Wildlife, diseases, database, emergence, warning, veterinary network

Biodiversity degradation, acceleration in emerging diseases and pandemic risks are indicators of the increasing need for an integrated approach to monitoring of diseases and of the development of an interdisciplinary vigilance. Having an efficient and precocious vigilance towards pathogens circulating within wildlife contributes to controlling risks of dissemination amongst the environment, human and domestic compartments. The earliness of the alerts relies on both the production of early data but also on the management and exploitation of this data in "real time".

In France, the vigilance towards wildlife diseases relies in large part on the SAGIR network. It is a generalist 30 year-old event-based French network, based on the casual discovery of dead or moribund free-ranging wild animals. It relies on the collaboration between hunting federations and the National hunting and wildlife agency (ONCFS) and on local veterinary laboratories for the diagnosis. Between 2 000 and 2 500 necropsies are carried out each year. A wide array of mammal and bird species are routinely collected: brown hare (*Lepus europaeus*), rabbit (*Oryctolagus cuniculus*), all kind of ungulate especially roe deer (*Capreolus capreolus*) and wild boar (*Sus scrofa*), red fox (*Vulpes vulpes*), grey and red-legged partridges (*Perdix perdix* and *Alectoris rufa*), ring-necked pheasant (*Phasianus colchicus*), pigeon sp. (of which *Columba palumbus*), raptors (of which kites *Milvus milvus* and *Milvus nigra*, buzzard *Buteo buteo*, tawny owl *Strix aluco*) and various passerines (e.g. Alaudidae, Corvidae, Embrizidae, Fringillidae, Turdidae, Sturnidae), etc. Early data are produced: i) mortality patterns are available at the time of the discovery; ii) clinical pictures are available within two or three days after field transmission. Data entry was centralized and filled into an ACCESS database by one person. Since 2007, the median of transmission delay of carcasses from field to laboratory is two days (except in cases of freeze preservation which represent 30 % of all cases). In 2013, the median of the data centralization delay was 25 days.

To improve vigilance and alert system, implementation of syndromic surveillance was decided in 2010 to better exploit early data. Simultaneously, dematerialisation was implemented to enhance reliability and accessibility of data. The cloud computing data base Epifaune, which centralizes data from different wildlife disease surveillance networks, is

thriving to answer these new challenges. The main data source is obtained through the SAGIR network. As SAGIR diagnostic relies on nearly 75 local veterinary laboratories, a 6-year preliminary work was needed to i) harmonise diagnostic procedures (while keeping the flexibility needed for diagnostics), ii) elaborate a common nomenclature and a terminology. Since the launch of Epifaune in early January 2016, 85 % of the French laboratories have been trained for the use of Epifaune, more than 1 600 cases were centralized (2014-2016), 739 of which were entered in "real-time" in 2016.

Epifaune now seems operational in providing a syndromic surveillance at the scale of the whole country, and in responding to the OIE recommendations of improvement of epidemio-surveillance of wildlife as sentinel of global health.

EFSA requirement of collecting and sharing data on wildlife populations and diseases: steps towards an integrated monitoring across Europe

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Keywords: Data collection, EFSA, harmonization, geographical distribution, spatial modelling, wildlife disease monitoring, wildlife population monitoring.

Wildlife disease surveillance is nowadays an integral component of general animal health surveillance, at least for selected diseases of particular relevance (e.g. rabies, classical swine fever, African swine fever, highly pathogenic avian influenza). However, current wildlife pathogen surveillance in Europe is not homogeneous. It is based on different combinations of scanning (passive) and targeted (active) surveillance, and often restricted to certain pathogens, regions or populations. Even more importantly, most current European wildlife pathogen surveillance schemes lack integration with appropriate population data. Integrated monitoring means combining population and disease monitoring. Given the diversity of available methods and geographical features, methodological harmonization for integrated monitoring in Europe is duly needed. Determining host distribution ranges and population abundance is necessary as these data represent key information for decision-making processes. Recent work within the APHAEA consortium (www.aphaea.eu) has significantly improved the European capacities for wildlife integrated monitoring: population assessment methods as well as sampling and diagnostic protocols were reviewed, proposing protocols for harmonized application. The call titled “wildlife: collecting and sharing data on wildlife populations, transmitting animal disease agents” by EFSA attempts to apply such harmonized protocols. The main objective is to set up a network of data collection on the geographic distribution and abundance of specific wildlife species and the pathogens they transmit taking a harmonized approach to data collection activities. Among specific objectives, EFSA aims to model the geographical distribution of selected wildlife species and diseases to fill identified gaps of knowledge, and to submit data to the EFSA and prepare regularly updated maps and charts of the geographic distribution of populations of wildlife hosts and associated diseases. This includes the collection of existing published and unpublished data on the geographical distribution, abundance of selected wildlife species and diseases. In response to this call, a project proposal (ENETWILD) was submitted to EFSA. This project proposal consists of the following main work packages:

1. Literature review and data collection on host distribution and disease occurrence as well as quality assessment. Development of work standards for data collection and aggregation.
2. Targeted surveys, also comprising the coordination of surveys as requested by EFSA and/or highlighted by gap analyses of packages 1 and 3.

3. Spatial distribution modelling based on collection of existing data and targeted surveys.
4. Networking and training with a focus on a stakeholder analysis and developing the network. Training is an essential requirement for the implementation of harmonized methods.
5. Strategic consultation to provide ad hoc technical advice to EFSA regarding wildlife population and disease surveillance in Europe.

The ENETWILD consortium is composed of leading research organizations with expertise in the areas of wildlife disease and population monitoring. They have the capacity to produce primary data on wildlife host density and disease in a number of sites representing the main bio-regions and countries in Europe. This consortium already has identified more than 200 potential partners belonging to 108 institutions from 33 countries, both in the EU and in neighbouring countries, and others are welcome to express interest.

Existing data collection will be organized through four partners dividing Europe into macro-regions, attending to the review of scientific literature and "grey data". We will examine the attributes of the different European datasets currently available, focusing on data that allow high quality studies on a scale that is effectively useful for real-life management. Citizen science for data collection on species presence will be of utmost importance to approach organisations in countries to use camera traps to target specific areas to confirm presence for data upon gap analysis and EFSA requests, particularly those where little information is available. Quality assessment of data will be performed to avoid inconsistent or erroneous information. Given the variability of methods used to assess abundance and disease occurrence, an important effort to identify the different methods and to standardize the way data are entered and described is necessary. Then, three-monthly updates of the geographical distribution of occurrence, predicted abundance and disease occurrence/ prevalence of wildlife populations will be produced as on-line maps and charts.

To support the harmonization of wildlife health surveillance, it is necessary to update the protocols recommended by APHAEA continuously where GAP analysis requires the collection of new data. Further harmonization efforts are still required for some methods on abundance estimation, and specifically in some species, such as wild boar. The diagnostic and statistical methods will be defined in a way that assures repeatability and data quality. The selected diagnostic methods we have selected are based on the APHAEA recommended diagnostic protocols (http://www.aphaea.eu/cards/diagnosis).

It is essential to further enhance the European network of wildlife health professionals established during the APHAEA project to support the data collection, and to link it to the European Wildlife Disease Association (EWDA) network for wildlife health surveillance in Europe, the OIE Wildlife Disease Working group and other European organisations. The project will make it possible to develop a deeper understanding of the practical implementation of harmonized protocols for wildlife disease and population surveillance. Sharing experiences in surveillance across countries will bring together stakeholders from different European and bordering countries to discuss harmonization of wildlife surveillance and data provision. Training activities through the network for data providers will keep the network colleagues motivated to collaborate and share data and to integrate them in the project.

Of wildlife experts' lists, project partners' lists and network members' list: where do we want to go?

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Keywords: network, EWDA, communication, member profile, members' list

The EWDA wildlife health surveillance network was initiated in October 2009 at a meeting in Brussels, Belgium. One of the first initiatives was to set up a Google group for the timely exchange of information on wildlife disease surveillance throughout Europe (www.ewda.org; see abstract by Kuiken et al., p. 4). Therefore, this Google group mailing list focuses on topics related to wildlife disease emergence and diagnostics and is not primarily meant to share other types of information such as the announcement of courses, meetings or work positions. Other characteristics of the Google group are that it is not limited in time, that it is meant to be further developed, and that it is restricted to wildlife health experts involved in wildlife disease surveillance schemes in Europe. Since the EWDA network Google group is a closed group, the members' list ist nor publicly available but members of the Google group can download the members' list from the Google group website or obtain it from T. Kuiken on request.

Separately but closely linked to this Google group, several experts' lists have been conducted over the past years for projects related to wildlife disease surveillance in Europe. They include:

- The WildList of WildTech (www.wildtechproject.com)
- The APHAEA partners (www.aphaea.eu)
- The ASF-STOP partners (website in preparation; see abstract by Gavier-Widén et al., p.13)
- The interested/future EFSA project partners (see abstract by Vicente et al., p. 19)

These projects, in particular APHAEA, aimed at developing a network of wildlife health experts and institutes to address wildlife health issues in a more comprehensive and coordinated manner in Europe. The WildList was originally created in a Med-Vet-Net Special Interest group before being hosted by the WildTech project and a substantial part of the

information spread through this discussion platform originated at EWDA or WDA. All of these project-related lists overlap with the Google group but they also include other colleagues who may not be concerned by the disease-specific discussions of the Google group, such as wildlife ecologists. Furthermore, project lists are limited in time: Once a project stops, the list is not updated anymore and the discussions among the partners gradually stop. As a consequence, the efforts to develop the existing network beyond the Google group do not result in a sustainable expanded network.

At former APHAEA partners' meetings, project partners repeatedly wished the development of a network partners' list indicating the areas of expertise of each member, in order to facilitate contacts, communication and collaboration among them. Therefore, the EWDA wildlife health surveillance network committee has elaborated a proposal for a sustainable partners' list in the sense of a European wildlife health network across all relevant disciplines and independently of any project, activity or professional association. Since the Google group is a closed group for specific discussions, it did not seem appropriate to merge project partners' lists such as that of APHAEA with the Google group. By contrast, the former WildList appeared to cover the needs expressed by the APHAEA partners/EWDA wildlife health surveillance network members and it formerly proved to be easy to use. Therefore, we propose to revive and transfer the former WildList from the WildTech website to the EWDA website and to adapt it to the needs of the EWDA wildlife health surveillance network. Google group members, APHAEA partners and all other wildlife health experts in Europe interested to be part of the European wildlife health network will have the possibility to register in the WildList and to introduce basic data on their area of expertise. Once they will be registered, they will have the possibility to update their profile at any time. Registration will be open to anybody who is interested in wildlife health in Europe. The existence of this list will make it easier to find people with appropriate interest and expertise in different areas related to health of European wildlife. Furthermore, the corresponding expanded email list will allow communication on a wider range of topics related to wildlife health, including the announcement of meeting and courses and job advertisements, with the Google group remaining a subgroup dedicated to specific discussion on wildlife disease detection in Europe.

New structure for the EWDA wildlife health surveillance network

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Keywords: Europe, network, organization, surveillance, wildlife health

Following EWDA meetings in October 2005 in Ciudad Real, Spain, and in October 2009 in Brussels, Belgium, there was consensus that wildlife health surveillance in Europe would benefit from a more formal network of people actively participating in this field. Therefore, an *ad hoc* EWDA committee was set up to develop such a network: the EWDA wildlife health surveillance network committee.

The long-term goals of this network are to improve exchange of information among wildlife health surveillance programmes in Europe; develop standard operating procedures for diagnostic investigation; develop common criteria for diagnosis of wildlife disease; share specialist expertise; and provide training opportunities for wildlife health surveillance. Now that this network has been in existence for seven years, it seems appropriate to renew its structure in at least three ways.

First, the *ad hoc* character of the committee should be changed. Given the interest in the network, the activities it has been involved in, and its predicted utility for the foreseenable future, it is proposed that the committee's status should be changed from *ad hoc* to permanent, through application to the EWDA council. Following the WDA bylaws, membership on this committee and term of membership (usually 3 years) will be determined by the EWDA chair in consultation with the vice-chair.

Second, all wildlife health surveillance programmes in Europe should be encouraged to participate in the network. Until now, participation in the network has been based on the 2009 survey of programmes in Europe plus membership of the EWDA network Google group, and no concerted effort has been made to involve additional programmes that did not participate in the 2009 survey or have been developed since then. Obtaining more participation is important to reach the widest geographical coverage and harmonization possible.

Third, partners of European multi-country projects should be invited to join the network. There are or have been several such projects in recent years: WILDTECH, an FP7 project to set up a technology platform for high-throughput disease diagnosis in wildlife; APHAEA, an

EMIDA ERA-NET project aimed at establishing a European wildlife disease surveillance network; and ASF-STOP, a COST action to better understand and combat African swine fever in Europe (see abstract by Gavier-Widén et al., p. 13). While such projects may significantly improve European wildlife health surveillance, there is a risk that obtained results and partnerships are partly lost once the projects end. Therefore, it is important to invite the project partners who are not yet members of the existing EWDA wildlife health surveillance network to join this network in order to maximize the long-term use of their results and the benefit of the developed collaborations. The proposed new network members' list (WildList; see abstract by Ryser-Degiorgis et al., p. 22) would facilitate this network expansion.