

European College of Zoological Medicine



Policies & Procedures, Part 2: Wildlife Population Health Specialty

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Table of contents

Chapter 1: Introduction.....	3
Chapter 2: Wildlife Population Health (WPH) members of the European College of Zoological Medicine (ECZM) committees	4
Chapter 3: Requirements for admission to the European College of Zoological Medicine (ECZM) as a Wildlife Population Health (WPH) diplomate	5
Chapter 4: Wildlife Population Health (WPH) residency programmes.....	6
A. General objectives of the WPH residency training programme	6
B. Detailed objectives of the WPH residency training programme.....	7
C. WPH training programme description	9
D. Facilities, services, and equipment required in a WPH residency programme.....	10
E. Documentation.....	10
F. Research, publication and speaking requirements.....	12
Chapter 5: Examination credentialing and application procedure	14
A. Examination credentialing	14
B. Applying for and sitting the examination.....	14
Chapter 6: Wildlife Population Health (WPH) reading list.....	17
Appendix 1: Wildlife Population Health (WPH) reading list	18
Appendix 2: European College of Zoological Medicine (ECZM) Wildlife Population Health (WPH) names and residency training sites	26
Appendix 3: European College of Zoological Medicine (ECZM) Wildlife Population Health (WPH) self-assessment checklist for reapproval of residency training sites	27
Annex 1	33
Annex 2	34
Annex 3	35

Chapter 1: Introduction

The European College of Zoological Medicine (ECZM) consists of five specialties:

- Avian Medicine and Surgery
- Herpetological Medicine and Surgery
- Small Mammal Medicine and Surgery
- Wildlife Population Health
- Zoo Health Management

Wildlife Population Health (WPH) as a specialty is not clinically orientated but instead has an emphasis on **wildlife population medicine** and **One Health** including:

- Disease management and prevention
- Health and disease surveillance
- Disease and outbreak investigation
- Epidemiology
- Assessment of causes of wildlife population decreases

WPH therefore encompasses all aspects related to the health of wildlife populations. Whilst many of the objectives of WPH are shared with other ECZM specialties, it must be recognised that there is minimal emphasis on clinical medicine.

This Policies & Procedures, Part 2: Wildlife Population Health Specialty document contains information about requirements for admission to the ECZM, application and examination procedures, the WPH reading list (Appendix 1) as well as details regarding the WPH specialty.

Chapter 2: Wildlife Population Health (WPH) members of the European College of Zoological Medicine (ECZM) committees

The WPH diplomates shall be represented on all seven of the ECZM committees with the minimum number of diplomates as follows:

Executive Committee: 1 member (i.e., the WPH Specialty Chair)
Communication and Outreach Committee: 2 voting members
Credentials Committee: 2 voting members
Education and Residency Committee: 3 voting members
Examination Committee: 6 voting members
Nomination Committee: 1 voting member
Scientific Committee: 5 voting members

The WPH diplomates shall elect the members of all WPH committee members. Elections can take place any time throughout the year and are done using a simple majority vote. It is the responsibility of the WPH Specialty Chair to create and report the results of these votes.

All members of the Executive Committee are voting members. If more WPH diplomates join the other six committees, additional members will become non-voting members. It is up to the WPH members of each of such committee to decide who are the voting and non-voting members.

WPH members of each committee (excluding the Executive Committee) will decide on their lead person as the main contact person for other ECZM diplomates and residents to use. Each committee will confirm their lead person at the annual WPH specialty meeting. A list of committee leads can be found in Appendix 2.

The WPH members of the Scientific Committee are responsible for leading the WPH Reading List update each year. The work with the reading list update shall commence no later than January each year (i.e., approximately 4 months before the annual WPH specialty meeting). The WPH members of the Scientific Committee can construct a Reading List Working Group should they wish to do so. Regardless, the WPH members of the Scientific Committee need to ensure that WPH members of the Education and Residency and Examination Committees as well as minimum one residency supervisor and one WPH diplomate having passed the exam within the past 3 years are all consulted in the process with the reading list update. After an updated version of the reading list has been completed by WPH members of the Scientific Committee and/or the Reading List Working Group, the WPH members of the Scientific Committee shall circulate this updated version to all WPH diplomates for consultation at least 4 weeks before the annual WPH specialty meeting. Following this, all WPH diplomates can make suggestions to additional edits of the reading list. At the annual WPH specialty meeting, the new reading list will be voted on using simple majority vote.

Chapter 3: Requirements for admission to the European College of Zoological Medicine (ECZM) as a Wildlife Population Health (WPH) diplomate

The requirements for admission to the ECZM as a diplomate and being a specialist are specified in the Bylaws of the ECZM, in line with the Policies and Procedures of the European Board of Veterinary Specialisation (EBVS®). The requirements listed below are a condensed version of the ECZM Policies and Procedures, Part 1: General Information, chapter 4 and the requirements found in Article 4 in the ECZM Constitution.

WPH diplomates appointed by the ECZM are veterinarians who:

- Have demonstrated fitness and ability in WPH by meeting the established training and experience requirements as assessed by the ECZM, including publication requirements.
- Have attained acceptable scores in the WPH examination.
- Demonstrate moral and ethical standing in the profession and practice scientific, evidence-based veterinary medicine, which complies with animal welfare legislation.
- Participate in WPH for at least 60% of their working time, based on a 40-hour working week (i.e., >24 hours/week).
- Are re-evaluated every 5 years using a standard re-certification process.

Everyone who satisfies the above requirements shall be authorised to use the designation of “Diplomate of the European College of Zoological Medicine (Wildlife Population Health)” which may be abbreviated to “DipECZM (Wildlife Population Health)”.

An individual is also awarded, by the EBVS®, the title “EBVS® European Veterinary Specialist in Wildlife Population Health”, following successful re-evaluation every 5 years.

Each WPH diplomate is expected to actively participate in the scientific and business affairs of the ECZM.

Further information on specific requirements for prospective candidates **can** also be found in the ECZM Policies and Procedures, Part 1: General Information.

Chapter 4: Wildlife Population Health (WPH) residency programmes

A WPH residency programme, is a training programme allowing a graduate veterinarian ("Resident") to acquire in-depth knowledge of WPH and its supporting disciplines, as well as the execution of a research project, all under the supervision and guidance of one or more WPH diplomates.

The residency programme will focus on **WPH** and aims to:

- instil theoretical knowledge, applied practical skills and an ethical attitude in the practice of WPH.
- provide the Resident with the opportunity to pursue career goals in teaching, research, service, and/or specialty practice.
- prepare the candidate for the WPH examination.

A. General objectives of the WPH residency training programme

(i) Knowledge and skills concerning professional contacts and transfer of knowledge

A specialist in WPH must demonstrate:

- clear expression of thinking, in oral as well as in written form, in the English language
- an approach to problems in an analytic, scientific way to find solutions and be able to assign priorities for these
- the ability to organise work efficiently
- the ability to search the literature to find relevant information and evidence.
- the ability to give a structured scientific presentation with clarity

(ii) General knowledge and skills concerning the specialty

A specialist in WPH must demonstrate:

- the ability to assess the health of populations of free-ranging wild animals and the consequences of disease for the population, ecosystem, human health and the economy (i.e., One Health context)
- conformity to modern standards of skills and methodologies

(iii) Knowledge and skills concerned with obtaining help for problems that lie outside the specialty and/or facilities

The specialist in WPH shall:

- keep abreast of new developments in their specialty and become familiar with new methods, before applying these in practice
- understand the limitations of their specialty
- understand the possibilities that other specialties have to offer
- be familiar with the potential of, and be actively involved in, multidisciplinary co-operation.

(iv) Knowledge and skills concerned with working as a professional specialist

A specialist should have extensive practical experience within the specialty. Through experience, the specialist should have developed the self-confidence, self-criticism and sense of responsibility that are essential for the practice of the specialty.

(v) Knowledge and skills concerned with the general practice of WPH

The specialist in WPH should:

- recognise, investigate and resolve issues as they occur in animal and human populations and the environment as related to the specialty
- perform procedures and investigations according to the principles of good veterinary practice
- cooperate with specialists and colleagues in other clinical and related disciplines to the benefit of human and animal population health and welfare
- contribute to the development and application of concepts and methods in WPH

B. Detailed objectives of the WPH residency training programme

It is not possible to be prescriptive regarding the exact quantity of training required in each of the following areas as each training programme will be uniquely tailored to the possibilities of the residency site as well as the resident. However, at least 15% of the resident's time should be spent on **each** of the first four sections and at least 20% on the fifth section (research), with the remaining 20% allocated according to the resident's particular interests and training requirements.

(i) Wildlife population medicine and One Health

1. Know the concepts, principles and application of epidemiology that apply to wildlife disease management. Attendance and satisfactory completion of a course on the principles of epidemiology is strongly encouraged as part of the residency training programme.
2. Demonstrate a critical understanding of how taxonomy, geographical distribution, and natural history of free-ranging wildlife species affect susceptibility to, and the epidemiology of diseases.
3. Understand the ecological context of health, including disease transmission at the wildlife/livestock/human interface (i.e., One Health context), and the role wildlife veterinarians play in the prevention of disease transmission.
4. Be able to conduct a qualitative risk analysis (hazard identification, risk assessment, risk management and risk communication) of wildlife diseases. Understand the concepts of quantitative risk assessment.
5. Understand how infections, toxins or other anthropogenic threats can impact on wildlife populations and how this can be measured in free-ranging populations.
6. Be familiar with disease modelling techniques and the interpretation of disease models.
7. Have knowledge of the major diseases (aetiology, epidemiology, pathology, diagnosis, treatment and control) of invertebrates, fish, amphibians, reptiles, birds and mammals. It is not sufficient to know only the pathogens responsible for disease but it is also important to have knowledge of which diseases occur more commonly in these groups of free-ranging wild animals. WPH specialists need to know the gross lesions produced by these diseases and to realise that a specific diagnosis can only be confirmed by using appropriate laboratory techniques.
8. Understand the role of wildlife in the epidemiology of new and emerging or re-emerging diseases; understand the differences between detection of these diseases and endemic wildlife diseases and be able to design suitable methods to detect them.
9. Have a conceptual understanding of the societal role and the responsibilities of the specialist with regard to his or her colleagues, public health and environmental issues, wild animals together with their habitats and the environment and also to be able to express and support views on current issues relevant to this field of knowledge.

(ii) Wildlife pathology and disease investigation

1. Have a critical understanding of the aetiology, epidemiology, diagnosis and control of infectious and non-infectious diseases of wildlife populations, both monofactorial and multifactorial in nature.
2. Be able to perform gross necropsies on wild invertebrates, fish, amphibians, reptiles, birds, and mammals, and be able to recognise the important lesions, and interpret gross findings.
3. Be able to undertake additional laboratory diagnostics including basic cytology and histology.

4. Understand the appropriate use of diagnostic testing, including PCR, ELISA, serology, microbiology, toxicology and other tests. Understand the limitations of these tests, be able to interpret them and advise on the appropriate use of diagnostic tests to detect infectious agents, and to diagnose wildlife disease.
5. Know how to conduct an appropriate health and safety risk assessment and how to use personal protective equipment to ensure human safety when carrying out sampling and postmortem examinations of wild animals.
6. Demonstrate a critical understanding of the common toxins, environmental contaminants and other impacts as well as habitat loss and food depletion, which are most likely to affect free-living wild animals. Know the clinical signs these toxic materials and other insults produce and be familiar with differential diagnoses. Know which body tissues and specimens are required by a laboratory for the identification of the contaminant or poison. It is important that the specialist is adept at gathering information and evidence in cases of poisoning.

(iii) Wildlife disease surveillance and preventive medicine

1. Be able to design a preventive medicine programme, e.g. for a rehabilitation facility, a conservation translocation project such as a re-introduction project.
2. Understand and implement the IUCN guidelines relating to conservation interventions and disease management in a pragmatic and cost-effective manner.
3. Understand and advise on the health components of sustainable use of wildlife, including hunting and fishing, with particular emphasis on zoonotic and foodborne risks to humans.
4. Be able to advise on a biosecurity programme for livestock keepers using knowledge of wildlife ecology and disease to reduce the risks for disease transmission between livestock and wildlife.
5. Understand the disease risks of wild animal translocations and methods to assess and ameliorate these risks
6. Be familiar with the concepts of disease surveillance design, setting objectives, and evaluation of surveillance systems. Be able to demonstrate experience in applying these processes.
7. Understand the different methods possible for free-ranging wild animal disease surveillance and monitoring at a local, national and international level including structures and organisations in place to achieve these aims.
8. Understand the potential role of wildlife in disease outbreaks particularly of notifiable, exotic and zoonotic disease, be able to provide advice and recommendations to policy makers and contribute to contingency planning.
9. Understand the application of telemetry, tracking and Geographic Information Systems with regard to wildlife disease surveillance, control and prevention, and a basic understanding of the statistical analysis of spatial data.

(iv) Wildlife medicine

1. Possess knowledge of how anatomical, physiological and immunological differences between free-ranging wild animals can influence their health and susceptibility to disease.
2. Show an understanding of the benefits and risks of managing free-ranging wild animals for conservation or disease control purposes, for example in supplementary feeding.
3. A critical understanding of available diagnostic tests and the interpretation of results for common diseases in wildlife.
4. Knowledge of the principles of population medication in free-ranging wild animals. This includes knowledge of the pharmacokinetics and the bioavailability of drugs that are suitable for treatment, and the various methods of administration.
5. It is necessary to have a general knowledge of the legislation relevant to WPH, and to have a detailed knowledge of the legislation relating to the role of the veterinary practitioner in the field (e.g. CITES, legislation with regard to import and export of animals, animal welfare, legislation on hunting and capture from the wild, the use of drugs and immunobiologicals, legal aspects of

supplementary feeding and treatment of free-ranging wild animals).

6. Know the techniques and equipment used to physically restrain wild animals, and to be able to perform physical restraint of free-ranging wild fish, amphibians, reptiles, birds and mammals.
7. Know the principles of remote drug delivery devices and field anaesthesia techniques.
8. Know the wildlife trapping methods, equipment and how to perform live capture of wildlife.
9. Be able to perform and interpret appropriate diagnostic procedures such as haematology, radiography and endoscopy of wild fish, amphibians, reptiles, birds and mammals.
10. Perform and monitor both inhalation and injectable anaesthesia on free-ranging wild fish, amphibians, reptiles, birds and mammals, including appropriate anaesthetic monitoring.
11. Understand the medical and ethical issues regarding the treatment, rehabilitation and conservation of wildlife.
12. Know common methods of euthanasia used for wildlife species.
13. Demonstrate competency in the above points through keeping a record book of experiences and training, and submitting reports on specific research undertaken as part of the residency.

(v) *Research studies*

1. Understand how to design research projects, both in the laboratory and in field situations.
2. Understand, and be able to conduct and interpret, relevant basic statistical techniques.
3. Know how to appropriately collect and process data, recognising its limitations and quality. Be able to interpret data accurately.
4. Participate in public engagement activities to disseminate the results of research to a wider audience.

C. **WPH training programme description**

The Residency programme will focus on all aspects of WPH specialty and be supervised by a Diplomat of that specialty.

(i) *Prerequisites for specialty training*

Details of the training required prior to undertaking a residency programme can be found in ECZM Policies and Procedures, Part 1: General Information, section 5.2.

In summary, this first period must be a one year rotating multi-disciplinary internship (in any species) or 2 years in general practice. This period of training must be approved by the Education and Residency Committee prior to starting a residency training programme, but *pre-approval* of this training period is not required.

(ii) *Residency programme description*

A second period shall comprise a three-year (minimum) postgraduate training programme (standard residency) or an alternate programme under supervision of a WPH Diplomat of ECZM. This period is designed to educate the resident primarily in the skills and science of WPH.

At least 60% of the 3-year programme must be spent on WPH focusing on free-ranging wildlife populations and One Health (and not exclusively clinical treatment of captive zoological species). The programme is divided into five training elements detailed in section B above. These may be undertaken at a single institution or may require time to be spent in partner institutions. Either route requires direct supervision from a WPH diplomat and collaborations need to be confirmed by letters in support of the residency training.

At least 20% of the residency programme must be off clinical duties. During this time, residents must fulfil their requirements for research, publications and speaking engagements.

The specific requirements for a standard residency programme or an alternate route can be found in the ECZM Policies and Procedures, Part 1: General Information, chapter 5 and in particular sections 5.3-5.6.

As stated in the ECZM Policies and Procedures, Part 1: General Information, chapter 5.7.3: “Approval of the training programme is valid for 5 years, after which re-evaluation is performed by the Education and Residency Committee”. The ECZM WPH self-assessment checklist for reapproval of residency training sites is presented in Appendix 2 and needs to be submitted electronically to the Education and Residency Committee Co-Chair in charge of residency programmes (eczm.residency@gmail.com) with a cover letter explaining how the programme has evolved over the past 5 years, if there were any changes and the reasons behind any potential changes.

D. Facilities, services, and equipment required in a WPH residency programme

- (i) *Library: a library containing recent textbooks and current journals relating to WPH, its supporting disciplines (working collection), and full access to all core items on the WPH reading list must be immediately accessible to the residents.*
- (ii) *Access to appropriate computer hardware, software and other information technology as needed.*
- (iii) *Pathology services must be available during the pathology and disease investigation training element*
 - a. Clinical pathology: a clinical pathology laboratory for haematology, clinical chemistry, microbiology, and cytological diagnosis must be available. Clinical pathology reports must be retained and be retrievable.
 - b. Morphologic pathology: a separate room for gross pathologic examination must be available. Facilities for histopathological examination of necropsy tissues must be made available. Anatomic pathology reports must be retained and be retrievable.

E. Documentation

The performance of the resident is formally monitored by the Education and Residency Committee (as detailed below). Each of the five training elements is assessed although it is accepted that, due to the structure of residency programmes, not all elements may be assessed on every occasion.

The resident is responsible for maintaining and timely submission of the reporting package to the Education and Residency Committee Co-Chair in charge of residents (eczm.edcom@gmail.com) as described in ECZM Policies and Procedures, Part 1: General Information, sections 5.6.

The WPH specialty is a non-clinical discipline and therefore follows the report submission frequency of 6-12-12 months (ECZM Policies and Procedures, Part 1: General Information, section 5.6.1). The reports and case logs must be maintained and submitted in the officially approved specialty report templates as described below. The necessary WPH documents for the resident to fill out will be shared with the resident at the start of a residency programme by the Education and Residency Co-Chair in charge of resident.

- (i) *Resident activity report (Word file)*

The resident activity report should contain an extensive summary (e.g., incl. background context, skills learned etc.) of all work undertaken in *wildlife disease surveillance, preventive medicine, wildlife population medicine and One Health* since the last submitted reporting package. The resident activity report should be a separate Word document in the range of 1000-2000 words, excluding references.

One activity report should be submitted with every reporting package (i.e. report submission frequency of 6-6-12-12 months).

Case report Excel file:

(ii) *Projects and special activities log*

This log should list all projects and special activities undertaken during the residency and if these are intended for publication (including topics such as wildlife disease surveillance, preventive medicine, wildlife population medicine, One Health). The topic of the publication counting as original research/investigative project conducted (mainly) during the residency needs to be mentioned in here.

(iii) *Wildlife pathology log*

Over the course of the residency, at least 100 post-mortem examinations must be conducted, which must include representation across the following taxa: mammals, birds, reptiles, amphibians, fish and invertebrates. There is a minimum requirement of at least five (5) examples per each of these taxa. The wildlife disease and pathology log should contain consecutive numbered cases with signalment, date, (case) history, investigation undertaken, postmortem findings, diagnosis, differential diagnosis and interpretation of the findings. Besides gross pathology, histo(patho)logy, microbiology (including bacteriology, mycology and virology), molecular biology, other investigations such as parasitology and toxicology are listed as further examinations. In at least 50 cases, histology and/or at least one further examination for the detection of pathogens, such as microbiology, parasitology or toxicology, need to be performed and addressed in the case log. In a separate column the resident must critically discuss the case including the performed diagnostic procedure and its limitations. It should detail if the resident was the primary investigator or the level of supervision provided. All cases should be discussed with the supervisor of the programme.

(iv) *Wildlife interventions log*

Over the course of the residency, interventions (e.g. captures, anaesthetic procedures, sampling procedures) on at least 50 individual live animals must be conducted, which must include representation across all taxa (mammals, birds, reptiles, amphibians, fish and invertebrates). This log should contain consecutive numbered cases including date, identification/signalment, (case) history/project background, presenting signs, presumptive clinical diagnosis, clinical differential diagnosis, capture &/or immobilisation procedure, anaesthetic protocol, diagnostic testing, diagnostic results, final diagnosis, and fate/ongoing plan. The wildlife interventions activity log should detail whether the resident was the primary veterinarian or assisting a senior colleague. All cases should be discussed with the supervisor of the programme.

(v) *Resident activity log*

The resident activity log should list the conferences, seminars and lectures attended and the presentations given at wildlife health and disease conferences and other professional meetings, as well as the status of peer reviewed publications.

(vi) *Resident progress report*

This Progress Report contains a summary of the resident's activity throughout the residency period and includes an up-to-date overview of the residency, including the level of supervision, total number of cases seen so far, days of specialist training that have been completed in the various disciplines, hours of completed CPD, number of international conferences attended and progress with regard to the research

project, number of publications in peer-reviewed journals and presentations/lectures. The Progress Report contains all residency periods in different tabs and is to be maintained as one consecutive document, following each approval of the Education and Residency Committee. Feedback on progress and concerns arising from the case log review will be included in this log and should be acknowledged by the resident and supervisor for quality assurance of the programme and the success of the resident.

(vii) Supervisor progress report

The Resident Supervisor will submit a Supervisor Progress Report to the Education and Residency Committee, in which the Supervisor states that he/she has seen and verified the case log submitted by the Resident, as well as his/her expectations regarding completion of the residency and additional concerns and/or actions to be taken.

In addition, the resident is required to complete an annual **Residency Evaluation Form**. This is submitted to the Chair of the Education and Residency Committee, and gives the resident an opportunity to evaluate the residency programme they are taking part in. The information is strictly confidential and if problems are raised, the Chair will contact the resident privately to discuss things further.

Residents must meet with the programme supervisor at least twice yearly for evaluation of performance and progress. When the resident has multiple supervisors, this meeting should be preceded by a meeting among the supervisors. A protocol of these meetings is to be submitted with the reporting package to the Education and Residency Committee.

Late submission of reports may be subject to sanctions as detailed in ECZM Policies and Procedures, Part 1: General Information, section 5.6.3.

F. Research, publication and speaking requirements

(i) Publications:

- a. The resident must publish, within the 5 years preceding the examination, two (2) first author OR one (1) first author and two (2) co-authored publications relevant for WPH.
- b. One of the articles must be accepted for publication by and the other(s) at least submitted to peer-reviewed scientific journals (i.e., mentioned on the Science Citation Index-Expanded) by the examination credentialing deadline as evidenced by email/letter from the editor.
- c. The resident might have only one of the required articles accepted for publication at the time of sitting the exam. In this case, the other article(s) need to be published within 2 years following the first attempt to sit the exam. The successfully examined candidate will not gain diplomate status until the publication requirements have been fulfilled.
- d. The resident must complete at least one (1) investigative project that contributes to the advancement of WPH and results in the publication of a scientific peer-reviewed article where the resident must be first author. The resident must further complete either one (1) other first authored OR two (2) co-authored scientific peer-reviewed articles that can be original scientific research, case series or a single case report, which also must contribute to the advancement of WPH. A substantive part of the work with all articles must be undertaken during the WPH residency training programme.

First author co-authorships (joint first-author) between different residents will only be accepted under the condition that all first authors can demonstrate an equal contribution to the article and that they worked individually in different parts of the article, but that they present it in a single article in order to make the article stronger. Only one (1) joint first-author article can count as a

first-author article for Examination Credentialing purposes.

(ii) *Other requirements:*

- a. **Continuing Professional Development:** A minimum of fifty hours of formal continuing education is required per year. External continuing education may be within the local, regional, national or international meetings in the specialty. This may include participation in wet labs. All activities in this area must be recorded in the *research activity log*. Internal continuing education at the institution includes participation in journal clubs, case presentation seminars and wet labs which are organised as part of the residency.
- b. **Conferences Presentations:** The Resident must give at least **two (2)** presentations at appropriate scientific conferences, relevant to WPH over the course of the residency.
- c. **Seminars:** Present a minimum of **two (2)** one-hour seminars per year in a formal setting with attendance of other veterinarians. A seminar is defined as a scientific presentation which is followed by a discussion period.

Chapter 5: Examination credentialing and application procedure

A. Examination credentialing

The process, documentation, and deadlines required to credential to sit an ECZM examination are detailed in the ECZM Policies and Procedures, Part 1: General Information, chapter 6.

Listed below is a **summarised** version of that chapter with reference to specific the WPH specialty requirements. Applicants are advised to refer to **BOTH** these lists and to ECZM Policies and Procedures, Part 1: General Information, section 6.4. to submit a complete application for examination credentialing.

- **Covering Letter**
- **Curriculum Vitae**
- **Reference letter(s)** from the programme supervisor(s) of each institution involved in the residency training programme.
- **Residency documentation.** Either a residency completion letter signed by the Co-Chair of the Education and Residency Committee in charge of residents or if the residency training programme is not complete at the time of application, all case logs (i.e., projects and special activities log, wildlife disease and pathology log, wildlife interventions log, resident activity log) complete up to the time of application.
- **Publications.** At least two (2) first author OR one (1) first author and two (2) co-authored original peer-reviewed scientific articles in the field of WPH published in well-established internationally refereed scientific journals (i.e., mentioned in the Science Citation Index-Expanded).
 - The applicant must be the principal author of both articles and at least one (1) must be the result of an original research project.
 - Both the applicant and the residency supervisor(s) are responsible for getting all required articles published within the residency period. However, in case this is not possible, submitted manuscript(s) of the other publication(s) will allow the applicant to sit the WPH examination. A successfully examined candidate will hereafter only gain diplomate status when the publication requirements have been fulfilled (latest within 2 years following the first attempt to sit the exam). Therefore:
 - One of the articles must be at least fully accepted for publication as evidenced by a letter/email from the journal editor.
 - For the other article(s), at least the manuscript must be submitted for publication at the time of application for examination credentialing as evidenced by a letter/email from the journal editor.
- Any relevant previous correspondence relating to the training programme and application.
- Evidence of payment of ***Credentialing for Examination fee.***

The application materials must be arranged as detailed above and sent electronically to the ECZM Secretary before the deadline. Any subsequent correspondence should be through the Secretary unless advised otherwise. All submitted application materials become the sole property of the ECZM and will not be returned to the applicant.

B. Applying for and sitting the examination

The WPH examination and application process, follows the general format of all ECZM examinations as detailed in ECZM Policies and Procedures, Part 1: General Information, chapter 7. Candidates are advised to read that chapter alongside this section, so they are fully informed about all aspects of the application and examination.

The WPH examination will aim to test all aspects of WPH. It will be composed of two sections:

(i) *Written section containing multiple choice questions (MCQs)*

The WPH exam has a total of 175 multiple choice questions (MCQs). In this section, each MCQ is worth 1 point. The pass mark is 65%. Each MCQ consists of two parts: the stem and the responses. The stem is the introductory statement or question. The responses are suggested answers that complete the statement or answer the question asked in the stem. For each question, there is 1 correct response and 4 distractors. The MCQ examination has a total duration of 4 hours.

(ii) *Practical/written section designed to test interpretive skills*

The second part is the practical/written part of the exam and contains 27 questions spread across 9 “stations”, with 3 separate questions at each station. The questions may be based on photographs or specimens related to the WPH specialty. The photographs or specimens may depict anatomical specimens, instruments, relevant diseases, pathological and histological specimens, or radiographs. Questions may use case/outbreak simulations or require practical application to a specific situation, for example, developing a disease risk assessment for a specific translocation. Each question will be read or shown to the candidate and 20 minutes will be given to answer before moving on. After all questions have been seen, a further review period of 20 minutes will be allowed, where the candidate can return to any station, before the exam papers are handed in to the examiner. Each question is worth 10 points (total available this section; 270 points). The pass mark is 65%.

(iii) *Exam blueprint*

The composition of the exam questions over the different disciplines/categories and taxa shall follow the “Exam blue print” presented here:

Table 1 – Distribution by category/disciplines

Topic category	Target % Approximate distribution	27 PQ Approximate distribution	150 MCQ Approximate distribution
Anaesthesia	15	4	20-25
Epidemiology	25	7	35-40
Infectious diseases	30	8	40-50
Non-infectious diseases	15	4	20-25
Other	15	4	20-25

Table 2 – Distribution by taxa

Taxon	Maximum distribution %
Avian	25
Herpetology	15
Terrestrial mammals	30
Marine mammals	15
Others	15
Multiple species	<i>Balance to 100</i>
	100

The integrity of the Diplomate status examination will be maintained by the European College of Zoological Medicine to ensure the validity of scores awarded to candidates.

Obligations for the successful examination candidate and requirements for re-application for an examination, along with all other policies and deadlines regarding the exam are found in the ECZM Policies and Procedures, Part 1: General Information, chapter 7.

Chapter 6: Wildlife Population Health (WPH) reading list

Residents should use a wide literature base to research subjects, critically analyse their findings, and distinguish between knowledge that has been established and where there are uncertainties and a need for further enquiry. The resident develops skills in the judgement of research validity (whether it used scientifically valid methods and interpreted the results and drew conclusions that are justifiable), and decision-making between important and unimportant information. To become aware of recent developments in the field, the aim should be to develop the ability to know where to look and how to search for relevant information using electronic databases, rather than dictation of a specific reading list. There are many potentially relevant books and journals published over a wide timeframe that make it impossible to list all of them.

Reference and learning materials are global in scope meaning Wildlife Population Health is not restricted to knowledge and expertise of European wildlife.

The **majority** of exam questions are based on the:

- Core list of books (relevant chapters where applicable).
- Core list of journals going back 5 years from 01 September to 31 August (e.g., for candidates sitting the exam in Spring 2026, the period for the journals would be 01 September 2020 to 31 August 2025). Only includes articles relevant to Wildlife Population Health.
- Core list of specified journal articles of particular relevance to Wildlife Population Health (which may come from any scientific journals and is not limited to the 5-year window mentioned above).

Exam questions may also be drawn from the additional lists of books and journals (only includes articles relevant to Wildlife Population Health published within the 5-year window mentioned above), but these will be in the **minority** (up to 10%).

As per the ECZM Policies and Procedures, Part 1: General Information document: *“The majority of examination questions will be referenced from the relevant specialty ECZM Reading List. However, a maximum of 3% of questions may be referenced from additional relevant resources where the subject matter is important and relevant to the specialty.*

Appendix 1: Wildlife Population Health (WPH) reading list

Core list of books:

Delahay, R.J., Smith, G.C., & Hutchings, M.R. 2009. <i>Management of Disease in Wild Mammals</i> . Springer.
IUCN/SSC 2013. <i>Guidelines for Reintroductions and Other Conservation Translocations</i> . Version 1.0. IUCN Species Survival Commission. https://portals.iucn.org/library/sites/library/files/documents/2013-009.pdf
Foufopoulos, J., Wobeser, G.A., & McCallum, H. 2022. <i>Infectious Disease Ecology and Conservation</i> . Oxford University Press.
Gavier-Widén, D., Duff, J.P., & Meredith A. 2012. <i>Infectious Diseases of Wild Mammals and Birds in Europe</i> . Wiley-Blackwell.
Jakob-Hoff, R.M., MacDiarmid, S.C., Lees, C., Miller, P.S., Travis, D., & Kock, R. 2014. <i>Manual of Procedures for Wildlife Disease Risk Analysis</i> . OIE. Published in association with the IUCN and the SSC. https://portals.iucn.org/library/node/43386
Jessup, D. A., & Radcliffe, R. W. 2023. <i>Wildlife Disease and Health in Conservation (Wildlife Management and Conservation)</i> . John Hopkins University Press. Only chapters 1-3, 5, 8 and 25. NEW BOOK – For the 2026 examination, this book is <u>additional</u> reading only
Miller, R.E., Lamberski, N., & Calle, P.P. 2019. <i>Fowler's Zoo and Wild Animal Medicine Current Therapy</i> , Volume 9. Saunders. Only the following chapters: 2-6, 9-11, 16-20, 27-30, 33-37, 39-46, 50-52, 55-58, 60-61, 64-65, 67, 69-70, 72, 74, 79-81, 84-85, 89, 91-92, 94-95, 100.
Miller, R.E., Lamberski N., & Calle, P.P. 2023. <i>Fowler's Zoo and Wild Animal Medicine Current Therapy</i> , Volume 10. Saunders. Only the following chapters: 9-12, 16-28, 51-56, 60-61, 64-67, 81, 83-87, 91, 98-99, 104.
Terio, K.A., McAloose, D., & St. Leger, J. 2025. <i>Pathology of Wildlife and Zoo Animals</i> . 2 nd Edition. Academic Press (publication due Aug 2025). NEW EDITION – For the 2026 examination, the 1st (2018) edition will be used instead
Thrusfield, M., & Christley, R. 2018. <i>Veterinary Epidemiology</i> . 4 th Edition. Wiley-Blackwell.
West, G., Heard, D., & Caulkett N. 2025. <i>Zoo Animal and Wildlife Immobilization and Anesthesia</i> . 3 rd Edition. Wiley-Blackwell. Only the following chapters: 1-22 NEW EDITION – For the 2026 examination, the 2nd (2014) edition will be used instead, for which only Part I is <u>core</u> reading; Part II (invertebrates, fish, reptiles, and amphibians) and Part III (bird anesthesia) are <u>additional</u> reading

Core list of journals (only articles relevant to Wildlife Population Health):

<i>Diseases of Aquatic Organisms</i>
<i>EcoHealth</i>
<i>European Journal of Wildlife Research</i>
<i>Journal of Wildlife Diseases</i>
<i>Journal of Zoo and Wildlife Medicine</i>

Core list of specified journal articles

- Awada, L., Tizzani, P., Noh, S. M., Ducrot, C., Ntsama, F., Caceres, P., Mapitse, N., & Chalvet-Monfray, K. 2018. Global dynamics of highly pathogenic avian influenza outbreaks in poultry between 2005 and 2016 — focus on distance and rate of spread. *Transboundary and Emerging Diseases*, 65(6), 2006-2016. <https://doi.org/10.1111/tbed.12986>
- Bean, A. G. D., Baker, M. L., Stewart, C. R., Cowled, C., Deffrasnes, C., Wang, L. F., & Lowenthal, J. W. 2013. Studying immunity to zoonotic diseases in the natural host — keeping it real. *Nature Reviews Immunology*, 13(12), 851–861. <https://doi.org/10.1038/nri3551>
- Beckmann, K. M., Cromie, R. L., Sainsbury, A.W., Hilton, G. M., Ewen, J. G., Soorae, P. S., & Kock, R. A. 2022. Wildlife health outcomes and opportunities in conservation translocations. *Ecological Solutions and Evidence*, 3, e12164. <https://doi.org/10.1002/2688-8319.12164>
- Boijesen, B., Uhlhorn, H., Ågren, E., & Höglund, J. 2017. Nodular onchocercosis in red deer (*Cervus elaphus*) in Sweden. *International Journal for Parasitology: Parasites and Wildlife*, 6(3), 340-343. <https://doi.org/10.1016/j.ijppaw.2017.09.003>
- Breed, D., Meyer, L. C. R., Stey, J. C. A., Goddard, A., Burroughs, R., Kohn, T. A. 2019. Conserving wildlife in a changing world: Understanding capture myopathy—a malignant outcome of stress during capture and translocation. *Conservation Physiology*, 7(1), co2027. <https://doi.org/10.1093/conphys/coz027>
- Byrne, A. W., Allen, A., Ciuti, S., Gormley, E., Kelly, D. J., Marks, N. J., Marples, N. M., Menzies, F., Montgomery, I., Newman, C., O'Hagan, M., Reid, N., Scantlebury, D. M., Stuart, P., & Tsai, M. 2024. Badger ecology, bovine tuberculosis, and population management: Lessons from the island of Ireland. *Transboundary and Emerging Diseases*. 2024:e8875146. <https://doi.org/10.1155/2024/8875146>
- Cãceres, P., Awada, L., Barboza, P., Lopez-Gatell, H., & Tizzani, P. 2017. The World Organisation for Animal Health and the World Health Organization: intergovernmental disease information and reporting systems and their role in early warning. *Revue Scientifique et Technique - Office International Des Epizooties*, 36(2), 539-548. <https://doi.org/10.20506/rst.36.2.2672>
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- Cárdenas, L., Awada, L., Tizzani, P., Cáceres, P., & Casal, J. 2019. Characterization and evolution of countries affected by bovine brucellosis (1996–2014). *Transboundary and Emerging Diseases*, 66(3), 1280-1290. <https://doi.org/10.1111/tbed.13144>
- Chiverton, L., Cromie, R., & Kock, R. 2022. European mammal exposure to lead from ammunition and fishing weight sources. *Heliyon*. <https://doi.org/10.1016/j.heliyon.2022.e10014>
- Chinnadurai, S. K., Strahl-Heldreth, D., Fiorello, C. V., & Harms, C. A. 2016. Best-practice guidelines for field-based surgery and anesthesia of free-ranging wildlife. I. Anesthesia and Analgesia. *Journal of Wildlife Diseases*, 52(2s), S14–S27. <https://doi.org/10.7589/52.2S.S14>

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Additional list of books:

<i>American Veterinary Medical Association. 2020. AVMA Guidelines for the Euthanasia of Animals: 2020 Edition. American Veterinary Medical Association. Available at: avma.org/euthanasia. Only Part I, Part II, and Section S7 of Part III.</i>
<i>Fairbrother A., Locke, L. N., Hoff, G. L. 1996. Noninfectious Diseases of Wildlife. 2nd Edition. Iowa State University Press. Only the following chapters: 4-6, 14, 15.</i>
<i>Fereidouni, S. 2024. Ecology of Wild Bird Diseases. Taylor & Francis</i>
<i>Gulland, F. M. D., Dierauf, L. A., & Whitman, K. L. 2018. CRC Handbook of Marine Mammal Medicine. CRC Press. Only chapters 1-10, 13-21, 26, 34.</i>
<i>Miller, R. E., Fowler, M. E. 2015. Fowler's Zoo and Wild Animal Medicine, Volume 8. Saunders. Only the following chapters: 1-64 (for these chapters, feeding and housing requirements are not required information).</i>
<i>Samuel, W. M., Pybus, M. J., & Kocan, A. A. 2001. Parasitic Diseases of Wild Mammals. 2nd Edition. Iowa State University Press.</i>
<i>Silvy, N. J. 2020. The Wildlife Techniques Manual. Volume 1: Research. Volume 2: Management. 8th Edition. Johns Hopkins University Press.</i>

Appendix 2: European College of Zoological Medicine (ECZM) Wildlife Population Health (WPH) names and residency training sites

As of 13 June 2025, the following WPH diplomates act as WPH leads of ECZM committees:

Communication and Outreach Committee: Carlo Citterio

Credentials Committee: Emmanuelle Gilot-Fromont

Education and Residency Committee: Lieze Rouffaer

Examination Committee: Luisa Fischer

Nomination Committee: Chris Walzer

Scientific Committee: Katie Beckmann

As of 01 May 2025, the WPH Diplomate-Resident liaison is Johan Espunyes.

The following eight WPH residency training sites are approved as of 01 January 2025:

Training site	Supervisor(s)
Ghent University, Belgium	An MARTEL
Royal Veterinary College/Institute of Zoology, London, United Kingdom	Julian DREWE Becki LAWSON
Swedish Veterinary Agency, Uppsala, Sweden	Caroline BRÖJER
Universitat Autònoma de Barcelona, Spain	Oscar CABEZÓN Rafael MOLINA-LÓPEZ
University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania	Andrei Daniel MIHALCA
University of Bern, Switzerland	Simone Roberto Rolando PISANO
University of Veterinary Medicine Hannover, Foundation, Germany	Stephanie GROSS Ursula SIEBERT
University of Zagreb, Croatia	Dean KONJEVIC

Appendix 3: European College of Zoological Medicine (ECZM) Wildlife Population Health (WPH) self-assessment checklist for reapproval of residency training sites

ECZM WPH self-assessment checklist for reapproval of residency training sites

Assessment of (site name):

Purpose of assessment (indicate which one applies for this assessment)

☐ re-assessment after 5 years

☐ re-assessment due to significant changes within the residency site (indicate which changes)

Date assessment conducted:

Assessors' names and affiliations:

Given the varied nature of a Wildlife Population Health Residencies not all of the clinical facilities mentioned may be available at the host institution. However, it is expected that residents have access to these facilities through collaborating institutions. Please state the name and contact details of individuals at collaborating institutions, whom the supervisor and/or resident could contact if these facilities were required in the attached form.

Pathology

Facilities

The resident should have **access to:**

- a separate **room for gross pathological examination** adhering to national standards and requirements.

Access at the (please indicate where the resident will have access):

☐ Residency site

☐ Cooperating institution (fill in the details in the attached form): n° on form:

- **facilities for histo(patho)logical examination**

Access at the:

☐ Residency site

☐ Cooperating institution (n° on form):

- a **laboratory for haematology and cytology** (incl. presence of microscope, staining facility,...)

Access at the:

- ☐ Residency site
☐ Cooperating institution (n° on form):

- a laboratory for **microbiology**

Access at the:

- ☐ Residency site
☐ Cooperating institution (n° on form):

- a laboratory for **toxicology**

Access at the:

- ☐ Residency site
☐ Cooperating institution (n° on form):

- **appropriate diagnostic testing** (e.g. ELISA, PCR)

Access at the:

- ☐ Residency site
☐ Cooperating institution (n° on form):

Comments:

Pathology case load

Please indicate the average **number** of wildlife pathology cases **per taxon per year over the past 5 years** and whether these cases have been attained through the **regular work** at the facility or, if applicable, were organised specifically for the resident in order to fulfil the requirements.

Taxon	Regular work at the Residency facility	Specifically organised
Amphibians		
Birds		
Fish		
Invertebrates		
Mammals		
Reptiles		

Comments:

Pathology reports should provide sufficient information for completion of the resident's case log and must be retained and retrievable until successful completion of the residency.

N.B Throughout the residency, at least **100 post-mortem examinations** should be conducted, which should include representation across the following taxa: mammals, birds, reptiles, amphibians, fish & invertebrates.

Wildlife medicine

Wildlife medicine procedures (incl. WPH project-based cases) and case load

Please indicate whether facilities for the following procedures are available at your institution, through cooperating institutions (state the corresponding number on Annex 1), or not available and provide an estimate on the number of procedures performed per taxon per year over the past 5 years (e.g. none, 1-10 cases, 10-50 cases, >50 cases per year).

Example:

Anaesthesia:

☒ *Residency site: Amphibians: 1-10 cases per year, Birds: >50 cases per year, Reptiles: 10-50 cases per year*

☒ *Cooperating institution (n° on form): Fish: 10-50 cases (N°: 1), Invertebrates: > 50 cases (N°: 2)*

☒ *Not available: Mammals: none*

Anaesthesia:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Remote drug administration/ immobilisation:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Surgery:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Physical restraint:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Trapping:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Radiography:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Ultrasonography:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Endoscopy:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

CT/MRI:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Sampling procedures (e.g. blood collection and analysis, faecal collection and analysis):

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Euthanasia:

☐ Residency site

☐ Cooperating institution (n° on form):

☐ Not available

Other:

☐ Residency site

☐ Cooperating institution (n° on form):

Comments:

By confirming the availability of facilities to perform the above procedures you confirm availability of all necessary equipment and an appropriate setup according to best practice guidelines. For example, facilities for surgical interventions would include the availability of appropriate instrumentation for the relevant diagnostic and surgical procedures, as well as appropriate equipment for cleaning and disinfection (e.g. steam or heat sterilisation) of instrumentation and supplies or the usage of non-reusable material.

Photographic equipment for case and incident documentation must be available.

Procedural reports should allow for sufficient information for the resident's medicine case log and must be retained and retrievable until successful completion of the residency.

Throughout the residency, interventions (e.g. captures, anaesthetic procedures, sampling procedures) on at least **50 individual live animals** should be conducted according to **best veterinary practices**, which should include representation across the following taxa: mammals, birds, reptiles, amphibians, fish & invertebrates. If these requirements cannot be met through the institution's own work, the supervisor must ensure the resident(s) can fulfil these requirements through collaborating institutions.

Continuing Professional Development

Medical library

A library containing recent textbooks and journal access (physical or online) relating to wildlife must be accessible to the resident.

✓ Does the resident have access to all titles on the current reading list? (indicate how the journals and books are made available for the resident within Annex 2)

If not, please explain how this problem will be addressed.

Access to legislation about the role of the veterinary practitioner in the field (e.g. CITES, legislation about import and export of animals, animal welfare, legislation on hunting and capture from the wild, the use of drugs and immunobiologicals, legal aspects of supplementary feeding and treatment of free-ranging wild animals) should also be available.

Computer services

The resident should have access to appropriate computer hardware, software and other information technology as needed for the resident to fulfill all residency requirements.

List any electronic supplementary learning materials that the resident has access to (e.g. online learning modules, short courses, CPD):

Staff

The WPH resident should preferably work with multiple veterinarians and a range of other staff from disciplines related to WPH (e.g. veterinary technicians, biologists, microbiologists, epidemiologists, pathologists, animal keepers)

Briefly describe the roles of staff involved in resident training and, if appropriate, their particular areas of expertise. (Please add extra lines for more disciplines, if necessary)

Staff	Area of expertise	Involvement in residency training
<i>Example: Pathologists (5 persons), including 3 board-certified pathologists</i>	<i>Forensic wildlife pathology (2 persons), amphibians reptiles and fish (1 person), marine wildlife (1 person)</i>	<i>All will be involved in the residency training, either through direct assistance (2) or available for further questions and journal clubs (3)</i>

Name of supervisor:

Current (re)certification status of the supervisor:.....

Address of training site:

Has the supervisor or training site changed since the last evaluation:

I, the responsible programme supervisor, attest that the above (incl. the annexes) is an accurate indication of the residency facilities, and that I will provide additional information or documentation as requested by the Education Committee.

Signed

Dated

Annex 1

Cooperating institutions:

Please fill in the details of the cooperating institutions (numbers related to the text above).

Please feel free to add extra institutions.

Number 1

Institution	
Contact person	
Research and training focus	
Covered taxa	
Contribution to the residency training	
Duration of the training period	
Further information	

Number 2

Institution	
Contact person	
Research and training focus	
Covered taxa	
Contribution to the residency training	
Duration of the training period	
Further information	

Annex 2

The content of the library must be in accordance with the latest approved WPH Reading list.

Annex 3

If the residency site has had previous residents over the past 5 years, please attach the curriculum(s) for each resident approved for your institution.

If previously mentioned collaborations/courses did not proceed, please explain why and which measures have been taken by the supervisor for the resident to be able to fulfill the residency programme.

I, the responsible programme supervisor, attest that the above annexes are correct, and will provide additional information or documentation as requested by the Education Committee.

Signed

Dated