

# NUISANCE WILD ANIMAL CONTROL CERTIFICATION MANUAL

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## Chapter 1 - Introduction

This manual is designed to provide you with the basic information you need to know to act as a commercial nuisance wild animal control operator in the State of Ohio. It is not intended to provide complete coverage of all methods, techniques and other matters. It will provide information regarding the laws you need to be aware of, methods you can use, life histories of some of the wild animals you may be dealing with, ethical considerations as well as 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 the owner's or operator's 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 within a distance of the person being supervised that enables uninterrupted, unaided visual and auditory communications.

### LICENSING

Ohio Revised Code 1531.40 states that "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."

If you are providing a nuisance wild animal removal or control services, and you are charging a fee or demanding some other form of compensation, you must have a valid Commercial Nuisance Wild Animal Control Operator License, or working on behalf of someone possessing such 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, or municipal corporation, as applicable, as part of the individual's employment is exempt from obtaining a license under this section.

The fee for obtaining a Commercial Nuisance Wild Animal Control Operator License is \$40.00 per year. The license must be renewed annually.

### CERTIFICATION

Certification is required for a commercial nuisance wild animal control operator and any individual who is working on behalf of an operator that 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 on-site supervision of a certified operator or employee are exempt from certification.

Certification is valid for three years, and requires passing a test.

## **PENALTIES**

A violation of the nuisance wild animal control laws or rules in Ohio may result in criminal charges. Most of these potential violations are classified as a Misdemeanor of the Fourth Degree, resulting in a possible penalty of up to \$250 in fines and/or 30 days in jail for an individual. An organization or business facing charges at this level may be fined up to \$2,000. A violation involving the illegal taking or possession of a deer or turkey may result in Third Degree Misdemeanor charges, resulting in up to \$500 in fines and/or 60 days in jail, or a \$3,000 fine for an organization or business. A violation of endangered species regulations (First Degree Misdemeanor) may result in fines of up to \$1,000 and/or six months in jail or for a business or organization a fine of \$5,000. In addition, any conviction for the illegal taking or possession of a wild animal may result in civil restitution being ordered and/or a revocation of licenses.

Other laws or rules apply, and it is up to the nuisance wild animal control operator to familiarize themselves with any laws regulating the activities they are involved in (pesticide application, migratory bird control, etc.)

It is also important to understand that all Nuisance Wild Animal Control Operators may be charged under the following section 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. This section of law includes trappers as well as hunters.

### ***1533.171 Prohibiting injuring persons or property while hunting.***

**(A) No person, in the act of hunting, pursuing, taking, or killing a wild animal, shall act in a negligent, careless, or reckless manner so as to injure persons or property.**

## Chapter 2 – Laws concerning nuisance wild animal control techniques and methods

This chapter will deal with the main points of the nuisance wild animal control laws and regulations. There are a number of laws and regulations dealing with the control of nuisance wild animals. For a complete review of the laws please contact the appropriate wildlife district office for your location (found at Wildohio.com) or review them at <http://codes.ohio.gov/>. Ohio Revised Code section 1531.40 and Ohio Administrative Code 1501:31-15-03 cover the primary laws regarding nuisance wild animal trapping. You may also find references for other relevant sections of law in the material to follow.

### MARKING TRAPS, SNARES OR OTHER DEVICES

All traps, snares or other unattended devices must be tagged with the name and address of the user, or the Commercial Nuisance Wild Animal Control Operator License number or your Wild Ohio Customer ID number. Information on the 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 or devices set for the following are exempt from trap monitoring requirements:

- Mice
- Nuisance rats
- Moles
- Shrews
- Voles

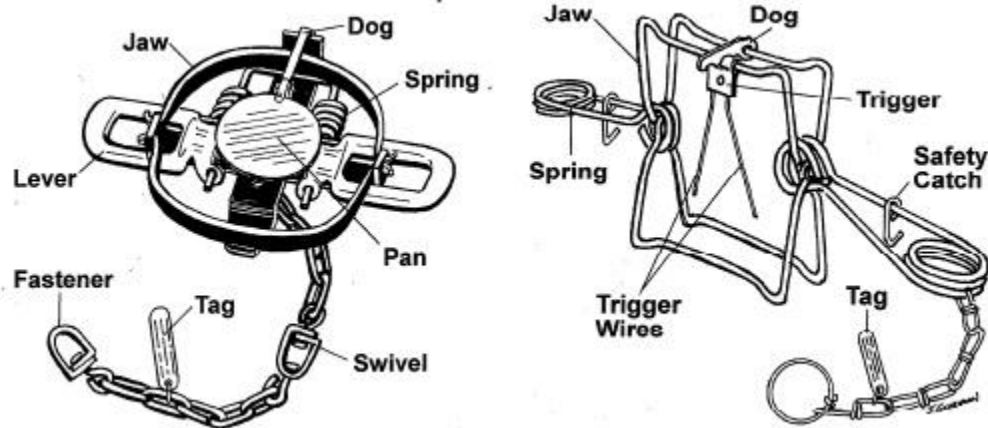
Traps set for the following under ice must be checked every 72 hours:

- Beaver
- River Otter
- Muskrat

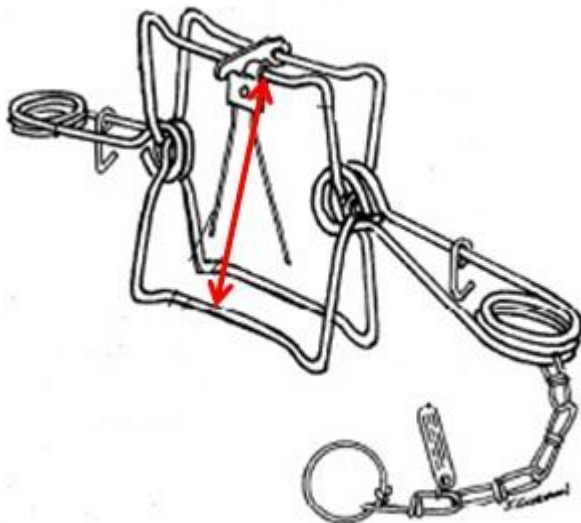
All other traps, snares or other unattended devices must be checked at least once **every calendar day**.

### HOW TO MEASURE A TRAP

For the purposes of this rule, traps shall be measured in the open set position, from the inside of the main trap jaws as produced by the manufacturer and shall not include jaw modifications or add-ons.



Body gripping trap – Body gripping traps shall be measured from the inside of the main jaw at the trigger assembly to the inside of the opposing jaw across the entrance window.



Foothold trap – Measurement of foot hold traps shall be made perpendicular to the frame at the widest location parallel with the dog. Measurement of foot hold traps without dogs shall be made

perpendicular to the frame at the widest location parallel with the pan shank.



#### **ALLOWABLE TRAP SIZES**

Those operating under a Commercial Nuisance Wild Animal Control Operator License are able to use the following trap sizes

##### **Body gripping trap**

On land – It shall be unlawful for any licensed commercial nuisance wild animal control operator to set, use, or maintain a body gripping trap, on land for the purpose of taking a nuisance wild animal, that has an inside diameter jaw spread larger than six inches in diameter, except when trapping woodchucks.

In water - It shall be unlawful for any person at any time to set, use, or maintain a body gripping trap, in the water for the purpose of taking a nuisance wild animal, that has a jaw spread larger than seven inches except while completely submerged.

##### **Foothold trap**

It shall be unlawful for any licensed commercial nuisance wild animal control operator to set, use, or maintain a foot hold trap, on land for the purpose of taking a nuisance wild animal, that has an inside diameter jaw spread larger than six inches.

##### **Snare (non-spring assisted)**

It shall be unlawful to set a snare with a loop diameter of greater than fifteen inches.

##### **Snare (spring assisted)**

On land – It shall be unlawful for any person to use a spring-loaded, spring-assisted or mechanical device on a snare that is designed or marketed as a lethal snare that has a loop diameter greater than five inches on land.

In water – It shall be unlawful for any person to use a spring-loaded, spring-assisted or mechanical device on a snare that is designed or marketed as a lethal snare that has a loop diameter greater than eight inches in water.

### **TRAPS WITH TEETH**

It is unlawful for any person to use traps, for the purpose of taking a nuisance wild animal, having teeth on the jaws except traps set for a mouse, rat or mole as designed by the manufacturer.

### **SNARES**

It shall be unlawful to use any snare that is constructed of any material other than multi or single strand steel cable. Additionally, all snares, except those set by a commercial nuisance wild animal control operator 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 two and one half inches in diameter or a relaxing lock system with a breaking point of not greater than three hundred fifty pounds.

It shall be unlawful to use a snare 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 as defined in law.

### **USING FLESH BAIT**

It is unlawful to use any flesh bait that is not totally covered or concealed unless such bait is encapsulated by the trap.

### **DOGS**

It is unlawful to take a raccoon, opossum, skunk or fox with the use of dogs 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.

### **FIREARMS OR AIRGUNS**

Firearms or air guns may be used to take nuisance wild animals in some situations. It is important that any local restrictions against the use of guns be followed, i.e. no discharge in city limits, near schools, etc.

It is the responsibility of the nuisance wild animal control operator to be familiar with all applicable firearms laws, and to use them in a safe manner. The negligent use of a firearm or other implement to take a nuisance wild animal that results in damage to persons or property may result in charges for “negligent hunting” under Ohio Revised Code 1533.171

***1533.171 Prohibiting injuring persons or property while hunting.***

*(A) No person, in the act of hunting, pursuing, taking, or killing a wild animal, shall act in a negligent, careless, or reckless manner so as to injure persons or property.*

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 or other state statutes must be followed.

**TOXICANTS**

It is lawful to use a toxicant or chemical substance as a means of control for nuisance wild animals.

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. Remember, “The label is the law” when it comes to the use of toxicant or chemical substances.

A licensed commercial nuisance wild animal control operator must first possess the appropriate pesticide applicators license under chapter 921 of the Revised Code to use a toxicant or chemical substance for the taking or control of a nuisance wild animal. A pesticide applicators license is issued by the Ohio Department of Agriculture. Additional information on toxicants can be found in chapter 4.

**DISPOSITION OF NUISANCE WILD ANIMALS**

To prevent the issue of moving certain problem animals from one location to another, and due to concerns for the spread of disease, it is unlawful to fail to euthanize, or release on site, any live trapped nuisance:

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

Some live trapped animals may be released outside of city limits (with permission of the landowner where the release takes place), or may be euthanized. These species are:

- Squirrels -Red, Gray, Fox, and Flying
- Chipmunks

- Woodchucks
- Moles

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. Under some conditions however, it is impossible to live trap some animals. In these situations, written permission from the 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
- Shrews
- Voles
- Moles
- Muskrat
- Opossum
- Raccoon
- Rats
- Squirrels-Red, Gray, Fox and Flying
- Skunks
- Woodchucks
- Coyote
- Fox-Red or Gray

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 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. If in doubt, call your local Wildlife Officer or the Wildlife District Office.

It is unlawful to possess for more than four days any live nuisance wild animals trapped or taken under the authority of a Commercial Nuisance Wild Animal Control Operator's License.

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 the following nuisance wild animals may be sold at any time:
  - Raccoon
  - Opossum
  - Beaver

- Muskrat
  - Fox-Red or Gray
  - 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.

## **Chapter 3 – Species Specific Regulations**

### **MIGRATORY BIRDS**

There are times when migratory birds are responsible for damage to property or become a nuisance. European starlings, English sparrows, and common pigeons, other than homing pigeons, may be killed at any time and their nests or eggs may also be destroyed at any time. Unless specified below, all other migratory birds are protected under the Migratory Bird Treaty Act covered in the United States Code of Federal Regulations (50 CFR). The Migratory Bird Treaty Act is a treaty signed between the United States, Japan, Canada, Russia, and Mexico that establishes a “Federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird (16 U.S.C. 703). Removals of migratory birds, such as woodpeckers that are causing damage, require a depredation permit from the United States Department of the Interior, Fish and Wildlife Service (USFWS). The 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 USDA-Wildlife Services representative to determine if a permit is needed.

Inactive nests of non-colonial migratory birds may be removed.

### **CROWS**

It is lawful for any person to take crows, during the closed season, which 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.

### **GEESE**

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 such landowner where the damage or nuisance is occurring has received a permit from the Chief of the Division of Wildlife or their designee.

The Division of Wildlife representative approving a goose damage permit for a landowner may include specific stipulations on the permit under which geese, their nests or eggs may be trapped, captured, taken or destroyed. It is unlawful for any person to violate any stipulation set forth on their permit. A

violation of any permit stipulation is a violation of law, and the permit is subject to revocation by the Chief or their designee.

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 such landowner where the damage or nuisance is occurring has received a permit from the United States Department of the Interior, Fish and Wildlife Service. Information on obtaining this permit can be found in the Migratory Birds section at the beginning of this chapter.

## **DUCKS**

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

## **SWANS**

When the landowner does not have a bill of sale for the 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 where the damage or nuisance is occurring has received a permit from the Chief of the Division of Wildlife or their designee.

The Division of Wildlife representative approving a mute swan removal permit for a landowner may include specific stipulations on the permit under which mute swans, their nests or eggs may be trapped, captured, taken or destroyed. It is unlawful for any person to violate any stipulation set forth on their permit. A violation of any permit stipulation is a violation of law, and such permit is subject to revocation by the Chief or their designee.

## **WILD TURKEY**

Wild turkey, which are causing damage or have become a nuisance may be captured or killed by licensed commercial nuisance wild animal control operators or other persons, only after such landowner or agent of the landowner, where the damage or nuisance is occurring has received a permit from the chief of the Division of Wildlife or their designee.

The Division of Wildlife representative approving a permit for a landowner or agent of the landowner, to take, trap or capture wild turkey may include specific stipulations on that permit under which wild turkey may be captured or killed. It is unlawful for any person to violate any stipulation set forth on their permit. A violation of any permit stipulation is a violation of law and such permit is then subject to revocation by the chief of the division of wildlife or their designee.

## **DEER**

White-tailed deer which are causing damage or have become a nuisance may be captured or killed by a licensed commercial nuisance wild animal control operator or other persons, only after such landowner or agent of the landowner, where the damage or nuisance is occurring has received a permit from the Chief of the Division of Wildlife or their designee. Deer damage control permits are issued under the authority of Ohio Administrative Code 1501:31-15-08.

The Division of Wildlife representative approving a permit for a landowner or agent of the landowner, to take, trap or capture white-tailed deer may include specific stipulations on that permit under which white-tailed deer may be captured or killed. It is unlawful for any person to violate any stipulation set forth on their permit. A violation of any permit stipulation is a violation of law and such permit is then subject to revocation by the chief of the division of wildlife or their designee.

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

## **BLACK BEAR**

Black bear are a state-listed endangered species. In situations where a bear is a nuisance or is causing damage, you must contact the Division of Wildlife. Under certain conditions, a permit may be granted to remove the problem bear.

Black bear which are causing damage or have become a nuisance may be captured or killed by licensed commercial nuisance wild animal control operators or other persons, only after such landowner or agent of the landowner, where the damage or nuisance is occurring has received a permit from the Chief of the Division of Wildlife or their designee.

The Division of Wildlife representative approving a permit for a landowner or agent of the landowner, to take, trap or capture a black bear may include specific stipulations on that permit under which a black bear may be captured or killed. It is unlawful for any person to violate any stipulation set forth on their permit. A violation of any permit stipulation is a violation of law and such permit is then subject to revocation by the Chief of the Division of Wildlife or their designee.

## **BATS**

It shall be unlawful to euthanize or kill a bat unless a bite or potential exposure to zoonotic diseases has occurred. Any bat killed or 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 to the animal cannot be ruled out (i.e. exposure involving young children that cannot talk, mentally-impaired individuals, etc.), the health department must be

contacted. Only humane methods of euthanasia can be used for securing the specimen for rabies testing. Bats submitted for testing should be identified to species if possible.

It is important to understand that some bats are listed as state or federally endangered species. The Indiana bat is listed as both, and has a statewide distribution. Precautions must be taken to ensure that no Indiana bats are destroyed or disturbed unless potential exposure to zoonotic diseases has occurred. This will necessitate contacting the local health department by the end of the next business day.

## **WOODCHUCKS**

It is unlawful to use a body gripping trap with a jaw spread greater than seven inches across to take woodchucks.

It is unlawful to set, use, or maintain a body gripping trap to take woodchucks which is set more than three feet from the hole, or structure the woodchuck inhabits.

It is unlawful to set, use, or maintain a body gripping trap greater than five inches to take a woodchuck that does not have an enclosure or structure around the trap which prohibits other animals from getting into the trap from the outside.

It is unlawful for any person except licensed commercial nuisance wild animal control operators to use snares without a relaxing lock for the purpose of taking woodchucks.

## **ENDANGERED SPECIES**

It is unlawful to capture or kill nuisance wild animals listed as endangered in 1501:31-23-01 or listed as threatened in 1501:31-23-02 of the Administrative Code without a permit to do so issued by the Chief of the Division of Wildlife or their designee. Caution must be taken so as not to injure or destroy any of these species, except as permitted, including through the use of pesticides or other lethal means of control.

Some species of wildlife listed in the referenced sections of Administrative Code are also federally listed, and all federal laws regarding those species must be followed. Please contact the United States Fish and Wildlife Service (USFWS) for guidance.

## **OHIO'S ENDANGERED WILDLIFE**

### **(1) Mammals**

Indiana bat, *Myotis sodalis*

Allegheny woodrat, *Neotoma magister*

Black bear, *Ursus americanus*

Snowshoe hare, *Lepus americanus*

(2) Birds

Cattle Egret, *Bubulcus ibis*  
King rail, *Rallus elegans*  
Kirtland's warbler, *Dendroica kirtlandii*  
Common tern, *Sterna hirundo*  
American bittern, *Botaurus lentiginosus*  
Northern harrier, *Circus cyaneus*  
Sandhill crane, *Grus canadensis*  
Piping plover, *Charadrius melodus*  
Black tern, *Chlidonias niger*  
Bewick's wren, *Thryomanes bewickii*  
Loggerhead shrike, *Lanius ludovicianus*  
Lark sparrow, *Chondestes grammacus*  
Snowy Egret, *Egretta thula*  
Upland sandpiper, *Bartramia longicauda*

(3) Reptiles

Plains garter snake, *Thamnophis radix*  
Copper-bellied water snake, *Nerodia erythrogaster neglecta*  
Timber rattlesnake, *Crotalus horridus*  
Eastern massasauga, *Sistrurus catenatus*

**OHIO'S THREATENED WILDLIFE**

(1) Birds

Black-crowned night-heron, *Nycticorax nycticorax*  
Barn owl, *Tyto alba*  
Least bittern, *Ixobrychus exilis*  
Peregrine falcon, *Falco peregrinus*  
Trumpeter swan, *Cygnus buccinators*

(2) Mammals

Bobcat, *Lynx rufus*  
Eastern harvest mouse, *Reithrodontomys humulis*

(3) Reptiles

Kirtland's snake, *Clonophis kirtlandii*  
Spotted turtle, *Clemmys guttata*  
Blandings turtle, *Emydoidea blandingii*  
Lake Erie watersnake, *Nerodia sipedon insularum*

## Chapter 4 - WILD ANIMAL CONTROL TECHNIQUES

This chapter will detail some of the methods for controlling common nuisance wild animals. It does not discuss all available methods or all species of nuisance wild animals that may be encountered.

### TRAPS OR SNARES

The following chart lists several common species of wild animals and the recommended trap sizes for those species. In some cases, other sizes or trap types may prove to be more efficient. These recommendations come from the Ohio State Trappers Association Snare Guide, the Association of Fish and Wildlife Agencies Best Management Practices, manufacturer's recommendations and the United States Geological Survey Northern Prairie Wildlife Research Center.

Recommended Trap and Snare Sizes in Ohio					
All sizes in inches					
SPECIES	FOOTHOLD	BODY GRIPPING	SNARE LOOP/HEIGHT	LIVE/CAGE TRAP	Encapsulated (dog proof)
Raccoon	3 1/2-4 5/8 (2)	6 (land) 7 (part submerged) (2)	6 - 8/3 - 4 (1)	32X10X13 (2)	1 1/2 diameter 2 1/8 - 2 7/8 trigger depth
Woodchuck	No greater than 6	5-7 (3)	4 - 6/2 -3 (3)	32X10X13 (2)	not recommended
Muskrat	3 1/2 - larger (submerged) (2)	4 1/2-5 (2)	3 3/4 /1 1/2 (3)	24X6X6 (3)	not recommended
Mink	3 1/2 - 4 1/2 (2)	4 1/2 - 4 5/8 (2)	2 1/2 - 3 1/2 / 1 - 2 (3)	24X6X6 (3)	not recommended
Beaver	5 - 6 (land) 5 - 7 1/2 (submerged) (2)	7-12 (2)	9 - 10/2 - 3 (1)	39X43 suitcase (3)	not recommended
Red Fox	4 1/2-5 1/2 (2)	not recommended	6 - 8/6 - 8 (1)	42X15X15 (3)	not recommended
Gray Fox	4 5/16 - 4 1/2 (2)	not recommended	6 - 8/6 - 8 (1)	32X10X13 (2)	not recommended
Coyote	4 1/2 - 6 (2)	not recommended	10 - 12/10 - 12 (1)	48X26X20 (3)	not recommended
Skunk	3 1/2 - 4 1/2 (4)	6 (2)	4 - 6 (3)	24X7X7 up to 32X10X13 (2)	not recommended
Opossum	3 15/16 - 4 1/2 (2)	4 1/2 - 6 (3)	6/2 - 3 (3)	32X10X13 (2)	1 1/2 diameter 2 1/8 - 2 7/8 trigger depth

Chipmunks	Not recommended	rat sized snap traps	not recommended	16X5X5 (3)	not recommended
Flying Squirrels	Not recommended	rat sized snap traps	not recommended	16X5X5 (3)	not recommended
Squirrel (red )	Not recommended	rat sized snap traps	not recommended	16X5X5 (3)	not recommended
Squirrel (gray)	Not recommended	3 1/2 - 4 1/2 (3)	not recommended	19X6X6 (3)	not recommended
mice/shrews	Not recommended	mouse snap trap	not recommended	10X3X3 (3)	not recommended
moles	Not recommended	"NoMol, Out of Sight, Nash Loop, spears, or similar" (3)	not recommended	11X3.5X3.5 (3)	not recommended
Rats	Not recommended	rat sized snap traps	not recommended	16X5X5 (3)	not recommended
Rabbits	Not recommended	ILLEGAL	not recommended	24X7X7 (3)	not recommended
(1)	OSTA Snare Guide				
(2)	BMP - AFWA				
(3)	Manufacturer's Recommendations				
(4)	USGS Northern Prairie Wildlife Research Center				

## RACCOON

### Damage Prevention and Control Methods

#### Exclusion

Exclusion, if feasible, is usually the best method of handling raccoon damage. Poultry damage generally can be prevented by excluding the raccoons with tightly covered doors and windows on buildings or mesh-wire fences with an overhang surrounding poultry yards. Raccoons are excellent climbers and are capable of gaining access by climbing conventional fences or by using overhanging limbs to bypass the fence. A "hot wire" from an electric fence charger at the top of the fence will greatly increase the effectiveness of a fence for excluding raccoons. Damage to sweet corn or watermelons can most effectively be stopped by excluding raccoons with a single or double hot-wire arrangement.

Storing garbage in metal or tough plastic containers with tight-fitting lids will discourage raccoons from raiding garbage cans. If lids do not fit tightly, it may be necessary to wire, weight, or clamp them down to prevent raccoons from lifting the lid to get at garbage. Secure cans to a rack or tie them to a support to prevent raccoons from tipping them over. Prevent raccoon access to chimneys by securely fastening a commercial cap of sheet metal and heavy screen over the top of the chimney. Raccoon access to rooftops can be limited by removing overhanging branches and by wrapping and nailing sheets of slick metal at least 3 feet (90 cm) square around corners of buildings. This prevents raccoons from being able to get a toehold for climbing. While this method may be practical for outbuildings, it is unsightly and generally unacceptable for homes. It is more practical to cover chimneys or other areas attracting raccoons to the rooftop or to remove the offending individual animals than to completely exclude them from the roof. Homeowners attempting to exclude or remove raccoons in the spring and summer should be aware of the possibility that young may also be present. Do not complete exclusion procedures until you are certain that all raccoons have been removed from or have left the exclusion area. Raccoons frequently will use uncapped chimneys as natal den sites, raising the young on the smoke shelf or the top of the fireplace box until weaning. Homeowners with the patience to wait out several weeks of scratching, rustling, and chirring sounds will normally be rewarded by the mother raccoon moving the young from the chimney at the time she begins to wean them.

### **Habitat Modification**

There are no practical means of modifying habitat to reduce raccoon depredations, other than removing any obvious sources of food or shelter which may be attracting the raccoons to the premises. Raccoons forage over wide areas, and anything other than local habitat modification to reduce raccoon numbers is not a desirable technique for reducing damage. Raccoons sometimes will roll up freshly laid sod in search of worms or grubs. If sodded areas are not extensive, it may be possible to pin the rolls down with long wire pins, wooden stakes, or nylon netting until the grass can take root, especially if the damage is restricted to only a portion of the yard, such as a shaded area where the grass is slower to take root. In more rural areas, use of electric fences may be effective (see section on exclusion).

### **Frightening**

Although several techniques have been used to frighten away raccoons, particularly in sweet corn patches, none has been proven to be effective over a long period of time. These techniques have included the use of lights, radios, dogs, scarecrows, plastic or cloth streamers, aluminum pie pans, tin can lids, and plastic windmills. All of these may have some temporary effectiveness in deterring raccoons, but none will provide adequate long-term protection in most situations.

### **Trapping**

Raccoons are relatively easy to catch in traps, but it takes a sturdy trap to hold one. For homeowners with pets, a live or cage-type trap is usually the preferable alternative to a foot-hold or body-gripping traps. Live traps should be at least 10 x 12 x 32 inches and constructed with heavy materials. They can be baited with canned fish flavored cat food, sardines, fish, or chicken. Place a pile of bait behind the treadle and scatter a few small bits of bait outside the opening of the trap and just inside the entrance.

Traps with a single door should be placed with the back against a wall, tree, or other object. The back portion of the trap should be tightly screened with one-half inch (1.3 cm) 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. Because these traps do not allow for selective release of non-target catches, they should not be used in areas where risk of non-target capture is high. It is possible, however, to use body-gripping traps in boxes or on leaning poles so that they are inaccessible to dogs. Raccoons also can be captured in foothold traps. Use a No. 1 or 1 ½ coil spring or No. 11 double long spring. The foot encapsulating trap such as the Dog Proof (DP) and Egg trap are new foot-holding devices that are highly selective. Once captured, raccoons may be released immediately at the capture site or euthanized

## **Shooting**

Raccoons are seldom seen during the day because of their nocturnal habits. Shooting raccoons can be effective at night with proper lighting. It is lawful to take nuisance raccoons which cannot be live trapped because of certain conditions by shooting. It is unlawful to take a nuisance raccoons with a dog during the closed season. Check with local authorities before using any lethal controls for raccoons with village or city limits.

## **Toxicants or Fumigants**

The use of toxicants or chemical substances as a means of control for nuisance wild animals is now permitted. It is however, unlawful to use these substances contrary to the label instructions or manufacturer recommendations. Commercial nuisance wild animal control operators must first obtain a commercial pesticide license before using these substances to control nuisance animals.

A commercial pesticide applicator license may be obtained through the Ohio Department of Agriculture Pesticide and Fertilizer Regulation Section. A test is administered and study materials are available at <http://www.agri.ohio.gov/apps/odaprs/pestfert-prs-index.aspx>. Training for new applicants is conducted by Ohio State University. Contact them at <http://pested.osu.edu> or 614-292-4070 for training and to schedule an appointment to take the test. The license period is October 1 – September 30 and an annual fee applies. License holders are required to meet recertification requirements every three years to maintain their license.

## **SKUNK**

### **Damage Prevention and Control Methods**

#### **Exclusion**

Keep skunks from denning under buildings by sealing off all foundation openings. Cover all openings with wire mesh, sheet metal, or concrete. Bury fencing 1 1/2 to 2 feet (0.4 to 0.6 m) where skunks can gain access by digging. Seal all ground-level openings into poultry buildings and close doors at night. Poultry yards and coops without subsurface foundations may be fenced with 3-foot (1-m) wire mesh

fencing. Bury the lowest foot (0.3 m) of fencing with the bottom 6 inches (15.2 cm) bent outward from the yard or building. Skunks can be excluded from window wells or similar pits with mesh fencing. Place beehives on stands 3 feet (1 m) high. It may be necessary to install aluminum guards around the bases of hives if skunks attempt to climb the supports. Skunks, however, normally do not climb. Use tight-fitting lids to keep skunks out of garbage cans.

### **Habitat Modification**

Properly dispose of garbage or other food sources that will attract skunks. Skunks are often attracted to rodents living in barns, crawl spaces, sheds, and garages. Rodent control programs may be necessary to eliminate this attraction. Debris such as lumber, fence posts, and junk cars provide shelter for skunks, and may encourage them to use an area. Clean up the area to discourage skunks. Frightening Lights and sounds may provide temporary relief from skunk activity.

### **Repellents**

There are no registered repellents for skunks.

### **Toxicants or Fumigants**

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### **Trapping**

*Live or Box Traps.* Skunks can be caught in live traps set near the entrance to their den. When a den is used by more than one animal, set several traps to reduce the amount of time needed to capture them. Live traps can be purchased or built. 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. Before setting live traps, cover them with canvas to reduce the chances of a trapped skunk discharging its scent. The canvas creates a dark, secure environment for the animal. Always approach a trap slowly and quietly to prevent upsetting a trapped skunk. Gently remove the trap from the area and release or kill the trapped

skunk. Removing and transporting a live trapped skunk may appear to be a precarious business, but if the trap is completely covered, it is a proven, effective method for transporting a skunk.

*Foothold Traps.* Foothold traps should not be used to catch skunks near houses because of potential problem of scent discharge. To remove a live skunk caught in a Foothold trap, a tarp, or blanket can be placed over it to calm it down before dispatching it.

## **Shooting**

Skunks caught in foothold traps may be shot. Shooting the skunk in the middle of the back to sever the spinal cord and paralyze the hind quarters may prevent the discharge of scent. Shooting in the back should be followed immediately by shooting in the head. Most people who shoot trapped skunks should expect a scent discharge.

## **Other Methods**

### *Skunk Removal.*

The following steps are suggested for removing skunks already established under buildings.

1. Seal all possible entrances along the foundation, but leave the main burrow open.
2. Sprinkle a layer of flour 2 feet (0.6 m) in circumference on the ground in front of the opening.
3. After dark, examine the flour for tracks which indicate that the skunk has left to feed. If tracks are not present, reexamine in an hour.
4. After the den is empty, cover the remaining entrance immediately.
5. Reopen the entrance the next day for 1 hour after dark to allow any remaining skunks to exit before permanently sealing the entrance. A wooden door suspended from wire can be improvised to allow skunks to leave a burrow but not to reenter. Burrows sealed from early May to mid-August may leave young skunks trapped in the den. If these young are mobile they can usually be box-trapped easily using the methods previously described.

Where skunks have entered a garage, cellar, or house, open the doors to allow the skunks to exit on their own. Do not prod or disturb them. Skunks trapped in cellar window wells or similar pits may be removed by nailing cleats at 6-inch (15-cm) intervals to a board. Lower the board into the well and allow the skunk to climb out on its own. Skunks are mild-tempered animals that will not defend themselves unless they are cornered or harmed. They usually provide a warning before discharging their scent, stamping their forefeet rapidly and arching their tails over their backs. Anyone experiencing such a threat should retreat quietly and slowly. Loud noises and quick, aggressive actions should be avoided.

## **Odor Removal**

Many individuals find the smell of skunk musk nauseating. The scent is persistent and difficult to remove. Diluted solutions of vinegar or tomato juice may be used to eliminate most of the odor from

people, pets, or clothing. Clothing may also be soaked in weak solutions of household chloride bleach or ammonia. Neutroleum alpha is a scent-masking solution that can be applied to the sprayed area to reduce the odor. It is available through some commercial cleaning suppliers and the local USDA-APHIS-ADC office.

Walls or structural areas that have been sprayed by skunks can be washed down with vinegar or tomato juice solutions or sprayed with neutroleum alpha. Use ventilation fans to speed up the process of odor dissipation.

Where musk has entered the eyes, severe burning and an excessive tear flow may occur. Temporary blindness of 10 or 15 minutes may result. Rinse the eyes with water to speed recovery.

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Original Publication

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## **OPOSSUM**

### **Damage Prevention and Control Methods**

#### **Exclusion**

Prevent nuisance animals from entering structures by closing openings to cages and pens that house poultry. Opossums can be prevented from climbing over wire mesh fences by installing a tightly

stretched electric fence wire near the top of the fence 3 inches (8 cm) out from the mesh. Fasten garbage can lids with a rubber strap.

## **Trapping**

Opossums are not wary of traps and may be easily caught with suitable sized box or cage traps. No. 1 or 1 1/2 foot hold traps also are effective. Dirt hole sets or cubby sets are effective. A dirt hole is about 3 inches (8 cm) in diameter and 8 inches (20 cm) deep. It extends into the earth at a 45 degree angle. The foot hold trap should be set at the entrance to the hole. A cubby is a small enclosure made of rocks, logs, or a box. The foot hold trap is set at the entrance to the cubby. The purpose of the dirt hole or cubby is to position the animal so that it will place its foot on the trap pan. Place bait such as cheese, or slightly spoiled meat, fish, or fruit in the dirt hole or cubby to attract the animal. Using fruit instead of meat will reduce the chance of catching cats, dogs, or skunks. Fruit baits such as apples, cherries, peaches, and grapes can be used with success. A medium-sized body-gripping (kill type) trap will catch and kill opossums. Place bait behind the trap in such a way that the animal must pass through the trap to get it. Body-gripping traps kill the captured animal quickly. To reduce chances of catching pets, set the trap above ground on a running pole.

## **Shooting**

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

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## **MUSKRAT**

### **Trapping**

Traps set for muskrats may include foot hold traps or body gripping traps. Foothold traps set on land may not have a jaw spread larger than 5 5/8". It is not recommended to use foot hold traps for muskrats for live capture in dry land situations. There is no size restriction for foothold traps set in water. 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. There are many variations of foothold traps designed for muskrats and the BMP's for muskrats should be consulted for proper trap sizes.

Body gripping traps set for muskrats should be set in water and traps with a jaw spread between four inches and six inches are recommended. Body gripping traps with a jaw spread larger than five inches in diameter cannot be set on dry land for muskrats. 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. These runs or trails can be seen in clear water, or can be felt underwater with hands or feet. Which runs are being used and which are alternate entrances can usually be discerned by the compaction of the bottom of the run. 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. This style of trap is typically used in a lethal fashion, however if the run, or den entrance is in shallow water, the muskrat may survive. This style trap is not recommended in a non-drowning situation. The box trap made with heavy-gauge hardware cloth or welded wire doors. The doors are hinged at the top to allow easy entry from either end, but no escape out of the box. The traps are a 6 x 6-inch rectangular box, 30 to 36 inches long. Death from drowning occurs in a short time. The trap design also allows for multiple catches. Its flat bottom works well on most pond bottoms, streambeds, and in flooded fields or marshes, and it is easy to keep staked down in place.

A box or live trap may be effective, but are not typically used.

It is suggested that person's setting traps for Muskrats utilize the BMP's recommended for Muskrats.

## **Shooting**

Muskrats that are causing damage that cannot be live trapped because of certain conditions may be killed by shooting. Extreme care must be taken when shooting muskrats to diminish the likelihood of ricocheting bullets. For this reason, it is recommended that muskrats are only shot when on land. It is unlawful to take muskrats from a power craft.

## **DAMAGE PREVENTION AND CONTROL METHODS**

### **Exclusion**

Muskrats in some situations can be excluded or prevented from digging into pond dams or other shoreline areas through stone rip-rapping of the shoreline. Serious damage often can be prevented, if anticipated, by constructing dams to the following specifications: the inside face of the dam should be built at a 3 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 (2.4 m), preferably 10 to 12 feet (3 to 3.6 m). The normal water level in the pond should be at least 3 feet (91 cm) below the top of the dam and the spillway should be wide enough that heavy rainfalls will not increase the level of the water for any length of time. These specifications are often referred to as overbuilding, but they will generally prevent serious damage from burrowing muskrats. Other methods of exclusion can include the use of fencing in certain situations where muskrats may be leaving a pond or lake to cut valuable garden plants or crops.

### **Cultural Methods and Habitat Modification**

The best ways to modify habitat are to eliminate aquatic or other suitable foods eaten by muskrats and where possible, to construct pond dams to previously suggested specifications. If pond dams or levees are being damaged, one of the ways that damage can be reduced is to draw the pond down at least 2 feet (61 cm) below normal levels during the winter. Then fill dens, burrows, and runs and rip-rap the dam with stone. Once the water is drawn down, trap or otherwise remove all muskrats. Another method is to line the bank of a pond or dike with chain-link fence four feet above and four feet below the waterline. Over time, the vegetation will grow through the chain-link and give a natural appearance. However, muskrats are not able to penetrate the chain-link to build burrows.

### **Frightening Devices**

Gunfire will frighten muskrats, especially those that get hit, but it is not effective in scaring the animals away from occupied habitat. No conventional frightening devices are effective.

### **Repellents**

No repellents currently are registered for muskrats, and none are known to be effective, practical, and environmentally safe.

## **Toxicants or Fumigants**

The use of toxicants or chemical substances as a means of control for nuisance wild animals is now permitted. It is however, unlawful to use these substances contrary to the label instructions or manufacturer recommendations. Commercial wild animal control operators must first obtain a commercial pesticide license before using these substances to control nuisance animals.

A commercial pesticide applicator license may be obtained through the Ohio Department of Agriculture Pesticide and Fertilizer Regulation Section. A test is administered and study materials are available at <http://www.agri.ohio.gov/apps/odaprs/pestfert-prs-index.aspx>. Training for new applicants is conducted by Ohio State University. Contact them at <http://pested.osu.edu> or 614-292-4070 for training and to schedule an appointment to take the test. The license period is October 1 – September 30 and an annual fee applies. License holders are required to meet recertification requirements every three years to maintain their license.

## **Other Methods**

Although a variety of other methods are often employed in trying to control muskrat damage, a combination of trapping and proper use of toxicants is the most effective means in most situations. In situations where more extensive damage is occurring, it may be useful to employ an integrated pest management approach: (1) modify the habitat by removing available food (vegetation); (2) concentrate efforts to reduce the breeding population during winter months while muskrats are concentrated in over wintering habitat; and (3) use both registered toxicants and trapping in combination with the above methods. There may be other effective methods beyond those already discussed. Some may not be species selective or environmentally safe. Before using any control methods for wildlife damage prevention or control, check existing regulations and use tools and methods that do not pose a danger to non-target species.

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## **BEAVER**

### **Damage Prevention and Control Methods**

#### **Trapping**

All nuisance beavers must be either released on site or euthanized. Traps set for nuisance beaver may include foot hold traps set on land may not have a jaw spread larger than 5 5/8". There is no size restriction for foothold traps set in water. Body gripping traps set for beaver must be set in water and traps with a jaw spread greater than seven inches must be completely submerged. Snares can be set for beavers. The use of the "suit case" or "Hancock" live type trap is permissible; however the beaver must either be released immediately or euthanized. Traps or snares set for beaver under ice must be checked and animals removed once every seventy-two hour period. It is suggested that person's setting traps for beaver utilize the BMP's recommended for beavers.

The use of traps in most situations where beavers are causing damage is the most effective, practical, and environmentally safe method of control. The effectiveness of any type of trap for beaver control is dependent on the trapper's knowledge of beaver habits, food preferences, ability to read beaver signs, use of the proper trap, and trap placement.

A variety of trapping methods and types of traps are effective for beavers, depending on the situation. Of the variety of traps commonly allowed for use in beaver control, the body-gripping traps type, No. 330, is one of the most effective. Not all trappers will agree that this type of trap is the most effective; however, it is the type most commonly used by professional trappers and others who are principally trapping beavers. When properly set, the trap also prevents any escape by a beaver, regardless of its size. Designed primarily for water use, it is equally effective in deep and shallow water. Only one trap per site is generally necessary, thus reducing the need for extra traps. The trap exerts tremendous pressure and impact when tripped. Appropriate care must be exercised when setting and placing the trap. Care should also be taken when using the body-gripping traps type traps in urban and rural areas where pets (especially dogs) roam free. Use trap sets where the trap is placed completely underwater. Some additional equipment will be useful: an axe, hatchet, or large cutting tool; hip boots or waders; wire; and wire cutters. With the body-gripping traps, some individuals use a device or tool called "setting tongs." Others use a piece of 3/8- or 1/2-inch (9- or 13- mm) nylon rope. Most individuals who are experienced with these traps use only their hands. Regardless of the techniques used to set the trap,

care should be exercised. Earlier models of the body-gripping traps type of trap came with round, heavy steel coils which were dangerous to handle unless properly used in setting the trap. They are not necessary to safely set the trap. However, the two safety hooks, one on each spring, must be carefully handled as each spring is depressed, as well as during trap placement. On newer models an additional safety catch (not attached to the springs) is included for extra precaution against inadvertent spring release. The last step before leaving a set trap is to lift the safety hook attached to each spring and slide the safety hook back from the trap toward the spring eye, making sure to keep hands and feet safely away from the center of the trap. If the extra (unattached) safety catch is used, it should be removed before the safety hooks that are attached to the springs to keep it from getting in the way of the movement of the safety hooks. body-gripping traps are best set while on solid ground with dry hands. Once the springs are depressed and the safety hooks in place, the trap or traps can be carried into the water for proper placement. Stakes are needed to anchor the trap down. In most beaver ponds and around beaver dams, plenty of suitable stakes can be found. At least two strong stakes, preferably straight and without forks or snags, should be chosen to place through each spring eye. Additional stakes may be useful to put between the spring arms and help hold the trap in place. Do not place stakes on the outside of spring arms. Aside from serving to hold the trap in place, these stakes also help to guide the beaver into the trap. Where needed, they are also useful in holding a dive stick at or just beneath the water surface. If necessary, the chain and circle attached to one spring eye can be attached to another stake. It is also suggested that the use of a box swivel would help prevent the twisting of the wire or circle (ring) resulting in the loss of the trap and stake when a catch is made. In deep water sets, a chain with an attached wire should be tied to something at or above the surface so the trapper can retrieve the trap. Otherwise the trap may be lost.

*Trap Sets.* There are many sets that can be made with a Body-gripping traps (for example, dam sets, slide sets, lodge sets, bank den sets, “run”/trail sets, under log/dive sets, pole sets, under ice sets, deep water sets, drain pipe sets), depending on the trapper’s capability and ingenuity. In many beaver ponds, however, most beavers can be trapped using dam sets, lodge or bank den sets, sets in “runs”/trails, dive sets or sets in slides entering the water from places where beavers are feeding. Beavers swim both at the surface and along the bottom of ponds, depending on the habitat and water depth. Beavers also establish runs or trails which they habitually use in traveling from lodge or den to the dam or to feeding areas, much like cow trails in a pasture. Place traps directly across these runs, staked to the bottom. Use a good stake or “walking staff” when wading in a beaver pond to locate deep holes, runs, or trails. This will prevent stepping off over waders or hip boots in winter, and will help ward off snakes in the summer. The staff can also help locate good dive holes under logs as you walk out runs or trails. In older beaver ponds, particularly in bottomland swamps, it is not uncommon to find runs and lodge or bank den entrances where the run or hole is 2 to 3 feet (0.6 to 0.9 m) below the rest of the impoundment bottom. To stimulate nighttime beaver movement, tear a hole in a beaver dam and get the water moving out of a pond. Beavers quickly respond to the sound of running water as well as to the current flow. Timing is also important if you plan to make dam sets. Open a hole in the dam about 18 inches to 2 feet (46 to 60 cm) wide and 2 to 3 feet (60 to 90 cm) below the water level on the upper side of the dam in the morning. This will usually move a substantial amount of water out of the pond before evening. Set traps in front of the dam opening late that same evening. Two problems can arise if you set a trap in the

morning as soon as a hole is made: (1) by late evening, when the beavers become active, the trap may be out of the water and ineffective; or (2) a stick, branch, or other debris in the moving water may trip the trap, again rendering it ineffective. Dam set. Set the trap underwater in front of the hole created in the dam. When the beaver returns to patch the hole, it will be caught in the trap. Always set the trigger on the Body-gripping traps®-type trap in the first notch to prevent debris from tripping it before the beaver swims into the trap. The two heavy-gauge wire trippers can be bent outward and the trigger can be set away from the middle if necessary, to keep debris from tripping the trap. This can also keep small beaver or possibly fish or turtles from springing the trap. Double-spring foothold traps have been used for hundreds of years and are still very effective when properly used by skilled trappers. Use at least No. 3 double (long) spring or coil spring type foothold traps or traps of equivalent size jaw spread and strength. Use a drowning set attachment with any foothold trap. As the traps are tripped, the beaver will head for the deepest water. A weight is used to hold the trapped beaver underwater so that it ultimately drowns. Some trappers stake the wire in deep water to accomplish drowning. If foothold traps are not used in a manner to accomplish drowning, there is a good likelihood that legs or toes will be twisted off or pulled loose, leaving an escaped, trap wise beaver. Placement is even more critical with foothold traps than with the body-gripping traps. Place foothold traps just at the water's edge, slightly underwater, with the pan, jaws, and springs covered lightly with leaves or debris or pressed gently into the pond bottom in soft mud. Make sure there is a cavity under the pan so that when the beaver's foot hits the pan, it will trigger the trap and allow the jaws to snap closed. Place traps off-center of the trail or run to prevent "belly pinching" or missing the foot or leg. With some experience, beaver trappers learn to make sets that catch beavers by a hind leg rather than a front leg. The front leg is much smaller. Sometimes it's wise, when using foothold traps, to make two sets in a slide, run, dam, or feeding place to increase trapping success and remove beavers more quickly. In some situations, a combination of trapping methods can shorten trapping time and increase success. Trappers have come up with unique methods of making drown sets. One of the simplest and most practical is a slide wire with a heavy weight attached to one end, or with an end staked to the bottom in 3 or more feet (>0.9 m) of water. The other end of the wire is attached either to a stake near the water's edge. The trap is attached to the wire by use of an "L" shaped drowning lock, or a universal swivel, and when used properly it will only slide one way on the wire. When the beaver gets a foot in the trap, it immediately dives back into the water. As the lock slides down the wire, it prevents the beaver from reaching the surface. The lock will not slide back up the wire and most often bends the wire as the beaver struggles, thus preventing the beaver from coming up for air. Trappers should be prepared to quickly and humanely dispatch a beaver that is caught in a trap and has not drowned. The foothold trap set in lodges or bank dens is also effective, especially for trapping young beavers. Place the set on the edge of the hole where the beaver first turns upward to enter the lodge or den, or place it near the bottom of the dive hole. Keep the jaws and pan off of the bottom by pulling the springs backward so that a swimming foot will trip the pan. Stake the set close to the bottom or wire the trap to a log or root on the bottom, to avoid the need for drowning weights, wires, and angle iron pieces. Generally, more time and expertise is necessary to make effective sets with foothold traps and snares than is required with the Body-gripping traps®-type trap. Use scent or freshly cut cottonwood, aspen, willow, or sweetgum limbs to entice beaver to foothold trap sets. Bait or scent is especially useful around scent mounds and up slides along the banks or dams. Most

trappers who use Body-gripping traps®-type traps do not employ baits or scent, although they are occasionally helpful. In some states it is illegal to use bait or scent.

Several other types of traps can be used, including basket/suitcase type live traps. These are rarely used, however, except by professionals in urban areas. These traps are difficult and cumbersome to use, and will not be further discussed here for use in beaver damage control.

Any type of traps used for beavers or other animals should be checked daily, except lethal under water trapping methods can be monitored once every 72 hours.

### **Snaring**

Snaring can be a very cost-effective method for capturing beavers. Snaring equipment costs far less than trapping equipment and is more convenient to use in many situations. In addition, beavers can be captured alive by snaring and released elsewhere if desired. Snare placement is similar to trap placement. First, look for runways and fresh sign that indicate where beaver activities are focused. Find a suitable anchor such as a large tree, or by the use of a stake. Snares are frequently placed under logs, near bank dens, and next to castor mounds. Drowning sets can be made using underwater anchors, slide cables, and slide locks. Snares should be checked at least every 24 hours, except lethal under water trapping methods can be monitored once every 72 hours. Snares must be used with great care to avoid capturing non-target animals. Avoid trails or areas that are used by livestock, deer, or dogs. Check with your local wildlife agency for regulations associated with trapping and snaring. Snaring is not allowed in some states.

### **Shooting**

Nuisance beaver that are causing damage and that cannot be live trapped because of certain conditions may be killed by shooting. It is not recommended to shoot beaver while in the water to reduce the likelihood of ricochets. The Division of Wildlife recommends shooting beaver when on land. It is unlawful to take beaver from a power craft.

### **Exclusion**

It is almost impossible as well as cost prohibitive to exclude beavers from ponds, lakes, or impoundments. If the primary reason for fencing is to exclude beavers, fencing of large areas is not practical. 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.

### **Cultural Methods**

Because beavers usually alter or modify their aquatic habitat so extensively over a period of time, most practices generally thought of as cultural have little impact on beavers. 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 (depending on availability of construction materials) sometimes cause a colony or individual beavers to move to another site. They might, however, be even more troublesome at the new location.

The use of a three-log drain or a structural device such as wire mesh culverts (Roblee 1983) or T-culvert guards (Roblee 1987) will occasionally cause beavers to move to other areas. They all prevent beavers from controlling water levels. However, once beavers have become abundant in a watershed or in a large contiguous area, periodic reinvasions of suitable habitat can be expected to occur.

Three-log drains have had varying degrees of success in controlling water levels in beaver impoundments, especially if the beaver can detect the sound of falling water or current flow. All of these devices will stimulate the beavers to quickly plug the source of water drainage. A new device for controlling beaver impoundments and keeping blocked culverts open is the Clemson beaver pond leveler. It has proven effective in allowing continual water flow in previously blocked culverts/drains and facilitating the manipulation of water levels in beaver ponds for moist-soil management for waterfowl (Wood and Woodward 1992) and other environmental or aesthetic purposes. The device consists of a perforated PVC pipe that is encased in heavy gauge hog wire. This part is placed upstream of the dam or blocked culvert, in the main run or deepest part of the stream. It is connected to non-perforated sections of PVC pipe which are run through the dam or culvert to a water control structure downstream. 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. The Clemson beaver pond leveler works best in relatively flat terrain where large volumes of water from watersheds in steep terrain are not a problem.

### **Toxicants or Fumigants**

The use of toxicants or chemical substances as a means of control for nuisance wild animals is now permitted. It is however, unlawful to use these substances contrary to the label instructions or manufacturer recommendations. Commercial wild animal control operators must first obtain a commercial pesticide license before using these substances to control nuisance animals.

A commercial pesticide applicator license may be obtained through the Ohio Department of Agriculture Pesticide and Fertilizer Regulation Section. A test is administered and study materials are available at <http://www.agri.ohio.gov/apps/odaprs/pestfert-prs-index.aspx>. Training for new applicants is conducted by Ohio State University. Contact them at <http://pested.osu.edu> or 614-292-4070 for training and to schedule an appointment to take the test. The license period is October 1 – September 30 and an annual fee applies. License holders are required to meet recertification requirements every three years to maintain their license.

### **Other Methods**

Because of the frustration and damage beavers have caused landowners; almost every control method imaginable has been tried. Such methods rarely solve a damage problem, although they may kill a few

beavers and non-target species. They are not recommended by responsible wildlife professionals. One method used occasionally along streams prone to flooding is shooting beavers that have been flooded out of lodges and bank dens. This method is often dangerous and rarely solves a damage problem.

Acknowledgments: Much of this section was reproduced and used with permission of Andrew J. Montoney, State Director, U.S. Department of Agriculture, APHIS, Wildlife Services

Original Publication

#### Prevention and Control of Wildlife Damage

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## **WOODCHUCK**

### **Exclusion**

Fencing can help reduce woodchuck damage. Woodchucks, however, are good climbers and can easily scale wire fences if precautions are not taken. Fences should be at least 3 feet (1 m) high and made of heavy poultry wire or 2-inch (5-cm) mesh woven wire. To prevent burrowing under the fence, bury the lower edge 10 to 12 inches (25 to 30 cm) in the ground or bend the lower edge at an L-shaped angle

leading outward and bury it in the ground 1 to 2 inches (2.5 to 5 cm). Fences should extend 3 to 4 feet (0.9 to 1.2 m) above the ground. Place an electric wire 4 to 5 inches (10 to 13 cm) off the ground and the same distance outside the fence. When connected to a UL-approved fence charger, the electric wire will prevent climbing and burrowing. Bending the top 15 inches (38 cm) of wire fence outward at a 45° angle will also prevent climbing over the fence. Fencing is most useful in protecting home gardens and has the added advantage of keeping rabbits, dogs, cats, and other animals out of the garden area. In some instances, an electric wire alone, placed 4 to 5 inches (10 to 13 cm) above the ground has deterred woodchucks from entering gardens. Vegetation in the vicinity of any electric fence should be removed regularly to prevent the system from shorting out.

### **Frightening Devices**

Scarecrows and other effigies can provide temporary relief from woodchuck damage. Move them regularly and incorporate a high level of human activity in the susceptible area.

### **Trapping**

Traps may also be used to reduce woodchuck damage, especially in or near buildings. Consult local ordinances before trapping as some municipalities prohibit certain traps. In the State of Ohio, the Body-gripping trap, foot-holds, snares and cage live traps are effective methods of removal. All traps must have a waterproof tag bearing either; the name and address of the user, the customer ID of the user, or the permit number of the company that owns and is employing the trap.

### **Cage/Live Traps**

Live trapping can sometimes be difficult, but is effective. Live traps can be built at home, purchased from commercial sources or borrowed. 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. Be certain the trap is set square on solid ground and to stabilize the trap to improve success. Place guide logs on either side of the path between the burrow opening and the trap to help funnel the animal into the trap. It is recommended to check all traps twice daily, morning and evening, so that captured animals may be quickly removed, however Ohio law states all traps must be checked once each calendar day. Groundhogs can be released on-site, outside the city or village limits, but they may not be released on public or private property without written permission of the landowner. They may also be euthanized by shooting, by lethal injection by a veterinarian (under veterinarian supervision), or by carbon dioxide gas

### **Body-Gripping Traps**

Body-gripping traps are effective in certain situations. Body-gripping traps are well suited for use near or under structures where shooting presents a hazard. Size 120, 160 and 220 are best suited for groundhog control. **Care must be taken to avoid trapping domestic animals such as cats and dogs.** All body-gripping traps set for groundhogs shall adhere to these rules;

- It is unlawful to use a body gripping trap with a jaw spread greater than seven inches across to take groundhogs/woodchucks.
- It is unlawful to set, use, or maintain a body gripping trap to take woodchucks which is set more than three feet from the hole, or structure the woodchuck inhabits.
- It is unlawful to set, use, or maintain a body gripping trap greater than five inches to take woodchucks that do not have an enclosure or structure around the trap which prohibits other animals from getting into the trap from the outside. Traps can be enclosed with welded wire screening, boards, or boxes.



## Snares

Snares are effective means of controlling woodchuck damage in open areas. All snares must comply with the following rules;

- All snares must be constructed of multi or single strand steel cable. 5/64 or 3/32 is recommended.
- It is unlawful for a person to set, use, and maintain snares for the purpose of taking a nuisance wild animal that does not have:
  - a relaxing lock and a stop to prevent the opening of the snare from closing to a diameter of less than two and one half inches in diameter, or,
  - a relaxing lock system with a breaking point of not greater than three hundred fifty pounds.
  - Only licensed commercial nuisance wild animal control operators to use snares without a relaxing lock for the purpose of taking woodchucks,
- It is unlawful to set a snare with a loop diameter of greater than fifteen inches.
- It is unlawful to use a snare attached to a drag.

- It shall be unlawful for any person, except a licensed commercial nuisance wild animal control operator, to have attached to or use a spring-loaded, spring-assisted or mechanical device on a snare to assist the snare in capturing or closing around a nuisance wild animal.
  - It is unlawful for any person to use a spring-loaded, spring-assisted or mechanical device on a snare that is designed or marketed as a lethal snare that has a loop diameter greater than five inches on land.
  - It shall be unlawful for any person to use a spring-loaded, spring-assisted or mechanical device on a snare that is designed or marketed as a lethal snare that has a loop diameter greater than eight inches in water.

### **Toxicants or Fumigants**

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### **Acknowledgments**

We want to thank the Ohio state director of USDA-APHISADC

## **COYOTE**

### **Damage Prevention and Control Methods**

For managing coyote damage, a variety of control methods must be available since no single method is effective in every situation. Success usually involves an integrated approach, combining good husbandry practices of effected livestock with effective control methods for short periods of time. Regardless of the means used to stop damage, the focus should be on damage prevention and control rather than elimination of coyotes. It is important to try to prevent coyotes from killing calves or sheep for the first time. Once a coyote has killed livestock, it will probably continue to do so if given the opportunity. Equally important is taking action as quickly as possible to stop coyotes from killing after they start.

### **Exclusion**

Most coyotes readily cross over, under, or through conventional livestock fences. A coyote's response to a fence is influenced by various factors, including the coyote's experience and motivation for crossing the fence. Total exclusion of all coyotes by fencing, especially from large areas, is highly unlikely since some eventually learn to either dig deeper or climb higher to defeat a fence. Good fences, however, can be important in reducing predation, as well as increasing the effectiveness of other damage control methods (such as snares, traps, or guarding animals). Recent developments in fencing equipment and design have made this technique an effective and economically practical method for protecting sheep from predation under some grazing conditions.

-Net-Wire Fencing. Net fences in good repair will deter many coyotes from entering a pasture. Horizontal spacing of the mesh should be less than 6 inches (15 cm), and vertical spacing less than 4 inches (10 cm). Digging under a fence can be discouraged by placing a barbed wire at ground level or using a buried wire apron (often an expensive option). The fence should be about 5 1/2 feet (1.6 m) high to discourage coyotes from jumping over it. Climbing can usually be prevented by adding a charged wire at the top of the fence or installing a wire overhang. Barrier fences with wire overhangs and buried wire aprons were tested in Oregon and found effective in keeping coyotes out of sheep pastures (Fig. 3). The construction and materials for such fencing are usually expensive. Therefore, fences of this type are rarely used except around corrals, feedlots, or areas of temporary sheep confinement.

-Electric Fencing. Electric fencing has been used for years to manage livestock. The chargers have high output with low impedance, are resistant to grounding, present a minimal fire hazard, and are generally safe for livestock and humans. The fences are usually constructed of smooth, high-tensile wire stretched to a tension of 200 to 300 pounds (90 to 135 kg). The original design of electric fences for controlling predation consisted of multiple, alternately charged and grounded wires, with a charged trip wire installed just above ground level about 8 inches (20 cm) outside the main fence to discourage digging. Many recent designs have every wire charged. The number of spaces between wires varies considerably. A fence of 13 strands gave complete protection to sheep from coyote predation in tests at the USDA's US Sheep Experiment Station. Other designs of fewer wires were effective in some studies, ineffective in others. The amount of labor and installation techniques required varies with each type of fencing. High-tensile wire fences require adequate bracing at corners and over long spans. Electric fencing is easiest to install on flat, even terrain. Labor to install a high-tensile electric fence may be 40% to 50% less than for a conventional livestock fence. Labor to keep electric fencing functional can be significant. Tension of the wires must be maintained, excessive vegetation under the fence must be removed to prevent grounding. Damage from livestock and wildlife must be repaired, and the charger must be checked regularly to ensure that it is operational. Coyotes and other predators occasionally become "trapped" inside electric fences. These animals receive a shock as they enter the pasture and subsequently avoid approaching the fence to escape. In some instances the captured predator may be easy to spot and remove from the pasture, but in others, particularly in large pastures with rough terrain, the animal may be difficult to remove.

-Electric Modification of Existing Fences. The cost to completely replace old fences with new ones, whether conventional or electric, can be substantial. In instances where existing fencing is in reasonably good condition, the addition of one to several charged wires can significantly enhance the predator-

detering ability of the fence and its effectiveness for controlling livestock (Fig. 5). A charged trip wire placed 6 to 8 inches (15 to 230 cm) above the ground about 8 to 10 inches (20 to 25 cm) outside the fence is often effective in preventing coyotes from digging and crawling under. This single addition to an existing fence is often the most effective and economical way to fortify a fence against coyote passage. If coyotes are climbing or jumping a fence, charged wires can be added to the top and at various intervals. These wires should be offset outside the fence. Fencing companies offer offset brackets to make installation relatively simple. The number of additional wires depends on the design of the original fence and the predicted habits of the predators.

-Portable Electric Fencing. Most are constructed with thin strands of wire running through polyethylene twine or ribbon, commonly called polywire or polytape. The polywire is available in single and multiple wire rolls or as mesh fencing of various heights. It can be quickly and easily installed to serve as a temporary corral or to partition off pastures for controlled grazing. Perhaps the biggest advantage of portable electric fencing is the ability to set up temporary pens to hold livestock at night or during other predator control activities. Portable fencing increases livestock management options to avoid places or periods of high predation risk. Range sheep that are not accustomed to being fenced, however, may be difficult to contain in a portable fence.

-Fencing and Predation Management. The success of various types of fencing in keeping out predators has ranged from poor to excellent. Density and behavior of coyotes, terrain and vegetative conditions, availability of prey, size of pastures, season of the year, design of the fence, quality of construction, maintenance, and other factors all interplay in determining how effective a fence will be. Fencing is most likely to be cost-effective where the potential for predation is high, where there is potential for a high stocking rate, or where electric modification of existing fences can be used. Fencing can be effective when incorporated with other means of predation control. For example, combined use of guarding dogs and fencing has achieved a greater degree of success than either method used alone. An electric fence may help keep a guarding dog in and coyotes out of a pasture. If an occasional coyote does pass through a fence, the guarding dog can keep it away from the livestock and alert the producer by barking. Fencing can also be used to concentrate predator activity at specific places such as gateways, ravines, or other areas where the animals try to gain access. Traps and snares can often be set at strategic places along a fence to effectively capture predators. Smaller pastures are easier to keep free from predators than larger ones. Fencing is one of the most beneficial investments in predator damage control and livestock management where practical factors warrant its use.

-Season and Location of Lambing or Calving. Both season and location of lambing and calving can significantly affect the severity of coyote predation on sheep or calves. The highest predation losses of sheep and calves typically occur from late spring through September due to the food requirements of coyote pups. By changing to a fall lambing or calving program, some livestock producers have not only been able to diversify their marketing program, but have also avoided having a large number of young animals on hand during periods when coyote predation losses are typically highest. Shortening lambing and calving periods by using synchronized or group breeding may reduce predation by producing a uniform lamb or calf crop, thus reducing exposure of small livestock to predation. Extra labor and facilities may be necessary, however, when birthing within a concentrated period. Some producers

practice early weaning and do not allow young to go to large pastures, thus reducing the chance of coyote losses. This also gives orphaned and weak young a greater chance to survive.

Producers who use lambing sheds or pens for raising sheep and small pastures or paddocks for raising cattle have lower predation losses than those who lamb or calve in large pastures or on open range. The more human presence there is around sheep, the lower the predation losses. Confining sheep entirely to buildings virtually eliminates predation losses.

-Corrals. Although predation can occur at any time, coyotes tend to kill sheep at night. Confining sheep at night is one of the most effective means of reducing losses to predation. Nevertheless, some coyotes and many dogs are bold enough to enter corrals and kill sheep. A “coyote-proof” corral is a wise investment. Coyotes are more likely to attack sheep in unlighted corrals than in corrals with lights. Even if the corral fence is not coyote-proof, the mere fact that the sheep are confined reduces the risk of predation. Penning sheep at night and turning them out at mid-morning might reduce losses. In addition, coyotes tend to be more active and kill more sheep on foggy or rainy days than on sunny days. Keeping the sheep penned on foggy or rainy days may be helpful. Aside from the benefits of livestock confinement, there are some problems associated with it. Costs of labor and materials associated with building corrals, herding livestock, and feeding livestock must be considered. In addition, the likelihood of increased parasite and disease problems may inhibit adoption of confinement as a method of reducing damage.

-Carrion Removal. Removal and proper disposal of dead sheep and cattle are important since livestock carcasses tend to attract coyotes, habituating them to feed on livestock. Some producers reason that coyotes are less likely to kill livestock if there is carrion available. This may be a valid preventative measure if an adequate supply of carrion can be maintained far away from livestock. If a coyote becomes habituated to a diet of livestock remains, however, it may turn to killing livestock in the absence of carcasses. Wherever there is easily accessible carrion, coyotes seem to gather and predation losses are higher. Conversely, where carrion is generally not available, losses are lower. A study in Canada showed that the removal of livestock carcasses significantly reduced overwinter coyote populations and shifted coyote distributions out of livestock areas.

### **Frightening Devices and Repellents**

Frightening devices are useful for reducing losses during short periods or until predators are removed. The devices should not be used for long periods of time when predation is not a problem. To avoid acclimation you can increase both the degree and duration of effectiveness by varying the position, appearance, duration, or frequency of the frightening stimuli, or using them in various combinations. Many frightening methods have been ridiculed in one way or another; nevertheless, all of the techniques discussed here have helped producers by saving livestock and/or buying some time to institute other controls.

-Lights. Lights above corrals at night have been shown to have a marked effect on losses to coyotes. Another advantage of lighted corrals is that coyotes are more vulnerable when they enter the lighted area. Coyotes often establish a fairly predictable pattern of killing. When this happens in a lighted corral,

it is possible for a producer to wait above or downwind of the corral and to shoot the coyote as it enters. Revolving or flashing the lights may enhance their effectiveness in frightening away predators. There is some speculation that the old oil lamps used in highway construction repelled coyotes, presumably because of their flickering effect.

-Vehicles. Parking cars or pickups in the area where losses are occurring often reduces predation temporarily. Effectiveness can be improved or extended by frequently moving the vehicle to a new location. Some producers place a replica of a person in the vehicle when losses are occurring in the daylight. If predators continue to kill with vehicles in place, the vehicle serves as a comfortable blind in which to wait and shoot offending predators.

-Propane Exploders. Propane exploders produce loud explosions at timed intervals when a spark ignites a measured amount of propane gas. On most models, the time between explosions can vary from about 1 minute to 15 minutes. Their effectiveness at frightening coyotes is usually only temporary, but it can be increased by moving exploders to different locations and by varying the intervals between explosions. In general, the timer on the exploder should be set to fire every 8 to 10 minutes, and the location should be changed every 3 or 4 days. Normally, the exploder should be turned on just before dark and off at daybreak, unless coyotes are killing livestock during daylight hours. Motion sensors likely improve their effectiveness, though it is still only temporary. Exploders are best used to reduce losses until more permanent control or preventive measures can be implemented.

## **Repellents.**

-Guarding animals with Livestock Guarding Dogs.

A livestock guarding dog is one that generally stays with sheep or cattle without harming them and aggressively repels predators. Its protective behaviors are largely instinctive, but proper rearing plays a part. Breeds most commonly used today include the Great Pyrenees, Komondor, Anatolian Shepherd, and Akbash Dog. Other Old World breeds used to a lesser degree include Maremma, Sharplaninetz, and Kuvasz. Crossbreeds are also used. The characteristics of each sheep operation will dictate the number of dogs required for effective protection from predators. If predators are scarce, one dog is sufficient for most fenced pasture operations. Range operations often use two dogs per band of sheep. The performance of individual dogs will differ based on age and experience. The size, topography, and habitat of the pasture or range must also be considered. Relatively flat, open areas can be adequately covered by one dog. When brush, timber, ravines, and hills are in the pasture, several dogs may be required, particularly if the sheep are scattered. Sheep that flock and form a cohesive unit, especially at night, can be protected by one dog more effectively than sheep that are continually scattered and bedded in a number of locations. The goal with a new puppy is to channel its natural instincts to produce a mature guardian dog with the desired characteristics. This is best accomplished by early and continued association with sheep to produce a bond between the dog and sheep. The optimum time to acquire a pup is between 7 and 8 weeks of age. The pup should be separated from litter mates and placed with sheep, preferably lambs, in a pen or corral from which it can't escape. This socialization period should continue with daily checks from the producer until the pup is about 16 weeks old. Daily

checks don't necessarily include petting the pup. The primary bond should be between the dog and the sheep, not between the dog and humans. The owner, however, should be able to catch and handle the dog to administer health care or to manage the livestock. At about 4 months, the pup can be released into a larger pasture to mingle with the other sheep. A guarding dog will likely include peripheral areas in its patrolling. Some have been known to chase vehicles and wildlife and threaten children and cyclists. These activities should be discouraged. Neighbors should be alerted to the possibility that the dog may roam onto their property.

#### -Guarding animals with Donkeys.

Donkeys are generally docile to people, but they seem to have an inherent dislike of dogs and other canids, including coyotes and foxes. The typical response of a donkey or llama to an intruding canid may include braying, bared teeth, a running attack, kicking, and biting. Most likely it is acting out of aggression toward the intruder rather than to protect the sheep. Donkeys and llamas are significantly cheaper to obtain and care for than guarding dogs, and they are probably less prone to accidental death and premature mortality than dogs. They may provide a longer period of useful life than a guarding dog. Livestock producers have identified several key points to consider when using a donkey for predation control:

1. Use only a jenny or a gelded jack. Intact jacks are too aggressive and may injure livestock. Some Jennies and geldings may also injure livestock. Select donkeys from medium-sized stock.
2. Use only one donkey per group of sheep. The exception may be a jenny with a foal. When two or more adult donkeys are together or with a horse, they will usually stay together, not necessarily near the sheep. Also avoid using donkeys in adjacent pastures since they may socialize across the fence and ignore the sheep.
3. Allow about 4 to 6 weeks for a naive donkey to bond to the sheep. Stronger bonding may occur when a donkey is raised from birth with sheep.
4. Avoid feeds or supplements containing monensin or lasolacid. They are poisonous to donkeys.
5. Remove the donkey during lambing, particularly if lambing in confinement, to avoid injuries to lambs or disruption of the lamb-ewe bond.
6. Test a new donkey's response to canids by challenging it with a dog in a pen or small pasture. Discard donkeys that don't show overt aggression to an intruding dog.
7. Use donkeys in smaller (less than 600 acres [240 ha]), relatively open pastures with not more than 200 to 300 head of livestock. Large pastures with rough terrain and vegetation and widely scattered livestock lessen the effectiveness of a donkey.

#### Guarding animals with Llamas.

Like donkeys, llamas have an inherent dislike of canids. Llamas reportedly bond with sheep within hours and offer advantages over guarding dogs similar to those described for donkeys.

### **Toxicants or Fumigants**

Pesticides have historically been an important component in an integrated approach to controlling coyote damage, but their use is extremely restricted today by federal and state laws. All pesticides used in the United States must be registered with the EPA under the provisions of FIFRA and must be used in accordance with label directions. Increasingly restrictive regulations implemented by EPA under the authority of FIFRA, the National Environmental Policy Act (NEPA), presidential order, and the Endangered Species Act have resulted in the near elimination of toxicants legally available for predator damage control. The only toxicants currently registered for mammalian predator damage control are sodium cyanide, used in the M-44 ejector device, and Compound 1080 (sodium monofluoroacetate), for use in the livestock protection collar. These toxicants are Restricted Use Pesticides and may be used only by certified pesticide applicators. Availability of these products in Ohio is only permissible through the State Director of the U.S. Department of Agriculture, APHIS, WS

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### **Trapping**

There are many effective methods for trapping coyotes, and success can be enhanced by considering several key points. Coyotes learn from past events that were unpleasant or frightening, and they often avoid such events in the future. In spring and summer, most coyotes limit their movements to a small area, but in late summer, fall, and winter they may roam over a larger area. Coyotes follow regular paths and crossways, and they prefer high hills or knolls from which they can view the terrain. They establish regular scent posts along their paths, and they depend on their ears, nose, and eyes to sense danger.

-Size of Traps for Coyotes. There are many suitable foothold traps for catching coyotes. The No. 3, No. 4, and the MT 550 are good choices, but Ohio law requires NWACO to utilize traps that have a six inch jaw spread or less. Many trappers prefer a round-jawed off-set trap. It is a good idea to use welded, kinkless chain. The length of chain varies depending on whether the trap is staked or a drag is used. A longer chain should be used with a drag. The off-set jaws are designed to reduce broken foot bones, which can

allow the coyote to escape by wriggling out of the trap. When non-target species, such as dogs, might be present, use a padded-jaw, double-jaw or off-set jaw coil spring trap to lessen the likelihood of any foot damage. Ohio law requires that traps are checked once a day.

## **Snares**

Snaring is the technique of setting a single or multi-strand steel-cable loop in an animal's path to capture it by the neck, body. Snares usually consist of a 2.5- to 10- foot (0.75- to 3.0-m) long piece of aircraft cable containing a slide lock that forms a loop in the cable, a deer stop to keep the snare from closing tighter than 2.5 inches and a swivel to prevent twisting and breaking the cable is attached to the end of the cable opposite the loop. On longer snares, swivels can be located near the middle of the cable and at one end. Snares offer several advantages over steel foothold traps. They are lightweight, compact, simple to use, affected little by weather, easy to set, low in cost, and offer a high degree of human safety

## **Where to Set Snares**

Animals usually follow the easiest route through heavy cover. These routes, which generally consist of trails, are excellent locations to snare predators. Snares are effective along trails leading to draw stations. Some effective locations for snaring coyotes include: (1) along trails in thickets or heavy vegetation leading to a carcass, (2) on trails under fences, (3) on livestock trails in vacant pastures, (4) in the bottoms of ravines, and 5) on narrow paths inside weeds or brush. Trails can be created by driving on weeds or stubble with a pickup, by walking in snow, or by mowing a trail through weeds or grass with a weed eater.

## **Methods to Avoid Capturing Non-target Animals**

Sites where snares are set should be carefully selected to avoid capturing non-target animals. Avoid setting snares: (1) in pastures with livestock, (2) within 25 yards (23 m) of animal carcasses (to prevent capturing birds of prey and other scavengers), (3) on any trails being used by livestock and other non-target animals, (4) under fences where livestock, or non-target dogs are using the space to crawl under the fence. Use a short snare cables to reduce injuries where accidentally captured dogs might jump over a fence or a tree branch and hang themselves. Use the lightest snare lock (breakaway lock) possible to capture the desired animal. If livestock are captured by a leg, they can usually break a light lock but may be held by heavy locks. Record the location and number of snares on a map so they can be found, and remove all snares when damage stops or when they cannot be checked frequently.

## **Shooting**

Shooting coyotes is legal in many situations, and it often ranks high among the choices for removing a predator. Safety, however, is a critical factor that in some circumstances may preclude the use of firearms (for example, local laws may prohibit shooting, or neighbors may be too close). For shooting coyotes, a medium powered bolt-action rifle fitted with a scope is recommended. The .223 Remington, .22-250, .220 Swift, or the .243 Winchester are all capable of killing a coyote up to a distance of 250

yards (225 m). Since coyotes are able to detect human scent, the shooter should take a stand downwind from where the coyote will likely approach. An elevated location where the lighting works to the shooter's advantage is a good choice. If predators are killing sheep in the daytime, construct a comfortable blind at a vantage point in the pasture where the killing has occurred. A shotgun, preferably a 12-gauge semi-automatic, can be used for shooting at short range (less than 50 yards [45 m]). Often it is advisable to have both a 12-gauge shotgun and a scoped rifle available. Copper-coated (BB) lead shot, No. 4 buckshot (lead), and in newer shotguns, the larger-sized steel shot works well for killing coyotes.

Shooting from Ground Vehicles. This is not an option for NWACOs in Ohio. Ohio Revised Code section 2923.16 only allows for landowners, tenants and their spouses or children to shoot coyotes from motor vehicles when the following apply:

- The act takes place at a time other than during a deer firearms season as established in 1501:31-15-11 of the Administrative Code.
- The motor vehicle from which the person discharges the firearm is on real property that is located in an unincorporated area of a township and that either is zoned for agriculture or is used for agriculture.
- The person owns the real property, is the spouse or a child of another person who owns the property, is a tenant of another person who owns the property, or is the spouse or a child of a tenant of another person who owns the property.
- The person does not discharge the firearm in any of the following manners:
  - While under the influence of alcohol, and/or a drug of abuse;
  - In the direction of a street, highway, or other public or private property used by the public for vehicular traffic or parking;
  - At or into an occupied structure that is a permanent or temporary habitation;
  - In the commission of any violation of law, including, but not limited to, a felony that includes, as an essential element, purposely or knowingly causing or attempting to cause the death of or physical harm to another and that was committed by discharging a firearm from a motor vehicle.

### Calling and Shooting Coyotes

Coyotes may respond to predator calls. Calling, should be used sparingly and only when needed like other methods of predation control,. Coyotes can be called at any time of the day although the first couple of hours after dawn and the last few hours before darkness are usually best. Call in areas where there are signs of coyotes, such as tracks or droppings. In some situations, coyotes can be located by listening to their howling at sundown and sunrise. Some hunters use sirens to elicit howls from coyotes. Often voice imitations of a coyote howl works as well. Coyotes often come to a howl without howling back, so the prudent hunter is always ready to shoot.

-Hunting at Night. Not many people have witnessed predators killing livestock because it usually occurs at night, away from human activity. As stated previously, calling and shooting predators at night is illegal in many states. Where legal, however, hunting at night with the use of artificial lights may be effective.

Red or blue light tends to spook predators less readily than white light does. Calling without the use of artificial lights is effective only with snow cover and the light of a full moon.

-Hunting with Dogs. Several breeds are generally known as trailing hounds, including Walkers, Julys, redbones, blueticks, black and tans, Plott hounds, and English fox hounds. Trail hounds follow the scent left by a predator and run it to tree or bay it on the ground. Coyotes are seldom caught and killed by trail hounds. In most instances, trail hounds are used in combination with sight hounds. The trail hounds run coyotes into the open, and then sight hounds are released to capture the fleeing coyote. More commonly, coyotes are shot as they run from the pack of hounds. Sight hounds, generally greyhounds or Russian wolf hounds, are used in open prairie country to run coyotes down and kill them.

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Wildlife Committee

## **SQUIRRELS**

### Damage Prevention and Control Methods

#### **Exclusion**

Close openings to attics and other parts of buildings but make sure not to lock squirrels inside. 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 (46-cm) section of 4-

inch (10-cm) plastic pipe over an opening. The pipe should point down at a 45° angle. A one-way door can also be used over an opening to let squirrels out and prevent them from returning. Close openings to buildings with heavy 1/2-inch (1.3-cm) wire mesh or make other suitable repairs. After squirrels appear to have been removed from the building, use appropriate exclusion methods to keep them out. One or more baited traps will catch squirrels that are accidentally closed in. This last step is very important because locked-in squirrels may cause damage when they try to chew their way out. Custom-designed wire mesh fences topped with electrified wires may effectively keep out squirrels out of gardens or small orchards.

### **Habitat Modification**

Trim limbs and trees to 6 to 8 feet (1.8 to 2.4 m) away from buildings to prevent squirrels from jumping onto roofs. In backyards where squirrels are causing problems at bird feeders, consider providing an alternative food source. Wire or nail an ear of corn to a tree or wooden fence post away from where the squirrels are causing problems. In high-value crop situations, it may pay to remove woods or other trees near orchards to block the “squirrel highway.”

### **Repellents**

A cat in the attic may discourage squirrels. Taste repellents may be applied to seeds, bulbs, and flowers; trees and shrubs; poles and fences; siding and outdoor furniture. Capsaicin is also a taste repellent, registered for use on maple sap collecting equipment. Polybutenes are sticky materials that can be applied to buildings, railings, downspouts, and other areas to keep squirrels from climbing. They can be messy. A pre-application of masking tape is recommended.

### **Toxicants or Fumigants**

The use of toxicants or chemical substances as a means of control for nuisance wild animals is now permitted. It is however, unlawful to use these substances contrary to the label instructions or manufacturer recommendations. Commercial wild animal control operators must first obtain a commercial pesticide license before using these substances to control nuisance animals.

A commercial pesticide applicator license may be obtained through the Ohio Department of Agriculture Pesticide and Fertilizer Regulation Section. A test is administered and study materials are available at <http://www.agri.ohio.gov/apps/odaprs/pestfert-prs-index.aspx>. Training for new applicants is conducted by Ohio State University. Contact them at <http://pested.osu.edu> or 614-292-4070 for training and to schedule an appointment to take the test. The license period is October 1 – September 30 and an annual fee applies. License holders are required to meet recertification requirements every three years to maintain their license.

### **Trapping**

There are a variety of traps that will catch squirrels. Regular rat-sized snap traps will catch flying squirrels. Glue traps for rats will also catch small squirrels. Wire cage traps and box traps can be used to capture squirrels alive. Pre-bait traps and tie trap doors open for 2 to 3 days to get squirrels accustomed

to feeding in the traps. Then set the traps and check them twice daily. Small body-gripping traps may be utilized inside buildings or in certain locations where the risk of capturing non-target species can be minimized. Translocation of squirrels is a discouraged practice because of concerns regarding the transmission of diseases. Squirrels may be euthanized, released on site or relocated outside of city or village limits on private property after obtaining permission of the landowner. Good baits for squirrels are slices of orange and apple, walnuts or pecans removed from the shell, and peanut butter. Other foods familiar to the squirrel may also work well, such as corn or sunflower seeds.

## **Shooting**

Where firearms are permitted, shooting is effective. 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.

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## **CHIPMUNK**

### **Damage Prevention and Control**

## **Exclusion**

Chipmunks should be excluded from buildings wherever possible. Use hardware cloth with 1/4-inch (0.6-cm) mesh, caulking, or other appropriate materials to close openings where they could gain entry. Hardware cloth may also be used to exclude chipmunks from flower beds. Seeds and bulbs can be covered by 1/4-inch (0.6-cm) hardware cloth and the cloth itself should be covered with soil. The cloth should extend at least 1 foot (30 cm) past each margin of the planting. Exclusion is less expensive in the long run than trapping, where high populations of chipmunks exist.

## **Cultural Methods and Habitat Modifications**

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 chipmunks that may attempt to gain access into the home. It is also difficult to detect chipmunk burrows that are adjacent to foundations when wood piles, debris, or plantings of ground cover provide above-ground protection. Place bird feeders at least 15 to 30 feet (5 to 10 m) away from buildings so spilled bird seed does not attract and support chipmunks near them.

## **Toxicants or Fumigants**

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## **Trapping**

Trapping is the most practical method of eliminating chipmunks in most home situations. Live-catch wire-mesh traps or common rat snap traps can be used to catch chipmunks. A variety of baits can be used to lure chipmunks into live traps, including peanut butter, nutmeats, pumpkin or sunflower seeds, raisins, prune slices, or common breakfast cereal grains. Place the trap along the pathways where chipmunks have been seen frequently. The trap should be securely placed so there is no movement of the trap prematurely when the animal enters. Trap movement may prematurely set off the trap and scare the chipmunk away. A helpful tip is to “pre-bait” the trap for 2 to 3 days by wiring the trap doors open. This will condition the chipmunk to associate the new metal object in its territory with the new free food source. Set the trap after the chipmunk is actively feeding on the bait in and around the trap.

Check traps frequently to remove captured chipmunks and release any non-target animals caught in them. Avoid direct contact with trapped chipmunks. By Ohio law, captured chipmunks may be euthanized or transported and released several miles from the point of capture outside of city or village limits, on private land after obtaining permission of the landowner. Common rat snap traps can be used to kill chipmunks if these traps are isolated from children, pets, or wildlife. They can be set in the same manner as live traps but hard baits should be tied to the trap trigger. Pre-bait snap traps by not setting the trap until the animal has been conditioned to take the bait without disturbance for 2 to 3 days. Small amounts of extra bait may be placed around the traps to make them more attractive. Set the snap traps perpendicular to the chipmunk's pathway or in pairs along travel routes with the triggers facing away from each other. Set the trigger arm so that the trigger is sensitive and easily sprung. To avoid killing songbirds in rat snap traps, it is advisable to place the traps under a small box with openings that allow only chipmunks access to the baited trap. The box must allow enough clearance so the trap operates properly. Conceal snap traps that are set against structures by leaning boards over them. Small amounts of bait can be placed at the openings as an attractant.

### **Shooting**

Where shooting is legal, use a small-gauge shotgun, air rifle or a .22-caliber rifle with bird shot or C.B. cap loads. Chipmunks are nervous and alert, so they make difficult targets. The best time to attempt shooting is on bright sunny days during the early morning.

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## BAT CONTROL

Most bats live near human habitations without ever making their presence known. Bats are the only major predator of a variety of night-flying insects. Bats may use existing openings (cracks as small as 3/8 inches) to enter buildings or to roost in attics. On the occasion that a single bat gets into a house, there are several things one can do. Close interior doors, confine it to one room if possible, and open a window or exterior door. The bat will leave as soon as it locates the exit. If the bat lands on a curtain or piece of furniture, cover it with a jar or a towel, or pick it up with a leather glove, and release it outdoors.

For bats, having a safe place to roost is critical for their survival. The type of roost they choose is usually species specific because each type of bat tolerates a narrow set of favorable environmental factors including temperature, humidity, light intensity and wind. Bats are sensitive to disturbance and will likely abandon a site if they are repeatedly disturbed. They often have strong homing instincts and will return to the same roost even if transported several hundreds of miles away. The key to keeping bats from roosting in a place they are unwanted, is to exclude them.

Only non-lethal methods may be used for the removal of nuisance bats by Commercial Nuisance Wild Animal Control Operators. If the bat was found in the living quarters or working space during March 1-August 31, the operator should immediately examine the building for potential colonies and temporarily or permanently seal entrance ways into the living quarters or working space from bats. If the operator finds or suspects that a colony exists in any non-living quarters (e.g. the attic, roof, soffit, walls, etc.) then the operator must diagnose the situation further and determine the main entrance holes and potential future access holes. An exit count of the colony at dusk is helpful and can be done by the operator or the owner of the house. Potential access holes can be sealed leaving the main exits open until September 1.

It is recommended that exclusion of colonies take place after September 1 but before bats begin hibernation (mid-November). Once the bats have left or have been successfully excluded, sealing of the main entrance is required and must be completed. Repellents are not effective and are not long-term solutions to nuisance bat situations.

If the customer is reluctant to wait until September 1 for exclusion, the operator should survey the roost and outline work to the customer that can be done prior to September 1. If the bat colony is visible, the operator should survey the roost and assess the stage of development of the young bats (is fur present or absent, relative size of pup to female, etc.) Bats may give birth anytime between April through early July. Excluding bats at the wrong time of year can lead to far greater problems for the homeowner than the one he or she currently faces, including bats dying and creating an odor problem or more bats getting inside the living quarters. Female bats that have been excluded and have flightless young trapped inside the house will fly around the outside of the house and try to find another way to get to their pups. This situation increases the likelihood that the bats may come in to contact with people. Once the main exits have been identified, sealing of other possible entrances may and should occur

prior to exclusion. There is always work that can be done in preparation for the exclusion. This tactic is ultimately more satisfying for the customer and what the Ohio Division of Wildlife recommends for cooperators.

### **Damage and Identification of Bat Presence**

Bats commonly enter buildings through openings associated with the roof edge and valleys, eaves, apex of the gable, chimney, attic or roof vent, dormers, and siding. Other openings may be found under loose-fitting doors, around windows, gaps around various conduits (wiring, plumbing, air conditioning) that pass through walls, and through utility vents. Bats are able to squeeze through narrow slits and cracks. For purposes of bat management, one should pay attention to any gap of approximately  $\frac{3}{8} \times 1\frac{1}{2}$  inches (0.6 x 3.8 cm) or a hole  $\frac{5}{8} \times \frac{7}{8}$  inch (1.6 x 2.2 cm). Such openings must be considered potential entries for at least the smaller species, such as the little brown bat. The smaller species require an opening no wider than  $\frac{3}{8}$  inch (0.95 cm), that is, a hole the diameter of a US 10-cent coin (Greenhall 1982). Openings of these dimensions are not uncommon in older wood frame structures where boards have shrunk, warped, or otherwise become loosened. The discovery of one or two bats in a house is a frequent problem.

### **Roosting Sites**

Bats use roosting niches that are indoors (human dwellings, outbuildings, livestock quarters, warehouses), semi-enclosed (loading docks, entrance foyers), partially sheltered (porches, carports, pavilions, highway underpasses, bridges), and open structural areas (window shutters, signs). Once there, active bats in and on buildings can have several economic and aesthetic effects, often intertwined with public health issues (Frantz, 1988). Unusual roosting areas include wells, sewers, and graveyard crypts. Before considering control measures, verify that bats are actually the cause of the problem.

### **Rub Marks**

Surface areas on walls, under loose woodwork, between bricks and around other bat entryways often have a smooth, polished appearance. The stained area is slightly sticky, may contain a few bat hairs, and is yellow-brown to blackish brown in color. The smooth gloss of these rub marks is due to oils from fur and other bodily secretions mixed with dust, deposited there as many animals pass repeatedly for a long period over the same surface. Openings marked in this way have been used heavily by bats.

### **Noise**

Disturbing sounds may be heard from vocalizations and grooming, scratching, crawling, or climbing in attics, under eaves, behind walls, and between floors. Bats become particularly noisy on hot days in attics, before leaving the roost at dusk, and upon returning at dawn. Note that rustling sounds in chimneys may be caused by birds or raccoons and scratching and thumping sounds in attics and behind walls may indicate rats, mice, or squirrels.

## **Guano and Urine**

Fecal pellets indicate the presence of animals and are found on attic floors, in wall recesses, and outside the house at its base. Fecal pellets along and inside walls may indicate the presence of mice, rats, or even roaches. Since most house bats north of Mexico are insectivorous, their droppings are easily distinguished from those of small rodents. Bat droppings tend to be segmented, elongated, and friable. When crushed, they become powdery and reveal shiny bits of undigested insect remains. In contrast, mice and rat droppings tend to taper, are un-segmented, are harder and more fibrous, and do not become powdery when crushed (unless extremely aged). Bat excrement produces an unpleasant odor as it decomposes in attics, wall spaces, and other voids. The pungent, musty, acrid odor can often be detected from outside a building containing a large or long-term colony. Similar odor problems occur when animals die in inaccessible locations. The odor also attracts arthropods which may later invade other areas of a building. Bat guano may provide a growth medium for microorganisms, some of which are pathogenic (histoplasmosis, for example) to humans. Guano accumulations may fill spaces between walls, floors, and ceilings. It may create a safety hazard on floors, steps, and ladders, and may even collapse ceilings. Accumulations also result in the staining of ceilings, soffits, and siding, producing unsightly and unsanitary conditions. Bats also urinate and defecate in flight, causing multiple spotting and staining on sides of buildings, windows, patio furniture, automobiles, and other objects at and near entry/exit holes or beneath roosts. Bat excrement may also contaminate stored food, commercial products, and work surfaces. Bat urine readily crystallizes at room temperature. In warm conditions under roofs exposed to sun and on chimney walls, the urine evaporates so quickly that it crystallizes in great accumulations. Boards and beams saturated with urine acquire a whitish powder-like coating. With large numbers of bats, thick and hard stalactites and stalagmites of crystallized bat urine are occasionally formed. As the urine saturates the surfaces of dry wood beams and crystallizes, the wood fibers expand and separate. These fibers then are torn loose by the bats crawling over such surfaces, resulting in wood fibers being mixed with guano accumulations underneath. The close proximity of bat roosts to human living quarters can result in excreta, animal dander, fragments of arthropods, and various microorganisms entering air ducts as well as falling onto the unfortunate residents below. Such contaminants can result in airborne particles of public health significance (Frantz 1988).

## **Public Health Issues Rabies—*General Epidemiology***

Bats are distinct from most vertebrate pests that inhabit human dwellings because of the potential for transmitting rabies — a viral infection of mammals that is usually transmitted via the bite of an infected animal. Rabies does not respond to antibiotic therapy and is nearly always fatal once symptoms occur. However, because of the long incubation period (from 2 weeks to many months), prompt vaccination following exposure can prevent the disease in humans. Dogs, cats, and livestock also can be protected by periodic vaccinations. Bats are not asymptomatic carriers of rabies. After an incubation period of 2 weeks to 6 months, they become ill with the disease for as long as 10 days. During this latter period, a rabid bat's behavior is generally not normal—it may be found active during the daytime or on the ground incapable of flying. Most human exposures are the result of accidental or careless handling of grounded bats. The virus in the carcass of dead bats is reported to remain infectious until decomposition is well advanced.

Rabies is the most important public health hazard associated with bats. Infection with rabies has been confirmed in all 40 North American species of bats that have been adequately sampled in all of the contiguous United States and in most provinces of Canada.

### **Legal Status**

The lethal control of bats, even when there is a proven potential danger to humans, often is subjected to careful scrutiny and interagency coordination, since bats are considered nongame wildlife. Most Ohio bats have protections as Species of Concern or as Threatened Species. The Indiana bat, found in Ohio, is listed as both Federal and State endangered species.

### **Control Methods**

To confirm that bats are actually roosting in or on a building, look for bats flying in and out of a site and/or for signs of infestation. A bat watch can be conducted by two people (more may be necessary to observe large or complex sites) posted at opposite corners of a structure. An evening watch begins about 30 minutes before dark and a morning watch begins about 1 hour before dawn. Observations should continue for approximately 1 hour. Such observations can indicate exit/entry points and the number of bats. With practice, distinguishing some bat species may also be possible. Observations can be enhanced with a standard flashlight, but be certain to keep the bright part of the beam as far as possible away from the exit hole being observed. Bright light will increase bats' reluctance to exit and may result in an incomplete exit of the colony. Bats are sensitive to light intensity and can visually discriminate shapes and patterns in extremely low light situations. They can only see in black and white; hence, the low-contrast illumination and soft shadows produced by red light has little effect on bats.

### **Locating the Roost(s)**

It is not always possible or convenient to conduct a bat watch. Thus, a detailed inspection inside the building for bats or bat sign may be necessary to find specific roosts. Daytime is best, especially during the warmer part of the day. Bats roost in the most varied kinds of buildings and in every part from cellar to attic. Some types of buildings appear preferable (older houses, churches, barns, proximity to water) as do certain roost locations therein, especially areas with little disturbance, low illumination, little air circulation, and high temperatures. Often it is easy to locate bats, especially in warm weather in attics or lofts, where they may hang in clusters or side-by-side from the sloping roof lath, beams, and so forth. However, bats have the ability to find crevices and cavities, and if disturbed may rapidly disappear into the angles between converging beams, behind such beams or wallboards, into mortise holes on the underside of beams, and into the multilayered wall and roof fabrications. If bats cannot be openly observed, usually there are various interior and exterior signs of their presence. Often there are multiple roost sites within or on a single building.

## **Problem Assessment**

Once it has been confirmed that bats are present, one must determine if there is damage, if there is a health risk, and if some intervention is warranted. There are circumstances in which “no action” is the correct action because of the beneficial role of bats. In cases where there is risk of contact, damage from excreta accumulations, stains, and so on, intervention may be necessary.

## **Timing**

With the exception of disease treatment and removal of the occasional bat intruder, timing becomes an important planning consideration. All interventions should be initiated before the young are born or after they are weaned and able to fly. Thus, the annual opportunity extends from about mid-August to mid-May for Ohio.

## **Removal of Occasional Bat Intruder**

A bat that has blundered into the living quarters of a house will usually find its way out by detecting air movement. When no bite or contact with people or pets has occurred, the simplest solution for “removing” the bat is to try to confine it to one room, then open windows and doors leading outdoors and allow it to escape. If the bat is present at night, the lights should be dimmed to allow the animal to find open doors and windows; some light is necessary if an observer is to insure that the bat finds its way out. If bright lights are kept on, the bat may become confused and may seek refuge behind shelving, curtains, hanging pictures, or under furniture. Healthy bats normally will not attack people even when chased. Chasing a flying bat with a folded newspaper, tennis racket, or stick will cause the bat to take evasive action. It is best to wait for the bat to come to rest. When it does, quickly cover it with a coffee can or similar container, and slide a piece of cardboard or magazine under the can to trap the bat inside. Take the captured bat outdoors and release it away from populated areas, preferably after dark. Note that reasonably thick work gloves should be worn at all times when trying to capture a bat. Also, if a bite or physical contact occurs, capture the bat without damaging its head and immediately contact a physician. Management of problems involving bat colonies requires more complicated procedures and a greater time commitment.

## **Exclusion**

### **Preventive Aspects**

The most satisfactory and permanent method of managing nuisance bats is to exclude them from buildings. Locate bats and their points of exit/entry through bat watches or other inspection methods. This is a tedious process to locate all openings in use, and bats may switch to alternate ones when normal routes become unavailable. Thus, consider “potential” as well as “active” points of access. Often it is apparent where bats might gain entrance even when such openings are not directly observable. By standing in various locations of a darkened attic during daylight hours, one often can find leaks of light at the extreme parts of eaves, in layers of sub-roofing, and below chimney flashings.

## **Devices and Methods**

Exclusion becomes “denial of reentry” once the bats have returned to establish maternity colonies (and before the young are born), usually from April through mid-May in Ohio. Denial of reentry is also appropriate anytime after mid-August when young are capable of flying, as long as bats continue to utilize the roost. The traditional way to exclude bats from an occupied roost involves five basic steps: (1) identify and close all indoor openings through which bats might gain access to human living quarters; (2) close most confirmed and all unused potential exterior exits, leaving only a few major openings (it’s best to complete this within 1 to 2 days); (3) at night shortly after the bats have departed to feed, temporarily close the few remaining, major exits; (4) check the roost for presence of bats and, if any remain, unplug the temporarily closed exits early the next evening to allow the bats to escape, then temporarily re-plug the exits, repeat as necessary; and (5) when the bats are all out, permanently seal the holes.

## **Repellents**

Illumination has been reported to be an effective repellent. Floodlights strung through an attic to illuminate all roosting sites may cause bats to leave. Where possible, the addition of windows to brighten an attic will help to reduce the desirability of the roost site and is not likely to introduce additional problems. Air drafts have successfully repelled bats in areas where it is possible to open doors, windows, or create strong breezes by use of electric fans. Addition of wall and roof vents will enhance this effort, as well as lower roost temperature. These measures will increase the thermoregulatory burden on the bats, thus making the roost less desirable. In a similar fashion, colonies located in soffits, behind cornices, and other closed-in areas can be discouraged by opening these areas to eliminate dark recesses.

Discourage bats from roosting behind shutters by removing the shutters completely or by adding small blocks at the corners to space them a few inches away from the wall.

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## **GOOSE CONTROL**



This section is designed to help guide you in alleviating problems associated with Canada geese for landowners. The key to solving the problem is to make property less attractive to Canada geese, be persistent using multiple harassment techniques, and to utilize scare tactics immediately when geese show up. Relocating Canada geese and destroying their nests and eggs are NOT effective long-term solutions and will only be authorized as a last resort.

### **FILING A COMPLAINT**

The Division of Wildlife utilizes an online goose complaint and permitting system. Landowners can file complaints at [www.wildohio.com](http://www.wildohio.com) or call the nearest Division of Wildlife office. Before any permits can be issued, landowners must file a complaint through the website listed above.

## **YEARLY CONTROL SCHEDULE**

The information below will help you know what to do throughout the year to control Canada geese on properties you are working on.

### **Management during Pre-nesting Season (January 15<sup>th</sup> thru March 31<sup>st</sup>)**

- 1) Place any harassment devices such as Mylar flagging, balloons, or decoys to deter geese
- 2) Repair barriers and other harassment devices
- 3) Use active harassment techniques such as chasing and noise makers when the geese are on the property
- 4) Have the landowner file a goose complaint at the website above if they are experiencing problems with geese

### **Management during Nesting Season (March 15<sup>th</sup> thru April 30<sup>th</sup>)**

- 1) Look for any goose nests on the property
- 2) If there are nests in locations near doors or parking lot islands guarded by aggressive geese, use snow fence to reduce aggressive encounters.
- 3) If the landowner has nests on their property, stop all active harassment of nesting geese and remove any other harassment devices so that they don't acclimate to them
- 4) Have the landowner contact your closest Division of Wildlife office if they would like to apply for a nest destruction permit

### **Management during Hatching Season (April 15<sup>th</sup> thru May 31<sup>st</sup>)**

- 1) Harass goslings (not the adults) as soon as they arrive on the property by chasing them off the property so the adult geese realize the property is not a safe location for them

### **Management during Molting Season (May 15<sup>th</sup> thru July 15<sup>th</sup>)**

- 1) Do not use active harassment such as dogs or noise makers since the geese are not able to fly at this time of year
- 2) Have the landowner contact their closest Division of Wildlife office if they would like to discuss the possibility of obtaining a roundup permit.

### **Management during New Flight Season (July 1<sup>st</sup> thru September 15<sup>th</sup>)**

- 1) Since adult geese have new flight feathers and goslings can now fly, restart active harassment such as dogs or noise makers and place out any harassment devices such as Mylar flagging, balloons, or decoys to deter the geese

### **Management during Fall/Winter/Hunting Season (September 1<sup>st</sup> thru January 31<sup>st</sup>)**

- 1) Encourage the landowner to utilize hunting wherever it is legal and safe to help reduce the Canada goose population especially in September
- 2) Continue all harassment techniques when Canada geese are on the property

### **GOOSE PERMITS AVAILABLE TO LANDOWNERS**

#### **Egg/Nest/Attack Goose Destruction Permit**

Eggs and nests of Canada geese cannot be touched without this permit from the Ohio Division of Wildlife. This permit serves three functions. First, it allows goose nests on a property to be manipulated using one of three methods (adding, oiling or puncturing) so that they do not hatch. The instructions for these three methods are below. Second, in situations where there is an aggressive goose protecting a nest, the nest may be removed. This should only be done in situations where providing a protective barrier to people (such as fencing) is not able to be installed or immediate safety concerns occur. It should be noted that simply removing a nest will not solve the problem and exclusion around the area where the nest was located is needed to keep the goose from laying another nest in the same location. Third, when an attack goose situation occurs and a Division of Wildlife employee determines the best course of action is removal of one or both of the geese, this permit allows for hand capturing the goose and euthanizing it.

#### **Roundup Permit**

Roundup permits are reserved as last resort tactics, used only after complainants have made an effort to utilize non-lethal harassment tactics without satisfactory results. Roundups are conducted in June and July when the goslings cannot fly yet and the adult geese are molting, or replacing, their feathers. Anyone handling geese under a roundup permit must view a video and correctly answer a related question on the certification test as well as reviewing the section below on how to handle geese.

#### **Shooting Permit**

Shooting permits are reserved as last resort tactics, used only after complainants have made an effort to utilize non-lethal harassment tactics without satisfactory results. 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. However, in situations where discharge of a firearm is permitted by local ordinances it can also be used to deal with aggressive geese that cannot be hand captured. Shooters will be permitted to take no more than 5 geese per day, with no more than 25 geese total under any one permit in one year in most situations. In general, shooting permits are issued early in the nesting season and are used: 1) to discourage adult and sub-adult birds that are capable of flight from feeding on emerging crops; 2) later in the summer, to discourage birds that are capable of flight

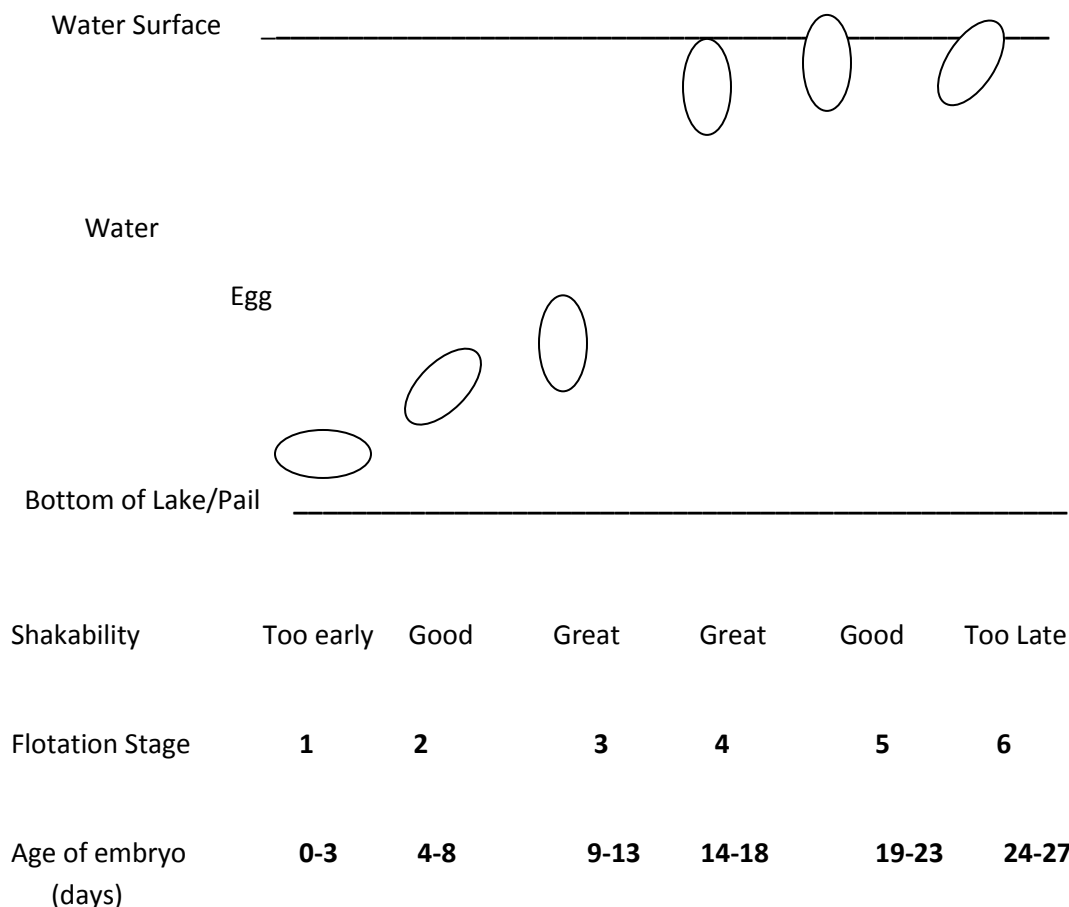
from utilizing a site. Flightless geese including molting birds and goslings are not allowed to be shot under a shooting permit.

## INSTRUCTIONS FOR WORKING ON EGGS

### UNDER AN EGG/NEST/ATTACK GOOSE DESTRUCTION PERMIT

There are three methods permitted to be used when rendering eggs unviable under an Egg/Nest/Attack Goose Destruction Permit that a landowner has obtained. The methods are egg shaking, egg oiling, and egg puncturing. Below are the instruction sheets for how to utilize each method properly. An Egg/Nest/Attack Goose Destruction Permit does not authorize you or others to keep or possess Canada goose eggs. It is a good idea to encourage the landowner to keep a log of activities showing where on the property all of the nests are located and the dates each nest is visited. This will help in the following years to know when to apply for a permit and to track the success of the goose program for the landowner.

#### Egg Shaking Instructions



Step 1 – Get the female goose off of the nest. A dog on a leash is a great way to get the goose off of the nest. DO NOT allow the dog to attack the goose. Another easy method is to use an opened umbrella.

Step 2 – Hold an egg to feel if it is cold or warm. If the eggs feel cool to the touch, incubation has not commenced and clutch has not been completely laid. Revisit the nest in 7-10 days when the eggs should feel warm to the touch. When the eggs do feel warm to the touch, go to step 3. Eggs that are being pipped (gosling hatching out) are NOT to be shaken.

Step 3 – Place one of the eggs in a pail of water or on a shallow spot in a pond/lake about 6 inches under the water surface. Follow the flotation chart above to determine what stage the eggs are in and when to shake them.

Step 4 – Shake the egg vigorously up and down until you are able to feel a “ball” moving inside the egg. Mark each egg with a permanent marker to identify that the egg has been shaken. Continue with ALL of the eggs in the nest.

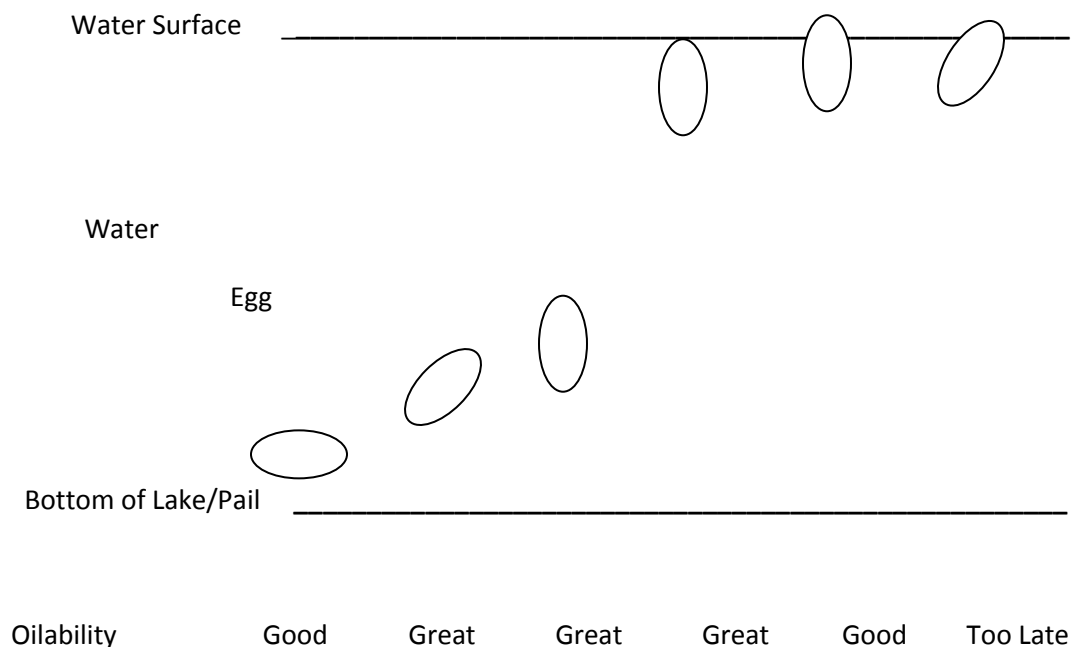
Step 5 – Place all of the eggs back into the nest. This will fool the goose and prompt her to continue to nest. If the eggs are not placed back into the nest, the goose will re-nest and you will have to start the process on that nest all over again.

Step 6 – Record the nest and eggs on the back of the permit.

Step 7 – Move onto the next nest and start over at step 3.

Step 8 – Re-visit the area once a week until all of the eggs in all the nests on the property are shaken.

### Egg Oiling Instructions



Flotation Stage	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Age of embryo (days)	<b>0-3</b>	<b>4-8</b>	<b>9-13</b>	<b>14-18</b>	<b>19-23</b>	<b>24-27</b>

Step 1 - Get the female goose off of the nest. A dog on a leash is a great way to get the goose off of the nest. DO NOT allow the dog to attack the goose. Another easy method is to use an opened umbrella.

Step 2 – Hold an egg to feel if it is cold or warm. If the eggs feel cool to the touch, incubation has not commenced and clutch has not been completely laid. Revisit the nest in 7-10 days when the eggs should feel warm to the touch. When the eggs do feel warm to the touch, go to step 3. Eggs that are being pipped (gosling hatching out) are NOT to be oiled.

Step 3 – Place one of the eggs in a pail of water or on a level spot in a pond or lake about 6 inches under the water surface. Follow the flotation chart above to determine what stage the eggs are in and when it is best to oil them.

Step 4 – Mark the egg with a permanent marker

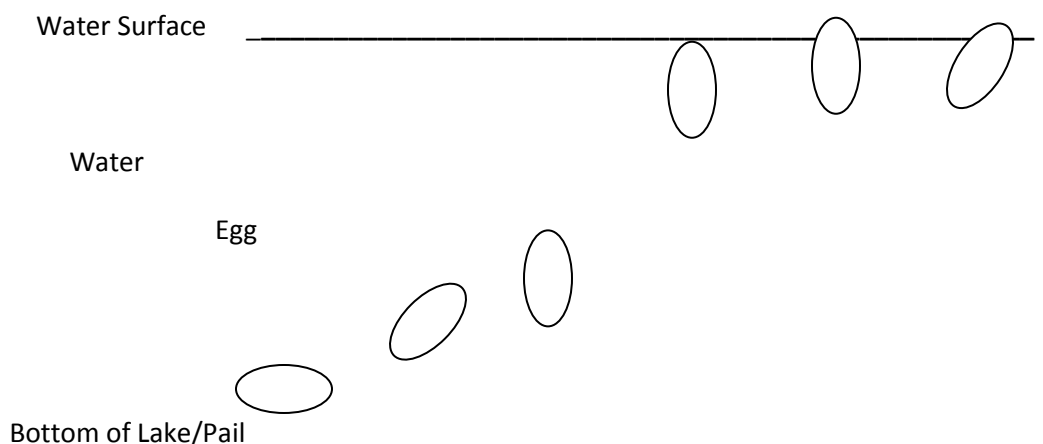
Step 5 – Either use a sprayer to spray vegetable oil on the eggs or dip the eggs into a bucket of vegetable oil and put the eggs back into the nest. Leaving the eggs in the nest will fool the goose and she will continue to nest. If the eggs are not placed back into the nest, the goose will re-nest and you will have to start the process on that nest all over again. Repeat steps 4 and 5 until all eggs are done.

Step 6 – Record the nest and eggs on the back of the permit.

Step 7 – Move onto the next nest and start over at step 3.

Step 8 – Re-visit the area once a week until all of the eggs in the nests on the property are oiled.

### Egg Puncturing Instructions



Puncturability	Great	Great	Great	Great	Great	Too Late
Flotation Stage	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Age of embryo (days)	<b>0-3</b>	<b>4-8</b>	<b>9-13</b>	<b>14-18</b>	<b>19-23</b>	<b>24-27</b>

1/8" hole

Step 1 - Get the female goose off of the nest. A dog on a leash is a great way to get the goose off of the nest. DO NOT allow the dog to attack the goose. Another easy method is to use an opened umbrella.

Step 2 – Eggs that are being pipped (gosling hatching out) are NOT to be punctured.

Step 3 – Place one of the eggs in a pail of water or on a level spot in a pond or lake about 6 inches under the water surface. Follow the flotation chart above to determine what stage the eggs are in and when it is best to puncture the eggs.

Step 4 – Using a tool, puncture a hole into the pointed end of the egg. Some of the tools that work great are a cordless drill with a 1/8" drill bit or a large finishing nail.

Step 5 – Place all of the eggs back into the nest. This will fool the goose and prompt her to continue to nest. If the eggs are not placed back into the nest, the goose will re-nest and you will have to start the process on that nest all over again.

Step 6 – Record the nest and eggs on the back of the permit.

Step 7 – Move onto the next nest and start over at step 3.

Step 8 – Re-visit the area once a week to look for newly laid nests. If some are found, start at step 3 with each new nest.

## HANDLING GEESE

When operating under either a Roundup Permit or dealing with an attack goose under an Egg/Nest/Attack Goose Destruction Permit, it is important that all geese are handled properly. The photos below will instruct you on how to properly handle geese when working under these permits.

Step 1  
Gently hold the goose down to the ground

Step 2  
Grasp both wings where they meet the body



Step 3

Grasp both legs with the other hand



Step 4

Gently lift the goose and hold it against your body



Do NOT grab geese by the neck or head

Do NOT grab goslings with down feathers by the wings. Gently hold them around their body and cradle them like a football against your body.

Watch the head so that the goose does not turn around and bite you

## DOGS

The use of dogs for goose harassment requires a Commercial Nuisance Wild Animal Control Operators License. Almost any obedient breed of dog, when trained, can be used to discourage Canada geese; however, border collies seem to be the breed of choice. Humans have enlisted the assistance of border collies for centuries. 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.

In herding, border collies circle and stalk the object of interest. Border collies work to discourage geese by simply keeping the birds on the run and/or in the water until they become frustrated and leave the area. 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, almost nothing will work to drive them off your property.

Border collies are widely available. Some border collies are not suited for the rigors of field trials. These dogs make good goose dogs, as well as a good pet for someone who wants to own and care for the dog. There are organizations set up to place these border collies into situations where they can be useful.

#### **PROPER USE OF DOGS**

Several locations have used dogs quite successfully. Below are a couple of tips which have been found to be successful:

- Start working with dogs very early in the spring before goose pairs have arrived (February & March). Go out four to five times per day to chase the geese away, and also go out at dusk when some geese may try to return to roost.
- Most geese leave after three or four weeks of harassment; however, if geese start nesting, almost nothing will drive them away.
- It is important to chase new goose arrivals frequently and persistently at least once a day.
- The dogs can clear a golf course of geese while golfers are there, since it requires less than 60 seconds of interference. Usually, the geese see the dog and start honking – signaling others to fly.
- Dogs are trained to commands and will respond to more than one person, although they tend to be one-person dogs.
- Some species of dogs, for example Border collies, need to work. If left alone, they become hyperactive and may dig in the lawn and chew flowers. Therefore, we do not recommend you purchase one of these dogs unless you are able to properly care for them.

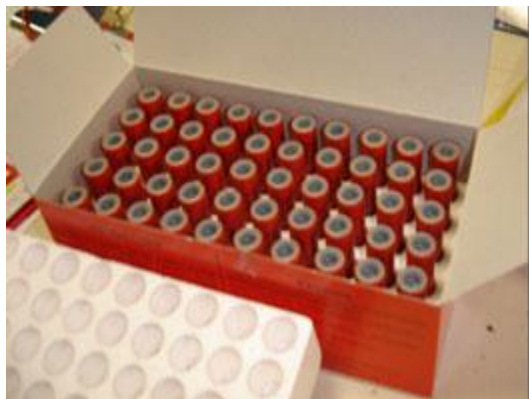
#### **TOXICANTS OR PESTICIDES**

##### **Ohio Pesticide License**

The use of toxicants or chemical substances as a means of control for nuisance wild animals is now permitted. It is however, unlawful to use these substances contrary to the label instructions or manufacturer recommendations. Commercial wild animal control operators must first obtain a Commercial Pesticide Applicators License before using these substances to control nuisance animals.

A commercial pesticide applicator license may be obtained through the Ohio Department of Agriculture Pesticide and Fertilizer Regulation Section. A test is administered and study materials are available at <http://www.agri.ohio.gov/apps/odaprs/pestfert-prs-index.aspx>. Training for new applicants is conducted by Ohio State University. Contact them at <http://pested.osu.edu> or 614-292-4070 for training and to schedule an appointment to take the test. The license period is October 1 – September 30 and an annual fee applies. License holders are required to meet recertification requirements every three years to maintain their license.

## EXPLOSIVE PEST CONTROL DEVICES



Explosive pest control devices are regulated by the Bureau of Alcohol, Tobacco, Firearms and Explosives. The following information was taken from their website regarding the use and storage of these devices. Additional information can be found at <http://www.atf.gov/explosives/how-to/explosive-pest-control-device-requirements.html>

Explosives industry members play an integral role in maintaining and improving our quality of life in the United States and work to bring countless benefits to our everyday lives. In addition to their evident use in mining and demolition, explosives are also used in the field of animal or pest control. Explosive pest control devices (EPCDs) — often referred to as “bird bombs,” “shell crackers,” or similar terms — are used to maintain adequate levels of agricultural and aquaculture production and aviation safety by minimizing crop damage and interference from pests, birds, and seals at airports, landfills, farmland, golf courses, and fishing areas.

EPCDs are regulated explosives that fall under ATF jurisdiction. As a part of ATF’s public safety mission, ATF is committed to working with industry members to protect the public from unsafe or insecure storage and the potential misuse of these explosive materials.

### License or Permit Requirements

Under Federal explosives laws, all persons who wish to manufacture, import, or distribute explosives, including EPCDs, must acquire a Federal explosives license, and those who wish to receive explosives must acquire a Federal explosives permit. ATF license and permit requirements may be found on ATF’s website at [www.atf.gov/explosives/how-to/become-an-fel.html](http://www.atf.gov/explosives/how-to/become-an-fel.html). In addition to an [ATF Form 5400.13](#) — Application for Explosives License or Permit, and the application fee, applicants must submit a 2” x 2” photograph and a completed FD-258, Fingerprint Identification Card (obtainable through a local law enforcement agency) for each Responsible Person (RP). Further, an [ATF Form 5400.28](#) — Employee Possessor Questionnaire, is required for each Employee Possessor (EP). An EP is an individual who has **actual or constructive possession** of explosive materials during the course of his or her employment with the applicant’s business. Background checks are conducted for all RPs and EPs submitted with an application.

## **Storage Requirements**

Licensees and permittees must store EPCDs in compliance with 27 CFR, Subpart K - Storage. Pest control devices containing flash powder are classified as high explosives and must be stored within Type-1 or Type-2 magazines. Licensees or permittees who desire to store high explosive pest control devices, packed in their original Department of Transportation-approved shipping containers, in a Type-4 magazine, may submit a [request for a variance](#) from regulations to the Explosives Industry Programs Branch. (If they are removed from the containers, they must be stored as high explosives within Type-1 or Type-2 magazines.)

Pest control devices containing only black powder or pyrotechnic compositions are low explosives and may be stored in Type-4 magazines without a variance. See [ATF P 5400.7](#) — Federal Explosives Law and Regulations 2007 (ATF Orange Book) for magazine construction and locking requirements.

When not in the process of manufacture; being physically handled in the operating process of a licensee or user; being used; or being transported to a place of storage or use by a licensee or permittee, EPCDs must be kept in the appropriate locked magazines that meet the construction, locking, and table of distance requirements of Subpart K. Magazines must be inspected every 7 days to ensure detection of any theft, or attempted theft, of explosive materials. For additional storage information, visit our website at <http://www.atf.gov/explosives/how-to/explosive-storage-requirements.html>

## **Records Requirements**

Persons who receive EPCDs generally must maintain separate records of explosive material acquisition and distribution. Persons who store EPCDs also must maintain a Daily Summary of Magazine Transactions (DSMT) for each magazine. (See 27 CFR, Part 555, Subpart G - Records and Reports for additional recordkeeping requirements.) The DSMT record must include:

- Manufacturer's name or brand name;
- The date of receipt or removal;
- Total quantity received in and removed from each magazine during the day; and
- Total remaining on hand at end of the day.

## **Storage Variances**

Licensees or permittees who wish to use an alternate method or procedure, including alternate magazine construction standards, must submit a request for variance from the regulations. For additional information regarding variance requirements, see ATF's Variance Request Guidelines at <http://www.atf.gov/explosives/how-to/request-variance-exemption-or-determination.html>

## **Reporting to Local Fire Authorities**

Persons storing explosive materials must notify the authority having jurisdiction for fire safety in the locality where the explosive materials are stored. This notification should include the type, magazine

capacity, and location of each site where the explosive materials are being stored. Notification must be made orally before the end of the day on which storage commences, and in writing within 48 hours from the time such storage commenced. The authority having jurisdiction for fire safety is typically the local fire department. The following web site is provided to assist individuals in determining who has jurisdiction for fire safety in their area.

[National Association of State Fire Marshals](#)

### **Report Explosives Theft/Loss**

Any person who has knowledge of the theft or loss of any explosive materials from their stock must report such theft or loss within 24 hours of discovery to ATF and to appropriate local authorities.

#### **Upon discovery of any theft or loss of any of your explosive materials:**

1. Call the [nearest ATF office](#) or the toll free number 1-888-283-2662.
2. Call your local law enforcement office to report the theft or loss. If the explosives are lost or missing, you should make it clear to the authorities that there is no evidence of a crime and that the disposition of the explosive materials is unknown.
3. Third, complete the report form ([ATF Form 5400.5](#)) and attach any additional sheets or invoices necessary to provide the required information and mail or fax it to the ATF office located nearest you. Be sure to submit the original form(s) to ATF and retain copies for your records.

### **Explosives Safety and Security**

ATF and industry share common goals of ensuring public safety and protecting America against potential criminal or terrorist activities. Therefore, while ATF is primarily concerned with law enforcement and regulatory duties, we also strive to work and consult with the explosives industry and its associations to ensure the safety and security of the public.

[ATF Publication 5400.15](#), Safety and Security Information for Federal Explosives Licensees and Permittees-produced in partnership with International Society of Explosives Engineers and the Institute of Makers of Explosives-provides industry members with useful tips, techniques, and tools for properly securing explosive materials. This publication includes voluntary check lists to help identify areas of weakness and vulnerability in security, recordkeeping examples, ATF hotlines, and contact phone numbers, as well as other useful information.

Note: As specified in the Federal explosives law at 18 U.S.C. §845, and the Federal explosives regulations at 27 CFR 555.141, the transportation, shipment, receipt, importation, manufacture, distribution to, possession by, and storage of explosive materials by Federal agencies of the United States are exempt from the Federal explosives requirements. However, States and their political subdivisions (e.g. municipal airports) must still comply with storage requirements and should report any theft or loss of explosive materials to the United States Bomb Data Center at 800-461-8841, or after hours at the ATF 24 hour hotline (800-800-3855).

### **General Safety Precautions**

- Notify law enforcement agencies prior to shooting.
- Always use eye and hearing protection.
- Keep the muzzle of the launch pistol pointed in a safe direction, away from any people.
- Shoot away from any buildings, vehicles and dry vegetation.
- Ensure immediate access to a class ABC fire extinguisher.
- Keep spare cartridges covered and away from the launch pistol.
- Never shoot from the inside of a vehicle or carry a loaded launch pistol in a vehicle.
- Consider wind direction and overhead obstructions.

## Chapter 5 – Common Nuisance Wildlife Damage Situations

This chapter contains some of the more common situations commercial nuisance wild animal control operators will encounter while on the job. The first step in solving a wildlife damage situation is to first identify the animal causing the problem. The information within this chapter will help you in determining which animal is causing the problem. While trapping is a very useful technique for solving wildlife damage situations, in most situations exclusion methods should be utilized so that the situation does not occur again. In some cases exclusion without trapping will even solve the problem.

These by no means are the only situations you will encounter and by no means should be viewed as the only ways to handle the situation but rather suggestions and guidance in determining the animal causing the damage. Each wildlife damage situation is unique and therefore you will need to make site-specific decisions on the best course of action to deal with each situation.

### **Trash Cans Disturbed**

**Raccoon** – Raccoons are opportunistic feeders and trash cans provide them a wealth of food options. You will usually see holes in the trash bag with trash pulled out and often you will find a trail of trash away from the location of the trash cans. If you find that raccoons are getting into trash cans, efforts should be made to move the trash cans into a garage or structure to exclude the access to the trash by the raccoons. If that is not possible, using locking lids on the cans or securing the lids with bungee straps will also keep the raccoons from being able to easily open the trash cans. If the landowner does not have a structure to put the trash cans in, regularly cleaning the trash cans and the area they are stored will help to reduce the attracting smells of the trash. Also, many cities and home improvement stores now have extra-large trash cans available that do a good job of keeping raccoons out of them. Placing heavy objects on the lid such as blocks or bricks can also make it more difficult for raccoons to access the cans.

**Bear** – In areas within Ohio where bears occur oftentimes they will find their way into trash much like raccoons. However, with bears they often will carry the trash can or trash bag away from the area the trash is stored. You will usually see a much larger scattering of trash than you will see with raccoon damage. The trash cans themselves will usually have substantial damage as well. If a bear is getting into trash cans, the cans must be moved into a garage or structure. Bears have a great memory and will return to the site repeatedly if they find a good meal. If a landowner has a bear on their property, contact the Division of Wildlife to notify them of the situation.

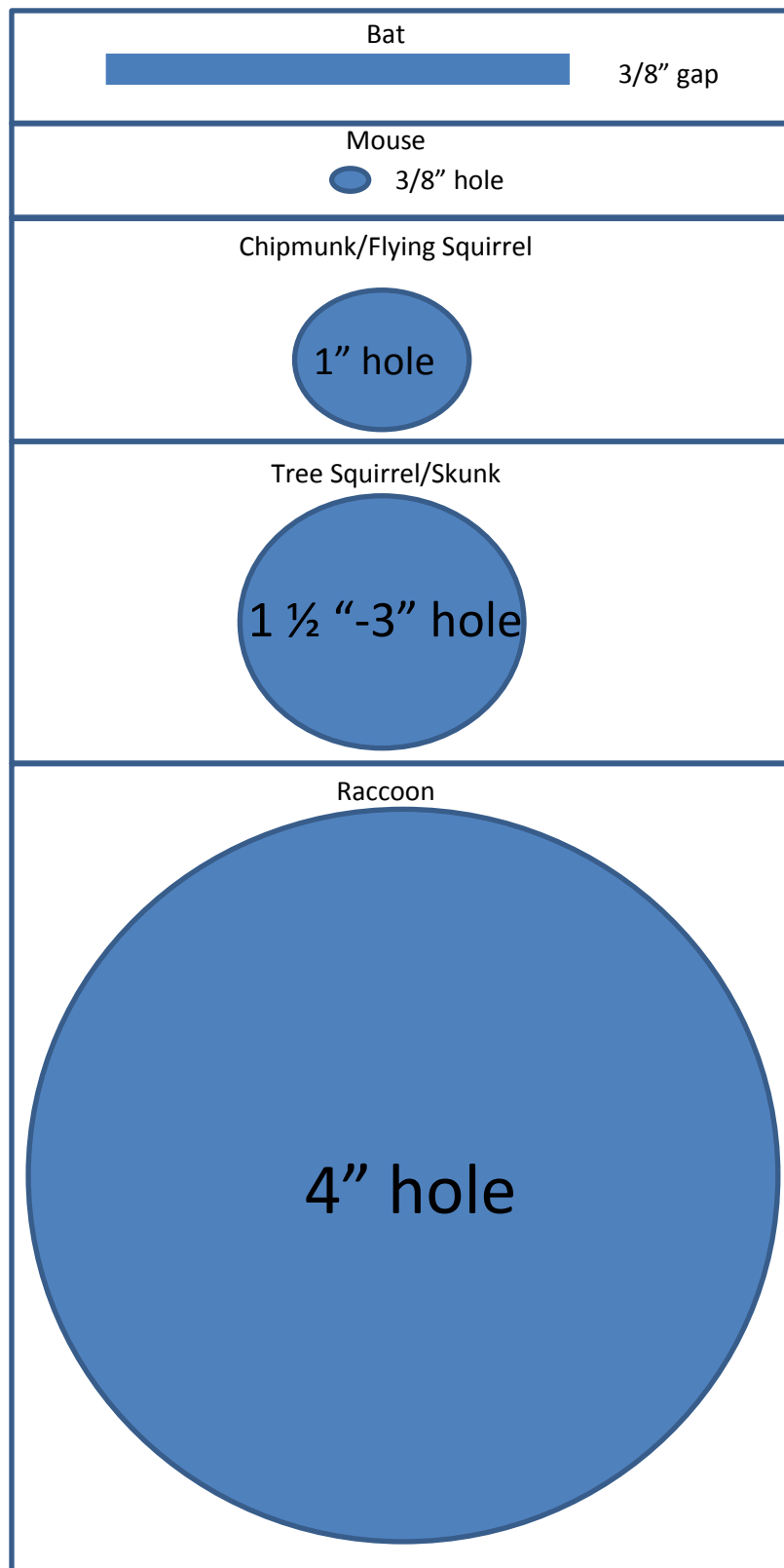
### **Raccoon in a Dumpster**

**Raccoon** – Raccoons are commonly found in dumpsters because of all the food available in the dumpster. If the dumpsters have side doors or lids, efforts should be made to keep the doors shut and secured until the day of trash pickup. However, raccoons will at times go into a recently emptied dumpster and not be able to climb their way out. If that is the case, using a snare pole to get the raccoon out works well. You can also simply place a tree branch or piece of wood at an angle in the

dumpster to allow the raccoon the ability to climb out. Usually the raccoon will not climb out until sunset.

### **Animal in Attic/Crawlspace**

If you or the landowner are unable to see the animal that is using the attic/crawlspace, sometimes assessing the hole they are using can help to determine which animal is using the space by ruling out which animals could not fit through the hole.



**Bats** – Looking for guano can often let you know that you are dealing with a bat. When you find guano in attics it is usually directly below where the bat is sleeping. If you notice the guano outside, it will be directly below the area they are getting in. An easy way to deal with a bat in an attic/crawlspace is to put up a one-way “door” in the spot where the bat is entering the structure. This is something that allows the bat to leave but not get back in. Dusk is a good time to determine whether or not bats are still leaving the structure by standing outside and watching for where. There are many commercially available one way door devices. You can also improvise one as well with household window screen. Leaving this in place for a couple of days will ensure that all the bats are out. However, you must be mindful if there are any pups in the structure since they are unable to leave the structure (see chapter 7). If the adults are excluded the pups will surely die leading to a new problem, the smell of dead animals. Once you are sure there are no more bats in the home, you can then seal up any cracks found including the one the bats were using to enter the structure.

**Mouse** – Mice can use very small holes to enter a home. Mice typically will not have any droppings by the hole they are using. Instead the homeowner will find their droppings throughout the house especially in cabinets and on shelves. Setting a mouse trap, either lethal or non-lethal, inside the home and then sealing the hole the mice are using to enter the structure usually will solve the problem. Because mice are good chewers, using metal flashing when sealing the hole will help keep the mice from finding their way back into the home.

**Tree Squirrel** – Squirrels are a common nuisance in homes. You will usually not be able to find any droppings when there is a squirrel using the attic/crawlspace. The homeowner will usually let you know they are hearing the animal running around during the day since tree squirrels are active during the day and sleep at night. Since tree squirrels are not colony nesters, in most situations you can seal the hole where it is entering and then set a live trap inside to trap the squirrel. Because squirrels are good chewers like mice, using metal to seal the hole will help keep the squirrel from finding its way back in (see House Being Chewed section). Also, like bats you want to determine if there are baby squirrels in the attic they are physically removed as well since they are likely not to find their way into the trap. It should also be noted that squirrels typically have two litters each year (see chapter 7).

**Flying Squirrel** – Same as Tree Squirrel with the exception that flying squirrels are nocturnal and their movement will be noted at night by the homeowner. However, due to their small size the noise will usually be more “scurrying” and light footed as opposed to raccoons.

**Raccoon** – As opposed to flying squirrels, due to their much larger size raccoons moving at night will be much louder. Also, raccoons will defecate and urinate in the area where they live. Therefore, the area in the attic or crawlspace will usually have lots of feces. They will also use insulation as bedding and so you can usually find insulation torn or moved around. If the raccoon is using a tree to get into the home, sometimes trimming the branches back will solve the problem of the raccoon getting into the home. You can also wrap flashing around the trunk of the tree to exclude them from the home not allowing them to climb the trunk of the tree. However, raccoons are very adept at climbing downspouts and looking for dirty marks on the downspouts can show you that they are using them to gain access. In these cases, greasing the downspout every few days can keep the raccoon from using them until they

move on to another location. Also, it is important to pay attention during rearing season that there are no young raccoons in the attic/crawlspace (see chapter 7).

### **Animal Going into Chimney**

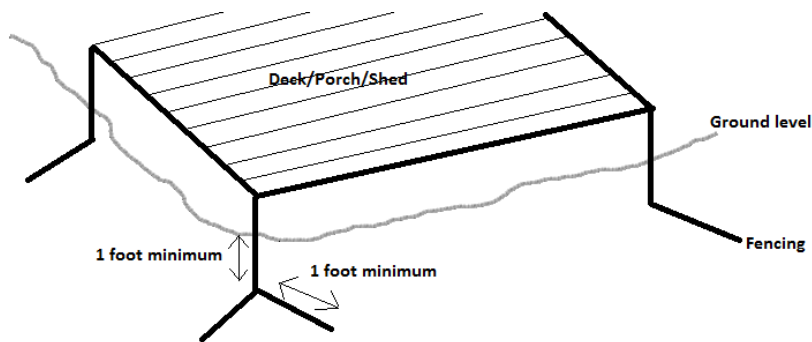
**Birds** – At times birds such as chimney swifts will use chimneys to roost in overnight. Oftentimes the homeowner will state that they hear lots of “chirping” in the chimney when this is occurring. They may also state that they see a large number of birds flying into/out of the chimney around sunrise or sunset. Some birds will even use chimneys for nesting. First ensure the birds are all out of the chimney and then install a chimney cap or fix the one that is there. Also, depending on the bird using the chimney you want to determine if there are any active nests that are in the chimney as well since most bird nests are protected under the Migratory Bird Treaty Act (see chapter 7).

**Bats** – Bats in a chimney is likely noticed when the homeowner sees bats at sunset flying out of the chimney. As you would with birds, ensure the bats are out of the chimney and there are no young (see chapter 7) and then installing/fixing a chimney cap will usually keep bats from continuing to use the chimney.

**Raccoon/Opossum** – Raccoons and opossums find chimneys a good place to have young. Raccoons will often leave feces on the roof, especially at the base of the chimney. The homeowner will often state they hear noise especially at night as the raccoons and opossums become active. A well-kept chimney cap will work to keep both of these animals out. However, unlike bats and birds which cannot work a small opening larger, raccoons and opossums will take a loose chimney cap and pry it open in order to use the space, and then installing/fixing a chimney cap will usually keep raccoons from continuing to use the chimney. Because they use chimneys during nesting season, it is important to know if there are young raccoons in the chimney before securing the chimney cap (see chapter 7).

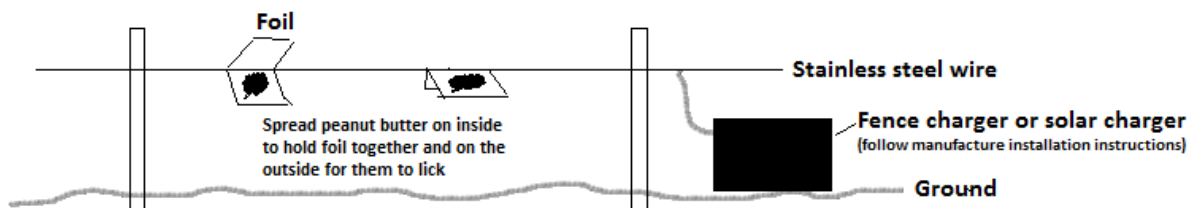
### **Animals Under Porch/Deck/Shed**

Regardless of the animal using the area beneath a porch, deck, or shed using a fence that is buried underground at least a foot will help to keep most animals out. The fencing can be simply functional like woven wire or hardware cloth, ensuring the holes are small enough to keep smaller animals out, or more decorative like vinyl lattice. To aid in keeping digging animals out, angling the fencing 1 foot away from the structure once it is 1 foot underground will usually stop any of the digging animals from getting under the structure.



### **Animal Getting into Garden**

**Deer** – Deer can quickly devastate a person’s hard work in a garden. They find many of the plants a desirable dinner. Aside from the tracks that can usually be seen in the dirt, the damage is usually at about 1 ½ feet off of the ground with the plant showing signs of tearing as the deer grabbed the plant and pulled to eat it. The damage is also usually sporadic throughout the garden with damage not being focused in one particular area. One tactic to keep deer out of a garden is called the “peanut butter fence” (see picture below). This uses an electrified wire to shock the deer on the tongue as they are getting ready think about going into the garden. Also, placing single strand wires every 1 ½ feet with some flagging up to about 8 feet can trick the deer into thinking that the fence is much higher than 8 feet. A combination of a solid fence to solve the smaller critters and the single strands above that can help solve most wildlife damage issues in a garden (see woodchuck section below).



**Woodchuck** – Woodchuck damage on a garden usually starts in one place along the edge of the garden and slowly radiates out from there. The plants will show “clean” cuts on the plant since Woodchucks have sharp teeth that cleanly cut through the plant. There oftentimes is also a trail leading back to a hole in the ground where they live or under a porch, deck, or shed. While Woodchucks are good climbers, they typically will not climb small gauge woven wire fence and rather choose to dig under it. Therefore, it is important to bury the fence at least 1 foot underground. Even better yet, you should angle the fencing 90 degrees away from the garden 1 foot after the fences is 1 foot below ground level (see Animals Under Porch/Deck/Shed section).

**Rabbit** – Rabbit damage to a plant in a garden is similar to Woodchuck damage; however the damage will usually be more sporadic throughout the garden. You will also usually be able to find small BB

looking droppings in the garden. The same fencing for Woodchucks will work to keep rabbits out of a garden, but care should be made to ensure the holes in the woven wire are not too large to allow young rabbits through.

**Raccoon** – One of the primary plants damaged in a garden by raccoons is corn. Deer are often blamed for raccoon damage on corn. The tell-tale difference between the two is that raccoons will actually break the stalk to get at the corn while deer do not. In situations where raccoons are damaging gardens, placing an electric line about 1 foot off of the ground (6 inches if a solid fence is not used in conjunction with an electric line) around the entire garden.



### **Animal Damaging Trees**

**Deer** – Male deer during the breeding season (see chapter 7) can cause substantial damage to trees. This is especially troublesome when the trees are ornamentals. One month before and one month after the breeding season for deer (October-December), any trees that the homeowner wants to protect should have either fencing placed around them or tree guards placed around the trees from the ground up 5 feet. There are many commercially available tree guards or a drainage pipe cut lengthwise to wrap the tree will also prevent the damage. Deer may also browse young ornamental trees. This is evident when the ends of the branches look torn off. Fencing the trees when this is occurring or until the tree is old enough to withstand the damage will help keep deer from browsing damage.



**Beaver** – Especially on properties along rivers, streams, or creeks trees are susceptible to beaver damage. Since beaver can cut a tree down overnight, the damage is usually seen with a cut stump left behind. Beaver will tend to target certain trees so oftentimes only certain trees are damaged. Any trees that need protected, wrapping metal fencing around the tree will keep the beavers from removing the tree. There are also commercially available tar repellents that can be applied to keep the beaver from chewing the tree which won't harm the tree.



**Rabbit** – Rabbit damage is seen from the base of the tree up to about a foot and a half. Usually you will see small strips laying on the ground as well as gnawing marks on the trunk. In most cases smaller diameter trees are chosen by rabbits to damage. Placing tree guards on the tree up about two feet, especially in the winter months, will keep them from being able to damage the tree. There are many commercially available tree guards or a drainage pipe cut lengthwise to wrap it will also prevent the damage.



**Squirrel** – Squirrel damage to trees usually occurs along the branches and appears as if the bark has been stripped down the branch. Isolated trees that experience damage can have flashing on the trunk to keep them from climbing the tree. However, in most cases the squirrels are able to jump from tree to tree and therefore trapping is usually needed to control the situation.



**Porcupine** – There currently is an unknown population of porcupines in Ohio, but most sightings and damage can be seen in the extreme eastern counties of the state. Unlike squirrel damage, porcupine damage is usually on the trunk of the tree and the damage does not run out to the ends of the smaller branches. You will also often see chips at the base of the tree that have fallen as the porcupine was causing the damage along with larger tooth marks on the trunk. Oftentimes they will pick certain trees to damage, so running flashing around the trunk of the tree will keep them from climbing up the tree to damage it. Because of their status in Ohio, if a landowner has porcupine damage contact the Ohio Division of Wildlife to notify them of the situation.



**Woodpecker** – Woodpecker damage is often confused for many other types of animal damage to trees. Woodpecker damage usually occurs when the woodpecker is getting insects from under the bark to eat. Oftentimes you can see the “trail marks” that the insects have left behind. In many cases the tree will show signs of old age or rot which is the reason the insects are there in the first place. The bark will also appear in strips and many times the strips or pieces of the tree pulled away by the woodpecker will be lying on the ground at the base of the tree. Woodpeckers are protected by the Migratory Bird Treaty Act and a permit is needed to physically remove them (see chapter 3). However, since only certain trees are targeted by woodpeckers sometimes using aluminum pie pans or other shiny objects tied to the tree will deter the woodpecker. However, usually there are other issues with the tree above and beyond the woodpecker damage and therefore a tree company should be consulted to determine if the tree is sound or if treatment for insects is needed.



### **Fish Being Killed in Pond**

**Otter** – While otter currently are not found throughout all of Ohio, the areas they do occupy are susceptible to otter damage on fish in a pond. Because of their playful nature, they often are seen in the pond swimming and eating fish. However, if the otter is not seen then otter damage can be sometimes noticed by signs of a drastic reduction in the fish in a pond as well as otter “slides” along the bank of the pond. There may also be “latrines” or areas otters are going to defecate with scat showing fish remains such as scales. Creating adequate structure in a pond to allow fish the ability to escape the otters usually will greatly reduce the damage they are causing.

**Great Blue Heron** – Great Blue Herons are a common suspect when fish are being killed in a pond. Often, the landowner is using koi or goldfish to stock their pond. These types of fish, due to their color, attract the attention of Great Blue Herons. In situations where the heron is not seen, there is often fish found that have a hole or spear mark through them. This is especially true on larger fish because they are not physically able to pull the fish out of the water. You will also sometimes find that the fish is lying on the bank partially eaten but with the head intact. There are also often tracks visible in the water along the shore where the heron was waiting for the opportunity to catch a fish. On small ponds, running netting over the pond will exclude the heron from having the ability to catch the fish and force them onto another location. On larger ponds, placing structure in the pond especially in shallow areas will allow the fish the ability to escape the herons. Herons are protected under the Migratory Bird Treaty Act and physical removal requires a federal permit (see chapter 3).

**Raccoon** – Raccoons will sometimes find ponds a great place to get a meal. Usually the fish will be found on the bank of the pond with the head removed. Similar to herons, placing structure close to the edge will allow a chance for the fish to escape the raccoon.

### **Dead Birds/No Birds at Bird Feeder**

**Hawk** – Many homeowners feed birds. However, hawks quickly learn that these bird feeders are buffets of songbirds for them to eat. When a hawk is feeding on songbirds, you will often see piles of feathers

on the ground near the bird feeder. The landowner may also see hawks perched in nearby trees. The homeowner may also notice a slow reduction of the number of birds using the feeders. If this is occurring, it is good to let the homeowner know to remove the bird seed for at least a month to allow the birds to disperse. When there is a lack of food for the hawk, it will move on to another location looking for food.

**Domestic Cats** – While not a wild animal and your commercial nuisance wild animal control license does not permit you to trap cats, it is good to recognize signs of them being present to rule out wild animals causing the damage. With cats, the homeowner may notice a slow reduction in the number of birds at the feeder much like when hawks are present. However, there typically will be no signs of the dead birds since cats typically will carry the bird away.

### **Holes in Yard/Sod Damage**

**Vole** – Voles will produce  $\frac{3}{4}$  inch diameter holes that are often found around the base of plants or trees. There are usually only a few holes in an area. Also, often trails from the holes are able to be seen.

**Chipmunk** – Chipmunk holes are often found in flower beds where the digging is easy for them. The holes will be  $1\frac{1}{2}$  to 2 inches in diameter with no dirt mounds around the hole.

**Crayfish** – While crayfish will dig holes in a yard, they are always near a body of water. The hole will be  $1\frac{1}{2}$  to 2 inches in diameter with a mound of muddy dirt about an inch or so high all around the hole.

**Woodchuck** – Woodchuck holes are usually found either next to structures such as barns or houses or on the edge of fields or yards. Woodchucks will often have at least 2 holes that they are using. The hole will be round and 10 to 12 inches in diameter with a circular pile of dirt that they piled up on one side of the hole when they were digging it.



**TYPICAL Woodchuck Burrow**

Round Hole  
10-12" Diameter



Circular Mound  
Heaped Near the  
Entrance

Photo courtesy of USDA, APHIS, WS

**Badger** – Badger holes closely resemble woodchuck holes and since badger are considered an endangered species in Ohio care should be taken to properly identify if a badger 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.

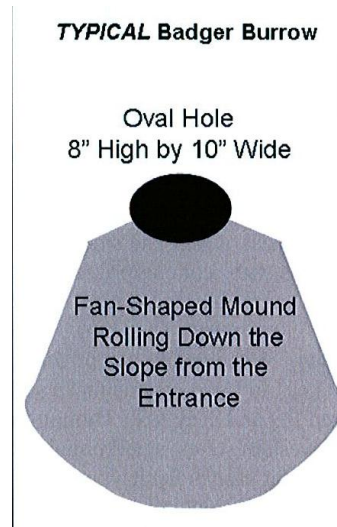


Photo courtesy of USDA, APHIS, WS

**Skunk** – As skunks are looking for grubs or insects in a yard, they will often dig holes to get at them. There are usually many cone-shaped holes in the yard when this is happening. Also, the skunk will usually return each night for more food resulting in additional holes in the yard each morning. Treating for the grubs or insects will take away the food and usually will stop the digging the skunks are doing.

Also, because skunks are not good climbers using temporary fencing around the area being damaged while the yard is being treated can help to exclude the skunk from the yard.

**Crows** – Crow damage is very similar to skunk damage. You can usually tell the difference based on when the damage is occurring. Crow damage will be throughout the day while skunk damage will not be noticed till the next morning since skunks are active at night. Treating for the grubs or insects will eliminate the food source and will usually stop the digging and force the crows to search elsewhere for food.

**Raccoon** – Raccoons can cause substantial damage to a yard. When they are going after grubs or insects in the yard, they will tear large patches of the grass up at a time. Also, like skunks they will return night after night as long as the food is available. The grass will often have the appearance of being “rolled up” as the animal moved along. Treating for the grubs or insects will take away the food and usually will stop the digging the raccoons are doing.

### **Holes in wood siding**

**Woodpecker** – Homes with wood siding are vulnerable to woodpecker damage. There are usually three reasons that woodpeckers damage wood siding and depending on the signs of the damage it can let you

know the best course of action. First, woodpeckers may be searching for insects that are beneath the wood siding. In these cases there usually are many small holes together in a particular area and the holes do not go past the sheathing of the home. There are commercially available products to treat the siding to repel/kill the insects. Second, woodpeckers may be using the home as a nesting location. When this is occurring there usually is one larger hole and the hole will penetrate past the sheathing of the home. You should be mindful of the nesting season of the particular type of woodpecker that is making the hole. Third, male woodpeckers may be using the home as a “sounding board” to attract females and mark territory. In this situation there are usually minor marks on the siding where they are pecking. Filling the holes with wood filler and placing flashing on the area being pecked or using many of the commercially available deterrent products will aid in repelling the woodpeckers from using the home for this situation.

***Songbirds*** – Songbirds other than woodpeckers will not make their own hole in a home for nesting, however they will use holes other animals have made to gain access to the home to nest. Therefore, fixing the hole in the home will solve the problem of them nesting. However, you should determine the type of bird using the hole and determine if there are any young in the nest. Also, you should be familiar if the birds using the hole are protected under the Migratory Bird Treaty Act. Also, an investigation as to whether the animal that caused the hole is still using the home is usually needed (see Animal in Attic/Crawlspace section).

#### **House Being Chewed**

***Squirrel*** – Squirrels, both tree squirrels and flying squirrels, are great at chewing openings for a home as well as randomly chewing various wood trim on homes. The homeowner usually will notice significant gnaw marks where this is occurring. The chewing will also usually be on areas at least 5 feet off of the ground. If there are no holes in the area where the squirrels are chewing, placing flashing or spraying with cayenne pepper can help stop the chewing in that location. If there is a hole, refer to the squirrel in Animal in Attic/Crawlspace section.

***Woodchuck*** – Woodchucks at times will also chew on structures. The damage can be differentiated from squirrels in that the damage usually is less than 1 ½ feet off of the ground. Placing flashing or spraying with cayenne pepper can help stop the chewing at that location.



### **Birds Flying into Windows**

**Songbirds** – A common annoyance to homeowners is songbirds flying into their windows. Some species such as the American Robin and Cardinal are well known for creating this situation. Not only can this be annoying, but the birds can damage glass or injure themselves. The birds do this for one of two reasons: either they see the reflection of trees and think that it is a continuation of the open space or males see their reflection and think that it is another male challenging their territory. In both situations taking away the reflection on any windows they are running into by covering them on the outside usually will keep the bird from running into the glass. Camouflage blind material works well to still allow light through, is not terribly visible from the inside, and takes away the reflection. If that is unsuccessful, the landowner can apply for a permit for physical removal.

### **Snakes in Home**

Much like bats and mice, snakes can use a small gap or hole to gain access to a home. Snakes leave no visible signs they are in the home and usually it is when the homeowner sees the snake when they realize it is inside. Simply capturing the snake and taking it outside is usually the easiest way to get rid of the problem. All cracks should be sealed to prevent them from getting back into the home.

### **Landscape Plants Damaged**

**Deer** – Deer are a common culprit of damage to landscape plants especially in cities. Deer damage on landscape plants will look like the plants have been torn off. A peanut butter fence (see deer in Animal Getting into a Garden section) put around plants that are being damaged by deer is an effective way to keep them from damaging the plants. Targeting plants when they start to emerge and moving the fence as new plants emerge will keep the deer wary of the area. Also, there is commercially available deer netting to keep deer away from highly valuable plants or plants highly desired by the deer.

**Woodchuck** – Plants that have woodchuck damage will appear to be clean cut as opposed to the tearing of the plant that deer do. There is also usually a trail leading to the place the woodchuck is living. You can run an electric line 6 inches off of the ground around the area where the woodchuck is damaging or

install a decorative short fence around the flower bed to deter the woodchuck from the area being damaged.

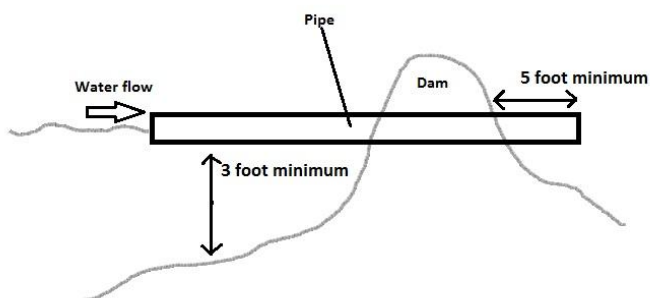
### **Bee Hives Damaged**

**Bears** – Bears can be very devastating to a bee yard. In one night they can demolish all the hives in an apiary. Usually when a bear is in a bee yard all the hives will be knocked over and the contents of the hive are spread all over the place. In areas of Ohio where there are bears, it is suggested to install an electric fence around all of the bee hives. The electric fence should have one strand at 1-2 ft. off of the ground and a second strand at 3-4 ft. off of the ground.



### **Beaver Flooding an Area**

Beaver can cause major problems when they dam up a creek or a culvert by backing water up onto roads or allow the water to go outside the normal banks of a river, stream, or creek. Tearing apart the dam can help temporarily to solve the problem, but if the beaver are present they can quickly repair the damage you caused to their dam. If there is a water level the landowner can tolerate, sometimes installing a control pipe (see picture below) can allow the beaver to stay without the issues of water backing up into areas they are not wanted. If the beavers are plugging an existing culvert or other type of drainage pipe, some sort of grate can be placed over the pipe that will still allow water to flow but will enable beavers to completely stop water flow which may cause the beavers to go elsewhere.



### **Holes Along a Pond Edge**

***Muskrat*** – Muskrat holes along the edge of a pond can cause major problems for landowners by either breaching the dam allowing water to leak out or by causing sinkholes along the edge eroding the bank away. During construction of the pond or if major renovations are needed, laying chain-link fencing several inches under the surface can greatly reduce the damage. However, if that is not practical then regular trapping of the muskrats is usually needed to continually reduce the potential of muskrat damage.



## 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**

There are numerous diseases that 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 come into contact with when dealing with wildlife. The following list of wildlife diseases are only a handful of the wildlife diseases in the environment, however these are the diseases you are most likely to encounter while performing your job. The end of this chapter provides some links to additional resources to learn more about wildlife diseases.

### **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.

### **Botulism**



Botulism die-off in late summer. Note both fresh and decomposed carcasses, mortality of multiple species, and receding water level. (Photo courtesy of National Wildlife Health Center.)

**Introduction**– There ARE several types of botulism. 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 times the animal has the inability to walk or fly and due to the paralysis of neck muscles caused by the toxin the animal often is found with their head lying to the side or underwater.

**Diagnosis** – In live birds, botulism is often suspected by visually seeing 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 very 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 including 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 in a particular environment for years leading to subsequent years of outbreaks of the disease in that area.

**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 with the Ohio Division of Wildlife should be made to determine the proper way to handle the species affected.

### **Canine Distemper**

**Introduction** – Canine distemper in Ohio is often found in foxes and coyotes. However, raccoons and skunks are also highly susceptible to canine distemper. Other mustelids including mink, weasel, and otter are potentially susceptible as well.

**Clinical Signs** – Canine distemper is often mistaken for rabies because the signs of rabies and canine distemper are similar. In addition to the signs of rabies, you will often notice respiratory distress, coughing, sneezing, diarrhea, or discharge from the eyes and nose which causes a crusty appearance around the eyes or nose. You may also notice the animal having convulsions or a loss of fear of humans.

**Diagnosis** – Diagnosis can be made on both live and dead animals depending on the type of test used. For dead animals, carcasses can be refrigerated to preserve the specimen until contact can be made with the Ohio Division of Wildlife for determination for the need to test. However, in most cases the animal is tested for rabies as well when there has been human or pet exposure.

**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 due to the similarity in the clinical signs. If a domestic dog has come in contact with a suspect animal and is not current on its vaccinations, encourage the owner to contact their veterinarian to describe the situation to determine the potential exposure to the dog.



Swollen inflamed conjunctiva and nasal exudate in a house finch infected with *Mycoplasma gallisepticum*.

## **Conjunctivitis**

**Introduction** – While a few different bird species can contract conjunctivitis, house finches are the most common wild bird species seen with the disease in Ohio.

**Clinical Signs** – The clinical signs of conjunctivitis are swollen tissue around the eyes and nasal cavities of birds which will at times appear as a crusty appearance around those areas.

**Diagnosis** – Typical diagnosis can be initially made by visualizations of the clinical signs. Confirmation testing is usually not necessary.

**Transmission** –Transmission is primarily thought to occur by direct contact from one bird to another. This most times occurs at bird feeders. When conjunctivitis is suspected, homeowners should remove all bird seed for at least a month to disperse the infected birds.

**Public Health Implications** – There are no known human health risks associated with conjunctivitis in house finches. However, care should especially be paid to proper management and periodic cleaning of bird feeders that house finches are using.

## **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 in the state. However, 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 due to 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 is 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.

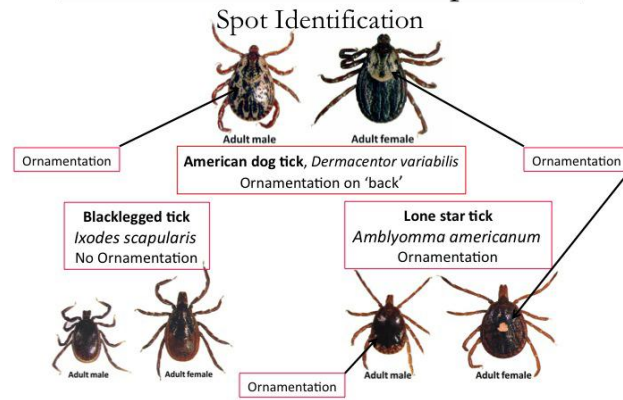
**Clinical Signs** – Flu-like symptoms with respiratory involvement is the most common problem in humans.

**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 aurally when working around large amounts of bird feces or bat guano.

**Public Health Implications** – Up to 80% of people become infected with histoplasmosis with an average of 90% 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% sodium hypochlorite.

## Three Ixodid Ticks of Importance



© G.R. Needham, The Ohio State University

Photos courtesy the Tick Research Laboratory, Texas A&M University

<http://tickapp.tamu.edu/>

### **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 blacklegged 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 bitten. 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.

## **Mange**



Red fox with sarcoptic mange.



Areas of hairloss (alopecia) on the side of the body of a young gray squirrel due to fungus infection.

**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. Notoedric mange occurs in gray and fox squirrels.

**Clinical Signs** – Animals with mange spend an inordinate amount of time scratching, chewing, or licking infected skin. The skin of animals with mange often will 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** – 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 very 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 cannot become infected with either of these types of mange through colonization of the mites. However, it is possible if the mites are on a human for that person to experience severe itching when regularly handling mangy animals.

## **Parvo**

**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. However, with the canine parvovirus that is carried by coyotes there is a possibility for transmission to domestic dogs. There is a pre-exposure vaccination for domestic dogs that will prevent transmission to them. Owners that notice that their unvaccinated dogs have eaten or come in contact with coyote feces should contact their veterinarian.

### 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 in 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 visualizations 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 most times occurs with handling of species 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.

### Rabies

**Introduction** – In Ohio, raccoons, skunks, and bats are the primary vector species of rabies. Opossums are least likely of all Ohio mammals to contract or carry rabies. However, all mammals are susceptible to rabies including humans. Birds are not capable of contracting rabies.

**Clinical Signs** – Animals with rabies typically will have marked changes from normal behavior. Rabies is typically classified in two categories, dumb rabies and furious rabies. The signs of dumb rabies, which is the more common category, are aimless wandering, lethargy, lack of coordination, and paralysis. Less frequent, the furious rabies causes animals to become viscous 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 having rabies should be killed without damage to the brain, double bagged, 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 of open wounds to 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 serious since once symptoms of rabies start showing the disease is almost always 100% fatal for the human or pet. Pre-exposure vaccination is available through your doctor and is strongly encouraged for those who routinely handle wild animals such as commercial nuisance wild animal controllers.

### **Raccoon Roundworm**



Adult *Baylisascaris procyonis* from intestine of raccoon.

**Introduction** – Raccoons are the vector of raccoon 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 eggs then develop into larvae 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 due to 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 come in contact with raccoon feces, and when handling material that has come into contact with raccoon feces. Care should be exercised in handling infected material to not stir up dried feces. However, aerosolized infection should be considered low risk. Hands as well as equipment should be thoroughly washed when contact with raccoon feces has occurred.

### **Tularemia**



Areas of focal necrosis in liver of rabbit with 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. Fortunately, with prompt antibiotic treatment, few cases are fatal. Fortunately tularemia is not well documented in the state but all precautions should be taken when handling highly vector species 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 common 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**– In the winter of 2006-07 New York Department of Environmental Conservation found approximately 10,000 bats of the genus *Myotis* (little brown bats, *M. lucifugus*, and Indiana bats, *M. sodalis*) dead and dying in four caves in New York. Since 2006, white-nose syndrome (WNS) has killed millions of bats in eastern North America, including several *Myotis* species, *Perimyotis subflavus* (Tri-

colored bat), and *Eptesicus fuscus* (big brown bat). WNS is currently confirmed in 22 states and 5 Canadian provinces, as well as is suspected in 2 additional states. In March 2011, the first case of WNS was confirmed in an abandoned mine in Lawrence County, Ohio. Currently 7 counties in Ohio have been confirmed as WNS positive to include Lawrence, Geauga, Cuyahoga, Summit, Portage, Preble, and Medina. The scope of bat mortality associated with the WNS epizootic is unprecedented in recent history. The fast rate of WNS spread across the eastern U.S., the high rate of mortality, and the previously unknown causal fungal pathogen (GD), have made this a challenging wildlife disease event. Scientists are actively evaluating the bat species that are most affected, surveying caves for the presence of the species, and developing strategies for disease management.

**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/dying bats on the ground, on buildings, trees or other structures during cold 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. If you suspect a bat has white-nose syndrome, contact your nearest Ohio Division of Wildlife district office or Jennifer Norris at 614-265-6349.

**Transmission** – WNS is defined by a cold-loving fungus, *Geomyces destructans* (GD). GD often grows into white tufts on the muzzles of infected bats, hence the name. GD 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 GD spores to other bats through direct contact with each other. However, experts believe humans can carry the GD spores that cause WNS on their clothing from contaminated sites which increases the spread of the disease. The USFWS has developed a decontamination protocol ([http://static.whitenosesyndrome.org/sites/default/files/resource/national\\_wns\\_revise\\_final\\_6.25.12.pdf](http://static.whitenosesyndrome.org/sites/default/files/resource/national_wns_revise_final_6.25.12.pdf)) that should be followed by anyone handling bats.

**Public Health Implications** – White-nose syndrome does not affect human health.

#### Additional Wildlife Disease Resources

##### **Center for Disease Control**

[www.cdc.gov/healthypets/animals/wildlife.htm](http://www.cdc.gov/healthypets/animals/wildlife.htm)

##### **Ohio Department of Health**

<http://www.odh.ohio.gov/default.aspx>

##### **Ohio Division of Wildlife**

[http://www.dnr.state.oh.us/Home/wild\\_resource/subhomepage/dealing\\_with\\_wildlifeplaceholder/Diseases/tabid/5830/Default.aspx](http://www.dnr.state.oh.us/Home/wild_resource/subhomepage/dealing_with_wildlifeplaceholder/Diseases/tabid/5830/Default.aspx)

##### **Michigan Wildlife Disease Manual**

[http://michigan.gov/dnr/0,1607,7-153-10370\\_12150\\_12220---,00.html](http://michigan.gov/dnr/0,1607,7-153-10370_12150_12220---,00.html)

## Chapter 7 – Life Histories

Although most wild animals do not cause conflict with humans, there are some species that are more likely to be considered a nuisance. The following species may exhibit behavior that is unacceptable to landowners. When making contact with these animals to remove them from a nuisance situation, it is important to first understand their identifying characteristics and behaviors.

### Barn Swallow



Swallows are small birds with long, pointed wings. They are fast, masterful flyers which catch all their insect food on the wing. Their legs and feet are small, unsuitable for walking, and their bills are very small. The outer tail feathers are the longest, producing notched or V-shaped tails. Swallows are usually seen perched on wires or flying over water, often in large flocks.

They are colonial nesters.

#### **Barn Swallow**

*Hirundo rustica*

#### **At-a-Glance**

- Peak Breeding Activity: May-August
  - Incubation: 13-15 days
  - Clutch Size: 4-6 eggs
- Young Fledge: 20 days after hatching
- Typical Foods: insectivorous; crickets, dragonflies, beetles, moths, and other flying insects

#### **Description**

The barn swallow is a beautifully colored bird - steel-blue on top with a creamy buff breast and rusty throat and forehead. The deeply-forked V-shaped tail is a good field mark.

#### **Habitat and Habits**

The barn swallow is considered a common summer resident and prefers to live in the open countryside, especially agricultural areas. It consumes large numbers of insects, especially mosquitos, which makes them very beneficial. The voice is a constant twittering or chattering.

#### **Reproduction and Care of the Young**

Originally barn swallows nested on rocky ledges over streams and lakes, but most now nest in barns, or under overhangs of sheds and other buildings. The nest is made of mud. The four to six eggs are white, spotted with brown.

## Bats

### **Bat facts originated from the following publications:**

Belwood, Jacqueline J. 1998. In Ohio's Backyard: Bats. Ohio Biological Survey. Backyard Series No. 1.  
Brack, Jr., Virgil et al. Bats of Ohio. 2010. ISU Center for North American Bat Research and Conservation

### **Additional bat resources:**

<http://www.batcon.org/>  
<http://whitenosesyndrome.org/>  
<http://www.fws.gov/northeast/pdf/white-nosefags.pdf>

### **Additional nuisance wildlife resources:**

<http://www.dnr.state.oh.us/Portals/9/pdf/pub083.pdf>

### ***Big Brown Bat***



The big brown bat is one of the most common and widely distributed bats in North America. It is the second largest bat in Ohio and the largest of the brown bats. It is also likely the second most abundant species of bat in the state behind the little brown bat. It will readily use man-made structures for hibernation, as well as for maternity colonies. It is the most common species in urban and suburban situations.

#### **Big Brown Bat** *Eptesicus fuscus*

#### **At-a-Glance**

- Mating: Polygamous
- Peak Breeding Activity: August through October
- Gestation Period: 50-60 days
- Young are Born: May and June
- Number of Litters per Year: 2 young are typical. Young are called pups and are dependent on their mothers.
- Migration Patterns: Year-round resident. Big brown bats appear to pick site-specific locations to live. Hibernacula are typically in the same area as their summer roost. Little is

#### **Description**

As with the little brown bat, the big brown bat's name is highly descriptive. Its fur is uniformly medium to dark brown on the upper parts, with slightly paler under parts. The fur is relatively long and silky in appearance, and they have a dark, naked muzzle that is somewhat square in appearance. The ears and wing membranes are dark brown. The wings and interfemoral membranes do not have fur.

This bat is distinguished from all other brown bats in Ohio by its large size. They measure 3.5-5.5 in. in total length with a forearm length of 1.7-1.9 in. and adult weight is 12-25 grams. Pregnant females may weigh up to 30 grams.

#### **Habitat and Habits**

During the warm months of the year, big brown bats feed over a variety of habitats, including water, fields, forest openings, and urban and suburban areas. They use two primary types of habitats: hibernation sites used during the winter (e.g., caves, mines, buildings) and roosting sites for reproduction (e.g., buildings and under bridges) during the summer.

Hibernation sites tend to be cooler, drier and more exposed to air currents than other species of bats. It is not uncommon for them to be hibernating in below-freezing temperatures. When hibernating,

known about the dispersal of young.

- Feeding Periods: One hour after sunset to about an hour before sunrise
- Typical Foods: Insects, especially agricultural pests, including June and cucumber beetles, mayflies, caddisflies, and stinkbugs
- Ohio Status: Species of Concern

this species will hang singly, in pairs and in clusters. Occasionally, individuals will be found within clusters of other species, such as little brown and Indiana bats. Clusters of big brown bats rarely contain large numbers of individuals. Clusters are often compact and tucked into a hole or other concavity. When hanging by themselves, the posture is relaxed with the wings opened slightly/partially.

Big brown bats have a strong homing instinct and will return to their maternity colony even if released up to 250 miles away.

### Reproduction and Care of the Young

Breeding takes place during the late summer and early fall during a behavioral phenomenon known as “swarming.” At this time, large numbers of bats visit and congregate in a succession of caves just prior to hibernation. Although sperm is transferred to the female during copulation that occurs in the fall, ovulation and fertilization of the egg are delayed until the females arouse from hibernation the following spring. By mid-March, females start forming maternity colonies ranging from 20-300 individuals. They often group in the peak of a building (such as a barn), behind beams or in a crack. At this time, big brown bats avoid some of the higher roost temperatures tolerated by little brown bats, and will abandon any area that gets over 95° F.

Pups are weaned at 3 weeks and reach adult size at 2 months.

### Eastern Red Bat

This woodland species is one of the most common bats in Ohio and is also known as one of the most attractive bats in the Midwest. It is one of the few mammal species where the sexes are distinctly different colors. Males are bright, orange-red while females are dull chestnut-yellowish.



### Red Bat

*Lasiurus borealis*

### At-a-Glance

- Mating: Polygamous
- Peak Breeding Activity: fall
- Gestation Period: Approximately 80-90 days

### Description

Male red bats are a bright red to reddish-brown color and females are usually yellowish with a reddish tint. This species of bat has dense, soft fur all over its body, including on its uropatagium (the skin connecting its legs and tail). They have long pointed wings, a long tail and white shoulder patches. Their ears are low, broadly rounded and lightly haired with a triangular tragus. The forearm is 1.5-1.9 inches and the weight is 9.5-15 grams.

### Habitat and Habits

Red bats use a variety of woodland habitats and are more abundant in southern states from December to March. Some

- Young are Born: May and June
- Number of Young Per Year: 3-4
- Migration Patterns: This species is more abundant in the north in the summer and migrates to southern states in the winter.
- Feeding Periods: One hour or two after sunset and before sunrise.
- Typical Foods: Insects, especially small soft-bodied moths, beetles, flies, and caddisflies that are trapped under closed tree canopies over small streams.
- Ohio Status: Species of Concern

individuals may hibernate as far north as southern Ohio. They are solitary and prefer to roost in trees, shrubs, and clusters of weeds in the summer although they have been found roosting on corn stalks in full sunlight. They overwinter in trees, tree cavities and leaf litter.

Red bats have been seen migrating across Lake Michigan in the fall during daylight hours making them susceptible to predation by other migrating species such as hawks. During migration, they are also highly susceptible to death at wind turbines.

### Reproduction and Care of the Young

Mating occurs in flight, usually during August. Fertilization does not occur until spring and 3-4 young are born around mid-June. Females have four teats unlike most other bats that only have two. At four to six weeks, the pups are weaned and learn to fly.



### Eastern Small-footed Bat

The Eastern small-footed bat is Ohio's rarest bat. Only a single bat has been found in Ohio and that was in 1842 in Erie County. Whether it was really found in Ohio or not is somewhat of a mystery as the specimen may have been mislabeled. Another potential record is known from 2005, but the identification was not confirmed.

#### Eastern Small-footed Bat *Myotis leibii*

#### At-a-Glance

- Mating: Polygamous
- Peak Breeding Activity: September and October

### Description

This bat is small with a black sparsely haired facial "mask", small black ears, and small feet that measure 0.2-0.3 inches in length. The fur is dark brown and may have a hint of gold. It has a strongly keeled calcar. It weighs 4-6 grams and has a short forearm (1.2-1.3 in.). It is best identified by the black facial mask and keeled calcar.

### Habitat and Habits

Little is known about the habitat preference of this

- Gestation Period: 50-60 days
- Young are Born: May and June
- Number of Young per Year: 1. Young bats are called pups and they are dependent on their mothers
- Feeding Periods: One hour or two after sunset and before sunrise
- Typical Foods: Insects, especially moths, beetles and spiders
- Ohio Status: Species of Concern

bat, but evidence suggests that it favors hilly or mountainous areas. In the winter, they hibernate in mine tunnels and caves, often near entrances where conditions are cooler, drier and windier than deeper inside. In the summer, these bats utilize buildings and rock crevices.

#### Reproduction and Care of the Young

Breeding occurs in the fall and like other bat species, fertilization is delayed until spring. One pup is born in late May or June. By mid-August, young are about the size of adults.

### Evening Bat



This bat looks like a smaller version of the big brown bat. It is however, rarely encountered in Ohio.

#### Evening Bat *Nycticeius humeralis*

##### At-a-Glance

- Mating: Polygamous
- Peak Breeding Activity: Fall and winter
- Young are Born: May and June
- Number of Young per Year: 2
- Feeding Periods: 1-2 hours at dusk
- Typical Foods: Insects, especially beetles, moths and leafhoppers.
- Ohio Status: Species of Special Interest

#### Description

This medium-sized brown bat looks like small big brown bats, but the forearm of adults is shorter at about 1.5 inches compared to 1.8 inches or more for big browns. The hair on its back is a bronze-brown, whereas the hair on its underside is slightly lighter/tanner.

The muzzle is hairless and black and the ears and wings are also black in color. It has short, rounded ears and a very short, curved, rounded tragus. The calcar is often keeled. The total length of this bat is 3.8-4.2 inches with an average weight of 6-14 grams.

#### Habitat and Habits

The evening bat is rarely encountered in Ohio. It is most abundant in the southeastern U.S. They roost in buildings and tree hollows in summer. It is not exactly known where they roost in the winter but it is thought to migrate to the south.

#### Reproduction and Care of the Young

Little is known about exactly when and where evening bats mate. In most Midwestern bats, mating takes place in the fall. Although sperm is transferred to the female during copulation, ovulation and fertilization of the egg are delayed until following spring. They usually have two pups in a litter. At four to six weeks, the pups are weaned.

## Hoary Bat



The hoary bat is the most widely distributed bat in North America. It is the largest and most colorful bat in Ohio. This bat shares many of the same characteristics as the Eastern red bat.

### Hoary Bat *Lasiurus cinereus*

#### At-a-Glance

- Mating: Polygamous
- Peak Breeding Activity: fall
- Gestation Period: Approximately 80-90 days
  - Young are Born: May and June
  - Number of Young Per Year: 2
- Migration Patterns: This species is more abundant in the north in the summer and migrates to southern states in the winter.
- Feeding Periods: Well after sunset and before sunrise.
- Typical Foods: Insects, primarily moths, also beetles, true bugs and flies

#### Description

The hoary bat is the largest bat in Ohio. It has a frosted appearance because of its dark, white-tipped fur. It has dense, soft fur all over its body, including on the top of its feet and its uropatagium (the skin connecting its legs and tail). It has a large head and short, rounded ears with black borders, whitish wrists and shoulder patches. Unlike the red bat, males and females have similar coloring although immatures are usually paler than adults. The hoary bat has a short and broad tragus. They are about 4-6 inches in length and weigh 15-38 grams.

#### Habitat and Habits

The hoary bat is normally solitary and prefers to roost in trees among foliage during both summer and winter. When roosting, they use the furred interfemoral membrane as a blanket. They are known to emerge long after dark to feed and do not seem to travel far from the roost to forage. They tend to forage in the open and seem to frequent developed areas. Hoary bats are uncommon in Ohio and migrate far south in the fall.

This is a woodland bat that is widespread although not frequently caught. They often fly higher than can be netted and are frequently killed at wind turbines.

#### Reproduction and Care of the Young

Hoary bats mate during the fall migration or on the wintering grounds. Fertilization is delayed until spring. They usually have two pups in a litter. At four to six weeks, the pups are weaned and learn to fly. By the time they are weaned, they can weigh as much as their mother.

## Indiana Bat

The Indiana bat is a rare species, and is listed on both the state and federal endangered species list. It was not until 1974 that the first maternity colony was discovered in Indiana. It is known as a "tree bat" in the summer and a "cave bat" in the winter.



**Indiana Bat**  
*Myotis sodalis*

**At-a-Glance**

- Mating: Polygamous
- Peak Breeding Activity: September and October
- Gestation Period: 50-60 days
- Young are Born: May and June
- Number of Young per Year: 1
- Migration Patterns: Seasonal resident. Indiana bats live in small summer colonies in the state. They home in on site-specific locations to roost. Little is known about the dispersal of young.
- Feeding Periods: One hour or two after sunset and before sunrise.
- Typical Foods: Insects, especially small soft-bodied moths, beetles, flies, and caddisflies and wasps.
- Ohio Status: Endangered

**Description**

The Indiana bat is medium-sized with a furred muzzle, short ears and an elongated, blunt tragus. It has a pink nose and fur that is short and less shiny than other *Myotis* species. Fur on the chest and belly is slightly lighter than on the back and the overall color is grayer which helps differentiate them from the little brown bat that they closely resemble. The wing membranes have a dull, flat appearance that doesn't contrast with the fur. This similarity in appearance to the little brown bat can make the two species difficult to distinguish. It is best identified by its distinctly keeled calcar, toe hairs that do not extend beyond the toenails and a blunt tragus.

**Habitat and Habits**

In winter, Indiana bats live in caves and abandoned mines which provide and maintain a cool and stable temperature. Male and female Indiana bats then segregate in the summer. It is assumed that male bats roost alone or live in small bachelor colonies. Females colonize under loose bark of exfoliating trees or in tree hollows. They show great site fidelity to both summer colony areas and hibernacula and can return to the same site for years.

This species is known to form very tight, compact clusters while hibernating. It is common to find 300-400 individuals compacted into a square foot.

**Reproduction and Care of the Young**

Breeding takes place during the late summer and early fall during swarming. At this time, large numbers of bats visit and congregate in a succession of caves just prior to hibernation. Although sperm is transferred to the female during copulation occurring in the fall, ovulation and fertilization of the egg are delayed until the females arouse from hibernation the following spring.

During the summer, females form maternity colonies, almost always under the loose bark of trees or in tree cavities. Maternity colonies usually consist of 60-80 females. Several roost trees near each other may be used.

Pups are weaned after 25-37 days and are flying by three weeks.



### ***Little Brown Bat***

The little brown bat is the most common of the four *Myotis* species in Ohio but there is concern about recent range wide declines primarily due to the spread of White-Nose Syndrome (WNS). This species has been hit hard by WNS and in some parts of its range, population numbers are down significantly.

During winter, these bats hibernate in caves and mines. They often colonize in buildings during the summer in maternity colonies.

#### **Little Brown Bat** *Myotis lucifugus*

##### **At-a-Glance**

- Mating: Polygamous
- Peak Breeding Activity: September and October
- Gestation Period: 50-60 days
- Hibernation: October – March. They are known to emerge on warm late winter days and may be active by mid-late February.
- Young are Born: late May to early July
- Number of Young per Year: 1 Young bats are called pups and they are dependent on their mothers.
- Migration Pattern: Both year-round resident and migrant. Little brown bats live in colonies. Hibernacula may be hundreds of miles from maternity areas. Little is known about the dispersal of young.
- Feeding Periods: One hour or two after sunset and before sunrise
- Typical Foods: Insects, especially small-bodied aquatic insects

##### **Description**

The little brown bat is distinguished by the toe hairs that extend beyond the ends of the toes, a rounded tragus and a calcar that lacks a keel or may be slightly keeled. Fur on its back is darker than the fur on its chest and belly. The wing membranes are dark brown. The bats are between 2.6 – 4.3 inches long and weigh 7-9 grams. Their total wingspan is 8.8 to 10.8 inches wide.

##### **Habitat and Habits**

There are two primary types of habitats for many bats: hibernation sites used during the winter (e.g., caves, mines) and roosting sites for reproduction (e.g., tree cavities) during the summer.

Summer colonies begin to form in April. They usually congregate in buildings or other manmade structures although some will roost in tree cavities or under the peeling bark of dead trees.

Summer roosts are typically warm and relatively dark. Adult females will gather in groups in the warmest parts of the building while immature females and males will be solitary or may form loose clusters.

By mid-to late October, little brown bats begin gathering in hibernacula. Some individuals do not enter hibernation until November. When hibernating, this species will hang alone, or in clusters of a couple individuals to many hundreds or thousands of individuals. The clusters do not appear closely compacted and or neatly organized.

##### **Reproduction and Care of the Young**

Breeding takes place during the late summer and early fall during a behavioral phenomenon known as “swarming.” At this time, large numbers of bats visit and congregate in a succession of caves or mines just prior to hibernation. Although sperm is transferred to the female during copulation that occurs in the fall, ovulation and fertilization of the egg are delayed until the females arouse from hibernation the following spring.

(caddisflies and mayflies), midges, moths, leaf hoppers, and plant hoppers.

- Ohio Status: Species of Concern

Between late May and early July, one or occasionally two young are born. The young, called pups, will stay in the maternity colony for the first three weeks of life until they begin to fly. Shortly after they are flying, they begin feeding on insects and soon leave the maternity colony.



**Northern Long-eared Bat**  
*Myotis septentrionalis*

**At-a-Glance**

- Mating: Polygamous
- Peak Breeding Activity: August and September
- Gestation Period: 50-60 days
- Young are Born: early to mid- June
- Number of Young per Year: 1 Young bats are called pups and they are dependent on their mothers
- Feeding Periods: One hour or two after sunset and before sunrise
- Typical Foods: Insects -- moths, beetles, caddisflies and flies

**Northern Long-eared Bat**

This bat species is relatively common across its range, but it is not readily caught and is rarely found in buildings.

**Description**

This medium-sized bat looks very much like other members of the *Myotis* species, such as the little brown bat. However, it can be easily distinguished by its long ears that can be 0.5-0.7 inches long and long, pointed tragus of 0.3-0.4 inches. When laid forward, the ears extend about 4 mm beyond the nostrils of the bat. Its body color is medium to dark brown with little variation. Its body length is 3-3.8 inches.

**Habitat and Habits**

There are two primary types of habitats for many bats: hibernation sites used during the winter (caves, mines) and roosting sites for reproduction (tree cavities) during the summer. It typically hangs by itself during hibernation.

Maternity colonies are formed in cracks, cavities and beneath the bark of dead and living trees. It uses a wider variety of roosts than the Indiana bat. Colonies are not known to exceed 100 individuals. Males do not roost with females.

This species is more active in wooded lands than other species of bats.

**Reproduction and Care of the Young**

Breeding takes place during the late summer and early fall during

- Ohio Status: Species of Concern

swarming. At this time, large numbers of bats visit and congregate in a succession of caves just prior to hibernation. Although sperm is transferred to the female during copulation occurring in the fall, ovulation and fertilization of the egg are delayed until the females arouse from hibernation the following spring.

Like other bat species, development of young is rapid with juveniles flying by 21 days of age.

### ***Rafinesque's Big-Eared Bat***

The ears on this bat can measure more than an inch in length. Only two specimens of this species have been recorded in Ohio. Both were collected before 1961.



#### **Big-eared Bat**

*Corynorhinus rafinesquii*

#### **At-a-Glance**

- Mating: Polygamous
- Peak Breeding Activity: Fall and winter
- Young are Born: May and June
- Number of Young per Year: 2
- Feeding Periods: Late in the evening
- Typical Foods: Insects, primarily moths

#### **Description**

This species is easily identified by its exceptionally long ears and the two large fleshy lumps on the nose, bordering the nostrils. The fur of the big-eared bat is long and silky. The total length of the bat is 3.2-4.4 inches and it weighs between 8-13 grams.

#### **Habitat and Habits**

The big-eared bat is very rare in Ohio, but has been found in Adams County. They roost in abandoned buildings and trees in the summer and winter, although they may also migrate south in the winter. Hibernation is usually in caves and mines in the northern part of its range. When in buildings, it is often in plain sight. These bats are easily disturbed during hibernation.

#### **Reproduction and Care of the Young**

Little is known about exactly when and where big-eared bats mate. Breeding is thought to occur in

the fall and winter. Although sperm is transferred to the female during copulation, ovulation and fertilization of the egg are delayed until following spring. Females give birth to one pup in late May or early June. At four to six weeks, the pups are weaned and learn to fly.

### ***Silver-haired Bat***

The silver-haired bat is not a permanent resident of Ohio. It is known to only migrate through in the spring and fall and is relatively common during those times.



#### **Silver-haired Bat**

*Lasiurus noctivagus*

#### **At-a-Glance**

- Mating: Polygamous
- Peak Breeding Activity: September and October
- Gestation Period: 50-60 days
- Young are Born: May and late June
- Number of Young per Year: 2
- Feeding Periods: Early in the evening (often before the sun has set) and sporadically through the evening.
- Typical Foods: Insects -- moths, beetles, bugs, caddisflies and stoneflies
- Ohio Status: Species of Concern

#### **Description**

This bat can be easily identified by the frosted appearance made by its white-tipped black hairs. The part of the interfemoral membrane closest to the body is furred. Its ears are short and rounded with a blunt rounded tragus. It is 3.4-4.5 inches in length with a forearm length of 1.6-1.7 inches and weight of 7-12 grams.

#### **Habitat and Habits**

The silver-haired bat is migratory and prefers mature northern forests with ponds and streams nearby. Its summer maternity range is largely north of Ohio and the winter range is south of Ohio. It colonizes in trees behind loose bark, in hollow trees, under a shingle or shutter and in crevices.

This bat is a slow flyer and likes to forage among trees and small shrubs bordering streams or ponds.

#### **Reproduction and Care of the Young**

Silver-haired bats mate during the fall migration or on the wintering grounds. Fertilization is delayed until spring. They usually have two pups in a litter. At four to six weeks, the pups are weaned and learn to fly.

### **Tri-Colored Bat (Formerly Eastern Pipistrelle Bat)**



The Eastern small-footed bat is Ohio's smallest bat. It is most often found singly and may be scattered throughout more caves and mines in Ohio than any other species.

#### **Tri-colored Bat**

*Perimyotis subflavus*

#### **At-a-Glance**

- Mating: Polygamous
- Peak Breeding Activity: fall
- Gestation Period: At least 44 days
- Young are Born: June to mid-July
- Number of Young Per Year: Often 2 and sometimes up to 3
- Feeding Periods: Often active well before dusk and sporadically till dawn
- Typical Foods: Insects - flies, beetles, moths and true bugs
- Ohio Status: Species of Concern

#### **Description**

This small bat varies in color from a pale yellowish-brown to dark reddish-brown. Its dorsal hairs are dark at the base, light in the middle with light reddish brown tips. Immature individuals may have a grayish appearance making them somewhat resemble *Myotis* species. It weights 4.5-8 grams. The forearms are pinkish and the wing membrane is black. The ears are longer than they are wide with a tragus that is less than ½ the ear's length. The forearm is about 1.3 in. and has a distinctly pinkish color that contrasts with the black wing membrane.

This bat is easily identified while hibernating by its hunchback appearance and contrasting pink forearm and black wing membrane. It often accumulates water droplets on its fur that make it glisten. It also typically roosts singly.

#### **Habitat and Habits**

Tri-colored bats hibernate in caves and mines that are typically close to their summer habitats. They tend to prefer warmer areas of their hibernacula that don't tend to be used by other species. Occasionally, they form maternity colonies in buildings, but most females have their pups in clusters of dead leaves.

They are a weak, erratic flyer and are often active well before dusk, especially in deep wooded ravines with streams. It is often the first species to enter hibernation in the fall and the last to leave in the spring.

#### **Reproduction and Care of the Young**

Breeding occurs in the fall and like other bat species, fertilization is delayed until spring. Typically 3-4 females colonize in clusters of dead leaves, hanging in trees to have their young. Two pups are common and are born in late June to mid-July. Young are foraging like adults at 4 weeks.

### **Beaver**



The beaver is North America's largest rodent, weighing up to 60 lbs and measuring 25-30 inches long.

### **Beaver**

*Castor canadensis*

#### **At-a-Glance**

- Mating: Monogamous
- Gestation: 3 months
- Litter size: 1 to 4
- Peak breeding activity: during the winter season, from late January to March.
- Typical foods: poplar, aspen, willow, birch, and maple trees.

### **Description**

Beavers are well adapted to life in the water. Their webbed feet, waterproof fur, clear “third-eyelids,” and flattened, rudder-like tail enable them to be excellent swimmers. Their huge front teeth help them to cut through hard woods like maple and oak. These teeth grow throughout the animal's lifetime and are necessary for survival.

### **Habitat and Habits**

This furbearer occurs in forested ponds, lakes, and rivers with the highest abundance being found in the eastern and southeastern portions of Ohio. Beavers living along a river make burrows with an underwater entrance in the riverbank; those in streams, lakes and ponds usually build dams that generally incorporate a lodge, which has one or more underwater entrances and living quarters in a hollow near the top. Wood chips on the floor absorb excess moisture and a vent admits fresh air.

### **Reproduction and Care of the Young**

Beavers are generally monogamous and sexually mature at about three years of age. Young are born between April and July, after a gestation period of about 128 days. The kits are born furred, with their eyes open, and are able to swim within 24 hours. They usually stay with their parents in colonies until age two when they move out to find a new home.

### **Canada Goose**

Before 1950, Canada geese were only known as migrants and winter visitors to Ohio. In the early 1950s, the Ohio Division of Wildlife initiated a program to establish resident flocks within the state. These introduction efforts were immediately successful.



**Canada Goose**  
*Branta canadensis*

**At-a-Glance**

- Mating: Monogamous
- Peak breeding activity: begins the first weeks of March and continues as late as June in colder areas.
- Incubation period: 23-30 days
- Clutch Size: 2-9 eggs; 5 average
- Typical Foods: plant matter and aquatic invertebrates

**Description**

The Canada goose is a large gray-bodied bird with a black head and long black necks. The best field mark is the large white cheek and throat patch. The sexes are alike. The size of this goose varies considerably - some are the size of a large duck and others are two to three times larger. At least 10 distinct subspecies exist.

**Habitat and Habits**

Thanks to wildlife management efforts by the Division of Wildlife of the Ohio Department of Natural Resources, the Canada goose is now living in Ohio year-round. Several large lakes and marshy areas have permanent flocks of thousands of geese. Their diet consists of plant material. They migrate by day and night in noisy V-shaped formations. The song is a loud *honk*.

**Reproduction and Care of the Young**

Canada geese have proven to be adaptable in their choice of nesting habitats. Typical nesting sites are on the ground adjacent to a pond or lake and on small islands in lakes and rivers. They maintain a small territory around these nests which is aggressively defended by the males. Most clutches are laid before April 15 and the majority of young geese hatch before May 10. The young geese attain flight after eight to nine weeks, and the family groups normally remain intact into autumn.

**Chimney Swift**



**Photo by Richard Day/Daybreak  
Imagery**

Chimney swifts can be found statewide. They spend the vast majority of time on the wing, and form large roosting colonies in favored chimneys.

**Chimney Swift**  
*Chaetura pelagica*

**At-a-Glance**

- Mating: Monogamous; birds form a pair and work together to rear the young.
- Peak Breeding Activity: May-July
  - Incubation: 19-21 days
  - Clutch Size: 4-7 eggs
- Young Fledge: 14-19 days after hatching
- Typical Foods: insects

**Description**

Many describe the chimney swift as looking like "a cigar with wings." It is a blackish swallow-like bird with long, slightly curved wings and a stubby tail. They fly very rapidly with their wings stiffly bowed.

**Habitat and Habits**

The chimney swift is most often found in areas dominated by humans. This extraordinary aerialist does not sing and has a limited repertoire. Rather, they give a fairly steady stream of rapid, staccato chips while in flight - *chitter-chitter-chitter* - occasionally interspersed with quick series of chip notes.

**Reproduction and Care of the Young**

A basket-like, half-cup nest is built out of sticks and is secured to the wall of a chimney or the inside of a hollow tree by secreted mucilage (saliva). Swifts form nesting colonies in which birds other than the breeding pair will help feed and care for young, a behavior called cooperative breeding.



**Cooper's Hawk**

Cooper's hawks are often mistaken for peregrines both in city areas and suburban and rural backyards. It is not hard to figure out why when we compare the two. There are several similarities. The main difference to look for when you see one of these birds perched is to look at where the wing tips fall in relation to the tip of the tail (when the wings are folded against the body). Cooper's hawks have shorter wings and a long tail and so their wing tips will fall several inches shorter than the tip of the tail.

**Cooper's Hawk**  
*Accipiter cooperii*

**At-a-Glance**

- Peak Breeding Activity: March
- Incubation: 32-36 days
- Clutch Size: 4-5 eggs
- Young Fledge: 27-34 days after hatching
- Typical Foods: birds and small mammals

**Description**

Cooper's hawks are medium-sized birds (about the size of a crow) with shorter, rounded wings. The tail is long and is crossed by several dark bands with a distinct white band at the tip. Adults have slate-gray upper-parts and a dark cap. The under-parts are finely barred with a rusty color.

**Habitat and Habits**

These hawks prefer deciduous forests and open woodland habitats with occasional open meadows and clearings.

**Reproduction and Care of the Young**

Cooper's hawks are monogamous and some pairs may even mate for life. Breeding begins in early spring and a nest of sticks and twigs is made in a tree, high above the ground. Both parents care for the young.

**Coyote**



Native American folklore is filled with tales of the coyote. This animal is either revered for its intelligence and ability to resolve a conflict or threat to its life or is frowned upon for being a cunning and deceiving manipulator, much as it is thought of in real life. The coyote is not native to Ohio, but it is present throughout the state today. Love or hate it, the coyote has the ability to make the best of a bad situation to survive or even

prosper. Usually, we associate the coyote with the open, deserted lands of the west. As its presence in Ohio shows, this versatile animal can make a home most anywhere.

**Coyote**  
*Canis latrans*

**At-a-Glance**

- Mating: Monogamous (male and female pair for life)
- Peak Breeding Activity: January through March

**Description**

The coyote is generally a slender animal, very similar in appearance to a medium-sized dog. Since the coyote and domesticated dog are from the same family, Canidae, the resemblance is more than a coincidence. Coyotes have a bushy tail which is usually tipped in black and is carried down at a 45 degree angle as the animal moves, unlike that of its other cousin the wolf. The majority of coyotes are gray, though some show a rusty, brown or off-white coloration. The coyote stands about one and one half to two feet tall and is between 41 to 53 inches in length. Males of this species are larger than the females and weigh anywhere from 20 to 50 pounds.

- Gestation Period: Approximately 63 days
- Litter Size: average of 5-7 pups
- Young are Born: April and May and are helpless; begin leaving the den with parents at 3 weeks of age
- Number of Litters per Year: 1
- Migration Patterns: Year-round resident; juveniles will break from the family unit and establish their own territory anywhere from 10 to 100 miles away.
- Feeding Periods: Has shown a preference for nocturnal activity, but in a secure environment, will hunt during the daylight hours.
- Typical Foods: Omnivorous (will eat what's available); small mammals (voles, shrews, rabbits, mice), vegetables, nuts, and carrion. Unchecked, they will eat livestock, particularly sheep and chickens.

### **Habitat and Habits**

The coyote is a nocturnal animal, active during the nighttime hours. However, when it is less threatened by man, it will hunt and move from place to place during the day. The coyote will hunt in unrelated (non-family) pairs or large groups. The coyote's strength is that it can adapt and exploit most any habitat to its advantage. While most wildlife species have avoided developed areas and often declined as a result of man's expansion, the coyote seems to have thrived.

### **Reproduction and Care of the Young**

The female selects, prepares, and maintains the den. Occasionally, two or three females will share a large den area. Related females will sometimes act as helpers in the care of offspring of other coyotes in the den. Both parents hunt for food and feed the young. However, the male takes the lead role when the pups are newborns, obtaining enough food for both his mate and offspring. The parents will regurgitate their stomach contents for their offspring's meals. At about three weeks of age, the young leave the den under the watch of their parents. At 8 to 12 weeks of age, the pups are taught hunting skills. The coyotes stay together in a family unit throughout the summer into mid-fall when the young will break from the family unit and develop territories of their own. It is not unusual for young female coyotes to remain in the family unit into the following year; young males that have either never left the unit or that attempt to rejoin it the following year are run off by the male.

### **Eastern Phoebe**



The Eastern phoebe is part of the flycatcher family. These birds are characterized by their stocky build, large heads and big mouths. The bill is broad and flattened. They fly out from usually exposed perches to capture insects on the wing and then return to the perch to eat.

Wing bars and eyerings are important identifying characteristics; in some species the song must be heard for positive identification.

**Eastern Phoebe**  
*Sayornis phoebe*

**At-a-Glance**

- Incubation: 16 days
- Clutch Size: 4-5 eggs
- Young Fledge: 15-16 days after hatching
- Typical Foods: insects

**Description**

This sparrow-sized bird varies from grayish to brownish color with a light breast. There are no wing bars or eye-rings, although some immature phoebes do have wing bars. The very similar wood pewee always has distinct wing bars. An excellent field trait for the phoebe is its tail-wagging habit.

**Habitat and Habits**

The Eastern phoebe is usually the first flycatcher to arrive in the spring and the last to leave in the fall. It is a fairly common summer resident. They are often seen near iron or stone bridges and farm buildings. Their preferred habitat is open woodland near water. Phoebes are named for their song a clear *fee-bee*, repeated many times.

**Reproduction and Care of the Young**

The nest of mud and grass, lined with moss, is attached to a rock overhang, bridge support, or barn rafter and will contain four to five white eggs.

**Gray Fox**



The gray fox is one of the two fox species in Ohio and one of four in North America. The state's other fox is the red fox. The Arctic and swift foxes are the other species found in North America. They are most common in the south and southeastern parts of Ohio.

**Gray Fox**  
*Urocyon cinereoargenteus*

**At-a-Glance**

**Description**

The gray fox's coat color is a salt and pepper gray. A black stripe runs from the base of the tail and ends in a black tip. Another black stripe crosses its face from the nose to the eye and then to the side of the head. Like the red fox, its cheek and throat area are white and this color extends on the gray fox to the lower jaw. There is a reddish patch on the side of its head below its

- Mating: Monogamous
- Peak Breeding Activity: February-March
- Gestation: 53 days
- Young are Born: April-May
- Litter Size: average of 4-5 kits
- Young Leave Parents: In the fall, about 5-7 months after birth
- Number of Litters per Year: 1
- Migration Pattern: Year-round resident
- Typical Foods: Mice, rats, rabbits, and other small mammals; also birds, insects, eggs, fruits, and acorns.

ear. Its belly is white and a reddish band separates it from the gray sides. The legs and back of the ears are an orange color while the feet are gray.

#### **Habitat and Habits**

As the state was settled and cleared, gray fox habitat declined and red fox habitat expanded. Wooded areas and partially open brush land with little human presence are the preferred habitat for gray foxes in Ohio.

Gray foxes are nocturnal creatures, meaning they are most active at night, feeding and moving from place to place. When pressured it will climb a tree or emit an odor from its anal glands. The gray fox will also climb a tree to sun itself. It has a distinctive bark that is usually repeated four or five times in a row. It will also squeal or growl.

#### **Reproduction and Care of the Young**

While the female is nursing her offspring, the male will bring her food. He continues in this role until the young are about three months old and can go with their parents on hunting trips where they learn a basic survival skill. Gray foxes have a reputation as excellent mousers. By fall of the same year, the family unit breaks up; the young are mature enough to go out on their own. Young gray foxes disperse anywhere from 1 to 10 miles from their home den to establish their own home ranges or territories.

#### **House Sparrow**



The house sparrow, originally from Eurasia, was introduced to North America in 1851. They have since prospered in areas associated with humans.

### House Sparrow

*Passer domesticus*

#### At-a-Glance

- Peak Breeding Activity: March-August
  - Incubation: 11 days
  - Clutch Size: 1-8 eggs
- Young Fledge: 14 days after hatching
  - Typical Foods: seeds and insects

#### Description

The male house sparrow has a gray body and crown with a brown back and wings streaked with black. It also has a black throat, white cheeks, and a touch of red on the back of the neck. The female is dull brown with a pale eyebrow.

#### Habitat and Habits

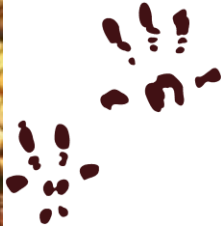
House sparrows thrive in areas dominated by humans, including urban and agricultural areas.

#### Reproduction and Care of the Young

Nests are made of all sorts of available materials and are usually placed in natural or man-made cavities. Both parents incubate and feed the young.

### Mice:

#### *House Mouse*



### House Mouse

*Mus musculus*

#### At-a-Glance

- Peak Breeding Activity: all year
- Gestation period : 18-21 days
  - Litter Size: 3-11
- Young weaned: 21days
- Typical Foods: omnivorous; plant matter, insects and meat

#### Description

The house mouse is a small, gray-brown mouse with a gray or buff-colored belly. The tail is scaly.

#### Habitat and Habits

House mice are generally found in close association with humans. While they are occasionally found in fields, they usually live in buildings.

#### Reproduction and Care of the Young

The house mouse reproduces often with several litters per year. They produce litters of 3-11 young after a gestation period of 18-21 days.

### ***Meadow Jumping Mouse***



#### **Meadow Jumping Mouse** *Zapus hudsonius*

##### **At-a-Glance**

- Peak Breeding Activity: April-May
- Gestation period : 18-21 days
- Litter Size: 4-5
- Typical Foods: seeds, insects and fruits

##### **Description**

This olive-yellow mouse has a long tail and large hind feet that help to distinguish it from other mammals.

##### **Habitat and Habits**

The meadow jumping mouse lives in a variety of habitats with herbaceous cover, but it prefers low, moist grasslands. Wooded areas are avoided.

##### **Reproduction and Care of the Young**

The breeding season occurs after hibernation in April or May. Females will produce two to three litters per year.

### ***Woodland Jumping Mouse***



#### **Woodland Jumping Mouse** *Napaeozapus insignis*

##### **At-a-Glance**

- Typical Foods: omnivorous; feeds primarily on seeds, fruits, fungi, and insects
- Ohio Status: Species of Concern

##### **Description**

This jumping mouse can be identified by its bright yellowish sides, brownish back, white belly, large hind feet, and long, white-tipped tail.

##### **Habitat and Habits**

Woodland jumping mice prefer brushy areas near water and wet bogs or stream borders. They live and hibernate in burrows.

##### **Reproduction and Care of the Young**

Woodland jumping mice mate after emerging from hibernation. Young are born between June and September, after a gestation period of about 29 days. Females produce one or two litters per season, with three to five young per litter.



## Mink

The mink was probably common in Ohio before settlement and today it occurs in every county in Ohio. Because of its preference for small streams cluttered with vegetation or wooded banks, the highest population densities occur in eastern and southeastern Ohio. The mink is prized by the trapper both for its pelt and for the great skill required to capture it. To the wildlife enthusiast, the sight of this elusive furbearer is a thrilling surprise that must be experienced quickly, before the dynamic creature can scurry away to a place of concealment.



### **Mink**

*Mustela vison*

### **At-a-Glance**

- Mating: polygamous
- Peak Breeding Activity: Jan-March
- Gestation: variable due to delayed implantation of embryo to uterus, range 39-76 days, average 42 days
  - Young are born: April- May
  - Litter Size: 2-10, average 4-5
  - Young Leave parents: 8-9 weeks
  - Number of litters per year: one
  - Adult weight: 1.25-3 pounds
  - Adult length: 12-17 inches
- Life Expectancy: 3-4 years, max. 5 years
- Migration pattern: Year-round resident
  - Typical foods: small mammals of muskrat size (muskrats preferred), as well as birds, frogs, eggs, fish and crayfish

### **Description**

This sleek furbearer is weasel-like or ferret-like in appearance possessing a long, narrow body, but is considerably larger with a bushier tail. It has small, rounded ears, beady eyes, short legs, and sharp claws. The mink's fur is usually a rich chocolate brown, but can look almost black. A white chest or chin patch with spots scattered on the underparts of the body is also characteristic. The coat is lustrous, durable and one of the most beautiful in the world.

### **Habitat and Habits**

The mink is almost invariably found near water - both running waters of streams and rivers and the standing waters of marshes and lakes. Minks are especially drawn to areas that are wooded or brushy. Although territorial by nature, the male often wanders far afield. When males meet, a violent fight is likely to ensue and may leave one or more mink dead. An angry mink can screech, hiss, snarl, and bark. A contented mink may purr or churr. Like its distant relative the skunk, the mink has anal scent glands which can excrete a fluid that smells somewhat like diluted skunk musk.

### **Reproduction and Care of the Young**

The mink is a solitary, restless creature which associates willingly with other mink only during the mating season which is January through March. The female, which is able to breed at one year of age, usually makes a den in a burrow along the bank of a stream or lake or under a stump or log. A muskrat hole in a stream bank or under a stump with exposed roots is an ideal location. The gestation period is variable due to delayed implantation of embryos into the uterus. The young are born with eyes closed and those eyes will open at five weeks of age. The female assumes all responsibility for rearing the young, which are considered full grown at five months.

## Moles

### ***Eastern Mole***



While the Eastern mole may cause damage to lawns and gardens, they also aerate the soil and eat unwanted insects.

#### **Eastern Mole** *Scalopus aquaticus*

##### **At-a-Glance**

- Typical Foods: worms, insects, and some vegetable matter

##### **Description**

The Eastern mole is characterized by its broad front feet with the palms turned outward and the lack of external ears. They have tiny eyes and ears, each covered with a thin layer of skin. Their soft fur is a silvery to slate-gray color. The tail is hairless.

##### **Habitat and Habits**

This mole can be found in areas with moist, sandy loam soil such as lawns, golf courses, gardens, and fields. They burrow just below the surface of the ground by pushing through the soil with their snout and forefeet.

##### **Reproduction and Care of the Young**

Eastern moles only breed once a year. After a gestation period of about six weeks, four to five young are born. They live in a nest in the tunnel system with their mother until they reach maturity at about one month of age.

### ***Hairy-tailed Mole***



Hairy-tailed moles are primarily fossorial (they live underground) and are most active during the day. The underground tunnels that they create may be used eight years or more by many generations of moles.

##### **Description**

The hairy-tailed mole looks much like the Eastern mole, except it is smaller and has a distinctly hairy tail.

##### **Habitat and Habits**

This mole prefers to live in sandy loam soils with good vegetative cover. They avoid heavy, wet soils. Unlike the Eastern mole, the hairy-tail will travel above ground at night.

##### **Reproduction and Care of the Young**

Hairy-tailed moles breed once or twice a year. After a gestation period of about four weeks, an average of four young is born. They live in a nest in the tunnel system with their mother until they reach maturity at about one month of age.

#### **Hairy-tailed Mole** *Parascalops breweri*

##### **At-a-Glance**

- Gestation period : 4 weeks
- Litter size : average of 4
- Typical Foods: insects and earthworms.

### Star-nosed Mole



Unlike



most moles, the star-nosed is semiaquatic, so many of its tunnels open under the surface of a stream or lake. They are also good swimmers!

#### Star-nosed Mole *Condylura cristata*

##### At-a-Glance

- Typical Foods: earthworms and aquatic insects
- Ohio Status: Species of Concern

##### Description

The star-nosed mole is easily identified by its nose, which is surrounded by 22 finger-like, fleshy tentacles. The body is dark brown or black and the tail is hairy.

##### Habitat and Habits

These moles live in low, wet soil near lakes or streams. The tentacles on its nose are used when foraging to feel its surroundings.

##### Reproduction and Care of the Young

Male and female star-nosed moles pair up in the fall and remain together throughout the mating season. Only one litter per year is produced with three to seven young being born between April and June. The gestation period is about 45 days. The young are independent at three weeks old.

### Muskrat



Musk rats are large freshwater rodents that look very much like a beaver, but are actually related to mice and rats. This is where they get the second part of their name, because their tail looks like that of a rat. The first part of their name comes from the strong-smelling odor, or

musk, that the muskrat produces during mating season and to mark its territory. Musk rats have had many names given to them over the years: marsh rabbit, mud cat, mud beaver, and the Algonquin Indian tribe called it musquash.

##### Description

Musk rats have two coats of hair. The thick fur undercoat keeps the muskrats warm in winter, and the outer coat is made up of long, shiny waterproof hairs. The muskrat's fur is a dark brown that gets lighter around its throat. The tail is long, flattened, and nearly hairless, making it a perfect rudder for swimming.

##### Habitat and Habits

Swimming is what muskrats do best. They can swim up to speeds of two to three miles per hour. It would take an Olympic swimmer to catch up with them! Musk rats spend much of their time sleeping during the day and slip into the water in the evening. They dive underwater for food, or in search of vegetation for their lodges.

**Muskrat**  
*Ondatra zibethicus*

**At-a-Glance**

- Peak Breeding Activity: March through November
- Gestation: 22 to 39 days
- Young are Born: Throughout the year
- Number of Litters per Year: One to five, average two
  - Adult Weight: 1 ¼ to 4 pounds
  - Adult Body Length: 16 to 24 inches including tail
- Migration Pattern: Year-round resident
- Typical Foods: Aquatic vegetation, a few terrestrial plants, clams, frogs, crayfish, and fish
- Nuisance Status: Possible nuisance in ponds and wetlands

Like beavers, muskrats also build lodges. However, their lodges consist of more aquatic vegetation than sticks. Sometimes they even make their own feeding stations to protect themselves from predators while they are eating. These private dining rooms are made from weeds and plants and are built on top of floating rafts of reeds. The muskrat lodges usually have one nesting chamber and several underwater entrances for quick escape routes.

**Reproduction and Care of the Young**

Females normally produce one to five litters per year, with each litter containing four to seven young. That's up to 35 young a year!

The females will often breed while still nursing. Young are born three to four weeks after breeding and are born hairless. Only two weeks after birth the young muskrats have fur and are able to swim. They are able to take care of themselves within a month and are on their own.



**Mute Swan**

Mute swans are a European introduction, brought over to beautify ornamental ponds.

They have escaped to the wild, and feral populations are expanding, causing increasing problems as these swans are aggressive and can displace native waterfowl.

**Mute Swan**  
*Cygnus olor*

**At-a-Glance**

- Peak Breeding Activity: March-April
  - Incubation: 36-38 days
  - Clutch Size: 5-7 eggs
- Young Fledge: 60 days after hatching
- Typical Foods: aquatic vegetation, aquatic insects, fish, and frogs

**Description**

These swans are easily recognized by their white bodies and orange bill with a black knob at the base. Mute swans hold their necks in an S-curve.

**Habitat and Habits**

Mute swans can be found in and around ponds, lakes, and marshes. These birds are not actually soundless as the name implies; they can deliver a variety of hisses, bugles, and other sounds. They also produce loud humming sounds from their primary flight feathers while on the wing, unlike our other swans.

**Reproduction and Care of the Young**

Nests are large mounds of aquatic vegetation, lined with feathers and down, and placed in swampy areas above the water. The young are precocial and able to leave the nest one day after hatching. Both parents care for the young.

**Norway Rat**

This rat can live pretty much anywhere. It is originally native to Asia's forests and brushy areas.



**Norway Rat**  
*Rattus norvegicus*

**At-a-Glance**

- Peak Breeding Activity: year-round
- Gestation period : 21-22 days
  - Litter Size: 8-10
- Time to weaning: 3-4 weeks
- Typical Foods: omnivorous: will feed on anything edible

**Description**

The Norway rat is a large member of the mouse family that can be distinguished by its grayish-brown color and long, scaly tail.

**Habitat and Habits**

Rats occupy any place where food and shelter can be found including woodlands, open fields, garbage dumps, sewers, and basements.

**Reproduction and Care of the Young**

These rats are social animals and tend to breed in large groups, where communal care makes this species somewhat of a cooperative breeder. Female Norway rats have been known to produce up to 12 litters per year!

## Raccoon



Raccoons are found in all parts of Ohio. For many years our raccoon population has been growing. They have moved into towns and cities and can live almost any place where there is food for them to eat and a den to serve as shelter. Many of them live, temporarily at least, in drain tiles and sewer systems. There is little wonder why they are plump, as raccoons will sample anything that even remotely resembles food.



### **Raccoon**

*Procyon lotor*

#### **At-a-Glance**

- Mating: Promiscuous
- Breeding age: 1 year
- Peak breeding activity: February to June, peaking in March
- Gestation: 63 - 65 days
- Litter Size: 3 to 7; 4 average
- Typical foods: omnivores (favorite foods are berries, acorns, baby birds, frogs, & fish)

### **Description**

Raccoons are normally gray or black in color with pale gray coloring underneath. They can also be red or blonde in color, although not as common. Their black mask is rimmed on top and bottom with white. The raccoon's tail has four to six black or dark brown rings.

### **Habitat and Habits**

The raccoon prefers to live in wooded areas with big trees and lots of water close by. During the daytime, raccoons sleep in hollow trees or logs and other animals' abandoned dens. They are nocturnal and are up and about during the dark hours of the night. Even though the raccoon does not really hibernate, it can sleep for days, and even weeks at a time during the cold winter months.

### **Reproduction and Care of the Young**

Raccoons mate from February through March in Ohio. Males will mate with several females during the breeding season. Typically only one litter is produced each year, but there can be exceptions to the rule. Newborn raccoons are well furred with their eyes opening around 19 days. By the sixth or seventh week the young are weaned and weigh about 1.5 pounds. The young raccoons will stay with the mother through the fall with some staying with her during the winter as well.



## Red Fox

The red fox is one of two fox species in Ohio and one of four in North America. The state's other fox is the gray fox. The Arctic, swift, and kit foxes are the other species found in North America. North American foxes inhabit a wide range of habitats from deserts to forests to snow-covered tundras. This isn't completely surprising as the red and other foxes are members of the same family of adaptable animals that includes the wolves, coyote, and domestic dog -- *Canidae*.

### **Red Fox**

*Vulpes vulpes*

#### **At-a-Glance**

- Mating: Monogamous
- Peak Breeding Activity: January-February
- Gestation: 51-53 days
- Young are Born: February-April
  - Litter Size: 5 or 6 kits
- Young Leave Parents: In the fall, about 6-8 months after birth
- Number of Litters per Year: 1
- Migration Pattern: Year-round resident
- Typical Foods: Mice, rats, rabbits, groundhogs, and other small mammals; also birds, fruits, and some grasses.
- Native to Ohio: No; arrived following European settlement

### **Description**

The red fox is likely the one that comes to mind when you think of a fox. Although it can have several color variations, the red fox takes its name from its most common color phase: a rusty-red or reddish yellow coat from its face down its back and sides. Its undersides, throat area, and cheeks are white. The legs, feet, and outside of the ears are black; its long, bushy tail has black hairs mixed with the red and ends in a white tip. This feature can be used to help identify it; the gray fox's tail has a black tip. The tail of the red fox is usually between 14 and 16 inches long.

### **Habitat and Habits**

Red foxes are solitary creatures during the fall and early winter.

Their range is one to two miles, but if food supplies dwindle within this area, the animals will extend their normal range to search for food. These foxes do not hibernate; under extreme winter weather conditions they will reduce activity levels and take shelter for a day or two.

Red foxes are nocturnal creatures, meaning that they are most active at night, feeding and moving from place to place. Nonetheless they are often found hunting during daylight hours.

### **Reproduction and Care of the Young**

Females that need to dig their own dens from scratch usually do so by selecting an area of loose, sandy soil with a southern exposure. Most fox dens are about four feet below ground.

While the female is below ground nursing her offspring, the male will bring her food. He continues in this role until the young are weaned and can go with their parents on hunting trips where they learn basic survival skills. By fall of the same year, the family unit breaks up; the young are mature enough to go on their own and their parents split and live independently until the start of the next breeding season.

### **Red-tailed Hawk**



The red-tailed hawk is classified as a buteo -- a hawk that spends much of its time soaring and has broad wings and a short, fan-shaped tail. It is a large hawk frequently seen in Ohio. It has not suffered the severe population declines caused by DDT and other pesticides that have struck other species. These birds are extremely beneficial and it is illegal to kill them.

#### **Red-tailed Hawk** *Buteo jamaicensis*

##### **At-a-Glance**

- Peak Breeding Activity: spring
- Incubation: 28-35 days
- Clutch Size: 2-3 eggs
- Young Fledge: 42-46 days after hatching
- Typical Foods: small rodents, reptiles, and birds

##### **Description**

This large, majestic bird has a brown back and white breast. The tail of the adult is a brick-red color, hence the name. A good field mark is the band of dark stripes across the breast. Much variation is found in the coloration of this bird. Immature red-tailed hawks are brown-and-white striped.

##### **Habitat and Habits**

This hawk is a fairly common permanent resident. It inhabits woodlands, fields, plains, and deserts. The diet is quite variable, but consists mostly of mice, insects, and some other small mammals, as well as carrion. Their typical call is a loud descending scream.

##### **Reproduction and Care of the Young**

These birds hunt in open country, but build a large nest of sticks high in the fork of a tall tree, often in the woods. The nest will contain two to three brown-spotted white eggs.



### **Ring-billed Gull**

This is the default gull throughout Ohio at nearly every season. With few exceptions, mainly along Lake Erie, and then primarily in winter, are other species commonly found. The ring-billed gull is the species that frequents urban situations such as landfills, mall parking lots, and inland reservoirs, which they often use to roost at night. This species is only one of two gulls that breed in Ohio, the herring gull being the other.

#### **Ring-billed Gull**

*Larus delawarensis*

#### **At-a-Glance**

- Peak Breeding Activity: May-August
- Incubation: 20-31 days
- Clutch Size: 3 eggs
- Typical Foods: fish, rodents, bird chicks and eggs, vegetable matter, etc.

#### **Description**

The ring-billed gull is gray on the back with a white head, breast, and tail, and black-and-white wing tips. Except for the distinct black ring around the bill, it is almost identical to the larger herring gull.

These "sea" gulls are large, robust birds with a strong flight. Their fully webbed toes make them good swimmers.

#### **Habitat and Habits**

This gull is a common permanent resident along Lake Erie and a fairly common migrant in the rest of the state. In the winter, concentrations of thousands of these birds can be seen on the open water around power plants on Lake Erie shores. They are scavengers, feeding mainly on dead fish and garbage, but will eat many types of plant and animal food as well. Their song is a loud, raucous cry.

#### **Reproduction and Care of the Young**

Huge colonies of ring-billed gulls often nest on small islands. The nest is a hollow depression lined with grass. The two to four eggs are a spotted olive-buff color.

**Shrews**  
***Masked Shrew***



**Masked Shrew**  
*Sorex cinereus*

**At-a-Glance**

- Typical Foods: insects, including ants, beetles, spiders, and snails

**Description**

The masked shrew is grayish-brown in color, with the underparts paler than the upperparts.

**Habitat and Habits**

This shrew is the most widely distributed shrew in North America and can be found in a variety of habitats, although it prefers forests, open country, and brushland.

**Reproduction and Care of the Young**

Masked shrews construct nests out of dry leaves and grasses, usually in stumps or under logs. They produce more than one litter per year with 2-10 young per litter.

***Least Shrew***

Unlike most shrews, the least is somewhat social. In the winter, more than one shrew may nest together for warmth.



**Least Shrew**  
*Cryptotis parva*

**At-a-Glance**

- Gestation period: 21-23 days
- Litter Size: 3-6
- Young weaned: 20-23 days after birth

**Description**

The fur of this shrew is dense, velvety, and cinnamon in color. The least shrew's color and extremely short tail help to distinguish it from other shrews.

**Habitat and Habits**

The least shrew prefers open, grass-covered or brushy areas. It can also be found in marshes.

**Reproduction and Care of the Young**

Least shrews nest under debris, underground, and sometimes in beehives. In Ohio, they breed from March to November, with more than one litter per year.

- Typical Foods: insects and other small animals like earthworms, slugs, and snails

### ***Smoky Shrew***

Smoky shrews travel and forage in underground tunnel systems, but they usually nest in stumps or logs.

#### **Description**

The smoky shrew is a uniformly dull brown color except for a bicolored tail that is yellowish below and brown above. Its feet are pale in color.

#### **Habitat and Habits**

These shrews generally live in the leaf litter of birch and hemlock forests.

#### **Reproduction and Care of the Young**

After a gestation period of three weeks, two to seven naked, blind young are born in April-June. Another litter may be produced later in the summer.

#### **Smoky Shrew** *Sorex fumeus*

##### **At-a-Glance**

- Typical Foods: insects such as earthworms and spiders
- Ohio Status: Species of Concern

### ***Pygmy Shrew***

The pygmy shrew is the smallest mammal in America. Its weight is about equal to that of a dime!

#### **Description**

This shrew is very small, with a pointed nose and narrow head. The hair varies from gray-brown to gray with a lighter colored underbelly.

#### **Habitat and Habits**

Pygmy shrews can live in a variety of habitats, including wooded and open areas, swamps, grassy clearings and floodplains. They are excellent diggers in soft soil, but they also use tunnels made by other animals.

#### **Reproduction and Care of the Young**

Pygmy shrews produce one litter a year, between June and August, with three to eight young in a litter. The average gestation period is 19 days.

#### **Pygmy Shrew** *Sorex hoyi*

##### **At-a-Glance**

- Typical Foods: insects such as ants, spiders, earthworms, beetles, and caterpillars
- Ohio Status: Species of Concern

### ***Northern Short-tailed Shrew***



This is the largest shrew in North America. The salivary glands of the Northern short-tailed shrew produce a toxic material which helps in subduing its prey.

### **Northern Short-tailed Shrew**

*Blarina brevicauda*

#### **At-a-Glance**

- Peak Breeding Activity: March-September
- Gestation period : 21 days
- Litter Size: 5-8
- Young are weaned: 20 days after birth
- Typical Foods: invertebrates, small vertebrates and plant material

#### **Description**

This species has short, dense, slate-gray colored fur and a small tail. The snout is also short and heavy.

#### **Habitat and Habits**

Short-tailed shrews are not restricted to a particular habitat, but seem to prefer forests, grasslands, marshes, and brushy areas. They are active year-round, both day and night.

#### **Reproduction and Care of the Young**

The breeding season occurs from March to September with females producing up to three litters per year. Nests are made of shredded grass and leaves. They are located in tunnels or under rocks or logs.

### **Snakes**

Snakes are a natural form of pest control. All snakes are carnivorous, with various diets they include birds, insects, small mammals, fish, eggs, snails, lizards and other snakes. Their presence should be valued, but they often suffer from a lack of appreciation. The following species are commonly found near homes and may be seen as a nuisance.

#### ***Eastern Gartersnake***



The Eastern gartersnake is one of the three gartersnakes in Ohio. It is the most abundant snake in Ohio. It is recognized by its pattern of three yellow stripes on a black or brown body. It can be found in almost every habitat type in the state.

### **Eastern Gartersnake**

*Thamnophis sirtalis sirtalis*

#### **At-a-Glance**

- Mating: Polygamous
- Peak Breeding Activity: March and April
- Gestation Period: 90-100 days; young born July-October
- Litter Size: 10-40 young snakes; 20

#### **Description**

The pattern can vary, but the Eastern gartersnake is marked with a pattern of three light stripes on a dark body. One narrow stripe runs down the center of the snake's back combined with a broad stripe on each side. The stripes are usually yellow, but can be shades of blue, green, or brown. Between the center and each of the side stripes are two rows of alternating black spots. The scales of the Eastern gartersnake are keeled (have ridges) and the snake's belly is yellow or pale green.

#### **Habitat and Habits**

The Eastern gartersnake occupies a variety of habitats including pond and stream edges, wetlands, forests, fields, rocky hillsides, and residential areas. They are often seen basking on wood piles, stone walls, hedges, and rocks.

average

- Young are Born: Able to care for themselves; they receive no parental care and disperse shortly after birth
- Number of Litters per Year: One
- Migration Patterns: Does not migrate; year round resident
- Feeding Periods: During daylight hours; feeding can depend on appropriate weather conditions.
- Typical Foods: Earthworms and amphibians
- Length: 18-26 inches
- Ohio Status: Species of Concern

The saliva of the Eastern gartersnake appears to be toxic to amphibians and other small animals and a bite may produce swelling or a rash in some people. The Eastern gartersnake eats its prey alive and whole.

#### **Reproduction and Care of the Young**

Eastern gartersnake young emerge alive from the body of the mother. Many other speices of snakes lay eggs from which the young hatch. During gestation, each young snake is protected and nurtured in a thin sac-like membrane that contains a yolk.

Young emerge from the mother anytime between July and October. The size and number of young depend on the age, size and condition of the female.

#### ***Black Rat Snake***



The eastern (or black) ratsnake is Ohio's largest snake and one of the most common snakes senselessly slaughtered out of ignorance and fear. The fact is that eastern rat snakes are one of Ohio's most beneficial and splendid reptile assets; they play an essential role in controlling destructive rodents.

#### **Eastern Rat Snake** *Pantherophis alleghaniensis*

##### **At-a-Glance**

- Length: 47-72 inches
- Peak Breeding Activity: April-June
- Incubation: 65-70 days
- Clutch Size: 12-20 eggs
- Typical Foods: mice and rats, chipmunks,

#### **Description**

Although it is typically four to six feet long, individuals have been known that were more than eight feet long. It is completely black except for a white chin. The body is slender and the head is wedge-shaped.

#### **Habitat and Habits**

An essentially forest-loving snake, the eastern rat occurs throughout most of Ohio. It is an accomplished climber and is often found high in trees, frequently taking shelter in woodpecker holes and other cavities.

When first encountered, most black rats freeze in position, blending in with their surroundings. They remain motionless until grasped. Although some offer little or no resistance when first captured, many will vibrate their tail rapidly and strike repeatedly. When picked up, they usually coil

moles, and other small rodents

tightly about the arm and discharge a foul-smelling substance from the anal scent glands.

### **Reproduction and Care of the Young**

Soon after winter hibernation, snakes will begin the mating process. The female will then lay her eggs in a hidden area, such as under hollow logs or leaves, or in abandoned burrows.

### ***Eastern Milksnake***

The milksnake is a true constrictor. It usually throws several loops of its muscular body around its prey.



These coils do not crush, but merely exert enough pressure to prevent breathing. The victim soon suffocates and is then swallowed whole. Like other members of the kingsnake group, milksnakes feed primarily upon mice and other small rodents, as well as smaller snakes. They should be considered an asset, worthy of protection on anyone's property.

#### **Eastern Milksnake**

*Lampropeltis triangulum triangulum*

#### **At-a-Glance**

- Length: 24-36 inches
- Peak Breeding Activity: April-June
- Gestation period : 28-39 days
- Number of offspring : 2-17
- Typical Foods: voles, mice, and rats, birds, bird eggs, lizards, snake eggs, or other snakes

#### **Description**

The belly has a black and white checkerboard pattern. A Y-shaped or V-shaped light-colored blotch is usually present on the nape of the neck.

#### **Habitat and Habits**

Eastern milksnakes are commonly encountered throughout Ohio in a variety of habitats, including woods, meadows, and river bottoms--even within cities, where they occasionally enter buildings in search of mice. Their frequent occurrence in rodent-infested barns led to the fallacy that they milk cows by night; hence the name milksnake. These secretive snakes usually move about at night and spend the day hiding beneath objects such as logs, rocks, and old boards.

When first encountered, the milksnake either remains motionless or attempts to crawl away. If thoroughly pestered, it may vibrate the tip of its tail rapidly and strike repeatedly. However, the teeth can barely puncture the skin.

#### **Reproduction and Care of the Young**

The eggs are usually laid in a rotting log or in humus. The young that emerge are brightly colored, but the color dulls as the snakes age.

### Striped Skunk



Skunks are known to everyone by sight, smell, and reputation. They are found in every county of Ohio as well as throughout the United States. Pioneers found the striped skunk when they came to Ohio, although skunk numbers are far greater now.

Skunks are most abundant in rural Ohio where there are farms with fencerows, forest edges and old fields. They are also found in urban areas.

Skunks are known for their ability to spray musk when threatened. They can spray with great accuracy up to 15 feet.



#### **Striped Skunk** *Mephitis mephitis*

##### **At-a-Glance**

- Peak Breeding Activity: late February through March
- Gestation Period: 63 days
- Litter Size: 3-10 offspring with average of 5
- Adult weight: 2.5-11.5 pounds
- Adult length: 22.5-31.5 inches
- Typical foods: Omnivore; favorites include insects, small mammals, fish, crustaceans, fruits, grasses, leaves, buds, grains, nuts, and carrion.

#### **Description**

The striped skunk is about the size of a house cat, with a large deep body, small head, and short legs. The hair is long and black, with a broad patch of white on its head and shoulders. Two white lines forming a “V” from the shoulder area may extend part way or all of the way to the base of the bushy tail. Color variations include brown, white, cream, black, and, occasionally, albino. Males and females are colored alike with males being slightly larger in size. Each foot has five slightly webbed toes with the forefeet having long, curved claws designed for digging. The rear feet have shorter, straighter claws.

#### **Habitat and Habits**

Striped skunks are highly adaptable and occupy a wide variety of habitats in Ohio from rural areas to the suburbs. It is this adaptability which accounts for their numbers growing stronger as civilization and humans encroached.

Although not true hibernators, skunks store quantities of body fat in the fall. When the weather gets cold they will retreat to protective dens where they might remain for several weeks or a month at a time. Skunks are primarily nocturnal animals and very seldom do they wander around during the daytime. They will occupy dens that they have dug or in dens that have been used previously by groundhogs or foxes. These dens may be located beneath buildings, in open fields, on hillsides, or under logs in the woods.

#### **Reproduction and Care of the Young**

Skunks mate in Ohio in late February and continue through March. Females are in heat for four to five days and will typically mate several times during this period. Males tend to be a bit promiscuous and will move from den to den mating with females. Litters tend to be from 2 to 10 young which are born pink-skinned and blind. By the second week they are furred and by the third week their eyes have opened. By the sixth week they are weaned and will be out and about with their mother on nightly hunting forays. This family will stay together until the next spring when the young will go off on their own.

## Virginia Opossum



The opossum is North America's only marsupial -- a mammal that carries its underdeveloped young in a pouch until they are capable of living independently. It is also one of the oldest and most primitive species of mammal in North America. This animal is little changed from its ancestors 70 million years ago.

Opossums were probably rare in the vast forests of unsettled Ohio, but began to take hold as the land was cleared for agriculture. Today they are found in every county of the state, and slightly more abundant in southern Ohio.



### **Virginia Opossum** *Didelphis virginiana*

#### **At-a-Glance**

- 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 as long as 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

#### **Description**

An adult opossum is about the size of a large house cat, with coarse, grizzled grayish fur. It has a long, scaly tail, ears without fur, and a long, pointed snout that ends in a pink nose.

#### **Habitat and Habits**

Opossums are quite adaptable and can also be found in suburbia and the city. Their ideal habitat, however, is an area interspersed with woods, wetlands, and farmland. The den is usually situated in a wooded area near water. The opossum is an opportunist that will take shelter anywhere it can stay dry and safe from predators. It often uses the deserted dens of other animals, brush piles, tree holes or openings under old buildings as shelter.

The opossum's best known behavior is that of "playing possum." When threatened, the opossum may hiss and bare its teeth. More likely, though, it will roll over and lay motionless, appearing to be dead. When the danger is past, the opossum "revives" and resumes its activities.

#### **Reproduction and Care of the Young**

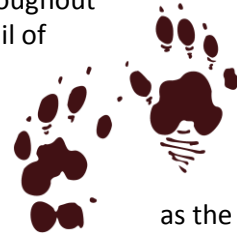
A female opossum carries her young approximately two weeks before they are born. Opossums are undeveloped, and tiny (1/15 ounce) at birth. The offspring must crawl to a nipple in the mother's pouch to survive. The nipple will swell in the offspring's mouth, providing a secure attachment and constant food supply for two months. At about three months of age, young possums emerge from the pouch for short periods and will hitch a ride on the mother's back to get from place to place. In several days to a week the young leave the "nest" for good.

### Woodchuck/Groundhog

When Ohio was first settled, groundhogs, or woodchucks, were a rare sight. However, as Ohio's forested land was cleared for agricultural production, the number of groundhogs increased. Today, groundhogs can be found in all of Ohio's 88 counties as well as throughout most of North America. Groundhogs are prevalent in the sandy gravel soil of central Ohio.



Groundhogs must put on a thick layer of fat to survive their hibernation through the winter months. In the early fall, groundhogs begin to ready themselves for hibernation by spending most of their time eating. Hibernation comes to an end as the first warm days of spring arrive.



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#### **Woodchuck**

*Marmota monax*

#### **At-a-Glance**

- Mating: Polygamous
- Breeding period: March – May with the peak in April
- Gestation: 31-32 days
- Birth Period: April – early June peak in May
- Litters per year: 1
- Litter size: 2-7, average of 4-5
- Eyes of young open: 4 weeks
- Young leave nest: 9-11 weeks
- Young weaned: at 6 weeks
- Breeding age: 1 year
- Food: Grasses, clover, alfalfa, soybeans, peas, lettuce, apples, but rarely animal matter such as snails and insects

#### **Description**

The head of a woodchuck is broad and flat with small ears and eyes. The coarse fur is usually grizzled grayish brown with a reddish cast. The legs and feet are typically dark brown to black colored and are well suited for digging. Unlike the dark yellow colored incisors of other rodents, the woodchuck's incisors are white to ivory white.

#### **Habitat and Habits**

Woodchucks live in open grasslands, pastures, and woodlands where it is easy to see predators such as man, hawks, or coyotes coming. Woodchucks prefer sandy, gravelly soil perhaps because it is easier to dig in. Burrows can be located in forested areas, along heavy fencerow brush, or along undisturbed stream banks. The entrance to the burrow usually has a large mound of dirt around it. It is usually forked with more than one entrance and several passages or rooms. Some burrows have had over 45 feet on tunnels going five feet beneath the surface. The rooms or chambers of a burrow are used for different purposes. There are usually sleeping, nesting, and excrement chambers.

**Reproduction and Care of the Young** Immediately after coming out of hibernation the male seeks a mate. After mating with one female, the male will usually search for other females to copulate with. Some males will stay at the burrow site until the female drives him off shortly before she gives birth to her young.

The naked, pink, and helpless newborn groundhogs weigh about 1.5 ounces. In the following few weeks the young will grow rapidly. By midsummer the den will be overcrowded and the female will drive the young off into nearby burrows, but she will continue to care for them. She will guide them in their development until they leave the territory to create territories of their own.



## Woodpecker-Downy

Woodpeckers are small to medium-sized, mostly black-and-white birds, with strong, sharply pointed bills for chiseling and digging into trees. They drill in search of food (insects and larvae) and to excavate nesting cavities. As they climb up tree trunks they use their stiff tails as a brace. Their flight is undulating, with the wings folded against the body after each series of flaps. These climbers have strong feet, with two toes forward and two backward.

### **Downy Woodpecker** *Picoides pubescens*

#### **At-a-Glance**

- Peak Breeding Activity: January-March
- Incubation: 12 days
- Clutch Size: 4-5 eggs
- Young Fledge: 20-25 days after hatching
- Typical Foods: insects and other arthropods, fruits, seeds, sap, and some cambium tissue

#### **Description**

About the size of a sparrow, the species is the smallest, most abundant, and tamest of our woodpeckers. The downy is black and white. Males have a bright red spot on the back of the head. The small downy is marked exactly like the larger, and much rarer, hairy woodpecker. The hairy, however, has a much larger bill as compared to the stubby bill of the downy.

#### **Habitat and Habits**

The downy's habitat may be anywhere a number of trees are found. This fairly common permanent resident is attracted to suet feeders in the winter. The song is a descending rattle. The call note, a sharp *pik*, is heard more frequently.

#### **Reproduction and Care of the Young**

An unlined cavity in a tree trunk is the site where four to five white eggs are laid. The male and female usually excavate the nest cavity together. They also share the responsibilities of incubating and feeding.

## Chapter 8 – Ethics of Commercial Nuisance Wild Animal Control Operations

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 commercial nuisance wild animal control operator may result in negative feelings towards the industry as a whole 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 on the evening news think I am acting?” The following considerations should be made when performing nuisance wild animal work:

- **Consider the safety of other people and pets that may come in contact with your traps.**  
*Not everyone is familiar with trapping and homeowners often do not properly 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 like commercial nuisance wild animal control operators. While it is easy 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.**  
*Since most homeowners you will deal with don't deal with wild animals, 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 you work with as well as adjacent property owners. Not everyone has the same views of trapping, but 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 due to disease concerns rather than telling them you will relocate it and then euthanizing it.*

- **Be courteous to other trappers.**

*Nuisance trapping is a needed 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 be found to 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. Not only will it help you gain work through referrals and recalls, but puts 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 appearance. Maintain a 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 the 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, (repairing siding, etc.) direct the homeowner to a person that can perform the needed 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 work.*