STUDY GUIDE FOR THE

ONTARIO WILDLIFE REHABILITATION EXAM

A pre-requisite for applying to be a wildlife custodian under the Ontario *Fish and Wildlife Conservation Act*

JANUARY 2020

Ontario

The Ministry of Natural Resources and Forestry would like to acknowledge the contributions of Dr. Sherri Cox, DVM to the development of this study guide. Dr. Cox is a Wildlife Veterinarian, an Adjunct Professor at the University of Guelph, and the founder of the National Wildlife Centre.

Cette publication est disponible en francais. Pour obtenir de l'aide en francais, veuillex communiquer avec le Centre d'information et de soutien sur les ressources naturelles (CISRN) au 1-800-667-1940.

Photos: National Wildlife Centre

On the Cover: Examining the eyes of a Long-eared owl

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WHAT IS THE ONTARIO WILDLIFE REHABILITATION EXAM?

This study guide and 2 other documents are essential reading for those interested in the Wildlife Custodian Authorization to rehabilitate native wildlife in the province of Ontario. To legally practice wildlife rehabilitation in Ontario, you must apply for and receive this authorization. To qualify for a Wildlife Custodian Authorization, you must first take and pass the Ontario Wildlife Rehabilitation Exam (OWRE). There is no fee associated with taking the OWRE, or applying for or being issued a Wildlife Custodian Authorization.

This document and others will assist you in preparing to take the OWRE.

The OWRE has an optional rabies component which is required for any rehabilitator wishing to work with mammals. Any mammal could contract rabies, although it is more common in some species. Rabies is a serious concern in Ontario and we wish to properly test the knowledge of those who intend to handle mammals that may have been exposed to rabies. Furthermore, as potential wildlife custodians, you may be asked by members of the public about rabies in mammals. If you do not wish to be authorized to handle mammals, you do not need to complete that portion of the OWRE. However, you are encouraged to learn about rabies by reading the rabies and rabies vector species (RVS) chapter in this study guide. All people who practice wildlife rehabilitation may encounter situations where knowledge about rabies is helpful to their work.

Documents 1-3 must be studied to prepare for the OWRE, and are available from your local MNRF district office. Document 4 is essential reading for anyone doing wildlife rehabilitation:

1) **Study Guide for the Ontario Wildlife Rehabilitation Exam (this document)**
2) **Standard Conditions of a Wildlife Custodian Authorization in Ontario**
3) **Ontario Wildlife Rehabilitation Policy**
4) IWRC/NWRA Minimum Standards for Wildlife Rehabilitation

This study guide and the other documents can assist you in understanding what wildlife rehabilitation entails and help you decide whether or not you want to become involved in this demanding field, and in what capacity. You may already be volunteering with a wildlife custodian and have a sense of the difficult work and decisions involved in wildlife rehabilitation. You do not need to become a wildlife custodian to help wildlife - volunteering at an established facility is extremely valuable.

It is important to remember that the information in these study materials is just an **overview** of wildlife rehabilitation. This is not a wildlife rehabilitation course. The information contained in this document is meant to outline the basic concepts needed to acquire your authorization.

If you choose to apply for an authorization and become a wildlife custodian, you will need to learn much more than what are in these study materials. You can do this by reading more detailed materials, taking courses, going to conferences, practicing skills as a volunteer, and networking with wildlife custodians. It is highly recommended that you volunteer for a period of time with an experienced wildlife custodian prior to applying for a wildlife custodian authorization.

As you learn more about wildlife rehabilitation, remember that caution should be taken when obtaining information from the internet. Be sure the sources are reputable and the information is up to date. With incorrect information a wildlife custodian can significantly injure or kill an animal despite their good intentions.

If you do decide to apply for an authorization you may want to consider starting small. Many experienced wildlife custodians started with small facilities focused on only one or a few species. This allows for good care of wildlife while a person grows their experience and knowledge-base, and their network of other wildlife custodians.

Wildlife custodians continue developing their skills, no matter their level of expertise. Provincial, national and international rehabilitation organizations publish newsletters and journals, offer training courses (see Appendix 1), and sponsor conferences. Joining one of these organizations is one way for wildlife custodians to stay up to date on wildlife rehabilitation information and techniques.

By the end of this study guide, it is expected you will have a better understanding of:

1. knowledge required to pass the Ontario Wildlife Rehabilitation Exam
2. resources that may be helpful for those seeking more information
3. the role of wildlife custodians in Ontario
4. how wildlife rehabilitation is regulated in the province, and the required conditions of a wildlife custodian authorization
5. important considerations in the field of wildlife rehabilitation; including but not limited to rabies vector species, determining if an animal requires help, animals-in-care, euthanasia, release, public health and safety, and biosecurity

Preparing for the Ontario Wildlife Rehabilitation Examination (OWRE)

The OWRE consists of written multiple choice questions of a similar format to those presented in Appendix 2. You must be at least 19 years of age and reside in Ontario to take the OWRE. It is a 'closed-book' exam, and you must achieve a score of eighty percent (80%) or higher to pass. Each exam question has only one correct answer.

All questions will come from the following 3 documents, which are all available from your local MNRF district office:

- ✓ Study Guide for the Ontario Wildlife Rehabilitation Exam (this document)
- ✓ Ontario Wildlife Rehabilitation Policy
- ✓ Standard Conditions of a Wildlife Custodian Authorization in Ontario

Remember that if you plan to work with mammals the rabies portion of the OWRE is required. Please inform the exam proctor if you intend to complete this part of the examination.

If you plan to work with migratory birds please see Canadian Wildlife Service information on pg 12.

How can I find more information about becoming a wildlife custodian in Ontario?

- ✓ Your local MNRF office can assist you in finding a wildlife custodian in your area.
- ✓ You may want to volunteer with an existing wildlife custodian. Ask questions about the wildlife custodian's facilities, look at the kinds of reference books they have, and find out how they located veterinarians and who they turn to when questions arise. The hands-on experience will help you decide if you want to dedicate the time and effort to be a wildlife custodian.
- ✓ Attend a conference for wildlife custodians.
- ✓ Become a member of a rehabilitation organization and read their publications.
- ✓ Seek out wildlife rehabilitation courses that provide additional information and training on wildlife rehabilitation. Numerous organizations offer introductory courses in basic and advanced wildlife rehabilitation (see Appendix 1).

Should you have any questions regarding the materials you have been provided, please speak with your local MNRF district office.

INTRODUCTION TO WILDLIFE REHABILITATION

What is Wildlife Rehabilitation?

Wildlife rehabilitation is the keeping of injured, sick or immature (orphaned) wildlife in captivity on a temporary basis to restore or effectively condition the wild animal so it can be successfully returned to the wild. Medical treatment may be required, in particular for sick and injured wildlife. For rehabilitation to be deemed successful, released wildlife must be able to function successfully as **wild** animals. This functionality includes being able to recognize and obtain the appropriate foods, select mates of their own species and reproduce, and show the appropriate behaviour, including fear of potential dangers (eg. people, cars, cats, dogs, etc.).

✓ The ultimate goal of wildlife rehabilitation is to successfully return healthy wildlife back to the wild.

People who are authorized to do this work in Ontario are called wildlife custodians. They provide an important service to the people and wildlife of Ontario. The wildlife cared for by a wildlife custodian are not pets, and any interaction between wildlife and humans is minimal and only what is absolutely necessary to provide proper care. Wildlife custodians must ensure the animal does not become habituated or tame. No interaction should occur between domestic animals and wildlife undergoing rehabilitation. The ultimate goal of wildlife rehabilitation is to successfully return healthy wildlife back to the wild as quickly as possible.

Wildlife rehabilitation falls under section 44 of Ontario's Fish and Wildlife Conservation Act (FWCA). A wildlife custodian is defined as "*a person who may, under subsection (2), keep injured, sick or immature game wildlife or specially protected wildlife in captivity for the purpose of rehabilitating or caring for them.*"

Released wildlife must be able to function as wild animals:

✓ recognize and obtain appropriate foods
✓ select mates of their own species and reproduce
✓ show appropriate behaviour including fear of potential dangers

You can obtain a copy of the FWCA at the E-Laws website *https://www.ontario.ca/laws* or from your local MNRF district office.

To learn which species are considered game wildlife or specially protected wildlife please refer to the schedules in the back of the FWCA.

Who can Keep or Rehabilitate Wildlife?

- People who are transporting or keeping wildlife for **less than 24 hours** for the purpose of delivering the wildlife to a veterinarian or to a wildlife custodian can do so without an authorization.
- A **wildlife custodian** may house and provide rehabilitation or care to game wildlife or specially protected wildlife, as specified in the Fish and Wildlife Conservation Act.
- A **veterinarian** may temporarily house game or specially protected wildlife without a wildlife custodian authorization only for the purpose of providing medical care. They require a wildlife custodian authorization to house wildlife for the purposes of rehabilitating and releasing wildlife.

- A wildlife custodian may designate a **foster care giver** as a secondary caregiver to work under their authorization through a written agreement (form available from the MNRF district office). The wildlife custodian is responsible for providing training and necessary resources, is responsible for assessing wildlife both upon entry to care and prior to release, and must ensure all conditions of the wildlife custodian authorization are met.

Wildlife Custodians must:

- Ensure wildlife being brought into rehabilitation is in need of care. Many animals are captured with good intentions but are unnecessarily taken from their life in the wild.
- Keep and care only for wildlife that has a good chance of being successfully rehabilitated and released.
- Release wildlife as soon as the animal has a reasonable chance of survival (including physically, psychologically, and during the right time of year).
- Abide by the conditions of their Wildlife Custodian Authorization, and refer to the standard practices of the wildlife rehabilitation community as identified through documents such as the IWRC/NWRA *Minimum Standards for Wildlife Rehabilitation*.

Some Responsibilities of a Wildlife Custodian

ROLE	DESCRIPTION
Providing Rehabilitation and Care for Wildlife	Wildlife custodians provide places for the public to bring wildlife in need of medical and rehabilitative care. They work with veterinarians, public-health officials, wildlife biologists, law enforcement agents, humane societies, and wildlife control agents.
Educating the Public	As a wildlife custodian, one of your most important roles would be as an "Ambassador of Wildlife." What you say to the public, both on the phone and in person, may be crucial to the way a person views wild animals and conservation issues. Wildlife custodians take the opportunity to educate the public about wildlife biology, management and rehabilitation to the extent that they are able. For example, knowing that Ontario only has one native species of venomous snake (Massassauga Rattlesnake) is important to diffuse the fear that all snakes in the province are venomous. Wildlife custodians are not wildlife removal personnel. However, by giving the public biologically-sound information, they can help prevent animals from being injured or orphaned unnecessarily.

ROLE	DESCRIPTION
Recognizing Species at Risk in Ontario	A current listing of birds, mammals, fish, amphibians and reptiles that are at risk in the Province of Ontario can be found on the Government of Ontario species at risk website *ontario.ca/speciesatrisk*. You should learn to recognize species at risk (SAR) that you may work with because these are species that require special attention. If you were to receive a species that is on the list, your authorization would require that you notify your local MNRF district office within one working day. Information provided to the district office feeds into SAR research and recovery programs.
Recognizing Zoonotic Disease	A zoonotic disease is a disease transmissible from any other animal species to humans. Such diseases can be caused by bacteria, viruses, parasites, fungi, prions or any other agent. Examples include rabies, Highly Pathogenic Avian Influenza (HPAI), Severe Acute Respiratory Syndrome (SARS), and *Baylisascaris* (roundworm) parasite of raccoons to name a few. Wildlife custodians can play an important role in protecting public health by being alert to these diseases. In fact, some diseases are reportable in Ontario under the Health Protection and Promotion Act. The possibility of coming into contact with a potential zoonotic disease always exists when handling wild animals.

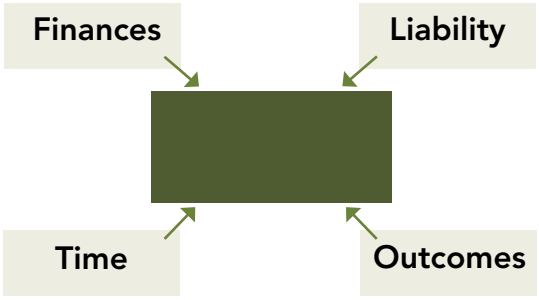
Important Information to Keep Easily Available

Knowing where to get information and help is an important part of being a successful wildlife custodian. All wildlife custodians should have the following contact information easily accessible:

- contact person at the local MNRF district office
- web address for the MNRF list of wildlife custodians
- veterinarians available to provide veterinary services to wildlife
- experienced wildlife custodians and their areas of expertise
- local animal control officers
- Ontario animal protection hotline 1-833-9-ANIMAL (264625)
- Public Health Unit
- police services office
- your physician and nearest emergency room
- Canadian Wildlife Health Cooperative (CWHC)

Considerations in Becoming a Wildlife Custodian

Although wildlife rehabilitation can be a very rewarding experience, it would create significant demands on your personal life. These need to be understood and appreciated before you become involved. To ensure that the rewards will outweigh the frustrations, it helps to have a realistic understanding of the responsibilities at the outset.



Competing Priorities

Time	Wildlife rehabilitation often takes much more time than you may expect. When you have wildlife in your care, you must be constantly attentive to their needs. For example, some nursing baby mammals need to be bottle-fed every few hours around the clock, and some nestling birds must be fed every 15 minutes throughout the day. The diets must be prepared, housing cleaned, cages built, water changed – then, it's time to feed them all again. If you were able to bring on volunteers, foster care givers or staff, you would be responsible for their actions. You would have to ensure they are properly trained and follow all conditions of the wildlife custodian authorization. Wildlife rehabilitation should be, in large part, preventive rehabilitation. Much of a wildlife custodian's telephone time may actually be spent trying to convince people not to interfere with wildlife (eg. determining if the baby bird is just fine, and therefore they should leave it alone). Educating on mitigating human-animal conflicts helps both people and animals (eg. put bird feeders away in the spring, make garbage cans inaccessible to deter raccoons, etc.). The actions of one wildlife custodian can reflect on all authorized wildlife custodians in the province. How you respond to the public and others in the wildlife rehabilitation community is important.
Finances	All expenses associated with wildlife rehabilitation are paid by the wildlife custodian. These costs can add up quickly to hundreds (if not thousands) of dollars per year. It includes buying food for the animals, caging or materials to build housing, special handling equipment and protective clothing, medications, vaccines (if the wildlife custodian chooses to provide such immunity), veterinary services, etc. There are also the costs associated with increased use of a car, telephone, electricity and other utilities. There are also expenses to buy reference books or acquire additional resources to find answers, and there are membership fees to join organizations and the costs of going to conferences. Many of the larger rehabilitation facilities solicit donations from people bringing in animals or try to get support from local civic groups, but very few wildlife custodians in North America receive enough in donations to cover their costs (let alone a salary or a wage).

Liability	If a wildlife custodian interacts with the public or has employees or volunteers (eg. Foster care givers), they must determine their liability and insurance requirements. The wildlife custodian is directly and solely responsible for ensuring that their volunteers, including foster care givers, comply with the conditions of the authorization. If one of your volunteers violates the conditions of authorization, know that it is you who would be charged, since they would be working under your authorization and your direct oversight. It is important to be aware that the Fish and Wildlife Conservation Act explicitly states in section 44(6) that the Crown has no liability for any act or omission of a wildlife custodian. It is strongly recommended that you ensure that you obtain insurance to protect you from liability. There are many situations in which you may be liable, for example an animal in your care injures someone or damages property, or advice you provide over the phone leads to a person being injured when attempting to capture an animal.
Outcome	While many wildlife custodians enter into this field to save wildlife, it is a reality that not all animals can be saved and euthanasia is sometimes the best option for the sick or injured animal to end its suffering. This is a tough but necessary part of wildlife rehabilitation. Would you be able to make this important decision and follow through to ensure the animal receives a humane death?

Setting Limits

An important consideration in wildlife rehabilitation is acknowledging limitations. When a wildlife custodian runs into something new they should ask other wildlife custodians and veterinarians with wildlife experience, and research expert resources from organizations like the IWRC and NWRA. Would you be prepared to create and nurture a network to assist you, and do the research needed to be an effective wildlife rehabilitator?

Financial and human resources must be considered. Would you be able to take 10 mammals, or 5 birds, or 20 turtles? Knowing what species and how many animals a facility can accept based on knowledge and experience, caging, and resources to care for the animals (time and financial) is the only way to provide the best care for wildlife. Wildlife custodians must set realistic limits and stick to them, and recognize that if they take in too many animals the quality of care will decrease.

Wildlife custodians must also consider geographical distances. If someone calls from across the province with an injured animal, are there resources to bring the animal to them? And will there be the resources to return it back to its point of origin when it is ready for release? Remember that in most cases, a wildlife custodian must return the animal back to where it originally came from.

What Is Best for the Animal?

It is important for all wildlife custodians to be realistic about what they have to offer, especially in the early stages of their practice. If an animal's injuries are beyond their skills, it would be in the animal's best interest to transfer the animal to someone with more experience and equipment. If cages lack the size or specialized features that are important for a particular type of animal, it might be better to send it to someone who has a better facility for that species. Particularly in dealing with endangered or threatened species, each wildlife custodian must consider whether another facility might be better equipped to maximize the chances of recovery for that individual animal.

Common and Rare Species

In most wildlife rehabilitation facilities, it is impossible to give the best possible care to every sick, injured or orphaned wild animal that is presented. As a wildlife custodian, you would have to decide which animals are likely to live and be released as healthy wild animals, given the skill, technology and resources you have at your disposal.

Inevitably, people working with wildlife become drawn into discussions of why one species is more "important" or "valuable" than another. Importance is, of course, a subjective term. These are indeed ethical debates. Some wildlife custodians believe that each living creature is equally important. Others might assign a low importance to non-native species such as the rock dove (pigeon) and European starling. But it can also be argued that, by honing one's techniques on more common species, one develops a high degree of skill that can be applied to rarer wildlife species.

Does wildlife rehabilitation consider individual animals or populations of animals?

Wildlife biologists view animals as members of dynamic and interacting populations. This view de-emphasizes the role of individual animals and focuses on preservation of quality habitat and genetically-viable populations. Conversely, some may focus on animals as individuals and that each individual animal is equally important.

Wildlife custodians should consider both the individual animal that they are rehabilitating and the potential impacts of their activities on the wider populations of wildlife in the wild. For example, it is important to follow protocols regarding quarantine and disinfection to prevent disease and parasite spread.

The majority of cases involving injury and death to individual wild animals do not impact on larger wildlife populations. However, large scale mortalities due to, for example, rabies, botulism, fowl cholera, highly pathogenic avian influenza (HPAI), or white nose syndrome (bats), can threaten entire local populations. The goal of wildlife rehabilitation is to help wildlife, and wildlife custodians must always consider and prevent actions that might hurt wildlife in the wild.

There is an increased interest in learning more about the fates of individual animals that have been rehabilitated and released. Techniques for marking and tracking rehabilitated wildlife range from simple (e.g., leg bands for birds) to complex (e.g., radio transmitting and receiving equipment), and all of them require the cooperation of biologists or other professionals who are qualified and licensed to use particular techniques. Marking of rehabilitated animals also has considerable potential for improving our understanding of the fate of these animals and the impact of rehabilitation on wildlife communities for the overall health and welfare of the wildlife.

Public Health

It is important to consider that wildlife custodians handle animals that may be carrying a zoonotic disease that can be transferred to humans. Therefore, if you, or someone with whom you may be in contact has a weak immune system (ie. is immunocompromised), you need to think about possible health implications. If you become a wildlife custodian you must take appropriate preventive measures to protect your health, the health of your family and friends, volunteers, and any others you may come in contact with.

More information on human health and zoonotic disease is in Chapter 7.

WHO IS INVOLVED WITH WILDLIFE REHABILITATION IN ONTARIO?

PROVINCIAL

The Ministry of Natural Resources and Forestry (MNRF) and the Wildlife Custodian Authorization

The MNRF manages and conserves Ontario's natural resources to contribute to the environmental, social and economic well-being of the province. MNRF has a broad mandate with operations in every part of Ontario. MNRF is the steward of Ontario's forests, fisheries, wildlife, mineral aggregates, petroleum resources and Crown lands.

MNRF manages and conserves Ontario's fish and wildlife to ensure healthy populations both today and into the future. Ontario takes an ecosystem-based approach, recognizing that individual species are part of complex ecosystems. Decisions are made in the context of the entire ecosystem to ensure sustainability.

In the late 1990s, the Ontario government recognized the benefits afforded to the public and to wildlife by establishing basic standards for the rehabilitation of native wildlife. Under the Fish and Wildlife Conservation Act (FWCA) the keeping of game wildlife or specially protected wildlife in captivity is generally prohibited; however, section 44 of the FWCA recognizes wildlife rehabilitation as an activity that can be allowed through issuance of a wildlife custodian authorization.

Along with this study guide you were given a copy of:

- **Wildlife Rehabilitation Policy** – this MNRF document outlines the intent, direction and rationale behind the wildlife custodian authorization.
- **Standard conditions of a wildlife custodian authorization** – These requirements are "conditions" of the authorization. In other words, keeping the authorization is conditional upon following these requirements.

These 2 documents are very important and you need to review and understand them to be successful in receiving a wildlife custodian authorization in Ontario. Material from these documents will be part of the OWRE.

You may also want to request a copy of the wildlife rehabilitation procedure, which provides guidance to MNRF staff who accept and review applications for and issue wildlife custodian authorizations.

Please report any illegal activity against Ontario's wildlife to the MNRF TIPS line at 1-877-847-7667

Provincial Animal Welfare Services Act (PAWS Act)

The PAWS Act and regulations outline the animal welfare laws in Ontario. All wildlife custodians are bound by the requirements of the PAWS Act. You can view a copy of the PAWS Act at *https://www.ontario.ca/laws*

If you believe that an animal is in distress, or to report suspected animal abuse:

- Contact 1-833-9-ANIMAL (264625)

Public Health Ontario

Public Health Ontario provides expert scientific and technical support to government, local public health units and health care providers relating to the following:

- communicable and infectious diseases
- infection prevention and control
- environmental and occupational health
- public health laboratory services

Public Health is the organization where your family doctor would request information regarding your protective titre levels if you are immunized for rabies (A titre in a blood test measures the concentration of antibody in the blood). Please speak with your family doctor if you have questions on rabies immunization.

Ontario Public Health Units

Public Health Units offer healthy living programs and disease prevention information to all members of the community.

Ontario Public Health Units also oversee the Health Protection and Promotion Act for reporting a communicable disease in Ontario. Wildlife custodians who encounter a communicable disease must report it to their local public health unit.

Reference website/Act.
https://www.ontario.ca/laws/regulation/910559

College of Veterinarians of Ontario

The College of Veterinarians of Ontario (CVO) regulates the practice of veterinary medicine in Ontario to protect the public interest. The CVO is not a school or university. The CVO licenses veterinarians, inspects and accredits veterinary facilities, and investigates complaints against veterinarians. *http://www.cvo.org/*

NATIONAL

Canadian Wildlife Service (CWS)

A separate federal permit issued by the Canadian Wildlife Service (CWS), Environment and Climate Change Canada is required to rehabilitate and care for migratory birds.

Migratory birds are defined as all species listed in the Migratory Birds Convention Act (MBCA), which includes migratory game birds, migratory insectivorous birds, and other migratory nongame birds. For example, Canada geese are a migratory species protected under the MBCA.

Go to *https://ec.gc.ca* and look under 'Acts and Regulations' to learn more.

Contact the Canadian Wildlife Service, Ontario Region office in Burlington for more information (Appendix 1).

- ✓ CWS permits are required for migratory birds.
- ✓ Establish a good working relationship with a veterinarian.

Canadian Food Inspection Agency

The Canadian Food Inspection Agency (CFIA) carries out programs related to animal health and production to guard against the entry of foreign animal diseases and to prevent the spread of certain domestic animal diseases.

Some diseases in animals are reportable to the CFIA. Animal owners, veterinarians and laboratories are required to immediately report the presence of an animal that is contaminated or suspected of being contaminated with one of these diseases to a CFIA district veterinarian.

To learn more and to view the list of reportable diseases go to:
http://www.inspection.gc.ca/

You should work with your veterinarian if you believe you may have an animal suspected of having a reportable disease.

Canadian Wildlife Health Cooperative

http://www.cwhc-rcsf.ca

The purpose of the Canadian Wildlife Health Cooperative is to apply the veterinary medical sciences to wildlife conservation and management in Canada. The organization is also dedicated to developing and using knowledge of wildlife health and disease to improve human health and the health of domestic animals. All 5 Canadian veterinary colleges are members.

The CWHC coordinates Canada's national wildlife health surveillance program and provides educational programs, information, and consultation to both government and non-government agencies, as well as to the public.

If you encounter a wildlife disease concern likely to have been acquired in the wild, please contact the CWHC and discuss your concerns and potential next steps. Email contact for the CWHC Ontario is: *on-nu@cwhc-rcsf.ca*

Canadian Council on Animal Care

The Canadian Council on Animal Care is the national organization responsible for setting and maintaining standards for the care and use of animals in research, teaching and testing throughout Canada *www.ccac.ca*

LOCAL

Municipalities

It is important to make sure that keeping wildlife on your property meets municipal by-laws and zoning. Please contact your municipality so you understand if these rules apply to you and how to comply with them.

Veterinarians

All authorized wildlife custodians must have a veterinarian-client-patient relationship (VCPR) with a veterinarian who has a current license with the College of Veterinarians of Ontario (CVO). The CVO provides clear expectations for establishing and maintaining a VCPR. Please see the CVO website to confirm licensing on the Public Register, and to learn more about VCPRs.

If you become a wildlife custodian, you must speak with a veterinarian before you start taking animals and find out how interested they are in helping. You are required to confirm on your application form for a wildlife custodian authorization which veterinarian will be working with you.

A good working relationship between the wildlife custodian and veterinarian is very important to a successful outcome for wildlife. Both the veterinarian and the wildlife custodian are often working under tight timelines and busy schedules. To avoid frustration, it is important to establish clear expectations by both parties before entering into this field and to understand the respective rules under which they must work (e.g., Veterinarian's Act).

If you decide to become a wildlife custodian, questions to discuss with veterinarians could include:

- What wildlife species do you treat?
- What would be the health care costs and options?

- How could we work together to help sick, injured and orphaned wildlife?
- What are your regular hours of operation?
- What options are there if an animal needs veterinary care outside of those hours?

There may be veterinarians in your area who specialize in wildlife who would be willing to help you and your veterinarian with cases. Wildlife custodians must reach out and network with colleagues to find out who has wildlife expertise and may be willing to help.

It is important to note that domestic, livestock and exotic animals are different than wildlife. A one-eyed cat may lead a relatively normal life, but a hawk that relies on perfect eyesight may not do well – and perhaps starve to death - in the wild without full sight from both eyes. Both the veterinarian and wildlife custodian need to understand the natural history of the species in their care in order to determine the best outcome for that animal.

Wildlife custodians are **not** authorized to practice veterinary medicine. All authorized wildlife custodians must have a VCPR with a veterinarian licensed in Ontario. Please see the CVO website to confirm licensing on the Public Register. Medical treatment must take place by, or under the supervision of a licensed veterinarian under the Veterinarians Act. The veterinarian will discuss options and access to services such as x-rays, blood tests and exams for parasites, surgery, tranquilizing animals, and euthanizing animals.

Other Wildlife Custodians

Should you become a wildlife custodian it will be essential to establish relationships with other wildlife custodians to provide sound advice on the rehabilitation and care of wildlife. Build a network of experienced wildlife custodians who will be able to help you.

There are many Ontario based wildlife rehabilitation organizations that can provide valuable networking and learning opportunities.

INTERNATIONAL

International Wildlife Rehabilitation Council (IWRC)

The International Wildlife Rehabilitation Council works to support wildlife and provide resources for wildlife custodians. IWRC is comprised of veterinarians, rehabilitators, conservationists, and other professionals from around the world, all committed to restoring the health, ensuring the welfare, and safeguarding the future of wildlife.
http://www.iwrc-online.org/

National Wildlife Rehabilitator's Association (NWRA)

The mission of the U.S. based National Wildlife Rehabilitator's Association (NWRA) is to improve and promote wildlife rehabilitation and its contributions to preserving natural ecosystems.
www.nwrawildlife.org

IMPORTANT CONSIDERATIONS WHEN ADMITTING ANIMALS INTO CARE

This chapter provides a broad overview of some of the considerations a wildlife custodian makes when admitting animals into care. You will see that it is a complex and nuanced set of knowledge and skills that leads to successful wildlife rehabilitation.

Again, this study guide is not intended to be a "how to" manual for wildlife rehabilitation. It is intended to give you an overview of what would be required of you should you apply for and be issued a wildlife custodian authorization.

Learning to assess and reassess problems in sick, injured and immature wildlife takes much time and practice. Similarly there is much to know about treating medical problems in wildlife, including use of rehydrating fluids, gavage feeding, wound management, fracture immobilization, and the feeding of emaciated animals.

These skills are best learned by working closely with an experienced wildlife custodian or veterinarian that has experience with wildlife, and by taking basic skills courses offered by groups such as OWREN, the IWRC, NWRA, or other regional associations with credible and reputable experience.

Reasons for Wildlife to be Brought to a Wildlife Custodian

The most common reasons for presentation of wildlife to an authorized custodian are because the animals are **sick**, **injured**, or (suspected to be) **orphaned**. For example, according to a recent study cat predation and collisions with windows, vehicles, and transmission lines causes more than 95% of the 269 million bird mortalities in Canada every year. The wildlife custodian is often the first point of contact when the public is looking for help finding someone to care for one of these animals.

It is not possible, nor is it the intent of this study guide, to provide information on all of the various illnesses and injuries often seen in wildlife rehabilitation settings. This material is covered through wildlife rehabilitation courses, and by working with experienced wildlife custodians and wildlife veterinarians.

Immature Mammals and Birds, "Orphans"

Each spring (and often again in late summer for some mammals and birds), wildlife custodians get many calls from concerned members of the public who have found baby animals. Handling these calls can take a lot of their time. Some wildlife custodians are very careful about how widely they advertise their facility to help minimize these phone calls. This is one important technique to help reasonably manage workload.

It is important that correct information is given out. If the wildlife custodian is unable to provide answers, they provide the caller with telephone numbers for nearby wildlife custodians or other wildlife professionals who are willing and able to answer the person's questions. Many of the young animals are not truly orphaned or in need of human help.

If you become a wildlife custodian, you will often have to convince adults and children not to "rescue" wild young. Wildlife custodians often hear people say, "I found a baby bunny" or "I found an injured baby bird that can't fly", or a member of the public sees a fawn in a field, believes it is orphaned, and insists you take it in. Many times these animals are not orphaned at all, and the public must be encouraged to leave the animal alone, or put it back if they

have already removed it from an area. With persistence and clarity on your part, people would hopefully understand when you explain how hard it is to raise baby birds and mammals and that no human can do as good a job as the real parents.

Understanding the natural history of animals is essential to determining if an animal is indeed orphaned. By asking many questions about the situation, it is the wildlife custodian's expertise that will eventually determine whether that animal is truly an orphan or not. Should you become a wildlife custodian there is much to learn about how to determine when an immature animal requires human help. For example, some mammal species are altricial (hatched or born in an undeveloped state and requiring care and feeding by the parents e.g., fox) and some are precocial (hatched or born in an advanced state and able to feed itself almost immediately e.g., hare).

In the case of an animal that is truly orphaned, it is important to get the young animal to a wildlife custodian as soon as possible. The finder should be instructed to keep the animal away from noise in a dark, closed cardboard box or other secure carrier with holes for ventilation. To keep the animal warm, a bottle of warm water or other gentle heat source can be placed near, not directly on, the animal. No food should be offered to the animal at this time.

Species Identification

Why is it so important to identify the species?

Species identification is a basic first step in wildlife rehabilitation. A wildlife custodian must identify the species and its age to make important decisions regarding housing, type of food, when it is expected to be weaned, and care needed for the life stage of the animal. For example, not all songbirds eat seeds, and skunks are not carnivores in terms of diet (they are omnivorous). Knowing the specific identity of an animal will also give you and your veterinarian some important clues as to which parasites or diseases may be present.

Identifying the species will aid in determining if an animal truly needs assistance. For example, some precocial birds should be on the ground and not in a nest in a tree. It is also helpful to know which animals are true hibernators (such as the black bear) versus "winter sleepers" (such as raccoons) if the public calls you about a particular animal in the winter months.

It is also important to identify the species because some species are rare and require reporting to the MNRF as a species at risk.

These are two excellent resources:

- ✓ *Minimum Standards for Wildlife Rehabilitation, 4th Edition*, references "determining if an animal needs to be rehabilitated" and offers suggested talking points between you and the caller.
- ✓ *Answering the Call of the Wild* is a hotline operator's guide developed by Toronto Wildlife Centre and offers useful information to aid people responding to calls about wildlife. Designed with staff and volunteers from wildlife rehabilitation facilities in mind, the book is available for purchase from the Toronto Wildlife Centre *https://www.torontowildlifecentre.com*

How can I find out more about wildlife species?

- ✓ Field guides and other books listed in Appendix 3 will help you identify species.
- ✓ Experienced wildlife custodians and local naturalist organizations can give you many valuable hints in identifying local species.
- ✓ Visit natural history museums or take classes in mammalogy and ornithology.
- ✓ MNRF biologists can also be of assistance in identifying more difficult species.
- ✓ Various apps and online resource guides to species identification are available.

Obtaining and Handling – Ensuring both Human and Animal Safety

Are wildlife custodians responsible for picking up animals?

No. The provincial authorization does not require wildlife custodians to go out and pick up wildlife. However, some wildlife custodians will arrange to pick up wildlife depending on the resources available to them. In some cases, the public will bring animals to the wildlife custodian.

It is important to wear proper safety equipment to protect you and the animal.

Sometimes in our eagerness to help an animal we forget a very important thing – human safety. A wildlife custodian must always protect themselves and those who work with them. It takes proper training and experience to safely restrain birds, especially the larger ones. You may see experienced raptor wildlife custodians restraining eagles and owls without equipment. Such skill takes experience and an intimate knowledge of that particular species' behaviour.

You need to understand how animals will try to defend themselves, for example:

- swans defend themselves using their powerful wings
- loons, bitterns and herons, will use their beak to stab
- raptors use their strong talons and beaks as their weapons
- many mammals will try to bite
- porcupines do not 'throw' quills, and their quills are not poisonous – although they do have barbed quills that can work themselves deeper into an attacking animal causing injury – that is their defense mechanism to compensate for poor vision

Some birds like loons, grebes, and herons have sharp beaks that they will use to protect themselves.

Safety equipment is required to safely handle wildlife (eg. gloves, nets, catch-poles, goggles). Do not be the next well-meaning person to lose an eye to the stabbing beak of a heron because you were not wearing safety goggles, or to lose the use of one hand because a great horned owl tore tendons with its talons. Mammals can be even more difficult to handle. Without the proper gloves, and proper use and training for catch-poles for larger animals (ie. do not place loop around the neck, rather encircle the loop around the animal's head and a forelimb), use of nets etc., even small mammals can give serious bites. Unless properly prepared to restrain a given species, a wildlife custodian should not allow the animal to be brought to them.

The same advice pertains when talking to someone on the telephone. If you become an authorized wildlife custodian and a member of the public calls you and says that she/he has found an injured animal, what do you tell the person? Certainly you want the animal to receive help, but what are the chances that this animal could hurt the person trying to catch it? If the person gets hurt while following your advice, what are your responsibilities?

A standard technique to determine which species the person is calling about is to have them send you a picture of the animal in question. Ask questions how the animal is acting. Think about how this particular animal species will try to defend itself and give the caller specific advice on being careful. As a wildlife custodian you would have to decide if you want to talk the caller through trying to capture this animal. Inexperienced people should not handle the more challenging species (e.g. fishers, adult deer); instead it would be best to see if an experienced person could go and retrieve the animal.

Safety also includes minimizing stress that could lead to injuries or illness of the animal. Some animals (including swans and deer fawns) that are chased can end up with capture myopathy – a potentially life-threatening condition. Animals transported in blankets (especially in summer) can overheat.

A North American river otter being safely restrained during an exam.

There is so much to consider should you become a wildlife custodian, and thus have to make decisions about the retrieval of sick, injured or orphaned wildlife. Would you know how to safely handle a snapping turtle, an adult coyote, a great blue heron, or a loon? Working with experienced wildlife custodians and taking additional training will help you learn how to safely handle animals – for their benefit and yours.

Intake Information

Gathering as much information on the animal as possible can help lead to appropriate diagnosis and treatment of wild animals. Was it found by the road? Was it found beside a window? Does it have fishing line hanging from its beak? Knowing the finder's contact information is important in case of zoonotic diseases that the animal may harbour. It is important to gather as much relevant information as you can to make a plan for the animal's care, treatment and – hopefully – eventual release.

A condition of the wildlife custodian authorization requires specific information be recorded in a log book:

"This logbook shall be true and accurate, and include the following information:

- **a)** Authorization number and name of holder;
- **b)** the case number;
- **c)** the date it entered the wildlife custodian's rehabilitation or care;
- **d)** the species, its lifestage (e.g., immature, adult), and estimated age.
- **e)** a description of the unique temporary marker;
- **f)** a description of how it is uniquely identifiable in the facility;
- **g)** the name, address, and phone number of the person who delivered it to the facility;
- **h)** the date and specific location of it's capture;
- **i)** the reason it was brought to the wildlife custodian; and
- **j)** the date of its death, if applicable, and the date, manner and location of its disposition."

Stress and the Impact on Wildlife in Care

It is critical to the success of wildlife rehabilitation to minimize stress on the animal.

Stressors are external influences that drive an animal to either attack what they perceive as threatening (or prey) or try to escape from what they perceive as threatening ("fight or flight"). This exerts stress on the animal. For wildlife custodians, there are two main things to be concerned about.

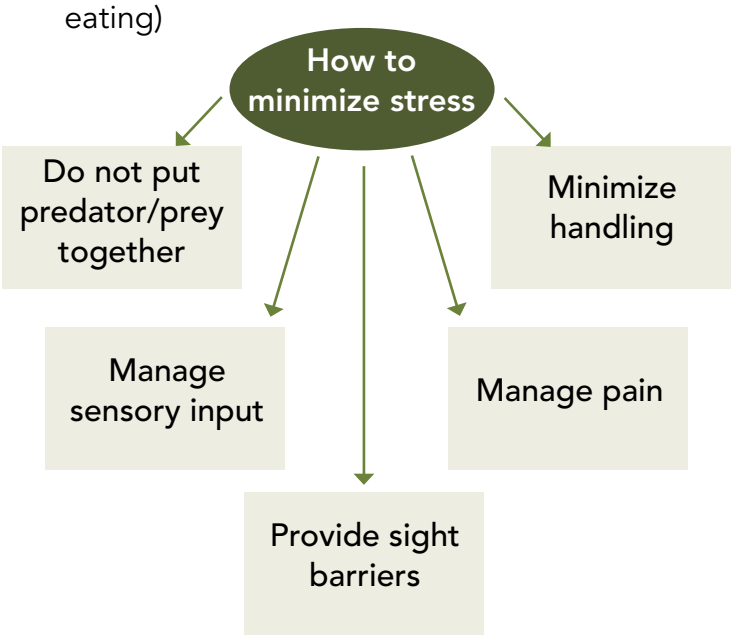
1. Stress increases circulating cortisol in the body, which in turn acts to suppress the immune system making the animals more susceptible to illness and disease that could lead to death. For example, acquired secondary infections such as aspergillosis infections in loons, many raptors, and other birds are not uncommon in stressed animals.
2. An animal that is stressed may injure itself or you. Minimizing stress aids in promoting both psychological health and physical health.

An Eastern cottontail rabbit with a blanket over its face to minimize stress while being examined.

How do wildlife custodians minimize stress in the animals in their care?

One of the main jobs of a wildlife custodian is to reduce or eliminate the stress on animals in their care. Here are some suggestions, and you will see others in Chapter 5:

1. Minimize handling
2. Provide sight barriers (so that the animals cannot see other animals or people) – whether that is while feeding, examining, or where animals are kept while in care. Repeated or prolonged eye contact with an animal is one of the most common threats and intense forms of stress incurred by captive wild animals. Keep heads covered with a small towel if handling/examining;
3. Manage sensory input: Limit or eliminate foreign smells (e.g. perfume) and noise (e.g. from radio, loud talking etc.), and ensure appropriate ambient room temperature;
4. Do not allow other predators (such as a coyote beside a rabbit, or any dogs/cats) within auditory or visual range of your wild patients;
5. Manage pain;
6. Give medications in the food rather than handling the animal to give injections whenever possible (assuming the animal is eating)



Triage and First Aid

If you become an authorized wildlife custodian, you will need to gain expertise in triage and first aid for wildlife. Below is a brief overview of the kinds of things you would need to know.

Triage is the process of sorting out the medical priorities to decide which cases will be treated

- first (because their injuries are urgent and life-threatening),
- which can be treated later (because their injuries are minor), and
- which will not be treated at all (because their injuries are too severe to be repaired).

As hard as it is, all wildlife custodians will eventually have to make a conscious decision to euthanize an animal. Volunteering at an established and reputable wildlife rehabilitation facility is the best way to gain experience regarding

(a) the kinds of injuries that will render an animal non-releasable no matter how expert the care, and

(b) how best to treat injuries from which an animal may recover.

Sometimes wounds can look horrible but be fixable (e.g. some soft tissue wounds); and other times there may be almost no visible sign of injury (e.g. blindness in a hawk) yet be catastrophic in terms of the animal's chance at survival in the wild. Open-mouth breathing in birds can indicate stress and overheating, but it can also be a life-threatening and emergency condition.

Most of the animals admitted to a wildlife rehabilitation centre require immediate medical attention. The initial step in triaging is to perform a brief exam to evaluate any critical conditions and address these emergency needs and think about a plan for the animal. The decision can be made to:

- provide care if the injuries are minor and the animal is stable,
- refer the case to a more experienced wildlife custodian,
- consult with your veterinarian for further assessment and potential medical treatment, including possible euthanasia.

✓ Treat
✓ Refer / Transfer
✓ Euthanize

Many times an animal will be experiencing more than one problem at the same time, and the primary problem is not always the most obvious. For example, a hawk that was hit by a car, may have been on the road because it was suffering from organophosphate or lead poisoning. Or a raccoon may have a fractured leg after falling from a tree, but fell from the tree because it was suffering from distemper. Many cases are quite convoluted and require some detective work to unravel.

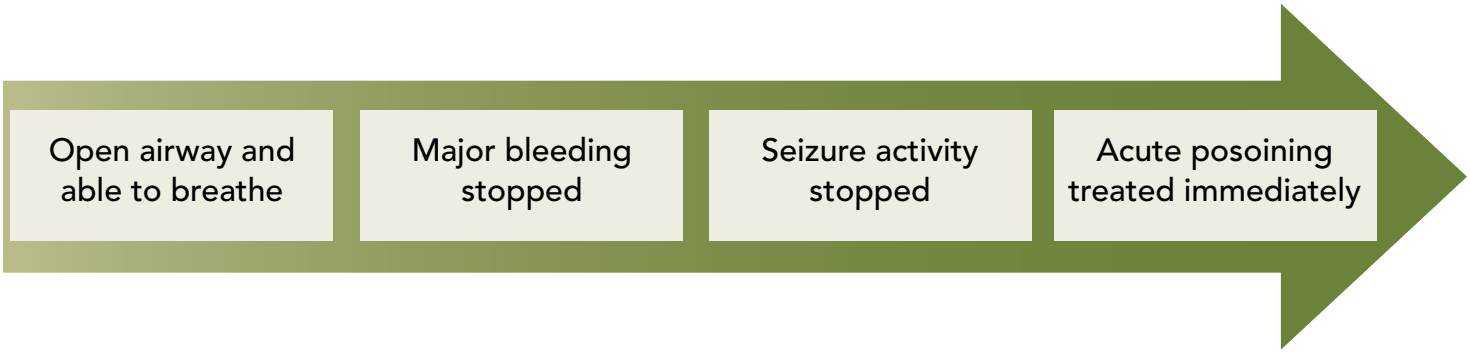
When admitting a wounded animal, it is always tempting to treat the most visible injury right away. However, in reality, a broken limb or even a fairly large wound is not often immediately fatal. In many cases, the best initial treatment might be to provide pain medication if feasible and as prescribed by your veterinarian, and to put wounded animals in a quiet and relatively dark place (such as a cardboard box with ventilation) where they can recover from the stress of being captured and transported, before a more thorough physical exam is conducted.

Emergency Triage

If the decision has been made that humane euthanasia is not required, there are some conditions that must to be dealt with right away:

- always ensure that the animal has an open airway and is able to breathe
- any major bleeding needs to be stopped
- seizure activity will have to be controlled; and
- in acute poisonings, rapid treatment is essential.

Many animals will also be in shock, whereby the circulation fails to provide adequate oxygen-rich blood to organs throughout the body. Often animals in shock will have pale mucus membranes (gums), an increased pulse and respiratory rate. It is essential to know how to recognize these life-threatening conditions.



Stabilization

Provided the emergency steps have been addressed, stabilization of the animal is needed.

Four Steps of Stabilization

1. **Analgesics**
   Provide appropriate analgesics (pain medicine) if the animal is injured

2. **Thermoregulation**
   Provide appropriate heat or fluid as necessary to keep the animal at a proper body temperature

3. **Stress reduction**
   Minimize stress by placing the animal in a quiet, dark space

4. **Fluids**
   Provide rehydration or fluid therapy support, provide warmed isotonic fluids to animals (unless they are hyperthermic)

These four stabilization steps can help increase the chances of a positive outcome for the animal. Once the immediate needs of a wildlife patient have been addressed, you can go back and conduct a proper physical exam and tend to any wounds once the animal is more comfortable. Similarly, animals should be in stable condition before radiographs, anesthesia or surgery is considered.

A veterinarian should see any patient with fractures as soon as possible. Wildlife custodians may have to immobilize a limb/wing prior to seeking assistance to prevent further injury to the animal.

Unless the wildlife brought into a facility are healthy immature wildlife, most animals presented to a wildlife custodian have some level of pain due to illness or injury, and most animals are considered dehydrated to varying degrees. Rehydrating fluids are usually given over a 24-48 hour period, providing both maintenance required fluids as well as compensating for losses (e.g. due to diarrhea, blood loss, dehydration). Fluid therapy is one of the most important treatments for a wildlife custodian to learn.

The administration of medications, such as antibiotics, analgesics, antiparasitics, and drugs for euthanasia, is an important aspect when working with sick and injured wildlife. By law, these must be prescribed and dispensed by a licensed veterinarian. Wildlife custodians must work closely with their veterinarian through the VCPR to determine how drugs will be administered. Wildlife custodians must establish protocols with their veterinarian that outline what medications to give, when they should be given, what the dose should be, how it should be administered and how frequently this should be done.

It is very important to follow the directions of the veterinarian in terms of proper medication use. For example, some drugs have a withdrawal time that must be adhered to. Also, there are some antiparasitic and antibiotic drugs whereby pathogens are becoming resistant to these drugs, leading to potential problems in the future for humans and animals.

Remember that your veterinarian also provides access to expertise beyond drugs and medications through your VCPR including diagnosis, prognosis, medical or surgical procedures.

Physical Exam

A thorough and accurate physical examination can be done at intake, or after the four steps of stabilization have been completed, depending on the case. As mentioned, this takes much time and practice. This is something that a new wildlife custodian should practice with an experienced wildlife custodian and their veterinarian until they are performing the exam correctly. Remember that this is an already-stressed wild animal, and being handled by humans who are considered predators to almost all wildlife is a traumatic experience.

There are many aspects of the physical exam that should be considered:

- Start with observing the animal. Then use a systematic approach to the physical exam. It is important to use all the senses. An example of a physical exam sheet is in Appendix 4.
- Ensure proper handling and restraint of each species so neither the animal nor the handler is injured. For example, do not hold birds too tightly around their chest as they will not be able to expand their chest wall in order to breathe.
- Use examination gloves to prevent bacteria from infecting any wounds the animal may have; to protect the critical waterproofing needed for birds; and to help decrease the risk of the custodian's exposure to a zoonotic disease.
- Handle patients in such a way to prevent any injuries from becoming worse. This is particularly important when there are fractures present.
- Conduct the physical exam in a consistent, systematic way.
- Record information in an organized fashion.
- Remember to obtain an accurate weight to be sure accurate calculation of appropriate pain medication, fluid therapy, and nutrition to monitor proper growth or maintenance.

Experienced wildlife custodians have a good understanding of the common diseases and injuries that they will see in the species admitted to their facility. If you become authorized, for each condition you should in time be able to describe what clinical signs you would expect the animal to be exhibiting. There are many clinical signs that are common to more than one disease or condition. For example, paresis in a duck could indicate spinal trauma, head trauma, botulism, weakness for any reason or lead poisoning to name few. With experience you may be able to learn to narrow down the problem based on the history you have, the time of year, and other clinical signs the animal is exhibiting. Remember that only a licensed veterinarian can provide a diagnoses and prescribe medical treatment.

- ✓ Wildlife may not show signs of pain.
- ✓ Provide pain medication as directed by your veterinarian.

Loon stretching its wings after being successfully rehabilitated and released back to the wild.

When completing a physical exam, it is essential to palpate bones gently as bone fractures are very painful. Do not assume because they are not vocalizing that they are not in pain. Wildlife custodians should always provide appropriate pain medication as directed by their veterinarian.

Each species is different and it is important to know the 'normal' values in the species you would be working with. For example, a normal temperature to an opossum could be life-threatening to most birds as birds generally have higher body temperatures compared to mammals. Even within mammals the normal body temperature varies.

Appendix 4 has an example of a physical exam form that can be modified based on the species most commonly encountered. Other examples of species specific forms can be found in *Minimum Standards for Wildlife Rehabilitation, 4th Edition*.

A monitoring plan should be made for all animals in the care of a wildlife custodian. Examples can be found in *Minimum Standards of Wildlife Rehabilitation, 4th Edition*. Weight, hydration, feather condition / body condition, eating and drinking habits, feces and urine (and urates) output, waterproofing, etc., are a few of the elements that should be monitored.

Record Keeping

It is important to maintain records and monitor the patients in care to ensure they are gaining appropriate weight, maintaining hydration, and receiving appropriate medications (just to name a few reasons). The information may also be required by others including veterinarians or public health officials. For example, a veterinarian may require copies of medical records for patients to whom they have dispensed medications. See Appendix 4 for an example of records of care for treatment and monitoring. These are only a few of many examples that exist in the wildlife rehabilitation community. More examples that are species specific can be found in *Minimum Standards for Wildlife Rehabilitation, 4th Edition*. As discussed on page 20 there are also log book requirements as a condition of a wildlife custodian authorization.

Disposal of Materials

It is important to practice responsible waste disposal of any materials used in the rehabilitation of wildlife. For example, the disposal of raccoon feces due to potential problems with *Baylisascaris procyonis* (raccoon roundworm). Make sure you use gloves and dispose of feces in the garbage to minimize human or other animal contact with the feces. How to dispose of deceased wildlife may vary by municipality, and in consultation with the Ministry of the Environment and Climate Change hazardous and biomedical waste services. You will need to consult your local by-law or work with a waste disposal company in terms of removing biomedical waste.

Injured porcupine with a cast applied for a broken radius and bandaged due to its wounds. The porcupine healed well and was subsequently released.

Many schools, nature centers, museums and colleges utilize dead wild animals for teaching, exhibit, or research. As long as there are no potential disease transmission concerns, rather than just disposing of dead animals, you might check around to see whom you can help. Providing precise information about when and where the animal was found is important to scientists. In this way, you may be able to establish helpful relationships with other people interested in wildlife issues. Some wildlife must be registered before they can be transferred to another person or facility. For more information see *https://www.ontario.ca/page/keep-dead-wild-animal*

Providing appropriate temporary housing to an injured baby bird.

This concludes Chapter 5 which gave you a broad overview of considerations when wildlife is admitted into care. It included how to confirm if an animal actually requires human intervention, handling, information recorded upon intake, how to reduce stress in wildlife, species identification, and emergency treatment. It is a huge amount to learn and it only covers off the first part of wildlife rehabilitation, just getting the animal safely into care and assessed.

HOUSING AND IN-FACILITY CARE

This chapter will give you an overview of some of the housing and in-facility care requirements that a wildlife custodian must meet.

Habituating and Imprinting

It is well known that the more comfortable a wild animal is around people, the less likely it is to survive and function well in the wild. Wildlife that consistently seek out human contact will be hit by cars, shot, or considered pests. One of the rewards of doing wildlife rehabilitation is getting to experience close contact with the animals, but the more inappropriate contact that occurs, the worse it often is for the animal's well-being.

Habituation is a simple form of learning where an animal learns not to respond to something it is frequently exposed to without any negative consequences (e.g. losing fear of humans when the animal realizes the humans bring food). It may even go so far as to associate social behaviours to humans (taming). Animals in rehabilitation may become habituated to the human activity around them. Because wildlife custodians are in daily contact with the animals in their care some habituating may be unavoidable, particularly when hand-raising young birds or mammals, but every effort should be made to minimize habituation to ensure the animal has its best chance of surviving once released back to the wild.

A juvenile Merlin.

A released, habituated animal may be killed as it could be perceived by the public as sick and behaving in a 'friendly' manner – a behaviour that is often seen in raccoons with distemper; yet, it may have been acting 'friendly' because it was habituated to people.

Animals in rehabilitation should never be allowed to become habituated to the presence of domestic pets, which may be predator species in the wild. This habituation is avoided by making sure animals are raised with others of their own species where possible, and never exposing them to domestic pets. Keep in mind that you cannot bundle animals together who originated from different release areas in order to minimize the risk of parasite and disease spread (see the policy and conditions of a wildlife custodian authorization for details).

✓ You can minimize chances of habituation by, where possible, raising animals with others of their own species, and by minimizing handling or exposure to people whenever possible.

Imprinting is a process by which the young of some animals learn what species they are as a result of being exposed to the sights and sounds of their parents and their siblings. It occurs rapidly during critical periods in development, and it persists for the life of the animal. Currently, there is no known way to reverse this condition. If young animals learn that their "parents" are human or another species they will

develop an identity for themselves that persists into adulthood. They may attempt to socialize and even mate with humans or other species rather than with members of their own species. Improperly imprinted animals are unlikely to live a successful life upon release to the wild and can be dangerous as they no longer have a fear of humans. **Intentional or unintentional habituating or imprinting wild animals to humans is not appropriate and should not be allowed to occur in any rehabilitation practice.** A human-imprinted animal is not releasable; because of the limited opportunities for placement, most of these animals must be euthanized.

Biosecurity

Biosecurity is a vital part of maintaining health and preventing disease. From ensuring excellent personal hygiene to regular cleaning and disinfection of the rehabilitation area, when done correctly it greatly reduces the spread of pathogens.

Important tips to protect both human and wildlife health:

- Always wear gloves when handling animals.
- Wash hands between handling animals or cleaning cages. Don't forget the light switches and door handles.
- Ensure syringes, dishes, water bowls are thoroughly disinfected, rinsed very well, and completely dry before reusing. Keep in mind, only sterile syringes should be used for any injections.
- Footbaths can be helpful if the solution is changed regularly. It should also be made clear that the purpose of the footbath is to remove material (and pathogens) on the shoes as appropriate contact time will not be made on the shoe itself.
- Wildlife custodians always prevent bites and scratches through proper handling of wildlife and wearing gloves.
- If it can't be disinfected, throw it away.
- Don't launder rehab clothes or animal bedding with family clothes, especially if there are children or anyone on immunosuppressive medication in the house. If possible, get a separate washing machine for rehabilitation materials. Always wear closed-toed shoes when working around wildlife.

To learn more about quarantine please see Chapter 7. Isolating animals upon intake is a technique to help prevent the spread of disease and parasites that can be transmissible to other animals. Seek advice from your veterinarian and experienced wildlife custodians for their quarantine protocols (and this must be done in accordance with Wildlife Custodian Conditions #15-19). One example of a raccoon quarantine protocol is provided in Appendix 5. You can adapt your own protocols based on risks and species admitted into your care.

Cleaning and Disinfecting

There are four general steps to cleaning and disinfecting an area:

1. Sweep the area thoroughly and remove all organic material (e.g. dirt, loose fur, feces). Disinfectants do not cut through organic waste.
2. Wash the area with soap and water. Allow the area to air dry.
3. Apply an appropriate disinfectant (follow the label instructions for minimum contact time – for example, some disinfectants must be left on for 10 minutes to kill bacteria and viruses).
4. Rinse well and allow the area to dry.

There are several broad categories of disinfectants, including phenolics, halogens, quaternary ammonium compounds, and biguanides. An ideal disinfectant should have properties such as broad spectrum of activity (it kills many types of disease organisms), non-irritating, non-toxic to animals and humans, non-corrosive to surfaces, inexpensive, and not readily inactivated after application. Because no single disinfectant has all of these properties, different agents may be more suitable for individual situations. The *Minimum Standards for Wildlife Rehabilitation, 4th Edition* booklet contains more information about specific disinfectants, and determining which disinfectant to use is a good conversation to have with your veterinarian.

Label instructions should be followed closely to ensure proper dilution and for the safety of animals. These chemicals should be allowed to remain on surfaces (cages, dishes, etc.) for the time indicated on the label, then the solution should be rinsed away thoroughly with several rinses of fresh water. Many disinfectants can hurt animals if they aren't rinsed away completely. Note that many products are more effective when used in hot water.

Be careful of harmful fumes that can affect people and wildlife. Animals should always be transferred to other cages prior to application of the disinfectant.

It is essential to also change all bedding in between housing different animals as the material may contain parasites or other contagious organisms. This includes conducting regular cleaning of large outdoor cages for birds and other mammals. The substrate may need to be removed depending on the type used in outdoor caging.

1. Remove organic material
2. Wash with soap and water
3. Apply disinfectant
4. Rinse and air dry

Enclosure Considerations

The *IWRC/NWRA Minimum Standards for Wildlife Rehabilitation* contains a summary of housing considerations, including tables of suggested sizes and design of cages for housing wild birds and mammals. These are the minimum standards that must be followed. Wildlife custodians should consult them before they start planning to build cages. Several different sizes of caging are needed even for a single species: the cage size criteria are based on the medical, health and age status of the animal. It will be helpful to speak with other wildlife custodians who have cared for similar species to learn more about housing tips. Caging from wild animals should provide shelter from the elements, stimuli for eliciting natural behaviours, and adequate space for exercise. The enclosure should also have appropriate lighting to keep an animal's internal clock synchronized to its natural environment to aid with reintroduction to the wild. If housed indoors, this can be accomplished by setting a household timer to turn non-flickering lights on and off to match the number of hours of daylight outdoors. In some cases, an artificial broad spectrum (UV) light may be required.

Size

- Smaller cages are appropriate for animals that are younger and/or recovering from injuries or illness.
- When a healthy, mature animal is nearing release, it needs more exercise and often much larger enclosures than those suggested as minimum sizes in the *Minimum Standards* guidelines.

Material

- Wire is not appropriate for most birds, and especially raptors who often damage their feathers, feet, and beaks by flying onto the wire. Use light netting over the wire inside the cage if wire is to be used.
- Wire is usually appropriate for most mammals. Use non-coated / non-toxic materials for chewing animals (eg. rabbits, rodents, foxes, etc.).
- Because of *Baylisascaris* (raccoon roundworm), no other species should ever be housed where raccoons have occupied, unless it is a stainless steel cage that can be heat-sterilized with a blowtorch. Roundworm eggs may remain alive for many years. Raccoons should be dewormed regularly because of the zoonotic potential of *Baylisascaris*.
- Can the animal walk on land or does it require a net-bottom/soft bottom/ or a pool? Wildlife custodians must think about comfort and prevent injuries that could occur.

Protection from the elements & UV light

- Shade should be incorporated into the cages.
- Shelter/hide box should be provided for all animals.
- Ice-free drinking water in winter (eg. bird bath heaters or heaters for outdoor dog bowls, special heat-discs to keep food and water from freezing).
- Birds and reptiles require UVb light for several reasons. Outdoor caging with shade and natural light provide this requirement. Full spectrum, non-flickering light (no fluorescent light bulbs) should be used in indoor settings.

Location / Proximity to other animals

- Cages must consider psychological well-being for an animal. Provide sight and sound isolation from things that might frighten and stress the animal. For example, minimize exposure to predators, people and pets. Never place a prey species (e.g., a rabbit) in a cage where it could see or hear one of its natural predators (e.g., a great-horned owl; or a pigeon near a Cooper's hawk). Such exposure could literally frighten the prey animal to death, or provoke attempted attacks by the predator species.
- Be aware of other predators. Wild raccoons, foxes, opossums, owls and other predators and scavengers could wander among cages at night. They would be only too willing to injure or eat one of the rehabilitating animals, or possibly spread disease to other wildlife in care. Raccoons, in particular, can become quite adept at reaching into cages, pulling animals over to the bars, and crippling or killing them.
- Many species cannot be housed together (e.g. red and gray squirrels) due to aggression. Even the same species of different age or sex could instigate aggression. Knowing natural history and working with other experienced wildlife custodians is important.
- Domestic animals (dogs/cats) should not be permitted anywhere near wildlife in rehabilitation at all times.

Burrowing animals

- Some species (e.g., foxes, beaver, mink, weasel, etc.), need the walls of the cages to extend well below ground level -- preferably one metre. It is also helpful to have the below-ground portion of the caging angle in towards the cage. Some species are such excellent burrowers (e.g., groundhog) that the entire bottom of the cage should be wired below the cage substrate.

Substrate and bowls

- Concrete flooring is easy to clean but cold and hard on feet.
- Soil and sand is good for many animals but needs to be shoveled and/or sifted regularly due to feces and parasites and completely replaced often (weeks/months).
- Hay/Straw – Mould spores are often abundant in hay/straw. Many wildlife species (waterbirds, raptors) are extremely sensitive to fungal respiratory diseases in captivity, probably because they are so stressed. Hay should never be brought into any indoor animal facility. Animals that need hay for food, such as ungulates, should be housed some distance from other patients.
- Soft bedding is important to prevent pressure-type ulcers (bedsores) and keel lesions as well as to provide insulation. Loose strings/fibres must be avoided as they can be ingested or become tangled around an animal's tail, limbs, tongue, digits, etc., and cut off circulation and cause serious problems.
- Perches should be appropriate for the species of bird. Eg. some birds prefer flat perches/rocks while others prefer branches and trees of appropriate size.
- Fresh, clean water should be available at all times. Weakened or sick animals should be observed closely as they may fall into their water dish and drown. Non-tippable bowls for mammals should be used.

Enrichment

When done correctly enrichment is helpful to minimize stress and increases the psychological well-being of an animal. It provides positive mental stimulation so that the animals do not become bored while housed in a captive environment. Examples of enrichment can be found in *NWRA Principles of Wildlife Rehabilitation, 4th Edition*. Consideration of how food is presented, nesting materials, and cage furniture should be provided where appropriate, after they are deemed safe for the animal. Enrichment can also have negative outcomes if not properly suited to the species and circumstances. It is important to research carefully and refer to experienced and successful wildlife rehabilitation programs for advice.

Understanding how a species lives and how it catches food can allow for combining enrichment and good nutrition. For example, hiding insects in drilled-holes of a tree stump may be beneficial for woodpeckers.

A tail guard is a helpful tool to prevent injuries that can be acquired in captivity.

Injuries or Illnesses Acquired in Rehabilitation

If you become a wildlife custodian you will have to consider that, without proper prevention, animals could become injured or acquire illnesses while in your care. For example, if housed in a small enclosure some raptors may require a tail guard to protect important flight feathers. A wildlife custodian could help the bird heal the wing fracture, but it would not be releasable with damaged tail feathers that are essential to guiding flight in order to catch prey.

To give the animal the best chance of release it is important to not only help them heal, grow and become healthy, but also to prevent them from acquiring additional illness or injury while in care. It is essential to learn the proper and appropriate techniques for wildlife handling and care.

The veterinarian that a wildlife custodian as a VCPR with becomes a partner in wildlife rehabilitation; active and regular conversations are needed on individual case treatment to ensure the best care for wildlife.

These are just a few examples of illness and injury that can happen in rehabilitation:

INJURY OR ILLNESS	PREVENTIVE MEASURES
Aspergillosis (often seen in birds)	■ Do not use hay/straw for bedding. ■ Ensure appropriate ventilation. ■ Keep mould at bay. ■ Provide prophylactic treatment for susceptible birds.
Keel lesions and damaged feathers (often seen in grebes, loons, and birds that are unable to perch or walk on land); damaged feathers or wings	■ Provide appropriate substrate (eg. net bottoms, pools, soft/padded bedding), carpal bumpers, tail guards. Inappropriate wire caging is often a cause of damage.
Pododermatitis (bumblefoot)	■ Provide appropriate perching (mimic what they would use in the wild) and substrate.
Wounds (from any cause)	■ Check housing / caging set up to ensure it is safe for the species; determine root cause of wound and take corrective action to prevent.
Aspiration pneumonia	■ Feed young mammals in a position where their legs are on the ground/ table with head/body at a 30-45 degree angle. Do not feed while on their back. Do not feed quickly or overfeed animal. Do not force feed or push formula into mouth. Ensure the glottis can be seen whenever possible in birds (and avoid this space that leads to the lungs). This is harder to see in mammals. Aspiration can be deadly and proper techniques must be followed.
Diarrhea	■ Minimize stress. Obtain fresh fecal sample and submit to your veterinarian for analysis and to determine potential treatment needs. Do not introduce formula too quickly. Ensure formula is an appropriate temperature. Ensure animal is hydrated and not sick with a virus (you may need to quarantine the animal if diarrhea is suspected to be from something other than a nutritional cause). Ensure diet is appropriate. Work with your veterinarian to understand common causes of diarrhea in wild animals. Maintaining hydration is important if diarrhea is present as they will likely be dehydrated.

Again, these are just a few of the acquired injuries or illnesses that could occur. A good wildlife custodian will do all they can to prevent them by working with experienced wildlife custodians, taking additional wildlife courses, and working closely through the VCPR with their veterinarian.

Nutrition

A great deal is known about the nutritional needs of wildlife, and many diets for captive wildlife have been published. However, one of the most important considerations about an animal's diet is whether or not the animal will eat the food it is offered. Animals in captivity are often sick or stressed, and a wildlife custodian must have the knowledge and training to know what stimuli will work to get a particular wildlife species to eat initially. It is sometimes necessary to feed an animal through a crop or stomach tube (gavage) if it cannot or will not eat for itself. Passing a feeding tube correctly is important as incorrect technique can result in fluid being introduced into an animal's lungs, which can be fatal to the animal. If you intend to become a wildlife custodian a veterinarian, a more experienced wildlife custodian, or the basic skills courses given by rehabilitation organizations will help you to learn this technique.

It is important to know which natural foods are consumed by the species. For example, never feed mostly vegetables to a strict carnivore (like a mink or bobcat). In addition, fawns do not digest grasses at birth as easily as they do as adults because their rumen takes several weeks to fully develop. It is essential to identify the species and approximate age as soon as possible to ensure that every animal in care has the nutrition it needs to heal or grow.

The most accurate way to determine the amount to feed an animal is by calculating the caloric content of the appropriate foods needed for that species based on age, weight, body condition and overall health status. Generally speaking, emaciated animals should not be fed a full, regular diet immediately. Rather, it is important to provide appropriate rehydration first, followed by a diet of easily digestible food until a regular diet can be slowly introduced.

NUTRITION CLASSIFICATION IN WILDLIFE	WHAT DO THEY PRIMARILY EAT?
Omnivores (e.g. opossums, raccoons, bears, skunks). These mammals have sharp canine teeth and flat-surfaced molar teeth for grinding food.	Animal protein and plants (including berries/fruits)
Herbivores (e.g. white-tailed deer, cottontail rabbits). These mammals have molar teeth for grinding.	Plant based diets including leaves, buds, shoots, grasses. Some are specialized including: Granivores - grains, hard seeds (e.g., squirrel) Frugivores - mostly fruits (e.g., oriole, robin, finch)
Carnivores (e.g. bobcat, mink, weasel, most snakes). Carnivorous mammals have long canines and sharp incisors for tearing tissue.	Animal protein (meat) diet, usually whole-prey
Piscivores carnivorous animal that primarily eats fish (e.g., otter, merganser)	Fish * Note that piscivores fed dead/frozen fish should receive supplemental thiamine (B1) due to thiaminase, which destroys thiamine
Insectivores (e.g. big brown bats)	Insects

As the terms "primarily" and "mostly" suggest, "specialization" is sometimes relative. For example, many birds consume some insects and some fruits or seeds, and the proportions of each may vary both seasonally and with the age of the bird. Most passerine nestlings are fed primarily protein, regardless of what their specialization will be as adults. And vitamin and mineral requirements change when a bird is brooding or molting.

Some animals, such as raccoons and opossums have opportunistic food habits; that is, they will eat almost whatever they can find. A high quality diet while in temporary captivity will help keep the animal's overall health.

In general, adult animals are easier to feed than babies. Adults have already acquired skills in obtaining food and simply need to be supplied with a balanced diet that they will eat – they are not growing rapidly and will be in captivity only for a short period. Wildlife custodians should understand the natural diet of the animal. It is conceptually not too hard to craft a captive diet that is similar to a natural diet. Carnivores, for example, can be fed smaller vertebrates. It is not recommended to feed dead wild animals to other animals as it is not known what the impacts might be. The dead animal might carry a disease, parasite or poison. Animals who have been chemically euthanized should never be fed to other animals.

Nutritional requirements for immature wildlife vary greatly among species. Working with experienced wildlife custodians will help you determine feeding protocols including what to feed (cow's milk is not appropriate for most young mammals), how to feed (timing, providing warm formula, positioning of the animal), and weaning schedules. Weighing animals on a regular basis will be important to determine if an animal is receiving enough correct food to sustain its weight during its growth and/or recovery. Ensuring appropriate amount and ratio of Calcium and Phosphorus (about 2:1 Calcium to Phosphorus) is necessary to avoid nutritional metabolic bone disease in young growing animals. This disease will lead to deformed or fractured bones and beaks. On the other hand, too much vitamin and mineral supplementation can also cause harm in young growing animals. It is important to learn which animals require Vitamin D and UVb light as well as special requirements such as preferred optimal temperature zone (POTZ) for reptiles.

Before their eyes open, most young mammals need to be stimulated to urinate and defecate. Failure to do this could lead to bladder rupture or other illness leading to death. These skills can be learned by working with an experienced wildlife custodian or veterinarian.

Some species must have very specific environmental requirements to allow them to meet nutritional requirements. For example, reptiles require an external heat source to reach their preferred optimal temperature zone (POTZ) that is required for normal metabolic activities including digestion and metabolizing drugs.

Finally, knowing when to feed is important to maintain a regular and healthy pattern for the animals. Crepuscular animals are most active around dawn and dusk and should be fed at this time (includes skunks and deer). Nocturnal animals, such as owls and raccoons, should be fed at night. Song-birds and squirrels are examples of diurnal animals that are most active during the day, and thus this should be the time they are fed.

Crepuscular: most active around dawn and dusk

Nocturnal: most active at night

Diurnal: most active during the daytime

HUMAN AND WILDLIFE HEALTH

Wildlife are susceptible to a number of diseases, some of which may be spread to humans. A zoonotic disease is a disease that can be spread between animals and humans. Zoonotic diseases can be caused by viruses, bacteria, parasites, and fungi. Many human diseases originated from animals. A good discussion may be found in the Veterinary Section of the *NWRA Principles of Wildlife Rehabilitation*; only a very brief overview will be presented here.

New arrivals in a facility should be quarantined; caged and physically separated from animals already in care. It is important to remember that bedding, food, water bowls, shoes and clothes can carry contamination from sick animals to healthy ones. Wildlife custodians should always follow protocols to ensure they do not transfer contamination, for example putting on new gloves as they begin working on a new patient.

If you become a wildlife custodian you should notify your family physician. Ask your doctor about recommended immunization shots, and if they are aware of specific zoonoses in your area.

As mentioned before, domestic animals must always be kept well away from all wildlife in care. It is also important to keep domestic animals away from wildlife feces and bedding. Be careful to change contaminated clothing and wash well before going into family or pet areas of your house.

Be alert and aware of potential zoonotic diseases and communicate reportable diseases as required. Always contact your veterinarian if you suspect an animal has a zoonotic disease. Wildlife custodians can play a significant role in protecting animal and human health.

EXAMPLES OF EPIZOONOTIC and ZOONOTIC DISEASES	
Rabies	■ Please see Chapter 7 of this study guide for information on rabies ■ Even if you do not intend to take the rabies portion of the Ontario Wildlife Rehabilitation Exam you are encouraged to read and learn from this chapter
Canine Distemper	■ A disease that may cause large-scale mortality in canids, raccoons, skunks and other susceptible species, but causes no problems for cats, birds, or people ■ Characterized by convulsive movements of the head, and discharge from the nose and eyes, disorientation, and often a lack of fear ■ Sometimes hyperkeratotic foot pads (thickening of the foot pads) and retinal degeneration leading to 'green eyes' can be seen

Visceral Larval Migrans	■ A condition that results when the eggs of certain animal parasites are shed in feces and are subsequently ingested by another species; when the eggs hatch, their larvae penetrate the digestive tract and migrate to other bodily systems, where they can cause damage to central nervous system, blindness and death ■ The most widely-known agent is the roundworm parasite of raccoons, *Baylisascaris procyonis* ■ Seen in many rodents (groundhogs and porcupines) ■ Although prevention may seem very straight-forward (do not ingest raccoon feces), it must be kept in mind that the eggs remain viable for extraordinary lengths of time despite conventional cleaning and decontamination procedures ■ A cage that has once housed raccoons should not be used subsequently for any other species ■ *P. tenuis* (the white-tail deer brain worm) does not cause harm to white-tailed deer, but can lead to death in moose and elk
Salmonella	■ Salmonella infection is a bacterial disease that occurs commonly in birds, mammals, reptiles and humans ■ Transmission primarily through ingestion of fecal material from any infected animal ■ The infection may not manifest itself with clinical signs; the animal may have a latent infection, harboring the pathogen in its lymph nodes, later shedding the organism in its stool intermittently ■ Clinical signs include: abdominal pain, vomiting and diarrhea. In some birds, and there might also be swelling in the joints. Prevention of the spread of this disease depends primarily on good hygiene. Washing your hands before and after handling any animal and especially in between ill animals is important
West Nile Virus (WNV)	■ Produces illness primarily in birds (but can occur in mammals) ■ Primarily spread among birds by mosquitoes, but transmission via infected saliva and feces of birds may be possible ■ Identified in over 100 species of birds, with those in the corvid family (crows, blue jays) being particularly susceptible, but also seen in waterfowl and raptors. Among raptors, great-horned owls and red-tailed hawks have been affected in large numbers. Mammals (including humans) may also be infected, but are less likely to become ill unless immunocompromised and generally do not accumulate sufficient virus to be infective ■ WNV causes encephalitis (inflammation of the brain) and/or endocarditis (inflammation of the heart muscle) that can manifest as respiratory distress, as well as damage to other organs

	■ If a high-risk bird demonstrates neurological dysfunction in the absence of evidence of injury or acute respiratory distress, then WNV should be suspected, particularly if body temperature is elevated ■ Other signs include anorexia and weight loss, excessive sleeping, head tremors, lack of awareness of surroundings, ataxia, and seizures. Some infected birds recover with supportive care (fluids, good nutrition, and warmth). Other animals succumb to death very quickly (eg. waterfowl and corvids) ■ Remove standing water to reduce breeding areas for the mosquito-vectors of West Nile Virus
Lyme Disease	■ Caused by an intracellular bacteria (*Borrelia* spp.) and is transmitted to humans by the bite of infected *Ixodes scapularis* or black-legged tick (formerly known as deer ticks) ■ Clinical signs include fever, headache, fatigue, and a characteristic skin rash ■ If left untreated, infection can spread to joints, the heart, and the nervous system ■ Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics ■ Steps to prevent Lyme disease include using insect repellent, and removing ticks promptly. The ticks that transmit Lyme disease can occasionally transmit other tick-borne diseases as well
Aspergillosis	■ Caused by inhaling the spores of a fungus ■ Fungus is found on decaying matter, and fairly ubiquitous in the environment and damp/humid areas ■ Frequently found in birds, especially waterfowl, corvids, and captive raptors but occasionally in mammals ■ Not usually considered contagious but infection can occur in individuals with impaired immune systems ■ Infected birds will often be emaciated and have difficulty breathing and exhibit symptoms similar to lead poisoning. This is of significant concern in particular to wildlife custodians caring for waterbirds (eg. swans, loons) and raptors
Leptospirosis	■ Bacterial disease that affects humans and animals ■ Causes a wide range of symptoms, and some infected persons may have no symptoms at all ■ May see high fever, severe headache, chills, muscle aches, and vomiting, and may include jaundice (yellow skin and eyes), red eyes, abdominal pain, diarrhea, or a rash. Many of these symptoms can be mistaken for other diseases ■ Different animals carry the bacteria especially raccoons and rodents

	■ People usually infected through contact with water, food, or soil containing urine from infected animals ■ Not known to be spread from person to person
Giardia	■ Also known as "beaver fever" is a protozoal parasite found in streams and ponds ■ Transmitted through feces and contaminated water causing gastrointestinal upset in many species, including humans
Highly pathogenic avian influenza (HPAI)	■ Avian influenza virus that emerged as a new strain in 2014 in British Columbia ■ Devastating effects to the poultry industry ■ Wild waterfowl may be endemic carriers of the low pathogenic avian influenza virus ■ Raptors may be particularly susceptible to this strain of avian influenza
Sarcoptes spp.	■ Causative agent in the form of 'mange' often seen in foxes, coyotes, squirrels and other mammals and often treated with an anti-parasitic medication (topical or injectable) ■ Alopecia (hair loss) and skin infection often accompanies this condition in wildlife, however, the *Sarcoptes* mite often seen in wildlife is fairly species specific and therefore does not live on humans for long ■ It can be a transient infection in humans and transmissible to pets ■ *Sarcoptes spp*. has known to live for 8-19 days off the host in temperatures between 10°C - 25°C
Tularemia	■ "Rabbit fever," is a disease caused by a bacteria ■ Typically found in rodents, rabbits, and hares ■ Although very rare, people can become infected through the bite of infected insects (most commonly, ticks and deerflies), by handling infected sick or dead animals, by eating or drinking contaminated food or water, or by inhaling airborne bacteria ■ Symptoms can include skin ulcers, swollen and painful lymph glands, inflamed eyes, sore throat, mouth sores, diarrhea or pneumonia. If the bacteria are inhaled, symptoms can include abrupt onset of fever, chills, headache, muscle aches, joint pain, dry cough, and progressive weakness ■ Can be fatal if the person is not treated with appropriate antibiotics

Tuberculosis	■ Bacterial disease of cervids (deer, elk) ■ Transmitted by inhaling air contaminated with the bacteria from an infected animal ■ Animals usually have lesions on the lungs, rib cage, and body organs but lesions may not always be visible ■ After handling any animal, hands should be washed with soap and water which will remove the bacteria. This practice should always be followed, even if the animal appears healthy ■ Clinical signs include cough, fever, night sweats, fatigue, and weight loss
Powassan	■ Virus that is transmitted by groundhog and black-legged ticks (also known as deer ticks, or *Ixodes scapularis*) ■ Clinical signs include fever and encephalitis ■ No treatment for Powassan virus ■ Very rare, but it is fatal in approximately 10% of cases
Echinococcosis multilocularis	■ A ~1-4 millimeter long tapeworm found in foxes, coyotes, and dogs (definitive hosts) ■ Small rodents are intermediate hosts for E. multilocularis ■ Alveolar echinococcosis (AE) disease is caused by infection with the larval stage of Echinococcus multilocularis ■ AE can be fatal to humans if left untreated, causing parasitic tumors that can form in the liver, lungs, brain, and other organs

RABIES AND RABIES VECTOR SPECIES (RVS)

Applicants for a wildlife custodian authorization who intend to work with mammals will be required to write the RVS portion of the OWRE. Even if you decide to not take the rabies portion of the OWRE, you are encouraged to read and learn from this chapter of the study guide.

Global Significance of Rabies

According to the World Health Organization (WHO), the annual number of human rabies deaths globally is estimated to be around 60,000 people. With the exception of Antarctica, rabies is endemic on all continents. The majority of human deaths occur in rural Asia and Africa. The highest incidence of rabies reported is in India; however, estimating rabies in the world is difficult. Many factors such as poor surveillance, underreporting in many countries, misdiagnosis of rabies and a lack of coordination have likely lead to an underestimation of the scale of the disease. In some countries as a result of growing human and feral dog populations, it is expected that rabies will become even more significant unless there is more effort put into post-exposure treatment and mass dog vaccination.

For more information about rabies around the world please see the World Health Organization website at *http://www.who.int/rabies*

What is Rabies?

Rabies is a zoonotic viral disease that infects domestic and wild mammals, including humans. A zoonotic disease is a disease that can be spread between animals and humans. Rabies is transmitted to other animals and humans through close contact with saliva from infected animals (e.g. bites, scratches, licks on broken skin and mucous membranes).

Once clinical signs of the disease develop, rabies is generally considered fatal to both animals and humans.

According to the World Health Organization (WHO), a clinical case of rabies can be defined as *"an animal with an acute neurological syndrome (i.e. encephalitis) dominated by forms of hyperactivity (i.e. furious rabies) or paralytic syndromes (i.e. dumb rabies) progressing towards coma and death, usually by cardiac or respiratory failure, typically within 7-10 days after the first sign, if no intensive care is instituted"*.

From a taxonomic perspective, the rabies virus is classified in the Rhabdoviridae family and in the *Lyssavirus* genus. The virus has been known for many years, originally isolated from bats in Europe. Rabies causes an acute encephalitis or meningoencephalitis (inflammation of the meninges and brain) due to a lyssavirus infection.

✓ Once signs of disease develop, rabies is generally considered fatal to mammals, including humans

Which Animals Get Rabies?

Any mammal (including humans) is susceptible to rabies. Birds, reptiles, amphibians, fish and invertebrates neither contract rabies nor pass on the virus.

Some mammals are less susceptible to rabies. Coyotes and wolves are rarely infected with it in Ontario. Opossums, which are marsupials, rarely get rabies. It is thought that rodents are neither primary hosts nor play a role in the transmission of rabies, however rabies has been reported in groundhogs (woodchucks) and beavers.

Livestock can be affected by rabies.

- ✓ Any mammal is susceptible to rabies
- ✓ Not as common in rodents
- ✓ During the incubation period rabies cannot be easily detected within the host

How Long Can the Rabies Virus Last Outside the Body and in Dead Animals?

The life span of the rabies virus depends on the duration of its exposure to air and climatic conditions. Freezing does not kill the virus; rather it only makes it dormant. You should always assume that a dead animal might still harbor the virus.

How is Rabies Spread?

Rabies is spread by infected mammals to other mammals (including humans) through saliva. This can occur in three main ways:

1. biting
2. contact with the virus through an open cut, sore or wound
3. contact with the virus through mucous membranes (mouth, nasal cavity, eyes)

Note that animal blood or urine does not serve as a vehicle for the transmission of rabies virus. However, cerebral spinal fluid or brain tissue, in addition to saliva from an animal, may contain virus.

How Does Rabies Cause Infection?

Rabies virus enters the body through direct contact with mucosal surfaces or through wounds. It cannot cross intact skin. Once rabies enters the body, it replicates in the muscle and affects nerves (axons) in order to reach the central nervous system.

The incubation period is between 5 days to several years (usually 2 to 12 weeks and rarely more than 1 year), depending on the amount of virus that was originally transmitted and the proximity of the exposure site to the central nervous system (CNS). During this incubation period, the virus cannot easily be detected within the host.

After the virus has reached the central nervous system, it infects non-nervous system tissue such as muscle, skin, heart, lung, and other organs via sensory innervation. Eventually, the virus reaches the salivary glands where it is released into the saliva in the mouth. By the time clinical signs have appeared the virus is widely spread throughout the central nervous system.

Clinical signs start off as neuropathic pain at the site of the bite. Neuropathic pain is a complex, chronic pain state that usually is accompanied by tissue injury. With neuropathic pain, the nerve fibers themselves may be damaged, dysfunctional, or injured. These damaged nerve fibers send incorrect signals to other pain centers.

There are two forms of rabies presentation: furious or dumb (paralytic). Some researchers suggest the form of rabies may be based on where the virus propagates in the brain. If the virus propagates in the limbic system, cortical control of behaviour is lost and the furious form will be observed. If the virus propagates in the neocortex, the paralytic form may occur.

Seizures and cardiac arrest are often seen in the final stages of rabies and once clinical signs occur, progression of infection is fast and death usually occurs in a matter of days.

✓ Rabies can look like other diseases

Forms of Rabies

FORM	SYMPTOMS
Dumb form of rabies	■ Animal may become depressed and hide in isolated places ■ Animal may lose fear of humans and appear unusually friendly ■ Animal who is normally active at night may be active during the day ■ Signs of paralysis: Head and neck paralysis may result in abnormal facial expression, drooling, drooping head, sagging jaw, sometimes the hind legs ■ Change in tone of voice – the animal becomes hoarse
Furious form of rabies	■ Animal may display extreme excitement ■ Animal may become restless, irritable, aggressive ■ Animal may gnaw and bite their own limbs ■ Animal attacks objects or other animals. Bouts of furious rabies usually alternate with periods of depression ■ Lower jaw hangs down, excessive salivation ■ May eat dirt, wood, or other objects

Pattern of Infection in a Raccoon

1. Raccoon is bitten by a rabid animal
2. Rabies virus enters the tissue through infected saliva
3. Virus spreads to the central nervous system (brain, spinal cord)
4. Virus incubates (2-12 weeks on average)
5. Virus propagates quickly and spreads to other organs, including salivary glands
6. Animal usually dies about 7-14 days after clinical signs appear

There may be no signs of illness during the incubation period

The animal begins to show signs of disease after propagation and spread

Keep in mind that rabies can have similar clinical signs to other diseases; one such example is distemper virus in raccoons. Wild animals with rabies, dumb or furious, can have very roughed or dirty fur and appear emaciated, or they can appear outwardly healthy.

How is rabies diagnosed?

It is not possible to identify if a wild animal has rabies simply by observing them. Euthanasia is required of any suspected wild animal because the only way to confirm a case of rabies is to test brain tissue.

Rabies has the highest fatality rate of any currently recognized infectious disease. Therefore, extreme caution should be taken when working with suspected rabies cases.

Rabies is an acute, progressive encephalitis (inflammation of the brain) and thus a diagnosis can be challenging in live animals. Viral antigens, isolation of virus in cell culture, presence of viral-specific antibodies in the cerebrospinal fluid or the serum of an unvaccinated animal, or presence of viral nucleic acids detected by molecular methods in samples (eg. brain biopsy) collected post-mortem can suggest confirmation of rabies.

- ✓ It is not possible to identify if a wild animal has rabies by observing them.
- ✓ Animals as young as 3 weeks of age can be infected.

Rabies in Ontario

Since 1924, twenty-four people have died from rabies in Canada (six from Ontario). About one to eight human rabies deaths occur annually in the USA as a result of wildlife rabies and an estimated US$ 300 million is spent per annum for rabies prevention.

Wildlife rabies is spread across the North American continent and prevention and control is challenging. Ontario has reduced the number of wildlife related rabies cases in the province by more than 99% since rabies control programs began. Continued vigilance is required to continue this positive outcome.

Unlike the situation in other countries the canine strain of rabies has been eliminated in Canada and the USA (as well as western Europe, Japan, Malaysia and some Latin countries).

What are the vector species for rabies in Ontario?

Rabies vector species (RVS) in Ontario include foxes, raccoons, skunks and bats. These are the most common animals that can be infected with rabies in Ontario.

Common primary hosts:

- ✓ Foxes
- ✓ Raccoon
- ✓ Skunk
- ✓ Bats

Foxes: The number of rabid fox cases has dropped significantly over the past few decades, but there were still some in 2016 and 2017. Red foxes are found province wide and can adapt to living in suburban areas.

Raccoons: Raccoons can pick up various strains of rabies, but they are most susceptible to the raccoon strain.

Photo: JD Taylor

Skunks: In Ontario, skunks primarily carry the Ontario fox strain, but are also susceptible to the raccoon strain.

Bats: Despite large numbers of bats in southern Ontario, rabies is infrequent. Fewer than 2% of bats submitted for testing have rabies (2% of all bats acting strangely, dead, or have possibly bitten a human or pet). In the overall population, this percentage would be much lower. In Ontario, over 90% of rabies positive bats are big brown bats.

Human rabies from bats is a concern, but a relatively rare occurrence. In Canada, since 1924, six of the 24 cases of human rabies have been due to contact with an infected bat.

Spread through saliva:
- ✓ Via bites
- ✓ Contact with virus through an open cut, sore or wound;
- ✓ Contact with virus through mucous membranes

Rabid bats often lose their ability to hang, fly, or do not fly well. They rarely become aggressive; however, like other mammals, bats can become agitated. For example, incessant biting at bedding or anything that touches them (different from defensive or fear biting when being handled), constant vocalizations when undisturbed and other neurological signs such as seizures may be seen. They may also move away from other bats in the group and isolate themselves.

Rabid bats may:
- ✓ Not hang or fly well
- ✓ Become agitated
- ✓ Vocalize
- ✓ Demonstrate neurological signs (eg. seizures)

What are the types, also called strains, of rabies in Ontario?

There are several types or strains of rabies in Ontario and it is important to note that **any mammal can get *any* strain of rabies** (e.g. raccoon strain of rabies in a skunk).

All strains of rabies are dangerous to pet mammals, livestock, humans, and other mammalian wildlife.

'Ontario fox' strain	The 'Ontario fox' strain is found mainly in Red foxes and Striped skunks in Ontario. The 'Ontario fox' strain rabies is a subsidiary of 'Arctic' or 'Arctic fox' strain. In 1948, an outbreak of rabies was detected in northern Canada where it was spread by Arctic foxes and sled dogs. This moved southward, resulting in the first case in Ontario in 1954.
Bat strains	The bat strain of rabies is found throughout Canada and the Americas. At least four strains have been identified in Ontario. Each of the following bat species has its own strain of rabies: ■ Big Brown Bat – more than 90% of all confirmed rabid bats in Ontario ■ Silver-haired Bat – some evidence suggests this strain is most likely to infect humans ■ Red Bat ■ Hoary Bat Several smaller bat species in Ontario, such as the Little Brown, the Pipistrelle, and others, do not have their own rabies strains. The Big Brown bat strain is usually found in those smaller bats.
Raccoon strain	The raccoon strain of rabies originated in Florida and was first confirmed in Ontario in 1999.

Prevention and Control

When the raccoon strain of rabies was first confirmed in Ontario in 1999, a 3-tiered strategy was used to control it. "Point Infection Control" (PIC) included targeted de-population in a small area around the site of a rabies case, trap-vaccinate-release (TVR) in a larger area around that, and oral rabies vaccination (ORV) using vaccine baits in large areas of Ontario. TVR included live-trapping of vector species vaccination against rabies by injection and release at the point of capture. ORV involved the distribution of baits containing liquid rabies vaccine either by hand or from aircraft. The bait was comprised of a small package filled with rabies vaccine that is absorbed through the lining of the mouth after the packet is bitten through.

The rabies vaccine used at the time was only moderately effective for the control of raccoon strain rabies, though it had been effective in the reduction and elimination of fox strain rabies in the past.

These 3 techniques were successfully used in combination to control the incursion of raccoon rabies into the province at that time, but it was recognized that a better approach was needed for the future.

Early experiments in oral rabies vaccination lead to the development of the vaccine used today – ONRAB® – which is effective in the vaccination against both fox and raccoon rabies virus strains in the main vector species: fox, skunk and raccoon.

The current ONRAB® vaccine bait is so effective that Ontario was able to eliminate the need for targeted de-population and trap-vaccinate-release. The current control strategy utilizes only oral rabies vaccination baits with ONRAB®, made possible by the effectiveness of the vaccine.

Today, in response to confirmed cases of rabies as well as part of planned operations, the MNRF distributes the ONRAB® baits for foxes, raccoons and skunks to eat. Approximately two weeks after the mammal ingests the vaccine bait it becomes immunized against rabies.

Vaccines baits used in the field must fulfill requirements of efficacy, safety and stability.

Exposure to the bait is not harmful to people or pets; however, in the unlikely event that people or pets come in contact with the vaccine contained in the bait, contacting a doctor or veterinarian as a precaution is recommended. The bait consists of vegetable fats, wax, icing sugar, vegetable oil, artificial marshmallow flavour and a dark-green food grade fat-soluble dye. There is a blister pack in the bait that contains the rabies vaccine.

Unfortunately bats cannot be vaccinated using baits as they are insect-eaters and will not consume vaccine baits. International research is being conducted on vaccination methods for bats.

✓ Pre-exposure vaccines against rabies exist for animals

Can a vaccinated animal get rabies?

While it may not be likely, it is possible that a vaccinated animal can get rabies. Also, if an animal that is already incubating the virus is vaccinated, the vaccine will not cure them. Vaccines are an essential tool in the management of rabies, but standard disease prevention measures (biosecurity) must always also be followed.

To learn more about rabies management in Ontario and to get up-to-date information please go to *www.ontario.ca* and search for the "Rabies in Wildlife" page.

Can I vaccinate wildlife in my care?

In addition to the oral ONRAB® vaccine used for wildlife by the MNRF, other pre-exposure rabies vaccines exist for use in animals. They include inactivated (killed), modified live, or recombinant vaccines administered through injection. If the wildlife custodian chooses to vaccinate animals against rabies, these vaccines must be administered by your veterinarian. Please contact your veterinarian for more information on vaccines.

May I get MNRF vaccine baits to feed to wildlife in my care?

No. The MNRF is not licensed to give out baits to individuals. Please discuss vaccination options with your veterinarian.

Home Ranges and Movement of Vector Species

Vector species movement may impact disease spread. Studies of movement behaviour in healthy and rabid raccoons have shown that movement patterns in rabid raccoons are not dramatically different from healthy raccoons.

Successful ORV requires that baits be dropped within the movement area/home range of the vector species.

Rapid Response Zone, Wildlife Rabies Vaccination Zone

When a case of rabies is confirmed in Ontario, MNRF initiates a plan to contain the disease and prevent it from spreading. This occurs in two phases:

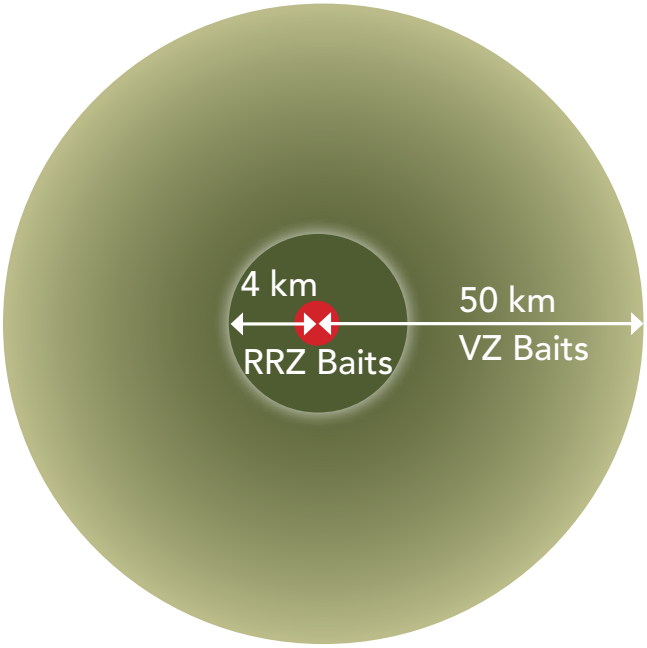
First, when a rabies occurrence has been verified by the Canada Food Inspection Agency (CFIA) the ministry initiates an oral rabies vaccination (ORV) campaign within the immediate area of the case to prevent spread of the virus both within the population and to other populations and species. Depending on the time of year the case was confirmed, ORV can occur as quickly as 48 hours from confirmation by CFIA. The area created by this effort is known as the Rapid Response Zone (RRZ) and may include a 4km radius or 8km x 8km square from the known occurrence of rabies. This is a high intensity bait drop in the immediate area of the known rabies occurrence.

Second, a Wildlife Rabies Vaccination Zone (VZ) is created to surround the location of the initial rabies occurrence (outside of the Rapid Response Zone) with the intention to follow up on the initial vaccination done during the rapid response and ensure that the vector population has been sufficiently vaccinated to control spread and eliminate the rabies virus. This zone encompasses approximately a 50 km radius of the initial occurrence and may occur months after the RRZ was established depending on when the initial rabies case occurred.

Caution will be maintained in the area until the risk that rabies is still present has been eliminated.

✓ Rapid Response Zone (RRZ)
✓ Wildlife Rabies Vaccination Zone (VZ)

Surveillance takes place by testing local vector species population for the presence of rabies. During an outbreak, increased surveillance occurs within the 50 km Vaccination Zone.



Rapid Response Zone (RRZ) of ~4km radius (or 8 x 8 km square) from initial rabid case and **Wildlife Rabies Vaccination Zone (VZ)** radius of ~50km

High Risk Area and Effects on Wildlife Custodian Authorizations

The area within 50 km of a recent (within the last 2 years) case of raccoon rabies may be defined as a High Risk Area (HRA). Once an HRA is defined, additional controls are placed on release of rehabilitated RVS. Please see the conditions of a Wildlife Custodian Authorization. Should this approach be implemented all authorized wildlife custodians would be notified.

Suspect Case of Rabies

If an animal is suspected of having rabies and there has been human contact, it is euthanized and the local public health unit will send it to the Canadian Food Inspection Agency (CFIA) so that a Fluorescent Antibody Test (FAT) can be done to determine whether rabies is present. If rabies is present CFIA will notify the public health unit directly.

If an animal is suspected of having rabies and there has been exposure to a domestic animal (e.g., livestock), it will be sent by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) directly to CFIA for testing.

MNRF is notified by these agencies if rabies is present in wildlife or other animals.

If a wild animal is suspected of having rabies and there has been no known contact to people, pets or livestock, preliminary testing is carried out by MNRF staff at the MNRF labs at Trent University using the Direct Rapid Immunohistochemistry Test (DRIT). If the results are positive MNRF sends the animal to CFIA for confirmation where a FAT test will be performed. CFIA will notify MNRF of the results.

Considerations for Wildlife Custodians Working with RVS

If a potentially rabid animal bites or scratches a person, prompt attention to wounds and scratches is necessary. Recommended first-aid procedures include immediate, thorough flushing and washing of the wound with soap and water, and then the use of povidone iodine or other substances with virucidal activity. Then seek medical attention: call the family physician, the public health unit, or go to the emergency department of the local hospital.

How do wildlife custodians help reduce risk of rabies in wildlife?

- Ensure that the release of rabies vector species is in accordance with the conditions of a wildlife custodian authorization. This helps prevent the spread of rabies and gives the animal a better chance of survival by releasing them close to the point of origin
- Encourage the public to eliminate potential wildlife food sources from their home, including pet food left outside. This will help to prevent the potential spread of rabies and other diseases to pets and wildlife that can congregate into unnaturally larger numbers and increase contact and disease transmission rates.

Because of the unknown (and potentially long) incubation period for rabies in wild animals, all RVS in a wildlife rehabilitation facility should be considered at risk for developing rabies and treated with the appropriate safety precautions.

✓ Rabies vector species must be released according to the authorization conditions for Wildlife Custodians

Should wildlife custodians be vaccinated against rabies?

Rabies is almost always fatal in humans and therefore it is recommended that you be vaccinated for rabies when working with animals, in particular with rabies vector species. Some wildlife rehabilitation centres and veterinary schools require proof of protective antibody titre annually or on some regular interval. The human rabies vaccine is fairly expensive, but if you plan to handle wild mammals regularly the pre-exposure vaccination may be worth the expense to you.

✓ Rabies is a **Reportable Disease** in Canada

There is a Raccoon/Skunk/Fox out wandering in the winter and / or during the daytime. Is it rabid?

Not necessarily. Mating season for the main rabies vector species (fox, raccoon, and skunk) is during the winter. There may be other reasons why an animal normally active at night is out during the day, such as searching for food to feed their young.

How can the public help reduce the risk of rabies in wildlife?

The public can initiate preventive measures that are successful against any strain of rabies. People should have pets vaccinated, warn children to stay away from wild or stray animals, and report any animal that behaves strangely to the local police department or animal control.

If travelling across a region known to have raccoon rabies, remember that raccoons can 'hitch a ride' on trucks and other vehicles. There is a risk that rabies could be spread far into the province this way. Before a trip begins, or after a roadside stop, make sure that there are no 'hitch-hiking' raccoons in your vehicle.

Handling, Caring for and Releasing Rabies Vector Species

RVS should always be handled as having the potential to transmit the virus. As you have already read the virus can incubate for long periods of time in wildlife without clinical signs of disease, so even a healthy looking animal must be handled carefully.

As with any wild animal, and in particular with RVS, safe capture and handling techniques are important for the safety of you, your volunteers, and the animal. Always handle rabies vector species (RVS) carefully and attentively. Protective clothing such as bite-proof gloves, long sleeves, safety glasses, and masks reduce the risk of being bitten or scratched.

If the public calls about a RVS that is to be brought in for rehabilitation, the wildlife custodian must be confident the caller is able to safely contain the animal. Heavy, leather/ bite-proof gloves should be worn when handling RVs including bats or baby raccoons and skunks. Ideally the animal would be safely contained without handling it (eg. A broom can be used to push adult raccoons, foxes, and skunks into a carrier or large container, or a container could also be placed over the animal and the lid or a board can be used to slide under the animal to safely contain it). It is not recommended to pick up RVS by hand – even if the animal seems to be not alert; once handled by humans, they may become very alert and pose a human safety risk.

It is essential to obtain specific information from the finder regarding location found and his/her contact information. If the animal develops signs of rabies while in the care of a wildlife custodian, they should inform the finder that they may have been exposed to rabies. And as with all wildlife, it is essential to record the point of origin so the animal can be back near its point of origin in accordance with the conditions of a Wildlife Custodian Authorization.

Longer-term housing in the rehabilitation area should meet or exceed the minimum standards listed in the IWRC/NWRA Minimum Standards for Wildlife Rehabilitation.

Remember that rabies can present in different forms; therefore, rabies should be a consideration for any mammal displaying neurological signs – not just those traditionally listed as rabies vector species. For example, it is not easy to differentiate distemper from rabies in raccoons, and euthanasia is required to confirm rabies. Both diseases have potential health implications on other animals in your care.

Similar to other mammals, special attention must be paid to ensure the RVS is not habituated or tamed in your care. A "friendly" raccoon may be mistaken for having distemper or rabies and could be killed when in fact it was a habituated raccoon. While it may be difficult, it is in the animal's best interest – and survival – to ensure it remains a wild animal. Keep contact and handling to a minimum, ensure appropriate care and housing as in accordance with other mammal species in your care. More information on appropriate housing, enrichment and nutrition can be obtained through wildlife rehabilitation network organizations and via continuing education.

Agencies and Partners in Rabies Prevention and Control

Responsibilities in a rabies situation are divided between public health units, the Ministry of Natural Resources and Forestry, the Ontario Ministry of Agriculture and Rural Affairs and the Canadian Food Inspection Agency. The Municipality with the local Health Unit acts as the lead communication agency, and MNRF has a strong supporting role.

✓ If bitten or scratched: seek medical attention; thoroughly flush and wash wound

Human exposure (eg. bitten, scratched) → Local Public Health Unit

Domestic animal exposure
- → Contact local veterinarian for any animal health concerns
- → Veterinarians can contact OMAFRA

Abnormal wild animal (dead) if NO domestic animal exposure, NO human exposure
- → MNRF Rabies Information Line (excluding bats) 1-888-574-6656
- → CWHC for bats 1-866-673-4781

Municipality

- Animal control – surveillance/sample pick-up

The Province of Ontario

Ministry of Natural Resources and Forestry:

- Delivery of the wildlife control and surveillance program
- Answer public enquiries via the rabies toll-free phone number regarding wildlife and bait distribution
- Maintain inter-agency and international relationships to help control rabies

Public Health Units:

- Treatment of individual people potentially exposed to rabies
- Implementation of health legislation (i.e. pet vaccinations)
- Communication with the public (news releases, public education, answer public inquiries, public meetings)

If a wildlife custodian suspects that they, one of the volunteers or foster care givers, or someone that has brought in wildlife may have been exposed to rabies they must report it to the local public health unit:

- Type of exposure, what occurred
- Animal involved, description
- Location of animal

Make sure the person gets medical attention. Note that it is the physician that makes the final decision regarding treatment in consultation with the person that has been potentially exposed.

In the event that rabies has been confirmed, and during a rapid response situation, the Public Health Unit is responsible for hosting public meetings, creating news releases and providing public education. The MNRF plays a strong supporting role, working cooperatively with the Public Health Unit, providing information on the Ministry's wildlife rabies program and specifically keeping the Health Unit informed of baiting activities associated with both the Rapid Response and Wildlife Rabies Vaccination Zones. MNRF is also specifically responsible for the support of the rabies toll-free number regarding wildlife and bait distribution. This phone number appears on all baits and is also advertised in many news releases.

Ontario Ministry of Agriculture, Food and Rural Affairs:

- Investigates and arranges testing of domestic animals for rabies

The Federal Government

Canadian Food Inspection Agency (CFIA):

- Performs laboratory diagnosis of suspect rabies cases that have potentially exposed a person to the virus
- The CFIA Biologics Section is responsible for licensing rabies vaccines.
- The Animal Import Section of the Health of Animals Regulations requires proof of rabies vaccination for all dogs, cats and ferrets over 3 months of age entering Canada. CFIA veterinarians can help to determine and provide certification when required to meet the rabies requirements of importing countries.

Rabies is a "reportable" disease under the Reportable Disease Regulations under the Health of Animals Act. This means immediately reporting the presence of an animal that is contaminated or suspected of being contaminated with one of these diseases to a CFIA district veterinarian.

A veterinary inspector under the Health of Animals Act must be notified by veterinarians who suspect that an animal is affected with rabies and by other persons of the presence or any fact indicating the presence of rabies.

EUTHANASIA AND QUALITY OF LIFE

Death and euthanasia are parts of wildlife rehabilitation. If you choose to become a wildlife custodian, you will have to deal with death and euthanizing wildlife.

It is sometimes difficult to recognize at the outset that an animal has little likelihood of surviving; some animals appear to do well for a day or two, but then die unexpectedly.

A particularly difficult part of dealing with death is euthanasia, but remember that euthanasia means "good death". There is no way around it – if you get into rehabilitation, you will have to euthanize or arrange for the euthanasia of animals. Often animals arrive at your facility so badly injured that they need to be euthanized to prevent further suffering. Euthanasia is a form of release; that is, a release from suffering.

Where a decision is made to euthanise, you must consider who would do the euthanasia. Would you be doing it yourself? What techniques would you use? How would you dispose of the carcasses? You would need to have answers to these questions **before** you start receiving animals. Many humane euthanasia techniques require the use of injectable drugs and can only be performed by, or with the approval and supervision of, a veterinarian. It is important to talk to your veterinarian about this issue early.

The NWRA *Minimum Standards* booklet has some helpful discussion about euthanasia agents. You should also discuss this issue with other wildlife custodians and with a veterinarian with expertise in wildlife, as the *Minimum Standards* booklet is U.S. based and some euthanasia options are treated differently in Canada. For example, T-61 is not available in the U.S., but it is available in Canada. Note that sedation should precede use of T-61 because it paralyzes skeletal muscle rendering an animal unable to breathe (ie. paralyzing pectoral muscle in birds, and the diaphragm in mammals).

✓ The word euthanasia means good death.

Work with your veterinarian to determine how best to humanely euthanize wildlife. Other resources include a section in the NWRA *Principles of Wildlife* Rehabilitation binder, and the American Veterinary Medical Association (AVMA) Guidelines for Euthanasia (Appendix 3).

Could I simply keep the animal in captivity and not have to euthanize?

If you determine that an animal is not releasable you must decide if it will be provided with humane euthanasia or put into long-term captivity. Getting advice from experienced wildlife custodians is essential, as is referring to documents like the NWRA Wildlife in Education. The decision to keep a wild animal in captivity for the remainder of its life is a significant one. Captivity can be extremely stressful for wildlife and not all animals have the temperament or physical ability to live in permanent captivity. If you choose to consider permanent captivity for a non-releasable animal, you must contact your local MNRF district office and work with them to have the animal transferred to an appropriate licensed / authorized individual.

✓ A wildlife custodian authorization does not allow you to keep non-releasable animals in permanent captivity.

RELEASE BACK TO THE WILD

Injured wildlife are treated, and orphaned wildlife are reared, with the express purpose of releasing them back into their natural habitats as soon as they are healthy and able to fend for themselves in the wild. No one wants to condemn a wild animal to life in a cage, nor do we wish to release severely disabled animals that will have little ability to compete and survive in the wild. It is important to constantly consider the likelihood of eventual releasability of an animal.

Who gets released?

A releasable animal must be able to fly, swim or run well enough to perform all the functions of a member of its species (e.g., find food, escape from predators, and migrate). It must demonstrate normal behaviour for that species, including showing a fear of humans.

Where do I release an animal?

Wildlife must be released in close proximity to its original point of capture, and in the appropriate habitat. Generally, the conditions of authorization require adult wildlife to be released within 1km from point of origin, and juvenile wildlife up to 15km from point of origin. Knowledge of an animal's natural history and resource needs are important in determining release sites. Releasing animals close to where they were found is of particular importance with adult animals. They have established territories and home ranges, and have learned the local resources necessary for survival. Release in the original location is less important for young animals that do not have established home ranges, and the conditions of authorization recognize this by allowing a slightly wider potential release zone for animals brought into rehabilitation when they are young.

Remember there are specific conditions of a wildlife custodian authorization regarding the release of wildlife to ensure the animal has its best chance of survival, and to minimize the risks to other wildlife. Release wildlife close to it's original point of capture to:

- prevent the spread of diseases and parasites
- give the animal its best chance of survival by ensuring it is released within or close to its original home range
- reduce the potential for nuisance activity
- ensure the carrying capacity of a release area is not surpassed.

If releasing on private property you must have landowner or occupier permission prior to any release activities. This includes on-property assessment for potential releases. In particular with release activities in rural areas, it is important to talk with the landowner/occupier about adherence to biosecurity protocols when entering agricultural property.

Please review the wildlife rehabilitation policy and the standard conditions of a Wildlife Custodian Authorization for more information about releasing rehabilitated wildlife in Ontario.

What are some considerations for releasing an animal?

Animals should be released when it gives them the best opportunity to survive. For example, many nocturnal animals (those who come out at night, such as opossums, foxes, and raccoons) will be released just prior to dusk; whereas diurnal animals (those who come out during the day) would be released when there is plenty of daylight to be able to acclimate and give it the best chance of survival.

Choosing an appropriate season or time of year is also important, in particular in time for migration, breeding season, and ability to find food. For example, gray squirrels should be released early enough in the fall to cache food for the winter and to find shelter.

Animals should go through a release evaluation (including pre-release conditioning) where they can be observed to be behaving in a way that would be appropriate in the wild. For example, raptors should be able to fly and land well, squirrels should be able to jump from one branch to another, owls must be able to hear (test for hearing for head trauma cases), and hawks and falcons need excellent eyesight, etc.

Other release considerations include a positive health assessment; the animal must be of normal weight for that species/sex/season, with no evidence of disease, and normal mobility and function.

There are different methods of releasing animals that can be found through various resources, additional information can be found in *NWRA Principles of Wildlife Rehabilitation*.

Release of a Great Horned Owl.

CONCLUSION

This study guide was developed to help you understand what is involved in rehabilitating wildlife in Ontario, and to help you prepare for the Ontario Wildlife Rehabilitation Exam should you decide to pursue authorization to become a Wildlife Custodian. As mentioned in this document, you will need to work with other wildlife custodians and obtain hands-on experience to gain knowledge, practice, and confidence when working with wildlife.

Should you apply for and receive a wildlife custodian authorization please remember that wildlife rehabilitation is a dynamic field in which improvements and changes occur rapidly. Some practices that were considered "state of the art" only a decade ago are no longer considered appropriate treatment or nutritional strategies. Conversely, many cases that were considered non-releasable may now be successfully treated by veterinarians trained in the field of wildlife medicine.

In order to properly help animals, it is essential for wildlife custodians to stay well-informed and engage in continuing education. Joining wildlife rehabilitation network organizations helps to keep knowledge current, especially when attending training sessions and conferences as well as reading their publications. Volunteering with a more experienced wildlife custodian or with a wildlife veterinarian will give you some hands-on continuing education.

Other possibilities include taking courses at local colleges on topics such as ecology, animal behavior, wildlife biology, and the studies of particular vertebrate groups (e.g., ornithology, mammalogy).

There is a wealth of information available online, and it is essential to remember that some of it may be misleading or inaccurate. To provide good care to animals, and prevent inadvertent suffering and/or death, everyone involved with wildlife rehabilitation must carefully assess the validity of each website. Prioritize the information from known sources such as the International Wildlife Rehabilitation Council (IWRC) and the National Wildlife Rehabilitator's Association (NWRA).

We hope you found this material and links to relevant resources helpful as you consider applying for a wildlife custodian authorization.

GLOSSARY

Acute: happens suddenly
Accipiter: genus and common name of type of diurnal raptors (the true hawks) that have short rounded wings and long tails, with flight specialized for maneuvering through trees; mostly bird-eaters
Altricial: bird hatched in helpless condition, usually naked, eyes closed, cared for by parents in nest
Anemia: deficiency of red blood cells, characterized by weakness and pale mucous membranes
Anesthetize: produce a local or general insensibility to pain by drugs
Anorexia: loss or lack of appetite
Antiseptics: chemical agents applied to living tissue (such as wounds) to prevent growth of microorganisms
Apnea: cessation of breathing
Aspirate: to inhale fluid into bronchi and lungs
Ataxia: incoordination or lack of controlled movements
Autecology: the natural history of a species, or the ecology of an individual, breeding pair, etc.
Bactericide: chemical agents that kill bacteria
BAR: Bright, Alert, Responsive
BID: twice daily; every 12 hours; also seen as q 12 hr
Brancher *(slang term)*: young bird not fully fledged, out of nest and hopping on branches
Brood: birds hatched from single clutch of eggs; also, a verb meaning to provide warmth and shelter for young birds
Bumblefoot: foot abscess sometimes seen in raptors (and other types of birds). Proper term is pododermatitis
Buteo: genus and common name of a diurnal raptor (also properly called "buzzards" though referred to as hawks in common usage) with long broad wings and short tails, with soaring flight; mostly eats rodent and herptiles
Canid: of the Canidae family of carnivorous animals that includes wolves, coyotes and domestic dogs
Candidiasis: infection by fungi of the genus Candida; also known as "thrush"
Carapace: the dorsal shell (top) of a turtle
Carnivore: in some dietary pattern schemes, an animal that eats other animals of any type; in other schemes, an animal that eats terrestrial vertebrates. Note that some animals (eg. bears, foxes) may be classified as carnivores, but they actually are omnivores in terms of diet
Carrion: dead and decaying animals
Carrying capacity: estimate of the population size of a species that can be supported by a specified area of a fairly stable habitat
Cast: undigested parts of prey (hair, bones, claws, teeth, etc.) eaten by raptors, which are egested (regurgitated) in the form of a pellet [also see "pellet"]; also used as a verb ("cast a pellet")
Cere: fleshy base of upper mandible in some birds (raptors, pigeons)
Cestodes: flatworm parasite; tapeworms are cestodes
Chronic: continuing for a long time
Closed fracture: when the bone at the fracture site has not broken through the skin
Clutch: the eggs laid in a single nesting
CNS: central nervous system
Comminuted fracture: fracture in which the bone is splintered into more than two pieces
Community Ecology: ecological study of groups of species populations
Conspecifics: other individuals of the same species
Coprophagy: ingestion of their own feces; this is normal and necessary in rabbits and some rodents
Crepuscular: animals that are most active around dusk and dawn

Crop: an enlargement of the esophagus in the neck area in some birds; a temporary food-storage area
Cyanotic: bluish/purple color of mucus membranes due to low oxygen levels in the blood
Dehydration: state of deprivation of water
Disinfectants: chemical agents applied to inanimate objects or surfaces to kill disease-causing microorganisms; this includes bacteria, fungi and at least some viruses
Dispersal: movement of individual animals from where born to the site of first breeding (not necessarily migration)
Distal: away from the center of the body (e.g., in a distal fracture of the femur, the fracture occurs in section of femur farthest from the hip)
Diurnal: animals that are most active during the daylight hours
Dorsal: pertaining to, or situated on, the back
Ecology: the scientific study of the interactions that determine the distribution and abundance of organisms
Ectoparasite: parasite found on the outside of the body (e.g., fleas, lice)
Edema: swelling or thickening caused by fluid leaking from blood vessels
Emaciated: very thin, starved
Endoparasite: internal parasites (most types of worms)
Enteric: pertaining to the intestines or gastrointestinal tract
Epizootic: disease that rapidly spreads and affects many animals (essentially, an epidemic)
Ethology: the study of the behavior of animals
Euthanize: to put to death humanely
Fever: elevation in body temperature, often due to infection or disease
Fledgling: a baby bird that has matured sufficiently to leave the nest; however, still may not be able to fly
Frugivore: animal that eats primarily fruit
Fungicide: chemical agents that kill fungi
Gavage: force feeding through a flexible tube placed down the esophagus
Germicide: a broad term applied to chemical agents that kill microorganisms
Gestation: time period from conception to birth of young mammals
GI: referring to the gastrointestinal tract through which food passes
Gizzard: muscular portion of stomach in birds; specialized for grinding food, ventriculus
Glottis: opening to the trachea that leads to the lungs
Granivore: animal that eats primarily grains and hard seeds
Habitat: An area on which a species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding.
Habituation: is a process by which an animal learns not to respond to stimuli to which it is frequently exposed without any particular consequences
Hacking: a technique for gradually returning animals to the wild; usually involves making food available to newly-released animal [see also "soft release"]
Hatchling: a newly hatched baby bird (or one no more than a few days old)
HBC: hit by car
Hemorrhage: bleeding (usually refers to profuse bleeding)
Herbivore: in some dietary classification schemes, an animal that eats plants of any kind; in another scheme, a plant-eating animal that feeds primarily on leaves, buds, shoots, grasses, etc.
Herpetology: the study of amphibians and reptiles
Home range: area of general movement and activity of an individual animal; not the same as territory
Hyper: more than normal

Hyperthermia: having an abnormally elevated body temperature, usually from being kept in too warm an environment and not being able to cool itself adequately; not the same as fever, and in some cases caused by drugs

Hypo: less than normal

Hypothermia: having an abnormally low temperature; such animals should be warmed before any food is given

Hypovolemic: abnormally low blood / circulating fluid volume

Immature: A specimen that cannot reasonably survive in the wild without significant parental care due to its early stage of development.

Immunosuppression: Occurs when T and/ or B clones of lymphocytes are depleted or suppressed in their reactivity, expansion or differentiation.

Imping: repairing of damaged feathers using undamaged feathers from another bird

Imprinting: process usually occurring early in a bird's life in which the bird learns to identify with and relate to its parental species

Incubation: the action of warming eggs to the temperature necessary for embryo development

Innervation: the supply of nervous energy or of nerve stimulation sent to a part

Insectivore: animal that eats primarily insects

Kcal (or kilocalorie, or Calorie): an energy unit equivalent to 1000 calories (the "calorie" on most food labels refers to Calories = Kcal)

Keel: the protruding part of a bird's breastbone (sternum) to which the large flight muscles attach

Lagomorph: members of the order Lagomorpha (rabbits and hares)

Lateral: denotes a position towards the side of the body

Litter: a group of young mammals born together

Mammalogy: the study of mammals

Marsupial: pouched mammals (kangaroo, opossum, etc.)

Medial: situated towards the midline of the body

Milwaukee protocol: an experimental course of treatment of an infection of rabies in a human being

Mycoplasmal conjunctivitis (finch eye): A bacterial disease that affects bird's eyes – possibly spread by contaminated food, physical contact with infected birds and/or contact with eye secretions found on feeders.

Nares: nostrils

Native wildlife: A species is defined as native to a given region or ecosystem if its presence in that region is the result of only natural processes, with no human intervention.

Necropsy: autopsy or post-mortem; an examination of the body after death. Protection against zoonotic disease is important by wearing gloves, eye protection, and masks.

Necrosis: death of individual cells or a localized area (decay)

Nematodes: unsegmented worm with cylindrical body, often parasites

Neonate: a newborn

Nestling: a baby bird too young to leave the nest, still dependent on parents, often unable to maintain its body temperature without parents incubating

Nocturnal: animals that are most active at night

Omnivore: an animal that eats both animals/ invertebrates and plants

Open fracture: bone at the fracture site has broken through the skin

Ornithology: the study of birds

Parasite: an animal that gains some advantage by living on or in another species

Parenteral: term used for the delivery of medications by routes other than oral; e.g., subcutaneous, intramuscular or intravenous

Paresis: severe weakness or partial paralysis of a limb

Passerine: birds belonging to the Order Passeriformes (literally, "sparrow-shaped"); largest order of birds (more than 5000 species); passerines are also sometimes referred to as "song-birds"

PCV: packed cell volume, volume of red blood cells in blood

Pectoral muscles: one of two sets of major flight muscles in birds, breast muscles

Pellet: roundish mass of bone and fur egested (regurgitated) by raptors [also see "cast"]

Peristalsis: contraction and relaxation of GI muscles forcing food downward

Photoperiod: the proportion of hours of light to hours of darkness in the daily cycle

Piscivore: animal that eats primarily fish

Plastron: the ventral (bottom) shell of a turtle

Plumage: entire feathery covering of a bird

Population ecology: the ecology of a group of individuals of one species living in a specified area

POTZ: Preferred Optimal Temperature Zone. The temperature required for reptiles to be at in order to metabolize food and drugs, and for other normal functions (eg. reproduction)

Precocial: birds that leave the nest soon after hatching, usually have strong legs, open eyes and are more responsive to external environment (quail, ducks, killdeer, etc.)

Predator: an organism that kills and eats other organisms

Preening: use of the bill or beak to clean and align feathers

Proventriculus: portion of a bird's stomach that partially digests food before it moves to the gizzard (ventriculus)

Proximal: close to the body (e.g., a proximal fracture of the humerus is a fracture of the section of the humerus close to the shoulder)

QAR: Quiet, Alert, Responsive

QID: four times daily; every six hours; q 6 hrs

Radiograph: x-ray

Raptor: animal with taloned (raptorial) feet that are used to kill prey

Rehab: a slang term used for anything related to wildlife rehabilitation

Refeeding Syndrome: a clinical condition characterized by electrolyte and mineral imbalances; occurs when nutrients are introduced prematurely to an emaciated patient

Rehydration: the process of restoring body fluids to normal levels

Rodent: member of the order Rodentia (includes rats, mice, squirrels, beavers, porcupines. Note that this does not include lagomorphs (rabbits and hares))

Roost: sleep; also used as a noun to mean location where birds congregate to sleep

Rumen: one part of a four compartment stomach to digest plant food such as grasses

Septicemia: invasion and replication of bacteria in the blood stream

Shock: collapse of circulatory function due to severe blood loss, toxins, etc.

SID: once daily; every 24 hours; q 24 hrs

Soft release: slow, gradual release of animals back into the wild [also see "hacking"]

Sterilization: process of complete destruction of all forms of microbial life

Talons: specialized claws of a raptor

Territory: any area defended by an animal, pair of animals, pack, etc.

Thermoregulate: an animal's ability to maintain its normal body temperature

Thiamine: vitamin B1 (should be supplemented in birds that are fed dead fish)

TID: three times daily; every eight hours; q 8 hrs

Trachea: passageway of air to and from lungs for breathing

Trematodes: parasitic flatworm with suckers (synonymous with fluke)

Triage: process of setting medical priorities – deciding what cases should be treated immediately, later, or not at all (because they cannot be helped)

Trichomoniasis: disease of upper digestive tract of bird caused by the protozoan Trichomonas gallinae; also known as "frounce" or "canker"

Tube feeding: same as "gavage"

Uropygial gland: oil gland above the base of the tail in most birds

Vaccination: injection of a preparation of killed or altered microorganisms that is intended to provide immune system protection from an infectious disease or parasite. Modified live vaccines are produced by chemically altering the microorganism so it is no longer capable of producing disease. Because the microorganism is still living, on occasion, some modified live vaccines have produced disease in vaccinated animals. Killed vaccines cannot produce disease, but often may not be as effective at stimulating the immune system. Newer, recombinant vaccines are available for some viruses and thought to be safer.

Ventral: pertaining to the belly or underside

Veterinarian: an individual with a current licence with the College of Veterinarians of Ontario

Virucide: chemical agent that kills viruses

Weaning: a young mammal that is of the appropriate age to transition from formula to solid foods

Zoonoses / Zoonotic: a disease that can be spread between animals and humans.

CONTACT INFORMATION

Regulatory Bodies

Ministry of Natural Resources and Forestry
Please direct any MNRF queries to your local MNRF district office
https://www.ontario.ca/page/ministry-natural-resources-and-forestry-regional-and-district-offices

Ontario Animal Welfare
ontario.ca/animalprotection
1-833-9-ANIMAL (264625)
Ministry of the Solicitor General

Canadian Wildlife Service
867 Lakeshore Road,
Burlington, ON L7R 4A6
Phone: 905-336-4464

College of Veterinarians of Ontario (CVO)
2106 Gordon Street
Guelph, ON N1L 1G6
Phone: 1-800-424-2856
Web: *https://cvo.org*
Email: *inquiries@cvo.org*

Wildlife Rehabilitation Organizations that provide training courses and/or resource documents

International Wildlife Rehabilitation Council (IWRC)
PO Box 3197 Eugene, OR 97403
Phone: 866.871.1869 Fax 408.876.6153
Web: *https://theiwrc.org/*
Email: *director@theiwrc.org*

National Wildlife Rehabilitators Association (NWRA)
Central Office
2625 Clearwater Road
Saint Cloud, MN 56301
Phone: 320-230-9920
Web: *http://www.nwrawildlife.org*
Email: *nwra@nwrawildlife.org*

National Wildlife Centre
PO Box 192, Caledon East
ON L7C 3L9
Phone: (416) 577-4372
Web: *https://nationalwildlifecentre.ca/*
Email: *info@nationalwildlifecentre.ca*

SAMPLE EXAM QUESTIONS

Wildlife custodians are generally required to release rehabilitated game wildlife or specially protected wildlife within a specified distance from the original point of capture to:
a. prevent spread of disease
b. give the animal its best chance of survival
c. prevent exchange of genetic material among different populations of wildlife
d. all of the above

The wildlife custodian is responsible for all activities carried out under their authorization including those carried out by wildlife assistants.
(T/F)

In the province of Ontario, wildlife custodians must:
a. be at least 19 years of age
b. reside in Ontario
c. pass the written examination with a score of 80% or higher
d. all of the above

Keeping accurate records is a mandatory part of rehabilitation.
(T/F)

The primary intent of a wildlife custodian authorization is to allow qualified people to provide temporary care to sick, injured, or immature wildlife so that they may be successfully returned to the wild.
(T/F)

Accurate body weights are necessary in determining which of the following?
a. fluids needed for replacement or maintenance
b. nutrition for proper growth or maintenance
c. dosing pain medication
d. all of the above

Zoonotic diseases are transmissible from animals to people.
(T/F)

What is the term for animals that are most active around dawn and dusk
a. nocturnal
b. diurnal
c. crepuscular
d. aboreal

What should a wildlife custodian know about an animal before deciding on the diet, care and housing for an animal?
a. species
b. age
c. natural history
d. all of the above

FIELD GUIDES, WEBSITES, AND OTHER INFORMATION

Basic Rehabilitation References

A large number of up-to-date references and basic texts can be found on the IWRC and NWRA websites. These include the *Minimum Standards for Wildlife Rehabilitation 4th Edition*, NWRA Principles of Wildlife Rehabilitation binder. See their websites for information on courses, conferences, and publications.

American Veterinary Medical Association
AVMA Guidelines for the Euthanasia of Animals
https://www.avma.org/KB/Policies/Pages/Euthanasia-Guidelines.aspx
Note that wildlife starts on page 81.

Advanced Rehabilitation and Additional Reading

Many such texts are available; they tend to be oriented toward particular species or groups of species, and they are often fairly expensive. As a new wildlife custodian, you may not want or need to purchase them now. As you become more experienced and decide on the species in which you will specialize, you can build your library accordingly.

Altman, R. (1997) *Avian Medicine and Surgery*. ISBN 0-7216-5446-0

IWRC Publications (various topics). *https://theiwrc.org/pub/publications.html*

Luther, Erin. Toronto Wildlife Centre. (2010) *Answering the Call of the Wild*. ISBN 978-0-9811170-0-3

Mader, D. (2013) *Current Therapy in Reptile Medicine and Surgery.* ISBN 072169327X

Mader, D. (2005) *Reptile Medicine and Surgery.* ISBN 978-0721693279

Miller, E., Fowler, M. (2014). *Fowler's Zoo and Wild Animal Medicine, Volume 8*. ISBN 978-1-455773978

NWRA Publications (various topics). *https://nwrawildlife.site-ym.com/store/ListProducts.aspx?catid=374883&ftr=*

Speer, B. (2015). *Current Therapy in Avian Medicine and Surgery, 1st ed.* ISBN 978-1455746712

Williams, E and Barker, I (2001) *Infectious Diseases of Wild Mammals, 3rd ed.* ISBN 0-8138-2556-3

Field Guides and Natural History

Many field guides are available, some as part of a series offered by a particular organization or publisher. In addition, electronic versions and various apps are available of relevant field guide and natural history information. Several examples of texts are listed here.

Alsop, F. (2001). *Smithsonian Handbooks Birds of North America Eastern Region* New York: DK Publishing.

Arent, L. Martell, M. (1996). *Care and Management of Captive Raptors*. The Raptor Center at the University of Minnesota

Baicich, P. (2005). *A Guide to the Nests, Eggs and Nestlings of North American Birds.* Princeton University Press

Banfield, A.

Burt, W. & Peterseon, R. (1998). *A Field Guide to Mammals.* Peterson Field Guide Series. NY: Houghton Mifflin.

Eder, T. (2002) *Mammals of Ontario.* Lone Pine Publishing

Ehrlich, P., Dobkin, D. and Wheye, D. (1988). *The Birder's Handbook: A Field Guide to the Natural History of North American Birds.* NY: Simon and Schuster.

Fisher, C. (1996) *Ontario Birds* Lone Pine Publishing

Kurta, A. (1995) *Mammals of the Great Lakes Region*. University of Michigan Press

MacCullock, R (2002) *The ROM Field Guide to Amphibians and Reptiles of Ontario* McClelland & Stewart

Martin, A., Zim, H. & Nelson, A. (1951). *American Wildlife and Plants: A Guide to Wildlife Food Habits.* NY: Dover Publications.

National Audubon Society (1996). *Field Guide to North American Mammals.* NY: Alfred A. Knopf.

Peterson, R. (2002) *A Field Guide to the Birds of Eastern and Central North America.* Houghton Mifflin

Sibley, D. (2003). *The Sibley Field Guide to Birds of Eastern North America.* Knopf Canada

Sibley, D. (2001). *National Audubon Society The Sibley Guide to Bird Life and Behavior* New York: Alfred A. Knopf.

Stokes, D. (1987). *Guide to Animal Tracking and Behavior*

Other Books

Hadidian, J., Hodge, G. and Grandy, J. (1997) *Wild Neighbors: The Humane Approach to Living with Wildlife.* Fulcrum Publishing

Other Helpful Website Links

American Society of Mammalogists provides access to extensive online information; *www.mammalsociety.org*

Buteo Books; on-line source for books on birds *www.buteobooks.com*

The Cornell Lab of Ornithology Online bird guide, bird help. *https://www.allaboutbirds.org*

Species at Risk in Ontario (SARO) To obtain a current list of Species at Risk in Ontario please contact your local MNRF district office, or go to *https://www.ontario.ca/page/species-risk*

U.S. Centres for Disease Control and Prevention *www.cdc.gov*

U.S. National Wildlife Health Center *www.nwhc.usgs.gov*

EXAMPLES OF HEALTH RECORDS, PHYSICAL EXAMINATION RECORDS

Medical Record **CASE# _____**

Date: Finder's Name: Address: Phone:	Intersection found: Email:
Species: Age:	Weight: Sex:
History:	
Medications given?:	
Food given?;	

Disposition Died in care (DIC) Euthanized	within 24 hours	after 24 hours Dead on arrival
Cause/type of injury suspected:		

Medical Exam	
Mentation	
Eyes	
Ears	
Nose/Nares	
Lungs / Breathing	
Wings	
Feathers / Plumage	
Fur	
Abdomen	
Heart	
Urine/Urates/Feces	
Feet / Legs / Tail	
Ambulation	
Ataxia	
CN deficits	
CNS/PNS lesions	
Body Condition (score)	
Dehydration level (5)	
Mucus membranes	
Other	
Wounds	
TPR, Blood Glucose	T: P: R: BG:

Summary of Lab & Radiograph Information		
Date:	Findings	Signature

Notes (SOAP Sheet)		
Date	Information	Signature
&		

Species: _____
Case ID #: _____
Admission Date: _____
Problem List: _____
_____
_____

Cage#: _____
Special ID/Band #: _____
Admit Weight: _____
Sex: _____
Age: _____
Supervisor: _____

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
Date																					
	AM	12	PM	AM	12	PM	AM	12	PM	AM	12	PM	AM	12	PM	AM	12	PM	AM	12	PM
Body Weight																					
Attitude 1 = BAR 2 = QAR																					
Urine/Feces/Urates Y/N																					
Clean Cage																					
Feed																					
Ate (Y/N)																					
Pellet (Y/N)																					
Pool / PT																					
TPR																					
BCS (*x* / 5) or Keel Score (*x* / 3)																					
Treatments																					

Cage Set up, Enrichment	Food & Water Instructions	Special Instructions	Weigh every:	Clean every:

Date																					
	AM	12	PM	AM	12	PM	AM	12	PM	AM	12	PM	AM	12	PM	AM	12	PM	AM	12	PM
Treatments																					

Mammal Daily Care Sheet

Species: _____ Sex: _____ Age: _____ Band/ID: _____

Patient ID#: _____ Admit Wt: _____ Admit Body Condition (*x*/5): _____

Problem list: _____ Diet: _____

_____ _____

Date	Time	Weight (g)	Amount tubed/HF	Amount offered	Amount eaten	Feces	Init	Comments / Instructions

Avian Daily Care Sheet

Species: _____ Sex: _____ Age: _____ Band/ID _____

Patient ID#: _____ Admit Wt: _____ Admit Body Condition-Keel Score (*x*/3): _____

Problem list: _____ Diet: _____

_____ _____

Date	Time	Weight (g)	Amount tubed/HF	Amount offered	Amount eaten	Pellet?	Feces	Init	Comments / Instructions

EXAMPLE OF A SIMPLIFIED QUARANTINE PROTOCOL (RACCOON PUPS)

1. Litters of baby raccoons are placed in a quarantine room (grouped according to location and time period found). Several cages can be used. Individual animals, even if from the same area, should not be added to an existing litter right away (e.g., ideally wait at least 7 days before adding a single animal from the same area to an existing litter, and again, be sure they are from the same area).
2. The last raccoon that enters the room starts the clock for a 2 (or 3) week quarantine period. That means no other raccoons can enter or leave that quarantine room for that period. For example, if the first raccoon was admitted into that quarantine room on April 1st and the last raccoon was admitted into the room on April 10th, a two week quarantine period would mean that all raccoons in that room must remain quarantined until at least April 24th.
3. A change of shoes, lab coats are provided at the entry to the room. They must stay in the room. Care-givers must put on lab coats, shoes etc. provided in that room and not exit the room with the quarantine clothing on.
4. All pens, charts, supplies (medical, feeding) are specific to that quarantine room (and can be colour coded) and must remain in the room and not taken to another room except for disinfecting of the dishes which will be place in a specific bin and taken to the disinfecting station.
5. Handwashing must occur prior to, and after handling raccoons. Disposable gloves are to be worn and all garbage will be disposed of in the room.
6. Providing all animals remain healthy, the quarantine may be lifted at the 2 (or 3) week period; however, animals continue to be kept in separate cages.
7. Recommended at least daily disinfecting of the floors, light switches, door knobs, etc.