European College of Zoological Medicine

POLICIES & PROCEDURES,

PART 2: WILDLIFE POPULATION HEALTH SPECIALTY

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The European College of Zoological Medicine (ECZM) recognizes five separate specialties under the ECZM umbrella; Avian, Herpetology, Small Mammal; Wildlife Population Health and Zoo Health Management.

The wildlife population specialty Policies & Procedures, Part 2 document follows the structurebelow:

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Chapter 1: Introduction

The specialty of Wildlife Population Health has an emphasis on ecosystem health and wildlife population medicine, including disease management and prevention, surveillance, outbreak investigation and epidemiology.

It is not clinically oriented but emphasizes on **ecosystem health** and **wildlife population medicine**, including:

- disease management and prevention
- health surveillance
- outbreak investigation
- epidemiology (with consideration of population estimates, habitat use, landscape structure and other ecological factors)
- assessment of causes of wildlife population decreases including assessing impact of human activities on wildlife populations

Wildlife Population Health is a discipline-related specialty. Whilst many of the objectives of the specialty are shared with the taxon-related specialties, it must be recognised that there is minimal emphasis on clinical medicine and the objectives are modified to reflect this difference.

The Policies and Procedures, Part 2 contains information about requirements for admission to theCollege, a profile of the specialties, and application and examination procedures.

Chapter 2: Requirements for admission to the European College of Zoological Medicine

The requirements for admission to the College as a Diplomate and being a Specialist are specified in the Bylaws of the College, in line with the Policies and Procedures determined by the EBVS. The requirements listed below are a condensed version Chapter 4 of the Policies and Procedures, Part 1: General Information and the requirements found in Article 4 in the ECZM Constitution.

Diplomates of the wildlife population health specialty appointed by the College are veterinarians who:

- Have demonstrated fitness and ability in wildlife population health by meeting the established training and experience requirements as assessed by the College, including publication requirements.

- Have attained acceptable scores in the wildlife population health examination.

- Demonstrate moral and ethical standing in the profession and practise scientific, evidence-based veterinary medicine, which complies with animal welfare legislation.

- Participate in wildlife population health for at least 60% of their 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.

Each individual who satisfies the above requirements shall be authorized to use the designation of Diplomate of the European College of Zoological Medicine (*Wildlife Population Health*), abbreviated to DipECZM (*Wildlife Population Health*). The individual is also awarded, by the EBVS, the title of European Veterinary Specialist™ in Wildlife Population Health, following successful re-evaluation every 5 years.

Each Diplomate is expected to actively participate in the scientific and business affairs of the College.

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

Chapter 3: Wildlife Population Health Residency Programmes

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

The residency programme will focus on **Wildlife Population Health** and aims to:

- instill theoretical knowledge, applied practical skills and an ethical attitude in the practice of wildlife population health.

- provide the Resident with the opportunity to pursue career goals in teaching, research, service, and/or specialty practice.

- prepare the candidate for the wildlife population health examination.

A. General objectives of the Wildlife Population Health Residency Training Programme.

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

A specialist in Wildlife Population Health 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 organize 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 Wildlife Population Health must demonstrate:
- the ability to assess the health of populations of free-living wild animals and the consequences of disease for the population, ecosystem, human health and the economy
- 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 Wildlife Population Health 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 specialities 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 Wildlife Population Health.

The specialist in Wildlife Population Health should:

- recognise, investigate and resolve issues as they occur in animal and human populations and the environment as related to the speciality
- 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 Wildlife Population Health

B. Detailed objectives of the Wildlife Population Health 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 needs of the trainee. 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 and Ecosystem 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-living 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, and the role wildlife veterinarians play in the prevention of disease transmission.
4. Be able to conduct a qualitative risk analysis (risk 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-living 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-living wild animals. Wildlife Population Health specialists need to know the gross lesions produced by these diseases and to realize 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-emergingdiseases; 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 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 ELISA, PCR, serology 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 post mortem 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 program, e.g. for a rehabilitation facility, a translocation project or a re-introduction project.
2. Understand and implement the IUCN guidelines relating to conservation interventions in a pragmatic and cost effective manner.
3. Understand and advise on the health components of sustainable use of wildlife, includinghunting 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 reintroduction 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-living 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-living wild animals can influence their health and susceptibility to disease.
2. Show an understanding of the benefits and risks of managing free-living 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-living wild animals. This includes knowledge of the pharmacokinetics and the bioavailability of drugs which are suitable for treatment and also the various methods of administration.
5. It is necessary to have a general knowledge of the legislation relevant to Wildlife Population Health 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-living wild animals).
6. Know the techniques and equipment used to physically restrain wild animals, and to be able to perform physical restraint of free-living wild 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 diagnostic procedures such as haematology, radiography and endoscopy of wild reptiles, birds and mammals.
10. Perform and monitor both inhalation and injectable anaesthesia on free-living wild 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. Wildife Population Health Training Programme Description

The Residency programme will focus on all aspects of Wildlife Population Health specialty and be supervised by a Diplomate of that specialty.

Prerequisites for specialty training

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

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

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 wildlife population health Diplomate of ECZM. This period is designed to educate the resident primarily in the art and science of wildlife population health.

At least 60% of the 3 year programme must be spent on wildlife population health focusing on free-living wildlife populations and ecosystem health (and not 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 Diplomate in Wildlife Population Health.

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 chapter 5 of the Policies and Procedures, Part 1: General Information and, in particular sections 5.3 – 5.6.

D. Facilities, services, and equipment required in wildlife population health residency programme.

A. Library: a library containing recent textbooks and current journals relating to wildlife population health and its supporting disciplines must be immediately accessible to the programme participants (working collection).

B. Access to appropriate computer hardware, software and other information technology as needed.

C. Pathology services must be available during the Pathology and Disease Investigation training element

(i) 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.

(ii) Morphologic pathology: a separate room for gross pathologic examination must be available. Facilities for histopathological examination of necropsy tissues must be 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 will be assessed on every occasion.

The resident is responsible for maintaining and timely submission of the reporting package to the Education and Residency Committee as described in Policies and Procedures; Part 1, sections 5.6.

The wildlife population health specialty is a non-clinical residency program and therefore follows the report submission frequency of 6-6-12-12 months (Policies and Procedures: Part 1, section 5.6.1). The reports must be maintained and submitted in the officially approved specialty report templates

as described below. A set of wildlife population health case log documents is available on the website.

1. Resident's Activity Summary

A Resident's Activity Summary should contain summaries of work undertaken in *Wildlife Disease Surveillance* and *Preventive Medicine and Wildlife Population Medicine and Ecosystem Health*. Two reports (between 1,000 and 2,000 words per report) should be submitted every six months.

2. Wildlife Medicine Activity Log

Over the course of the residency, interventions (e.g. captures, anaesthetic procedures, sampling procedures) on at least 50 individual live animals should be conducted, which should include representation across all taxa (mammals, birds, reptiles, amphibians, fish & invertebrates). The Resident's Wildlife Medicine Activity Log should detail whether the resident was the primary veterinarian or assisting a senior colleague.

3. Pathology and Disease Investigation Activity Log

Over the course of 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. The Resident's Pathology and Disease Investigation Activity Log should contain signalment, date, investigation undertaken, post mortem diagnosis and interpretation of the findings. It should detail if the resident was the primary investigator or the level of supervision provided.

4. Research Activity Log

The Resident's Research Activity Log should list the conferences, seminars and lectures attended and the presentations given at wildlife health and disease conferences and other professional meetings.

5. 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 % 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 andprogress with regard to the research project, number of publications in peer-reviewed journals and presentations/lectures.

6. **Supervisor Progress Report**

Similar to the Resident, the Resident Supervisor will also 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 with regardto 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.

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

F. Research, Publication and Speaking Requirements

Publications:

(i) The resident must complete at least one (1) investigative project that contributes to the advancement of wildlife population health. The resident must be first author and have the work accepted for publication in a peer reviewed well-established internationally refereed scientific journal (i.e. mentioned in the Science Citation Index or in the reading list of the smallmammal specialty) prior to sitting the examination.

(ii) The resident must complete at least one (1) additional paper that also should be accepted for publication, and can be original scientific research, a case series or a single case report. The resident must also be the first author of this paper.

Other requirements:

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.

Conferences Presentations: The Resident must give at least **two (2)** presentations at appropriate scientific conferences, relevant to wildlife population health over the course of the residency

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 4: Examination Credentialing and Application Procedure

Examination Credentialing

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

Listed below is a **summarized** version of that section with reference to specific the wildlife population health specialty requirements. Applicants are advised to refer to **BOTH** this list and section 6.4. of the Policies and Procedures, Part 1: General Information, in order 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 training programme.
- **Documentation logs**. For wildlife population health these include *Resident's Activity Summary, Wildlife Medicine Activity Log, Pathology Disease and Investigation Activity Log,* and *Research Activity Log.* If the training programme is not yet finished, then the logs must be complete up to the time of application.
- **Publications**. At least two (2) original peer reviewed papers in the field of wildlife population health, published in a well established internationally refereed scientific journal (i.e. mentioned in the Science Citation Index or on the avian specialty reading list). With **both** of these papers the applicant must be the principal author and **one** must be the result of an original research project. Publications must be already published or fully accepted for publication as evidenced by a letter from the 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.

Applying for and sitting the examination

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

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

1. Written section containing multiple choice questions

ECZM wishes to harmonize the exam structure across specialties and has proposed that all exams shall have a total of 175 multiple-choice questions. A transition process is therefore agreed for the WPH exam which will contain in 2021-125 questions, in 2022-150 question and from 2023 onwards 175

questions. In this section each multiple-choice questions is worth one point (total available this section; 125 points in 2021; 150 points in 2022 and 175 points in 2023). The pass mark is 65%. Each multiple-choice question 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 one correct response and 4 distractors. The MCQ examination is 3 hours in duration only, with no additional perusal time in 2021 and will increase to 3,5 hours in 2022 and 4 hours from 2023 onwards.

2. 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 Wildlife Population Health 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%.

The integrity of the Diplomate status examination will be maintained by the European College ofZoological Medicine to insure 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 polices and deadlines regarding the exam are found in **Chapter 7** of the Policies and Procedures, Part 1: General Information.

Chapter 5: Wildlife Population Health Approved Residency Training Sites

Faculty of Veterinary Medicine, Ghent University, Merelbeke, **Belgium**
Supervisor: An Martel
An.Martel@UGent.be

University of Veterinary Medicine, Hannover, **Germany** and University of Aarhus, **Denmark**
Supervisor: Ursula Siebert and Christian Sonne
Ursula.Siebert@tiho-hannover.de; cs@bios.au.dk

Clinic for Birds, Reptiles, Amphibians and Fish, Justus-Liebig-Universität Giessen, **Germany**
Supervisor: Michael Lierz
Michael.Lierz@vetmed.uni-giessen.de

Department for Game Biology, Pathology and Breeding, University of Zagreb, Zagreb, **Croatia**
Supervisor: Dean Konjevic
dean.konjevic@vef.hr

Institute of Zoology, Zoological Society of London and Royal Veterinary College, London, **United Kingdom**
Supervisor: Becki Lawson and Julian Drewe
jdrewe@rvc.ac.uk becki.lawson@ioz.ac.uk

Centre for Fish and Wildlife Health, Vetsuisse Faculty Bern, Bern, **Switzerland**
Supervisor: Marie-Pierre Ryser-Degiorgis
marie-pierre.ryser@vetsuisse.unibe.ch

Faculty of Veterinary Medicine, Autonomous University of Barcelona**, Spain**
Supervisor: Oscar Cabezon Ponsoda
ocabezon@yahoo.com

Centro de Recuperación de Fauna Salvaje de Torreferrusa, Barcelona**, Spain**
Supervisor: Rafael Molina López
rafael.molina@gencat.cat

Chapter 6: Wildlife Population Health 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 journals and books published over a wide timeframe that make it impossible to list all of them.
Reference and learning materials are global in scope – we are a European College, but that does not restrict our knowledge and expertise to European wildlife.

The **majority** of exam questions are based on the:
1. core list of books (relevant chapters where applicable),
2. core list of journals (going back 5 years from September 1st to August 31st e.g. e.g. for a resident sitting the exam in Spring 2021, the period for the journals would be September 1st 2015 to August 31st 2020.),
3. core list of specified journal articles of particular relevance to Wildlife Population Health (which may come from the additional list or other journals and is not limited to the 5-year window).

Exam questions may also be drawn from the 'Additional' list of books/journals but these will be in the **minority** (up to 10%).

As per the ECZM POLICIES & PROCEDURES, PART 1: GENERAL INFORMATION UPDATED OCTOBER 2016 7.3.
The majority of examination questions will be referenced from the relevant specialty ECZM Reading List. However, occasional questions may be referenced from additional relevant resources where the subject matter is important and relevant to the specialty.

Journals: (only publications relevant to Wildlife Population Health):

Journal title	CORE or ADDITIONAL
Diseases of Aquatic Organisms	CORE
European Journal of Wildlife Research	CORE
EcoHealth	CORE
Journal of Wildlife Diseases	CORE
Journal of Zoo and Wildlife Medicine	CORE
Conservation Biology	ADDITIONAL
Conservation Physiology	ADDITIONAL
Emerging Infectious Diseases	ADDITIONAL
International Journal for Parasitology: Parasites and Wildlife	ADDITIONAL
Journal of Wildlife Management	ADDITIONAL
OIE Revue Scientifique et Technique	ADDITIONAL
Nature	ADDITIONAL
Nature Communications	ADDITIONAL
PLoS ONE	ADDITIONAL
PNAS	ADDITIONAL
Science	ADDITIONAL
Scientific Reports	ADDITIONAL
Transboundary and Emerging Diseases	ADDITIONAL
Veterinary Pathology	ADDITIONAL
Wildlife Research	ADDITIONAL

Books:

Book title	CORE OR ADDITIONAL
Delahay, R., Smith, G., Hutchings, M. 2009. Management of disease in Wild Mammals. Springer pp 1-300	CORE
Fairbrother, A., Locke, L.N., Hoff, G.L. (eds.). 1996. Noninfectious Diseases of Wildlife, 2nd ed. Iowa State University Press, Ames, Iowa. pp 1-219. *(Only following chapters: 1, 2, 4-15, 17)*	CORE
Fowler, M.E. (ed). 2011. Zoo and Wild Animal Medicine 7th edition, W.B. Saunders, Philadelphia. (*Only following chapters: 9, 18, 20, 28, 29, 30, 33, 38, 46, 51, 54, 59, 72, 83*)	CORE
Fowler, M.E. (ed). 2014. Zoo and Wild Animal Medicine, 8th edition, W.B. Saunders, Philadelphia. (*Only following chapters: 1-64 (for these chapters feeding and housing requirements are considered Additional information), 72-76)*	CORE
Gavier-Widen, D., Meredith, A., Duff, J.P. 2012. Infectious Diseases of Wild Mammals and Birds in Europe. Wiley-Blackwell pp 1-568.	CORE
Hudson, P., Rizzoli, A., Grenfell, B.T., Hesterbeek, H., Dobson, A.P. (2002) The Ecology of Wildlife Diseases. Oxford University Press pp. 1-218.	CORE
IUCN Manual of procedures for wildlife disease risk analysis. pp 1-143, IUCN-OIE, downloadable for free at https://portals.iucn.org/library/node/43386 pp 1-143.	CORE
IUCN Guidelines for reintroductions and other conservation translocations. pp 1 -72, downloadable for free at https://portals.iucn.org/library/efiles/documents/2013-009.pdf	CORE
Miller, E.R., Lamberski, N., Calle, P. (2018) Miller – Fowler's Zoo and Wild Animal Medicine Current Therapy, Volume 9. W.B. Saunders, Philadelphia. ("Only chapters 2-6, 9-11, 16-20, 27-30, 33-46, 50-52, 55-58, 60-61, 64-65, 67, 69-70, 72, 74, 79-81, 84-85, 89, 91-92, 94-95, 100")	CORE

Terio, K., McAloose, D., St. Leger, J. (Eds) (2018). Pathology of Wildlife and Zoo Animals. 1st Edition. Academic Press. Pp.1-1136.	CORE
Thrusfield, M., Christly, R. 2018. Veterinary Epidemiology Fourth Edition. Blackwell Publishing 1-841.	CORE
West, G., Heard, D, Caulkett, N. (eds). 2014. Zoo Animal and Wildlife Immobilization and Anesthesia. Blackwell Publishing. pp 1-968. (*Only chapters 1-13*)	CORE
Atkinson, C.T., Thomas, N.J., Hunter, D.B. (Eds.) 2008. Parasitic Diseases of Wild Birds. Blackwell Publishing. pp 1-484	ADDITIONAL
Aguirre AA, et al. (eds). 2012. New Directions in Conservation Medicine. Applied examples of ecological health. Oxford University Press, Inc., New York, NY. pp 1-672.	ADDTIONAL
AVMA Guidelines for the Euthanasia of Animals 2013, pp 1-103	ADDTIONAL
FAO. 2014. Risk-based disease surveillance – A manual for veterinarians on the design and analysis of surveillance for demonstration of freedom from disease. FAO Animal Production and Health Manual No. 17. Rome, Italy.	ADDTIONAL
Friend, M. 2006. Disease Emergence and Resurgence: The Wildlife-Human Connection. US Geological Survey. pp 1-357, downloadable for free at http://www.nwhc.usgs.gov/publications/disease_emergence/	ADDITIONAL
Friend, M., Franson, T.C. (eds). 1999. Field Manual of Wildlife Diseases: General Field Procedures and Diseases of Birds. U.S. Geological Survey. pp 1-426, downloadable for free at http://www.nwhc.usgs.gov/publications/field_manual/	ADDITIONAL
Gulland, F.M.D, Dierauf, L.A., Whitman, K.L. (2018) CRC Handbook of Marine Mammal Medicine. 3rd Edition. CRC Press. Pp.1-1124. (*Only chapters relevant to free-living wildlife*)	ADDITIONAL
Ladds P. (2009) Pathology of Australian Native Wildlife Pp.1-648	ADDTIONAL
Pfeiffer, D. U. 2009. Veterinary Epidemiology: An introduction, Wiley-Blackwell pp 1-150.	ADDITIONAL
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