



Commonwealth of Massachusetts
 Division of Fisheries and Wildlife
 Wildlife Rehabilitation
 State Examination
 Study Guide



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Study Guide: **Second Revision**
March 2015

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- Animal Track Answers**
- Recommended Reference Materials**
- Glossary of Terms**
- Medical Terms and Common Conversions**
- Mammal and Bird Diagrams**
- NWRA Code of Ethics**

Chapter 1: How to Use this Study Guide

In order to receive a Massachusetts Wildlife Rehabilitation permit, an applicant must successfully pass the State Wildlife Rehabilitation Exam. This written exam is approximately one hundred questions and covers a comprehensive range of material pertaining to wildlife rehabilitation. The purpose of this study guide is to help you prepare for this exam. This study guide is intended to outline the areas of information you will need to be familiar with in order to be a successful wildlife rehabilitator, and inform you where to find accurate information. This study guide is not intended to give you all the information you will need to pass the exam. It is up to you to gather additional reference materials, research the current laws, look up the Massachusetts endangered species list, and receive proper training on how to be a wildlife rehabilitator.

The study guide is divided into 27 chapters, each covering a major topic relevant to wildlife rehabilitation. Each chapter will begin by pointing out why the topic is important. Each chapter will provide key points, which are areas within the topic that should be well understood. For example, the Wound Management chapter will highlight key points of various injuries, including abrasions and fractures.

In order to prepare for the state exam, it is suggested that you study materials on all of the mentioned key points. It is also highly recommended that you work with permitted wildlife rehabilitators who can mentor you, share their knowledge and experiences with you, and answer any questions you may have. This may involve volunteering with a local wildlife rehabilitator or spending time observing a wildlife rehabilitator at work. Most wildlife rehabilitators are happy to answer your questions and demonstrate how they work with various species.

At the end of most chapters, there are sample questions similar to those you can expect to find on the state exam. This will help you practice your written testing skills.

At the back of the study guide, a list of resource materials is provided, along with a description of each. This list is a collection of references that other wildlife rehabilitators have found to be helpful. This is not meant to be a comprehensive list, as there are many other resource books, field guides, and articles available. As always, it is recommended that you only study information from credited sources, such as wildlife rehabilitation organizations. Many of these books are useful for on-going wildlife rehabilitation, as well as for preparation for the state exam.

This study guide also includes the following attachments:

1. Recommended reference materials
2. Glossary of terms
3. Medical terms and common conversions
4. Diagrams of mammal and bird bones
5. National Wildlife Rehabilitators Association (NWRA) Code of Ethics

And just for fun.....

There are wildlife tracks on some of the pages. See if you can guess which animals the tracks belong to. The answers are located in the back of the study guide.



Chapter 2: What is Wildlife Rehabilitation?

Welcome to the field of wildlife rehabilitation! A wildlife rehabilitator is a person who receives a permit from the state to rescue orphaned, injured, and ill wildlife. The goal of a wildlife rehabilitator is to provide the care required to release the animal back into the wild. This is more than a hobby; this is a commitment to gain expertise on how to provide appropriate care for wildlife.

There are many types of people who become wildlife rehabilitators, but they all have one thing in common: a wildlife rehabilitator understands and appreciates the wild nature of an animal. People who just want to play with wildlife and keep them as pets should not become wildlife rehabilitators. A true wildlife rehabilitator provides care for an animal while maintaining its wild nature.

Being a wildlife rehabilitator can be challenging at times. This study guide will provide information on the general topics necessary to provide appropriate care to animals. It takes time to gain the knowledge and skills necessary to provide quality wildlife care. At times, it will feel overwhelming, but there are many resources available to assist you. Being a wildlife rehabilitator is a long-term commitment and a continual learning process, even well after a state permit is received.

As mentioned, being a wildlife rehabilitator can be challenging. Sometimes animals die or have to be euthanized regardless of how hard you try to save them. It is not always a happy ending. However, there are many times when you are successful in providing the supportive care needed for an animal to be released back into the wild; this is a rewarding feeling.

For most people, there is no substitute for experience in working with wildlife. It is strongly recommended that you work with a permitted wildlife rehabilitator and gain hands-on experience in addition to studying books and other reference materials. Consider volunteering your time to assist a wildlife rehabilitator in exchange for the ability to ask questions and learn certain techniques. For instance, try syringe feeding a baby squirrel under the supervision of a trained wildlife rehabilitator. You may discover you have a passion for this work or you may decide this is not the profession for you.

What is Wildlife Rehabilitation?

There are many levels of wildlife rehabilitation. There are wildlife veterinarians who are able to do complex surgeries and diagnostic testing of injured and ill wildlife. There are many at-home wildlife rehabilitators who care for a small number of wild animals in their home. There are larger wildlife centers that care for high case loads and a wide diversity of species from their region of the state. There are also people who specialize in caring for only one type of animal, such as squirrels or song birds.

What kind of wildlife rehabilitation would work for you? This would depend on many factors, including how much free time you have, the space you have available, and the amount of money you are willing to spend on wildlife care. Wildlife rehabilitation is expensive. Some wildlife rehabilitators create non-profit agencies to raise funds to pay for various expenses such as food, medications, and caging. A

licensed wildlife rehabilitator is not allowed to charge the public for any wildlife care, but donations may be gratefully accepted.

In order to become permitted by the state, you will need to pass the state Wildlife Rehabilitation Exam designed by the Commonwealth of Massachusetts, Division of Fisheries and Wildlife. This study guide is designed to help you prepare for the test. This study guide will also provide an accurate glimpse into the exciting world of wildlife rehabilitation.



What kind of tracks are these?



Chapter 3: State and Federal Regulations

Being a permitted wildlife rehabilitator is a commitment to being an advocate for wildlife. It also means that you have agreed to uphold the regulatory standards set by the state and federal governments. This chapter will give you an overview on these various state and federal regulations.

One of the attachments at the end of this study guide is a copy of the Massachusetts Wildlife Rehabilitation Regulations (321 CMR 2.13). These regulations should be well understood. You can expect there to be questions on the state exam about these regulations.

The following are examples of how the state wildlife regulations directly impact the practice of licensed wildlife rehabilitators:

1. There are regulations differentiating between a wildlife rehabilitation permit and a wildlife possession permit for education. A wildlife rehabilitation permit allows a person to care for distressed animals for a limited amount of time. An educational permit allows a person to permanently keep one or more animals strictly for educational purposes. An educational permit is intended for people who are primarily educators, not rehabilitators.
2. There are regulations that require a wildlife rehabilitator to euthanize animals that are not releasable and cannot be placed in a licensed, educational setting.
3. There are regulations on the amount of on-going training required for a wildlife rehabilitator. The regulations require proof of participation in an approved wildlife rehabilitation seminar, workshop, or training session at least once every three years. These standards are designed to encourage wildlife rehabilitators to seek a higher level of professional development.
4. There are regulations on how long an injured or ill animal can be maintained at a rehabilitation facility. After a period of 365 days, a wildlife rehabilitator requires a waiver from the Division of Fisheries and Wildlife to continue to care for a mammal. Most mammals should be released in a much shorter time. For birds, the maximum time allotted for rehabilitation is 90 days.
5. There are regulations about where you are allowed to release an animal upon completion of rehabilitation. Review the regulations on "point of capture" and what that means.
6. There are regulations on how to submit an annual report to the Division of Fisheries and Wildlife. The report must be submitted by January 31st for the preceding calendar year. Maintaining documentation and submitting information to the state is an annual requirement for wildlife rehabilitators.
7. There are regulations on what species you are permitted to rehabilitate with the basic state wildlife rehabilitation permit. For example, the state permit does not allow you to provide care for venomous snakes, black bears, moose or white-tailed deer. These species require a special permit from the Division of Fisheries and Wildlife. Did you know that Massachusetts has two species of venomous snakes (Copperhead and Timber rattlesnake)? Learn how to identify these species.
8. There are regulations about the rehabilitation of certain avian species (raptors, water fowl, and songbirds). In order to care for these species, you are required to obtain a Federal permit from the U.S. Fish and Wildlife Service, in addition to your state permit.
9. You should memorize which avian species can be rehabilitated by a person holding only a state permit. For example, the wild turkey, bob-white quail, ring-necked pheasant, and ruffed grouse

are not federally protected “migratory birds”, so they can be rehabilitated with just a state permit. The rock dove (pigeon), house sparrow, and European starling are examples of non-protected birds that anyone can receive and rehabilitate. The rehabilitation of these non-protected species is good practice for a person wishing to learn about songbird rehabilitation.

10. In Massachusetts, a person is not eligible to receive a Federal permit from the U.S. Fish and Wildlife Service without first holding a state permit. If you are interested in rehabilitating raptors, migratory birds, or waterfowl, you need to receive a state wildlife rehabilitation permit prior to submitting an application for a Federal permit. Raptors include hawks, owls, and eagles. There is no examination for the Federal permit, but it typically requires a minimum of one hundred hours of documented training over a period of at least one year under a person who already holds a Federal permit.

This study guide will concentrate on the requirements for the state permit from the Division of Fisheries and Wildlife. The information on the Federal permit is only to make you aware that the U.S. Fish and Wildlife Service has its own regulatory requirements.

Here is an example of the types of questions you can expect to find on the state wildlife rehabilitation exam:

1. You have been rehabilitating an Eastern Cottontail rabbit that is almost ready for release. There is a spring fair next week where you plan to educate the public about living with cottontails. You currently hold a state wildlife rehabilitation permit. It would be legal for you to bring your Eastern Cottontail to the spring fair since you have been rehabilitating it. True or False?

Answer: False. Animals being held for rehabilitation may not be displayed to the public, and if you do not hold a wildlife possession permit for education, you can't keep a non-releasable animal.

2. Circle the wildlife species that you would be permitted to rehabilitate while holding only a state wildlife rehabilitation permit.

Moose European Starling Meadow Vole Raccoon Coyote

Answer: You would be permitted to rehabilitate everything except the moose.



Chapter 4: Endangered Species

The federal Endangered Species Act (ESA) and the Massachusetts Endangered Species Act (MESA) are designed to provide extra protection for species in jeopardy. Some wildlife species are listed as Endangered or Threatened at the federal and/or state level, while others are listed as Species of Special Concern within Massachusetts. All three of the categories represent species that are rare, declining, or are facing some threat to their continued survival. Wildlife rehabilitators are part of the safety net of protection for these vulnerable species of wildlife. The state definitions of these categories (321 CMR 10.03) are as follows:

Endangered – in danger of extinction throughout all or a significant portion of its range, or in danger of extirpation from Massachusetts.

Threatened – likely to become endangered within the foreseeable future throughout all or a significant portion of its range, or to be declining or rare and likely to become endangered in Massachusetts in the foreseeable future.

Special Concern – has suffered a decline that could threaten the species if allowed to continue unchecked, or occurs in such small numbers, with such a restricted distribution, or such specialized habitat requirements, that it could easily become Threatened within Massachusetts.

As a permitted Massachusetts Wildlife Rehabilitator, you are required to be familiar with the species on the Massachusetts Endangered Species List. It is imperative that a wildlife rehabilitator identify species they are presented with and recognize whether they are Endangered or Threatened species. Any delay in the identification of an Endangered or Threatened species may significantly decrease the animal's chance for survival. Having good field guides on birds, mammals, and reptiles will help with prompt identification of an unknown species. If you are presented with an orphaned, ill, injured, or deceased animal that is Endangered, Fish and Wildlife regulations require that the wildlife rehabilitator notify the nearest Division of Fisheries and Wildlife office about the listed species *immediately*.

The regulation specifically states the following:

The acquisition of endangered, threatened, or special concern wildlife, as listed in 321 CMR 10.90 (the MESA list), whether dead or alive, shall be reported immediately to the Division for special instructions relative to the disposition of such wildlife [see 321 CMR 2.13 (22)(c) of the Wildlife Rehabilitation regulations]. In the case of an acquisition on a Saturday, Sunday, or legal holiday it shall be reported on the work day, Monday-Friday, immediately following.

It is the responsibility of the wildlife rehabilitator to give careful thought and act swiftly when presented with an injured or ill animal on the Endangered Species List. Wildlife rehabilitators need to know what resources are in their areas to help with endangered species, especially on weekends. This could include having contact with an experienced licensed wildlife rehabilitator with expertise in a particular species or being able to transport the species to Tufts Wildlife Clinic in North Grafton, MA. It is appropriate to provide initial first aid and to try to stabilize the animal until you can get instructions or can transfer the animal to the Tufts Wildlife Clinic.

You can access the Endangered Species list by going to the Massachusetts Division of Fisheries and Wildlife's (MassWildlife) website and looking at the Natural Heritage and Endangered Species "species information and conservation" section. It is important to review this list in preparation for the wildlife exam. This list is updated about every two or three years.

The web address for the Natural Heritage and Endangered Species Program is:

<http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/>

The following is a sample question to help you prepare for the state wildlife rehabilitation exam.

1. You are presented with a turtle that appears to have a shell injury. Since you don't recognize the turtle, you immediately check one of your field guides. The field guide tells you it is a Blanding's turtle. It is Monday afternoon and your first telephone call is to:
 - a) Your local veterinarian
 - b) A licensed wildlife rehabilitator
 - c) The Division of Fisheries and Wildlife
 - d) Your local animal hospital

Answer: c) You contact the Division of Fisheries and Wildlife for further instructions since this turtle is a Threatened species.



What kind of tracks are these?



Chapter 5: Role of the Veterinarian

Working with wildlife without the assistance of a veterinarian is similar to learning to walk a tightrope without a safety net; it just doesn't make any sense. This chapter will cover some of the reasons why a cooperating veterinarian is a requirement for all wildlife rehabilitators.

As a wildlife rehabilitator, you will be asked to help with animals that appear injured or ill. There will be some common illnesses and minor injuries that you can handle by yourself. Most wildlife rehabilitators can bandage an abrasion or remove a tick. But the time will come when you need the expertise of a veterinarian. It is important for wildlife rehabilitators to recognize when an animal's problem is beyond the scope of what a rehabilitator can handle and requires the attention of a veterinarian.

The following are examples of the services a veterinarian can offer a wildlife rehabilitator:

1. The veterinarian can perform diagnostic tests, such as x-rays, fecal examinations, and possibly blood tests.
2. The veterinarian can perform surgeries, splint fractured limbs, stitch up wounds, and assist with dental problems.
3. The veterinarian can prescribe antibiotics and other medications to the wildlife rehabilitator and explain how to use them correctly.
4. The veterinarian can help with differential diagnosis on complex cases.
5. The veterinarian can perform humane euthanasia on wildlife using a controlled drug.

The wildlife rehabilitator and the veterinarian make a good team. The wildlife rehabilitator has the expertise on raising orphans and an extensive knowledge of natural history that is important for wildlife care. The veterinarian has knowledge about diseases, wound management, and use of medications for wildlife care. Wildlife rehabilitation is most successful when the rehabilitator and veterinarian work together.

Not all veterinarians are interested in working with wildlife. Some veterinarians are willing to work with wildlife, but have little or no experience with wild animals. It is important for the wildlife rehabilitator to meet with local veterinarians and learn whether they would be willing to be part of a wildlife support system for you and the general public. Sometimes a veterinarian is willing to learn and grow with the wildlife rehabilitator as a shared experience. It is important to establish a relationship with the veterinarian to show that you are a professional working with wildlife.

As part of the process to obtain a state permit for wildlife rehabilitation, you must identify a cooperating veterinarian. The veterinarian will sign-off on a form to indicate they are willing to provide you with their support.

Wildlife rehabilitators who work with multiple species may need to find several veterinarians to cover the expertise of the various species. You may find a veterinarian who does great work with squirrels, but has limited expertise with avian species. Additionally, you may find a veterinarian who wants to work with you, but not with rabies vector species, which add a risk factor to the practice.

Wildlife rehabilitators know that a professional relationship with a veterinarian is one of communication and respect. Ensure that the veterinarian gets a telephone call prior to the arrival of an animal. There may be times that the veterinarian is simply too busy with his/her own practice to provide needed assistance to you. Help the veterinarian by taking care of simple wildlife cases. Be prepared with names of other veterinarians and wildlife rehabilitators in case you have to make a referral for an animal. Cherish any veterinarian who is willing to help wildlife and let them know how valued they are as a member of your team.



Chapter 6: Is this Animal Really Orphaned?

As a wildlife rehabilitator, you will receive phone calls from the public about baby animals they have found. You may be asked to rescue an orphaned fawn found in a field, or you may be asked to take home baby bunnies found in an abandoned nest in a back yard. Are these animals really orphans though?

Wildlife rehabilitators have a responsibility to ensure that baby animals really are orphans before taking the babies into their care. A wildlife rehabilitator knows that the parent animals provide the best care for their babies. A wildlife rehabilitator can raise a baby raccoon, but can't communicate where the food sources are in that area. A wildlife rehabilitator can't communicate with a baby pigeon about a dangerous hawk flying in the skies. Keeping baby animals with their parents is the primary goal of a wildlife rehabilitator.

How does one know when an animal really is an orphan and needs help? Some of the cues come from understanding the natural history of each species. The following are a few examples:

A white-tailed doe will instruct her fawn to lie down in a field and remain in that spot until she returns. The mother leaves the immediate area to browse for food. A hiker comes across the baby fawn with no mother in sight. Is this animal an orphan or just waiting for the mother to return? If the baby fawn looks healthy, it is highly likely that the mother is nearby. It is a normal part of the life history of White-tailed deer for fawns to be left alone. Therefore, the fawn should be left alone and the hiker should leave the area so the mother feels safe to return.

Eastern Cottontail rabbits often make their nests in backyards where they are discovered by people or pets. You receive a phone call about six little bunnies in a nest and with no mother in sight. The caller has watched the nest for two hours and believes the nest is abandoned. Do you take the bunnies into care? It is normal for a mother rabbit stay away from her nest for long periods of time. To stay on or near her nest would place her babies at greater risk of predators. The mother rabbit only visits her nest two or three times per day, generally in the pre-dawn and dusk hours. Therefore, the public rarely sees the mother rabbit on or near the nest and assumes it has been abandoned. If the bunnies are healthy, they should be left alone in the nest, but an effort should be made to keep pets away from the nest. As always, babies do much better with their mothers.

The babies of some species of songbirds, especially American robins, frequently leave the nest before they can fly. The parents will continue feeding them for several days before they make their first flights. These baby birds are not orphans, but they are very vulnerable to free-ranging cats, so try to keep pets out of the area. Even baby hawks and owls that fall out of their nests before they can fly do much better if they are put back up in a tree near where they were found, rather than being raised by a wildlife rehabilitator. They do not need to be put back into their nest, or even the same tree, just somewhere off the ground. Their food begging calls will let the parents know where they are.

Wildlife rehabilitators can often save more animals by giving good advice to the public than by actual rehabilitation. We save many baby animals by simply educating the public to leave them alone.

Sometimes it is not clear whether a baby animal is really an orphan. Wildlife rehabilitators know that a baby animal that appears cold, weak, and lethargic has probably lost its mother. This study guide will cover the topics of emaciation and dehydration, both of which are common indicators that an animal needs help.

The following are some areas to study for the wildlife rehabilitation exam:

1. Learn the natural history of bird, mammal, and reptile species. Specifically, study how the mothers (and fathers) raise their young in the wild. Do both parents feed the babies? What do the nests look like? Are babies normally left alone for long or short periods of time?
2. Learn what a healthy baby looks and acts like for the various species. How can you tell when an animal is at normal weight versus emaciated?
3. Learn some ways you can “test” to see whether the parent is around and caring for the baby. For example, there is an easy way to check if a bunny nest has been abandoned. Someone can put a “tic-tac-toe” design of dental floss over a bunny nest, leave it alone for 12-24 hours, and re-check the nest the next day. If the dental floss has been re-arranged, it is likely the mother rabbit came back to feed her babies. Learn some other tricks by talking to other wildlife rehabilitators
4. Learn the ages when a young animal may go exploring without a parent in sight. For example, it is not uncommon for fox kits to be seen exploring outside the den without their mother when they reach the age of five or six weeks. However, a baby squirrel out of the nest at six weeks old has probably lost its mother and requires help.
5. Remember that some species, such as turtles and snakes, are born ready to fend for themselves without the help of any parent. These babies are not orphans!

Here are examples of similar questions you might find on the state wildlife rehabilitation exam:

1. It is mid-summer and a caller has observed a small, feathered bird hopping on the ground unable to fly. There is another bird feeding the smaller bird. The smaller bird is probably injured and needs to be rescued. True or False?

Answer: False. The smaller bird is likely a fledgling that is being fed by its mother. Many songbirds leave the nest and are fed on the ground by their mothers for about a week before they can fly. The caller should be instructed to leave the parent and baby alone.

2. A caller tells you that a baby chipmunk has been found shivering on the ground in their yard. They did not observe any adults caring for the baby. What should you instruct the caller to do?
 - a) They should leave the baby chipmunk alone.
 - b) They should bring the baby chipmunk to you for rehabilitation.
 - c) They should observe the baby chipmunk for 24 hours before calling you back.
 - d) They should find a burrow and put the baby chipmunk back inside.

Answer: b) Baby chipmunks live in burrows and should not venture out without a parent nearby until they are old enough to take care of themselves. The public would generally find a baby chipmunk out of the burrow when the mother fails to come back and the baby is starving to death. This baby needs help.



Chapter 7: Assessing a Wildlife Call: Rescue or Referral?

Wildlife baby season in Massachusetts is generally the busiest time of the year for a wildlife rehabilitator. The baby season lasts about half a year, running from April through October, but is dependent upon weather conditions and the time that various species give birth to their young. This is also the time when the public spends more time outdoors enjoying the warmer weather and comes into contact with wildlife. You will receive many phone calls from concerned citizens about baby animals found in their yard or while hiking in the woods.

By now, you probably realize that making decisions about wildlife needing care is more of an art than a science. In previous chapters, you have learned key points about deciding whether an animal is an orphan. You have learned that the natural history of a species will help you determine when an animal needs to be rescued and when it needs to be left alone in the wild or re-united with a parent.

Wildlife rehabilitators also receive phone calls about animals that are injured or ill. The animals may be very young or may be mature adults. This chapter will give an overview about assessing wildlife for illness or injury. There will be further discussion regarding injuries and illness in subsequent chapters. However, this study guide cannot list all the illness and injuries that occur in wildlife. This is an area where purchasing resource books and obtaining additional training is essential. It is also imperative for you to work with a veterinarian experienced in the care of wildlife.

Here are some of the key points to consider:

1. An animal that is weak, thin, and has flies circling around it should be admitted for care.
2. An animal that has sunken eyes and appears lethargic should be admitted for care.
3. An animal that has maggots on its body should be admitted for care. Learn how maggots can be both external (on the body) and internal (inside the body).
4. An animal that has a severe injury, such as a fractured limb, burns, or lacerations should be admitted for care.
5. An animal that has been attacked by a cat should be admitted for care, *even for a minor puncture wound*, because cat saliva contains bacteria that can cause a lethal infection in wildlife if left untreated.
6. An animal with diarrhea or foul-smelling feces is likely ill and should be admitted for care. Wildlife rehabilitators should learn how to recognize normal droppings versus abnormal droppings. This helps them with a preliminary diagnosis for illness.
7. An animal with neurologic symptoms may have suffered head or spinal trauma and needs to be admitted into care. A common cause of head and spinal trauma is an animal being hit by a car. Birds frequently suffer trauma from flying into windows. Neurologic symptoms can also be caused by disease or toxins affecting the central nervous system.
8. An animal that does not have the strength to stand, run, or fly should be admitted for care unless it is still too young for these activities.

As a wildlife rehabilitator, you may determine that an animal is orphaned, injured, or ill and requires rescuing. The next question is whether you are adequately prepared to care for that animal. Most new

wildlife rehabilitators are only trained to deal with one or two species of animals. Many new wildlife rehabilitators have minimal experience with wound management and, for their first year or two, are only prepared to properly care for healthy orphaned babies. It is poor judgment to keep an animal for care unless you are ready to provide the quality care needed for that animal.

Here are some areas to consider before deciding to rescue an animal:

1. Many baby animals require frequent feedings during the day and occasionally during the night. Research how often an animal requires feeding at each developmental stage in the infant's life. If you cannot meet this feeding schedule, the animal must be referred to another wildlife rehabilitator.
2. Adult animals that are injured or ill may not be able to self-feed. These animals may require frequent feedings in the same manner as a much younger animal of their species.
3. Animals with an injury or illness may require medications to be administered. Do you have access to this medication and know how to dose and administer it properly?
4. An animal with a serious injury will need the services of a veterinarian before going to a wildlife rehabilitator. Know which veterinarians in your area would be willing to help. Wildlife rehabilitators must work with a cooperating veterinarian as part of the state permit requirements.
5. Every species has different requirements in the areas of formulas, natural foods, and habitats. Is this something you can provide for this animal?

If a wildlife rehabilitator cannot meet the needs of an animal, the animal must be referred to another wildlife rehabilitator or veterinarian.

One of the biggest mistakes made by new wildlife rehabilitators is taking too many animals into care. The sad fact is there are often too many animals needing care and not enough wildlife rehabilitators to receive animals. Experienced wildlife rehabilitators know that overloading their facility with too many animals will dramatically decrease the quality of care and the success rate of animals being returned to the wild. It is difficult to say "no" to a caller who is begging for your help. However, the responsible thing to do is to refer the animal to another wildlife rehabilitator or veterinarian for care. It is important to set reasonable limits for yourself and your facility, and stick to them. If you find yourself with more animals that you can provide a good standard of care for, then you will need to contact other Massachusetts wildlife rehabilitators that may be willing to take some of these animals, or you may need to provide humane euthanasia for the extra animals.

Another common mistake made by new wildlife rehabilitators is rescuing species for which they've had no training. There are acceptable standards for the care of each species. If you do not know or cannot provide these standards, then the animal needs to go to someone with the ability to provide proper care.

People who become wildlife rehabilitators generally have a compassion for wildlife. It is important to remember that compassion alone won't save lives. The wildlife rehabilitator has to be committed to providing an adequate standard of care for every animal rescued. Wildlife rehabilitation requires time, money, and extensive training in order to be successful. The main advice from experienced wildlife rehabilitators is to take it slow by learning how to rehabilitate one species at a time. This will ensure a better experience for you and the wildlife in your care.



Chapter 8: Reuniting Wildlife with Parents

In the previous chapter, you learned that animals are more successful in the wild when they have been raised by their wild parents. No matter how experienced you become as a wildlife rehabilitator, you will never be able to provide the same care as the animal's natural parents. Therefore, it is the responsibility of wildlife rehabilitators to help wild baby animals remain with their wild parents whenever possible.

Sometimes wildlife rehabilitators receive phone calls from the public about orphaned baby animals that have been placed in a box. The caller typically wants you to either rescue this baby animal or raise it as a pet.

After asking the caller a few questions, you determine the likelihood that the baby animal was kidnapped from its parents by a well-meaning adult or child. In some cases, it is possible to reunite the baby with the parent. In other cases, this is not a likely event. It is the responsibility of the wildlife rehabilitator to know which species have a good success rate when reuniting with their parents and which species require the care of a wildlife rehabilitator.

In order to make the right decisions about orphans, a wildlife rehabilitator should learn the following key points:

1. Learn how reptiles are raised differently from bird and mammal species. For example, baby turtles hatch from their eggs and are independent of their parents from the moment they are born. Therefore, a baby turtle found by the public should be left alone since it is not an orphan. In contrast, a songbird is born naked and helpless (altricial) and needs the constant support of their parents to survive. A baby bird that fell from its nest may or may not need your attention.
2. Learn the techniques for reuniting baby birds with their parents. It is possible to make a substitute bird nest when a storm has damaged the nest made by the parent birds. There are many articles written on how to use a wicker flower basket or a berry basket as a substitute nest. Learn how to identify a fledgling bird that has been mistaken for an injured bird. Many times, a fledgling can be brought back to the area of capture and reunited with the parents. It is seldom necessary to raise a baby hawk or owl. Younger babies can be returned to their nest or placed in a basket in a tree nearby. Older branchers just need to be put into a nearby tree or on a nearby building roof with enough shade, or even fostered the same way into the nesting territory of another adult pair of the same species. Hawks and owls do not recognize their own young and will readily feed another pair's chick once it starts food begging.
3. Learn the techniques for helping a kidnapped White-tail fawn to be reunited with the parent. This may be as simple as returning the baby to the exact same spot where it was found and monitoring from a distance.
4. Research what time periods are optimal for reuniting an orphan with its mother. A mother animal generally looks for her missing young for a period of 12-24 hours, but depending on the species, this time period may be longer. This is often the optimal period for reuniting a baby with its parents. Many times, the baby animal will cry out for the mother and attract it back to the location. Other species, such as many waterfowl, are difficult to reunite even if only separated from their mother for a few short hours.

5. Understand that the condition of the baby animal may not allow for reuniting or fostering. A baby animal with a serious injury (i.e. leg fracture) would need the help of a wildlife rehabilitator. A baby animal that is emaciated might be too weak to eat on its own even if offered food by the mother. A baby animal with an infection or illness would need medication that the natural parent could not provide. *The animal has to be healthy in order for reuniting or fostering to be successful.*

Here is a sample test question on reuniting and fostering:

1. Circle each species that would be a good candidate for either reuniting with their parent or having a foster parent.

Eastern chipmunk

White-tail fawn

Virginia opossum

Eastern cottontail

Answer: The white-tail fawn is a good candidate for both reuniting with the natural parent and being accepted by a foster parent. The Eastern cottontail is a good candidate for re-nesting within twenty-four hours of being removed from the nest. Circle those two species.

The Eastern chipmunk found outside the burrow is probably starving and should be placed into care. The Virginia opossum that got separated from the mother is a species that cannot be reunited and should be placed into care. By knowing the natural history of animals, you can make the best decisions.



Chapter 9: Physical Restraint, Capture, and Transport

This chapter will discuss the proper steps to follow after it has been determined that an animal needs to be rescued. In some cases, the animal is already in a container and ready for transport. In other cases, the animal is located alongside a road waiting for help. Taking the correct steps to get the animal to you quickly and safely is important for the animal's chances of survival. Keep in mind that the safety of the public is the most important factor to remember.

Scenario One:

The animal is injured alongside a road. The caller is willing to capture the animal with instructions from you.

There are many factors to consider when attempting to capture an animal. The most important factor is the safety of the public and the wildlife rehabilitator. Before picking up an injured animal on the side of the road, be sure it is safe and legal to stop. Also be careful not to chase the animal into traffic, as this could cause an accident or the animal to be hit. Some species of animals carry diseases that could be harmful to people. Many species of animals will attack a rescuer and can cause harm with their teeth, claws, talons, or beaks. The public needs to be informed about risks before being encouraged to capture wildlife.

The technique for the capture of wildlife is dependent on the species and age of the animal. For example, an infant squirrel can easily be captured by a person wearing leather gloves and wrapping the baby in a soft cloth. Now let's compare this to the capture of an adult squirrel that was injured by a car. An adult squirrel has the jaw strength to crack open shelled walnuts without effort. Leather gloves will not provide adequate protection to your hands when the adult squirrel tries to bite you. The result could be a serious and painful injury. Wildlife rehabilitators can purchase specially designed gloves to provide protection against various types of teeth, claws, and talons, or can use nets and other special equipment.

Understanding the natural history of different animal species will help you improve your capture and handling skills. The more knowledgeable and proficient you are, the safer it will be for both you and the animal. An injured Red-tailed hawk will primarily use its razor-sharp talons as a defense mechanism, while a Great Blue heron may try to poke your eyes out with its bill. By knowing how an animal usually defends itself, you can plan a safe capture.

As part of your research, learn about the different tools and techniques for capturing wild animals. There will be simple techniques, such as throwing a cloth or net over a baby bird. There will be more advanced techniques, such as the use of pole restraints and humane traps for more aggressive animals.

Scenario Two:

The animal is already in a box or cage and ready for transport. The caller is willing to bring the animal to you.

The wildlife rehabilitator has a responsibility to ensure that both the animal and the caller arrive safely at your home. It is not enough to be told the animal is in a box. The wildlife rehabilitator needs to ensure that the box is appropriate for the wild animal by providing the following guidance:

1. The container needs to be big enough so the animal has room to turn around. It should not be excessively large or the animal will get injured trying to hop, fly, or jump out.
2. The container needs to have a secure cover and be sturdy enough to contain the animal. A cardboard box will contain a baby pigeon, but it will not contain an adult squirrel.
3. The container needs to have ventilation holes.
4. The container may need to have a soft cloth on the bottom so the animal can maintain balance during transport. This will depend upon the species. The soft cloth should not have loopy holes, such as those found in terry cloth. Many animals could get their claws caught in these loops, which would increase their chance of injury during transport.
5. The container should not have a water dish that would spill on the animal during transport. It is not helpful for the animal to be cold and wet upon arrival.
6. Birds should not be transported in metal cages. A panicked bird will harm its flight feathers as it struggles in a cage.

Animals can become stressed and even die from stress during transport. The transport should be conducted in a manner to reduce this stress. The best way to reduce stress for wild animals is to maintain them in an environment that is warm, dark, and quiet. Here are some key points to investigate regarding the best ways to transport animals:

1. Learn which animals require supplemental heat during transport. This might include many infant mammals that cannot thermoregulate. Supplemental heat is also important for ill or emaciated animals, including both baby animals and adults.
2. Look up simple methods that can be used to provide supplemental heat for animals. This may include hand warmers or the use of hot water bottles covered in soft cloth. The heat source usually needs to be covered with a cloth to prevent an animal from getting burned when coming into direct contact with it.

Animals usually experience less stress when they feel hidden. It is important to remind the rescuer to reduce noise by turning off music and to speak softly during the trip.

An efficient capture and transport of an animal is the first step to successful wildlife rehabilitation. Remember, the safety of the wildlife rehabilitator and the public are your first priority. Some mammals have the potential to transmit rabies by contact with saliva via a bite or scratch from the animal. Helping to keep the public safe is part of a wildlife rehabilitator's responsibility. It is strongly recommended that you gain experience in the capture and transport of wild animals by working with an experienced wildlife rehabilitator.



What kind of tracks are these?



Chapter 10: Intake Procedures and Record-Keeping

Wildlife rehabilitation requires a certain amount of record-keeping in order to provide appropriate treatment for animals and to fulfill permit requirements. This chapter will cover some of the basic record-keeping that all wildlife rehabilitators should maintain.

Intake Procedures:

Animals in distress can't tell us what has happened to them, but the people finding the animals can often fill in some of the blanks. Experienced wildlife rehabilitators conduct an intake interview in which they ask the finder a series of questions concerning the circumstances under which the animal was found and how it behaved. The intake procedure is a vital tool in diagnosing an injury or illness and determining an appropriate course of treatment. There are many wildlife rehabilitation books that offer sample intake forms for your use. Some of the common intake form questions include the following:

1. When was the animal found? It is important to know if the finder has held onto the animal for several days or if they brought it straight to the rehabilitator.
2. What caused the animal to come into care? Was it hurt by a cat or hit by a car? This information will help create an appropriate treatment plan for the animal.
3. Did anyone feed the animal? It is important to know whether an animal has been fed an inappropriate food that could be causing more harm. Allowing an emaciated animal to eat a full meal can cause its death.
4. Did anyone get bitten or scratched by the animal? This is a public safety issue when people come into contact with certain animals, especially bats, raccoons, and skunks which are common rabies vector species.
5. Where was the animal found? It is vital to know this information so the animal can be released back into its home territory, if appropriate.

The intake procedure is also a great opportunity to educate the public about the wild animal being placed into your care. The public is fascinated with how quickly a baby bird develops feathers or when a skunk's scent glands are fully developed. Remember that a wildlife rehabilitator is like an ambassador for wildlife. Your interactions with the public can promote greater tolerance and understanding for wildlife in your community.

Maintaining Wildlife Records:

A wildlife rehabilitator must maintain treatment records for each animal in order to ensure the animals are progressing in care. You can develop your own wildlife forms or adapt forms that can be found in many wildlife rehabilitation books. The following key points are important for a new wildlife rehabilitator to learn:

1. Train with an experienced wildlife rehabilitator on how to mark an animal for identification using materials such as non-toxic paints, magic markers, or tape. A litter of baby raccoons will all look alike unless they are marked for identification. Each animal should have a chart showing its progress in treatment. Assessing the progress of each individual animal is a key to quality wildlife rehabilitation.
2. Research how to determine the age of each species. When does a baby squirrel open its eyes or develop front teeth? It is critically important to know the age of the animal to determine the

appropriate foods, caging, etc. There are wildlife manuals available that contain this vital information.

3. Train with an experienced wildlife rehabilitator in order to learn how to weigh animals safely. Many infant animals need to be weighed daily to show they are growing properly. Learn the benefits of the metric system for weighing small animals. Tracking the weight of an animal is an important part of record-keeping.
4. Learn how to record how much an animal has consumed for food or formula per feeding.
5. Learn why it is important to record whether the animal has urinated and/or defecated each day. What does the quality and quantity of wildlife droppings tell us about the health of an animal?
6. Learn how to record the administration of medication. This will minimize an accidental overdose or a missed dose of medicine.

Maintaining Placement Records:

As part of the Massachusetts Wildlife Rehabilitation Permit, you will be required to maintain records for the state's annual report. In order to complete the annual report, you will need to maintain the following information:

1. Record how many animals received care from you during the calendar year. Separate the count into specific species. *It is important to use the precise names for each species.* For example, how many Virginia opossums did you care for, how many American goldfinches and house finches did you care for, or how many southern flying squirrels did you care for?
2. Record the disposition of each animal.
 - a) Was the animal released back into the wild?
 - b) Did the animal die in care?
 - c) Was the animal euthanized?
 - d) Was the animal transferred to another licensed facility?
 - e) Is the animal being held into the next calendar year?

Being a licensed wildlife rehabilitator makes you part of a larger system involving the welfare of wildlife. The data collected by wildlife rehabilitators can be used by Fish and Wildlife officials to detect trends in causes of injury and mortality, or the appearance of emerging diseases. Maintaining good record-keeping is an essential part of wildlife rehabilitation. Wildlife rehabilitators may develop their own systems to maintain records. These systems can be as simple as written notes or as complex as computer generated programs. As part of your training, ask an experienced wildlife rehabilitator to show you what forms they use and how they maintain up-to-date records on all of the animals in their care.

The following are the types of questions you might find on the state wildlife rehabilitation exam:

1. The doorbell rings and you are greeted by a person with a baby squirrel in a box. Circle the answer that is least important to ask the finder during the intake procedure:
 - a) What gender (male or female) is the squirrel?
 - b) When did you find the squirrel?
 - c) Have you given the squirrel anything to eat?
 - d) Where did you find the squirrel?

Answer: a) It is not highly important to know whether the baby squirrel is a male or female. It is important to know when the squirrel was found to estimate how long it has been without proper nourishment or warmth. It is important to know if the finder gave the squirrel anything to eat and whether the food was appropriate. It is important to know where the squirrel was found. Squirrels often have litters of five babies, so the finder might need to go back and check for other baby squirrels.

2. When submitting your annual report to the Division of Fisheries and Wildlife, which of the following would not be an acceptable name for a species?

Fox

Raccoon

Opossum

Rock dove

Turtle

Answer: Fox, opossum, and turtle are vague identifications and, therefore, unacceptable. Rock dove is a precise identification of a species.



Chapter 11: First Response for Animal Care

Animals often arrive at wildlife rehabilitation centers in critical condition. They may have been without food or water for days. They may have been left out in the cold or heat of the season. They may have injuries or illnesses that threaten their survival. They also often arrive stressed from being captured, restrained, and transported. How we treat the animal upon arrival can significantly impact their survival.

Warm, Dark, and Quiet:

The first response upon receiving an animal is usually to allow the animal to calm down from the stress of the transport. Most animals prefer being in warm, dark, and quiet locations. This gives them a feeling of safety and allows them to think they have hidden from the predator (you) that has captured them. It is important to have an appropriate cage ready to receive the animal. Some species prefer having a hiding place in the cage, which can be as simple as some polar fleece bunched in the corner. Allow the animal to be in a calming environment and check to see whether the signs of stress (i.e. open-mouth breathing, unnatural posture, etc.) have diminished. Generally the animal should be allowed to de-stress for a period of about 15-30 minutes.

Please note that if an animal has a life-threatening condition, such as excessive bleeding or difficulty breathing, these conditions must be addressed immediately. Work with your veterinarian to learn how to properly recognize medical conditions that put animals at imminent risk of death and learn how to address these issues. Novice wildlife rehabilitators often transport wildlife to their veterinarian to handle serious medical problems. The wildlife rehabilitator may also request the animal be immediately transported to a veterinarian by the person who found the animal.

One of the most common mistakes made by new wildlife rehabilitators is immediately giving food to a starving animal. A cold animal cannot properly digest food. The undigested food in the animal's stomach promotes bacterial infection that can be lethal to the animal. There will be more information in subsequent chapters about how to deal with emaciated and dehydrated animals.

Hyperthermia and Hypothermia:

Wildlife rehabilitators often receive animals that have been left in excessive cold or heat. Hyperthermia means that an animal is suffering from the effects of excessive heat. Hypothermia means that an animal is suffering from the effects of excessive cold. Both of these conditions can be life-threatening. It is important to correctly diagnose these conditions and understand how these conditions impact an animal's body. As part of your exam preparation, study how to respond to hyperthermia and hypothermia.

1. Animals with hyperthermia need to be cooled down quickly. Learn the best ways to help wild animals cool off.
2. Animals with hypothermia need to be warmed up slowly. Warming up an animal too quickly can cause the animal to go into shock. Placing the animal in a container with a heating pad on low is generally acceptable. The best option would be an incubator, which allows for greater control of heat and humidity.

Preliminary Examination:

The next steps are based on the assumption that the animal is a relatively healthy infant, juvenile, or adult animal and has been allowed to de-stress in an appropriate environment. The wildlife rehabilitator will begin a written record about the animal in care. The animal will be weighed and may be marked or tagged to identify it among a group. Obtaining the initial weight of an animal is very important because it allows the wildlife rehabilitator to track whether there is progress or regression during treatment. This measurement is also needed before giving any medication or fluids to an animal.

The wildlife rehabilitator will do a preliminary examination of the animal before returning it to the cage. This will allow the wildlife rehabilitator to collect the supplies needed for the full physical examination. It will also allow the wildlife rehabilitator to determine the age of the animal.

For an infant mammal, this is a good time to stimulate the animal to urinate and/or defecate. For many animals, this is as simple as tickling the genital area with a tissue or cotton ball. Infant mammals that still have closed eyes require this stimulation to produce urine or feces. An experienced wildlife rehabilitator can show you different techniques for stimulating infant mammals.

Rehydration Fluid:

Wildlife rehabilitators assume that all wildlife is at least slightly dehydrated upon arrival. Giving an animal some rehydration fluid will improve the function of the digestive track. Please note that rehydration fluid is not the same as water. This will also be discussed in the chapter on dehydration.

The following are questions to help you practice for the wildlife rehabilitation exam:

1. An infant mammal with closed eyes can usually urinate and defecate on its own. True or False?

Answer: False. An infant mammal with closed eyes usually needs to be stimulated in order to urinate and defecate. This is not the same for baby birds, who can produce droppings on their own.

2. You are brought an infant Eastern chipmunk that is very cold and lethargic upon arrival. There are no apparent injuries. The first thing to do is:
 - a) Give the chipmunk some warm formula.
 - b) Give the chipmunk some food to provide energy.
 - c) Warm the chipmunk up slowly to a normal body temperature.
 - d) Warm the chipmunk up quickly to a normal body temperature.

Answer: c) The chipmunk has symptoms of hypothermia, which means its body temperature has dropped below normal. The chipmunk needs to be warmed up slowly back to normal body temperature. This can usually be accomplished using a heating pad placed on low heat underneath a cage. Giving the chipmunk any food or water too quickly could cause a fatal reaction. Warming the chipmunk up too quickly could cause heart arrhythmias and shock.



Chapter 12: Physical Examinations of Wildlife

A comprehensive physical examination is one of the most important first steps in the rehabilitation of wildlife. Oftentimes, wildlife will appear to be normal while hiding a serious injury or illness. This is a normal defense mechanism for wildlife, especially for prey species. It is up to the wildlife rehabilitator to conduct a head to tail examination of the animal to ensure all abnormalities are treated.

The following are some of the areas to learn about for the physical examination of an animal. This is not a full list and be aware that the list would vary with different species.

1. Examine the animal's eyes for vision impairment. Learn how to check for pupil dilation and what this means.
2. Examine the animal's nares (nostrils) for signs of mucous or blood.
3. Listen for the rate of breathing (normal versus shallow/rapid breathing). Is the breathing through the nose or open-mouthed? Learn what these differences mean.
4. Examine the animal's ears for blood or mites. Does the animal appear to respond to sounds?
5. Does the animal have proper posture? Learn how incorrect posture may be a sign of fear or something different, such as a neurologic or nutritional problem.
6. Do all the limbs appear sound and functional?
7. Does the animal have ectoparasites? (i.e. fleas, lice, mites, hippoboscids)
8. Does the animal have endoparasites? (i.e. tapeworms or internal maggots)
9. Does the fur (or feathers) appear healthy looking or in poor condition?
10. Any there any wounds on the animal? Do the wounds appear new (fresh blood) or old (dried, black blood)?
11. Is the vent (anal area) clean or dirty? Does the animal have a foul odor?
12. Is the animal overly calm or behaving normally (fearful of you)? Learn how this can be a sign of disease.

One of the most common mistakes made by a new wildlife rehabilitator is to stop the physical examination after the first injury is found. For example, animals often arrive with multiple bite wounds from cats and dogs. If you find a puncture wound on one side of an animal, it is likely that there is a second puncture wound on the opposite side of the animal. This is because the cat or dog would use its upper and lower teeth while attacking an animal.

If the animal begins to show signs of stress during the physical examination, it may be important to let the animal rest for fifteen minutes or more before resuming the exam again. Animals can die from stress while being examined. It is important to learn how to reduce stress in animals during the physical examination.

There are several good ways to learn how to conduct a good physical examination. You can have your veterinarian or an experienced wildlife rehabilitator demonstrate their techniques to you. Some wildlife conferences include sessions that use dead animals to show how a proper exam should be conducted. Following a standard procedure will ensure that every animal is carefully inspected from one end to another so nothing is missed.

Don't be discouraged if this seems like a difficult skill to master. It is not always easy to conduct a physical examination with a struggling animal. Sometimes two people are required to properly conduct a physical examination. In this case, one person would be responsible for holding the animal, while the second person conducts the examination. This is an example of why new wildlife rehabilitators should work with a mentor until they are more proficient.

Record any signs of abnormality on a wildlife medical form. This will help you remember which animal needs treatment during the following days. Use your veterinarian to help you with any serious injuries and unknown illnesses. Remember that you are not a veterinarian and you must use good judgment about what types of injuries and illnesses you can appropriately treat.

Here are some sample questions for your test practice:

1. A European Starling was brought to you after getting its toe tangled in a feeder. The bird is open-mouthed breathing upon arrival from a one hour transport. Your first step is:
 - a) Give the bird something to eat.
 - b) Give the bird something to drink.
 - c) Immediately conduct a full physical examination on the bird.
 - d) Give the bird approximately fifteen minutes to de-stress in a warm, dark, and quiet environment. Re-check to see if the breathing has become normal.

Answer: d) It is likely the bird is open-mouth breathing due to stress from the transport. Keeping the bird warm, dark, and quiet for a period of time will allow the bird to calm down before the physical examination.

2. Using the example of the European Starling in the above question, you decide on what next steps:
 - a) You immediately check the injured toe and decide it is fractured. You apply a splint and return the bird to the cage.
 - b) You observe the bird for several days in the cage to see whether the toe is a problem for perching.
 - c) You conduct a full examination of the bird and find only a fractured toe. The toe is splinted and the bird is returned to the cage.
 - d) You decide to euthanize the bird because the open-mouth breathing upon arrival indicates a serious respiratory problem.

Answer: c) You need to conduct a full examination on the bird once it has de-stressed. It is not enough to observe a fractured toe and not complete the rest of the examination. If the toe is the only injury or illness found, the toe can get splinted and the bird returned for cage rest. If the bird becomes stressed during the examination, you can allow the bird to rest and splint the toe once the bird is stabilized.



Chapter 13: Basic Equipment for Wildlife Rehabilitators

Becoming a wildlife rehabilitator requires that you have the space, caging, and equipment to provide proper wildlife care. The amount of space, the type of caging, and the various equipment needed will depend on the number of animals being kept and the species in your care. Clearly, the cage requirements for a turtle will be dramatically different than the cage requirements for a squirrel. This chapter will provide an overview of some of the common pieces of equipment needed for wildlife rehabilitation.

Before any equipment can be purchased, the wildlife rehabilitator needs to identify both an indoor and an outdoor area where wildlife can be safely maintained. The indoor space should be separate from common living areas (i.e. a room with a closed door). Wildlife may be fearful of people and need a quiet location for stress reduction. Wild animals need to be kept separate from domestic pets, such as dogs and cats, which are their natural predators in the wild. The wildlife area should be easy to clean, free from vermin, and have a sink nearby for frequent hand washing. The outdoor space should be predator-proof and have a mixture of sun and shade available to the animal.

Before you start purchasing equipment, you have to decide which species you wish to rehabilitate. With the exception of large wildlife centers, most wildlife rehabilitators limit themselves to one or two species in the beginning. By starting slowly, you can decide which species appeal to you and work with your schedule. *It is strongly recommend that you work with a licensed wildlife rehabilitator with the particular species of your choice.* This will help you learn what materials and equipment are needed for that species.

The following is a list of some common equipment and materials required for wildlife rehabilitation:

1. Various indoor caging for animals, inclusive of plastic tubs, net caging, wire caging, and aquariums.
2. A scale to weigh animals. For small animals, the scale should be accurate to one tenth of a gram.
3. Various sizes of syringes or bottles with accompanying nipples for feeding infants.
4. Mechanisms to keep infants warm, such as heating pads, microwave “snuggle safe” disks, hand warmers, heating lamps, and incubators. The wildlife rehabilitator needs to learn how to safely use these heat sources in a manner that does not cause burns or overheat the animal.
5. A mechanism to keep formulas warm, such as a mug warmer, candle warmer, etc.
6. Cage accessories, such as food dishes, water dishes, nest boxes, and polar fleece blankets.
7. Wildlife gloves to protect your hands from teeth and claws.
8. Disposable medical exam gloves to prevent infectious disease exposure.
9. Outdoor pre-release caging. These cages will generally be large units to encourage exercise.
10. Medications for injured and ill wildlife.
11. Medical supplies, such as vet wrap, gauze, cotton balls, and tape.
12. Wildlife formulas, weaning foods, and natural foods for each species.

The National Wildlife Rehabilitators Association (NWRA)(<http://www.nwrawildlife.org/>) has developed a listing of the minimum cage size requirements for a variety of wildlife. It is strongly recommend that you review these caging criteria to ensure the health and safety of wildlife in your care. Building cages for wildlife is often an expensive project, so you want construct them correctly the first time.



Chapter 14: Wildlife Caging

Experienced wildlife rehabilitators understand the importance of cage enrichment for wildlife. Wild animals do best when housed in cages that include some of the features of their natural environment. Simple details, such as including a tree branch with leaves in the cage, may reduce the stress of songbirds. Cage enrichment materials reduce stress in wildlife and also prepare animals for life in the wild.

This chapter will describe different types of caging used for wildlife and why they are important. You are encouraged to visit other wildlife rehabilitation facilities and study the various caging used. Remember that every species has slightly different environmental needs. This is another instance in which knowing the natural history of different species is important.

The following key points should be studied in preparation for becoming a wildlife rehabilitator:

1. Birds should not be placed in caging with metal bars. They will often damage their flight feathers if they attempt to fly and hit their wings against metal bars. Birds do best in a cage with soft netting, such as a Reptarium.
2. Nestling birds should be raised in a container that mimics their natural nest. A small container will support the baby bird around the middle to take pressure off their weak legs. Nestlings that do not get this support often get a condition called "splayed legs". Natural bird nests are not recommended because they are difficult to keep clean. Simple substitute nests can be made using berry boxes or margarine containers filled with soft tissue.
3. Some species, such as raccoons, need to be placed in isolation cages when they first arrive at a rehabilitation facility. Learn about the diseases and parasites that require quarantine and which animals are susceptible to them.
4. An injured or emaciated animal may need a small cage initially. The small cage will limit movement and help the animal's health to stabilize.
5. Caging needs to grow with the size of the animal. An infant squirrel may start with a small net cage. As the animal grows older, it will need a large pre-release cage to practice climbing and jumping skills.
6. Learn about the minimum size requirements for caging for different species. The National Wildlife Rehabilitators Association (NWRA) has established standards for minimum caging requirements for many species.
7. Cages have to be designed for safety. Remember that animals may panic or try to escape their cage. Ensure there are no sharp edges, protruding nails, or entrapment areas that could cause injury. Consider whether the location of the cage will allow you to safely capture an animal that has escaped.
8. Cages must have the capability to be easily cleaned without the animal escaping. Learn the ways to clean and disinfect cages while minimizing stress to the animal. Caging used by raccoons should not be used by other species due to the risk of contamination with raccoon roundworm eggs which are very resistant to disinfection. Raccoon roundworm is lethal to most other mammal species.
9. Learn how to control various temperature ranges in cages so animals have a choice of going from a warmer to a cooler area. This is especially important for infant and adult animals that

have mobility problems caused by an injury or illness. Animals that can't move away from a hot area risk hyperthermia or skin burns.

10. Outdoor cages need to be predator-proof. Learn how hardware cloth is commonly used to keep predators from gaining access to cages. Outdoor cages need to provide a mixture of sun and shade while the animal acclimates to life outdoors.
11. Learn how cage enrichment can help a juvenile animal learn new skills and keep an adult animal from being bored. Hide nuts around the cage of a juvenile squirrel so they practice their foraging skills. Place sprigs of berries or millet in the cage of a bird to mimic food in the wild. Try to replicate the natural world in your cage and see how well the animal responds.

The following are some questions for you to practice for the exam:

1. A person brings you a juvenile raccoon that looks stressed and weak. You already have a cage with three raccoons of a similar age. You should:
 - a) Follow a quarantine procedure by placing the new raccoon in an isolation cage.
 - b) Immediately place the new raccoon in with your other raccoons so it is less stressed.
 - c) Place the new raccoon in a cage with only one of your other raccoons. This will help to reduce stress in the new raccoon without jeopardizing all the raccoons.
 - d) Examine the new raccoon for fleas. If the raccoon appears clean, it should be placed with the other raccoons.

Answer: a) Raccoons are known to have contagious diseases, such as canine distemper and rabies. This raccoon needs to be quarantined until the health of the raccoon has been determined. There are other species, such as skunks, that require a similar quarantine protocol.

2. Which of the following statements is true about disinfecting cages?
 - a) A raccoon cage can be used by multiple species as long as it is disinfected with bleach.
 - b) Soap and water are good disinfectants for most bacteria, virus, and fungi.
 - c) Feces and organic materials need to be removed before disinfecting a cage.
 - d) If an animal was healthy, the cage does not need to be disinfected before being re-used.

Answers: c) Disinfectants don't work well unless feces and organic matter are first removed. This is the only true statement. All other statements were false. Soap and water can clean a cage, but do not kill disease causing germs as well as a disinfectant. Even if an animal was healthy, the cage should be disinfected before another animal uses it. A raccoon cage should only be used by raccoons due to the concerns of a nematode parasite called Raccoon Roundworm (Baylisascaris procyonis). The eggs of this parasite are resistant to disinfectants and persist for years in the environment. The only effective way to destroy the eggs is through extreme heat, such as a blowtorch, which is not recommended as a routine procedure.



Chapter 15: Feeding Baby Animals

One of the most common responsibilities of a wildlife rehabilitator is to feed baby animals in their care. How well this task is accomplished will directly impact the health and survival of those babies. This chapter will deal with some important key points for you to study and practice under the supervision of an experienced wildlife rehabilitator.

1. Feed baby animals on a consistent schedule that will meet the animal's nutritional needs. This will vary from species to species as well as with the developmental stage of an animal. Learn about the feeding schedules of common species. Recognize that missed feedings will deny baby animals the sufficient nutrition they need to grow.
2. Use only formulas that have been researched and found to meet the nutritional needs of an animal. This will be discussed further in the next chapter (Wildlife Nutrition).
3. Use a gradual process to transition an orphaned animal from rehydration fluid to formula. Many rehabilitators give baby animals a formula that has been fifty-percent diluted for the first feeding and increased to full strength formula for the next two or three feedings. This gives the animal a chance to adjust to a formula that is different from the natural formula provided by the mother. Monitoring the quality of the animal's feces helps the wildlife rehabilitator to identify whether a baby's digestive system is ready to accept full-strength formula or requires a more gradual transition.
4. Keep the baby warm during feeding. Many infant animals cannot regulate their own body temperatures (thermoregulation) and require external sources to be kept warm. Wildlife rehabilitators commonly wrap baby mammals in a warm cloth during feeding. Baby birds are kept in an incubator or under a heat lamp.
5. Use the appropriate syringes, feeding tubes, bottles, and nipples as required for each particular species. The wrong size syringe or bottle could cause the formula to come out too fast or too slow. The wrong type of nipple could make the animal fussy at feeding time or could cause the nipple to be chewed and swallowed. There is a large assortment of nipples and syringes available for consideration. Experienced wildlife rehabilitators can tell you which feeding tools they prefer and why. For many animals, a syringe is preferred over a bottle because the flow of the formula can be controlled.
6. Keep formula warm when feeding multiple babies. Formula that is cold can cause digestive problems, such as diarrhea and bloat. Many wild babies will refuse formula that is not warm. The wildlife rehabilitator needs to warm up the formula before feeding. This can be accomplished by placing the formula in a container of hot water or using an electric mug warmer and testing it frequently.
7. Learn how to calculate the correct amount of formula required for each baby animal. This is not guesswork. Feeding a baby animal too little formula per day results in the animal not getting enough nourishment to properly grow. Feeding a baby animal too much formula per day could result in life-threatening digestive problems, such as bloat or diarrhea. The wildlife rehabilitator needs to calculate how much formula to feed an animal per feeding and how many feedings are required per day. These calculations will constantly change as the animal grows. Remember that every animal has individual nutritional needs and must be monitored to ensure the animal is gaining weight and growing strong. The following are some general calculations used by wildlife rehabilitators:

- a) You must know the stomach capacity of each species in order to determine how much formula can be fed at once. Many mammals have a stomach capacity of 5-7% of their body weight. However, there are exceptions to the 5% rule. For example, infant Eastern cottontails can hold 10% of their body weight per feeding. Learn the stomach capacity of common mammal species.
 - b) Many baby birds also have a stomach capacity of 5% of their body weight. However, some birds (i.e. rock doves) can hold up to 10% of their body weight due to having a large crop. Learn the stomach capacity of common avian species.
 - c) Learn how to convert the weight of the baby animal to the amount of formula it can eat per feeding. Here is an example: You have a Red squirrel weighing fifty grams. The Red squirrel has a stomach capacity of 5% of its body weight. You calculate that 5% of fifty grams is 2.5 ($.05 \times 50 = 2.5$). You can safely feed the Red squirrel 2.5 ml (milliliters) of formula per feeding. You would have to know the developmental stage of the animal in order to know how many feedings per day is required.
 - d) Learn how to calculate the minimum number of calories an animal requires per day to survive. This term is symbolized by **Kcal/day**. It is also called the **MEC** (metabolic energy coefficient) or basal rate of the animal. Learn how to calculate the MEC for placental mammals, marsupials, passerines, non-passerines, and reptiles. There are wildlife rehabilitator books available that provide these formulas. The formulas can be adjusted for animals that require more nutrition, such as infant animals or debilitated animals.
8. Learn what aspiration pneumonia is and how to avoid it. In brief, aspiration pneumonia can occur when an animal inhales formula into its lungs rather than swallowing the formula. This can occur if the animal is being fed too quickly, is being held in a poor feeding position, or an incorrect feeding tool is being used. The aspirated fluid in the lungs can cause a life-threatening infection.
 - a) One sign that an animal has aspirated would be the animal blowing “formula bubbles” out of its nose during feeding.
 - b) If an animal has aspirated, immediately stop the feeding and tip the baby so the head is closest to the floor. Gravity will cause the fluid to flow out of the lungs. Give the baby a short time to rest before resuming the feeding.
 - c) Try to determine why the baby aspirated and correct the problem.
 9. There is a process called “weaning” that involves an animal going from a liquid diet (formula) to a solid diet. This is generally the time when the animal begins self-feeding. Weaning is a gradual process since the animal needs time to learn how to recognize and eat natural foods. Learn the techniques for weaning an animal from formula to natural foods. Learn why it is important for an animal to recognize natural foods before being released into the wild.
 10. Learn how overfeeding can be a cause of diarrhea. Diarrhea can cause severe dehydration and could be fatal to young animals. Diarrhea has many causes, such as stress, parasites, cold formula, inappropriate formula, abrupt change in formula, or unclean feeding tools. However, one of the most common causes of diarrhea is overfeeding an infant animal, which overloads the animal’s digestive system.
 11. Some baby animals are precocial, which means they can eat on their own at a young age. Examples of precocial animals are waterfowl, game birds, and turtles. It is important to recognize that precocial animals need to be in an environment that encourages self-feeding, one that is warm and helps reduce stress.

The following are sample questions similar to those found on the state wildlife rehabilitation exam:

1. You are feeding an Eastern grey squirrel formula from a syringe. The animal has become fussy and does not want to finish the syringe. Which of the following should you check?
 - a) Is the formula too cold?
 - b) Is the formula too thick and should be diluted with water?
 - c) Does the squirrel need to urinate or defecate before finishing the formula?
 - d) Only "a" and "c"

Answer: d) You should check to see if the temperature of the formula is appropriate. Sometimes baby mammals need to eliminate before eating. Diluting the formula would decrease the amount of nutrients being given to the animal. However, there are some instances where formula is diluted as part of a treatment for diarrhea.

2. You have a House Sparrow with half-grown wing feathers that should be fed:
 - a) Every four hours during the day.
 - b) Every four hours during the day and throughout the night.
 - c) Every two hours during the day.
 - d) Every two hours during the day and night.

Answer: c) Healthy baby birds do not need to be fed during the night, which eliminates answers "b" and "d". This bird is not yet a fledgling and would need feeding at least every two hours. A bird being fed every four hours should have full feathers and only need minor support feeding.



Chapter 16: Wildlife Nutrition

One of the most important and complex areas of wildlife rehabilitation is the topic of nutrition. This is a constantly evolving topic and, therefore, difficult for a wildlife rehabilitator to learn. The best nutrition for a wild baby animal comes from a healthy parent of the same species. Wildlife rehabilitators strive to replicate the specific nutrients required for each species by using various formulas.

Over the years, many homemade formulas have been used by wildlife rehabilitators. These formulas were created through a trial and error process to see which ones produced the healthiest animals. Many of these formulas were not analyzed to see whether they matched the nutrients found in the milk of the natural parent. This is not considered good practice by current wildlife rehabilitation standards. Homemade formulas may help a baby animal to survive, but they may not produce an animal healthy enough to withstand life in the wild.

Good practice in wildlife rehabilitation demands that wildlife rehabilitators only use tested formulas. The protein, fat, and carbohydrate contents of the milk or food provided by the natural parents of different species have been determined. Companies now produce formulas designed for specific wildlife species that attempt to match the nutrients young animals would receive from their natural parents. It is best to use a formula or food that has been specifically developed to meet the nutritional needs of the species you are rehabilitating.

Since this is an evolving science, the recommended composition of certain formulas may change from year to year. Wildlife rehabilitators stay current on these issues by attending wildlife rehabilitation conferences and joining wildlife rehabilitation organizations.

The following key points are important to learn about wildlife nutrition:

1. Learn about the role of protein, fats, and carbohydrates for growth and development. Some animals require a higher level of these nutrients because they grow so quickly. An animal that fails to obtain vital nutrients during infancy might have stunted growth, unhealthy fur, or poorly functioning internal organs. Nestling birds that lack proper nutrition will develop a condition, known as stress bars, that causes their feathers to easily break.
2. Learn about Metabolic Bone Disease (MBD) and how it is caused by an imbalance of calcium, phosphorus, and vitamin D in the body. This is a disease that can cause brittle bones and crippled joints in an animal. It can be difficult to reverse and may cause an animal to be non-releasable. For many animals, the proper ratio of calcium to phosphorus is 2:1. An excess of phosphorus is one cause of Metabolic Bone Disease. It is highly important to learn what types of foods contain calcium and phosphorus to ensure the correct balance is maintained in an animal's diet.
3. Learn about various vitamins and how they help an animal to grow. Vitamin supplements are needed in wildlife facilities because animals often arrive depleted of vital nutrients. Some vitamin supplements can be added to water, while others can be added to food. Learn the differences between the B, C, D, and K vitamins in contributing to the health of an animal.

4. Learn about the purpose of fiber in maintaining digestive health for some species. For example, juvenile and adult rabbits require fiber (easily provided by timothy hay) in order to maintain digestive health. Fiber can also be found in many fruits and vegetables.
5. Learn about the role of probiotics for wildlife health. Many species depend on the addition of probiotics to help them digest formulas. Probiotics are also helpful when animals are recovering from antibiotic therapy.
6. Understand how dietary needs vary from species to species. Diets will also change as an animal grows from an infant to a juvenile to an adult.

Be wary of some formulas and foods that are carried by your local pet store. They may be falsely advertised as being complete diets for birds or mammals. For example, a pet store may suggest that a young squirrel be fed sunflower seeds, cracked corn, and peanuts. An experienced wildlife rehabilitator knows that this is not a balanced squirrel diet and would produce a stunted squirrel that would likely require euthanasia. Since a squirrel is a rodent, the primary diet for a squirrel is a high quality rodent chow or something with similar nutrients. There are wildlife rehabilitation websites and internet stores that can help you obtain items not found in local pet stores.

It may become confusing when wildlife rehabilitators are advocating for different formulas for the same species. Since this is an emerging field of science, there will be differences of opinion about which formula or food works best. As long as a formula or food has been shown to contain the proper nutrients, it's a matter of personal preference when deciding which to use.

Wildlife nutrition is one of the most important topics to study when preparing to become a wildlife rehabilitator. Take the time to discuss this topic with an experienced mentor.

The following are sample questions to help you prepare for the state wildlife rehabilitation exam:

1. A vitamin that promotes nerve growth and eye development is:
 - a) Vitamin A
 - b) Vitamin B6
 - c) Vitamin C
 - d) Vitamin D

Answer: b) Vitamin B6 is one of the vitamins needed for healthy nerves and eyes.

2. Metabolic bone disease (MBD) is generally caused by:
 - a) A lack of fiber
 - b) A lack of protein
 - c) An improper balance of calcium and phosphorous
 - d) An improper balance of fats and carbohydrates

Answer: c) Metabolic bone disease is often caused by an improper balance of calcium and phosphorous. It can also be caused by a lack of Vitamin D, which is why most reptiles should have a UVB light source with a bulb that has been used for no more than six months. The UVB output will wear out before the illumination of the bulb does.



Chapter 17: Dehydration Protocols

Wildlife rehabilitators should assume that all wildlife entering their facility has some level of dehydration. Whether the animal is orphaned, injured, or ill, it is likely that something has kept the animal from getting adequate fluids. Helping to rehydrate an animal requires more than simply giving it a drink of water. Proper rehydration requires a planned process to supply the proper types of fluids the animal needs to return its body back to normal.

In order to appreciate the impact of dehydration on an animal, it is important to learn about the mechanism of dehydration. The loss of fluid from the body affects all organ systems of an animal. A severe loss of fluid can prevent the maintenance of normal blood pressure, resulting in insufficient oxygen supply to organs. Also, an imbalance of the electrolytes normally present within bodily fluid will have multiple negative effects at the cellular level. If you understand what is wrong inside an animal, you will understand why giving water to a dehydrated animal is not sufficient.

There are levels of dehydration that range from mild and moderate to severe and life-threatening. These levels are determined by the loss of fluid as a percentage of an animal's body weight. An animal that has lost 10% or more of its body fluid will be in extremely serious condition and may die.

Providing an appropriate rehydration fluid is one of the first things a wildlife rehabilitator should do after warming up an animal and assessing it for injuries. In most cases, the animal needs to be at least partially rehydrated before it can receive food or medications. It may take several hours to several days for the animal to become fully rehydrated.

All animals need a certain amount of fluids daily to survive. This is called "maintenance fluid". Existing dehydration and ongoing fluid loss, such as from diarrhea, are referred to as a "fluid deficit". Rehydration therapy involves calculating an animal's needs for both maintenance and deficit fluids.

The following key points are important to study in preparation for the state wildlife rehabilitation exam:

1. Learn about the mechanism of dehydration and what it means to an animal. Study how this is not just a loss of water, but rather an electrolyte imbalance inside an animal that affects it at the cellular level.
2. Learn the clinical signs of the different levels of dehydration. Learn what a "skin pinch" test shows about the level of dehydration in a squirrel. Find out what the mucous membranes of an animal can tell us about the animal's state of hydration. Learn how sunken eyes or sticky saliva might be an indicator of severe dehydration. Be prepared to determine whether an animal is mildly or moderately dehydrated versus in a severe or life-threatening state of dehydration.
3. Learn about how observation of urine and feces helps the wildlife rehabilitator assess the dehydration level of an animal. Has the animal urinated and, if so, what was the color of the urine? In many cases, a darker urine (dark yellow or brown) can be an indicator of dehydration. Learn how observation of feces can also provide similar information.

4. Learn about the terms “isotonic”, “hypotonic”, and “hypertonic” as they pertain to rehydration fluids. See the glossary in the back of this study guide for more information.
5. There are a variety of rehydration fluids available to the wildlife rehabilitator. Some fluids, such as Pedialyte, can only be given orally (PO) to an animal. “PO” is Latin for per os, or by mouth. Other fluids, such as Lactated Ringers, can be given orally, subcutaneously (under the skin), or intravenously (in the veins). Learn about the different hydration fluids and the different routes for administering them to animals.
6. Learn how to transition infant animals from rehydration fluids to formula. Many wildlife rehabilitators use a gradual process of diluted formula to make this transition easier for the animal’s digestive system. (See chapter on Feeding Baby Animals)
7. Learn how to calculate how much fluid must be replaced for an animal of a particular weight when a particular level of dehydration is determined. The fluid calculations will include the fluid deficit as well as the maintenance fluid the animal needs.
 - a. To calculate the fluid deficit: % dehydration of the animal X body weight (grams) = ml fluid to be replaced over 72 hours. For example, an animal is determined to be 10% dehydrated and weighs 1000 grams. To calculate the fluid deficit you do the following equation: $.10 \times 1000 = 100$ milliliters of fluid to be replaced over a three day period.
 - b. To calculate the maintenance fluid: estimate 55 ml/kg/day for mammals and 50 ml/kg/day for bird species. For example, a one kilogram mammal needs 55 milliliters each day of replacement fluid.

Using the above example, a mammal (one kilogram weight) that has been determined to be ten percent dehydrated would need 100 milliliters of deficit fluid replaced over a three day period plus a daily maintenance amount of 55 milliliters of fluid. The 100 milliliters of deficit fluid would be replaced at the rate of 50% of the amount (50 milliliters) the first day and 25% of the amount (25 milliliters) during each of the next two days. This would mean that the animal would receive $50 + 55 = 105$ milliliters of fluid the first day, $25 + 55 = 80$ milliliters the second day, and $25 + 55 = 80$ milliliters the third day. Any animal that continues to have severe blood loss or diarrhea would continue to have a higher fluid deficit level and must be given additional fluids.

A new wildlife rehabilitator should consider attending a workshop on fluid therapy commonly offered at wildlife rehabilitation conferences. These workshops are very helpful in training wildlife rehabilitators how to recognize and treat the various levels of dehydration. Proficiency at fluid therapy will save the lives of many animals in your care.

The following sample questions will help you prepare for the wildlife rehabilitation exam:

1. You receive a bird that seems lethargic, has sunken eyes, and sticky saliva. You judge that the bird is:
 - a) Mildly dehydrated
 - b) Moderately dehydrated
 - c) Severely dehydrated
 - d) Just needs a sip of water

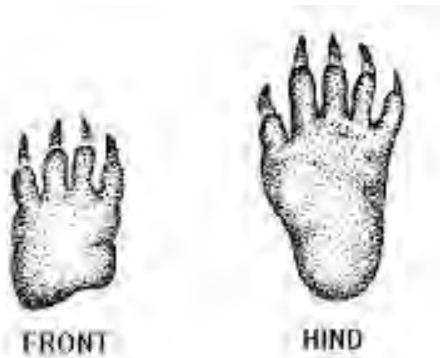
Answer: c) The bird is severely dehydrated and at imminent risk of death.

2. You receive a young Virginia opossum that has a leg injury with a deep puncture wound. The opossum has suffered a loss of blood due to this wound. You determine that:
- a) The opossum does not need rehydration fluid because the injury occurred on that day.
 - b) The opossum needs only maintenance rehydration fluid.
 - c) The opossum needs replacement rehydration fluid because of the blood loss.
 - d) The opossum needs both maintenance and replacement rehydration fluids.

Answer d) The opossum needs maintenance fluid to keep normal fluid levels, but it also needs replacement fluids due to the blood loss from the wound.

3. Water is an isotonic fluid and can be given subcutaneously. True or False?

Answer: False. Water is a hypotonic solution and can only be given orally to animals.



What kind of tracks are these?



Chapter 18: Dealing with Emaciated Animals

Wildlife rehabilitators regularly receive animals in varying states of malnutrition. This means that the animal has been deprived of the nutrients needed for survival. There are many causes of malnutrition and emaciation in an animal. A young animal may be deprived of food because its mother was killed or unable to come back to the nest. Additionally, a parent may have become injured and, therefore, unable to hunt or scavenge for food. There are also many diseases that can debilitate an animal to the extent that it is unable to forage in the wild. An emaciated animal is often on the verge of death when it is brought into care.

Any emaciated animal should be thoroughly evaluated for long-standing injuries that may have prevented it from being able to find food and could potentially prevent it from being released back to the wild. Such an injury would necessitate humane euthanasia.

A new wildlife rehabilitator may be dismayed when receiving an emaciated animal. Our first instinct is to give this animal something to eat. However, an experienced wildlife rehabilitator knows that giving an emaciated animal food right away would likely cause its death.

Emaciation is a complex process in which an animal is trying to cope with a lack of nutrients and protect the most vital organs of its body. The process starts by using the animal's body fat to provide energy to vital organs. Once the body fat is gone, the animal begins to break down muscle to use as fuel as a last resort to stay alive. The animal becomes severely dehydrated during this process. Many of the animal's body systems, such as the digestive system, start to shut down. Once an animal reaches this state, it is unable to digest food. It is harmful to give food to an animal that can't digest it. Undigested food will cause complications, including changes in the body's fluid balance, which may hasten death.

As a wildlife rehabilitator, it is important to learn about the different stages of malnutrition so you know how to proceed with an effective response. The following are some key points to learn:

1. Learn about the different levels of malnutrition and the mechanism of what is occurring in an animal's body at each level. You will make better treatment decisions when you understand the effect of malnutrition on an animal.
2. Never forget the basic first response for animal care. An emaciated animal needs to be warmed up and rehydrated before anything else can occur.
3. If an animal has a disease, this will need to be addressed in order to reverse the emaciation. Please see the section on "Wildlife and Diseases" for additional information.
4. There are many different products that can help an animal that is emaciated. Some products are "pre-digested" or easily digested foods and formulas. These are products that don't require much energy from an animal to digest. Learn about these products from experienced wildlife rehabilitators, wildlife manuals, or wildlife conferences.
5. Learn why not all "pre-digested" foods and formulas are alike. Some products provide the animal with more sugar than protein. For many animals with severe emaciation, the need for highly digestible protein is the best choice.
6. Learn about the term "re-feeding syndrome" and what it means for the treatment of emaciated animals. Re-feeding syndrome explains why a starving animal can have a sudden collapse if given whole food too early in the treatment process.

7. Learn how to give smaller portions of food or formula to an emaciated animal. It is important not to overload the gut since it may only be minimally functioning. For example, an animal that would normally get four servings of formula a day may now need eight smaller servings to accommodate an impaired digestive system.

Not all animals recover from severe emaciation, but it is possible to save some of them with the proper training and supplies. Severe emaciation is more problematic for growing babies than adults since their organs may still be developing. It is recommended that you work with a veterinarian or experienced wildlife rehabilitator to develop sound protocols for dealing with emaciated animals.

The following questions will help you prepare for the state wildlife rehabilitation exam:

1. You receive a juvenile woodchuck suffering from moderate emaciation and dehydration. Your first response is to:
 - a) Feed it Ensure.
 - b) Warm up the animal and feed it Ensure.
 - c) Provide Lactated Ringers solution, warm up the animal, and feed it watermelon for sugar energy.
 - d) Warm up the animal, provide Lactated Ringers solution, and feed an easily digested diet.

Answer: d) You need to warm up the animal and provide rehydration fluid before moving onto an easily digested diet.

2. A person brings you a seven day old Eastern cottontail rabbit that they kept in a box for three days before finding you. They tell you that the bunny wasn't given anything, but the bunny's belly is distended and hard. The most likely reason for this is:
 - a) The finder gave something inappropriate to the bunny resulting in gastric stasis (bloat).
 - b) The bunny was appropriately fed.
 - c) The bunny has been self-feeding.
 - d) The bunny is not emaciated.

Answer: a) An infant Eastern cottontail rabbit in a box for three days is going to be emaciated and not have a swollen belly. The most likely reason for the swollen belly is bloat (GI stasis) due to being fed an inappropriate formula after being starved. Seven day old bunnies do not self-feed.



Chapter 19: Injured Wildlife and Wound Management

One of the more advanced and challenging areas of wildlife rehabilitation is working with injured wildlife. Unless you are a veterinarian or veterinary technician, you have probably had limited exposure to injured animals. This chapter was written to help new wildlife rehabilitators who have had little to no exposure to injured wildlife.

A new wildlife rehabilitator may only have adequate training to deal with relatively healthy orphans. It is important to recognize your limitations when dealing with injured animals rather than trying to treat an injury for which you are not trained. It is common for new wildlife rehabilitators to be brought injured animals by the public. A new wildlife rehabilitator needs to learn basic wound management skills so they can minimally “do no harm” until the animal can be brought to a veterinarian or more experienced mentor.

There are numerous types of injuries that a wildlife rehabilitator may encounter; this study guide will highlight some of the common wildlife injuries. The following key points are areas to study in preparation for being a wildlife rehabilitator:

1. Learn how to clean wounds properly. It is important to remove dead tissue (dead skin or broken feathers) that could cause infection. In moderate to severe cases, this has to be done with the animal anesthetized since this process will cause pain. There are solutions that can be used to clean debris without harming tissues. In contrast, undiluted hydrogen peroxide is a substance that can harm normal tissue and is not recommended for the cleansing of wounds. Unpasteurized honey has long been recognized as an antimicrobial substance that helps fight infected wounds.
2. One common animal injury is puncture wounds caused by another animal, such as a cat or dog. Learn how to clean and treat these wounds with topical and oral antibiotics. Even the most minor scratch caused by a cat can cause a life-threatening infection in an animal. Cats have harmful bacteria in their saliva that can cause severe infections and possible death.
3. Another common injury is a skin abrasion on an animal. Learn how to clean debris from these areas and treat with topical and/or oral antibiotics. These injuries are commonly found on an animal that has “road burn” from being hit by a car.
4. Learn about the use of antibiotics for infection control. A wildlife rehabilitator must learn how to correctly use antibiotics in order to “do no harm”. Some antibiotics used by humans can harm certain species of animals. For example, rabbits cannot tolerate penicillin given orally. A wildlife rehabilitator must learn how to give the correct dose of an antibiotic to avoid an overdose or an ineffectual dosage. See the chapter on “Medication Administration” for further information. Note: Improper use of antibiotics can result in the development of bacteria that are resistant to antibiotics, which can result in severe infections in animals and humans. Antibiotics should not be given unless there is a legitimate indication for their use. Consult with a veterinarian about the proper use of antibiotics.
5. Learn the proper techniques to safely restrain an injured animal. Remember that an animal in pain is likely to fight back. Have a backup plan in anticipation of the injured animal defending itself or fighting back. Know when it is safe to conduct a physical restraint by yourself and when a second (or third) person will be required.

6. Learn how to stabilize a fractured limb or wing so an animal can be safely transported to a veterinarian. Learn the difference between a simple fracture and an open fracture. Learn the basic bone structure of bird, mammal, and reptile species so you can have a knowledgeable conversation with your veterinarian. *Do not attempt to splint a fracture unless you have received specific training in this area.* Remember that manipulating a broken bone can be very painful for the animal. Learn to recognize when a wound or injury should not be addressed without anesthesia due to the amount of pain the animal would experience. In these cases, it is best to give pain medication and antibiotics, if indicated, and transport the animal to a veterinarian as soon as possible.
7. Turtles are often hit by cars while crossing roads, and brought to a wildlife rehabilitator with a cracked shell. There are several techniques for turtle shell repair that can be performed by a new wildlife rehabilitator. However, a veterinarian should be consulted prior to attempting any major repair. Remember that a turtle shell is composed of living bone. Shell fractures are painful and can become severely infected if not treated properly.
8. Animals frequently experience neurologic symptoms due to head or spinal trauma. This can result from any severe impact, such as an animal colliding with a motor vehicle or a bird hitting a window. Learn how supportive care can often help these animals survive. Understand that neurological symptoms may be due to trauma, but they can also be caused by toxins, bacteria, or viruses. This is another area where the advice of a veterinarian is recommended to make a differential diagnosis.
9. A more severe injury is paralysis of limbs due to spinal trauma. This requires assessment by a veterinarian to determine whether the animal can be saved. The animal will be assessed for a “deep pain reflex” to help determine whether recovery is possible. These cases often carry a poor prognosis for recovery.
10. Learn about the benefits of pain management for animals. Many animals don’t show signs of pain even when in major discomfort. Animals often benefit from a pain medication, such as Meloxicam. The general rule of thumb is to give pain medication if a similar injury would cause pain in humans. Animals that are given pain medication will eat and sleep better, and may also recover from their injuries more quickly.
11. Learn about the benefits of physical therapy for recovering animals. It takes time for an injured animal to regain strength and flexibility of its limbs after a lengthy recovery from an injury. Some animals require their wings and limbs to be periodically stretched, but often the best physical therapy is simply providing the animal with a proper enclosure in which it can exercise.

Realistically, wound management is a skill that requires both textbooks studying and practical application to become proficient. It is important for a wildlife rehabilitator to work with their veterinarian or mentor to gain these practical skills. Many wildlife rehabilitators acquire basic skills by first working on dead animals. Working on cadavers allows the wildlife rehabilitator to learn and practice techniques on an animal that is not struggling and won’t be harmed if mistakes are made.

The following sample test questions will help you prepare for the state wildlife rehabilitation exam:

1. You are brought a baby squirrel with two small puncture wounds in its side. The finder reported that the squirrel was taken out of the mouth of a cat. Due to the small size of the wounds, this animal does not need antibiotics. True or False?

Answer: False. Any animal that has been in the mouth of a cat will need antibiotic therapy. Cat saliva has gram negative bacteria that can cause a lethal infection in small animals.

2. Which of the statements about wound management is true?

- a) Animals can take care of minor wounds on their own and don't need our help.
- b) To "debride a wound" means to cover it with a dry bandage.
- c) A drop of antibiotic would generally be the correct dose.
- d) An open fracture is generally more serious than a simple fracture.

Answer: d) An open fracture means the bone is sticking out of the skin. This type of fracture is more serious than a simple fracture since the animal is prone to infection. It is false to assume an animal can take care of minor wounds by itself. Although this may happen in nature, it is safer to conduct wound management on all wounds. To "debride a wound" means to clear out any dead skin, fur, or feathers. A drop of antibiotic is not a precise dose and would often be incorrect. See the chapter on "Wildlife Diseases" to learn about how to determine the correct dose of medication for an animal.



Chapter 20: Using Medication with Wildlife

Wildlife may come into your care with both injuries and illness. Each of these conditions generally requires the use of medications to provide appropriate treatment. This chapter will provide a general overview of how medications are administered to wildlife. It is essential for a veterinarian to help new rehabilitators select the appropriate medications and their proper dosages. This chapter provides an introduction to administering medications to wildlife.

Many medications are commonly used for a variety of purposes. Some may kill parasites or are intended to treat infections, while others stop diarrhea or relieve pain. The use of medications for wildlife is an “off-label” use. This means that the medication was not developed with the intention of being used to treat wild animals, and the drug’s effectiveness for treating wildlife, or its safety when administered to wildlife, has not been tested. However, if a drug is known to be safe and effective in treating similar conditions in domestic animals, it can reasonably be assumed that it may be useful for treating at least some wildlife species as well. The use of any medical drug carries a certain level of risk. Some medications can be beneficial for some species, but lethal to others. Some medications should only be given after the animal has been rehydrated.

The wildlife rehabilitator should begin with a differential diagnosis of the animal's condition. Based on this diagnosis, the wildlife rehabilitator should consult with their veterinarian or a medical reference book to select the appropriate medication and dosage. Most medical drugs can only be obtained through a veterinarian. Many wildlife rehabilitators are able to establish a strong working relationship with a veterinarian and may be given medications for free or at a reduced cost.

A wildlife rehabilitator needs to know the precise amount of medication to give a specific animal. One drop of a particular medication for a six-week old squirrel may be an overdose of medicine. One drop of the same medication for a full-grown raccoon may be too little medicine. The squirrel risks side effects from the high dosage while the raccoon may not receive enough medication to treat the problem.

There are mathematical calculations that must be made in order to determine the correct dose of medication. These calculations take into account the concentration of the medication, the animal’s weight, and the type of species (i.e. bird, mammal, or reptile).

1. To calculate the amount of drug to administer you take the *animal's weight multiplied by the recommended dose rate of drug to get the specific amount of drug needed.*
2. To calculate the volume of drug to administer you take *the amount of drug divided by drug concentration to get the volume of drug to administer.*

Let's take an example of how these calculations work. Let's say you want to give an animal an antibiotic called Baytril, which is a broad-spectrum antibiotic. Like many medications, Baytril can come in various concentrations or strengths of the medicine. The medicine you have is a liquid with 22.7 milligrams per milliliter (22.7 mg/ml). This means that there are 2.27 grams of medication per 100 milliliters of medicine. You check with your veterinarian and learn that your animal needs 10 milligrams per kilogram

of the animal's weight for the medication to be effective. You also know that your animal weighs 100 grams. So here are the calculations:

First you convert the animal's weight in grams to the weight in kilograms. There are 1000 grams in a kilogram. Therefore, a 100 gram animal weighs 0.1 kilograms. If the animal needs 10 milligrams per one kilogram of weight, then your 0.1 kilogram animal needs only 1 milligram of medicine (10 mg/kg (the required dose) multiplied by 0.1 kilogram (your animal's weight) equals one milligram).

Next you need to determine the volume of medicine that would give this animal 1 milligram of Baytril. Your Baytril comes in a concentration of 22.7 milligrams per one milliliter (22.7 mg/ml). Therefore, the volume of Baytril needed is (1 (the number of mg of Baytril needed) divided by 22.7 (the concentration of Baytril in your medicine)) = .04 ml of medicine. The correct dose of Baytril to give this animal is 0.04 ml.

Different medications have different dosing regimens. Some medications should only be given once a day, while other medications recommend twice a day. The medical term for once a day is "SID" and for twice a day is "BID." These terms are used only in veterinary medicine.

There are also different options for administering medications. The most common technique is oral, in which the animal swallows the medication. The medical term for this is "PO". Another common technique is subcutaneous, which means injection under the skin. The medical term for this is "SQ". There are other techniques for administering medication, such as IM (intramuscular) and IV (intravenous). These are generally only used by persons with veterinary experience or medical training.

It is important to learn these terms in order to converse clearly with your veterinarian. Your veterinarian may give you a bottle of medication that shows the name of the drug, the concentration of the drug, the technique for administering the drug, and the correct dose for the specific species. It is also important to use these terms for record keeping purposes.

Wildlife rehabilitators must ensure that drugs are stored safely and correctly in their homes. Keep these drugs out of the reach of children. Don't use these drugs on a pet unless you have the consent of your veterinarian. Some drugs require refrigeration and many drugs must be kept out of bright daylight. All drugs have an expiration date that will let you know how long the drug will retain its full potency.

In addition to traditional medications, some wildlife rehabilitators also use homeopathic medications. Homeopathic medications help an animal's immune system recognize an illness or injury and focus the body on its own healing process. Homeopathic medications can be used in combination with traditional medications dispensed by veterinarians without causing any harm. Many wildlife rehabilitators use homeopathic medications to help reduce fear, grief, and stress in animals.

Please review the glossary of medical terms located at the back of this study guide. You should anticipate that some of these terms may be included in questions on the state wildlife rehabilitation exam.

The following questions will help you prepare for the state wildlife rehabilitation examination:

1. You have an animal that weighs 2 kilograms. The animal needs a drug dose of 10 milligrams per kilogram of Medicine X. The drug comes in a tablet with a concentration of 20 milligrams per tablet. How much medication will the animal need?
 - a) 2 tablets
 - b) 1 tablet
 - c) 1/2 tablet
 - d) none of the above

Answer: b) The animal needs only one tablet. First, determine how many milligrams are needed per kilogram of the animal's weight. If the medication dose rate is 10 milligrams per one kilogram, then your two kilogram animal needs double that amount (2×10) = 20 milligrams of medication. Lucky for you, the drug comes in a tablet of 20 milligrams.

2. Your veterinarian tells you to give the medication PO, BID. This means you should:
 - a) Give the medication once a day orally.
 - b) Give the medication twice a day subcutaneously.
 - c) Give the medication twice a day orally.
 - d) Give the medication twice a day subcutaneously.

Answer: c) The terms mean to give the medication orally (PO) twice a day (BID).



Chapter 21: Wildlife and Zoonotic Diseases

Working with wildlife presents the risk that you may be exposed to animals with diseases. Some of these diseases can be transmitted from wild animals to people (i.e. from raccoons to humans). These diseases are called zoonotic diseases. *Some zoonotic diseases have the potential to be life-threatening to humans.* Other diseases can only be transmitted between wildlife species and cannot be transmitted to humans. As a wildlife rehabilitator, you need to become familiar with all of the common diseases that affect wild animals. This chapter will concentrate on zoonotic diseases, but you should also take the time to learn about the common non-zoonotic diseases.

It is critically important for you to learn about zoonotic diseases for your own health as well as the safety of the public. This chapter will cover some basic zoonotic diseases, their symptoms, and their means of transmission. The following chapter will also cover basic guidelines called “standard precautions” that should be used every day when you work with wild animals.

By learning how zoonotic diseases are transmitted, you can take the necessary steps to avoid transmission. Some of these steps are as easy as washing your hands and wearing disposable gloves. Other steps may not be as obvious to the novice wildlife rehabilitator. Learning about these diseases enables you to give sound advice to the public when they call about an animal that appears ill. Remember that the health and safety of your family, volunteers, and community may depend on your knowledge of wildlife diseases.

It is important to realize that an animal that does not appear sick can be a carrier of a disease or parasites, which can cause illness in anyone who has contact with the animal.

The following are some of the common zoonotic diseases of wildlife in Massachusetts:

Salmonellosis:

This is a widespread bacterial disease.

Host Animals: Birds, reptiles, and mammals.

Transmission: Through fecal-oral contamination. Infection results from the accidental ingestion of small fecal particles from an infected animal. Hand washing or use of latex gloves are simple precautions.

Animal Symptoms: Variable due to the degree of infections. Some animals may have minimal symptoms. Other animals may have weakness, diarrhea, vomiting, fever, lethargy, and convulsions. Death may result from dehydration.

Human Symptoms: The same as animal symptoms.

Leptospirosis:

This is a bacterial disease.

Host Animals: Raccoons, skunks, opossum, rodents, and other mammals.

Transmission: Contact with infected food, water, soil particles, or direct contact with an infected animal, particularly the urine. This disease is often acquired by humans from contact with rodent urine.

Animal Symptoms: Animals may have minimal symptoms with the exception of marine animals. Marine animals may have depression, anorexia, fever, and reluctance to move hind flippers.

Human Symptoms: Humans may react with flu-like symptoms, vomiting, depression, thirst, respiratory distress, diarrhea or constipation, and kidney infection.

Tularemia:

This is a bacterial disease.

Host Animals: Rabbits and rodents.

Transmission: Contact with infected animals, inhalation of bacteria from disturbed feces, contact with wounds, and the bites of flies, mosquitoes, or ticks.

Animal Symptoms: The animal may have no symptoms or may have fever, anorexia, septicemia, lethargy, and possible death.

Human Symptoms: Humans may also have the above animal symptoms, in addition to an ulcerated area.

Aspergillosis:

This is a widespread fungal disease.

Host Animals: Raptors and waterfowl are the primary target population, but it can also infect other birds.

Transmission: The infected animal sheds spores that can be inhaled. The highest risk of infection would occur during the necropsy of an animal with Aspergillosis without using proper protective equipment.

Animal Symptoms: The disease causes respiratory problems in birds. The birds may become lethargic and emaciated.

Human Symptoms: This disease is a hazard to people with compromised immune systems. Most healthy people can resist the infection.

Rabies:

This is a dangerous and fatal viral disease. All wild mammals must be considered potential carriers of rabies.

Host Animals: The most common animals in Massachusetts that contract rabies include all species of bats, raccoon, Striped skunk, Red and Grey fox, and woodchuck. The Virginia opossum appears somewhat resistant to this disease due to its lower body temperature. However, there have been documented cases of rabies in opossums. Other smaller animals (rodents and lagomorphs) do not tend to spread rabies because they are unlikely to survive an attack from another rabid animal.

Transmission: The virus is transmitted from the saliva of the host animal. This may occur via a bite wound or contact with infected saliva to open cuts or mucous membranes.

Animal Symptoms: The symptoms may include the animal exhibiting lethargy, aggression, friendliness, motor dysfunction, paralysis, excessive salivation, seizures, and eventual death.

Human Symptoms: Human symptoms are the same as animal symptoms and may also include an ascending paralysis. This disease is fatal once symptoms are observed. Human exposures require immediate washing of the wound area, allowing the wound to bleed, and immediate post-exposure rabies treatments. If exposure occurs, a doctor should be consulted immediately. The diseased animal should be euthanized according to the requirements of the Department of Public Health, and the brain tissue should be examined for the disease.

For more information on rabies, see the Massachusetts Department of Public Health web page devoted to rabies at the following link:

<http://www.mass.gov/eohhs/gov/departments/dph/programs/id/epidemiology/providers/public-health-cdc-rabies-info-providers.html>

All wildlife rehabilitators are strongly encouraged to have a pre-exposure rabies vaccination even if they don't intend on working with the common rabies vector species. Talk to your physician about the benefits of this important vaccination. Learn about the protocols of booster shots if exposure to rabies occurs.

Hantavirus:

This is a dangerous viral disease.

Host Animals: This is a disease that is carried by rodents and may be spread to humans.

Transmission: The virus is shed through the feces, saliva, and urine of an infected animal. The virus can be transmitted via a bite from an infected rodent or breathing aerosolized dust contaminated with rodent urine or feces.

Animal Symptoms: The primary symptoms are flu-like symptoms, such as fever, muscle aches, nausea, diarrhea, and abdominal pain.

Human Symptoms: Humans can develop coughing and shortness of breath if the disease is not diagnosed and treated.

Baylisascaris procyonis:

This is a dangerous parasitic disease.

Host Animals: Raccoons

Transmission: The infectious eggs are excreted in the feces. Transmission is through fecal-oral contamination (ingestion of the roundworm eggs). The eggs are resistant to disinfectants and can remain infectious in the environment for ten years.

Animal Symptoms: Adult raccoons show no signs of infection and are not harmed by this parasite.

Human Symptoms: In humans and other animals, the symptoms include irreversible central nervous system damage, inclusive of blindness and death, as the larvae migrate to the eyes, brain, and spinal cord. Children appear particularly susceptible to this disease from playing in infected dirt. The disease can be managed in adult raccoons through monthly administration of a de-worming medication.

Note that a similar parasite called Baylisacaris coolumnaris is commonly found in skunks. This parasite is equally as dangerous to other animals and humans.

Sarcoptic Mange:

This is a parasitic disease caused by a species-specific mite.

Host Animals: Many species of parasitic mites have evolved to live on a single host species, or a group of related species (i.e. canids – foxes, coyote, and domestic dog). However, sarcoptic mange mites can be transmitted to non-target species, including humans. They may not be able to live indefinitely away from their preferred host, but they can cause a great deal of discomfort while they do.

Transmission: The mite can be transferred by direct contact with an infected animal.

Animal Symptoms: The mite causes extensive fur loss and can be debilitating for the animals. The sarcoptic mite can burrow under the skin of the animal.

Human Symptoms: Skin irritation and itching, but the mites cannot reproduce on humans and the infection will heal in a few weeks.

Giardiasis:

This is a widespread protozoal disease.

Host Animals: This disease is found in beavers, muskrats, and waterfowl.

Transmission: The primary mechanism is the ingestion of water that has been contaminated with infected feces.

Animal Symptoms: The animal may show no signs of the disease or they can develop a variety of intestinal symptoms, such as diarrhea, abdominal cramping, weight loss, and lethargy.

Human Symptoms: Similar to the animal symptoms.

Please note that the above information is only a partial list of zoonotic diseases that affect wildlife. It takes time to learn about these various diseases, including the symptoms, means of transmission, and possible treatment options. However, the conscientious wildlife rehabilitator maintains current information regarding the zoonotic and non-zoonotic diseases associated with the species in their care.

As part of your preparation for becoming a wildlife rehabilitator, you should learn about some of the other well known wildlife diseases not mentioned above. Examples include Coccidiosis, Trichomoniasis, Brucellosis, Psittacosis, Histoplasmosis, West Nile virus, Lyme Disease, and Ehrlichiosis. You should also learn about diseases that are not communicable to humans, but can be serious to domestic animals. An example of this would be Canine Distemper.

Wildlife rehabilitators are encouraged to talk to their health care professionals about their work with wildlife. Health care professionals need to know what species you work with in order to be aware of possible zoonotic diseases in the event you become ill. Many zoonotic diseases look “flu-like”, but may require specific treatment. Working closely with your health care professional is an important step to protecting your own health.

There are multiple challenges that wildlife face in addition to natural predators and disease. Wildlife can become threatened by environmental hazards, such as lead poisoning, rodent poisons, pesticides, discarded fishing lines, and toxic spills. Being a wildlife rehabilitator provides an opportunity to help animals overcome some of these obstacles to survival.

The following sample questions will help you prepare for the state wildlife rehabilitation exam:

1. There is a juvenile Red fox that has scabby skin and missing fur. The fox is most likely suffering from the following:
 - a) Canine Distemper
 - b) Rabies
 - c) Rickets
 - d) Sarcoptic Mange

Answer: d) The symptoms being described are consistent with Sarcoptic Mange. The animal can be treated with Ivermetin and will likely make a full recovery.

2. Which of these animals is not as susceptible to rabies?
 - a) Little Brown Bat
 - b) Striped Skunk
 - c) Virginia opossum
 - d) Gray fox

Answer: c) The Virginia opossum seems to be resistant to rabies due to the animal's lower body temperature. However, wildlife rehabilitators should assume the possibility of rabies when handling all mammals.



Chapter 22: Sanitation and Infection Control

The previous chapter covered animal diseases and may have left you wondering about the risks to your own health and the health of your family by working with wild animals. Being a wildlife rehabilitator will expose you to more diseases than the average person, but these risks can be managed by following standard precautions. Standard precautions are used by doctors, nurses, veterinarians, emergency workers, and many other professionals whose work exposes them to potentially harmful substances. This chapter will cover some of the key points you should learn about standard disease control precautions appropriate for wildlife rehabilitation.

How can a wildlife rehabilitator avoid contracting a disease or exposing family members or volunteers to zoonotic diseases? The following are some ways to maintain a healthy wildlife facility:

1. Maintain control of insect and rodent infestations in your facility. Remember that insects and rodents can facilitate the transmission of some diseases.
2. Wash your hands frequently with anti-bacterial soap and warm water. Wash hands before entering a facility, after contact with an animal, and before exiting a facility. Immediately wash hands thoroughly if you receive a bite wound. Contact your health professional if the bite wound is from a common rabies vector species.
3. Wear disposable exam gloves for your protection and the protection of wildlife. Put on a new pair of gloves, as needed, to avoid transmission of germs from one animal to another. You may also need masks, gowns, disposable footwear, and eye protection for some high risk cases.
4. Wear specially designed protective gloves to shield hands and arms from animals that bite.
5. Learn the correct way to use needles to inject an animal with fluids or medication. Have an appropriate container for the disposal of "sharps".
6. Know which animals require an isolation cage due to their potential to spread certain diseases. For example, a raccoon has the ability to spread distemper and rabies. Distemper can be spread to other animals and the rabies virus is a threat to both humans and other animals. Skunks require a similar level of isolation for the same reasons.
7. Use raccoon cages only for raccoons to avoid transmission of *Baylisascaris procyonis*. The eggs can remain infectious in the environment for years.
8. Learn the proper techniques for cleaning and disinfecting a cage. Most disinfectants won't work unless the cage has been cleared of debris (animal feces, bedding, left-over food, etc.) Some disinfectants need to remain on a surface for a period of time before the germs are killed. Read the labels of all bottles of disinfectants to learn their proper use.
9. Learn about the role of disinfectants. Soap and water is not adequate for killing many bacteria, fungi, and viruses. Some disinfectants will work on bacteria, but may not be effective on viruses.
10. Bleach and water solution can be an effective disinfectant and is inexpensive. Learn about the effectiveness of other disinfectants. Cages require disinfecting before use by any new animal. Animal food dishes, bottles, syringes, etc. require cleaning and disinfecting after each use.
11. Whenever possible, feed healthy animals before feeding diseased animals. This will help prevent the transfer of disease to healthy animals.
12. Allow only approved and trained staff to enter the rehabilitation area and/or work with the animals. Children and pets should not be allowed to have contact with any wild animals.
13. Train all volunteers how to safely work with wild animals.

14. Never consume food or drink in animal areas. Do not store food for human consumption in refrigerators or cabinets used for animals.

Learning how to run a clean and sanitary facility will help you provide better animal care as well as a safer work environment.

The following questions will help you prepare for the state wildlife rehabilitation exam.

1. It is not necessary to wear disposable gloves if you wash your hands after touching an ill animal. True or False?

Answer: False. The best procedure would be to wear gloves while working with an ill animal, and wash your hands afterwards.

2. You've had a new coyote pup in an isolation cage for twenty-four hours. Your normal isolation period is three days, but the coyote pup appears depressed. You have a group of two other coyote pups the same age in another cage. You should do the following:
 - a) Take the coyote pup out of the isolation cage and put it with the other group of coyotes.
 - b) Keep the coyote pup in the quarantine cage for the full isolation period.
 - c) Have the coyote pup visit the other cage, but only for a period of one hour.
 - d) Have the isolation cage and the other coyote pup cage next to each other so the coyotes can interact, but not come in direct contact with each other.

Answer: B. You should keep the coyote in the isolation cage for the full quarantine period. The other answers risk spreading germs from one coyote to another.

3. A volunteer wants to work with bats, but does not want to get the rabies pre-exposure vaccination because she is fearful of needles. You should:
 - a) Allow her to work with bats, but encourage her to get the vaccination.
 - b) Allow her to only work with bats you have deemed to be healthy.
 - c) Require her to get the pre-exposure vaccination before working with any of the common rabies vector species, including bats.
 - d) Respect that she has a phobia and make an exception to your rule.

Answer: C. The volunteer needs to have a pre-exposure rabies vaccination prior to working with any of the common rabies vector species, such as bats. There should be no exceptions to this rule. It is not possible to determine which animals are free from rabies and no chances should be taken with this potentially lethal disease.



Chapter 23: Release Criteria

The release of a rescued animal is the biggest reward for being a wildlife rehabilitator. It is a joyful occasion to watch a rehabilitated squirrel or an orphaned raccoon return to its rightful place in the wild. How well the release is done will significantly impact the animal's chance for survival after release.

There are many factors to be considered prior to releasing an animal back into the wild. The following issues need to be considered when preparing for a successful release:

1. Determine the developmental stages at which each species can live independently in the wild. Some species may need to be kept longer in captivity before they are able to survive in the wild than if they had been raised in the wild by their parents.
2. Know what a healthy and fit animal should look like. Is the animal the correct weight? Can the animal run, jump, fly, etc. to hunt for food and escape predators?
3. Know the appropriate habitat in which to release each animal. Some animals require deciduous forests while other animals require coniferous forests. Some animals require a nearby water source while other animals (i.e. lagamorphs) can survive on morning dew. The appropriate habitat will provide the requirements for food and shelter needed by the species being released.
4. Has the animal demonstrated the ability to recognize and eat natural foods? Orphaned animals may need to be exposed to the types of foods they will need to rely on in the wild. A healthy juvenile fox that is only use to eating canned dog food may not survive if it has not learned how to hunt and kill prey. A squirrel that cannot crack open hard shelled nuts is not ready for release.
5. Is the habitat already densely occupied by the species being released, or is the site devoid of this species? Either of these situations may be of concern. Releasing an orphaned squirrel into a setting where there is already a high density of adult squirrels may place the orphan in competition for space and food resources with the well established resident squirrels. If there are no squirrels at the site, there may be some necessary resource that is missing.
6. Does the animal have predator awareness? This is a crucial skill for an animal to survive in the wild. The wild animal that has become use to dogs and cats will not know to avoid them and their wild cousins (i.e. coyotes and bobcats) after it has been released. An animal is not suitable for release until it has the ability and instinct to run, hop, fly, or hide when approached by a predator.
7. Learn the differences between the terms "habituated to humans" versus "imprinted on humans". These are both problems that may result in an animal being non-releasable. Being habituated means that the animal is no longer afraid of people. For example, a squirrel that is habituated to humans might approach a stranger looking for food. This is generally caused by a wildlife rehabilitator treating the baby animal as a pet by over-handling it or exposing it to multiple persons. Being imprinted is a more serious problem. An imprinted animal believes that it is a human being (or another animal) rather than its own species. Certain species (i.e. passerines, raptors, deer, and waterfowl) can easily imprint on people. These animals are not releasable and generally have to be euthanized or placed in an educational setting. Learn how to avoid both habituation and imprinting in your wildlife rehabilitation facility. Both result from improper wildlife rehabilitation practices.

8. Check to be sure the weather will be favorable for at least three days after release. This is especially important for the release of orphaned animals that need time to find or build a new shelter. Releasing an animal in good weather can greatly increase its chances of success.
9. Understand the terms diurnal, crepuscular, and nocturnal. For example, a little brown bat is a nocturnal animal and is most active at night. Therefore, it makes sense to release bat species at dusk or after dark when the animal is alert and safe from diurnal predators. The glossary in the back of this study guide includes the definitions of diurnal and crepuscular.
10. Learn the terms soft release and hard release. Soft release means that an animal requires nutritional support for days or weeks after being released. For example, many mammals do best with a soft release where food is provided for them until they become self-sufficient. Other animals only require a hard release. For example, a juvenile Eastern cottontail rabbit needs no additional assistance after being released into an appropriate habitat.
11. Learn how to determine if an animal needs to be kept over-winter before it can be released. This may be the case for an orphan born very late in the season that was not developed enough to be released in the early fall. This may also occur if an adult animal has an injury or illness that prevents it from migrating or storing food for the winter. Some juvenile species (i.e. Southern flying squirrels) are generally over-wintered because they usually remain with their parents through the first winter. Turtles may need to be over-wintered if they cannot be released before freezing nighttime temperatures have set in.

In preparing for the state exam, consider the key points above for a variety of animal species. It might be helpful to have a discussion with an experienced wildlife rehabilitator about the release criteria they use. By making good judgments as a wildlife rehabilitator, the success of a released animal can be substantially increased.

Here are some sample questions to help you prepare for the state wildlife rehabilitation examination:

1. A member of the public brings you a juvenile European starling to practice flying in your flight cage. You notice that the starling repeatedly flies over and lands on you when you enter the cage. One of your volunteers commented that the same thing happened to other staff. Based on this information, you decided:
 - a) The starling needs to be euthanized since it is annoying the staff
 - b) The starling is friendly, but is ready for release since it is healthy.
 - c) The starling may be imprinted or habituated on humans. More observation is needed to determine whether the starling is a releasable animal.
 - d) The starling should be released in an area where there are few humans.

Answer: c) This starling is either imprinted or habituated to humans. If it is only habituated, it might be possible to "wild up" the bird before release. More information is needed to make a sound decision.

2. You have rehabilitated an orphaned red squirrel. The squirrel is now ready for release. The preferred location to release this squirrel is:
 - a) At your site in the city so you can provide supplemental food.
 - b) At the site of another wildlife rehabilitator who has a mixture of coniferous and deciduous trees.

- c) In a location where you recently observed several Eastern Grey squirrels, but is not where this squirrel was found.
- d) At the home of the person who found the squirrel because they would enjoy watching it.

Answer: b) The red squirrel has a preferred habitat of a mixture of coniferous and deciduous trees. You might even get the other wildlife rehabilitator to occasionally provide supplemental food for your squirrel. It is not likely that your location in the city will provide appropriate habitat for the squirrel. Finders often want an animal to be released at their home, but that may not be an appropriate location.



What kind of tracks are these?



Chapter 24: The Lessons of Natural History

Throughout this study guide, there have been references made about the value of knowing the natural history of wildlife. This knowledge helps set a wildlife rehabilitator apart from the general public and many veterinarians. Wildlife rehabilitators often try to match their care of an animal as closely as possible to what the animal would receive in the wild. This would include things such as infant formula, weaning foods, natural foods, caging features, and socialization with their own species.

Let's use the example of the red fox and gray fox to show how their natural history would guide a wildlife rehabilitator:

1. A red fox can be distinguished from a gray fox (or juvenile coyote) by looking at its tail: a red fox has a white-tipped tail, while a gray fox has black running down the top of its tail and on the end. A gray fox is generally about 20% smaller than a red fox. It is important for the wildlife rehabilitator to correctly identify the species since some aspects of their care will differ.
2. Red fox kits are born in dens that are dug out by the parents, while gray fox often dens in tree cavities.
3. Around five weeks of age, the kits of both fox species start to venture out of their dens. This is when the public may notice them and mistakenly believe they are orphans. If the mother is killed and the kits are already weaned, the father can finish raising the kits on his own. This knowledge enables a wildlife rehabilitator to leave the baby kits with their natural parents in many circumstances.
4. Both the red and gray fox are social animals. Therefore, a single fox kit should not be raised alone. It may be necessary to locate another rehabilitator who has one or more fox kits of the same species, and transfer the single kit to be raised with the others.
5. The red fox prefers a mosaic of fields and forest borders. The gray fox prefers forested areas and has semi-retractable claws that allow it to climb trees. Both species can easily adapt to suburban neighborhoods. As part of the rehabilitation process, pre-release caging that allows for climbing by the gray fox and digging by the red fox should be provided.
6. The red fox hunts mice and rabbits as a large part of its natural diet, while the gray fox eats more insects, corn, and fruit. The wildlife rehabilitator must provide the appropriate natural diet required by each species.
7. Both the red and gray fox are rabies vector species, so a wildlife rehabilitator needs to know what precautions to take when handling these animals. If the kits are to be vaccinated for rabies, it should be done when they are approximately twelve weeks old. Any wildlife rehabilitator who expects to handle rabies vector species should get pre-exposure rabies vaccinations before working with these animals.
8. Both the red and gray fox are legal to hunt and trap, so they need to be fearful of humans and dogs in order to survive in the wild. As soon as foxes are able to feed themselves, they should be allowed to socialize with each other and have very limited human contact.
9. Since both the red and gray fox are most active at dusk and after dark, late afternoon is the best time for release.
10. The red fox is resistant to Canine Distemper, while the gray fox is highly susceptible to this disease. In contrast, the red fox is highly susceptible to Sarcoptic Mange, while the gray fox is resistant to this condition. It is important to learn which diseases can be prevented by vaccination and which cannot.

Now let's take the natural history of the Virginia opossum as another example:

1. The Virginia opossum is the only marsupial in the United States. A marsupial (like a kangaroo) has babies that develop in the mother's pouch. An opossum gives birth to an average of eight or nine babies that migrate to the mother's pouch and attach themselves to her nipple.
2. Since baby opossums that are attached to their mother's nipples in the pouch drink milk very slowly, they have a poor sucking reflex. As a result, most wildlife rehabilitators have to gavage feed (tube feed) formula to baby opossums.
3. When the babies are older, they travel around by holding onto their mother's back. If a baby falls off, the mother will continue walking and will not retrieve the baby. Therefore, baby Virginia opossums cannot be readily re-united with their mother or a foster mother.
4. The Virginia opossum is an omnivore. It requires a varied diet that includes animal protein as well as plant protein.
5. The natural habitat of the Virginia opossum is open woods with a nearby water source. The pre-release cage should include lots of tree branches so the animal can practice its climbing skills.
6. Since the Virginia opossum is a nocturnal animal (most active at night), it would be best to release one into the wild at nighttime.
7. The Virginia opossum has a defense mechanism, which is an involuntary response to fear. When threatened, the animal goes into a near coma state. It will also display its teeth and omit a foul discharge from its anal glands to ward off predators.

These are just two examples of how an animal's natural history may guide a wildlife rehabilitator in the care of wild animals. Here are some natural history facts you should study in preparation for the wildlife rehabilitation exam:

1. Learn the schedule at which infants of different species meet milestones in their development, such as when they first open their eyes or begin to accept solid food. This will help you determine the age of a baby animal brought to you and what type of care it will require.
2. Learn how to distinguish one baby animal from another. For example, a newborn Eastern grey squirrel may look very much like a Norway rat, except the squirrel has black toenails. A coyote pup looks very much like a fox pup except the fox pup has more elliptical eyes.
3. Learn what the nest or den of an animal looks like. This will also help with identification of the species.
4. Learn the average litter size of common species. If you hear that a mother porcupine was hit by a car, you know to look for only one orphaned baby. If you hear about a baby Eastern grey squirrel appearing to be an orphan, you know that other babies may be nearby.
5. Learn how adult animals defend themselves from predators. How does a porcupine use its quills? At what age does a baby skunk have the ability to spray with a foul scent? Learning these defense mechanisms will help you safely work with wild animals.
6. What type of hunting, climbing, and/or flying skills does an animal need to be ready for release? A wildlife rehabilitator has to take over the role of the parent for an orphaned animal and teach it the skills needed to survive in the wild.
7. What are the weaning foods and natural adult foods of each species? Which animals are herbivores, omnivores, insectivores, or carnivores?
8. When is each species most alert and active in the wild? Which animals are diurnal, crepuscular, or nocturnal? Know the meaning of those terms as they relate to wildlife.
9. Learn about the value of the senses (vision, hearing, smell, etc.) of each species and how important each sense is for their survival. For example, raptors rely heavily upon their vision to

hunt for prey. Rabbits rely heavily on their hearing and sense of smell to detect predators. It is a myth that birds cannot be put back in their nest after being touched by humans since most birds do not have a good sense of smell.

10. Know the appropriate release sites for animals. Wildlife rehabilitators have to make decisions about whether to return animals to their original location or find a new site. Some animals, such as Southern flying squirrels, should be released into a colony.
11. Know which species are true hibernators (turtles) versus animals that den in the winter (bears). You would not want to release a snapping turtle back into the wild in December in Massachusetts since the animal should already be deep into hibernation.
12. Learn some of the common diseases of each species so you can be prepared to recognize symptoms. Do you know the symptoms of Squirrel Pox? Which animals are susceptible to Canine Distemper and what are the symptoms? Which animals always need to be quarantined upon admission to prevent transmission of infectious diseases?

The natural history of wildlife is a vast topic and may seem overwhelming to learn. This is one reason why having a comprehensive collection of wildlife rehabilitation reference materials is important. Wildlife rehabilitators often refer to reference books to help them make informed decisions about the treatment of different wildlife species. Take the time to look at the resource book section at the back of this study guide for reference materials that have proven to be invaluable to other wildlife rehabilitators.

The following sample questions will help you prepare for the state wildlife rehabilitation exam:

1. You have raised a healthy fisher, but it has only been fed dog food while in your care. You don't want to give the fisher live prey because it is against your beliefs to harm other animals.
 - a) It is okay to release the fisher because the wild instincts to kill prey will kick in once released.
 - b) You can have the fisher practice chasing a toy mouse on a string as preparation for killing a real mouse.
 - c) You release the fisher, but give it support feeding of dog food for several days as part of a soft release.
 - d) You don't release the fisher until it learns to identify and kill natural prey.

Answer: d) Most wildlife rehabilitators believe that you should not release a fisher until it learns how to identify and kill natural prey. The fisher will have some natural instincts to kill prey, but without experience it could struggle in the wild. It is helpful to provide support feeding to many animals, but the primary goal is to have the fisher learn basic skills prior to release. There are some wildlife rehabilitators who have used dead mice on a fishing pole to simulate prey. It is questionable whether this method is adequate. In general, it is preferable to teach predator species the hunting skills they need prior to release.

1. Which of the following animals are rarely found near residential neighborhoods?
 - a) Bobcat
 - b) Raccoon
 - c) Eastern coyote

d) Big brown bat

Answer: a) A bobcat usually avoids populated areas, but can occasionally be seen in residential back yards or crossing residential streets. Raccoons and coyotes are highly adaptable and can coexist well in residential settings. Maternity colonies of big brown bats often spend their summers in attics and barns. In the past, little brown bats were also fairly common in buildings during the summer, but their numbers dropped by about 99% in Massachusetts as a result of White Nose Syndrome. The only bats that hibernate in houses in Massachusetts are big brown bats.



Chapter 25: Euthanasia and Wildlife

Euthanasia is the act of providing a humane death for an animal. Although this is not a favorable topic among many wildlife rehabilitators, it is necessary to learn and understand. A crucial part of wildlife rehabilitation is knowing when euthanasia is the most appropriate and humane option for an animal. All wildlife rehabilitators need to learn the basic concepts of euthanasia so they can quickly and humanely end the life of an animal that does not have any reasonable likelihood of recovery.

The field of veterinary medicine has developed standards that guide the use of euthanasia for domestic pets, which can be applied to wildlife. The goal of euthanasia is to provide a quick and painless death. The intent is for the animal to swiftly lose consciousness, followed by the cessation of breathing and heart function. The animal should be in a safe environment and handled in a manner that minimizes its fear.

The American Veterinary Medical Association's standards of humane euthanasia can be found online at <https://www.avma.org/kb/policies/documents/euthanasia.pdf>.

The preferred, most effective, and least stressful method of euthanasia is the injection of a controlled drug by a veterinarian. Some veterinarians use an additional drug to sedate the animal prior to using the euthanasia drug. The wildlife rehabilitator should have a discussion with their cooperating veterinarian to learn more about this process and when it is most appropriate.

Some wild animals, such as turtles, are very difficult to euthanize due to their slow metabolism. The euthanasia of a turtle should be done by a veterinarian who has much experience working with turtles.

There are a few methods of euthanasia that can be used by the experienced wildlife rehabilitator. As an example, the use of a carbon dioxide chamber may be an effective form of euthanasia for small animals. Decapitation, when performed correctly, meets the humane standards of euthanasia for small wildlife. It is crucial that the wildlife rehabilitator obtains proper training in order to perform euthanasia correctly without causing the animal additional suffering.

There are some methods of euthanasia that should not be used. These include freezing an animal, drowning an animal, or using carbon monoxide from an automobile. These methods fail to meet the criteria for humane euthanasia.

Every wildlife rehabilitator should develop a relationship with a veterinarian who can perform euthanasia when necessary.

When should an animal be euthanized? The answer to this question is not always clear. Any animal that has been injured so severely that there is no reasonable expectation of recovery and release should be euthanized.

The Division of Fisheries and Wildlife also requires that any non-releasable animal that cannot be placed in a legally permitted educational setting must be euthanized. For example, a juvenile Eastern grey squirrel with head trauma may come into your care with recurring seizures. If the seizures do not cease,

this squirrel cannot be released since a seizure while in a tree would cause the squirrel to fall to its death. There may be medication available to control the seizures, but clearly the squirrel would have to be kept in captivity to receive the medication on a daily basis. Since a squirrel is a common animal, it would be unlikely that an educational placement would be found. Therefore, the law requires humane euthanasia for this squirrel. It would be tempting to keep the squirrel as a pet since the squirrel appears content in captivity, but that would be a violation of your state permit.

Experienced wildlife rehabilitators know that in many instances euthanasia of a wild animal is the most humane option for an animal that can recover from its injuries, but cannot be released. For many wild animals, life in captivity can be linked to a human facing life imprisonment. There is no cage or habitat that provides the freedom of the wild. Most wild animals instinctively fear humans and being in captivity creates a state of constant fear for them. Infant animals that appear cute grow up into sexually mature adults that feel frustrated in captivity. These animals may demonstrate their frustrations with aggression, which places people at risk of injury. Keeping a squirrel like this in captivity is not only illegal, but would likely result in a miserable animal after a period of time. It is important for wildlife rehabilitators to put aside their own feelings about euthanasia and make the most humane decision for the animal.

On occasion, a wildlife rehabilitator is faced with decisions about whether to release an animal into the wild that has some limitations, but appears to be function properly. There are no easy answers for these types of cases. The wildlife rehabilitator has to give careful thought about the ability of the animal to seek shelter, obtain food, and escape predators on a daily basis. The NWRA (National Wildlife Rehabilitators Association) has criteria that help wildlife rehabilitators make the most appropriate decision for animals that fail to make a full recovery from an illness or injury. It is not humane to release an impaired animal into the wild that cannot fully fend for itself. The wildlife rehabilitator has to have a reasonable expectation that the animal can be successful in the wild despite any minor impairment.

It is never easy to make a decision about euthanasia and it is common to feel sadness for the passing of an animal. The only thing that gets easier is recognizing that you made the correct decision on behalf of the animal in care. New wildlife rehabilitators often find it helpful to have animals assessed for euthanasia by another wildlife rehabilitator or their cooperating veterinarian prior to making a final decision. It is hard to be objective about an animal that you may have spent long hours trying to save. Delaying inevitable euthanasia only makes it more difficult for you and the animal. It also takes away precious time and money that could be spent on other animals in need of rehabilitation.

Take the time to fully understand all aspects of euthanasia before you are faced with putting it to use. Deciding when it is appropriate to euthanize an animal is part of being a wildlife rehabilitator. Humane euthanasia is the final gift you can give an animal that has no reasonable chance of survival in the wild.



Chapter 26: Dealing with the Public

Part of being a wildlife rehabilitator means dealing with the public. Wildlife rehabilitators are ambassadors for wildlife. We are the voice for countless creatures who can't speak for themselves. We are representatives of an organized group of people with professional standards, working on behalf of wildlife. Much of the public education occurs via telephone conversations and contact with the general public. For example, we can explain how bats eat thousands of insects, which, in turn, benefits crops. We can also explain how to deal with the skunk that has decided to raise a family under the front porch.

Wildlife rehabilitators are not Problem Animal Control (PAC) agents. We are not licensed to trap and remove wild animals from buildings. This is a common request made to wildlife rehabilitators. Some wildlife rehabilitators have made connections with their local Animal Control Officer (ACO) and/or PAC agents to help save wildlife that would otherwise be killed.

Most of the time, dealing with the public is satisfying. There are many wonderful people who will drive miles just to bring you a tiny sparrow and will express their gratitude for the work you do. Some of these wonderful people turn into amazing volunteers for your program or new wildlife rehabilitators. But like everything in life, there are exceptions to that rule.

On occasion, there will be a member of the public who is ignorant about wildlife and doesn't know (or care) about the value of a wild animal. This person may be very demanding and rude. It would be very easy to be rude back or simply refuse to take the animal they found. Consider this an opportunity to educate this person about wildlife. Even if the person does not appear to listen, a calm conversation about an animal could be productive. If you are rude back or refuse to take the animal, consider what will happen to the animal. It is not the animal's fault that it was found by a difficult person. The animal needs care and you might be its only chance for survival.

There are many ways that you can make it easier to deal with the public. One recommendation is to set clear limits about what you are willing and able to do. What hours do you accept telephone calls from the public? Are you willing to pick up the animal yourself (or have a volunteer do it), or does the finder need to transport the animal to you? By setting simple rules, you can give a clear message to the public about what they can expect. This will help to keep the process more orderly and manageable.

It is important for wildlife rehabilitators to maintain a balance in their life. Many wildlife rehabilitators have to juggle the needs of a job, family, and friends in addition to wildlife rehabilitation. Sometimes there are conflicts, such as when your family wants to go on a vacation and you have cages filled with animals needing your care. Have a discussion with the relevant people in your life about what time constraints you may be facing in the future as a wildlife rehabilitator. Make a decision about how much money can be safely spent on wildlife without harming your family's budget. This is a good time to practice negotiation skills so harmony is maintained. A wildlife rehabilitator who learns to preserve balance in their life is more likely to be able to practice wildlife rehabilitation for years to come. **Know your limits.**

At the back of this study guide is a copy of the NWRA Code of Ethics for Wildlife Rehabilitators. Review this document and strive to achieve these ideals. Being a wildlife rehabilitator is more than taking care of animals; it is a commitment to being an advocate for wildlife in many different ways,



What kind of tracks are these?



Chapter 27: Professional Development and Mentoring

This study guide is designed to help you pass the State Wildlife Rehabilitation exam and become eligible to receive a Wildlife Rehabilitation Permit. It is important for you to understand that becoming a wildlife rehabilitator puts you on a continual path of learning.

The field of wildlife rehabilitation is constantly evolving as new research provides better information on how to care for wildlife. The techniques used today might well be obsolete within the next five years. It is critical for the wildlife rehabilitator to stay well trained in current methodology and best practices for treating and raising animals.

Fortunately, there are many ways for you to continue your professional development. Here are some of the resources available to you:

1. The Wildlife Rehabilitators Association of Massachusetts (WRAM) is a nonprofit membership organization established to support wildlife rehabilitators in Massachusetts and the surrounding states. The purpose of WRAM is to keep active rehabilitators informed about conferences and trainings, and to promote the practice of quality wildlife rehabilitation in Massachusetts. WRAM traditionally provides a newsletter, website, and annual conference to achieve its goals. Please consider joining this important group. <http://www.wraminc.org/>
2. Some of the neighboring states also have organizations designed to support wildlife rehabilitators. The Connecticut Wildlife Rehabilitators Association (CWRA) (<http://www.cwrwildlife.org/>) and New York State Wildlife Rehabilitators Council (NYSWRC) (<http://www.nyswrc.org/>) are two such groups. Both organizations hold conferences that are available to Massachusetts wildlife rehabilitators.
3. Cummings School of Veterinary Medicine at Tufts University is home to the Tufts Wildlife Clinic that provides the most sophisticated medical care to wildlife in the Northeast. The Tufts veterinarians are nationally known for their expertise and often speak at the state, regional, and national wildlife rehabilitation conferences. <http://vet.tufts.edu/wildlife/>
4. The National Wildlife Rehabilitators Association (NWRA) is the national organization for wildlife rehabilitators. This agency has an annual conference, email updates, and articles to promote the professional development of wildlife. This agency helps wildlife rehabilitators connect with each other throughout the country. <http://www.nrawildlife.org/>

Attending wildlife conferences gives the new wildlife rehabilitator a jump start on new techniques for wildlife rehabilitation. Several conferences have a full day "Animal Basic Care" course that gives hands-on training on topics including physical examinations, wound management, gavage feeding animals, and much more. This is a wonderful way to work with experienced wildlife rehabilitators and network with rehabilitators in your community.

It is equally important for every wildlife rehabilitator to have an experienced mentor. A mentor will be there when you receive a new animal and have questions about its care. A mentor will be there when you want to share a success story about a challenging case. A mentor can also provide comfort when a wildlife case goes wrong and can help you figure out what can be done differently in the future.

The Division of Fisheries and Wildlife's website provides the location and contact information for many wildlife rehabilitators. Don't be afraid to contact a local wildlife rehabilitator and ask whether they can be a mentor to you. Find out which wildlife rehabilitators work with the species that interest you most. The best wildlife rehabilitators recognize when they need help and are not afraid to seek it out.

Being a wildlife rehabilitator is being part of a professional group of people committed to helping wildlife in our communities. It is your responsibility to continue your training even beyond the minimum state requirements so you can offer the very best care for wildlife. With experience and training, you will have a higher rate of success and be able to take on more advanced and challenging cases.

Animal Track Answers

Chapter 2: What is Wildlife Rehabilitation?

Wild turkey

Chapter 4: Endangered Species

White-tail deer

Chapter 12: Physical Examinations of Wildlife

Raccoon

Chapter 17: Dehydration Protocols

Porcupine

Chapter 23: Release Criteria

Black bear

Chapter 26: Dealing with the Public

Eastern Cottontail

Recommended Reference Materials

Wild Mammal Babies: The First 48 Hours and Beyond, 2nd Edition

Debra Gode and Irene Ruth

NWRA Principles of Wildlife Rehabilitation

Adele Moore and Sally Joosten

NWRA Quick Reference, 3rd Edition

Compiled and edited by Erica A Miller, DVM

Wild Mammals of New England

Alfred J. Godin

New England Wildlife

Richard DeGraaf and Mariko Yamasaki

Hand-Rearing Birds

Laurie Gage DVM and Rebecca Duerr DVM

Exotic Animal Formulary

James Carpenter

Glossary of Terms

Altricial: animals that are born helpless and depend on their parents for food and thermoregulation.

Avian: relating to birds

Brancher: a bird that spends time out of the nest, but has not fledged

Callus: the collection of collagen that mends a fractured bone

Carnivore: an animal that eats primarily animal protein

Crepuscular: most active at dawn and dusk

Debride: remove debris, dirt, and dead or damaged skin from a wound

Dehydration: the condition where there is insufficient fluid in the tissue or blood

Diurnal: most active during the day

Electrolyte: a solution that conducts electricity by means of ions

Gavage: feeding an animal through a tube passed into the stomach

Glottis: the opening of the airway (trachea) to the lungs

Herbivore: an animal that eats vegetation

Humerus: the bone that goes from the shoulder to the elbow

Hyperthermia: having an elevated body temperature

Hypothermia: having a lower than normal body temperature

Hypertonic: a substance that will draw fluid out of the cells

Hypoglycemic: having low blood sugar

Isotonic: a substance that will not draw fluid out of cells by osmosis

Kcal: the energy value of food (kilocalories)

Metabolic Bone Disease (MBD): a condition that develops from a prolonged deficiency of calcium, phosphorus, vitamin D, or an improper ratio of those elements that results in defective development of bones.

Necrosis: cell death of localized tissue death

Nocturnal: most active at night

Nystagmus: a rapid involuntary movement of the eyes

Open Fracture: a fractured bone that is protruding out of the skin

Omnivore: an animal that eats both vegetation and animal protein

Packed Cell Volume (PCV): the percentage of red blood cells in a blood sample

Passerine: a perching bird, altricial

Precocial: able to function independently at birth (i.e. thermoregulate, stand, eat food)

Raptor: a bird of prey

Rickets: another term for MBD

Shock: acute peripheral circulatory failure

Thermoregulation: the ability to control your own internal body temperature

Vent: the anal opening in birds

Zoonoses: diseases that can be transmitted from animals to humans

Medical Terms

SID: once a day; every twenty-four hours

BID: twice a day; every twelve hours

TID: three times a day; every eight hours

QUID: four times a day; every six hours

PRN: as needed

q: every (add a time period)

q.24: every twenty-four hours (same as SID).

IM: intramuscular

IO: intraosseous (in the bone)

IP: intraperitoneal (in the abdominal cavity)

IV: intravenous (in the vein)

PO: oral, by the mouth

SQ: subcutaneous (also known as SC or SubQ)

BAR: bright, alert, responsive

FX: fracture

GM: gram

HBC: hit by car

Kg: kilogram

LRS: lactated Ringers solution

L: liter

IB: pound

Mg: milligram

ML: milliliter

Oz: ounce

Tab: tablet

Tb: tablespoon

WNL: within normal limits

Conversions

1 gram = 1000 milligrams (mg)

1 kilogram = 1000 grams = 2.2 pounds

1 grain = 65 mg

1 ounce = 28.35 grams

1 pound = 16 ounces = 454 grams = 0.454 kilograms (kg)

1 milliliter (ml) = 1 cubic centimeter (cc)

1 liter (L) = 1000 milliliter (ml)

1 teaspoon (tsp) = 5 ml

1 tablespoon (TB) = 3 tsp = 15 ml

1 fluid oz = 30 ml = 2 TB

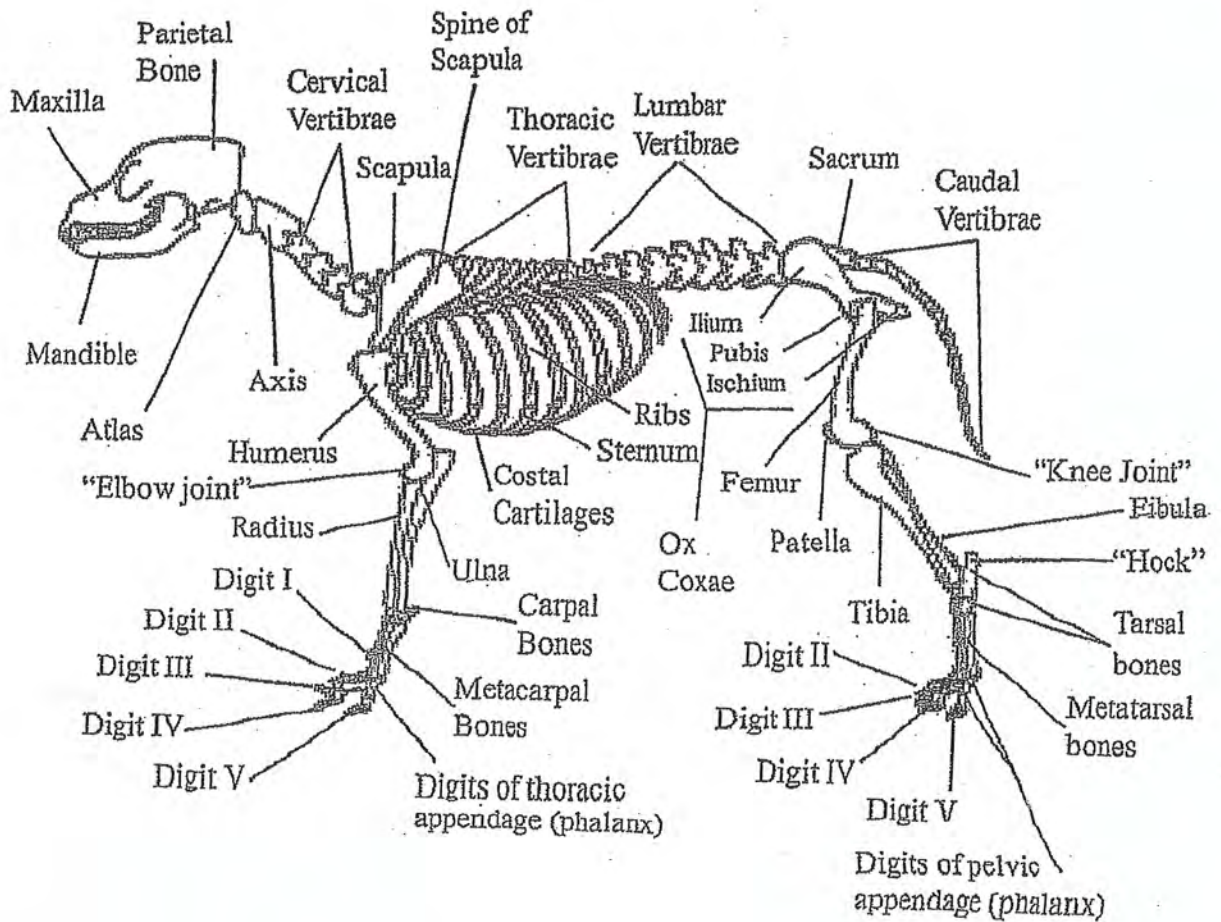
1 cup (c) = 8 oz = 16 Tb

1 pint (p) = 2 cups = 16 oz

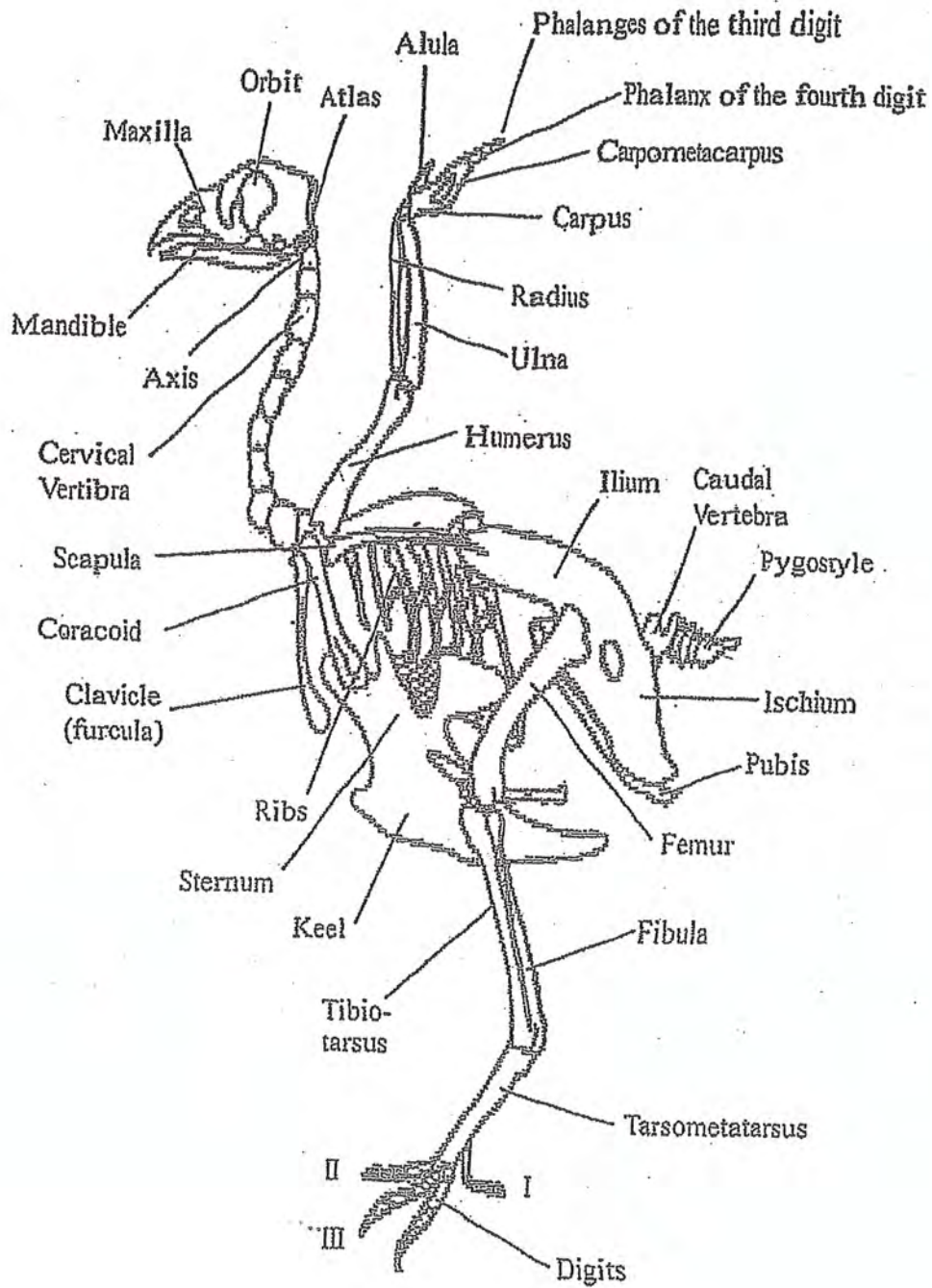
1 quart (qt) = 2 pints = 4 cups = 32 oz

1 gallon (gal) = 4 quarts = 8 pints = 16 cups = 128 oz

Mammal Skeleton



Bird Skeleton



CODE OF ETHICS

A Wildlife Rehabilitator's Code of Ethics

1. A wildlife rehabilitator should strive to achieve high standards of animal care through knowledge and an understanding of the field. Continuing efforts must be made to keep informed of current rehabilitation information, methods, and regulations.
2. A wildlife rehabilitator should be responsible, conscientious, and dedicated, and should continuously work toward improving the quality of care given to wild animals undergoing rehabilitation.
3. A wildlife rehabilitator must abide by local, state, provincial and federal laws concerning wildlife, wildlife rehabilitation, and associated activities.
4. A wildlife rehabilitator should establish safe work habits and conditions, abiding by current health and safety practices at all times.
5. A wildlife rehabilitator should acknowledge limitations and enlist the assistance of a veterinarian or other trained professional when appropriate.
6. A wildlife rehabilitator should respect other rehabilitators and persons in related fields, sharing skills and knowledge in the spirit of cooperation for the welfare of the animals.
7. A wildlife rehabilitator should place optimum animal care above personal gain.
8. A wildlife rehabilitator should strive to provide professional and humane care in all phases of wildlife rehabilitation, respecting the wildness and maintaining the dignity of each animal in life and in death. Releasable animals should be maintained in a wild condition and released as soon as appropriate. Non-releasable animals which are inappropriate for education, foster-parenting, or captive breeding have a right to euthanasia.
9. A wildlife rehabilitator should encourage community support and involvement through volunteer training and public education. The common goal should be to promote a responsible concern for living beings and the welfare of the environment.
10. A wildlife rehabilitator should work on the basis of sound ecological principles, incorporating appropriate conservation ethics and an attitude of stewardship.
11. A wildlife rehabilitator should conduct all business and activities in a professional manner, with honesty, integrity, compassion, and commitment, realizing that an individual's conduct reflects on the entire field of wildlife rehabilitation.