PROJECT: FLU-FLYWAY

Date: **31.03.2020** **PREPROPOSAL** ID: 66

PROJECT TITLE

From flyway to farm – wild birds as vectors for avian influenza virus in Europe

RESEARCH AREA

Research Area 1: Improved understanding of epidemic and emerging infectiuos animal diseases

PROJECT DURATION
36 Months (03 / 2021 to 02 / 2024)

TOTAL REQUESTED FUNDING
1312000 €

TOTAL COSTS
1506000 €

CONSORTIUM

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KEYWORDS

Supplementary keywords	avian influenza, veterinary epidemiology, movement ecology, risk assessment, waterfowl

PROJECT SUMMARY

Avian influenza is a devastating disease in poultry, with large consequences for animal health, production and trade. Wild aquatic birds are the main reservoir of avian influenza viruses, and can introduce the disease in previously unaffected area. In particular, dabbling ducks are less susceptible to avian influenza, and can carry the viruses without evident symptoms and with lower mortality rates. The ecological mechanisms of dispersion of avian influenza viruses is not completely unravelled, leaving open questions on how biological, seasonal and climatic variations could influence the risk of avian influenza virus incursion from wild birds to poultry.

In this proposal, a multidisciplinary approach combining veterinary epidemiology and movement ecology is presented, to study how movement behaviour of a key avian influenza reservoir host – the mallard – affects risks of incursion of the disease into poultry premises. The acquired knowledge could potentially be translated into better management procedures, such as targeted biosecurity measures, ultimately mitigating the risk of spill-over of avian influenza to the domestic sector.

We will use novel telemetry techniques to remotely study movements of mallards throughout the year, targeting two northern sites (Sweden and Lithuania), two central sites (Ukraine and Germany) and two southern sites (Italy and Spain). These study sites represent broader regions of Europe, encapsulating climatic and biological differences as well as differences in the density of poultry farms and history of avian influenza epidemics, enabling us to look at movements and risks all the way from the flyway to the farm. The analysis of mallard movements at different spatial scale, together with the study of their land use, will enable conducting simulations of Avian Influenza spread in different ecological and epidemiological scenarios. The inclusion of realistic and field-based values of waterfowl movement at different spatiotemporal scales will allow strengthening our ability to simulate the mechanism of where and when new avian influenza cases could be detected.

The One Health approach achieved by integrating movement ecology and epidemiology has great premise and will lead to new methodological ways of tackling AIV dispersal and incursion questions, and result in lasting collaborations. Although the focus is on avian influenza viruses, the way epidemiology and movement ecology are integrated here can be extended more broadly to other avian pathogens such as Salmonella, Campylobacter, Sarcocystis or Newcastle Disease virus, and even dissemination of antimicrobial resistance genes in gastrointestinal bacteria.

As avian influenza is mainly driven by the ecology of the wild waterfowl reservoir, in particular the mallard, understanding the role of birds as vectors of this disease is key to improve our preparedness and ability to respond to disease in poultry, as well as help designing appropriate surveillance for early warning.

PROJECT DESCRIPTION

Scientifical/technical overwiew

Highly pathogenic avian influenza (HPAI) is a threat to the European Union due to the devastating direct and indirect losses imposed on the poultry industry, the disease effects on wild bird populations, and the potential impact on public health. From being uncommon twenty years

ago, the epidemiology of the disease changed when HPAI H5N1 emerged in Hong Kong 1999. This virus and reassortant progeny viruses such as H5N2, H5N6 and H5N8 have since become an ongoing threat to poultry, the livelihood of farmers, and wildlife in Asia, Europe and Africa. This change was marked by the capacity of the virus to be maintained in wild migrating waterfowl, making the disease more difficult to combat in poultry as epizootics can be seeded from the wild bird reservoir. Hence, understanding how movement behaviors of wild hosts on all spatial scales relate to the risk of incursion into domestic poultry is pivotal to predict and mitigate any such events.

In wild birds, the severity of HPAI infections varies between different species, ranging from no apparent symptoms to high levels of mortality. The former group is primarily comprised of dabbling ducks, which are the natural reservoir for low-pathogenic avian influenza (LPAI) viruses. It has been hypothesized that through repeated exposure to LPAI viruses, ducks can limit HPAI disease to a subclinical infection and thereby shed virus even during energetically costly activities such as migration. Most European dabbling duck species are facultative or obligate migrants, with the scale of migration ranging from year-round residency to long-distance migration. They are able to cross long distances non-stop, thus providing rapid means of transport for pathogens. Incorporating waterfowl movement ecology in epidemiological models is thus vital for risk assessment for disease in poultry.

This project will focus on the mallard (*Anas platyrhynchos*), a reservoir host for LPAI viruses and a common species across Europe. It occurs in urban, agricultural, and natural environments, and is thought to be a key source for avian influenza in poultry. We will study mallard movements at several spatial scales, and investigate how they are shaped by environmental conditions and landscape configuration. This will help answer how the movement of wild animals translates to disease incursion risk into domestic animals.

Expected project impact and relevance to the call

Although the focus of this project is on avian influenza viruses (AIV), the integration of epidemiology and movement ecology presented here can be generalised to other avian viral and bacterial pathogens, as well as antibiotic resistance in gastrointestinal bacteria. Avian influenza is mainly driven by the ecology of the wild waterfowl reservoir, and understanding the role of birds as vectors of this disease will improve our preparedness and ability to respond to disease in poultry, and is a key focus of this proposal.

This consortium can address how risk of AIV incursion into poultry varies with differences in waterfowl responses to climate and configuration of the agricultural landscape at a broad spatial scale. The approach detailed in this proposal addresses risks conveyed by mallards ranging from local, farm-scale movements all the way to the flyway perspective by integrating movement and landscape utilization of AIV reservoir hosts in to risk assessment. Stakeholders include both national policy makers and broader expert organizations such as EFSA, FAO, and OIE, and the European poultry sector as a whole.

Added value to European Research and Innovation

The project will produce large amounts of movement data from a key HPAIV host which together with data from other national and international projects, including the DELTA-FLU project (European Union Horizon 2020, grant agreement No. 727922), will form the basis for analyses. The consortium combines expertise from veterinary epidemiology and movement ecology, and integrates these fields in an innovative way. Both disciplines study spatial and temporal patterns using complementary frameworks to understand how host and virus, and ultimately risk for disease in poultry, vary in time and space.

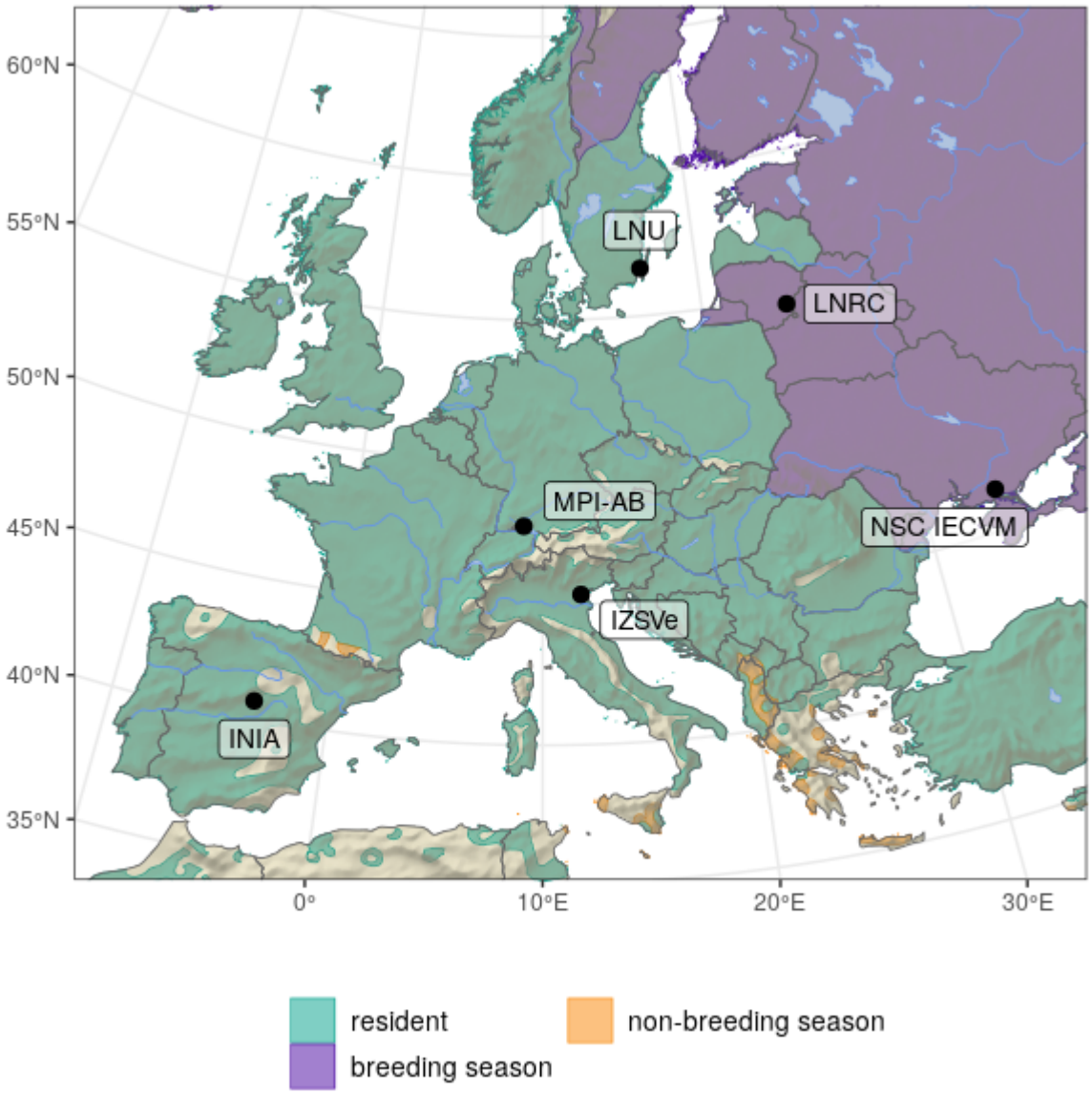
The partners LNU and IZSVe are part of DELTA-FLU, and here we build on progress made within that project. While the wild bird part of DELTA-FLU focuses on the potential for multi-species intra-continental HPAI dispersal through long-distance migratory connectivity in Eurasia, this proposal focuses on a single, high-importance host on the European continent. We specifically ask how this reservoir host interacts with landscape elements at regional and local scale, and how the risk of introducing HPAI virus to poultry is affected by climatic and seasonal variation of the host. This multidisciplinary approach will reveal how the virus can move between countries, spread into resident wild bird populations, and spill into poultry farms. All partners are already involved in either movement ecology or AIV epidemiology, and this project will create synergy and long-lasting collaborations guaranteeing a smooth information flow, and facilitate important results on avian pathogens in general, and AIV in particular.

Project management and responsibilities of partners

The coordinator (LNU) is responsible for organizing WP activities, and the interactions between the partners. This will involve scheduling of meetings, the delivery of related minutes, and setting up digital platforms for efficient communication between partners. Dedicated university personnel at the Grant and Innovation Office at LNU will aid the coordinator to ensure that financial reporting and deliveries of tasks are conducted in the specified timeline. Each partner will budget for participation in annual grant holder meetings (initial in 2nd quarter

2021) and a final dissemination meeting (3rd quarter 2024). A website will be created to increase visibility of the project, and to allow for communication of results to a wider audience. Apart from a public section, the website will contain a private section with options for data sharing and storage of sensitive information only accessible to partners.

The partners represent three regions of Europe: Sweden (LNU) and Lithuania (LNRC) in the north, Ukraine (NSC IECVM) and Germany (MPI-AB) in Central Europe, and Italy (IZSVe) and Spain (INIA) in the south. Fieldwork will be conducted in all countries (see WP 1) by the respective partners, and with assistance from the coordinator in the case of Ukraine. Ukraine is strategically situated at the entry point for migration to the EU, and NSC IECVM participating in this proposal as a non-funded partner significantly strengthens the applicability of results to a European-wide approach. Responsibilities for the movement analyses will primarily lie with the ornithological partners (LNU, LNRC, MPI-AB), and epidemiological analyses primarily with the veterinary epidemiologists (IZSVe, INIA, NSV IECVM), but with significant interactions among partners. The proposed work is detailed in the following work packages.



WP 1 Waterfowl movements at continental, regional and local scales

Fuelled by developments in mobile communication technology, devices for remote animal telemetry have become so small that they can be deployed on ducks while maintaining GPS accuracy and high-frequency sampling. We will collect mallard movement data at different spatial scales and contextualise the data with biological and seasonal information to enable risk assessment for AIV incursion into poultry. We will deploy GPS/GSM-transmitters on mallards in populations representative of the partners' countries, thereby covering much of the natural variation expected from the movements of European mallards: migratory tendency increases from residency in the south over partial/facultative migration in central Europe, whereas northern populations are strictly migratory. This means that mallards from both north and east move towards milder regions of Europe in autumn and winter, and potentially transport viruses between populations, and between wild birds and poultry. As data collection will be continuous, we will be able to study the movement of individuals throughout all life-history stages, and record movements ranging from small-scale daily movements in the agricultural landscape of Europe, to long-distance seasonal migrations.

Task 1. Collect mallard movement data across Europe

Through the existing network of partners, we will catch mallards using existing ringing schemes in six different locations in Europe, and equip them with transmitters programmed to sample locations regularly throughout the day. To achieve a representative sample of each study site, we will focus the majority of trapping at the end of the breeding season and start of the moult when birds are dispersed close to their breeding sites, but also deploy transmitters during migration and wintering. We will furthermore collect already existing datasets from partners and published data to be included in the subsequent analyses.

Task 2. Migration analysis

The high-resolution trajectories of fully or partially migratory mallards collected within Task 1 will form the basis for the migration analyses, which aim to further our understanding of the environmental conditions that facilitate mallard migratory movements across the continent, and to define a biologically informed mallard migration model that will allow us to address the potential for HPAI virus transmission via migration in different regions of Europe.

We will investigate the different levels determining the propensity and decision making in the onset of migration, the choice of routes when migrating and finally the decisions involved in termination of migration using the empirical tracking data. We will identify migratory behaviour from the individual trajectories using behavioural annotation, e.g. using hidden Markov models. Remotely sensed environmental data such as climate re-analyses (e.g. ECMWF ERA-5) accessible through the EnvDATA infrastructure (see WP3) will allow us to identify the conditions leading to individual departure decisions, and can reveal how linear topographic features or wind conditions affect the routes chosen by mallards. This will allow us to generalise from the empirical trajectories to scale up to a landscape level of mobility and inter-connectedness of European mallards. The quantification of these basic parameters is key to estimating encounter probabilities of migratory and resident mallards, as well as the probability of utilisation of landscape structures that are shared between mallards and domestic farmed species.

Task 3. Mallard movements in the agricultural landscape

Mallards commute between roosting areas and foraging sites during dawn and dusk. These daily movements provide an opportunity for dispersal of viruses into areas occupied by domestic animals. Quantifying these movements and the space accessible to mallards during these commutes are necessary for estimating the risk of introduction (see WP2). We will analyse home range size and intensity of space use of mallards during resident periods using autocorrelated Kernel density estimators, and investigate how space use varies with region, season, and landscape configuration. We will further apply resource and step-selection functions to elucidate the drivers or resources determining the likelihood of utilisation and movement between patches of homogeneous habitat. Based on such models we will investigate to what extent the different populations, but also individuals, differ in how they respond to fluctuations in resource availability and derive predictions of land use based on the data from the wild animals operating under the natural conditions. As the study locations differ in the extent and intensity of agriculture, we will be able to provide a broad picture of how mallards interact with the agricultural landscape throughout the year.

WP2 Risk of introduction, maintenance and dissemination of HPAI viruses from wild birds to poultry

Avian influenza outbreaks are epidemiologically complex in nature; they may involve multiple wild bird species that vary in spatial ecology and clinical disease severity. Avian influenza viruses are normally introduced via migratory movements; the viruses can then spread to resident wild birds, which are the maintenance hosts at a local level, with potential incursions into domestic birds. Data generated from WP1, integrated with pre-existing animal movements and epidemiological datasets, will form the basis for an extended risk assessment of the contribution of wild waterfowl, and in particular mallard, to introduction and maintenance of AIVs in novel areas, and spread to poultry farms.

Epidemiology and mathematical modelling will be integrated with movement ecology, allowing to disentangle the dynamics of introduction and transmission of avian influenza in wild birds, to elucidate how the wild reservoir can interact with the domestic host, and using the information to establish thresholds for the risk of disease occurrence. Results could be used to explain the past history of avian influenza in EU and help to design an early warning prediction of AI behaviour and future incursions into the EU.

Task 1. Introduction of HPAI via migratory movements

We will model the risk of AIV being dispersed across the EU via mallard migration depending on season and climatic conditions. We will combine the migration model developed in WP 1 with mallard ring recovery data, that, while less precise than GPS data, can provide a general overview of mallard migratory connectivity. Together with the knowledge of the biological and climatic conditions that facilitate migratory movements, as investigated in WP1, these tools will allow us to make predictions about the risk of virus dispersal under certain climatic conditions. We will especially focus on the role of weather, such as cold spells and changes in wind direction, for shaping the large-scale risk of virus dispersal across the continent, and particularly the risk of introducing the virus into a domestic host population.

Task 2. Maintenance and spread of HPAI at the local and regional level under different epidemiological scenarios

The estimates of utilisation of space and habitat by mallards throughout the day through WP1 will allow us to assess the risk of transmission of AIVs from mallards to poultry farms via non-migratory and local movements. This will advance currently available knowledge, and allows us to map risk of transmission between wild and domestic animals across a variety of European agricultural landscapes. Cellular Automata and/or Multi Agent Simulation approaches will be used to analyse the diffusion dynamics of AIVs through local movements, accounting for the presence of poultry farms and the spatial configuration of habitat identified as important to mallards in WP1. These simulations will reveal the potential interactions between migratory and residential wild birds. Risk of transmission will be evaluated considering different scenarios, and validated using data from previous HPAI/LPAI epizootics in the countries included in the Consortium.

WP3 Geographical and environmental data platform

The amount and complexity of the data will require a Data Management Plan (DMP), as well as specialised analytical platforms and visualisation procedures to allow for efficient work flow and knowledge production. Assistance to both previous work packages is of essence to allow efficient analytical pipelines from raw data to final results. This will require that from the collection of data, via its storage and fusion with existing public data sources to its final destination, the elements gathered in WP3 happen in tight coordination with the tasks scheduled in WP1 and WP2. WP3 centralises the storage, management, access, and analysis of the data.

Task 1. Storing, management and access of wild bird movement data

Data will be stored in the animal movement data base movebank.org. This database will foster the collaborative network of the partners by providing elaborate collaboration and data sharing facilities. The movebank.org API allows for big data analysis using the cluster computing facilities and high performance computing of the Max-Planck computing and data facilities (MPCDF), a partner of MPI-AB.

Task 2. Management of environmental and land use data

Spatiotemporally explicit information about environmental and climatic conditions are pivotal to understanding movement decisions of wild animals. To enable the analyses in WP1 and WP2, we will use the movebank.org EnvDATA tool to access a wide range of publicly available environmental data sets. EnvDATA is focused on global data sets, and we will supplement it with regional data sets to achieve higher relevance and accuracy, and thus better prediction performance. Such spatial data are available via a large and heterogeneous set of services, e.g. the European Union's Earth Observation Programme – Copernicus. This task will also include the solicitation of data sources and invitation to contribution of environmental data sets by European community and countries and more regional authorities.

Task 3. Definition of geographical data models and analytical framework

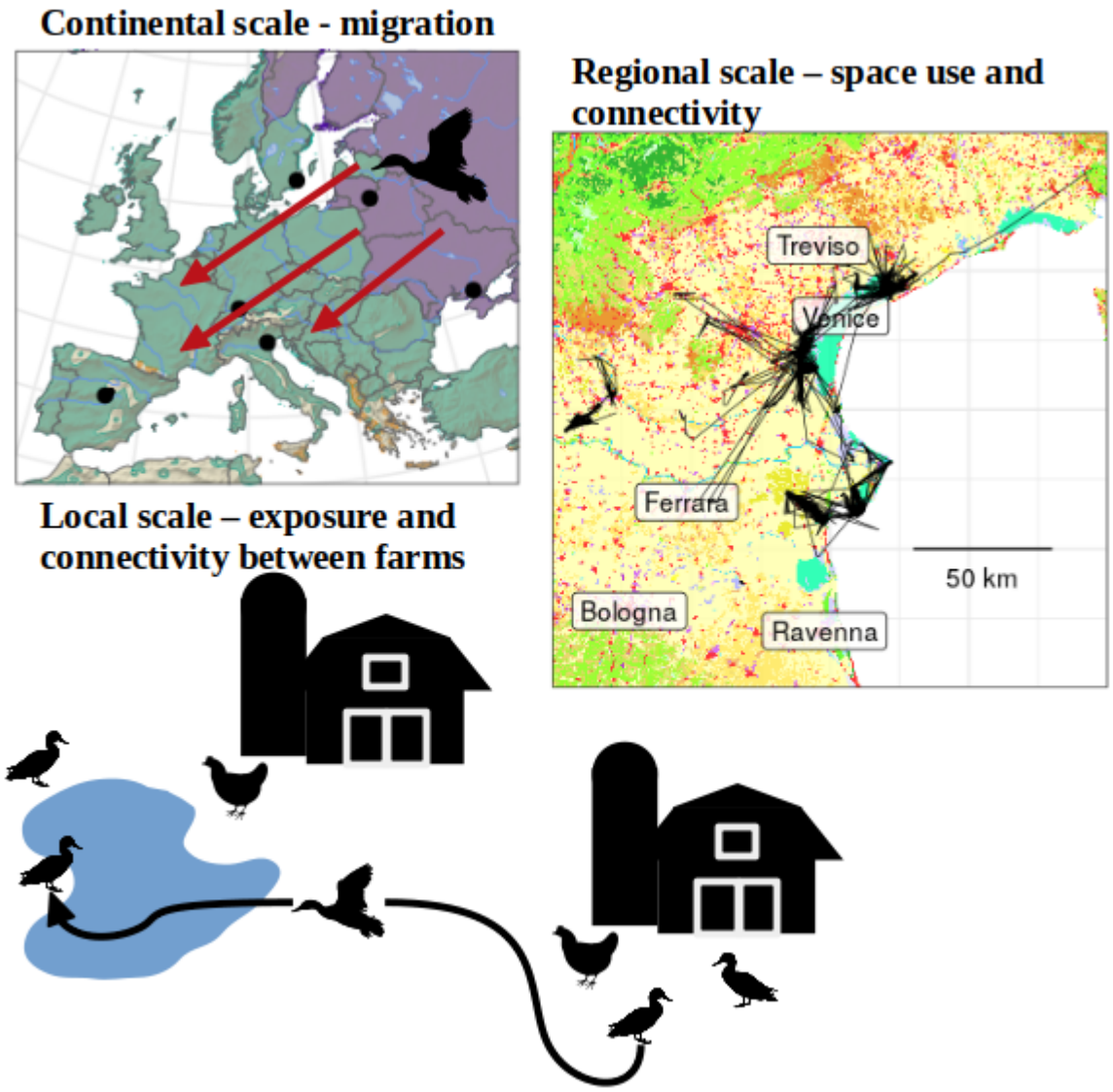
The diversity of data relevant to this project requires the definition of spatial data models to describe and represent information related to wild bird movements and territorial elements (e.g. poultry farms, water basins, etc.), and we will use a multi-scale study approach to identify the different geographical and temporal scales covered by the project. We will integrate information from collaborative open databases such as OpenStreetMap® and Natura 2000 with information produced during the project, which promotes the re-use of the existing data sources and supports the open source projects of the Free and Open Source Software community.

Maintaining transparency and reproducibility is just as pivotal for the analytical tools and algorithms applied as it is for the underlying data. This project aims to provide interpreted and relevant results to decision makers while ensuring that the project results are entirely reproducible. This can be achieved e.g. through the moveStore initiative, a platform for implementing analytical work flows in the movebank.org environment. It is currently being implemented with a stringent definition of licence terms, data models, and analytical frame works, and uses docker architecture to ensure reproducibility across platforms while being entirely scalable. MoveStore can be used to integrate the processes and algorithms derived in the WP1 and WP2 and thereby engage the open source science community at the analysis level while delivering the proposed results. The moveStore workflow also ensure that the projects' end products such as infection risk assessments can be continuously updated as additional data are being linked to the project.

Task 4. Data Management and Development Plans

The DMDP are dedicated to defining the data sets generated and processed in the scope of the project, and how they will be curated and stored. This task also includes extensions and adjustments to the infrastructure used in this project, and will consider data policy and re-use issues in order to evaluate the possibility of making the research data and analytical path ways publicly available.

Although the existing infrastructure can be readily used to start the project, adjustments will be required to allow for remote data selection, bi-directional communication and encrypted data transmission. The required changes also open the door for deep learning and AI approaches for modelling association rules between individual and environment.



NAME OF (UP TO) 3 PERSONS WHO MAY NOT EVALUATE THIS PROPOSAL.

SOCIETAL AND ETHICS ASPECTS

Ethical concerns

This project relies on capturing wild mallards and equipping them with telemetry loggers. All capturing and handling of birds will be conducted by experienced ornithologists. PhD students and other staff recruited to the project will undergo pertinent education regarding handling and tagging of birds, and required animal ethics education. Four of the partners have extensive experience of working both with waterfowl and telemetry loggers. Each country has their own legislation that handles the formal parts of capturing birds and to work with them in animal experiments. Overall, the technique of dorsally mounted GPS/GSM transmitter, or GPS/GSM transmitter mounted with leg-loop harness, are widely used in avian movement ecology. The weight of the harness and transmitter should not exceed 3% of the body mass, and be mounted in a way that to the smallest extent possible interfere with the animal's normal life. For mallards, these types of transmitters have been used successfully in other projects. The coordinator has an ethical approval for capturing and tagging mallards in Sweden (Linköpings djurförsöksetiska nämnd, Dnr 834-2017) and before the onset of the project, will make sure that each partner has relevant experience and approval to conduct work with animals.

PARTNER DATA

Partner 1 (Consortium Coordinator): LINNEUNIVERSITETET

FINANCE COMMENTS

Personnel	Salary for project member Mariëlle van Toor (2 year, 10 months) as a senior researcher, and 9 months for a field technician to be enrolled for duck captures and deploying loggers
Travel	Field-related travel and accommodation costs in relation to fieldwork in Sweden and Ukraine, and to field visits in other partner countries (in total 10 k€). Travel to annual consortium meetings (4k€)
Consumables / Equipment	The majority of the requested fund for consumables/equipment relates to telemetry transmitters (70 k€). These devices are either GPS/GSM transmitters, available from different companies at a cost of around 0.9 k€ per transmitter (including data fees), or if available ICARUS transmitters that are satellite based systems for tracking animal movements. If ICARUS transmitters are available, they will come at a price of 0.5 k€ per transmitter including data fees. Other costs applied for includes smaller items, such as harness materials, nets and other trapping devices, as well as computers for analysis.
Subcontracts	
Other	We have budgeted 8k€ for costs of organizing and hosting annual consortium meetings, and for communication and dissemination activities

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TASK(S)

Jonas Waldenström is coordinator and responsible that the work will be conducted as planned, through active participation of all partners. He will lead WP1 and make sure that the specified Tasks be delivered on time.

He is a partner on another application: WISER. That application addresses novel tools for AIV surveillance through serology and environmental sampling, and how we should improve EU surveillance. The two proposals are complimentary, and we declare no conflict of interest.

LITERATURE REFERENCES

- Kleyheeg, E., Fiedler, W., Safi, K., Waldenström, J. & Wikelski, M. & van Toor, L. M.
  A comprehensive model for the quantitative estimation of seed dispersal by migratory mallards
  Frontiers in Ecology and Evolution (7), 40 (2019)
  10.3389/fevo.2019.00040
- van Toor, M. L., Avril, A., Wu, G., Holan, S. C. & Waldenström, J.
  As the duck flies – Estimating the dispersal of low-pathogenic avian influenza viruses by migrating Mallards
  Frontiers in Ecology and Evolution (6), 208 (2018)
  10.3389/fevo.2018.00208
- van Dijk, JGB., Verhagen, JH., Wille, M. & Waldenström, J.
  Host and virus ecology as determinants of influenza A virus transmission in wild birds
  Current Opinions in Virology (28), 26-36 (2017)
  doi.org/10.1016/j.coviro.2017.10.006
- Avril, A., Grosbois, V., Latorre-Margalef, N., Gaidet, N., Tolf, C. & Waldenström, J.
  Capturing individual-level parameters of influenza A virus dynamics in wild ducks using multistate models
  Journal of Applied Ecology (53), 1289-1297 (2016)
  10.1111/1365-2664.12699
- Olsen, B., Munster, V. J., Wallensten, A., Waldenström, J., Osterhaus, A. D. M. E. & Fouchier, R. A. M.
  Global patterns of influenza A virus in wild birds
  Science (312), 384-388 (2006)
  doi:10.1126/science.1122438

Partner 2: Nature Research Centre

FINANCE COMMENTS

Personnel	1 senior researcher (0,6 time in 36 moths), 1 researcher (0,7 time in 30 months) and 1 technical assistant (0,5 time in 30 months)
Travel	Travel costs abroad of 2 persons for the initial, mid-term grant holder meetings and the final dissemination meeting. Travel costs of 3 persons for fieldwork within Lithuania in 6 months
Consumables / Equipment	Costs for 60 GPS/GMS loggers - 50,000 Euros; price for one PC necessary for analysis of project data – 2,000 Euros; costs of communication/dissemination activities – 2,000 Euros
Subcontracts	
Other	Costs for communication and dissemination activities

TEAMMEMBER

TASK(S)

Project partner will be responsible for deploying GPS telemetry transmitters on mallards in Lithuania, thus contributing to analysis of movements of mallard across Europe. Available long-term ringing recoveries data of the species in Lithuania will be compiled and analyzed, as well as other relevant data (weather factors affecting migration pattern, land use and poultry farm distribution).

LITERATURE REFERENCES

- Viksne J., Švažas S., Czajkowski A., Mischenko A., Kozulin A., Kuresoo A., Serebryakov V., Janaus M.
  Atlas of Duck Populations in Eastern Europe Journal
  Monograph. “Akstis“, Vilnius (), 1-188 (2010)
- Švažas, S., Morkūnas, M., Verhagen, J., Fouchier, R., Morkūnas, J., Mundkur, T., Czajkowski, A., Sruoga, A., Butkauskas, D., Krejaras, R., Jurgelevičius, V., Pridotkas, G., Milius, J., Tubbs, N., Stanevičius, V.
  Surveillance of wild waterbirds for avian influenza viruses in Lithuania
  Lithuanian Journal of Veterinary (60), 72-78 (2012)
- Treinys, R., Dementavičius D., Rumbutis S., Švažas S., Butkauskas D., Sruoga A., Dagys M.
  Settlement, habitat preference, reproduction, and genetic diversity in recovering the white-tailed eagle Haliaeetus albicilla population
  Journal of Ornithology (157), 311-323 (2016)
- Prakas, P., Butkauskas, D., Švažas, S., Juozaitytė-Ngugu, E., Stanevičius, V.
  Morphological and genetic identification of Sarcocystis fulicae N. Sp. (Apicomplexa: Sarcocystidae) from the Eurasian Coot Fulica atra.
  Journal of Wildlife Diseases (54), 765-771 (2018)
  10.7589/2017-11-279
- Beekman J, Koffijberg K, Wahl J, Kowallik C, Hall C, Devos K, Clausen P, Hoenman M, Laubek B, Luigujoe L, Wieloch M, Boland H, Švažas S, Nilsson L, et al.
  Long-term population trends and shifts in distribution of Bewicks Swans Cygnus Columbianus bewickii wintering in northwest Europe
  Wildfowl (Special Issue 5), 73-102 (2019)

Partner 3: Istituto Zooprofilattico Sperimentale delle Venezie

FINANCE COMMENTS

Personnel	Salary for a junior scientist for 24 person months
Travel	Expenses for field trips, and travel to other partners as well as to annual Consortium meetings.
Consumables / Equipment	GPS/GSM transmitters or ICARUS transmitters as agreed with other Consortium partners
Subcontracts	Contract with the Institute for Environmental Protection and Research (ISPRA) for handling wild birds and deploying transmitters

Other	Costs for communication and dissemination activities

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TASK(S)

- Gps-tagging activities on mallard ducks in Italy
- Contribution to the analysis or the risk of intoduction of Avian Influenza viruses (AIVs) via migratory movements
- Assessment of the diffusion dynamics of AIVs through movements of wild waterfowl at the regional and local level (simulation models)
- Support to management of environmental data
- Definition of geographical data models
- Definition of a Data Management Plan for the data produced and used within the project

LITERATURE REFERENCES

- Harvey WT, Mulatti P, Fusaro A, Scolamacchia F, Zecchin B, Monne I, Marangon S
  Spatiotemporal reconstruction and transmission dynamics during the 2016–17 H5N8 highly pathogenic avian influenza epidemic in Italy
  Transboundary and Emerging Diseases (00), 1-14 (2019)
  10.1111/tbed.13420
- Mulatti P, Fusaro A, Scolamacchia F, Zecchin B, Azzolini A, Zaperin G, Terregino C, Cunial G, Monne I, Marangon S

Integration of genetic and epidemiological data to infer H5N8 HPAI virus transmission dynamics during the 2016-2017 epidemic in Italy
Scientific Reports (8), 18037 (2018)
10.1038/s41598-018-36892-1

- Fusaro A, Monne I, Mulatti P, Zecchin B, Bonfanti L, Ormelli S, Milani A, Checckettin K, Lemey P, Moreno A, Massi P, Dorotea T, Marangon S, Terregino C
  Extensive genetic diversity of H5N8 and H5N5 Highly Pathogenic Avian Influenza Viruses in Italy, 2016-2017
  Emerging Infectious Diseases (23), (2017)
  10.3201/eid2309.170539
- Brown I, Mulatti P, Smietanka K, Staubach C, Willeberg P, Adlhoch C, Candiani D, Fabris C, Zancanaro G, Morgado J, Verdonck F
  Avian influenza overview October 2016–August 2017
  EFSA Journal (15), (2017)
  10.2903/j.efsa.2017.5018
- Brouwer A, Gonzales J, Huneau A, Mulatti P, Kuiken T, Staubach C, Stegeman A, Antoniou SE, Baldinelli F, Van der Stede Y, Aznar I
  Annual Report on surveillance for avian influenza in poultry and wild birds in Member States of the European Union in 2018
  EFSA Journal (17), (2019)
  10.2903/j.efsa.2019.5945

Partner 4: Center of Animal Health Research. National Institute of Agriculture Research of Spain (INIA-CISA)

FINANCE COMMENTS

Personnel	12 months/person contract (junior scientist), and part time salary for Irene Iglesias/Ana de la Torre/Fernando Esperon
Travel	Expenses for field trips, and travel to other partners as well as to annual Consortium meetings.
Consumables / Equipment	GPS/GSM transmitters or ICARUS transmitters as agreed with other Consortium partners. Software licenses.
Subcontracts	Contract with SEOBirdlife for handling wild birds and deploying transmitters
Other	Costs for communication and dissemination activities

TEAMMEMBER

Title	Dr.
Email address	iglesias@inia.es
First name	Irene
Family name	Iglesias
Phone number	0034 916202247
Function	Researcher

Title	Dr.
Email address	torre@inia.es
First name	Ana
Family name	de la Torre
Phone number	00 34 916202247
Function	Head of group

Title	Dr.
Email address	esperon@inia.es
First name	Fernando
Family name	Esperon
Phone number	00 34 916202247
Function	Researcher

TASK(S)

-Development of epidemiological spatial analyses: Evaluation and mapping of risk of transmission of AI at the livestock interface. Evaluation of the AI spread dynamic. Identification of risk scenarios.
-Support to provide: 1) Ornithological data and information from mallard in Spain and its migratory movements (SEO-Birdlife); 2) Spatial distribution and census data of poultry in Spain (obtained from the Ministry of Agriculture)
-Support to Gps-tagging activities on mallard ducks in Spain

LITERATURE REFERENCES

- Iglesias, I., Vergne, T., Paul, M. C., Mulatti, P., Tiensin
  Epidemiology and avian influenza
  Front. Vet. Sci. (), (2019)
  10.3389/978-2-88945-994-0
- Iglesias, I., Montes, F., Martínez, M., Perez, A., Gogin, A., Kolbasov, D., & de la Torre, A.
  Spatio-temporal kriging analysis to identify the role of wild boar in the spread of African swine fever in the Russian Federation.
  Spatial statistics (28), 226-235 (2018)
  In press
- Iglesias, I., Pérez, AM., Sánchez-Vizcaíno JM., Muñoz MJ., Martínez, M., De la Torre, A
  Reproductive ratio for the local spread of HPAI wild bird populations of Europe in 2005-2008
  Epidemiology and Infection (139), 99-104 (2011)
  10.1017/S0950268810001330
- Iglesias, I; Muñoz MJ; Martínez, M; de la Torre, A
  Environmental factors associated with high risk for H5N1 HPAI in Ramsar wetlands of Europe.
  Avian diseases (54), 814-820 (2010)
  10.1637/8970-062609-Reg.1
- 12. Iglesias, I., Pérez, A.M., De la Torre, A., Muñoz, MJ., Martínez, M., Sánchez-Vizcaíno, J. M
  Identifying areas for infectious animal disease surveillance in the absence of population data: highly pathogenic avian influenza in wild bird populations of Europe.
  Preventive Veterinary Medicine (96), 1-8 (2010)
  https://doi.org/10.1016/j.prevetmed.2010.05.002

Partner 5: Max Planck Institute of Animal Behavior

FINANCE COMMENTS

Personnel	Salary for PhD student (3 years, based on DFG Personnel Rates for 2020) and 9 months for a field technician to assist with capturing mallards and deploying tags (based on the University of Konstanz' personnel pates for student assistants for 2020). MPI is not eligible for overhead in this call and have instead booked this as Own Contribution, calculated based on the DFG regulations (DFG-Programmpauschale)
Travel	Field-related travel and accommodation costs for fieldwork in Germany (6k€). Travel to annual consortium meetings (4k€).

Consumables / Equipment	The majority of the requested fund for consumables/equipment relates to telemetry transmitters (70k€). These devices are either GPS/GSM transmitters, available from different companies at a cost of around 0.9 k€ per transmitter (including data fees), or if available ICARUS transmitters that are satellite based systems for tracking animal movements. If ICARUS transmitters are available, they will come at a price of 0.5 k€ per transmitter including data fees. Other costs applied for includes smaller items, such as harness materials, nets and other trapping devices, as well as computers
Subcontracts	10k€ for external software engineers to adjust the movebank.org Application Programming Interface (API) to allow large-scale big data analysis. Further 22k€ for software developers for the implementation and integration of the analytical procedures and algorithms developed in WP1 and WP2 into MoveStore.
Other	Costs for communication and dissemination activities

TEAMMEMBER

Title	Dr.
Email address	ksafi@ab.mpg.de
First name	Kamran
Family name	Safi
Phone number	
Function	Group Leader

Title	Dr.
Email address	dpiechowski@ab.mpg.de
First name	Daniel
Family name	Piechowski
Phone number	
Function	Science Coordinator

TASK(S)

The partner will be involved in all ornithological aspects of the project and contribute with the excellence in animal movement ecology analyses. Will lead WP3 on data management and analytic pipelines.

LITERATURE REFERENCES

- Bengtsson B, Safi K, Avril A, Fiedler W, Wikelski M, Gunnarsson G, Elmberg J, Tolf C, Olsen B, Waldenström J
  Does influenza A virus infection affect movement behaviour during stopover in its wild reservoir host?
  Royal Society Open Science (3), 150633 (2016)
  10.1098/rsos.150633
- Choi CY, Takekawa JY, Liu Y, Wikelski M, Heine G, Prosser DJ, Newman SH, Edwards J, Guo F, Xiao X
  Tracking domestic ducks: A novel approach for documenting poultry market chains in the context of avian influenza transmission
  Journal of Integrative Agriculture (15), 1584-1594 (2016)
  10.1016/S2095-3119(15)61292-8
- Kays K, Crofoot MC, Jetz W, Wikelski M
  Terrestrial animal tracking as an eye on life and planet
  Science (348), aaa2478 (2015)
  10.1126/science.aaa2478
- Dodge S, Bohrer G, Weinzierl R, Davidson SC, Kays R, Douglas D, Cruz S, Han J, Brandes D, Wikelski M

The environmental-data automated track annotation (Env-DATA) system: linking animal tracks with environmental data
Movement Ecology (1), 3 (2013)
https://doi.org/10.1186/2051-3933-1-3

- van Toor ML, Hedenström A, Waldenström J, Fiedler W, Holland RA, Thorup K, Wikelski M
  Flexibility of continental navigation and migration in European mallards
  PLoS ONE (8), e72629 (2013)
  10.1371/journal.pone.0072629

Partner 6: National Scientific Center «Institute of Experimental and Clinical Veterinary Medicine»

FINANCE COMMENTS

Personnel	Not eligible for funding
Travel	Not eligible for funding
Consumables / Equipment	Not eligible for funding
Subcontracts	
Other	Not eligible for funding

TEAMMEMBER

TASK(S)

Project partner will be help with deploying GPS telemetry transmitters on mallards in Ukraine, and organize field operation in suitable areas in Ukraine, thus contributing to analysis of movements of mallard across Europe. Available long-term ringing recoveries data of the species in Ukraine will be compiled and analyzed, as well as other relevant data (weather factors affecting migration pattern, land use and poultry farm distribution).

LITERATURE REFERENCES

- D. Muzyka, O. Rula, S. Tkachenko, N. Muzyka, S. Köthe, O. Pishchanskyi, B. Stegniy, M. Pantin-Jackwood, and M. Beer
  Highly pathogenic and low pathogenic avian influenza H5 subtype viruses in wild birds in Ukraine
  Avian Diseases (63), 219-229 (2019)
- M. Sabra, K. M. Dimitrov, I.V. Goraichuk, A. Wajid, P. Sharma, D. Williams-Coplin, A. Basharat, S. F. Rehmani, D. V. Muzyka, P. J. Miller, C. L. Afonso
  Phylogenetic assessment reveals continuous evolution and circulation of pigeon-derived virulent avian avulaviruses 1 in Eastern Europe, Asia, and Africa.
  BMC Veterinary Research (13), 291 (2017)
- D. Muzyka, M. Pantin-Jackwood, E. Spackman, D. Smith, O. Rula, N. Muzyka, B. Stegniy
  Isolation and Genetic Characterization of Avian Influenza Viruses Isolated from Wild Birds in the Azov-Black Sea Region of Ukraine (2001–2012)
  Avian Diseases (60), 365-377 (2016)
- D. Muzyka, M. Pantin-Jackwood, E. Starick, S. Fereidouni
  Evidence for genetic variation of Eurasian avian influenza viruses of subtype H15: the first report of an H15N7 virus
  Archives of Virology (161), 605-612 (2015)
  10.1007/s00705-015-2629-2
- AJ Ayala, KM Dimitrov, CR Becker, IV Goraichuk, CW Arns, VI Bolotin, HL Ferreira, AP Gerilovych, GV Goujgoulova, MC Martini, DV Muzyka, MA Orsi, GP Scagion, RK Silva, OS Solodiankin, BT Stegniy, PJ Miller, CL Afonso
  Presence of Vaccine-Derived Newcastle Disease Viruses in Wild Birds
  PLoS ONE (11), e0162484 (2016)

FINANCES

Requested funding **[in k€]**

Organisation name	Personnel	Travel	Consumables / Equipment	Subcontracts	Other	Requested Funding	Total Own Contribution	Total Costs
LINNEUNIVERSITETET	309	14	74	0	8	500	43	543
Overhead	95	0	0	0	0			
Nature Research Centre	62	9	50	0	2	150	3	153
Overhead	25	0	2	0	0			
Istituto Zooprofilattico Sperimentale delle Venezie	52	10	38	50	2	162	55	217
Overhead	5	1	4	0	0			
Center of Animal Health Research. National Institute of Agriculture Research of Spain (INIA-CISA)	70	8	29	29	4	150	24	174
Overhead	7	1	1	0	1			
Max Planck Institute of Animal Behavior	234	10	74	32	0	350	69	419
Overhead	0	0	0	0	0			
National Scientific Center «Institute of Experimental and Clinical Veterinary Medicine»	0	0	0	0	0	0	0	0
Overhead	0	0	0	0	0			
TOTAL	859	53	272	111	17	1312	194	1506

1 k€ = 1000 €

Own contribution **[in k€]**

Organisation name	Personnel	Travel	Consumables / Equipment	Subcontracts	Other	Total Own Contribution
LINNEUNIVERSITETET	43	0	0	0	0	43
Nature Research Centre	3	0	0	0	0	3
Istituto Zooprofilattico Sperimentale delle Venezie	55	0	0	0	0	55
Center of Animal Health Research. National Institute of Agriculture Research of Spain (INIA-CISA)	24	0	0	0	0	24
Max Planck Institute of Animal Behavior	51	2	16	0	0	69
National Scientific Center «Institute of Experimental and Clinical Veterinary Medicine»	0	0	0	0	0	0
TOTAL	176	2	16	0	0	194

1 k€ = 1000 €

PERSONAL DETAILS	
Full name and title	Date of birth
Jonas Waldenström, Professor	20 Mar 1975
Nationality	Country of residence
Swedish	Sweden
Institution	Contact details (telephone/email)
Linnaeus University	0046-702018218, Jonas.waldenstrom@lnu.se

PROFILE

Professor Jonas Waldenström (Linnaeus University) studies ecology and epidemiology of bird-borne pathogens, particularly influenza viruses in waterfowl where he has run a long-term disease surveillance time series of infections in wild birds. In recent years, his research group has utilized various telemetric techniques to link bird movement ecology and migration with the epidemiology of pathogens, and carries out projects in Sweden, Europe, Asia and Africa. With a background in ornithology, he has a large network within this field of research and he will be coordinator for the application. Moreover, he will be work package leader for all work related to capture of wild birds and deployment of GPS transmitters on mallards, and participate in the work on spatial movement ecology.

EDUCATION

List of academic degree(s) and year of achievement

- Master of Science, Biology, Uppsala University, Sweden, 1999
- PhD, Animal Ecology, Lund University, Sweden, 2005

PROFESSIONAL EXPERIENCE

List of current and past positions

- Assistant professor, Linnaeus University, Sweden, 1 Oct 2006 – 31 Aug 2010
- Associate professor, Linnaeus University, Sweden, 1 Sep 2010 - 31 Nov 2014.
- Faculty lecturer in Microbiology, Linnaeus University, Sweden, 1 Dec 2014.
- Professor, Linnaeus University, Sweden, 1 Mar 2015 to present.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 862605

COORDINATOR

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International coordination of research on infectious animal diseases

PERSONAL DETAILS	
Full name and title	Date of birth
Saulius Švažas, Dr. Sci.	10 June 1961
Nationality	Country of residence
Lithuanian	Lithuania
Institution	Contact details (telephone/email)
Nature Research Centre	+37065029680, saulius.svazas@gamtc.lt

PROFILE

Saulius Švažas , Dr. Sci., is Senior Researcher at Lithuanian Nature Research Centre. He has long experience in studies focused on waterbird ecology and migration. In recent years his research team is involved also in studies of avian influenza viruses and Sarcocystidae protozoan parasites in waterbirds. Coordinator of several major international projects on migration of waterbirds recently implemented in Eastern Europe (ex. UNEP/GEF *Wings Over Wetlands* Program; EU/AEWA *Status of Ducks Populations in Eastern Europe* Program, etc.). Chair of Duck Specialist Group, Wetlands International, 1993-1997; Regional Representative for Eastern Europe, AEWA's Technical Committee, 2012 – 2018; Chair of AEWA's Technical Committee, 2016-2018. He will participate in tasks of work packages related to capture of wild birds and deployment of GPS loggers on mallards in Lithuania, in analysis of available ringing recoveries data and will contribute to spatial movement ecology work.

EDUCATION

List of academic degree(s) and year of achievement

- Master of Science, Biology, Vilnius University, Lithuania, 1984
- Dr. Sci., Ecology, Institute of Ecology and Evolution, Moscow, Russia, 1992
- Ph.D., Birds Ecology, National Academy of Sciences, Vilnius, Lithuania, 1993

PROFESSIONAL EXPERIENCE

List of current and past positions

- Dept. Director, Regional State Conservation Agency, 1984-1987
- Doctoral student, Institute of Zoology, Vilnius, Lithuania, 1988-1992
- Junior Researcher, Institute of Zoology, Vilnius, Lithuania, 1992-1993
- Researcher, Institute of Ecology of Vilnius University, Lithuania, 1994-1997
- Senior Researcher, Nature Research Centre, Vilnius, Lithuania, 1998 to present

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 862605

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PERSONAL DETAILS	
Full name and title	Date of birth
Paolo Mulatti, Dr	7 Sep 1977
Nationality	Country of residence
Italy	Italy
Institution	Contact details (telephone/email)
Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe)	+39 0498084252, pmulatti@izsvenezie.it

PROFILE

Dr Mulatti is involved in providing epidemiological support to regional and national surveillance programs, and in designing national and international research projects. His research activities are related to study infectious disease transmission dynamics, of both directly transmitted and vector-borne diseases. In particular, his main interest is to study ecological aspects of infectious diseases, concerning both the assessment of the effect of environmental/climatic drivers on disease introduction and re-activation, and the analysis of population dynamics in animal hosts and arthropod vectors. He has been involved in research and collaboration projects both national and international, and he participated as lecturer in training courses organized in cooperation with international agencies as FAO and OIE.

EDUCATION

List of academic degree(s) and year of achievement

- PhD in Public Health, Farming and Animal Production Hygiene, University of Padova, Italy, 2007
- Postgraduate specialisation in Animan Health, Farming and Zootechnics, University of Bologna, Italy, 2010
- MSc in Quantitative Skills in Applied Ecology, Epidemiology and Conservation Biology, University of Glasgow, UK, 2012

PROFESSIONAL EXPERIENCE

List of current and past positions

- Research grant, IZSVe, Padua - Italy, 5 Feb 2007 – 21 Jan 2011
- Veterinarian contractor, IZSVe, Padua - Italy, 1 Feb 2011 – 4 Apr 2014
- Veterinarian, IZSVe, Padua - Italy, 15 Apr 2014 – 31 Jan 2015
- Executive Veterinarian, IZSVe, Padua - Italy, 21 Feb 2015 – 31 Aug 2015
- Executive Veterinarian, IZSVe, Padua – Italy, 1 Sep 2015 – to date

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PERSONAL DETAILS		
Full name and title		Date of birth
Dr. Irene Iglesias Martin		04/04/1977
Nationality	Country of residence	
Spanish	Spain	
Institution	Contact details (telephone/email)	
INIA-CISA	Iglesias@inia.es 00 34 610 025 673	

PROFILE

Scientific researcher in the Epidemiology and Environmental Health group at Center of Animal Health Research of theNational Institute of Agriculture Research of Spain (INIA-CISA), specialized in conventional and spatial epidemiology applied to animal health. Long experience on veterinary epidemiology, for the last 15 years my R&D activity has been focused on the epidemiological studies of infectious diseases relevant to animal health, especially at the livestock-wildlife interface under the One Health approach. The ultimate goal of this research has been to improve knowledge of the behaviour of the diseases in order to better design contingency plans related to prevention, surveillance, and control of diseases. The results of which have been applied at national and international level in the improvement of surveillance and control plans of diseases relevant to animal health such as highly pathogenic avian influenza (HPAI), African Swine Fever, Aujezsky, Newcastle, etc. My R+D activities developed include: Participation in a total of 22 international and national projects, 42 scientific and/or technical publications, 4 books, 5 residencies in prestigious national and international research groups in animal health, collaboration with 22 national and international research groups, 72 invitations and presentations at national and international conferences, ongoing technological transfer work with official bodies and national and international companies, production of scientific and scientific-technical reports (19), edition and reviewer activities, continuous teaching work to national and international personal of sectorial and ministerial health workers and tutoring students.

EDUCATION

2002.DVM Veterinary. Faculty of veterinary. Universidad Complutense Madrid (UCM)
2011. PhD Veterinary Epidemiology. Faculty of veterinary. UCM.
2012. Expert University “Statistical in Health Sci”. Univ.Nacional Estudios a Distancia.

PROFESSIONAL EXPERIENCE

Since August 2018: researcher Veterinary epidemiologist in the Epidemiology and Environmental Health group. INIA-CISA
2012-2017.Post-doctorate stages as epidemiologist in 1) INIA-CISA; 2) Faculty of veterinary at the University of Minnesota (UMN) and 3) Faculty of veterinary of UCM.
2016. Creation of a scientific consulting company in epidemiology of animal health which assessed the Spanish Ministry of Agriculture (MARM), UMN and UCM.
2005-2011.Predoctoral (two pre-doctoral scholarships by the INIA and by the UCM)
2002–2005. Pet (exotic and domestic) clinics activity: surgery, lab. Analysis, eco, x-ray.

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PERSONAL DETAILS	
Full name and title	Date of birth
Martin Wikelski, Professor	18 Nov 1965
Nationality	Country of residence
German	Germany
Institution	Contact details (telephone/email)
Max Planck Institute of Animal Behavior	+49 7732 1501-25 wikelski@ab.mpg.de

PROFILE

Professor Martin Wikelski, Founding Director of the Max Planck Institute of Animal Behavior, is the world-leader in tracking animals with miniaturized electronic tags. With his team, he developed and runs MoveBank.org, the worldwide largest database to manage, share, protect, analyse, and archive animal movement data. He founded the International Cooperation for Animal Research Using Space, ICARUS. ICARUS is a satellite-based system to track animals globally from space. It is right now being tested on the International Space Station (ISS) and will start full operations in autumn 2020. Martin Wikelski's scientific background is in ornithology and animal physiology.

EDUCATION

1994 PhD in Zoology, Faculty of Biology, Bielefeld University, Germany
1991 Diplom in Biology, Ludwig-Maximilians-University of Munich, Germany

PROFESSIONAL EXPERIENCE

since 2019 Director, Dept. of Migration, Max Planck Institute of Animal Behavior, Radolfzell, Germany
since 2017 Director, Max Planck-Yale Center for Biodiversity Movement and Global Change, Yale University, USA
since 2016 Honorary Professor, Dept. of Biology, University of Konstanz, Germany
2008 – 2018 Director, Dept. of Migration and Immuno-Ecology, Max Planck Institute for Ornithology, Radolfzell, Germany
2008 – 2016 Full Professor, Dept. of Biology, University of Konstanz, Germany
2005 – 2008 Associate Professor, Dept. Ecology & Evolutionary Biology, Princeton University, USA
2000 – 2005 Assistant Professor, Dept. Ecology & Evolutionary Biology, Princeton University, USA
1998 – 2000 Assistant Professor, Dept. of Ecology, Ethology and Evolution, University of Illinois at Urbana-Champaign, USA
1996 – 1998 Postdoctoral Fellow, Smithsonian Tropical Research Institute, Panama
1995 – 1998 Research Associate, Dept. of Zoology, University of Washington, Seattle, USA

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 862605

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PERSONAL DETAILS	
Full name and title	Date of birth
Denys Muzyka, PhD, Doctor of Science	18 Dec 1977
Nationality	Country of residence
Ukraine	Ukraine
Institution	Contact details (telephone/email)
National Scientific Center "Institute of Experimental and Clinical Veterinary Medicine"	0038-0673855798, dmuzyka77@gmail.com

PROFILE

Main scientific interests of Dr. Muzyka research group are focused on studying of especial dangerous infectious of animal, avian, human and diseases which significantly impact on animal and avian health, as well as their natural reservoirs and hosts. The main attention is paid to studying of pathogens' circulation and ecology in natural reservoirs of infection in the context of "One Health" concept, studying of the effect of various anthropogenic factors and climatic changes on pathogens' circulation features, as well as their connections with other hosts and reservoirs and capability to overcome interspecific barrier. In recent years, his research group has conducted wide avian influenza and avian avuloviruses surveillance in wild birds in Ukraine. More than 100 viruses were isolated from different species of wild birds and poultry, including HPAI H5N1 and H5N8. Phylogenetic studies revealed connection between Ukrainian and European viruses.

EDUCATION

List of academic degree(s) and year of achievement

- Veterinary doctor, Kharkov Zooveterinary Institute, Kharkiv, Ukraine, 2000
- PhD, Epizootology and infectious diseases. Institute of Experimental and Clinical Veterinary Medicine, Kharkiv, Ukraine, 2006
- Doctor of Science (Vet), Veterinary microbiology, epizootology, infectious diseases and immunology. National Scientific Center Institute of Experimental and Clinical Veterinary Medicine, Kharkiv, Ukraine, 2015

PROFESSIONAL EXPERIENCE

List of current and past positions

- Junior Researcher, Laboratory for Avian Viral Diseases Study, National Scientific Center Institute of Experimental and Clinical Veterinary Medicine, 2003-2006
- Senior Researcher, Laboratory for Avian Viral Diseases Study, National Scientific Center Institute of Experimental and Clinical Veterinary Medicine, 2006-2008.
- Head, Laboratory of Avian Viral Diseases, National Scientific Center Institute of Experimental and Clinical Veterinary Medicine, 2008-2015.
- Head, Department of Avian Diseases, National Scientific Center Institute of Experimental and Clinical Veterinary Medicine, 2015 to present.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 862605

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Dr. Muzyka Denys
83, Pushkinska str., Kharkiv, 61023, Ukraine

ICRAD co-funded call "International Coordination of Research on Animal Diseases"

Letter of commitment

Project title: From flyway to farm – wild birds as vectors for avian influenza virus in Europe

Kharkiv (Ukraine), March 25, 2020

We hereby confirm that National Scientific Center «Institute of Experimental and Clinical Veterinary Medicine» has sufficient resources and is committed to participate to the project **FLU-FLYWAY**, in accordance to the pre-proposal which is submitted by **LINNEUNIVERSITET** in the frame of the ICRAD co-funded call and in case the proposal is selected for funding by the ICRAD Funders Consortium.

Head of Department of Avian Diseases NSC IECVM,
Ph.D., Doctor of Science
Muzyka Denys