



Department of  
Environmental  
Conservation



College of  
**Veterinary Medicine**

# New York State Wildlife Health Program

## **WILDLIFE EUTHANASIA** **STANDARD OPERATING PROCEDURES (SOP)**

*Updated 2024*



# STANDARD OPERATING PROCEDURES (SOP)

## Euthanasia of Wildlife

### Purpose:

This SOP has been prepared to enable field personnel in the NYSDEC Bureau of Wildlife to euthanize wildlife using best practices based on guidance from several sources (see citations). This document gives guidance for different euthanasia options for the most common animals that are handled by the wildlife staff.

### Background:

Euthanasia methods are procedures that end an animal's life while minimizing pain and distress. The methods used require a rapid loss of consciousness either simultaneous to or preceding death so that any pain or distress is avoided or momentary. Methods such as drowning, mechanical asphyxiation or freezing in fully conscious animals do not meet this requirement and so are not considered euthanasia. The best method of euthanasia is often situational- it will vary with the field location of the animal, safety considerations, potential for disease exposure and resources available.

For the most part, the injectable anesthetic drugs available to staff are inadequate and unreliable as a means of euthanasia for most animals. During business hours, the Bureau of Wildlife's Wildlife Health Program (WHP) can provide additional advice and assistance with cases. Contact information is on [page 9](#) of this document.

### Primary considerations:

1. To preserve the safety of staff and the public and protect them from exposure to disease agents or injury
2. To ensure that the animal is euthanized in a manner that provides a rapid loss of consciousness and minimal amount of pain and distress
3. To preserve the tissues in the best condition possible for disease testing, given the species and the likely tests needed
4. To use methods that are practical and readily available

## Deer, Bear or Moose

### PREFERRED METHOD

#### GUNSHOT TO THE CHEST OR NECK

The chest is a large target area with flexibility for multiple angles into the heart and lungs. Neck shots require extra attention to ensure a hit to the narrow spinal column. Either method preserves brain tissue for rabies and chronic wasting disease (CWD) testing, and brain is a frequent site of disease in clinical deer. If the animal is showing respiratory distress, the neck shot is preferred to preserve the lungs.

When feasible, animals may be chemically immobilized prior to euthanasia via gunshot to minimize pain and distress (see Chemical Immobilization SOP for more information). Shooting in the chest is not considered euthanasia unless the animal is anesthetized/unconscious.

To prevent scavenger exposure to lead, personnel should consider use of non-lead ammunition, or remove the carcass from the landscape via burial, incineration or necropsy.

### ALTERNATIVE METHODS

#### Gunshot to Head

Head shots can be used in circumstances where the animal is **not going to be submitted for necropsy**, or if the animal is in a position where a chest or neck shot is not possible. Care must be made to ensure proper angle of the bullet into the brain cavity (see [page 2-3](#)).

Head shots increase the risk of human exposure to pathogens such as rabies virus due to leakage of brain or spinal fluid from the damaged skull, and decrease our ability to test and diagnose diseases of the brain. Care should be taken on the part of staff to wear the appropriate protective equipment (gloves, mask, and goggles) and minimize exposure to infectious materials when handling these animals.

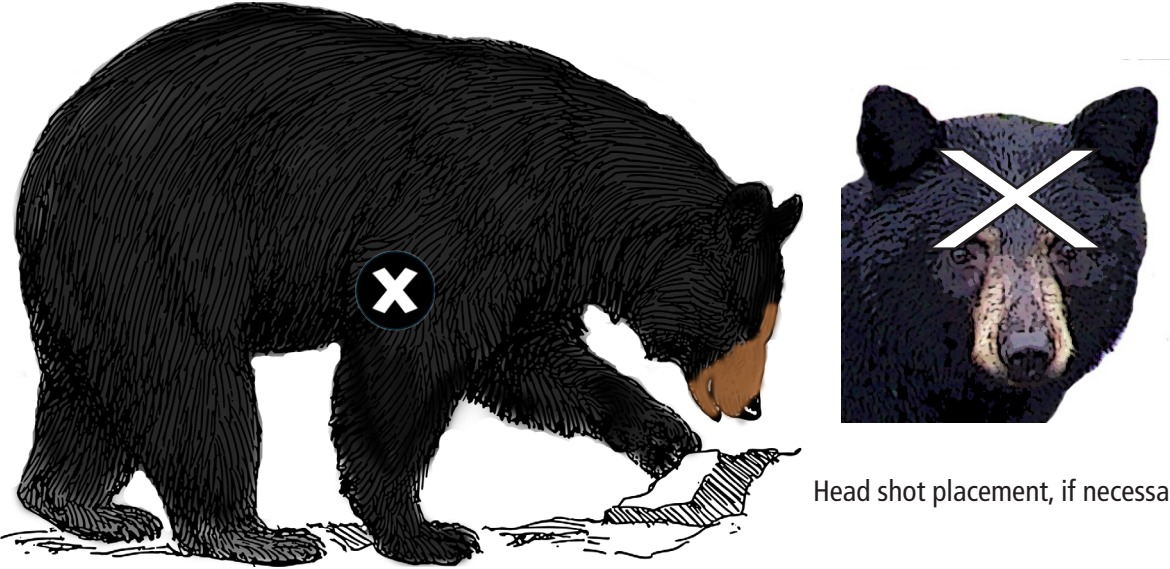
#### Injectable drugs

Intravenous administration of barbiturates or potassium chloride (KCl) may be used with veterinary assistance. Barbiturates are controlled substances and must be used under the supervision of personnel registered with the US DEA. KCl requires heavy sedation/anesthesia prior to injection.

Due to anesthetic drug residues, animals euthanized with barbiturates need to be collected and disposed of properly (incineration or burial  $\geq 3$  feet if not submitted for necropsy) so that the carcass is not available to scavengers including humans and domestic pets.

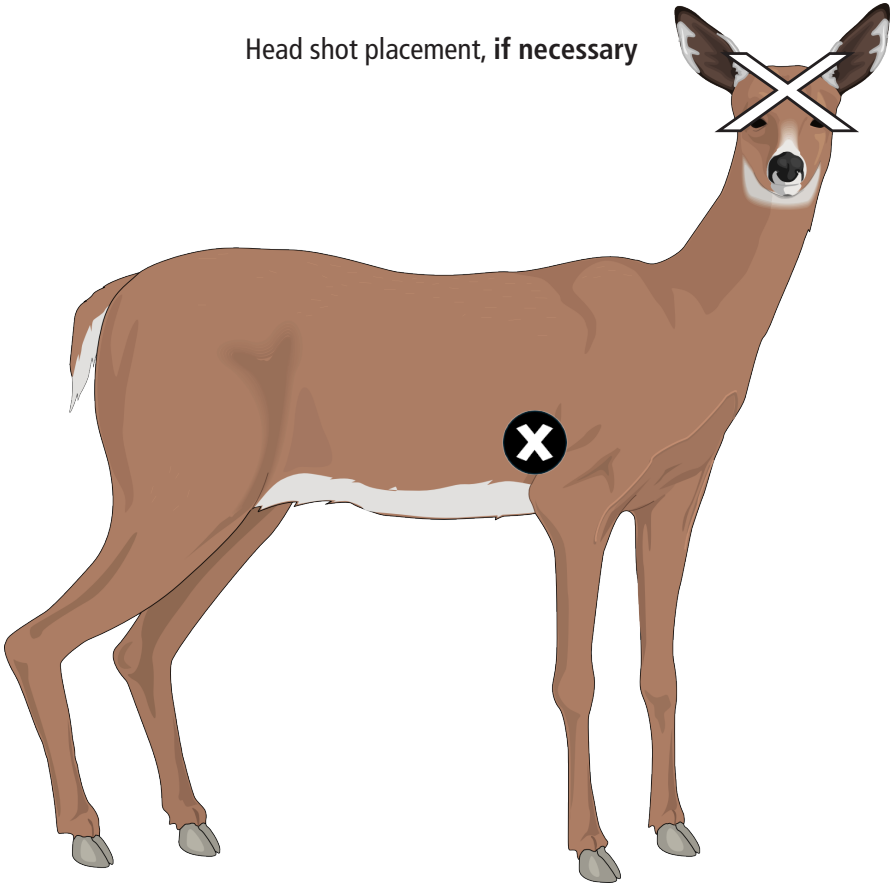
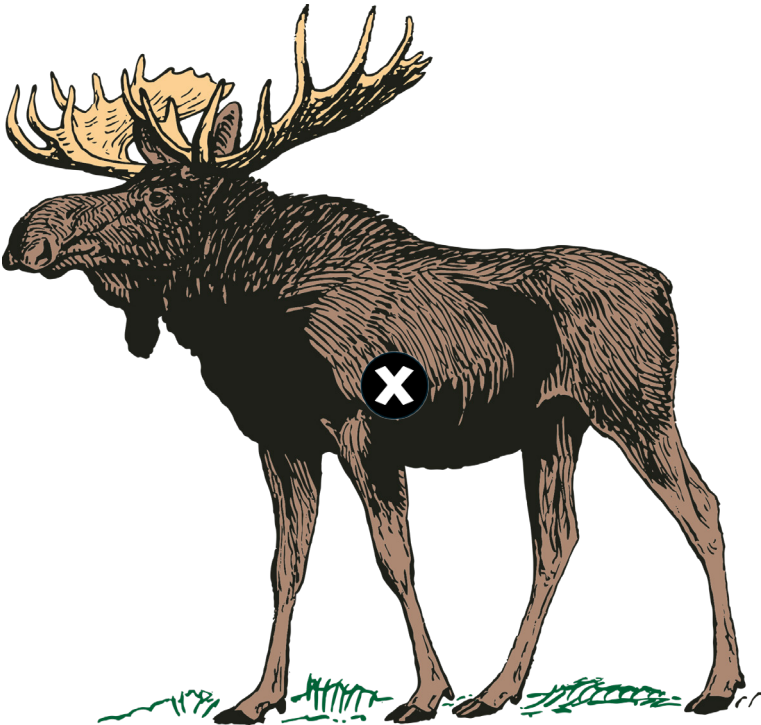


EUTHANASIA DIAGRAMS

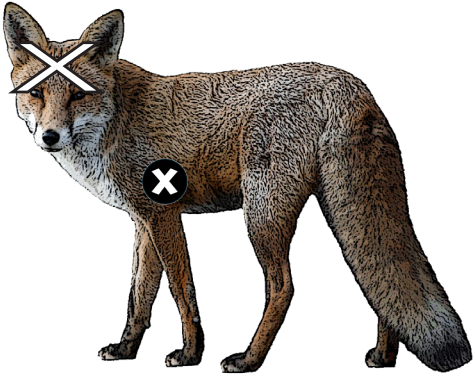
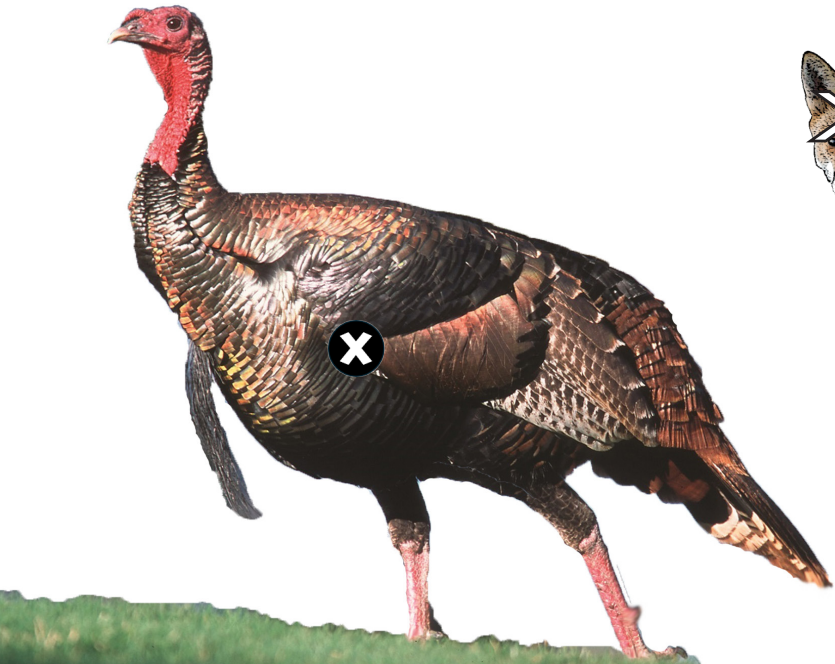


Head shot placement, if necessary

On large mammals, wait for the front leg to move forward (despite image depiction) to avoid a non-lethal shot.



Head shot placement, if necessary



Head shot placement, if necessary



## Small Mammals

raccoon, skunk, fox, coyote, rabbit, woodchuck, beaver, bobcat, fisher, otter

### PREFERRED METHODS

#### **GUNSHOT TO CHEST OR BODY**

In most cases, the priority is to preserve the brain for rabies testing. When feasible, animals may be chemically immobilized prior to euthanasia via gunshot to minimize pain and distress (see Chemical Immobilization SOP for more information).

If using lead ammunition, carcass should not be left on the landscape. It can be disposed of via burial, incineration or necropsy.

The chest represents the largest target area on these relatively small animals when using rifles. Shotguns at close range are less desirable since they may damage important tissues if the animal requires testing.

#### **CARBON DIOXIDE (CO<sub>2</sub>)**

Requires specialized equipment which is present at Cornell and the WHU. Instructions for building a CO<sub>2</sub> unit are available through the WHU or the CWWL.

Once animals are placed in the chamber, set a flow rate that displaces 30-70% of the chamber volume per minute. Maintain gas flow for at least 1 minute after respirations have ceased. It should be emphasized that training and the ability to make necessary mathematical calculations is critical for proper use of this equipment. It may not work well on immature animals and burrowing or diving species (e.g. rabbit, beaver, otter) due to breath holding.

### ALTERNATIVE METHODS

#### **Gunshot to the head or blunt force trauma**

Use only if no other options are possible. This increases the risk of human exposure to rabies due to damage to the skull, decreases our chances of diagnosing disease, and while an approved method, blunt force trauma is likely not acceptable in public.

Use .22 rimfire or a handgun rather than a high-powered rifle or shotgun if possible. Shotguns can be used on body or head shots but may damage important tissues if animal requires testing.

#### **Injectable drugs**

Intravenous administration of barbiturates or potassium chloride (KCl) may be used with veterinary assistance. Barbiturates are controlled substances and must be used under the supervision of personnel registered with the US DEA. KCl requires heavy sedation/anesthesia prior to injection.

Due to anesthetic drug residues, animals euthanized with barbiturates need to be collected and disposed of properly (incineration or burial ≥3 feet if not submitted for necropsy) so that the carcass is not available to scavengers including humans and domestic pets.

Drowning and injection with acetone are **not recognized as acceptable methods** of euthanasia because they do not promote a rapid loss of consciousness and can cause considerable distress.

## Bats

Optimal methods provide for as little contact as possible with the bat. Bats should **NEVER** be handled with bare hands.

#### **ISOFLURANE** (veterinary inhalant drug)

Applied to a cotton ball in a small container. This is the **preferred** method for field use. This drug is highly volatile and care should be taken to minimize human exposure. Reach out to the WHP for more details.

#### **CARBON DIOXIDE (CO<sub>2</sub>)**

This method requires specialized equipment. See additional notes under small mammals ([page 4](#)).

#### **CERVICAL DISLOCATION FOR BATS <30g**

Care should be taken to avoid human contact with saliva and teeth due to rabies risk. See procedure description for cervical dislocation and diagram ([page 6](#)).

#### **INJECTABLE DRUGS**

Requires veterinary assistance for these species.



## Small Birds

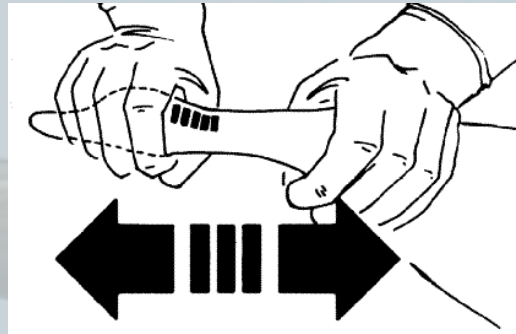
### PREFERRED METHODS

#### **CERVICAL DISLOCATION**

Rapid loss of consciousness preserves brain and other tissues for testing. See information on procedure below.

The dislocation must take place at the base of the brain, or within the upper one-third of the neck (the cervical spine).

1. Grasp the base of the bird's skull in one hand and its body, usually at the base of the neck, in your other hand
2. Pull rapidly and firmly in opposite directions to separate the spinal cord in a strong snapping action



#### **CARBON DIOXIDE (CO<sub>2</sub>)**

Equipment for CO<sub>2</sub> is available at Cornell and the WHU. Once animals are placed in the chamber, set a flow rate that displaces ~40-70% of the chamber volume per minute (birds require a higher flow rate than mammals). Maintain gas flow for at least 1 minute after respirations have ceased. See additional notes under small mammal section (page 4). Newly hatched chicks may require higher CO<sub>2</sub> concentrations for euthanasia.

#### **INJECTABLE DRUGS**

Requires veterinary assistance for these species.

#### **DECAPITATION**

Based on information currently available, decapitation is considered to be acceptable with conditions for euthanasia of small (< 200 g) birds.

### ALTERNATIVE METHOD

#### **Blunt force trauma to head or chest compression**

While these are conditionally approved methods under AVMA guidelines, these should only be used when no other methods are possible. Chest compression is only acceptable as a secondary method in animals that are unconscious. Care should be taken to apply enough pressure to restrict respiration, but not so much as to crush the animal.

## Large Birds

raptors, turkey, pheasant, large waterfowl

### PREFERRED METHODS

#### **GUNSHOT TO BODY**

Can use either a shotgun or small caliber rifle such as a .22 rimfire. Carcass must be removed from the landscape if using lead ammunition. Burial or incineration is acceptable if not submitting for necropsy.

#### **CARBON DIOXIDE (CO<sub>2</sub>)**

Available at Cornell and the WHU. See additional notes under small birds. Newly hatched chicks may require higher CO<sub>2</sub> concentrations for euthanasia.

CO<sub>2</sub> euthanasia in diving waterfowl capable of holding their breath requires prolonged exposure or a secondary method (i.e., physical) to ensure euthanasia is achieved.

#### **CERVICAL DISLOCATION**

May be difficult in very large birds. The recommended weight limit is 3 kg or 6 pounds. If done properly it is humane but it does take some practice to learn the technique. This method can be followed by decapitation if needed. See procedure description for cervical dislocation and diagram ([page 6](#)).

#### **INJECTABLE DRUGS**

Requires veterinary assistance for these species.

### ALTERNATIVE METHOD

#### **Blunt force trauma to the head**

This is the least desirable method because it destroys brain samples, exposes personnel to infectious disease elements, and would not be acceptable in public.



# Reptiles

The method requiring the least human contact should be used for venomous snakes

## PREFERRED METHODS

### INJECTABLE DRUGS

This method is preferred due to its effectiveness in this species and low level of animal distress. Most useful for controlled situations where the animal can be contained. Requires veterinary assistance.

### GUNSHOT, BLUNT FORCE TRAUMA TO THE HEAD

Acceptable in emergency situations (venomous species or large constrictor threatening public or staff safety, or the animal is in severe distress). Blunt force trauma to the head should be followed by decapitation and pithing, when safe to do so, to ensure death.

## ALTERNATIVE METHODS

### Carbon Dioxide (CO<sub>2</sub>)

This method may not be completely effective in reptiles due to their low oxygen requirements and breath-holding ability (particularly for turtles). This must be followed by secondary methods (decapitation and pithing) and verification of death. Brain death can be distinct from stoppage of the heart in reptiles. Because of this, this method is not recommended for staff without training and equipment to verify death.

### Decapitation

Decapitation is an acceptable method of euthanasia in *anesthetized* reptiles. This should be followed by pithing whenever possible to ensure brain death. Due to low oxygen requirements, brain function can continue for some time after decapitation. Pithing involves insertion of a needle or rod through the rear base of the skull and side to side movement to destroy the brain. Because of this, this method is not recommended for staff without training. Contact WHP before using this method.

Freezing using standard freezers is **not an acceptable method** of euthanasia since it can cause pain due to ice crystal formation and time to death may be significantly prolonged while the animal remains conscious.

# Amphibians\*

## TOPICAL MEDICATIONS (20% BENZOCAINE)

Apply a generous amount of the commercially available 20% benzocaine gel (Orajel™), enough to thickly cover the underside and inner thighs. Leave the amphibian in a container, in a cool and quiet spot for 20-30 minutes. Avoid handling after application. Check for non-responsiveness: body flaccid and no blinking when eyes are gently touched. If submitting for necropsy or diagnostics, place the non-responsive amphibian in a solution of 70% ethanol for preservation.

Amphibian heart beat often continues after death so its presence is not always an indication of euthanasia failure.

\*Methods for amphibians include everything under Reptiles, but benzocaine is the preferred method.

# CONTACTS:

## NYSDEC Wildlife Health Unit

|                 |                            |              |
|-----------------|----------------------------|--------------|
| Kevin Hynes     | kevin.hynes@dec.ny.gov     | 518-478-3034 |
| Therese McNamee | therese.mcnamee@dec.ny.gov | 518-478-3046 |

## Cornell Wildlife Health Lab

|                             |                    |              |
|-----------------------------|--------------------|--------------|
| Jenny Bloodgood, DVM, PhD   | jcb469@cornell.edu | 607-253-3534 |
| Krysten Schuler, PhD        | ks833@cornell.edu  | 607-253-3629 |
| Gavin Hitchener, DVM, DACVP | grh68@cornell.edu  | 607-253-4188 |

## References:

1. The AVMA Guidelines for Euthanasia of Animals, 2020 (recently updated with input from wildlife professionals): <https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>
2. Training Information for Nuisance Wildlife Control Officers: <http://nwco.net>
3. Humane Euthanasia of Bats for Public Health Rabies Testing. Michigan Rabies Working Group. 2023
4. OLAW Webinar: Field Euthanasia Methods for Wildlife: <https://olaw.nih.gov/education/educational-resources/webinar-2018-03-28.htm>

# NOTES:



