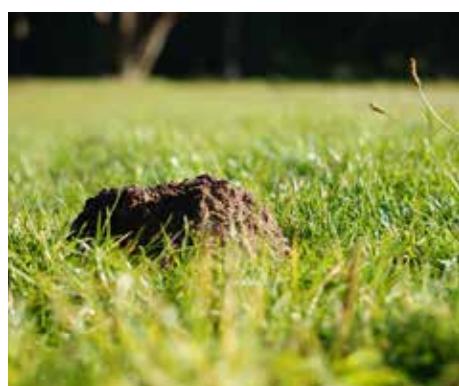
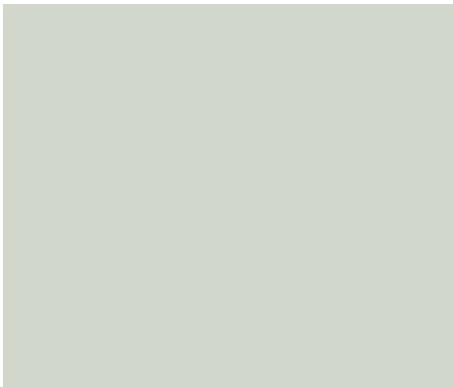




COMMERCIAL NUISANCE WILD ANIMAL CONTROL OPERATOR CERTIFICATION MANUAL

JANUARY 2025



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CHAPTER 1 – INTRODUCTION

This manual is designed to provide general guidance for commercial nuisance wild animal control operators in Ohio. The intent of the manual is not to provide comprehensive coverage of all laws, methods, and techniques for nuisance animal control. However, the manual provides relevant information regarding laws, legal methods of take, species' life histories, ethical considerations, and wildlife diseases.

DEFINITIONS

COMMERCIAL NUISANCE WILD ANIMAL CONTROL OPERATOR: An individual or business that provides nuisance wild animal removal or control services for hire to the owner, the operator, or an authorized agent of a property or a structure.

NUISANCE WILD ANIMAL: A wild animal that interferes with the use or enjoyment of property, is causing a threat to public safety, or may cause damage or harm to a structure, property, or person.

ON-SITE SUPERVISION: Staying near the person being supervised to allow for uninterrupted, unaided visual and auditory communications.

LICENSING

No person shall provide nuisance wild animal removal or control services for hire without obtaining a license from the chief of the Division of Wildlife (Ohio Revised Code [O.R.C.] § 1531.40).

If you are providing nuisance wild animal removal or control services and you are charging a fee or another form of compensation, you must have a valid commercial nuisance wild animal control operator License (here forward, license), or work for someone possessing a license.

An individual who is employed by the state, a county, or a municipal corporation and who performs nuisance wild animal removal or control services on land that is owned by the state, county, federal government, or municipal corporation as part of the individual's employment is exempt from obtaining a license.

The fee for obtaining a commercial nuisance wild animal control operator license is \$40.00 per year. The license expires annually on the last day of February and may be renewed.

CERTIFICATION

Certification is required for a commercial nuisance wild animal control operator and any individual who is working on behalf of an operator who is engaged in activities that are part of or related to the removal or control of nuisance wild animals, including setting or maintaining traps. However, employees under the direct on-site supervision of a licensed operator are exempt from certification.

Certification requires passing an online test (80 percent or greater) and is valid for three years from the date of a passing grade.

CERTIFICATION	LICENSE
Valid for three years	Valid only for one year
Needed by anyone doing work	Only needed by owner
Passing of a test required	No test required
Free	\$40 per year
Covers only individual	Covers owner and employees

PENALTIES

A violation of a nuisance wild animal control law or rule in Ohio may result in criminal charges. Violations are classified as misdemeanors, depending on the offense, which may result in a fine or jail time. The ODNR Division of Wildlife may suspend or revoke any nuisance control license if the operator is convicted of a violation.

OTHER LAWS AND PERMITS

Other state, local, and federal laws, permits, or rules may be applicable to nuisance wild animal control operators. Therefore, it is the operator's responsibility to be aware of and become familiar with all pertinent laws (such as pesticide application, migratory bird control, Migratory Bird Treaty Act, federal Endangered Species Act.)

Pursuant to O.R.C. § 1533.171, all nuisance wild animal control operators, trappers, and hunters are liable if injury to a person or property results from a negligent, careless, or reckless act of that person while in the process of killing or taking a wild animal.

CHAPTER 2 - ETHICS OF COMMERCIAL NUISANCE WILD ANIMAL CONTROL OPERATIONS (CNWACO)

Ethics, although not regulated, could impact the future of the commercial nuisance wild animal control operators not only in Ohio, but nationwide. An unethical action by one operator may result in negative feelings towards the industry and may lead to legislation, locally or statewide, that takes away the ability to perform these services. Perception sometimes means everything. A good rule to follow is to act as if your actions will be viewed on the evening news and think, "How would someone watching the evening news think I am acting?" The following considerations should be made when performing nuisance wild animal control work:

Consider the safety of other people and pets that may come into contact with your traps. Not everyone is familiar with trapping and homeowners often do not fully understand how traps work. You should take any opportunity to show a landowner how a trap operates and abate any fears the homeowner may have as well as showing them where your traps are set.

ANIMAL CARE SHOULD BE GIVEN A HIGH PRIORITY.

Once you set a trap, you take on the responsibility of care for any animal that goes in the trap, both wild and domestic. Many homeowners don't regularly deal with wild animals. While it is easy for you as a professional to become complacent when dealing with animals, it is important to stay vigilant in taking the best care possible of any animals that you handle. This responsibility also extends to carrying animals in traps to your vehicle for removal and when using equipment for handling wild animals such as catch-poles and nets. Handling animals requires consideration of the safety of the handler, minimizing pain and distress to the animal and public perception.

YOU ARE VIEWED AS THE EXPERT.

It is important to not take advantage of homeowners by charging them for services that are not needed or using scare tactics to secure a job.

BE UP FRONT, OPEN, AND HONEST.

It is important to be up front, open, and honest with the landowners as well as adjacent property owners. Not everyone has the same views of trapping. Explaining why the need for nuisance trapping exists can go a long way to people understanding the reasons for what you are doing. Also, be honest with homeowners and the public about what you are doing. For instance, it is better to explain why you cannot relocate a raccoon because of disease concerns rather than telling them you will relocate it and then euthanizing it.

BE COURTEOUS TO OTHER TRAPPERS.

Nuisance trapping is a necessary service to deal with animals that regulated trapping cannot address, such as a nesting raccoon in the springtime when trapping season is out. It is important to be respectful of the fact that regulated trapping is also an important economic industry. It is also important to be courteous to other commercial nuisance wild animal control operators. Instead of speaking poorly about another person or company, explain the positive practices you and your company follow.

CONTINUE TO DEVELOP YOUR KNOWLEDGE AND SKILLS.

New techniques are constantly being developed and new equipment is constantly becoming available. In contrast, some techniques and equipment may, over time, not be the best methods to use. It is important to actively educate yourself about the most currently accepted and available options for nuisance wild animal control operators. There are many options including magazines, workshops, and conferences to stay current with the most up-to-date methods and technology.

BE PROFESSIONAL.

Always make a good first impression. This will help you gain work through referrals and repeat customers, and shows all commercial nuisance wild animal control operators in a good light. It is not appropriate to use profanity when on a job site. Be considerate in comments that are made regarding the euthanasia of animals. You may be recorded or video-taped. You should also strive to keep a clean, professional appearance. It is also important to make sure all your equipment is in proper working order.

BE COMPLETE WHEN WORKING ON A JOB.

You should ensure that when you are done with a nuisance wild animal job that there is little likelihood of the homeowner experiencing the problem again. Finishing the job with proper exclusion techniques or properly stopping access is important. If you are not able to complete a job (such as repair siding), direct the homeowner to a person that can perform the necessary work. In addition, follow up with the homeowner to ensure that the work was completed. A follow up call can go a long way to getting future business.

CHAPTER 3 – GENERAL NUISANCE WILD ANIMAL LAWS

This chapter outlines laws and regulations that may be relevant to nuisance wild animal control operators. For relevant statutory language refer to O.R.C. § 1531.40 and Ohio Administrative Code (O.A.C) 1501.31-15-03 (<http://codes.ohio.gov>).

MARKING TRAPS, SNARES, OR OTHER DEVICES

All traps, snares, or other unattended devices must always be tagged with one of the following:

Your name and address of the user

OR

Your commercial nuisance wild animal control operator license number

OR

Your Wild Ohio customer ID number

Tags must be legible, in the English language, and must be waterproof.

Traps or devices used for the following animals are not required to be marked:

- Moles
- Shrews
- Voles
- House mouse (*Mus musculus*)
- Norway rat (*Rattus norvegicus*)
- Roof rat (*Rattus rattus*)

CHECKING TRAPS

Traps, snares, or other devices used to take or capture nuisance wild animals may be monitored with an operational electronic device or by personal observation by the person setting the trap or a designated agent. Traps must be checked according to the following:

EXEMPT FROM CHECKING	EVERY 72 HOURS	EVERY CALENDAR DAY
TRAPS SET FOR:	TRAPS SET UNDER ICE OR WATER FOR:	TRAPS, SNARES OR OTHER DEVICES SET FOR:
Mice	Beaver	All other wild animals not listed in this chart
Nuisance rats	River otter	
Moles	Muskrat	
Shrews		
Voles		

ALLOWABLE TRAPS AND SIZES

Commercial nuisance wild animal control operators shall adhere to the following trap size restrictions:

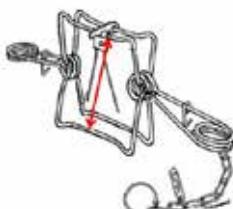
TRAP TYPE	FOR USE	
	ON LAND:	SUBMERGED OR SET TO FUNCTION IN A LETHAL MANNER IN WATER:
Bodygripping	6 inches or smaller (except with woodchuck)	7 inches or smaller (except when completely submerged)
Foothold (both dogless and with dog)	6 inches or smaller*	Not applicable
No spring-assisted snare	15 inches or smaller	15 inches or smaller
Spring-assisted snare	5 inches or smaller	8 inches or smaller

* 5 5/8 inch or smaller- not more than 6 inches if they fall within the following criteria:

- minimum of 5/16 inch gripping surface
- minimum of 3 swiveling points

HOW TO MEASURE A TRAP

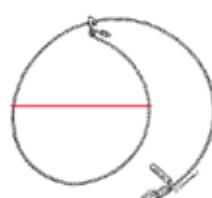
For the purposes of commercial nuisance wild animal control operator license, all traps shall be measured in the open set position, and measured from the inside of the main trap jaws as manufactured, thus shall not include jaw modifications or add-ons.



BODYGRIPPING TRAPS are measured from the inside of the main jaw at the trigger assembly to the inside of the opposing jaw across the entrance window.



FOOTHOLD TRAPS are measured perpendicular to the frame at the widest location parallel with the dog. Dogless foothold traps are measured perpendicular to the frame at the widest location and parallel with the pan shank.



SNARES are measured at the diameter of the loop.

POSSESSION OF NUISANCE WILD ANIMALS

It is unlawful to possess any live wild animal for more than four days trapped or taken under the authority of a commercial nuisance wild animal control operator's license.

SELLING NUISANCE WILD ANIMALS

It is unlawful to sell any nuisance wild animals trapped or taken under the authority of a commercial nuisance wild animal control operator license except:

Carcasses or parts, except hides, of:

- Raccoon
- Opossum
- Beaver
- Muskrat
- Red or Gray fox
- Coyote
- Skunk
- Woodchuck
- Mink

Hides and tails of red, gray, and fox squirrels trapped or taken under the authority of a commercial nuisance wild animal control operator license may be sold at any time.

Hides of furbearing animals taken during the open season under the authority of a commercial nuisance wild animal control operator license may be held and sold from the first day of the respective open season through June 15 of the following year.

- Raccoon
- Skunk
- Beaver
- Coyote
- Red Fox
- Opossum

DISPOSITION OF NUISANCE WILD ANIMALS

It is important to check local regulations for acceptable methods of carcass disposal.

You are required to euthanize or release on site, any nuisance raccoon, skunk, beaver, coyote, red fox or opossum that is captured, trapped or taken.

Unless listed above, live-trapped nuisance wild animals must be released outside of city limits and with the permission of the landowner where the release takes place or may be euthanized. The following species may be released or euthanized:

- Squirrels (Red, Gray, Fox, and Flying)
- Chipmunk
- Woodchuck
- Moles
- Voles
- Shrews
- Mice
- Rats (except wood rats)
- Rabbit
- Mink
- Muskrat

Under some conditions, it is impossible to live trap some animals. In these situations, written permission from the ODNR Division of Wildlife to use lethal means of capture or taking is required. No such written permission is required to kill or use lethal means of control for the following nuisance wild animals:

- Beaver
- Chipmunk
- Mice (except eastern harvest mouse)
- Shrews
- Voles
- Moles
- Muskrat
- Opossum

- Raccoon
- Rats (except wood rats)
- Squirrels (Red, Gray, Fox, and Flying)
- Skunk
- Woodchuck
- Coyote
- Red
- Fox
- Mink
- Thirteen-lined ground squirrel
- Feral swine
- Rabbit
- Weasel

INJURED NUISANCE WILD ANIMALS

It shall be unlawful to fail to euthanize nuisance wild animals trapped or taken whose injuries affect normal biological or physiological functions.

This does not apply to migratory birds, bats, or threatened or endangered species. An example would be an animal with a badly broken or severed leg, broken jaw, severe injury to an eye, etc. Call your local wildlife officer or the wildlife district office with questions.

ADDITIONAL TRAPPING RESTRICTIONS

Traps with teeth are illegal for taking a nuisance wild animal, except traps designed by the manufacturer for mice, moles, or rats.

Snares shall be constructed with only multi- or single- strand steel cable. All snares, except those set for woodchucks, must have a relaxing lock and a stop to prevent the opening of the snare from closing to a diameter of less than 2½ inches or a relaxing lock system with a breaking point of not greater than 350 pounds. Snares shall not be attached to a drag. Spring-loaded snares, spring-assisted snares, or a snare with a mechanical device to assist the snare in capturing or closing around a nuisance wild animal may only be used by a licensed commercial nuisance wild animal control operator and only to take nuisance wild animals.

Flesh bait shall not be used unless it is completely covered and concealed, or unless the bait is encapsulated by the trap.

Dogs shall not be used to take a raccoon, opossum, skunk or fox outside of a structure during the closed season. The use of dogs to control all other nuisance wild animals does require a commercial nuisance wild animal control operator license.

Toxicants and chemical substances may be used for control of nuisance wild animals. It is unlawful to use contraceptive chemicals except to control the population of common pigeons. It shall be unlawful to use a toxicant or chemical substance for the taking or control of a nuisance wild animal contrary to or in violation of instructions on the label or manufacturer recommendations (The label is the law). A licensed commercial nuisance wild animal control operator must possess the appropriate pesticide applicators license in the appropriate category to use a toxicant or chemical substance for the taking or control of a nuisance wild animal. The Ohio Department of Agriculture issues a pesticide applicator's license.

Firearms or air guns may be used to take nuisance wild animals in some situations. It is lawful for a licensed commercial nuisance wild animal control operator to use a gun equipped with a silencer or muffler for the control of nuisance wild animals. Any applicable federal, state, or local statutes or restrictions must also be followed.

CHAPTER 4 – SPECIES SPECIFIC LIMITATIONS

BATS

It is illegal to euthanize or kill any bat, except in situations where there is a direct human health risk such as a bite or potential exposure to rabies. Any bat euthanized must be reported to the local health department by the affected landowner or their designated agent by the end of the next business day. If a person has been bit by a bat or if exposure is possible, the health department must be contacted for guidance on the disposition of the animal.

Precautions must be taken to ensure that no federally protected species are harmed or harassed unless potential exposure to rabies has occurred.

BLACK BEAR

Black bear which are causing damage or have become a nuisance may be captured or euthanized by a licensed commercial nuisance wild animal control operator, only after the landowner or agent of the landowner has received a permit from the chief of the ODNR Division of Wildlife. Stipulations may apply.

CROWS

It is lawful for any person to take crows during the closed season if the crows are found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance.

However, it is unlawful to take or attempt to take nuisance crows outside of the open season with the aid or assistance of any calls, artificially placed bait, or decoys.

WHITE-TAILED DEER

White-tailed deer which are causing damage or have become a nuisance may be captured or euthanized by a licensed commercial nuisance wild animal control operator, only after the landowner or agent of the landowner has received a permit from the chief of the ODNR Division of Wildlife.

The ODNR Division of Wildlife has an online application and permitting system for deer damage permits. Landowners with current, ongoing damage issues can submit an application for a deer damage permit at <https://ohiodnr.gov/discover-and-learn/safety-conservation/wildlife-management/nuisance-wildlife/deer-damage-control>. Stipulations may apply.

All nuisance white-tailed deer immobilized with chemicals or drugs shall be euthanized.

DUCKS

Ducks, including their nest and eggs, are protected under the Migratory Bird Treaty Act. For removal of nests, eggs, or ducks, the landowner must contact USDA Wildlife Services for a permit at 1-866-4USDAWS (1-866-487-3297).

FERAL SWINE

It shall be unlawful to fail to euthanize a trapped nuisance feral swine at the trap location. Feral swine are a non-native Ohio species. It is illegal to transport a trapped feral swine in Ohio. It is legal to live trap feral swine at any time, provided the animal is immediately euthanized at the trap location.

GESE

From March 11 through August 31, Canada geese which are causing damage or have become a nuisance may be captured or taken by licensed commercial wild animal control operators, landowners, or agents of the landowner, only after the landowner has received a permit from the chief of the ODNR Division of Wildlife. Stipulations may apply.

The ODNR Division of Wildlife has an online complaint and permitting system for Canada goose damage permits. Landowners can file goose complaints at <https://ohiodnr.gov/discover-and-learn/land-water/issues-for-landowners/huisance-geese>

From September 1 through March 10, Canada geese which are causing damage or have become a nuisance may be captured or taken by licensed commercial wild animal control operators, landowners, or agents of the landowner, only after the landowner has received a permit from the U.S. Fish and Wildlife Service (USFWS). Information on obtaining this permit can be found below.

MIGRATORY BIRDS

Migratory birds are protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act is a treaty signed between the United States, Japan, Canada, Russia, and Mexico that establishes protection for migratory birds, their eggs, and nests.

European starlings, English/House sparrows, and common pigeons (other than homing pigeons) are not considered migratory birds and may be dispatched at any time and their nests or eggs may also be destroyed at any time. They may not be possessed except under a collection permit.

Removal of migratory birds, such as woodpeckers that are causing damage, requires a depredation permit from the U.S. Fish and Wildlife Services. USDA Wildlife Services facilitates the application of the depredation permits. The landowner must contact the USDA Wildlife Services at 1-866-4USDAWS (1-866-487-3297) to speak to a representative to determine if a permit is needed.

Inactive nests of non-colonial migratory birds may be removed without a federal permit.

MUTE SWANS

Mute swans may be captured or taken by licensed commercial nuisance wild animal control operators, landowners, or agents of the landowner, only after such landowner has received a permit from the chief of the ODNR Division of Wildlife. Stipulations may apply.

WILD TURKEY

Wild turkey, which are causing damage or have become a nuisance may be captured or euthanized by licensed commercial nuisance wild animal control operators or other persons, only after such landowner or agent of the landowner has received a permit from the chief of the ODNR Division of Wildlife. Stipulations may apply.

ENDANGERED & THREATENED SPECIES

It is unlawful to capture or euthanize nuisance wild animals listed as state endangered or threatened without a permit to do so issued by the chief of the ODNR Division of Wildlife. For the most up-to-date list, go to <https://ohiodnr.gov/discover-and-learn/safety-conservation/about-ODNR/wildlife/state-listed-species> Caution must be taken so as not to injure or destroy any of these species, including with pesticides or other lethal means of control.

Some species of wildlife listed as state endangered or threatened are also federally listed, and all federal laws regarding those species must be followed. Please contact the U.S. Fish and Wildlife Service for guidance.

CHAPTER 5 –SPECIES INFORMATION AND CONTROL TECHNIQUES

This chapter will explain some of the methods for controlling common nuisance wild animals as well as provide information on their life history, diseases, and laws pertaining to that species. It does not discuss all methods or all nuisance wild animals that may be encountered.

SPECIES-SPECIFIC RECOMMENDED TRAP AND SNARE SIZES

Commonly encountered species of wild animals for nuisance animal control operators and the recommended trap sizes for those species. In some cases, other sizes or trap types may prove to be more efficient.

SPECIES/ TAXA	FOOTHOLD (INCHES)	BODYGRIPPING (INCHES)	SNARE LOOP (INCHES)	LIVE/CAGE TRAP	ENCAPSULATED (DOG PROOF)
Bats	Not legal	Not legal	Not legal	Not recommended	Not legal
Beaver	5 - 6 (land), 8½ (submerged) ¹	7-12 ²	9 – 10, 2 - 3 ³	39 x 43 Suitcase ⁴	Not recommended
Canada Goose	Not legal	Not legal	Not legal	Not legal	Not legal
Chipmunks/Rats	Not recommended	Rat sized snap traps	Not recommended	16 x 5 x 5 ⁴	Not recommended
Mice/shrews	Not recommended	Mouse snap trap	Not recommended	10 x 3 x 3 ⁴	Not recommended
Moles	Not recommended	“NoMol, Out of Sight, Nash Loop, spears, or similar” ³	Not recommended	11 x 3 ½ x 3 ½ ⁴	Not recommended
Coyote	4 ½ - 6 ²	Not recommended	10-12, 10 – 12 ³ high	48 x 26 x 20 ⁴	Not recommended
Red Fox	4 ½ -5 ½ ²	Not recommended	6 - 8, 6 - 8 ³ high	42 x 15 x 15 ⁴	Not recommended
Gray Fox	4 5/16 - 4 ½ ²	Not recommended	6 - 8, 6 – 8 ³ high	32 x 10 x 13 ²	Not recommended
Muskrat	3 ½ + (submerged) ²	4 ½ -5 ²	3 ¾, 1 ½ ⁴ high	24 x 6 x 6 ⁴	Not recommended
Opossum	3 15/16 - 4 ½ ²	4 ½ - 6 ⁴	6, 2 - 3 ⁴ high	32 x 10 x 13 ²	1 ½- in. diameter, 2 1/8 - 2 7/8 in. trigger depth
Rabbits	Not recommended	Not legal	Not recommended	24 x 7 x 7 ⁴	Not recommended
Raccoon	3 ½ -4 5/8 ²	6 (land), 7 (part submerged) ²	6 – 8, 3 – 4 ³ high	32 x 10 x 13 ²	1 ½- in. diameter, 2 1/8 - 2 7/8 trigger depth
Skunk	3 ½ - 4 ½ ⁵	6 (2)	4 - 6 ⁴	24 x 7 x 7 up to 32 x 10 x 13 ²	Not recommended
Squirrel (gray or fox)	Not recommended	3 ½ - 4 ½ ⁴	Not recommended	19 x 6 x 6 ⁴	Not recommended
Squirrel (red)	Not recommended	Rat sized snap traps	Not recommended	16 x 5 x 5 ⁴	Not recommended
Squirrel (flying)	Not recommended	Rat sized snap traps	Not recommended	16 x 5 x 5 ⁴	Not recommended
Woodchuck	No greater than 6	5-7 ⁴	4 – 6, 2 -3 ⁴ high	32x x10 x 13 ²	Not recommended

¹ OAC 1503:31-05-03

² Association of Fish and Wildlife Agencies Best Management Practices

³ Recommended by the Ohio State Trappers Association Snare Guide

⁴ Specific manufacturer's recommendations

⁵ U.S. Geological Survey Northern Prairie Wildlife Research Group

BATS

OHIO NATIVE BAT SPECIES

- Red Bat (*Lasiurus borealis*)
- Indiana Bat (*Myotis sodalis*)
- Hoary Bat (*Lasiurus cinereus*)
- Big Brown Bat (*Eptesicus fuscus*)
- Eastern Small-footed Bat (*Myotis leibii*)
- Little Brown Bat (*Myotis lucifugus*)
- Evening Bat (*Nycticeius humeralis*)
- Tri-colored Bat (*Pipistrellus subflavus*)
- Northern Long-eared Bat (*Myotis septentrionalis*)
- Silver-haired Bat (*Lasionycteris noctivagans*)
- Rafinesque's Big-eared Bat (*Corynorhinus rafinesquii*)

There are 10 bat species commonly found in Ohio and they are all insectivores, meaning they eat insects. Four species of bats found in Ohio are state-endangered, including the federally endangered Indiana bat and the northern long-eared bat. Since the appearance of white-nose syndrome, bat populations have experienced declines of over 90%. Population declines of some species that roost in buildings may be as high as 96% to 99%. Bats are the only major predator of night-flying insects, and they help farmers by saving them billions of dollars a year on pest control. Bats are usually able to exist near human homes without making their presence known.

LAWS PERTAINING TO BATS

While all of Ohio's bat species are protected by law, the Division recognizes there may be times when human health or safety is at risk. For example, it is illegal to kill a bat for any reason unless a bite or potential exposure to rabies has occurred. Ohio Administrative Code (OAC) 1501:31-15-03 provides additional opportunities to address human/wildlife coexistence issues, including the exclusion or eviction of unwanted bats from a man-made structure.

It is illegal: To use traps (including glue traps) to catch or kill bats; to use chemicals, toxicants, or foggers to exclude or kill bats; to seal all entry/exit points while bats are inside the structure; and to otherwise kill bats.

BAT ROOSTING LOCATIONS



LIFE HISTORY NOTES

Mating: Polygamous.

Peak Breeding Activity: August to October; some will breed again in the spring.

Gestation: 40-90 days depending on species, weather conditions, and nutritional availability (delayed implantation).

Young are Born: Late May through July.

Litter Size: 1, but there can be large numbers of young in a colony.

Number of Litters per Year: 1

Seasonal Patterns: While some migrate in the winter, they can also be year around residents; Some species will use different roosting, hibernacula, and maternity sites.

Typical Foods: Insects

DISEASES OF CONCERN WHEN HANDLING BATS

- Rabies
- Histoplasmosis
- White-nose syndrome

COMMON SITUATIONS ENCOUNTERED

- Roosting in chimneys
- Flying around inside home
- Roosting or colonizing in attic

TECHNIQUES FOR DEALING WITH BATS

Living Space: When trying to remove a bat in a living space, open a window or exterior door, and close interior doors, confining it to one room if possible. The bat will leave as soon as it locates the exit. If the bat continues to stay in the house, you may use a box, bucket or small jar over the bat to capture. You should never handle the bat with bare hands, so wear the thickest gloves you can find, preferably leather gloves to use when attempting to remove. Put on gloves. Use capture container and place it over the bat when it lands, whether on the floor or wall. Then, slip a lid or

piece of cardboard under the box. Tape the cardboard to the container to secure the bat inside. If the bat is unharmed and it is April 1- May 15 or August 1- October 14 , take the capture container outside and place it up against a tree so that the bat can crawl out onto the tree as bats cannot fly from the ground. If the bat is injured or it is outside the release window period, contact your local wildlife rehabilitator for admission.

Exclusion: Removal of bat colonies or individuals roosting in buildings may be dealt with a bat exclusion. A bat exclusion is defined as the act of installing a device or materials to remove bats from a structure. If bats are entering the living space inside of a home (i.e., from attic access into a bedroom), these interior routes may be sealed or blocked at any time without a permit. However, unless otherwise approved by the Division, exterior routes may not be sealed without first installing an exclusion device. The periods for bat exclusion are between April 1st through May 15th and August 1st through October 15th. The only allowable method of bat removal is bat exclusion. Exclusion devices or materials allow the one-way passage of bats out of a home or structure. Installing materials that close secondary access points while still allowing bats to enter and exit the structure through a main access point is not considered bat exclusion. Exclusion devices must be left in place for at least a week to be effective. Once all of the bats have been excluded from the structure, the device may be removed, and the entrance sealed within the same day to prevent bats from reentering.

Bats may not be intentionally killed or harmed unless human rabies exposure is suspected.

Requesting Written Permission During Restricted Periods: Before applying for bat exclusion authorization from May 16th through July 31st, the property owner or designee must:

- Inspect the structure for bats;
- Perform two bat watches at the structure from ½ hour before until 1 hour after sunrise or from ½ hour before until ½ hour after sunset within seven days.
- If five or more bats are observed during the inspection or first bat watch, additional watches are not required. Exclusion is not permitted without the Division's authorization.
- If four or fewer bats are present or observed, bat exclusion can be performed without the Division's authorization.

The Division will consider immediate exclusion when human health and safety are at risk or when nighttime temperatures exceed 40°F for the full 10-day forecast during the October restricted dates. Applicants will typically receive a response to their request within a few days but no later than ten days after the Division receives it.

Property owners or their agents and Division licensed/certified nuisance wild animal control operators may apply for bat exclusion authorization during the restricted periods. It is illegal for anyone who is not a licensed commercial nuisance wild animal control operator to receive compensation for wild animal control activities, including bat exclusions.

Bats may not be killed or euthanized unless a bite or potential exposure to rabies has occurred. Contact your doctor if rabies is suspected in a bat or if a bite cannot be ruled out. There are two restricted periods for bat exclusion in Ohio:

- **From May 16th through July 31st, when 5 or more bats are present;**
- **From October 15th through March 31st, if any bats are present.**

During these restricted periods, bats may only be excluded by first obtaining written permission from the chief of the Division of Wildlife or their designee. Written authorization will be considered when human health and safety are at risk or when nighttime temperatures exceed 40°F for the full 10-day forecast during the October restricted dates (see Requesting Written Permission During Restricted Periods below for additional information). The spring/summer restricted period is in place to protect bats and their flightless pups during the maternity period. Exclusions performed during this time may cause undue deaths of bats until pups can fly (August). Not only could the exclusion result in the death of pups, but frantic mothers attempting to get back to their young often find their way into living spaces. The fall/winter restricted period is put in place to protect hibernating bats. Bats that exit structures when temperatures drop below freezing may die if they cannot return to the same hibernaculum or shelter due to an exclusion device. Bats cannot be released outside when temperatures at night are below 50F, bats should be admitted to a wildlife rehabilitator for continued care if there is no human health or safety concerns. If assistance is needed, contact wildlife.permits@dnr.ohio.gov.

To apply for exclusion authorization, please complete and return a Bat Exclusion Authorization Application (Please contact ODNR Division of Wildlife customer service at 1-800-WILDLIFE (945-3543) or wildlife.ba-textclusion@dnr.ohio.gov. Go online at <https://dnrohio.my.site.com/WildlifeBatExclusion/s/> for more information).

When locating entry and exit areas, consider potential as well as active points of access. It may also be possible to locate entry and exit areas by standing in various locations of a darkened attic during daylight hours and looking for light at the extreme parts of eaves, in layers of subroofing, and below chimney flashings. Seal all gaps of ¼ x 1½ inches (0.6 x 3.8 cm) and openings 5/8 of an inch (1.6 cm) or larger. Often, there are secondary access points that are not always used. These secondary access points may be sealed in advance of sealing the primary access point if you are waiting for pups to be flighted.

There are many commercially available one-way door devices that you can install to allow the bats to leave the following night that will exclude them from being able to get back in. You can also use screen and tape to create your own one-way door. Put a square section of screen just slightly larger than the hole they are using over it, and then tape three sides leaving the bottom side open to allow the bats to squeeze out. Be sure the screen is tight enough so that there is not a gap for them to climb back in, but not too tight to keep them from being able to get out. It is recommended that exclusion of colonies take place after September 1, but before bats begin hibernation. Excluding bats during the wrong time of year can lead to far greater problems for the homeowner, including bats dying and creating an odor problem, or more bats getting inside the living quarters seeking a way out.

Habitat modification: Installation of bat houses may help deter bats from using a structure, but it must also be considered that it may attract bats to the area as well. In dark areas such as attics, leaving lights on or install lights to help repel bats. In areas where bats are roosting, such as under soffits and above doors, using a 45-degree piece of wood can deter the bats from using that area.



BEAVER (*Castor canadensis*)

LAWS PERTAINING TO BEAVER

Can be trapped or euthanized at any time if causing a nuisance. If trapped, can NOT be relocated and must be euthanized.

DISEASES OF CONCERN WHEN HANDLING

- Tularemia
- Giardia

RECOMMENDED TRAP SIZES (all sizes in inches)

FOOTHOLD	BODYGRIP- PING	SNARE LOOP WITH HEIGHT	LIVE OR CAGE TRAP
5 - 6 (land) 5 - 8 1/4 (submerged)	7-12	9-10, 2-3	39 x 43 Suitcase

COMMON SITUATIONS ENCOUNTERED

- Cutting trees
- Plugging pipes
- Flooding an area

TECHNIQUES FOR DEALING WITH BEAVER

Trapping: It is recommended that traps set for beaver be used in a lethal manner in either deeper water or with the aid of a drowning set. The most effective sets are those placed in runs, places where the beaver enters and exits the water, or at the entrance to a beaver lodge. Place the trap as close to the den entrance as possible without restricting trap movement. Snares can be set for beavers on land and in water.

Shooting: Beavers are generally nocturnal. Shooting a beaver can be effective at night with proper lighting. Check local regulations before discharging a firearm within a city or village. Extreme care must be taken when shooting beaver to diminish the likelihood of ricocheting bullets off the water surface.

Exclusion: It is difficult as well as cost prohibitive to exclude beavers from ponds, lakes, or impoundments. Fencing of culverts, drain pipes, or other structures can sometimes prevent damage, but fencing can also promote damage, since it provides beavers with construction material for dams. Protect valuable trees adjacent to waterways by encircling them with hardware cloth, woven wire, or other metal barriers. Construction of concrete spillways or other permanent structures may reduce the impact of beavers.

Habitat modification: Where feasible, eliminate food, trees, and woody vegetation that is adjacent to beaver habitat. Continual destruction of dams and removal of dam construction materials daily will sometimes cause a colony or individual beavers to move to another site. The use of a three-log drain or a structural device such as wire mesh culverts or T-culvert guards will occasionally cause beavers to move to other areas. Fencing around culvert heads can also be constructed to allow beavers to build but still allow water flow. The length of each side of the fence is normally at least twice the diameter of the culvert. Installing this device can be the best solution for a large flowage where the water flow is too great for a pipe system or smaller flowages where roads were built in floodplains. A floor of fencing is usually laid first to deter beaver burrowing. A device for controlling beaver impoundments and keeping blocked culverts open is the Clemson beaver pond leveler. It is effective because the beavers cannot detect the sound of falling or flowing water as the pond or culvert drains; therefore, they do not try to plug the pipe. Periodic reinvasions of suitable habitat can be expected to occur.

LIFE HISTORY NOTES

Mating: Monogamous.

Peak Breeding Activity: January-February.

Gestation: 3-4 months.

Young are Born: April-June.

Litter Size: 1-8; average 3.

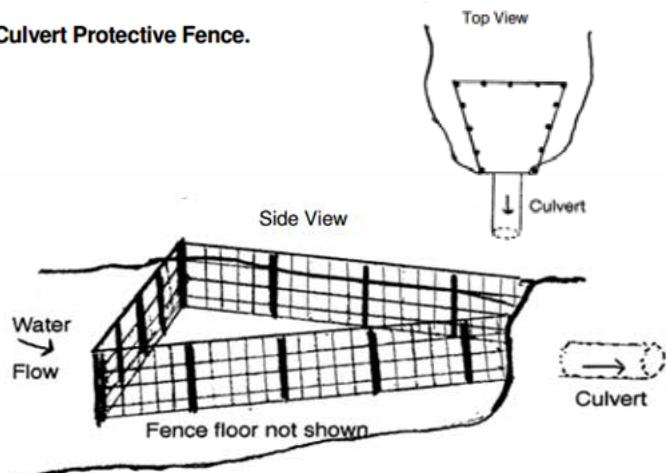
Number of Litters per Year: 1.

Seasonal Patterns: Year-around resident; Active primarily at night however will be out during the day as well.

Typical Foods: While they will eat or chew almost any tree, they prefer poplar, aspen, willow, birch, and maple.



Culvert Protective Fence.



Frightening: Shooting of individuals or continued destruction of lodges, bank dens, and dams, where legal, will occasionally move young colonies out of an area.

Toxicants and fumigants: None registered.

Repellents: None registered.



CANADA GOOSE (*Branta canadensis*)

LAWS PERTAINING TO CANADA GEESE

There are no permits needed to harass Canada geese, as long as they are not nesting. Permits for nests, eggs, shooting, or rounding up the geese from March 15-August 31 require a permit from the ODNR Division of Wildlife. Permits for shooting from September 1-March 14 require a permit facilitated by the U.S. Department of Agriculture Wildlife Services.

*The ODNR Division of Wildlife utilizes an online goose complaint and permitting system. Landowners can file complaints at wildohio.gov or call the nearest district office. A complaint must be filed before any permits can be issued.

<https://apps.ohiodnr.gov/wildlife/goose/>

DISEASES OF CONCERN WHEN HANDLING

- Avian influenza
- E. Coli
- Botulism
- Avian cholera

RECOMMENDED TRAP SIZES

A permit is required to trap Canada geese.

COMMON SITUATIONS ENCOUNTERED

- Defecating on lawn
- Aggression towards people and pets
- Nesting location (by doors, walkways, landscaping, roofs, parking lots, etc.)
- Destroying grass, yards, or golf courses

TECHNIQUES FOR DEALING WITH CANADA GEESE

Trapping: A nuisance goose capture permit is required from the ODNR Division of Wildlife to trap geese. Capture permits are reserved as last resort tactics, used only after complainants have attempted nonlethal harassment tactics without satisfactory results. Roundups are conducted in June and July when the goslings cannot fly and the adult geese are molting, or replacing, their feathers. This permit can also be used in a situation where an aggressive goose needs to be removed. When an attack goose situation occurs and an ODNR Division of Wildlife employee determines the best course of action is removal of one or both geese, this permit allows for hand-capturing the goose and euthanizing it.

Shooting: As with trapping, shooting permits are reserved as last resort tactics. Shooting geese should be used to reinforce nonlethal tactics which must continue after the permit is issued. Shooting permits are typically issued in agricultural situations. In general, shooting permits are issued early in the nesting season and are used to discourage birds from feeding on emerging crops or to discourage birds from utilizing a site. Flightless geese, including molting birds and goslings, are not allowed to be shot. Check local regulations before discharging a firearm within a city or village.

Exclusion: Installing perimeter fencing around a pond or using an overhead grid system can help to prevent access to geese. Physical barriers should be installed prior to March, before goose territories are established, and the barriers should be left intact year-round. When properly installed and maintained, physical barriers will prevent geese from walking from the pond into your yard.

Habitat modification: Geese are grazers and rely on grass for most of their diet. Geese can be discouraged from using these grass areas by the following methods: 1) Reduce or eliminate fertilizer applications to the surrounding grass area to make the grass less desirable and nutritious to the geese; 2) Plant grass species that are less desirable, such as tall fescue (has a bitter taste); 3) Seed surrounding areas to natural prairie grasses or other tall vegetation; 4) Dense plantings around feeding areas and tall trees in flight paths will deter geese from using these areas; 5) Turn off pond aerators in the winter to allow the pond to freeze; and 6) Do not feed the geese.

LIFE HISTORY NOTES

Mating: Monogamous

Peak Breeding Activity: February-March

Gestation: 26-28 days

Young are Born: May

Clutch Size: 2-9; Average 5

Number of Broods per Year: 1

Seasonal Patterns: Some geese will be around all year; Ohio also gets migrant geese

Typical Foods: Grass and aquatic vegetation

Frightening: Almost any obedient breed of dog, when trained properly, can be used to discourage Canada geese. However, border collies seem to be the breed of choice. A border collie's natural herding instinct, along with some command training, make it particularly useful for discouraging Canada geese from areas with ponds including golf courses, apartment complexes, and industrial parks. It is best to use dogs to discourage geese before and after the nesting season (before March 15th and after eggs have hatched). Once geese are actively nesting, it is difficult to drive them off your property. Noise makers, including screamers, bangers, and shell crackers are effective. For best results, begin harassment early in the season (February and March) and during dusk or early evening when the birds congregate in numbers. Harassment at this time will disperse the birds before they roost for the night and become accustomed to the area. Care should be given to not overuse noise makers because geese can become accustomed to the persistent noise. Often, congregated birds must be harassed for several days before any results will be seen. Be persistent and you will succeed. It is advised to contact local law enforcement officials before using noise makers in a city or village.

Toxicants and fumigants: None registered.

Repellents: Two types of chemicals are registered with the U.S. Environmental Protection Agency as goose repellents: methyl anthranilate (MA) and anthraquinone (AQ). Both chemicals were originally designed to be sprayed on grass, thus making the grass unpalatable to geese. In recent years, however, MA has also been used as an aerosol to chase geese away. MA is a naturally occurring nontoxic, biodegradable food ingredient found in concord grapes and orange blossoms. Two MA based repellents found in the marketplace are ReJeXIT and Repel. AQ is a naturally occurring compound found in many plants and is virtually odorless. The compound is harmless to wildlife and humans, and it persists in all weather conditions (rain, snow, ice). Flight Control is the only AQ-based repellent currently on the market.

Repellents are effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using repellents.



CANADA GOOSE

MOLES, VOLES, SHREWS, MICE, RATS, AND CHIPMUNKS

LAWS PERTAINING TO SMALL RODENTS

Can be trapped or euthanized at any time if causing a nuisance. If trapped, they can be euthanized OR relocated after receiving permission from the landowner where it will be released.

DISEASES OF CONCERN WHEN HANDLING SMALL RODENTS

- Hantavirus

RECOMMENDED TRAP SIZES (All sizes in inches)

SPECIES	BODYGRIPPING	LIVE OR CAGE TRAP
Chipmunks and rats	Rat-sized snap trap	16 x 5 x 5
Mice and shrews	Mouse sized snap trap	10 x 3 x 3
Moles	Several commercially available traps; spear type trap	11 x 3 1/2 x 3 1/2

COMMON SITUATIONS ENCOUNTERED

- Holes and tunnels in yard
- Chewing holes in home, garage, or barn
- Eating landscape plants

TECHNIQUES FOR DEALING WITH SMALL RODENTS

Trapping: Trapping is the most practical method of eliminating small rodents in most situations. Live-catch wire-mesh traps or common snap traps can be used to catch most small rodents. Baits used to lure them into live traps include peanut butter, nutmeats, pumpkin or sunflower seeds, raisins, prune slices, or common breakfast cereal grains. A helpful tip is to pre-bait the trap for 2 to 3 days by wiring the trap doors open. This will condition the animal to associate the new metal object in its territory with the new free food source. Bodygripping or spear traps can be effective for dealing with moles. The traps are usually set in-line with the tunnel the moles are creating in the yard. Traps must be checked each calendar day.

Shooting: The use of an air rifle or a .22-caliber rifle with bird shot or C.B. cap loads can be an effective method to kill small rodents. Check local regulations before discharging a firearm within a city or village.

Exclusion: Rodents can fit through small holes. Use hardware cloth with 1/4-inch mesh, caulking, or other appropriate materials to close openings where they could gain entry. In many cases, seeds and bulbs can be covered by 1/4-inch hardware cloth and covered with soil to protect the seeds and bulbs from being eaten but allow them to grow through the hardware cloth. The cloth should extend at least 1 foot past each margin of the planting. Exclusion is less expensive in the long run than trapping.

Habitat modification: Landscaping features, such as ground cover, trees, and shrubs, should not be planted in continuous fashion connecting wooded areas with the foundations of homes. They provide protection for small rodents that may attempt to gain access into the home. Place bird feeders at least 15 to 30 feet away from buildings so spilled bird seed does not attract and support rodents near them. Spilled bird seed should be removed daily.

Toxicants and fumigants: None registered.

Repellents: None registered.

LIFE HISTORY NOTES

Mating: Polygamous

Peak Breeding Activity: Can be throughout the year, but usually during the spring and fall

Gestation:

 • Voles and Shrews - 19 days
 • Chipmunks - 31 days
 • Moles - 42 days
 • Mice - 25 days
 • Rats - 22 days

Young are Born: Can be throughout the year, but usually during the spring and fall

Litter Size: Average 4-5

Number of Litters per Year:

 • Shrews and moles - 1 litter
 • Chipmunks - 2 litters
 • All others – More than 2 litters

Seasonal Patterns: Year-around resident. Active both during day and night throughout the entire year

Typical Foods: Vegetation, seeds, nuts, fruits, insects, and grubs. Moles feed on earthworms as well.

Other Comments: Many small rodents, especially white-footed mice, are important reservoirs for the bacterium for Lyme disease. While they can't pass Lyme disease to humans they can be an important management component to dealing with the other animals that ticks use as hosts.



WHITE-FOOTED MOUSE

Make sure you know which small rodent you are dealing with before control activities. Many small mammals are similar in appearance and habitat.

COYOTE (*Canis latrans*)

LAWS PERTAINING TO COYOTES

Can be trapped or euthanized at any time if causing a nuisance. If trapped, can NOT be relocated and must be euthanized. CANNOT be rehabilitated if injured or orphaned.

DISEASES OF CONCERN WHEN HANDLING

- Rabies
- Canine distemper
- Parvovirus

RECOMMENDED TRAP SIZES (All sizes in inches)

FOOTHOLD	SNARE LOOP/HEIGHT	LIVE/CAGE TRAP
4 1/2 - 6	10 - 12, 10 - 12	48 x 26 x 20

COMMON SITUATIONS ENCOUNTERED

- Conflicts with domestic pets
- Killing livestock and poultry

TECHNIQUES FOR DEALING WITH COYOTES

Trapping: The use of a snare usually affords the best option especially in an urban setting. Sites where snares are set should be carefully selected to avoid capturing non-target animals. Avoid setting snares on any trails being used by non-target animals or domestic dogs. Use a short snare cables to reduce injuries for accidentally-captured dogs.

Shooting: A rifle or other firearm is an effective method to euthanize a coyote. There is no closed season for hunting coyotes (although there are some time restrictions during deer gun seasons) and the use of hunting is an effective maintenance tool for controlling coyote problems. Coyotes may even be shot at night (check Ohio hunting and trapping regulations for any additional laws about shooting coyotes at night), however care should be taken to ensure all shots are done safely. If coyotes are killing sheep or other livestock in the daytime, construct a comfortable blind at a vantage point in the pasture where the killing has occurred. Check local regulations before discharging a firearm within a city or village.

Exclusion: While total exclusion of all coyotes by fencing is highly unlikely, good fences and appropriate housing can be important in reducing livestock predation or incidents with domestic animals, as well as increasing the effectiveness of other damage control methods (such as snares, traps, or guarding animals). Coyotes that climb fences can be prevented by adding a charged wire at the top of the fence or installing a wire overhang. With any fencing, regular maintenance checks to repair damage is essential. Most situations with dogs involves the dog chasing after the coyote before the actual conflict occurs.

Habitat modification: Removal and proper disposal of dead livestock are important in rural nuisance situations. Livestock producers should use a fall lambing or calving program. Coyotes tend to kill sheep at night, so confining sheep is one of the most effective means of reducing losses to predation. Pets in urban areas, especially from January through April, should not be let out between sunset and sunrise without either being on a lead, within a fenced in area, or with the owner who is confident that the pet will not chase after a coyote or other wild animal.

Frightening: Frightening techniques are not usually effective in urban areas. However, frightening devices can be useful for reducing losses during short periods or until coyotes are able to be shot or trapped in rural areas. The devices should not be used for long periods of time. Lights above corrals at night have been shown to help reduce losses by coyotes

LIFE HISTORY NOTES

Mating: Monogamous

Peak Breeding Activity: February and March

Gestation: 58-63 days

Young are Born: Late April or May

Litter Size: 5-7

Number of Litters per Year: 1

Seasonal Patterns: Year-round resident; active primarily at night and sometimes during the day.

Typical Foods: Small mammals (voles, shrews, mice, rabbits), carrion, poultry, sheep



Toxicants and fumigants: Toxicants are effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants.

Repellents: The use of guard animals such as llamas, donkeys, and guard dogs can greatly help to reduce coyote predation on livestock.

Other Comments: Coyotes are common inhabitants of urban areas and in most cases removal is not necessary. The most common issue in urban areas is coyotes attacking domestic cats. This issue can almost entirely be solved by not allowing cats to free-range or ensuring the cat is indoors from sunset to sunrise.



COYOTE

RED FOX AND GRAY FOX

LAWS PERTAINING TO FOXES

Red fox can be trapped or euthanized at any time if causing a nuisance. If trapped, red fox CANNOT be relocated and must be euthanized or released on site. **Gray fox can be trapped if causing a nuisance. Prior written approval from the ODNR Division of Wildlife must be obtained to euthanize a gray fox. Otherwise, gray fox must be released on site.**

DISEASES OF CONCERN WHEN HANDLING

- Rabies
- Canine distemper
- Leptospirosis
- Echinococcus Infection
- Sarcoptic Mange

RECOMMENDED TRAP SIZES (All sizes in inches)

FOOTHOLD	SNARE LOOP/ HEIGHT	LIVE/CAGE TRAP
Red Fox 4 1/2-5 1/2	6-8	Red Fox 42 x 15 x 15
Gray Fox 4 5/16 – 4 1/2	6-8	Gray Fox 32 x 10 x 13

COMMON SITUATIONS ENCOUNTERED

- Killing poultry

TECHNIQUES FOR DEALING WITH FOX

Trapping: A great deal of expertise is required to effectively trap foxes. Trapping by inexperienced people may serve to educate foxes, making them difficult to catch, even by experienced trappers. Traps with offset and padded jaws cause less injury to confined animals and facilitate the release of nontarget captures. In addition to foothold traps, snares are also an effective method for trapping foxes. Cage traps are sometimes effective for capturing juvenile red foxes living in urban areas.

Shooting: It is lawful to take nuisance red fox which cannot be live trapped because of certain conditions by shooting. A rifle or other firearm can be an effective method. Foxes, especially in damage situations, are usually not seen during the day because of their nocturnal habits. Shooting them can be effective at night with proper lighting. A rifle of most calibers or a shotgun will effectively kill a fox. If a fox is killing poultry, construct a blind at a vantage point close to where poultry has been killed. Check local regulations before discharging a firearm within a city or village. Prior written approval from the ODNR Division of Wildlife is required prior to killing a nuisance gray fox.

Exclusion: Construct net wire fences with openings of 3 inches or less to exclude red foxes. Bury the bottom of the fence 1 to 2 feet with an apron of net wire extending at least 12 inches outward from the bottom. A top or roof of net wire may also be necessary to exclude all foxes, since some will readily climb a fence. A three-wire electric fence with wires spaced 6 inches, 12 inches, and 18 inches above the ground around a poultry yard can help repel foxes.

Habitat modification: The protection of livestock and poultry from fox depredation is most important during the spring denning period when adults are actively acquiring prey for their young, especially if there is a history of fox depredation. Foxes frequently den near humans, such as under decks or barns. A usual attractant for a fox in an area are large numbers of small mammals. Reducing the number of small mammals (see the small mammal section) can help deter foxes from frequenting an area.

LIFE HISTORY NOTES

Mating: Monogamous

Peak Breeding Activity: March-May

Gestation: 22-30 days

Young are Born: Throughout the year

Litter Size: 4-7

Number of Litters per Year: 2-3

Seasonal Patterns: Year-round resident; active primarily at night, and sometimes during the day

Typical Foods: Aquatic vegetation, clams, frogs, crayfish, and small fish



Frightening: Frightening techniques are not usually effective in urban areas. However, frightening devices can be useful for reducing losses during short periods or until foxes are able to be shot or trapped in rural areas. The devices should not be used for long periods of time. Lights over poultry yards or coops at night can help to reduce losses by a fox. Flashing lights, such as a rotating beacon or strobe light, may also provide temporary protection.

Toxicants and fumigants: Pesticides use is restricted by federal and state laws. Toxicants can be effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants.

Repellents: The use of guard animals such as llamas, donkeys, and dogs (Great Pyrenees, Komondor, Anatolian Shepherd, and Akbash varieties are commonly used) can greatly help to reduce fox predation on poultry or livestock.



MUSKRAT (*Ondatra zibethicus*)

LAWS PERTAINING TO MUSKRATS

Can be trapped or euthanized at any time if causing a nuisance. If trapped, they can be euthanized OR relocated after receiving permission from the landowner where it will be released.

DISEASES OF CONCERN WHEN HANDLING

- Tularemia

RECOMMENDED TRAP SIZES (All sizes in inches)

FOOT HOLD	BODY GRIPPING	SNARE LOOP WITH HEIGHT	LIVE OR CAGE TRAP
3 1/2 or larger (submerged)	4 1/2 - 5 3 3/4	1 1/2	24 x 6 x 6

COMMON SITUATIONS ENCOUNTERED

- Den holes along pond edge

TECHNIQUES FOR DEALING WITH MUSKRATS

Trapping: It is recommended that traps set for muskrats be used in a lethal manner in either deeper water or with the aid of a drowning set. The most effective sets are those placed in runs or trails where the muskrat's hind feet scour out a path into the bottom from repeated trips into and out of the den. Place the trap as close to the den entrance as possible without restricting trap movement.

Snares can be set for muskrats on land and in water. The use of the cage or colony type trap is permissible and is an appropriate trap if the muskrats are to be relocated. A box or live trap may be effective, but are not typically used.

Shooting: A rifle or other firearm can be an effective method to euthanize a muskrat. Check local regulations before discharging a firearm within a city or village. Extreme care must be taken when shooting muskrats with a rifle to diminish the likelihood of ricochetting bullets off the water's surface. For this reason, it is recommended that muskrats are only shot when on land when using a rifle. If shooting the muskrats on the water is the only option, a shotgun is the best choice.

Exclusion: Exclusion through buried fencing (usually chain-link) 4 feet above and 4 feet below the waterline on dikes or dams especially when done during the construction phase can be helpful in stopping muskrats from creating holes on the dike or dam. Using short fencing can also be helpful where muskrats may be leaving a pond or lake to cut valuable garden plants or crops. It is easiest to fence the plants you want to protect since muskrats could dig under fencing along the pond edge. Various companies, sell animal or bar guards to install on the end of the pipe which help to exclude muskrats from blocking water flow into the pipe.

Habitat modification: Serious damage often can be prevented by con-

LIFE HISTORY NOTES

Mating: Monogamous

Peak Breeding Activity: March-May

Gestation: 22-30 days

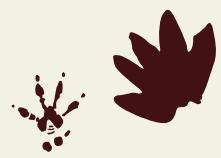
Young are Born: Throughout the year

Litter Size: 4-7

Number of Litters per Year: 2-3

Seasonal Patterns: Year-round resident; active primarily at night, and sometimes during the day

Typical Foods: Aquatic vegetation, clams, frogs, crayfish, and small fish



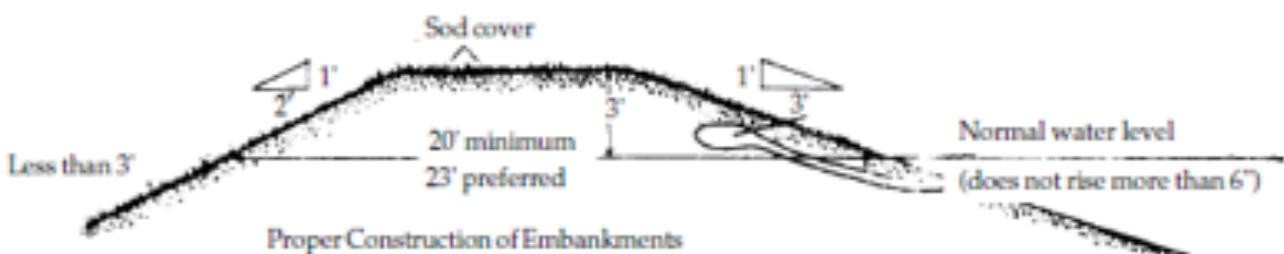
structing dams to the following specifications: the inside face of the dam should be built at a 6-to-1 slope; the outer face of the dam at a 2-to-1 slope with a top width of not less than 8 feet, preferably 10 to 12 feet. The normal water level in the pond should be at least 3 feet below the top of the dam. Muskrats in some situations can be excluded or prevented from digging into pond edges or other shoreline areas through stone rip-rapping. Limestone rip rap sizes No. 1 or No. 2, or D rock placed 3-4 inches thick from bottom of the levee to several feet above the normal waterline is needed. Also, drawing the pond or wetland down in the winter months helps prevent muskrats that use bank dens.

Frightening: No conventional frightening devices are effective.

Toxicants and fumigants: Pesticides use is restricted by federal and state laws. Toxicants can be effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants.



MUSKRAT



OPOSSUM (*Didelphis virginiana*)

LAWS PERTAINING TO OPOSSUMS

Can be trapped or euthanized at any time if causing a nuisance. If trapped, can NOT be relocated and must be euthanized.

DISEASES OF CONCERN WHEN HANDLING OPOSSUM

- Rabies
- Leptospirosis

RECOMMENDED TRAP SIZES (All sizes in inches)

FOOT-HOLD	BODYGRIP-PING	SNARE LOOP WITH HEIGHT	LIVE OR CAGE TRAP	ENCAPSULATED (DOG PROOF)
3 15/16 - 4 1/2	4 1/2 - 6	6/2-3	32 x 10 x 13	1 1/2 diameter, 2 1/8 - 2 7/8 trigger depth

COMMON SITUATIONS ENCOUNTERED

- Denning under a porch, deck, or shed
- Denning in a chimney
- Getting into trash
- Eating food left outside for pet

TECHNIQUES FOR DEALING WITH OPOSSUM

Trapping: Opossums are not wary of traps and may be easily caught with suitable sized box or cage traps. Foothold traps in a dirt hole set or cubby set are effective. Bodygripping traps can also be effective. Using fruit for bait such as apples, cherries, peaches, or grapes instead of meat as this practice will reduce the chance of catching cats, dogs, or skunks. Also, traps set on a running pole, on a picnic table, or off the ground to further reduce the chance of catching a skunk.

Shooting: A rifle of almost any caliber, or a shotgun loaded with No. 6 shot or larger, will effectively euthanize opossums. Check local regulations before discharging a firearm within a city or village.

Exclusion: Keep opossums from denning under buildings by sealing off all foundation openings with wire mesh, sheet metal, or concrete. Opossums can be prevented from climbing over wire mesh fencing by installing a tightly stretched electric fence wire near the top of fence 3 inches out from the mesh. A properly installed chimney cap will prevent opossums from entering a chimney. Make sure trash is in containers and lids are secured.

Habitat modification: Opossums are opportunistic and will readily take advantage of most any food source. They can be discouraged from an area by eliminating food sources such as pet food, bird seed, fallen fruit, compost piles, and household trash. Remove cover such as brush piles, wood piles, and other piled debris. Properly dispose of garbage and remove other food sources such as pet food. Areas around cooking grills should be cleaned regularly.

LIFE HISTORY NOTES

Mating: Polygamous

Peak Breeding Activity: February-March but can run from January-October

Gestation: 12-13 days

Young are Born: Peak is March-April, but can be February-November

Litter Size: 5-25; average is 9

Number of Litters per Year: 1-3; 1 is typical in Ohio

Migration Patterns: Year-round resident; individuals wander widely with a home range of 15-40 acres

Typical Foods: Omnivorous. Will eat carrion, insects, fish, reptiles, eggs, fruits, vegetables, and nuts



OPOSSUM

COTTONTAIL RABBIT (*Sylvilagus floridanus*)

LAWS PERTAINING TO RABBITS

Can be trapped at any time if causing a nuisance. If trapped, they may be euthanized or released with landowner permission.

DISEASES OF CONCERN WHEN HANDLING RABBITS

(See Chapter 6 for more specific information regarding diseases)

- Tularemia
- Staphylococcosis

RECOMMENDED TRAP SIZES (All sizes in inches)

LIVE/CAGE TRAP

24 x 7 x 7

COMMON SITUATIONS ENCOUNTERED

- Garden damage
- Damaging trees
- Eating landscape plants

TECHNIQUES FOR DEALING WITH RABBITS

Trapping: Trapping with live or cage traps is the best way to remove rabbits in cities, parks, and suburban areas. Place traps where you know rabbits feed or rest and near cover so that rabbits won't have to cross large open areas to get to them. Traps must be checked each calendar day. Move traps if they fail to make a catch within a week. For best results, use baits that are similar to what the target rabbits are feeding on. A commercial wire trap can be made more effective (especially in winter) by covering it with canvas or some other dark material. Be sure the cover does not interfere with the trap's mechanism.

Shooting: Check local regulations before discharging a firearm within a city or village.

Exclusion: One of the best ways to protect a backyard garden or berry patch is to put up a fence. A 2-foot fence with the bottom tight to the ground or buried a few inches is sufficient. However, a fence to address multiple species such as groundhogs and raccoons will help address other potential situations. Cylinders of 1/4-inch wire hardware cloth will protect young orchard trees or landscape trees. The cylinders should extend higher than a rabbit's reach while standing on the expected snow depth and stand 1 to 2 inches out from the tree trunk. Commercial tree guards or tree wrap are another alternative.

Habitat modification: Remove cover such as brush piles, wood piles, and other piled debris. There is always the risk that this tactic can draw in greater numbers of rabbits or increasing the survival of those present.

Frightening: A piece of rubber hose on the ground may look enough like a snake to scare rabbits away.

Repellents: Taste repellents are usually more effective than odor repellents. Several chemical repellents, usually using thiram, discourage rabbit browsing. Always follow the directions for application on the container to maximize effectiveness.

Pesticides use is restricted by federal and state laws. Toxicants can be effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants.

LIFE HISTORY NOTES

Mating: Polygamous

Peak Breeding Activity: April-May

Gestation: 26-28 days

Young are Born: March-September

Litter Size: 1-9; average is 5

Number of Litters per Year: Average of 3 litters a year

Seasonal Patterns: Year-round resident. Active both during day and night throughout the entire year

Typical Foods: Clover, dandelion, plantain, and ragweed in summer. In winter they eat seeds, brambles, and bark of tree saplings.



COTTONTAIL RABBIT

RACCOON (*Procyon lotor*)

LAWS PERTAINING TO RACCOONS

Can be trapped or euthanized at any time if causing a nuisance. If trapped, can NOT be relocated and must be released onsite or euthanized. Can NOT be rehabilitated if injured or orphaned in specific counties.

DISEASES OF CONCERN WHEN HANDLING RACCOON

- Rabies
- Canine distemper
- Parvovirus
- Leptospirosis
- Ascarid Roundworm

RECOMMENDED TRAP SIZES (All sizes in inches)

FOOT-HEAD	BODYGRIPPING	SNARE LOOP WITH HEIGHT	LIVE OR CAGE TRAP	ENCAPSULATED (DOG PROOF)
3 1/2 - 4 5/8	6 (land), 7 (part-submerged)	6 – 8, 3 - 4	32 x 10 x 13	1 1/2 diameter, 2 1/8 – 2 7/8 trigger depth

COMMON SITUATIONS ENCOUNTERED

- Denning under a porch, deck, or shed
- Denning in a chimney
- Denning in an attic
- Garden damage
- Eating fish in pond
- Eating chickens or other poultry
- Sod damage
- Getting into trash
- Eating food left outside for pet
- Trapped in dumpsters

TECHNIQUES FOR DEALING WITH RACCOONS

(Refer to Chapter 2 for specific information regarding these techniques)

Trapping: Raccoons are relatively easy to catch in traps, but it takes a sturdy trap to hold one. They can be baited with marshmallows, canned fish flavored cat food, sardines, fish, or chicken. The back portion of the trap should be tightly screened with one-half inch or smaller mesh wire to prevent raccoons from reaching through the wire to pull out the bait. Body-gripping traps are effective for raccoons and can be used in natural or artificial cubbies or boxes and should be used in areas where risk of non-target capture is low. Raccoons also can be captured with foot-hold traps. The foot-encapsulating trap can be highly effective and are highly-selective for raccoons. Once captured, raccoons may be released immediately at the capture site or euthanized. Trapped raccoons cannot be relocated.

Shooting: Raccoons are seldom seen during the day because of their nocturnal habits. Shooting raccoons can be effective at night with proper lighting. A rifle of almost any caliber, or a shotgun loaded with No. 6 shot or larger, will effectively euthanize raccoons. Check local regulations before discharging a firearm within a city or village.

Exclusion: A wire at the top of a fence from an electric fence charger will greatly increase the effectiveness for excluding raccoons. Where raccoons are entering homes or poultry coops ensure all fascia and soffit wood is adequately attached and that doors, vents, and windows are

LIFE HISTORY NOTES

Mating: Polygamous

Peak Breeding Activity: February-March

Gestation: 63-65 days

Young are Born: March-May

Litter Size: 3-7; average is 4

Number of Litters per Year: 1

Seasonal Patterns: Year-round resident; active year-round, primarily at night and sometimes during the day

Typical Foods: Omnivorous. Prefer berries, acorns, nestling birds, frogs, and fish



properly sealed. Damage to sweet corn, watermelons, or other garden plants can most effectively be stopped by excluding raccoons with a single or double hot-wire arrangement. Make sure trash is in containers and lids are secured. Because raccoons are able to use their front paws well, it may be necessary to wire, weight, or clamp trash can lids down. It may also be necessary to secure cans to a rack or tie them to a support to prevent raccoons from tipping them over. A properly installed chimney cap will prevent raccoons from entering a chimney. If raccoons are climbing the downspouts for access, use vegetable oil or other slick materials to keep them from climbing. Do not complete exclusion procedures until you are certain that all raccoons, including young, have been removed from or have left the exclusion area.

Habitat modification: Raccoon access to rooftops can be limited by removing overhanging branches and by wrapping or nailing flashing at least 3 feet up from the base of the tree. Properly dispose of garbage and remove other food sources such as pet food. Areas around cooking grills should be cleaned regularly. Grub control may be necessary to eliminate sod damage. Ensuring there is adequate hiding places or shelter for fish in a pond can greatly reduce raccoons being able to grab the fish.

Frightening: Lights and loud noise will only provide temporary relief.

Repellents: Pesticides use is restricted by federal and state laws. Toxins can be effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants..

Other Comments: Raccoons often find themselves trapped in dumpsters. Placing a board or stout tree branch in the dumpster at an angle and giving the raccoon 24 hours to get out will allow the raccoon the opportunity to get out.



RACCOON

STRIPED SKUNK (*Mephitis mephitis*)

LAWS PERTAINING TO SKUNKS

Can be trapped or euthanized at any time if causing a nuisance. If trapped, can NOT be relocated and must be euthanized or released onsite.

DISEASES OF CONCERN WHEN HANDLING

- Canine distemper
- Rabies
- Leptospirosis

RECOMMENDED TRAP SIZES (All sizes in inches)

FOOTHOLD	BODYGRIPPING	SNARE LOOP WITH HEIGHT	LIVE OR CAGE TRAP
3 1/2 -4 1/2	6	4-6, 1 1/2-2	24 x 7 x 7 up to 32 x 10 x 13

COMMON SITUATIONS ENCOUNTERED

- Denning under a porch, deck, or shed
- Sod damage
- Spraying pets
- Getting into trash
- Eating food left outside for pet

TECHNIQUES FOR DEALING WITH SKUNKS

Trapping: Skunks can be caught in live traps set near the entrance to their den. Several traps may be used when more than one animal is present to reduce the amount of time of removal. Use canned fish-flavored cat food to lure skunks into traps. Other food baits such as peanut butter, sardines, and chicken entrails are also effective. Foothold traps should be avoided near houses or other sensitive areas because of potential problem of scent discharge. When removing a trap with a skunk, cover the trap with a tarp or other plastic and carry gently to reduce the chance of the skunk spraying.

Shooting: A rifle or another firearm may be used to dispatch a skunk. Shooting in the back, severing the spinal cord, immediately followed by a shot in the head may prevent the discharge of scent. However, anyone shooting a skunk should expect a scent discharge.

Exclusion: Keep skunks from denning under buildings by sealing off all foundation openings with wire mesh, sheet metal or concrete. Bury fencing 1 1/2 - 2 feet where skunks can gain access by digging. Window wells or similar pits can be covered with commercially designed products or with wire mesh. Skunks normally do not climb so even short fencing can prove an effective exclusion technique. Make sure trash is in containers and lids are secured.

Habitat modification: Remove cover such as brush piles, wood piles, and other piled debris. Properly dispose of garbage and remove other food sources such as pet food. Areas around cooking grills should be cleaned regularly. Grub control may be necessary to eliminate sod damage.

Frightening: Lights and loud noise will likely only provide temporary relief. Remember, as a natural defense skunks will spray when frightened. Move slowly when around skunks to reduce the chance of them spraying.

Toxicants and fumigants: Pesticides use is restricted by federal and state laws. Toxicants can be effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants.

LIFE HISTORY NOTES

Mating: Polygamous

Peak Breeding Activity: Late February through March

Gestation: 63 days

Young are Born: Late April through May

Litter Size: 3-10; average is 5

Number of Litters per Year: 1

Seasonal Patterns: Year-round resident; active year-round; active primarily at night and sometimes during the day

Typical Foods: Omnivorous. Will eat carrion, insects, fish, crustaceans, small mammals, fruits, grasses, buds, grains, and nuts



Other Comments: The skunk odor is persistent and difficult to remove.



STRIPED SKUNK

SNAKES

LAWS PERTAINING TO SNAKES

Only non-lethal methods may be used for the removal of nuisance snakes. If a snake is caught, it must be released on the same property where trapped. There are many species of snakes in Ohio and attention must be made to determine if the snake causing the problem is endangered or threatened.

DISEASES OF CONCERN WHEN HANDLING SNAKES

- Salmonellosis

RECOMMENDED TRAP SIZES (All sizes in inches)

LIVE OR CAGE TRAP

Snake funnel trap

COMMON SITUATIONS ENCOUNTERED

- In home and other structures

TECHNIQUES FOR DEALING WITH SNAKES

Trapping: Conventional traps are not legal for snakes. However, you can make a snake funnel trap with drift fences constructed of 1/4- inch or 1/2-inch mesh hardware cloth erected 2 feet high and 25 feet long. One type of funnel trap can be made by rolling a 3 x 4-foot piece of 1/4-inch mesh hardware cloth into a cylinder about 1 foot in diameter and 4 feet long. An entrance funnel can be made similarly and fitted into one end of the cylinder. Close the other end of the cylinder with hardware cloth and attach the drift fence. To catch the animal from either direction, put another funnel at the other end of the trap and another drift fence facing the opposite direction.

Shooting: It is not legal to shoot a snake.

Exclusion: It is usually best to deal with snakes in buildings through exclusion. Locate the snakes and their points of exit or entry through inspection, usually around the foundation of the structure. When locating entry and exit areas consider potential as well as active points of access. Snakes enter houses, barns and other buildings when habitat conditions are suitable inside the buildings. They are particularly attracted to rodents and insects as well as cool, damp, dark areas often associated with buildings. All openings 1/4 inch (0.6 cm) and larger should be sealed to exclude snakes. Check the corners of doors and windows, as well as around water pipe and electrical service entrances. Holes in masonry foundations (poured concrete and concrete blocks or bricks) should be sealed with to exclude snakes.

Habitat modification: A primary food of many snakes are rodents such as rats, mice, and chipmunks. Removing rodents and rodent habitats can help eliminate the desire for snakes to use the area. Put all possible sources of rodent food in secure containers. Keep all vegetation closely mowed around buildings. Remove bushes, shrubs, rocks, boards, and debris of any kind lying close to the ground, as these provide cover for both rodents and snakes.

Toxicants and fumigants: None are legal.

Repellents: Pesticides use is restricted by federal and state laws. Toxicants can be effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants.

LIFE HISTORY NOTES

Mating: Polygamous

Peak Breeding Activity: Most from April to June, but can vary

Gestation: Varies by species

Young are Born: Varies by species

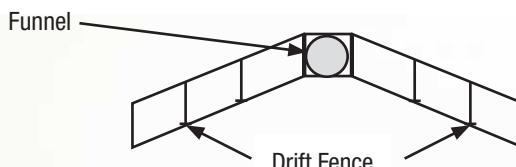
Litter Size: Varies by species

Number of Litters per Year: One

Seasonal Patterns: Year-round resident; will hibernate in winter (location and time depends on species)

Typical Foods: Small rodents, insects, bird eggs, amphibians

SNAKE FUNNEL TRAP



BLACK RAT SNAKE

SQUIRRELS

LAWS PERTAINING TO SQUIRRELS

Can be trapped or euthanized at any time if causing a nuisance. If trapped, they can be euthanized OR relocated after receiving permission from the landowner where it will be released. Can be rehabilitated if injured or orphaned.

DISEASES OF CONCERN WHEN HANDLING

- Rabies

RECOMMENDED TRAP SIZES (All sizes in inches)

	BODYGRIPPING	LIVE/CAGE TRAP
Gray and Fox Squirrel	3 1/2 -4 1/2	19 x 6 x 6
Red Squirrel	Rat sized snap trap	16 x 5 x 5
Flying Squirrel	Rat sized snap trap	16 x 5 x 5

COMMON SITUATIONS ENCOUNTERED

- Denning in an attic
- Denning in a chimney
- Chewing on base of small trees or on tree limbs
- Chewing on wood of home, deck, or shed
- Chewing maple sap tubing

TECHNIQUES FOR DEALING WITH SQUIRRELS

Trapping: A variety of traps will catch squirrels. Regular rat-sized snap traps will catch flying and red squirrels. Typically, wire cage traps and box traps are used for squirrels. Pre-bait traps and tie trap doors open for two or three days to get squirrels accustomed to feeding in the traps. Then set the traps and check them daily. For fox or gray squirrels, small bodygripping traps may be utilized inside buildings or in certain locations outside where the risk of capturing non-target species can be minimized.

Shooting: A rifle or other firearm is an effective method to dispatch a squirrel. A shotgun with No. 6 shot, an air rifle, or a .22-caliber rifle is suitable. The shooting of squirrels is permitted in situations where live trapping is not practical or when not effective. It is lawful to shoot nuisance squirrels which cannot be live trapped because of certain conditions. Check local regulations before discharging a firearm within a city or village.

Exclusion: Close openings to attics and other parts of buildings but make sure not to lock squirrels inside or they may cause a great deal of damage in their efforts to chew out. Place traps inside as a precaution after openings are closed. A squirrel excluder can be improvised by mounting an 18-inch section of 4-inch plastic pipe over an opening at a 45-degree angle. Close openings to buildings with heavy 1/2-inch wire mesh or make other suitable repairs. Fences topped with electrified wires may effectively keep squirrels out of gardens or small orchards. Wrap tree trunks with flashing about 4 feet from the ground to eliminate squirrels from using it to access structures. If squirrels are using a chimney, installation or repair of the chimney cap is in order.

Habitat modification: Trim limbs and trees to 6 to 8 feet away from buildings to prevent squirrels from jumping onto roofs. In backyards where squirrels are causing problems at bird feeders, replace with squirrel-proof bird feeders, apply baffles to bird feeder or discontinue feeding.

LIFE HISTORY NOTES

Mating: Polygamous

Peak Breeding Activity: February and March; June and July

Gestation: 40-45 days

Young are Born: Late April or May

Litter Size: 2-4

Number of Litters per Year: 2

Seasonal Patterns: All are year-around residents; gray, fox, and red squirrels active primarily during the day while flying squirrels are active at night

Typical Foods: Hickory, oak, and beech nuts; blackberry, dogwood, cherry, and wild grape; corn, buds of maple, elm and willow; insects



Frightening: In some situations, the use of owl decoys may dissuade the squirrel from an area. Recordings of hawks or owls may also deter squirrels from an area. However, these are only effective for a short time and not during nesting season to allow for repairs of holes or entrances into the structure or installation of a chimney cap.

Repellents: Pesticides use is restricted by federal and state laws. Toxins can be effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants.



RED SQUIRREL

GROUNDHOG (WOODCHUCK) (*Marmota monax*)

LAWS PERTAINING TO WOODCHUCKS

Can be trapped or euthanized at any time if causing a nuisance. If trapped, they can be euthanized OR relocated after receiving permission from the landowner, and released outside city limits.

DISEASES OF CONCERN WHEN HANDLING

- Rabies
- Ascarid roundworm

RECOMMENDED TRAP SIZES (All sizes in inches)

FOOTHOLD	BODYGRIPPING	SNARE LOOP WITH HEIGHT	LIVE OR CAGE TRAP
No greater than 6	5-7	4 – 6 , 2 – 3	32 x 10 x 13

COMMON SITUATIONS ENCOUNTERED

- Denning under a porch, deck, or shed Garden damage
- Holes in yard or field
- Chewing on wood of home, deck, or shed
- Eating landscape plants

TECHNIQUES FOR DEALING WITH WOODCHUCKS

Trapping: Woodchucks can be caught in live traps. Traps baited with apple slices, broccoli, lettuce, cabbage or other vegetables that are changed daily work best. Locate traps at main entrances or major travel lanes. Place guide logs on either side of the path between the burrow opening and the trap to help funnel the animal into the trap. Groundhogs can be released on-site, outside the city or village limits with permission of the landowner, or may be euthanized. Bodygripping traps are effective in certain situations. Bodygripping traps are well suited for use near or under structures where discharge of firearm presents a hazard. Bodygripping traps greater than 5 inches must be covered to prohibit other animals and domestic pets from getting into the trap from the outside. Traps can be enclosed with items such as welded wire, screening, boards, or boxes. Snares are also an effective means of controlling woodchucks. Only licensed commercial nuisance wild animal control operators are permitted to use snares without a relaxing lock for the purpose of taking woodchucks.

Shooting: A rifle or other firearm is an effective method to kill a woodchuck, especially when in large fields to address holes in the field or crop loss. Check local regulations before discharging a firearm within a city or village.

Exclusion: Fencing is an effective tool to stop garden and landscape damage. Fences should be at least 3 feet high. However, woodchucks are good climbers and can easily scale wire fences. To alleviate groundhogs climbing over the fence you can place an electric wire 4 to 5 inches off the ground and the same distance outside the fence. When connected to a fence charger, the electric wire will prevent climbing and burrowing. Vegetation near the electric fence should be removed regularly to prevent the system from shorting out. To prevent burrowing under the fence, bury the lower edge 10 to 12 inches in the ground.

Habitat modification: Remove cover such as brush piles, wood piles, and other piled debris.

Frightening: Scarecrows and other effigies can provide temporary relief from woodchuck damage. Move them regularly and incorporate human activity in the susceptible area.

LIFE HISTORY NOTES

Mating: Polygamous

Peak Breeding Activity: March-May

Gestation: 31-32 days

Young are Born: April-early June

Litter Size: 2-7; average is 4



Number of Litters per Year: 1

Seasonal Patterns: Year-round resident; hibernates in the winter; Active primarily during the day

Typical Foods: Grasses, clover, alfalfa, soybeans, lettuce, apples

Toxicants and fumigants: Gas cartridges can be used to kill the woodchuck in the den when used according to the label.

Repellents: Woodchucks will also chew on structures. The damage can be differentiated from squirrels because squirrel damage usually is more than 18 inches off the ground. Placing flashing to help stop the chewing at that location. Pesticides use is restricted by federal and state laws. Toxicants can be effective when used according to the label and with proper licensing from the Ohio Department of Agriculture. Check with USDA Wildlife Services before purchasing or using toxicants.

Other comments: Woodchuck damage usually starts in one place along the edge of the garden or crop field and slowly radiates out from there. The plants will show clean cuts on the plant because woodchucks have sharp teeth. There oftentimes is also a trail leading back to a hole in the ground where they live or under a porch, deck, or shed. Be mindful that there may be several woodchucks or other wild animals using a woodchuck burrow. Care should be taken to ensure that a badger is not using the burrow. Badger holes closely resemble woodchuck holes. Because a badger is listed as an endangered species in Ohio, care should be taken to properly identify if one is using the hole. A hole that a badger digs will be oval in shape and 8 to 10 inches in diameter, with a fan-shaped mound of dirt on one side of the hole.

TYPICAL BADGER BURROW

Oval Hole
8" high by 10" wide

Fan-shaped mound
rolling down the
slope from the
entrance



GROUNDHOG

CHAPTER 6 – WILDLIFE DISEASES

Information within this chapter was primarily obtained from the Field Manual of Wildlife Diseases in the Southeastern United States, Third Edition by William R. Davidson

INTRODUCTION

Many diseases affect wildlife. Some are infectious to humans while others are more problematic for wildlife alone. As a commercial nuisance wildlife control operator, it is important to have knowledge about potential diseases you may encounter when dealing with wildlife. The following list includes the wildlife diseases you are most likely to encounter.

COMMON TERMS:

Host – An organism negatively affected by a disease.

Vector – The route of infection of a disease.

Reservoir – An organism that harbors a disease but is not negatively affected.

curred.

ASCARID OR RACCOON ROUNDWORM

Introduction– Raccoons are the vector of ascarid roundworms.

Clinical Signs– No known symptoms.

Diagnosis– Adult parasites can be seen in the intestinal tract of raccoons. Fecal flotation can be used to examine feces under a microscope for the presence of eggs.

Transmission– Adult worms present in the intestinal tract shed eggs in the feces of raccoons. The egg then develops into a larva until they are ingested by mammals. Once ingested, the larvae develop into adult worms in the intestinal tract of that animal and then migrate to other organs and the central nervous system. In wild animals, the cycle is completed when raccoons eat the carcasses of infected animals. In humans, raccoon roundworm is an end host.

Public Health Implications– The larvae of raccoon roundworms are infectious to humans if ingested. There have been human fatalities confirmed because of the ingestion of raccoon roundworm. Humans should avoid contact with raccoon feces, particularly where sufficient time has elapsed for the eggs to develop to the infectious larval stage. Rubber gloves should be worn when handling animals, when handling traps that have contact with raccoon feces, and when handling other material that may have contact with raccoon feces. Care should be exercised in handling infected material to not stir up dried feces. Hands and equipment should be thoroughly washed when contact with raccoon feces has oc-



AVIAN CHOLERA

Introduction– Most birds and mammal species can become infected with this bacterial disease as it has multiple strains. There is usually one strain, Type 1, that can be found in wild birds. The most commonly affected birds are ducks, geese, coots, gulls, and crows.

Clinical Signs– This disease has a sudden onset and sick birds usually are not seen because the disease normally kills birds rapidly, resulting in large die-offs in wild ducks and geese. Body condition of the birds is usually good. If any sick birds are present they will appear lethargic, and when captured may die in a short period of time. Visual signs to look for are swimming in circles, throwing head back between wings, erratic flights, and mucous discharge from the mouth, and blood-stained droppings.

Diagnosis– Look for hemorrhages on the liver, heart, intestines, and gizzard. The liver may appear dark in color and may be swollen and rupture when handled. In the upper digestive tract, food that was recently ingested may be present, but the lower tract may contain a thick yellowish viscous fluid that contains the bacteria.

Transmission– Bacteria is usually transmitted by bird-to-bird contact, contact with feces or secretions of infected birds, or ingestion of food or water that containing the bacteria. Aerosol transmission can occur also. The bacteria can survive in soil and water for up to four months.

Public Health Implications– Humans are not at high risk for infection, but it is recommended to wear gloves and wash hands when handling sick or dead birds.

AVIAN INFLUENZA

Introduction– Avian Influenza is present in many strains. Wild waterfowl can be carriers of the Type A virus which can be classified into two different categories: low pathogenic avian influenza (LPAI) A viruses, and highly pathogenic avian influenza (HPAI) A viruses. Wild waterfowl carry the virus in their intestines and respiratory tract, but usually do not get sick. Wild birds are viewed as hosts for this virus and it can be spread to domesticated birds such as ducks, turkey, and chickens. Domesticated birds can get very sick or even die from this virus.

Clinical Signs– In wild birds, there usually are no signs of the virus as they are carriers of the disease.

Diagnosis– Diagnosis is made through oral or cloacal swabbing. Contact your local ODNR Division of Wildlife district office to see if the birds qualify for testing.

Transmission– Infected waterfowl can spread the virus through nasal secretions, saliva, and feces. Susceptible birds become infected when they encounter the virus as it is shed by infected birds. Transmission also occurs when a susceptible bird has contact with surfaces that are contaminated.

Public Health Implications– Avian Influenza Type A viruses usually do not infect humans, but rare cases have been reported. These rare cases have occurred after direct or close contact with infected poultry.

BOTULISM

Introduction– Botulism comes in many forms. Botulism Type C is a common disease of waterfowl, but it can also occur in mammals or other birds. Botulism Type E is a common disease of mergansers, loons, and gulls.

Clinical Signs– The botulism toxin produces paralysis of muscles in animals. Often, the animal has the inability to walk or fly. Because of a paralysis of neck muscles caused by the toxin, the animal often is found with its head laying to the side or underwater.

Diagnosis– In live birds, botulism is often suspected by visually confirming the clinical signs such as birds with their heads under water and loss of coordination. In many cases there are many dead birds lying in the water together along with some additional birds that are dying. Suspected animals can be tested by sampling their blood either right before death or soon after death. Most times the disease is associated with periods of hot weather and stagnant water, and therefore animals needing to be tested must be immediately refrigerated. Frozen samples often impair the ability to test for the toxins.

Transmission– The bacteria grows in decaying organic matter in the water, including dead vertebrates (such as dead waterfowl) and invertebrates. Maggots on the carcasses will concentrate the toxins within the dead animal and when eaten by other animals, passes the large toxin concentration onto the animal eating the carcass. Recent studies have shown that botulism spores can persist for years, leading to subsequent outbreaks of the disease.

Public Health Implications– Type C botulism in humans has not been associated with botulism in waterfowl. However, Type E botulism is highly toxic to humans. Basic sanitary procedures should be followed for Type C, however, if Type E is suspected contact your local ODNR Division of Wildlife district office to determine if the birds need tested and the proper way to handle the species affected.

CANINE DISTEMPER

Introduction– Canine distemper in Ohio is often found in raccoons, skunks, foxes and coyotes. Other species potentially susceptible are mink, weasel and otter. Supplemental feeding by people such as bird feeders, outdoor domestic pet feeding stations can increase incidents of distemper in wild animals.

Clinical Signs– Canine distemper is often mistaken for rabies because the signs are similar. Symptoms include coughing, sneezing, diarrhea, respiratory distress, or discharge from the eyes and noses which can cause a crusty appearance around the face. The animal may have tremors, convulsions or seizures or show signs of mutilation.

Diagnosis– If there is a human or pet exposure, please contact your local health department or local ODNR Division of Wildlife district office for recommendations on testing. For dead animals, carcasses can be refrigerated to preserve the specimen until contact can be made to determine need to test.

Transmission– Transmission is by contact with infected animals or their excretions or secretions such as the discharge from the eyes or nose or urine.

Public Health Implications– Humans cannot contract canine distemper, however if there has been contact with a human to a suspect animal the same procedure should be followed for submission of the animal for rabies testing because of the similarity in the clinical signs. If a domestic pet has come in contact with a suspect animal, encourage the owner to contact their veterinarian in regards to the potential exposure to the pet.

ECHINOCOCCUS INFECTION

Introduction– This is a parasite disease caused by infection from a tiny (less than 1/8-inch long) tapeworm. Red foxes are the major host of this tapeworm.

Clinical Signs– Red foxes that are infected normally do not show signs of the disease.

Diagnosis– Eggs can be detected in the feces of infected foxes, but they are impossible to distinguish from eggs of other common tapeworms. Infected animals can be determined best at necropsy by recovery and identification of adult tapeworms which can be found in the intestine of the fox.

Transmission– Transmission can be made by accidentally ingesting eggs shed in the feces of definitive host.

Public Health Implications– Humans are susceptible to infection by the larval stage of *E. multilocularis*, which causes alveolar hydatid disease in people. When eggs that are shed from the host are accidentally ingested, the larvae develop into large cysts that destroy the liver. Humans who have regular contact with fox or coyotes are more susceptible to this disease because eggs are immediately infectious when shed in the feces of foxes or coyotes.

E. COLI

Introduction– *Escherichia coli* is a naturally occurring bacteria that can be found in digestive tracts of warm-blooded animals.

Clinical Signs– *E. coli* may cause gastrointestinal problems such as nausea, vomiting, and diarrhea when present in large amounts. Some *E. coli* can even cause urinary tract infections and respiratory sickness. Symptoms usually last for about a week or two.

Diagnosis– Typical diagnosis can be initially made by visualizations of the clinical signs.

Transmission– *E. coli* is contagious and can spread easily when a person does not wash their hands after handling raw food or feces.

Public Health Implications– People who are around animals should wash their hands frequently as the bacteria can spread by handling the animal or touching objects that are contaminated.

GIARDIA

Introduction– Beavers, muskrats, voles, coyotes, and others are susceptible to infection by protozoan parasites and are considered a host for carrying this parasite.

Clinical Signs– Clinical signs are not reported in wild mammals, but in humans and domestic pets, it may cause diarrhea, upset stomach, abdominal pain, and dehydration.

Diagnosis– Diagnosis is made by microscopic examination of feces.

Transmission– Once the parasite is passed through feces of the host, it can survive for weeks or even months. A person can become infected by swallowing the parasite, for example by drinking contaminated water. It cannot be passed through contact with blood.

Public Health Implications– Giardia is one of the most common water-borne diseases. Most outbreaks occur from drinking contaminated water from streams, rivers, or lakes.

HANTAVIRUS

Introduction— Rodents are the primary reservoir hosts of Hantavirus. The deer mouse is likely the principal reservoir in Ohio, however the white-footed mouse could also be a reservoir. Ultimately, all rodents likely have the potential for carrying the viruses.

Clinical Signs— Human infection with some Hantavirus causes an acute, severe respiratory disease in which affected patients have difficulty breathing because of rapid fluid build-up in the lungs. Rodents are asymptomatic carriers and do not show any clinical signs when infected.

Diagnosis— Diagnosis of hantavirus is made by looking for antibodies in the serum of patients or by demonstrating hantavirus antigen or RNA in tissues.

Transmission— Human infection occurs when virus particles aerosolized from rodent urine, feces, or saliva are inhaled. Transmission is also possible from handling rodents.

Public Health Implications— Residents of houses with heavy rodent infestation or workers who have frequent contact with rodents such as commercial nuisance wildlife control operators have a higher risk of infection. However, the overall risk of infection with Hantavirus is considered low. You should use safety precautions such as use of a half-face air-purifying filter, rubber gloves when handling traps and rodents, disinfection of supplies, and proper disposal of carcasses.

HISTOPLASMOSIS

Introduction— While wild animals are not directly responsible for spreading histoplasmosis, animals, especially birds and bats, are responsible for creating an enriched organic environment in their fecal droppings that allows the fungus to grow as a mold.

Clinical Signs— Flu-like symptoms with respiratory involvement is the most common problem in humans.

Diagnosis— Anytime you are working in large areas of bird feces or bat guano you should assume the fungus is present. Confirmation of its presence can be made in a laboratory under microscope.

Transmission— Histoplasmosis is not transmissible from human to human. Transmission occurs when the spores of the fungus are inhaled either physically or aerially when working around large amounts of bird feces or bat guano.

Public Health Implications— Up to 80 percent of people become infected with histoplasmosis with an average of 90 percent of infections in people with normal immune systems going without symptoms. In some rare cases severe systemic disease can occur. When in areas of potential histoplasmosis such as large quantities of bird feces or bat guano, preventative measures such as minimizing disturbance of the feces or guano and wetting it before removal as well as use of an appropriate protective face mask is suggested. Areas can be decontaminated with the use of household chlorine bleach solution containing 5 percent sodium hypochlorite.

LEPTOSPIROSIS

Introduction— This disease can be found any in a wide variety of wild mammals. It is caused by members of the bacterial species *Leptospira interrogans*, which is represented by more than 180 serologically distinct varieties.

Clinical Signs— Most wild animals have not been studied for signs of leptospirosis, but isolation from clinically normal animals show very little to any signs.

Diagnosis— Diagnosis can be made by using fluorescent antibody staining of fresh tissues. Serologic testing of blood for antibodies can also be used on wild animals for leptospiral infection. Preferred diagnostic specimens are a live animal or fresh tissues such as a kidney, blood serum, or tissues preserved in 10 percent buffered formalin.

Transmission— Organisms can last a long length of time in alkaline waters or moist soils. Ingesting water or food contaminated with urine from an infected animal is the primary route of transmission.

Public Health Implications— Humans who are infected with leptospirosis can have unapparent to severe disease with fatalities. Clinical signs usually result in fever, headaches, weakness, and vomiting. Severe cases can include meningitis, renal failure, and death. Sources of organisms can be water, soil, or infected animals.

LYME DISEASE

Introduction— Rodents, especially the white-footed mouse in Ohio, are the primary reservoir for the disease. All mammals are considered hosts for the black-legged ticks. There is even evidence that birds and reptiles can also be considered hosts for Lyme disease.

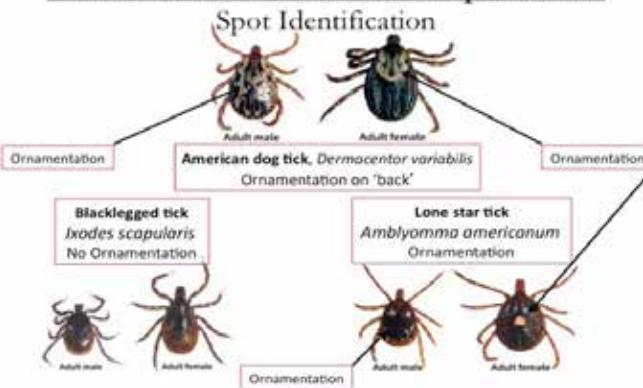
Clinical Signs— Clinical signs of Lyme disease in an animal typically is neurologic impairment. There is usually a red rash that appears at the bite site and the rash may spread out to 5 inches or more from the site of the bite. The animal usually exhibits flu-like symptoms as the spirochete spreads.

Diagnosis— Diagnosis is typically made by a physician through sampling of blood.

Transmission— Transmission occurs when an animal is bitten by an infected blacklegged tick and the tick passes the spirochete onto the animal. When the host is bitten by the larvae or nymph stage of the black-legged tick, it passes the spirochete onto the tick. The tick then in turn passes the spirochete onto the next host.

Public Health Implications— Humans and animals in areas where the blacklegged tick exists should consider themselves susceptible to getting bit especially in areas of mid-height grass and shrubs. However, the disease is treatable in the early stages with antibiotics. If you develop a rash from the area of a tick bite you should contact your physician immediately. When possible, it is important to use insect or tick repellents, tuck pant legs into socks, and frequently search for and appropriately remove the ticks when in areas of known populations of blacklegged ticks.

Three Ixodid Ticks of Importance



PARVOVIRUS

Introduction— There are two main carriers of parvovirus in Ohio, raccoons and coyotes.

Clinical Signs— Common signs of the parvovirus in animals is diarrhea, dehydration, and depression followed rapidly by death. Also, the intestines of the animal are often reddened.

Diagnosis— Initial diagnosis can typically be made by visualization of the clinical signs of an animal. Confirmation can be made by submitting refrigerated fresh intestines for sampling.

Transmission- Transmission from animal to animal is typically through contact with infected feces. The virus is very stable in the environment and can persist for several weeks in fecal material.

Public Health Implications- There are no known human health concerns with parvovirus. If a domestic pet has come in contact with a suspect animal, encourage the owner to contact their veterinarian in regards to the potential exposure to the pet.

RABIES

Introduction- In Ohio, raccoons, skunks, and bats are the primary vector species of rabies. However, all mammals are susceptible to rabies including humans. Birds are not capable of contracting rabies.

Clinical Signs- Animals with rabies typically have marked changes from normal behavior. Common signs of rabies are aimless wandering, lethargy, lack of coordination, and paralysis. Less frequent, animals become vicious at any moving object and often leads to self-mutilation.

Diagnosis- Diagnosis of the virus cannot be made on a live animal. Trapped wildlife suspected of having rabies should be euthanized without damage to the brain, double bagged, if possible kept cool but not frozen and contact with the local health department should be made by the next business day.

Transmission- The primary way the rabies virus is transmitted is by the bite of an infected animal or by exposure to open wounds of the saliva or bodily fluids of an animal.

Public Health Implications- In cases where there has been contact with a human or a pet and rabies is a possibility, especially when there has been contact with raccoons, skunks, or bats you should insist the person contact their local health department by the next business day with a history of who and what has had contact with the animal. Rubber gloves should be used to handle the animals. Human and pet exposure to rabies should be treated seriously. Once symptoms of rabies start showing, the disease is almost always 100 percent fatal for the human or pet. Pre-exposure rabies vaccinations are available through your doctor and is strongly encouraged for those who routinely handle wild animals (such as commercial nuisance wild animal control operators).

SALMONELLOSIS

Introduction- Almost any animal can be a host for salmonellosis. However, birds and reptiles tend to be the primary vectors for transmission to humans.

Clinical Signs- Clinical signs of salmonellosis in wildlife can be difficult to notice, but can sometimes be recognized when an animal is having difficulty swallowing, loss of appetite, or intense thirst. In humans it causes diarrhea, acute gastroenteritis, or meningitis.

Diagnosis- This disease is often suspected when several dead birds are found in an area and when, based on observations, conjunctivitis is ruled out. However, confirmation can be made by culturing the bacteria in a laboratory from samples of the liver or spleen from refrigerated carcasses.

Transmission- Transmission primarily occurs when handling individuals infected with the bacteria. However, objects that come in contact with infected animals, such as bird feeders, can also harbor salmonellosis and provide a method of transmission to other animals including humans.

Public Health Implications- Humans and animals are highly susceptible to salmonellosis and proper hand washing as well as washing of equipment such as cages and bird feeders with hot soapy water will greatly reduce the spread of the bacteria.

SARCOPTIC MANGE

Introduction- The causative agent leading to the clinical signs are mites. There are many types of mange and in most cases, mange mites are species specific. Sarcoptic mange occurs in red fox and coyotes but can also be passed to domestic dogs. Mange in fox has been linked with the use of rodenticide.

Clinical Signs- Animals with mange spend an inordinate amount of time scratching, chewing, or licking infected skin. The skin of animals with mange will often have a crusty appearance which is a result of the scratching or chewing. Significant hair loss is usually also seen on animals with mange. At times, animals can appear weak or emaciated, especially when infected during the winter months.

Diagnosis- A typical diagnosis is made by visualizing clinical signs of the mite's presence. Confirmation of the disease can be made by viewing skin scrapings under a microscope to look for the mites.

Transmission- Transmission from one animal to another is made when direct contact is made with an infected animal. The mite itself will not kill the animal. However, the open wounds caused by the scratching or chewing can lead to infection, sometimes causing the animal to become sick or die. In addition, animals with severe hair loss in the winter may become susceptible to hypothermia and die from exposure to the harsh winter elements.

Public Health Implications- Humans can get sarcoptic mange from close contact with infected animals. However, it is possible if the mites are on a human for that person to experience severe itching when regularly handling mangy animals.



STAPHYLOCOCCOSIS

Introduction- Staphylococcosis is a common bacteria found on the skin and membranes of most animals. It can occasionally be found in wild rabbits. Caution should be given especially when the person handling an animal has lesions or cuts that may come into contact with the animal.

Clinical Signs- Clinical signs are not specific although listlessness, emaciation, and lameness may occur in rabbits.

Diagnosis- Diagnosis is made by examination of the lymph nodes, blood, or organs from a fresh dead animal with gross lesions. Carcasses should be refrigerated and preferably not frozen.

Transmission- Biting arthropods such as ticks or fleas may produce localized tissue damage and allow invasion of the bacteria. Transmission can also occur when a lesion or cut comes into contact with the bacteria on the animal.

Public Health Implications- Rabbits with staphylococcosis should not be consumed due to the fact that lesions resemble tularemia. Tularemia can have significant human significance. Properly washing hands after handling a wild animal will help reduce the potential for transmission.

TULAREMIA

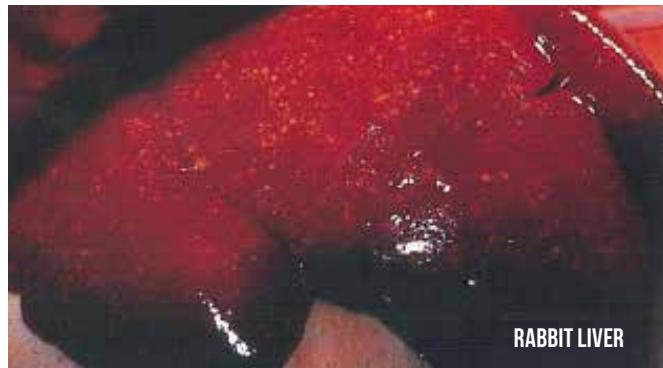
Introduction— The most common carriers of tularemia are cottontail rabbits and rodents such as beavers and muskrats.

Clinical Signs— Clinical signs of wildlife with tularemia are often variable and often go unnoticed. With live animals they may become lethargic or show incoordination. Most times tularemia is detected with dead animals. On dead animals, the liver and spleen can have pinpoint white spots on them. In humans, tularemia typically manifests in a fever, infected sores at the point of entry of the disease, swollen lymph nodes, and general flu-like symptoms that progresses rapidly to debilitation.

Diagnosis— Diagnosis can initially be made by noticing the pinpoint white lesions on the liver and spleen.

Transmission— Tularemia has been found to be transmitted by all known epidemiologic routes. With terrestrial animals, the transmission is typically through fleas and ticks being passed from one animal to the next. In aquatic mammals the organism is thought to be primarily waterborne.

Public Health Implications— Tularemia is a life-threatening human disease and extreme caution should be used when handling animals, especially cottontail rabbits, beavers, muskrats, and other rodents. Anyone with potential exposure, especially in conjunction with exhibiting symptoms, should contact their physician immediately. With prompt antibiotic treatment, few cases are fatal. Fortunately, tularemia is not well documented in Ohio, but all precautions should be taken when handling species considered as a vector or in areas where it has been documented.



WEST NILE VIRUS

Introduction— The primary hosts of West Nile Virus are birds. However, mammals, including humans, and even reptiles can contract the virus.

Clinical Signs— Clinical signs can range from unnoticeable to dead animals but is variable depending on the species. Some animals will exhibit lethargic behavior, lack of coordination, or unresponsiveness.

Diagnosis— A confirmation diagnosis cannot be made by visual signs, however there are several ways to sample for the virus. Diagnosis confirmation in Ohio is only needed when a large number of birds in a particular area are found dead.

Transmission— Transmission is primarily through bites from mosquitos, primarily of the *Culex* genus. However, there have been some studies that have shown transmission by direct contact with some bird species.

Public Health Implications— West Nile Virus primarily affects birds. However, humans are susceptible to the disease. In most cases, humans contract the virus from being bitten by an infected mosquito. Because there is a possibility of direct transmission from birds, care should be taken to not handle potentially infected dead birds with bare hands. Also, care should be taken when working in environments of stagnant water, which is a com-

mon breeding area of the *Culex* mosquitos, by using mosquito repellent products or wearing long sleeves and pants, especially during sunset when the mosquitos become very active.

WHITE-NOSE SYNDROME

Introduction— White-nose syndrome (WNS) is named for the white fungus observed growing around the noses of affected bats. This aggressive fungus attacks the exposed skin of bats while they hibernate, resulting in dehydration, unrest, and increased activity. Affected bats quickly burn through stored energy and often die in the caves and mines where they hibernate, or out on the landscape. Since its discovery, WNS has been confirmed in 35 states (including Ohio) and Canada. Over 6 million bats have died as a result of this disease, which continues to spread. As a result of the drastic population declines caused by WNS, it has become increasingly important to reduce other sources of bat mortality. Spores of the fungus that causes WNS can remain on materials and be transported from one location to another. Decontamination protocols should be followed to reduce the risk of transmission of the fungus to other bats and locations.

Clinical Signs— Bats with white-nose syndrome are characterized by the following: white fungus on the body, bats flying outside during the day in very cold temperatures, bats clustered near the entrance of hibernacula, or dead and dying bats during winter months.

Diagnosis— A presumptive diagnosis can be made by a bat exhibiting any of the clinical signs. However, a confirmative diagnosis must be done in a lab.

Transmission— The fungus often grows into white tufts on the muzzles of infected bats. The fungus infects the exposed epidermis on bat's skin during hibernation, which ultimately causes the death of the bats infected. Bats infected with WNS transmit the disease and spores to other bats through direct contact with each other. However, experts believe humans can carry the spores that cause WNS on their clothing from contaminated sites which increases the spread of the disease. Anything that comes into contact with a bat should be disposed of in the trash or decontaminated according to the most recent national decontamination protocols available at whitenosesyndrome.org. The most common items that require disposal or decontamination include cones, tubes, chutes, and mesh that are used to construct one-way doors.

Public Health Implications— White-nose syndrome does not affect human health. However, extreme caution should be taken to eliminate transmission on equipment and clothing to eliminate the spread from one location to another.



CHAPTER 7 - METHODS OF EUTHANASIA FOR FREE RANGING WILDLIFE

Resource: AVMA Guidelines for the Euthanasia of Animals: 2020 Edition* pgs. 97-99

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S7.6 FREE-RANGING WILDLIFE; PG 97

S7.6.2 SPECIAL CONSIDERATIONS

The primary factor influencing methods selected for euthanasia of free-ranging wildlife is lack of control over the animal. Given that close human contact is stressful and difficult to achieve for most free-ranging animals, these animals may have to be euthanized or immobilized from a distance. In some cases (eg, suburban areas), discharge of a firearm is illegal, is considered a serious threat to human safety, or may be inappropriate for other reasons.

S7.6.3 METHODS

S7.6.3.1 ACCEPTABLE METHODS

S7.6.3.1.1 NONINHALED AGENTS

Chemical methods of euthanasia applicable to free-ranging wildlife include overdoses of injectable anesthetic agents (including barbiturates), T-61, or other agents that are listed as acceptable for domestic animals or captive wildlife. Premedication with an injectable or inhaled agent may reduce animal distress and/or human safety risks, under some circumstances.

S7.6.3.2 ACCEPTABLE WITH CONDITIONS METHODS

S7.6.3.2.1 INHALED AGENTS

Inhaled anesthetics— Inhaled anesthetics are acceptable with conditions for euthanasia of avian and mammalian wildlife species when these methods are more practical than acceptable methods, and where the limitations of this method are understood and addressed.. Smaller species that can be confined in enclosed containers can be euthanized using open-drop methods of administration. **Carbon dioxide, carbon monoxide, and other inert gases**—These agents, which are classified as being acceptable with conditions for domestic animals, are also acceptable with conditions for euthanasia of free-ranging wildlife. Conditions that must be met for using these agents are similar to those for domestic animals.

S7.6.3.2.2 PHYSICAL METHODS

Gunshot is acceptable with conditions for euthanasia of free-ranging, captured, or confined wildlife, provided that bullet placement is to the head (targeted to destroy the brain). Gunshot targeted to the heart (chest) or to the neck (vertebrae, with the intent of severing the spinal cord) presents challenges for accurate placement, but may be the best option for free-ranging or other settings where close approach is not possible or where the head must be preserved for disease testing (rabies, chronic wasting, or other suspected neurologic diseases).

S7.6.3.3 ADJUNCTIVE METHODS

Potassium chloride— Potassium chloride may be administered IV or intracardially to stop the heart of animals that are deeply anesthetized or unconscious. Administration of potassium chloride can also be preferred for large animals when administered with barbiturates, where volume of administration is a limitation.

Exsanguination— Bleeding may be used as an adjunctive method to ensure the death of animals that are anesthetized or otherwise unconscious. The aesthetics of this procedure and its acceptance by personnel and observers should be considered.

Cervical dislocation or decapitation— Applied to small mammals and birds, this method may be useful as an adjunct or as a first-step method of euthanasia. A paucity of data for wildlife and the potential for interspecies variation create challenges for establishing specific size recommendations. However, on the basis of data for domestic animals, manual cervical dislocation without the use of tools may be appropriate for birds < 3 kg, rodents < 200 g, and rabbits < 1 kg.³⁶⁵ A secondary method such as decapitation or exsanguination should be employed to ensure death when feasible.

Thoracic compression—Thoracic compression may be useful in rare circumstances in animals that are deeply anesthetized or otherwise unconscious, or as a final, confirmatory method to ensure death when the animal's status is uncertain.

ADDITIONAL RESOURCES

Ohio Division of Wildlife <https://ohiodnr.gov/discover-and-learn/safety-conservation/about-ODNR/wildlife>

Center for Disease Control cdc.gov

Internet Center for Wildlife Damage Management <https://icwdm.org/>

Ohio Department of Health <https://odh.ohio.gov/>

White-nose Syndrome <https://www.whitenosesyndrome.org/>

AVMA Euthanasia Guidelines <https://www.avma.org/resources-tools/avma-policies/avma-guidelines-euthanasia-animals>

READY TO TAKE THE TEST?

The Commercial Nuisance Wild Animal Control Operator license is considered a specialty license. Information regarding this license, including the test, study materials, and application can be found at <https://ohiodnr.gov/buy-and-apply/regulatory-permits/commercial-wildlife-permits/nuisance-wild-animal-control-operator>

