Oregon Department of Fish and Wildlife

Wildlife Control Operator Training Manual

Revised March 31, 2016

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Introduction

As Oregon becomes more urbanized, wildlife control operators are playing an increasingly important role in wildlife management. The continued development and urbanization of forest and farmlands is increasing the chance for conflicts between humans and wildlife. As development occurs:

- Less land is available for wildlife. Natural habitat may not be readily available for wild animals. The lack of traditional den sites may cause wild animals to use chimneys, attics, and crawl spaces as alternate shelter or den sites. Animals displaced from their habitat by new homes or business construction may reestablish themselves in new surroundings.
- Reclusive species lose habitat, while opportunistic species, such as raccoons; build populations to unnaturally high densities.
- Many people move from the city out into the country or newly developed area, often bringing with them unfamiliarity with wild animals and their habits.

These consequences of development have combined to make the problem of wildlife damage and nuisance control a major concern of wildlife managers. Add in finite government resources to deal with the problem and the result is more opportunity for involvement from the private sector in the prevention and control of wildlife damage and nuisance situations.

Wildlife "Damage" and "Nuisance"

Wildlife control operators deal with wildlife damage and wildlife nuisances. While the term "damage" is easily understood, "nuisance" means different things to different people. For some, the mere presence of a raccoon in a tree near their house is an intolerable situation. For others, catching a glimpse of the same animal would be a thrilling and a rewarding experience.

As individuals familiar with wildlife, wildlife control operators have an opportunity to help educate the public about damage and nuisance. They also have the responsibility to assure that any damage and nuisance control measures are necessary and warranted.

A wild animal that poses no real threat to the safety of the public, livestock, crops or property should not be viewed as a nuisance simply because it exists. Further, wild animals exhibit a number of predatory and competitive behaviors that can be misinterpreted as cruel, aggressive, or detrimental by the public. These behaviors are natural, necessary for species survival, and should not necessarily be viewed as harmful.

The role of Oregon Department of Fish and Wildlife (ODFW) is to ensure the well-being of the state's wildlife population while also assuring that individual wild animals are not posing a threat to human safety or creating unreasonable property, crop or livestock damage. As long as humans coexist with wildlife, conflicts will arise. ODFW attempts to resolve these conflicts through direct action, education and

technical assistance, in cooperation with private businesses, the federal government and other agencies.

All wildlife, are public property and are therefore subject to controls and regulations by the State (ORS 498.002).

Part 2

History, Definitions and Rules

History

Wildlife damage control statutes were first designed to deal with agricultural and livestock damage in rural areas. The statutory authority granted to Oregon Department of Fish and Wildlife and to landowners was designed to protect agricultural and forest landowners while also protecting wildlife populations. However, increasing urban population has lead to dramatic increases in wildlife/human conflicts in recent years. Unfortunately, state statutes do not always fit urban situations.

Senate Bill 832 was passed by the 2003 Legislative Assembly to create the Task Force on Wildlife Control Activities. Its purpose was to make recommendations on the development of a system of licensing and regulating businesses conducting nuisance, damage or public health risk animal control operations.

In 2004, a seven member "Task Force" on Wildlife Control Activities was appointed by the Director of Oregon Department of Fish and Wildlife. The "Task Force" was composed of three County Commissioners, two Wildlife Control Operators, a representative from the Humane Society of the United States and a representative from Audubon Society of Portland. The Task Force adopted 16 recommendations which were presented to the Legislative interim committee related to natural resources on September 30, 2004 and to the Oregon Fish and Wildlife Commission on January 7, 2005.

In April 2006, an eleven-member Wildlife Control Operators Advisory Group was created to address the recommendation from the Task Force and to develop rules and guidelines for the wildlife control industry. The Advisory group consisted of one County Commissioner, four representatives from Wildlife Control Operators, a representative from the Humane Society of the United States, a representative from Audubon Society of Portland, a representative from the Oregon Chapter of The Wildlife Society, a representative from Portland Metro, a representative from local law enforcement, and two biologists from ODFW. The rules and guidelines developed by the Advisory group were based on the Task Force recommendations, with some modifications due to input and review from ODFW field biologists, an ODFW veterinarian, Oregon State Police, and Oregon Department of Justice. In October 2006, Division 435 rules were adopted by the Oregon Fish and Wildlife Commission.

In 2014, a Wildlife Control Operators Advisory Group was formed to review and revise current Division 435 rules in regards to training and authorization requirements, wildlife handling, Wildlife Control Operator (WCO) permit fees, and to review and update the training manual and test. The Advisory group consisted of three Wildlife Control Operators, a representative from the forest product industry, three district staff members, three headquarters staff members and the Department's State Veterinarian. On December 4, 2005 the amended Division 435 rules were adopted by the Oregon Fish and Wildlife Commission.

Definitions

“Agent” means an individual or business conducting wildlife control activities for a fee for a property owner, legal occupant, local jurisdiction or agency to take furbearers, unprotected mammals and western gray squirrels for the purpose of reducing property damage, removing nuisance animals, or resolving public health threat or safety concerns caused by wildlife.

“Commission” means the Oregon Fish and Wildlife Commission.

“Controlled Species” means wildlife that the Commission has placed on the Controlled list. These animals are allowed under certain conditions but they do have the potential to harm native wildlife.

“Department” means the Oregon Department of Fish and Wildlife (ODFW).

“Damage” means loss of or harm inflicted by wildlife on land, livestock or agricultural or forest crops (ORS 498.012).

“Endangered Species” means any native wildlife species determined by the commission to be in danger of extinction throughout any significant portions of its range within this state or any native wildlife species listed as an endangered species pursuant to the federal Endangered Species Act of 1973.

“Euthanasia” means to humanely end the life of an individual animal by a person in a way that minimizes or eliminates pain and distress as defined in the “American Veterinary Medical Association (AVMA) Guidelines for Euthanasia of Animals: 2013 Edition”.

“Exotic” means a wildlife species not native to Oregon; foreign or introduced.

“Feral Swine” means animals of the genus *Sus* as defined by the Oregon Department of Agriculture in OAR 603-010-0055.

“Furbearers” means beaver, bobcat, fisher, marten, mink, muskrat, otter, raccoon, red fox and gray fox. For any person owning, leasing, occupying, possessing or having charge of or dominion over any land (or an agent of this person) who is taking or attempting to take beaver, muskrat on that property, these two species are considered predatory animals.

“Diurnal” means active during the daytime.

“Gestation” means the period in mammals from fertilization to birth.

“Game Bird” means any waterfowl, snipe, band-tailed pigeon, mourning dove, pheasant, quail, partridge, grouse, or wild turkey.

“Game Mammal” means pronghorn antelope, bighorn sheep, black bear, cougar, deer, elk, moose, Rocky Mt. goat, and western gray squirrel.

“Herbivores” means feeding on herbs and grasses.

“Hold” means any form of possession or control of an animal, gamete, hybrid, or part thereof.

“Introduced” means a species, subspecies or population which occur in Oregon because of human action or intervention, rather than natural (nonhuman) colonization or immigration.

“Native” means species, subspecies or populations which occur currently or historically in Oregon through natural (i.e. nonhuman) colonization or immigration, rather than by human action or intervention.

“Nocturnal” means active during the night.

“Neonatal” means a newborn infant.

“OAR” means “Oregon Administrative Rules”.

“Omnivore” means eating both animal and vegetable tissue.

“ORS” means “Oregon Revised Statutes”.

“Possess” means to have control or exercise dominion over any wildlife or wildlife parts.

"Predatory animals" means coyotes, rabbits, rodents, and feral swine which are or may be destructive to agricultural crops, products and activities (ORS 610.002 & 610.105). This definition is applicable where wildlife is taken under the authority of one who owns leases, occupies, possesses or has charge or dominion over the land. Beavers, muskrats, western gray squirrels (*Sciuris griseus*), gophers, mountain beaver (boomer), marmot, nutria, and porcupine causing damage on private property are defined as predatory animals under ORS 610.002.

“Prohibited Species” means wildlife that the commission has placed on the Prohibited list in its Wildlife Integrity Rules (OAR 635-56-0050 and 635-056-0130).

“Protected wildlife” means species that meets any of the following definitions: “game mammals” as defined in OAR 635-045-0002, “game birds” as defined in OAR 635-045-0002, “furbearers” as defined in OAR 635-045-0002, “threatened or endangered species” as defined in OAR 635-100-0125, or “Nongame wildlife protected” as defined in OAR 635-044-0130 or wildlife that is otherwise protected by statute or law.

"Public Nuisance" means loss of or harm inflicted by wildlife on persons, gardens, ornamental plants, ornamental trees, pets, vehicles, boats, structures, or other personal property.

"Relocation or Translocation" means any removal from the site of capture and moving to another site for release.

"Species" means a unit of classification of animals which are capable of interbreeding and producing fertile offspring.

"Take" means to kill or obtain possession or control of any wildlife (ORS 496.004).

"Threatened species" means any native wildlife that the commission determines is likely to become an endangered species within the foreseeable future throughout any significant portion of its range within this state or any native wildlife species listed as a threatened species pursuant to the federal Endangered Species Act of 1973.

"Unprotected Mammals" means badger, coyote, gophers (*Thomomys bottae, T. bulbivorus, T. mazama, T. talpoides and T. townsendii*), moles (*Scapanus townsendii, S. orarius and S. latimanus*), mountain beaver (*Apolodontia rufa*), yellowbellied marmots (*Marmota flaviventris*), nutria, opossum, porcupine, spotted skunk, striped skunk, and weasel. For any person owning, leasing, occupying, possessing or having charge of or dominion over any land (or an agent of this person) who is taking or attempting to take coyote, gophers, mountain beaver (boomer) marmot, nutria, or porcupine on the property, these six species are considered to be predatory animals.

"USFWS" means "United States Fish and Wildlife Service."

"WCO" means "Wildlife Control Operator."

"Wildlife Control Operator" (WCO) means an "agent" as defined above, who is the principal manager or business owner, or employee of the business listed on the WCO permit and responsible for activities conducted in the course of wildlife control activities.

Oregon Administrate Rules, Division 435 for Wildlife Control Operators

Rules can be changed or amended over time so as a WCO you are responsible for understanding and following any city, county, state or federal rules and regulations. Current Oregon Administrate Rules for Wildlife Control Operators can be found online at http://dfw.state.or.us/OARs/435.pdf . **Rules will be on the WCO test**.

Part 3

Business Practices

Business Practices

As with any business, good customer service is KEY to operating a successful wildlife control business. Listen carefully to what the landowner is telling you so you can fully understand their problem and best address it. Show the person that you care about helping them solve their problems.

For WCOs, it is also vital to show care and respect for the animal being removed. The public will not support the inhumane treatment of animals.

When responding to a wildlife damage or nuisance complaint, we recommend WCOs take the following steps to ensure both customer satisfaction and the protection of your reputation and business:

1. **Assess the problem.** – Identify species involved, approximate number of animals involved, extent and type of damage.

2. **Describe the methods used to solve the problem.** – The WCO should recommend methods of control to the landowner, the estimated costs, and the advantages and disadvantages of each method. The final decision should be made mutually by the landowner and the WCO.

3. **Discuss and agree on an acceptable solution to the problem.** – The WCO should explain to the landowner how much of the problem he/she expects to be able to resolve within the limits of their abilities and methods. The WCO and the landowner should agree upon a realistic solution.

4. **Estimate the fee or rate payment to be charged**. – The WCO and the landowner should determine and agree upon the fees to be charged, whether made on an hourly, per animal, per trip or flat fee for the entire job. Make sure to estimate the total cost of the job to the landowner. Both parties should also agree on how and when the payment will be made.

5. **Draw up a written "contract" signed by both parties**.

6. **Determine liability issues. –** The WCO and the landowner should review the property boundaries and the WCO should be made aware of any domestic animals in the vicinity that may be caught inadvertently if trapping is to be used.

7. **Make it clear to landowners that** you are operating under an ODFW permit but not as an agent of ODFW.

Building and maintaining positive public relations and support for wildlife control operators should be as important to you as it is to ODFW. Let's work together on this!

Part 4

Methods of Control
Relocation of Wildlife
Handling of Sick or Injured Wildlife
Euthanasia
Transportation
Disposal of Wildlife
Migratory Birds
Diseases

Methods of Control

When faced with wildlife damage or nuisance situations, the WCO and the landowner must carefully evaluate the situation and decide upon one of the following courses of action:

1. **Realize concerns are unfounded**: Some calls come from people who regard certain animals as nuisances even though the "offending" animal has not caused any damage to property, poses no real threat of damage, and therefore cannot be controlled under the terms of a permit. The most common reason for these types of calls are an unjustified concern over potential damage to property, crops, livestock, or a perceived threat to the safety of humans or pets. In many situations, education and reassurance will alleviate concerns. The natural predatory and competitive interactions of wild animals are not generally a legitimate reason for control. Observing a coyote or raccoon walking through the neighborhood or a person's backyard may be a cause for concern but does not warrant any action to be taken by the property owner.

2. **Manage the habitat**: The activities of people often create habitat for animals that eventually becomes a problem. Piles of brush, wood, rocks, dense tall grass and shrubs areas provide cover for many species of wildlife. Better management of these areas often reduces their attractiveness to wildlife species causing the problem. Plugging or covering holes into buildings and under porches are only a few of the "**exclusionary**" efforts that can be initially implemented to solve a problem. Properly covering holes and entrances through which animals/birds can enter a structure is often the most effective, long-term solution to nuisance animal problems. Always verify that there are no animals present before sealing structures and if animals happen to be present, evict and/or trap prior to sealing all the access points.

3. **Eliminate the attraction**: When left outdoors, refuse, garbage, or pet foods provide a strong attraction for a number of wildlife species including raccoons, opossum, skunks, and certain species of birds. Such "dinner plates" can eventually entice animals into creating real damage to property if the lure of a free handout is not properly managed. Landowners are encouraged to eliminate such an "**attractive nuisance.**" In this situation, control measures such as live trapping are unwarranted until every effort is made to educate the landowner and proper trash handling is implemented to permanently eliminate the attraction.

4. **Alter the situation so that the potential for damage is reduced**: In many cases this option will provide the best long-term solution to a nuisance animal problem. Poor building design and/or poor maintenance, which provide easy and inviting access to wildlife, can be corrected. **Exclusion,** such as fencing, screening and repairs to existing vents, woodwork, chimneys (screens and caps should meet building code standards) or foundations are very effective at keeping wild animals away from areas where they are not wanted.

Harassment measures such as a radio and/or lights in the crawl space or attic may prove effective for transient problems.

5. **Remove the offending animal**: For most species that can be handled with a WCO permit, box or cage-type live traps are the devices recommended for capture, particularly in urban and suburban areas. Traps must be tagged (legibly marked or branded) with either the owner's business name and phone number or the owner's furtaker license or WCO (brand) number assigned by ODFW. The use of firearms to euthanize an animal or bird is not permitted within most city limits. Always use good judgment when using any type of trap to avoid catching neighborhood pets and other non-target animals. It is highly recommended that when an animal is euthanized, it is done away from the capture site in a humane and discreet manner.

   In many cases humane euthanasia is the preferred method of disposal for damage and nuisance wildlife.

Relocating Animals

The following rules should be followed and recommendations considered and explained to the landowner before capturing damage or nuisance wildlife:

A. For the purpose of release, a WCO permit does not allow a WCO to transport, any wildlife captured under terms of the WCO permit except for the following species:
   a. Western Gray Squirrel, Marten and Fisher
   b. Willamette Valley Populations of Western Rattlesnake (*Crotalus oreganus*)
   c. Sharptail snake (*Contia tenuis*),
   d. Common Kingsnake (*Lampropeltis getula*)
   e. California Mountain Kingsnake (*Lampropeltis zonata*)
   f. Western Ground Snake (*Sonora semiannulata*)
   g. Badger and Beaver with prior approval from the Department.

B. Predatory animals, furbearers, and incidentally caught wildlife may be released onsite, except Prohibited species must be euthanized and cannot be released onsite, but may be transported offsite to be humanely euthanized. The list of Prohibited species can be found in OAR 635-056-0050. Except for those species specifically authorized for relocation, wildlife that are causing damage or are a nuisance cannot be relocated (OAR 635-435-0010 (4)) because:
   1. Wildlife are stressed from capture, handling and transport.
   2. Wildlife can carry a variety of diseases and parasites that can spread to areas that were previously free of disease or parasite.
   3. Relocation of wildlife to an environment that is already at carrying capacity causes increased competition with the resident population for food, water and shelter and disrupting the social structure, which can

lead to increased fighting, injury and death to resident or relocated animals .

4. Relocated wildlife often will try to return home.
5. Relocated wildlife may cause problems for humans in the vicinity of the release site.
6. Relocation alone does not solve the problem. Unless appropriate steps are taken to modify the environment, another animal will move into the area that is now vacant.

Handling Sick or Injured Wildlife

Many wildlife diseases are readily transmissible to a wide range of species, including humans and their pets. Because different diseases may exhibit similar symptoms, it is usually not possible to diagnose a disease simply by observing an animal's condition or behavior. Common symptoms of disease may include: (1) lack of coordination; (2) lack of aggressiveness; (3) secretions from the rectum, eyes, nose or mouth; (4) weak, rapid or uneven respiration; (5) malnourishment; (6) local or general loss of muscle control; and (7) loss of large patches of fur.

Potential causes of these symptoms could include viral infections (i.e. distemper, rabies and tularemia), bacteria toxins (i.e. botulism) or parasite infestations (i.e. mange, roundworms). Poisoning, starvation or dehydration may also cause animals to behave abnormally. Because the permittee often will know little more than that the animal is sick, the animal should be handled as little as possible, and then only with equipment to protect against bites and elbow-length rubber or disposable plastic gloves.

Animals showing signs of disease should be euthanized as soon as possible with minimal handling.

Wildlife That Has Injured a Person

Any person that is bitten or scratched by a wild animal should seek medical advice from their health care provider or physician as soon as possible. Under such conditions the animal should be maintained in confinement until instructions are provided for disposition by the health care professional with approval of local District Biologist or ODFW Veterinarian. The same precaution applies if a person has handled an obviously sick animal which may be harboring a contagious disease. Children are particularly inclined to handle lethargic small mammals. If the animal cannot be restrained safely, it should be humanely euthanized and the carcass temporarily kept for possible testing.

Under no circumstance should an animal that has bitten someone, or is needed for rabies examination, be shot in the head or subject to head trauma. The brain is required to be intact for rabies determination.

Information regarding submitting an animal for testing can be obtained from your County Public Health Office.

Euthanasia

The term euthanasia is derived from the Greek terms *eu* meaning good and *thanatos* meaning death. A "good death" would be one that occurs with minimal pain and distress. Euthanasia is the act of inducing humane death in an animal. It is the responsibility of Wildlife Control Operators to ensure that if an animal's life is to be taken, it is to be done with the highest degree of respect and with the emphasis on making the death as painless and distress free as possible. Euthanasia techniques should result in rapid loss of consciousness followed by cardiac or respiratory arrest and the ultimate loss of brain function. In addition the technique should minimize distress and anxiety experienced by the animal prior to loss of consciousness. Wildlife Control Operator euthanasia methods must be consistent with the "AVMA Guidelines for the Euthanasia of Animals; 2013 Edition. The table below describes some of the more common methods of euthanasia.

Some Acceptable Agents and Methods of Euthanasia

Agent	Ease of performance	Rapidity	Safety for personnel	Efficacy and comments
Barbiturates	Animal must be restrained; personnel must be skilled to perform	Rapid onset of anesthesia	Safe except human abuse potential; DEA-controlled substance	Highly effective when appropriately administered-veterinarian required
Carbon dioxide	Used in closed container (Small mammals and birds only)	Moderately rapid, depending on protocol	Minimal hazard with adequate ventilation	Effective, but time required may be prolonged in immature or neonatal animals
Penetrating captive bolt	Requires skill, adequate restraint, and proper placement of captive bolt	Immediate	Safe	Instant loss of consciousness, but motor activity may continue

Gunshot	Requires skill and appropriate firearm	Immediate	Personnel must be trained in the use of firearms; only in jurisdictions that allow for legal firearm use; safety of personnel, the public, and other animals that are nearby should be considered	Instant loss of consciousness, but motor activity may continue
Cervical dislocation	Requires training and skill. Only effective on small animals or birds	Variable	Safe	Variable

Transportation

When transporting wildlife, a WCO **must provide all live wildlife with humane care** and visually observe an animal for stress as often as possible. Vehicles must be equipped to provide fresh air without injurious exhaust fumes and with adequate protection from extreme weather and temperature that could cause injury or death to an animal. It is important that cages be of sufficient strength and in good repair to hold wildlife securely and safely and be large enough so that each animal has sufficient space to turn, stand and lie naturally. They should have adequate protection from extreme weather conditions and temperatures that would cause hypo- or hyperthermia or conditions that would lead to illness or death

To help avoid increasing the stress on an animal, no more than one animal will be transported in the same cage or enclosure unless they are of the same species, accepting of a cage-mate and were captured together in the same trap or capture device All animals in traps or cages should be kept far enough apart or a divider placed between them so that there is no physical contact between animals. A visual barrier should always be placed between frightened, stressed or aggressive individuals. If cages or traps are stacked with animals in them; each cage or trap must be fitted with a floor or barrier which prevents excretion or body parts from entering lower cages or enclosures. If you must transport healthy and visibly sick, injured or dead animals together, place barriers between them to prevent any type of

physical contact or body secretion from touching the healthy animal. Disinfect your vehicle with a commercial cleaning product or weak bleach solution before transporting any other wildlife.

Disposal of Wildlife

OAR Chapter 635 Division 002 directs the disposal of certain classifications of wildlife. Unfortunately it is not always possible to find educational or scientific uses for carcasses of common species. Therefore, unless otherwise directed by the department, WCO's should dispose of the wildlife carcasses by rendering, incineration, burial or placement in a landfill. The permittee must have permission of the landowner or land management agency prior to burial of any carcass. Permittee should consult with their local disposal company before placing carcasses in a landfill or trash collection. If the collection company accepts animals carcasses, the carcass should be triple bagged or disposed of as instructed by the collection company prior to placement for collection.

Migratory Birds

Migratory birds are protected by both state and federal regulations (Migratory Bird Treaty Act, 1973). **The Migratory Bird Treaty Act makes it unlawful for any person to pursue, hunt, take, capture or kill migratory birds or to destroy any migratory bird nest or egg.** Thus, the control of migratory bird species requires a federal permit in addition to a state permit. Federal and state regulations do not protect feral pigeons (rock doves), Eurasian collared-dove, European starlings or house sparrows. In Oregon, feral pigeons (rock doves), Eurasian collared-dove, European starlings, and house sparrows are covered under predatory animal status on private property, thus a Federal Permit is not required. In order for a WCO to help a homeowner with a federally protected migratory bird problem, the property owner must apply to the USFWS for a federal depredation permit, even to employ non-lethal controls like relocation. A federal permit is not required in order to herd or frighten migratory birds, except for endangered or threatened species. When helping property owners with bird problems (except for feral pigeons, Eurasian collared-dove, European starlings or house sparrows), a WCO should consult with the USFWS or the local department biologist.

Wildlife Diseases

As a WCO you should be aware of diseases and parasites carried by wildlife and should take common sense precautions to protect yourself, your clients, their pets and other wildlife. You should always practice good personal hygiene when handling wildlife and disinfecting the work area is essential to reduce infection and the spread of disease. Since doctors may not routinely look for diseases which could be transmitted from wildlife to you, it is the WCO's responsibility to inform the doctor of the type of work you do if a puzzling disease should develop.

A WCO should also be aware that even a healthy-appearing animal can be a carrier of disease and parasites without showing any visible symptoms at the time you are doing the control work. Visible symptoms may never appear or could appear days, weeks, or months after the control work is completed.

Rabies

The rabies virus can infect any mammal, including humans. However, in wild species the disease is more common in carnivores and omnivores. In Oregon, the occurrence of rabies is rare, with bats being the more common species that carry the bat strain of the rabies virus. The rabies virus is transmitted by the bite of infected animals or by the saliva of an infected animal coming into contact with non-infected species through cuts or scratches.

Rabies occurs in two forms in wildlife. In the "furious" form, the animal becomes irritable and aggressive, may attack moving objects and may self-mutilate. In the "dumb" form, the animal becomes lethargic or depressed, and exhibits aimless wandering, weakness in the hind legs, loss of awareness and lack of coordination. Both forms of rabies normally end in convulsions, coma, and death.

Be aware that many diseases mimic rabies symptoms including canine distemper, hepatitis, tetanus, botulism or plant or chemical toxins. So, just because you have never seen rabies in mammals in Oregon doesn't mean the animal automatically has distemper. Be cautious and report all sick wildlife to your local ODFW biologist or the wildlife health lab.

If you suspect that an animal has rabies, the animal involved should be captured or humanely euthanized without damage to the head.

Histoplasma capsulatum

Histoplasma capsulatum is a fungus found in soil contaminated with bird droppings or bat excrement. When inhaled into the lungs the infection can have varying effects on humans depending on their age and immune system. These effects can range from a lung infection that has a rapid onset and short duration, to a chronic infection and possible death. When working in areas of visible amounts of bird and/or bat droppings, wear appropriate personal protective equipment including, at a minimum, latex gloves and an N-95 rated mask.

Tularemia

Tularemia is a bacterial disease of mammals. The disease can be transmitted to humans through cuts or scratches while handling infected animals, from drinking contaminated water during water-borne outbreaks, and from fleas, ticks or insect bites.

Symptoms in rodents may include lethargy and uncoordinated movement. In humans, symptoms include fever, infected sores where the bite occurred, swollen lymph nodes and general flu-like symptoms that progress rapidly. If symptoms do occur you should see your doctor immediately for treatment.

Giardia lamblia
Giardiasis is a disease cause by a protozoan parasite, *Giardia lamblia.* Many species (including beaver) do not appear to be severely affected by the organism, but in some states parasites excreted by infected beaver appear to have contaminated water sources that cause outbreaks of the disease in humans. There are many species of *Giardia* and a variety of mammals, birds, reptiles, amphibians and fishes are also known to harbor this organism.

Canine Distemper
Canine distemper is a viral disease that infects dogs, foxes, coyotes, mink, marten, otter, weasel, skunks and raccoons. **This disease cannot be transmitted to humans.** This disease is more likely to occur when populations are large or concentrated. The distemper virus can be spread either as an airborne virus or by animal to animal contact (droppings, secretions or aerosolized salivary fluids). Distemper is always present in the environment, so the best prevention for dogs is to make sure they are vaccinated.

Symptoms of canine distemper may include discharge from the nose and eyes, a rough coat of hair, emaciated appearance, coughing, sneezing, diarrhea, intermittent convulsions and tremors. Infected animals may exhibit unusual behavior such as aggression, moving around during daylight hours (not typical for nocturnal animals), self-mutilation, disorientation or aimless wandering. The animal's symptoms become progressively worse and the disease is generally fatal.

Distemper is not the same disease as rabies, although some symptoms are similar. Rabies is extremely rare in Oregon.

Feline Distemper or Feline Panleukopenia
Feline distemper is caused by a virus classified as a parvovirus. Feline distemper should not be confused with canine distemper which rarely occurs in wild cats and is caused by a different type of virus. Feline distemper is highly infectious.

Symptoms include depression, loss of appetite, fever, vomiting, and diarrhea. After symptoms are observed, mortality can occur within a few days.

Canine Hepatitis
Canine hepatitis is a highly contagious viral disease that affects the liver and other organs in domestic dogs, coyotes, wolves, foxes, bears and skunks.

Canine hepatitis is transmitted by direct contact with an infected animal, contaminated objects (e.g. food and water dishes or feces), ticks, fleas and mosquitoes. The virus can be shed from the host for up to nine months after exposure in the feces, saliva or urine.
Symptoms range from mild to severe and may include nausea, vomiting, loss of appetite, fever, diarrhea, lethargy, bleeding from the nose and gums and sudden death.

Parvovirus
Coyotes, foxes, raccoons, mink, cats and other wildlife all have a form of the highly infectious parvovirus but forms are distinctly different depending on the species. Symptoms include loss of appetite, diarrhea, vomiting, dehydration and depression, often followed by death. Wildlife becomes infected by coming in contact with other infected animals or coming into contact with virus-contaminated feces. When shed in fecal material, this virus is difficult to destroy. Exceptional decontamination efforts are required to rid the virus from the environment.

Pseudorabies
Pseudorabies is a viral disease that affects most mammals except humans. Wildlife other than swine, when affected with the pseudorabies virus, may show symptoms such as severe itching, self-mutilation, loss of appetite, depression, staggering, spasms, convulsions and death.

Transmission of pseudorabies is by direct contact with the nasal or oral secretion of an affected animal or contaminated food or water. Pseudorabies can also be transmitted into the environment on boots, clothing, or other contaminated surfaces.

Leptospirosis
Leptospirosis is a *spirochete* bacterium that can infect humans, domestic animals, and wildlife. The disease varies in severity from no clinical signs to causing death depending on the host and species of lepto. Leptospirosis has little affect on the health of wildlife but some species such as raccoons, striped skunks, red fox, gray fox, opossums, rats and mice can serve as reservoirs and shed the pathogen in their urine, thereby infecting susceptible domestic animals and humans.

Transmission usually occurs by direct contact with urine-contaminated water or food through the mucous membranes of the nose, eyes and mouth or skin abrasion.

Symptoms in humans may include fever, headaches, muscle aches, weight loss, blood in the urine and kidney failure. In wildlife, symptoms may include fever, weight loss, blood in the urine, kidney failure and aborted fetus.

Roundworms
Baylisascaris procyonis is a roundworm of raccoons that is considered a health risk to both humans and other wildlife species, including birds. If the raccoon roundworm egg is ingested by other species, the larvae mature and migrate through the intestinal tract, ultimately invading other organs in the body including the central nervous system, brain, and the eye. There have been confirmed human fatalities in the United States due to *B. procyonis* migrating to the brain and several non-fatalities caused by the migration of *B. procyonis* to the ocular tissue.

Symptoms of *Baylisascaris procyonis* infection include a loss of balance, circling, abnormal posture and blindness.

Baylisascaris columnaris is a roundworm of skunks and should also be considered a public health risk. Symptoms are similar to those caused by *Baylisascaris procyonis*.

Mange

Foxes and coyotes are most commonly parasitized with mites causing a condition known as mange. The most common type of mange is sarcoptic mange. Sarcoptic mites burrow into or under the skin and deposit their eggs. In a relatively short period, the eggs hatch and the mite populations increase rapidly, causing skin and hair follicle pathology which is observed as fur loss and thickened crusting over the skin. Mange is spread from animal to animal by direct contact between an uninfected and infected animal. WCOs should take care and wear latex gloves when handling mangy animals, since it is possible for humans to experience infections of the mites resulting in a red, itching rash.

Warbles

Warbles are the larval stage of the botfly and infect animals in multiple ways. The female botfly may deposit her eggs on the host, often near the head. During the process of grooming, the host ingests the eggs. The eggs quickly hatch and the larvae migrate through the body to areas just below the skin. Sometimes the eggs hatch and the larvae migrate to the nose and enter the nasal passages. Eggs and larvae can also be deposited on tree limbs where they are picked up unsuspectingly by a passing squirrel and then migrate up through the nasal regions and bore under the skin. Once the larvae reach the area below the skin, they cut a respiratory pore through the skin and continue their development.

Warbles are generally noticed by a large swelling (1/2 to 1 inch in diameter) below the skin and a small hairless opening in the center through which the larva breathes. A host may be seen with one or many warble swelling present on them during the late spring to early fall when the adult flies are active. The larva ultimately matures, exits the host and completes its life cycle as a breeding adult botfly.

Echinococcosis Infections (Hydatid disease)

Echinococcosis or Hydatid disease is an infection involving larval (cystic) stage of the tapeworm. Eggs are consumed and the developing larvae migrate through the intestinal wall to other organs where they encyst. Cysts most commonly develop in the liver, but can also be found in other organs, nervous tissue, or bone. The life cycle of this tapeworm depends on wild ungulates and canids (fox, coyote, and wolves) but any mammal can become infected. This invasive parasite and its cystic life stage cause solid, tumor-like masses. People become infected by accidentally ingesting the echinococcus eggs when handling animals that are infected with the tapeworm or by eating contaminated food, water, or soil. Like *Baylisascaris procyonis*, if not properly treated, this infection is potentially fatal. Cysts are often removed surgically.

Symptoms in humans may include pain or discomfort to the stomach area, weakness and weight loss. Symptoms may mimic those of cancer or cirrhosis of the liver.

Part 5

Liabilities
Record Keeping and Reporting Requirements
Live Animals and Sale of Animals
Complaints
Cancellation or Non-Renewal of Permit

Liabilities

Through the Wildlife Control Operators (WCO) authorization system, the Department provides a mechanism by which landowners can address wildlife damage problems. However, the Department is not liable for any action, or lack of action, taken by the permittee, their assistants or the landowner, nor is the Department liable for any damages or injuries caused or suffered by either party. Any control measure undertaken by a WCO is considered a contractual matter between the permittee and the complainant. Liability insurance to cover the permittee is highly recommended.

Record Keeping and Reporting Requirements

Landowner or occupier of the premise must sign an "Affidavit of Damage" designating the WCO as his or her agent to address damage caused by any wildlife and a copy of the signed affidavit must be submitted with monthly report.
A complete record of the WCO activities must be maintained by permit holder on a calendar-month report form provided by the Department for all wildlife captured or transported on a WCO permit. A WCO permit and reporting is not required to control predatory animals as long as all wildlife control activates including euthanasia are conduct on the clients property and no live wildlife is transported off the premises.

A WCO must submit a monthly report form to the Department by the 15th day of the following month, even if they did not have any wildlife control activity occurring during that month. Failure to submit a report on may lead to cancellation or denial of renewal of the permit. The report covers one calendar month.

Live Animals and Sale of Animals

All wildlife captured, held, transported or relocated under a WCO permit remains the property of the State of Oregon and cannot be sold, traded, bartered or exchanged except as allowed by Oregon Administrative Rule Chapter 635, Division 200. Wildlife captured, held, transported or relocated under a permit cannot be intentionally displayed for public exhibit.

Animals taken, possessed, and/or transported under this permit cannot be removed from the state.

Complaints

Complaints from the public regarding violations of the WCO regulation should be forwarded to the Department or to Oregon State Police. Complaints against a WCO will be thoroughly and fairly investigated.

Cancellation or Non-Renewal of Permit

Failure of a WCO to comply with the record keeping, reporting or other requirements of the WCO Permit may lead to cancellation or denial of renewal of the permit.

The Department may revoke or deny issuance of a WCO permit if listed employees were convicted of or admit to violation of a wildlife law (under the Interstate Violators Compact) or rule, or permit issued under the wildlife laws within the previous five years.

A permittee may appeal cancellation or non-renewal of a permit through a contested case hearing. The request for a contested case hearing on a proposed cancellation must be received by the Department within 21 days after service of notice (90 days for emergency cancellations). The request for hearing on a proposed non-renewal must be received by the Department within 60 days of notice. Final Orders in contested case hearings shall be issued by the Director.

Part 6

Best Management Practices
Traps
Trap Sets
Baits and Lures
Equipment
Trap Maintenance and Safety
Releasing Nontarget Wildlife
Resources

Best Management Practices (BMPs)

Wildlife agencies have a long history of regulating trapping to ensure that the traps and trapping practices being used are the best available.

The BMP (Best Management Practices) framework developed by the Furbearer Conservation Technical Work Group of the Association of Fish and Wildlife Agencies provides a structure and criteria for identifying and documenting trapping methods and equipment that has and will continue to improve trapping. Trapping BMPs are based on scientific research and professional experience regarding currently available trap and trapping technology. Trapping BMPs identify both techniques and traps that address the welfare of trapped animals and allow for the efficient, selective, safe, and practical capture of animals.

Trapping BMPs are intended to be a practical tool for trappers, wildlife biologists, wildlife agencies, and anyone interested in improved traps and trapping systems. BMPs include technical recommendations from expert trappers and biologists, and a list of specifications of traps that meet or exceed BMP criteria. BMPs provide options, allowing for discretion and decision-making in the field for trapping furbearers in various regions of the United States. They do not present a single choice that can or must be applied in all cases.

The suggestions contained in this document include practices, equipment, and techniques that will continue to ensure the welfare of trapped animals, avoid unintended captures of other animals, improve public confidence in trappers and wildlife managers, and maintain public support for trapping and wildlife management.

Trappings BMPs are recommendations to be implemented in a voluntary and educational approach. The trapping BMPs are the product of ongoing work that may be updated as additional traps are identified in the future. BMPs for trapping are intended to complement and enhance trapper education programs.

It is recommended that all trappers participate in a trapper education course. Trapping BMPs provide additional technical and practical information to help trappers and mangers identify and select the best traps available for a given species and provide an overview of methods for proper use.

Traps

Five Categories:

There are five main categories of traps:

Bodygrip traps
Foothold traps
Box traps
Snares
Specialty Traps and Devices

Key concept: The type of trap you use depends upon various factors including the intended target, the location you are trapping in and your purpose in trapping. These same factors, along with the time of year, determine the "set," or how your traps are set up to catch your intended target(s). Your focus should always be on the intended target to minimize or eliminate the capture of an unintended target.

Bodygrip Traps:

These are lethal traps and are often referred to as Conibear traps (after Frank Conibear of Canada who first came up with this type of trap). They are designed to capture an animal with a quick, powerful striking force which results in a very quick death. These traps are available in a variety of sizes for targeting animals from small to large. The animal passes thru the trap and fires it by pushing against the trigger. Animals rarely escape from a Bodygrip trap unharmed and caution must be used in placing this type of trap to avoid unintended captures.

Foothold traps:

These are sometimes inappropriately referred to as "leghold" traps. They are designed to capture an animal by the foot (thickest part of the pads of the paw) and restrain it. Common types include coilspring and longspring traps. In general, the traps are constructed with two jaws, one or more springs and a trigger. When the animal steps on the trigger, the jaws clamp onto the foot with the thick pads of the paw being the intended target. When properly used, foothold traps are not likely to injure an animal. They are available with offset jaws, padded jaws and laminated jaws. Caution must be exercised to match the proper trap with the intended animal paw size and the user must consider weather conditions, other animals in the area, and type of bait to maximize species selectivity.

Foothold traps can be used for any species or size of animal in a great variety of sets. One must use a trap size that is appropriate to the size of the target animal. Injury to the animal can occur if too large a trap is used.

Box Traps:

Box traps are sometimes referred to as "live traps," but remember that Foothold traps and Snares can also be used to capture animals live. Box traps can be made of wood, plastic, metal, or a combination of all three materials. They can be rectangular or rounded. The animal enters the trap, activates a trigger, and the door closes behind it preventing escape. Some box traps are constructed with two or more doors. Box traps can be used for any species and size animal with differing degrees of difficulty.

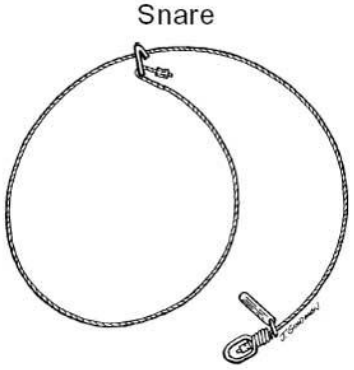
Multi-catch box traps are constructed with one-way type doors that immediately close behind the animal. This style is available in various sizes for different sized target animals from rodents to raccoons.

Box traps tend to be bulkier than other types, although some are available in a collapsible style. Many are designed with rear release doors, which are useful for baiting as well as releasing animals.

Any trap that restrains an animal within an enclosure without actually attaching to or holding on to the animal should be considered a box trap.

Snares:

Snares are sometimes referred to as wire restraints or cable restraints. They are typically constructed of woven steel wire of single or multiple strands. When the animal enters the loop of the snare, its movement causes the snare to tighten around the animal and restrain it. Snares can be used lethally or to make a live capture, depending upon the type of snare used and how it is set.



Snares may be equipped with "stops" which restrict the minimum or maximum size of the loop. A deer stop, for example might be added to prevent a snare from closing small enough to hold a deer's foot.

Snare Locks are added to most snares to prevent the snare from opening after an animal is captured. There are basically three types:

- One type is characterized by the ability to hold without increasing or decreasing pressure.
- The second type relaxes slightly when the animal stops pulling.
- The third type continues to increase pressure.

Anchoring swivels and in-line swivels may also be added to a snare to increase the mobility of a captured animal and lessen the probability of damage or injury.

As with other types of traps, one must use a snare and snare set appropriate to one's intention, location, and target animal.

Specialty Traps:

Recently there have been many special purpose traps designed, introduced or re-introduced to the market. Many are combinations of trap types listed above. A brief description is provided to better understand how these special purpose traps differ from the traditional traps described above.

Body gripping rodent traps: Mouse, Gopher, Mole and small rodent traps are often referred to as Body Gripping and they differ from those above in that they actually are designed to grip or induce a crushing effect on the small body of the intended animal. Examples would include the Victor Out-Of-Sight mole traps, Cinch and Easy-set Gopher trap and No-Mol mole traps.

Enclosed Foot traps: These would include the Egg Trap, Little Griz, Coon Cuff, Dog Proof Coon Trap, Lamb Saver, and many others too numerous to list here. However, the principle of all these and others like them is an animal must reach into an enclosed area to pull or push a trigger. The traps are all designed to hold or restrain the animal by the paw. Minimizing the capture of unintended animals, these traps will capture only animals with the ability or desire to reach into an enclosed area.

Bite and Pull traps: These traps require an animal to bite a baited trigger and pull with their mouth to be captured. This device is designed primarily for canines and the restraining device will not hold other animals even if they pull the bait. The newest example of this type of trap is one known as the Collarum. This trap is often inappropriately referred to as a Snare because the device that restrains the animal is made of cable similar to that used in snares.

Foot Snares: These traps are also not snares as the name would imply. They are inappropriately referred to as snares, again because the restraining part of the trap is made of cable similar to that used in snares. The foot snares work the same as a traditional foot trap as far as setting. The difference lies in the type of device that restrains the animal. Cable is used instead of the traditional jaws of a foot trap.

One-way doors: Often referred to as traps, these devices are not actually traps that capture. They are designed for eviction and exclusion and the animal is not

restrained once it passes thru the door. Placed at the den entrance, the animal leaves and cannot reenter.

Trap Sets

How and where one sets a trap are as important as selecting the appropriate trap for the circumstances. Again, this is governed by the intended target, the general location, and your purpose. The “trap set” is the actual setting of the trap and must always take into account the presence of animals you wish to avoid trapping.

There are two general categories of sets: blind sets and constructed (baited) sets. A blind set is created by setting the trap in a known path the animal uses, sometimes right at the opening of a den. Blind sets rely on the travel instincts and behavior of the intended animal instead of attractants such as baits or lures. Most often a blind set is used without any bait or lures.

One builds a constructed (or baited) set to entice the animal into the trap in situations where the animal’s exact path may not be known or relevant. Constructed sets can be developed using materials at hand, and may involve digging a hole for the animal to investigate. They may employ arranging a cubby by covering the area of the trap with brush. Constructed sets often make use of baits and/or lures.

Baits and Lures

Baits and lures are attractants used in trapping. Baits are food items attractive to an animal. Lures can be organic or artificial. Lures attract animals with odors, sounds, and/or visual appeals. One can make their own baits and lures or purchase them from suppliers who offer a great variety in the marketplace. Electronic lures that generate sounds and/or visual appeals are increasing in number on the market. Some run on batteries and some are solar powered. Keep in mind that some baits and lures are attractive to multiple species, which can complicate your efforts to focus on the target animal. Additionally, many species have overlapping tastes. In general terms, bait refers to food-type smells applied in larger quantities (tablespoon size or larger) while lures refer to smaller amounts and are often formulated to trigger a curiosity or territorial response.

Equipment

In working with traps, one will need appropriate clothing (including protective gloves) and tools. Necessary and useful items include wire, rope, flashlights, fiber optic scope, ladders, assorted hand and power tools, screws, nails, and a snare pole. Many items are used in setting traps, locating animals, moving, and releasing them. It is very important to maintain your traps and other equipment in proper working order.

Trap Maintenance and Safety

Maintain your traps in good working order. Follow manufacturers' recommendations for maintenance. Additional tips are available through the National Wildlife Control Operators Association (NWCOA). Well-maintained traps will be safer for the operator and for the animals, avoiding unintended injuries. Be aware of the potential, if it exists, for other people, especially children, to come into contact with your traps.

Releasing Nontarget Animals

Nontarget animal should be released from the trap. If the animal is small enough, cover it with a wash tub or heavy blanket, pull the trap out and release the animal. A catch pole, with a sliding loop that is placed over the animal's head, also works well.

Another method of releasing larger animals is to lay just enough brush, limbs or poles over the animal to pin it so that it can't reach the person releasing it. When done with just enough pressure to pin down the animal but not to injure it, this method is the safest and least stressful on the animal and trapper.

How to Remove a Nontarget Animal from a Body-grapping Trap

If a nontarget species is caught in a body-gripping trap (Conibear) you have a brief amount of time to safely release the animal. It is important to act as quickly as possible before anything serious could happen

Step 1: Immediately squeeze both springs and twist the trap so the jaws are not placing pressure on the animal's windpipe.

- Twisting 90 degrees takes the pressure off the animal's windpipe.

Step 2: Squeeze together one of the springs using both hands until you are able to fasten the safety locks over the arms of the spring. This relieves the pressure from one side of the trap. If you have a hard time squeezing the spring, see the "Rope Trick".

- Secure safety hooks, making the springs inactive. Again, use both hands on each spring, if necessary.

Step 3: Repeat the same process for the other spring.

Step 4: Slide the animal's head out from between the jaws of the trap.

"Rope Trick"

Step 1: Tie a loop in rope (string, leash) and place your foot through the loop.

Step 2: Take the free end of the rope and feed it through both eyes of the spring.

Step 3: Loop the rope over the spring eye furthest away from you and feed it back through the eye closest to your foot.

Step 4: Stabilize the other side of the trap with your foot by standing on the lower edge of the spring.

Step 5: Pull up on the rope with both hands until the spring is compressed.

Step 6: While still holding the rope, secure the safety hook in place to lock the spring in the compressed position, taking pressure off the jaws. If the trap has a second spring, you will need to repeat these steps. With both jaws compressed, you will be able to remove the animal from the trap.

How to Remove a Nontarget Animal from a Foothold Trap

Single Longspring Foothold:
Step 1: Try to calm and secure the animal.

Step 2: Use both hands to depress spring, or if the trap is on solid ground, hold onto the animal and position a foot on the spring and step down on it to depress the spring. The trap will relax or open so the animal can step out of the trap.

Double Coilspring Foothold:
Step 1: Try to calm and secure the animal.

Step 2: To open jaws, use two hands to push down with equal pressure on the spring handles. If the trap is placed on solid ground, it is easier to straddle the animal and use two feet, one on each spring, stepping down with equal pressure on the spring handles at the same time. The trap jaws will relax or open, allowing the animal to step out.

How to Remove a Nontarget Animal from a Snare

Step 1: Try to calm and secure the animal. This will help prevent the snare from tightening and allow more time to free the animal.

Step 2: Loosen the locking device on the snare in order to slacken the cable around the neck or body and remove the snare from the animal.

Step 3: If you are unable to loosen the locking device, try to cut the loop of the snare cable with a set of wire cutters wherever you can gain access to the cable around the neck of the animal. The best location is often just past the locking device on the loop. You may also be able to pass a finger under the cable around the neck to lift it away from the skin slightly and cut the snare cable at that point.

Step 4: If you are unable to directly cut the cable loop around the animals

neck, cutting the cable as close as possible to the lock may allow you to work the lock a bit, causing this short cut-end of the cable to slip through the hole in the lock, loosening the cable and freeing the animal.

Resources

Publications: There are numerous books and magazines on the market (e.g. Wildlife Control Technology Magazine) that provide valuable information.

"Prevention and Control of Wildlife Damage" Vol. 1 & 2, University of Nebraska Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

"Wildlife Pest Control around Gardens and Homes 2nd Edition", University of California Agriculture and Natural Resources, Publication 21385.

Oregon Department of Fish and Wildlife: http://www.dfw.state.or.us/

Internet Center for Wildlife Damage Management: http://icwdm.org/

Jack H. Berryman Institute: http://www.berrymaninstitute.org/

National Wildlife Control Operators Association: http://nwcoa.com/

Fur Takers of America: http://www.furtakersofamerica.com/

Associations:

National Wildlife Control Operators Association: www.nwcoa.com

National Trappers Association: http://www.nationaltrappers.com/

Fur Takers of America: http://www.furtakersofamerica.com/

Part 7

SPECIES INFORMATION

Bats

Beaver

Coyote

Eastern Cottontail

Eastern Gray Squirrel

Eastern Fox Squirrel

Western Gray Squirrel

Gray Fox

Red Fox

Mountain Beaver

Muskrat

Nutria

Opossum

Porcupine

Raccoon

Striped Skunk

Oregon Species List

Minimum Acceptable Practices for Managing Bats in Structures

Authors: H. Dixon Herman, Jr. CWCP and Jason S. Reger, Wildlife Biologist, CWCP
Contributors: Dianne Odegard, Bat Conservation International, Stephen Vantassel, PhD, University of Nebraska, Lincoln.

The purpose of this document is to provide minimum acceptable practices for nuisance wildlife control operators (NWCOs), through state agencies, to reduce impacts on White-nose Syndrome (WNS)-affected or susceptible species and populations during bat control or removal activities in structures. These guidelines were developed in response to recent catastrophic declines in many bat species due to WNS, but are recommended for use with all structure-dwelling bat species, regardless of their conservation or imperiled status.

Nuisance wildlife control operators regularly interface with the public and are an integral voice for bat conservation. NWCOs are also an important resource for information on the size and geographical distribution of bat colonies and are thus encouraged to communicate with their state biologists to aid in management decisions, regardless of whether a colony is being evicted from a structure or not. State biologists, in turn, can provide additional resources and information on bats to homeowners and cooperating NWCOs.

This document is designed to provide minimum practices for safely addressing human-bat conflicts, while minimizing disturbance to bats and preventing the further spread of WNS. General background information is included on the significance of, threats to, and biology and behavior of bats in order to illustrate the context and justification for these standards. Please contact your state wildlife agency to determine if there are specific details about time-of-year restrictions, regulations, threatened and endangered species laws, and/or permits in the state where you conduct work.

Helpful Definitions:

- *Eviction/venting* refers to the use of one-way doors and exits to remove bats from a structure using their natural tendency to leave the roost at night.
- *Exclusion* refers to closing gaps and sealing holes to prevent bats from entering or re-entering a structure.

Significance of bats

A great deal of misinformation exists about bats. NWCOs have an opportunity to educate their clients on the significance of bats to humans and the environment, while dispelling common myths. The following talking points may be useful. *More resources can be found in* ***Appendix B***.

- Bats have inspired scientific advancements for humans including navigational aids for the blind, blood-clot medications, low-temperature surgery, and military sonar.
- Bats play a significant role in our economy and ecosystem. Most bat species in the United States eat insects, including those insects that are agricultural, forest, and disease-spreading pests. During the summer a typical bat can eat half its body weight in insects each night.

Bat Myths and Truths

- Although bats (like other mammals) can contract rabies, the naturally occurring infection rate has been documented at 0.1-1.5% in common structure-dwelling species (Trimarchi, 1977). (Pybus, 1986) Even among sick-acting bats or those submitted for rabies exposure, the infection rate in the US and Canada has been reported at only 4.6-8.6% (Burnett, 1989) (Prins, 1988) (Rosatte, 1985).
- Bats are not rodents. In fact, unlike rodents, bats can live up to 30 years and most species produce only one or two young per year. Therefore, drastic population declines such as those caused by WNS are very difficult for bats to recover from.

Threats to Bats

Bats are faced with a variety of threats including habitat loss (e.g. loss of roost structures and foraging areas), pesticide use, and outright persecution by people. However, the most significant threat to hibernating North American bats in recent years is from a disease called White-nose Syndrome, first documented in 2007.

- WNS is named for the white fungus observed growing around the noses of affected bats (Blehert, 2008). This aggressive fungus attacks the exposed skin of bats while they hibernate, resulting in dehydration, unrest, and increased activity (Lorch, 2011) (Reeder, 2007).
- Affected bats quickly burn through stored energy and often die in the caves and mines where they hibernate, or out on the landscape (Turner, 2011).
- Since its discovery, WNS or the causative fungus (*Pseudogymnoascus destructans*) has been confirmed in 25 states and 5 Canadian provinces.
- Over 5.7 million bats have died as a result of this disease, which continues to spread (USFWS, 2012).
- Despite significant advances in understanding this deadly disease, much remains unknown about WNS, its spread, and the long-term consequences of losing significant numbers of bats.
- Federal and state agencies, as well as universities and private organizations, are working together to track and understand WNS. There is no evidence to suggest that WNS has any effect on humans.
- As a result of the drastic population declines caused by WNS, it has become increasingly important to reduce other sources of bat mortality.
- **NWCOs have an opportunity to contribute to the conservation of our remaining bats by following simple guidelines for dealing with bats encountered in structures.**

Bat Biology and Behavior:

For the purposes of this document, the following life history information pertains to hibernating bat species due to their susceptibility to WNS. Other types of bats, such as migratory species, may have differing life-histories but may also utilize structures.

The typical life-cycle for hibernating bat species includes an over-winter period of hibernation to conserve energy while temperatures are cold and food sources scarce, a spring emergence period when bats migrate to summer foraging and roosting areas, a summer maternity period when females gather in groups of up to hundreds or thousands to grow and raise young (males return to summer foraging areas but may be more transient and in much smaller groups), and a fall swarm period when bats gather at hibernation sites to breed and find shelter for the winter. These species use delayed fertilization and pregnancy is not initiated until the following spring (Whitaker, 1998).

Bats use structures as warm places to roost and raise young during the summer, for temporary shelter (night roosting), and sometimes as hibernation areas during colder months. As a result, they may come into direct contact with people, becoming a nuisance or a health concern.

Species Identification:

There is a great deal of behavioral variability among bat species. NWCOs are encouraged to become familiar with the species most commonly encountered in their area. ***Appendix A*** *includes a list of bat species commonly found in structures, along with their current (2014) federal and state listing status and susceptibility to WNS.*

Please contact your state wildlife agency for more information. As NWCOs don't always see bats for accurate species identification, they should err on the side of caution to protect listed species.

Seasonal Restrictions:

Bats emerge from hibernation in the spring. Females gather in maternity colonies to raise their pups (young) over the summer. Bats will return to the same location year after year and, if excluded, may go to an enormous amount of effort to get back into the roost. (Humphry, 1976) Therefore, careful and thorough evictions/venting and exclusions are advised and erecting alternate roost structures nearby (bat houses) is recommended.

Bat pups are generally born in early summer and are unable to fly and feed on their own until mid to late summer. (Whitaker, 1998) Bat-proofing or extermination during the maternity season resulted in the population loss of over 50% of little brown bats within a decade in an extensive study of this species in Indiana (Humphry, 1976) For these reasons, **evictions/venting should not be performed during the maternity season when flightless young are present.** Attempts to evict or exclude bats at this time can result in the death of flightless young (sometimes also resulting in insects and foul odors) as well as an increase in

the number of adult bats that enter the living space trying to reunite with their trapped young (potentially increasing the risk of human/bat contact and rabies exposure).

Bats also occasionally hibernate in structures during the winter. At this time, bats don't regularly exit the roost because there is no food source available, so eviction/venting activities may be ineffective and exclusions may result in trapped bats dying inside.

Finally, in northern climates, bats found in buildings during the winter may not survive if released outside in below-freezing temperatures. **Contact your state wildlife agency or local wildlife rehabilitators for help if you encounter this situation.**

Effective Bat Evictions:

The only effective way to permanently get bats out of structures without harm and prevent re-entry is by performing a humane eviction and complete exclusion.
Materials and techniques for conducting bat evictions and exclusions are provided in the Professional Standards of Practice for Structural Management for Wildlife Control Operators, available through the National Wildlife Control Operators Association. Methods that include poisoning, trapping, relocating, or in any other way harming, harassing, or killing bats are illegal in many states and **do not meet the minimum acceptable practices** outlined in this document.
One-way exit devices allow bats to leave the structure but not re-enter and are an acceptable and effective means of eviction. One-way exit devices must be constructed out of a material that does not have any sharp edges or parts that could damage a bat's wings or any spaces for bats to become tangled in.
Because not all bats will exit every night, one-way exits should be left in place for a **minimum** of five nights, including at least three consecutive nights of weather conducive to bat flight (temperatures above 50 degrees F, winds below 10 mph, and no sustained or heavy rains). If weather conditions are not conducive to bat flight while the devices are in place, the time period should be extended until at least three consecutive good weather nights are achieved.
A complete exclusion should be performed to seal off all other holes, cracks, and crevices that could serve as potential entry/exit points. It is also strongly recommended that someone watch the vented exits on the last night and/or do an inside inspection before the hole is sealed to verify that no bats remain inside the roost.

Time of Year Restrictions:

Exclusions should not be performed during the maternity season because this can result in the unnecessary death of flightless young and an increase in human-bat contact and rabies exposure when adult bats find their way into living spaces while trying to reunite with their trapped young. **Contact your state wildlife agency for time-of-year restrictions** as maternity season varies by region and species. In the absence of specific guidance from your state biologist, **maternity season should include April 1 through August 31.**

In addition to the presence of maternity colonies, some species (the big brown bat in particular) may hibernate in buildings. **Therefore, exclusions (sealing off exit points) should not be performed during the winter months** if there is a history or evidence of winter bat activity in the building.

Decontamination for WNS:

Spores of the fungus that causes WNS, *Pseudogymnoascus destructans*, can remain on materials and be transported from one location to another. Decontamination protocols should be followed to reduce the risk of transmission of the fungus to other bats and/or locations. Anything that comes into contact with a bat should be disposed of in the trash or decontaminated according to the most recent national decontamination protocols available at whitenosesyndrome.org. The most common items that will require disposal or decontamination include cones, tubes, chutes, and mesh that are used to construct one-way doors.

Bat-Proofing the Living Space:

Bat-proofing the living space offers a NWCO the opportunity to temporarily relieve the homeowner's concerns during the maternity season and then schedule an eviction after pups are volant (flying) and able to survive on their own. During the maternity season, or when bats are suspected to be hibernating in the building, the best option for protecting concerned homeowners and public health is to bat-proof the living space, or provide "interior seals". This work consists of locating openings (typically areas where air flows) leading into the living space from attics, garages, walls, or any place that bats are roosting. Entry/exit points can be as small as 5/8-inch round or 3/8-inch wide and 3/4-inch long that open into the living space. Likely openings include:

- Attic hatch doors
- Chimneys
- Fireplaces
- Around piping or plumbing
- Open windows or loose windowsills
- Openings around air conditioners and ducts
- Louver fans
- Screens in disrepair
- Pet doors

Getting a Single Bat out of the Living Space:

Bats may occasionally find their way into a living space, especially during the summer months when young-of-the-year are becoming more independent. This is not necessarily an indication that a bat is rabid. Homeowners are responsible for contacting their physician or health department, or following the Center for Disease Control's guidelines to determine if a rabies exposure has occurred. *See **Appendix B** for resources.*

If no rabies exposure has occurred and weather conditions are appropriate (above 40 degrees F, no rain or high winds), a bat found in a living space can be safely removed and released outside. Close doors to contain the bat in one room then wait for the bat to land on wall or other surface. **Gloves** should always be worn for safety and a container such as a kitchen strainer or a clear plastic container with a piece of cardboard slid underneath can be used to safely contain and move the bat. A bat on the ground is vulnerable to predators so it should be placed up off the ground on a window sill or large tree branch, or released from at least 4

feet above the ground. *An illustrated guide to removing a bat from the living space and a video link can be found in* ***Appendix B.***

Bat Houses:

Because bats naturally return to the same location year after year (Neilson, 1994), individuals may attempt to reenter the structure they have been excluded from or spend precious time and energy searching for a roost, thereby lowering reproductive output (producing fewer offspring) (Brigham, 1986). Young born earlier in the summer have a significantly higher probability of surviving their first year than those born later in the season (Frick, 2009). Therefore, bat houses and roosting chambers are recommended as alternative housing for displaced bats. Ideally, bat houses should be erected a few months to a year before a scheduled exclusion to give bats time to find and explore the new roosting option, and should be installed as close to the original roost entrance as possible to maximize the likelihood of bats finding the new habitat.

There is no guarantee that bats will use a bat house, but research has shown that bat houses can be successfully occupied during and after an eviction (Kiser, 1999) (Brittingham, 2000). Choosing the proper location, placement, design, color, and materials are all important factors for increased success (Tuttle, 2013). These attributes can vary by species and geographical region. *Guides to bat house design and placement can be found in* ***Appendix B.*** Landowners interested in improving their property by enhancing natural roosting options such as large diameter trees, can **contact their state for forest best management practices** that will benefit local bat species.

This document is the product of the multi-agency WNS Conservation and Recovery Working Group established by the National WNS Plan (A National Plan for Assisting States, Federal Agencies, and Tribes in Managing White-Nose Syndrome in Bats, finalized May 2011). This Minimum Acceptable Practices guidance document will be updated as necessary to include the most current information and guidance available www.whitenosesyndrome.org/NWCO (this is not a live link yet).

Appendix A – Structure-Dwelling Bat Species:

Bat species commonly found in structures around the United State.

Common Name	**Scientific Name**
Arizona myotis	*Myotis occultus*
Big brown bat	*Eptesicus fuscus*
Big free-tailed bat	*Nyctinomops macrotis*
Brazilian free-tailed bat	*Tadarida brasiliensis*
Californian myotis	*Myotis californicus*
Canyon bat	*Parastrellus hesperus*
Tri-colored bat	*Perymyotis subflavus*
Eastern small-footed bat	*Myotis leibii*
Evening bat	*Nycticeus humeralis*
Florida bonneted bat	*Eumops floridanus*
Fringed myotis	*Myotis thysanodes*
Greater bonneted	*Eumops perotis*
Indiana bat	*Myotis sodalis*
Little brown bat/myotis	*Myotis lucifugus*
Northern long-eared bat	*Myotis septentrionalis*
Pallas's mastiff bat	*Molossus molossus*

Pallid bat	*Antrozous pallidus*
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*
Southeastern myotis	*Myotis austroriparius*
Townsend's big-eared bat	*Corynorhinus townsendii*
Long-eared myotis	*Myotis evotis*
Western small-footed bat	*Myotis ciliolabrum*
Yuma myotis	*Myotis yumanensis*

Appendix B - Resources:

Contact your **state wildlife agency or partners for time of year guidelines** that apply to your geographic area. A list of contacts can be found at:
http://www.whitenosesyndrome.org/partners

More information about bats:

- Animal Diversity
  - http://animaldiversity.ummz.umich.edu/accounts/Chiroptera/
- Bat Conservation International
  - www.batcon.org
  - http://www.batcon.org/index.php/bats-a-people/bats-in-buildings.html
- Organization for Bat Conservation
  - http://www.batconservation.org/
- US Geological Service
  - http://www.usgs.gov/
  - http://www.npwrc.usgs.gov/resource/mammals/housebat/
- US Fish and Wildlife Service
  - http://www.fws.gov/
  - http://www.fws.gov/asheville/pdfs/beneficialbats.pdf
- US Forest Service
  - http://www.fs.fed.us/
  - http://www.fs.fed.us/biology/wildlife/bats.html
- Save Lucy the Bat
  - http://savelucythebat.org/
- Conserve Wildlife NJ
  - http://www.conservewildlifenj.org/protecting/projects/bat/
- Others?

Rabies and other health concerns:

- Your state or local Department of Health
  - http://www.healthguideusa.org/local_health_departments.htm
- Centers for Disease Control
  - http://www.cdc.gov/rabies/

Information about White-Nose Syndrome:

- US Fish and Wildlife Service White-nose Syndrome website
  - http://whitenosesyndrome.org/
- "Battle for Bats" video:
  - http://vimeo.com/76705033

Decontamination guidelines:

- http://whitenosesyndrome.org/topics/decontamination

General bat eviction/venting and exclusion techniques:

- National Wildlife Control Operators Association bat standards training course
  - http://nwcoa.com/bat_standards.html
- Bat Conservation International
  - http://www.batcon.org/pdfs/binb/ExcludersGuidelines2014.pdf
- Others?

- Removing a bat from the living space:Bat Conservation International
  - http://www.batcon.org/index.php/resources/for-specific-issues/bats-in-buildings/there-s-a-bat-in-my-house
  - Video: http://www.youtube.com/watch?v=mzax0V0DG_M
- Bat World Sanctuary
  - http://batworld.org/bat-problems/

Bat Rehabilitation:

- Link to our National Rehab BMP document when it is done!
  - http://www.whitenosesyndrome.org/Rehab (this will be a live link when the document is complete)
- Bat World
  - http://batworld.org/what-to-do-if-you-found_a_bat/
- International Wildlife Rehabilitation Council
  - http://theiwrc.org/
- National Wildlife Rehabilitator Association
  - http://www.nwrawildlife.org/

Bat house design and placement:

- Bat Conservation International
  - http://www.batcon.org/index.php/resources/getting-involved/install-a-bat-house
- Organization for Bat Conservation
  - http://www.batconservation.org/bat-houses
- Bat Conservation and Management
  - http://www.batmanagement.com/Batcentral/batcentral.html
- Bat World
  - http://batworld.org/bat-house-information/

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Common Name – Beaver

Scientific Name – *Castor canadensis*

Description: Beavers are the largest members of the rodent family in North America. Adult beavers weigh from 35 to 65 pounds and may reach lengths of four feet. Beaver are usually brown in color and have distinctively large protruding front teeth. The tail is large, flat, scaled, naked and black in color. The hind feet are webbed for swimming and considerably larger than the front feet. The front feet are quite dexterous in manipulating food and are often used for digging. The eyes and ears of beaver are small.

Protection Status: "Furbearers" on public land and have "Predatory Animal" status on private land.

Habitat: Beavers are almost always associated with riparian habitats bordered by a zone of trees and are found in many of Oregon's stream, rivers, lakes and ponds.

Habits: Because of their ability to change their environment by falling trees, damming streams, irrigation ditches and culverts, canal digging, bank tunneling and preferences for certain crops, the beaver may be one of the most loved or hated wildlife species in Oregon, depending of the point of view of those affected. Beavers can stay under water for up to 15 minutes and it can take a beaver about three minutes to cut down a five-inch diameter tree.

Reproduction: Beavers generally breed from January through February with a gestation period of approximately 105 days. The young, which are called kits, are born from April through June and a typical litter consists of 3-4 young. The young are born completely furred, have their eyes open and can walk and swim at birth. The young are weaned when they are about 6 weeks old and become sexually mature when they are about 2 years of age. The young will live with their parents as a family group until they are about 2 years old.

Diet: Beaver are herbivorous and eat from one to two pounds of food daily. In the spring and summer beavers eat a wide variety of green plants including sword-fern, pondweed, horsetail, waterweed and yellow water-lily. In the fall and winter beavers shift their diet to stems, leaves, twigs and the bark of birch, willow, cottonwood, maple and some coniferous species of trees.

Sign: Beaver signs at times can be difficult to spot but usually their cuttings will be easily spotted if beaver are present. Beavers may also be distinguished by castor deposits and slides leading from the water to cuttings or other desirable food and habitat.

Predators: Coyotes, bobcats, red fox, river otters and mink prey upon young beavers.

Diseases: Tularemia and *Giardia lamblia* are the most common diseases known in beavers.

Parasites: Lice, fleas, beetles, flies, roundworms and flukes parasitize beavers.

Prevention and Control:

Exclusion:

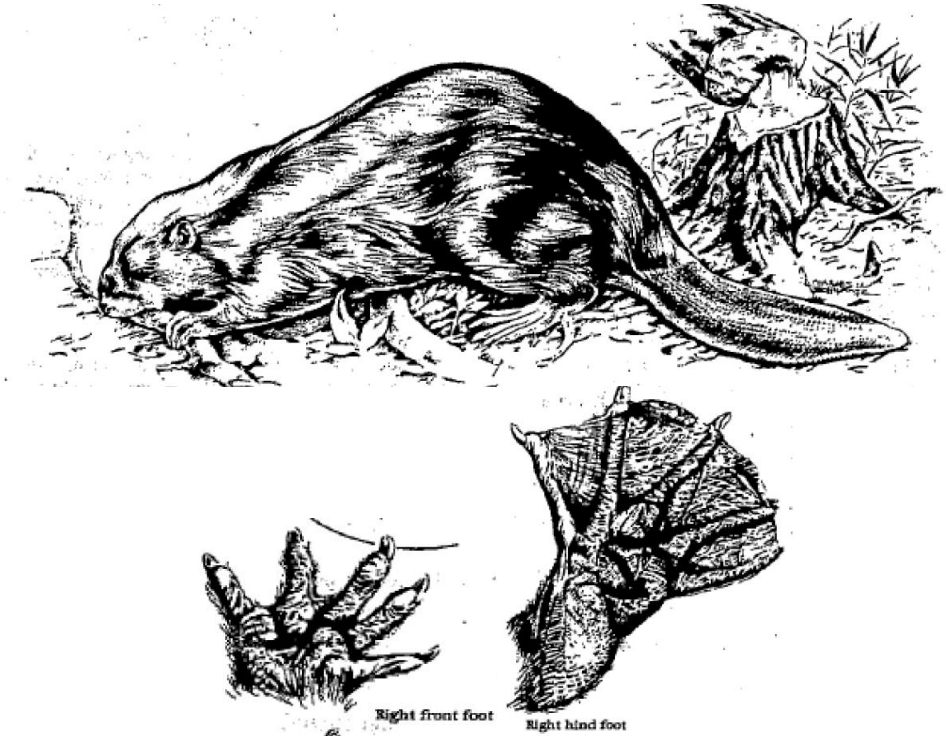
- Fence small critical areas such as culverts, drains, or other structures.

Habitat Modification:

- Eliminate foods, trees, and woody vegetation where feasible.
- Install a Clemson beaver pond leveler, three-log drain, or other structural device to maintain a lower pond level and avoid further pond expansion.

Trapping: Foothold, bodygrip, snares, basket/suitcase type, cage or box traps.

Baits and lures: Small sticks with the bark partially peeled, carrots, corn, beaver castor, sweet flay and anises are used successfully.



Common Name – Coyote

Scientific Name – *Canis latrans*

Description: The coyote resembles a medium size dog with adults weighing an average of 22-30 pounds; males are generally heaver than females. The muzzle is long, slender, and pointed; the eyes yellow with round pupils; the ears large and erect; the lips black-pigmented and the tail bushy. Coloration can vary from nearly black to light gray. Coyotes have exceptional senses of smell, vision and hearing.

Protection Status: Unprotected on public land and "Predatory Animal" on private property.

Habitat: Coyotes are very adaptable. They can live in a wide variety of areas from the city to the wilderness. They prefer to live in brushy habitat near timber edges and in open farmlands.

Habits: The home range of a coyote may be as small as 3 to 4 miles when caring for young or as large as 25 to 30 miles during the rest of the year. They like semi-open country and prefer to travel on ridges or old trails. Coyote normally hunt singly or in pairs, but in late summer or early fall may hunt with a family group. They are primarily nocturnal with peak activity periods within one or two hours of sunset or sunrise. Coyotes swim well and can run as fast as 45 miles per hour for short distances. Coyote dens are found in steep banks, rock crevices, sink holes, hollow logs and underbrush.

Reproduction: Coyotes breed mainly during the months of February and March. The gestation period is about 60-63 days. Coyotes produce one litter per year. Young are born in April and May with litter sizes averaging 5-7 pups. The young are weaned at 5-6 weeks and leave the parents at around 6-9 months of age. Pairs may remain together for several years. Both parents care for the pups

Diet: Coyotes are opportunistic predators. They commonly prey upon small animals, sometimes including pets, and often scavenge food items and carrion, as well as fruits, seeds and other plant material. Coyotes also kill larger mammals such as deer, antelope and livestock.

Sign: Coyote tracks are sometimes confused with certain breeds of domestic dog tracks. Generally they are more elongated and the toes are closer together than

dogs. The hind portion of the heel pad of the front foot of a coyote is well lobed and spread horizontally in comparison to a dog's. Coyote scats are extremely varied in size and will overlap in size with dog and red fox scats. The most conspicuous coyote sign denoting their presence is their howl.

Predators: Other coyotes, dogs, and great-horned owls may take pups. Mountain lions, wolves and bears have been reported taking adult coyotes.

Diseases: Distemper, canine hepatitis, parvo virus, rabies and tularemia.

Parasites: Ticks, fleas, roundworms, tapeworms, fluke and mites.

Prevention and Control

Many coyote problems are based upon unfounded fear of these animals due in part because of sensational media coverage of their presence on urban landscapes. **Education is often sufficient to resolve human-coyote conflict.** Property owners should be made aware that even if a coyote is removed, other coyotes could soon move back into the area.

Exclusion:

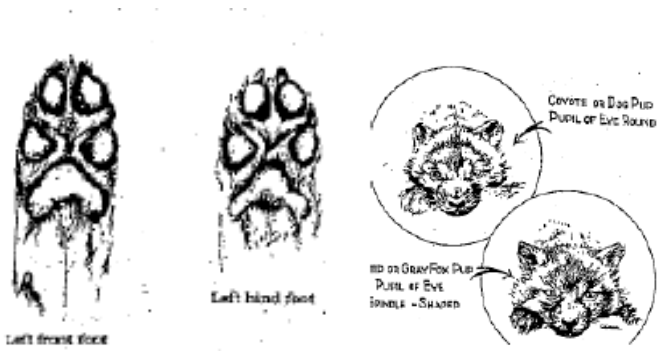
- To exclude coyotes, fences should be at least 6 feet tall and buried in the ground at least 12 inches. An outward slant at the top can be added to keep coyotes from climbing over, and a 23 inch apron of wire extending outward from the bottom will keep them from digging under the fence.
- Coyotes can get through anything wider than their own head so closing fence gaps is essential.
- A high-tensile predator-proof electric fence built to the proper specifications can be effective.

Habitat Modification:

- Secure garbage can lids at all times or store indoors.
- Feed pets outdoors only during the day.
- Bring pet food and water bowls in before dark.
- Cover ripe fruits and vegetables at night; enclose gardens and/or fruit trees with a coyote-proof fence; pick up all downed fruit and vegetables daily.
- Do not leave cats or small dogs out after dark and allow them outside only under strict supervision after dark.
- Never leave food out for wild animals.
- Bring livestock into barns, sheds, or coyote-proof enclosures at night.
- Illuminate area at night.
- Trim and clear near ground level any vegetation that provides cover for coyotes or their prey.
- Remove birdfeeder. Coyotes are attracted to them and to the birds and rodents that use the feeder.

Trapping: Snares and foothold traps. Cage traps are not effective in capturing adult coyotes.

Baits and lures: Commercial lures, fox urine, and tainted meat baits.



There are four species of rabbits (one non-native and three native species) and three species of hares in Oregon. The rabbit species are Eastern cottontail, brush rabbit, pygmy rabbit, and mountain cottontail. The hare species consists of Snowshoe hare, Black-tailed jackrabbit, and White-tailed jackrabbit. For the purpose of this manual we will focus on the Eastern cottontail.

Common Name – Eastern Cottontail

Scientific Name – *Sylvilagus floridanus*

Description: The eastern cottontail is the largest species of cottontail in Oregon. They are generally a brownish color and become darker towards the rump with light brown along the flank area and a large white tail. The eastern cottontail can weigh three to seven pounds. Eastern cottontails were first introduced into the Willamette Valley in Benton and Linn counties in the late 1930s and early 1940s.

Protection Status: Non-native and a “Prohibited Species” in Oregon on both private and public property. On private property they are classified as a “Predatory animal”. Prohibited species can only be euthanized.

Habitat: Eastern cottontails commonly occupy areas that contain large clumps of blackberries, brushy fence rows or field edges, railroad right-of-ways and riparian zones.

Habits: The eastern cottontail is generally active during the early evening to early morning hours.

Reproduction: The breeding season generally starts in January and ends in September. A female can produce 5-8 litters in a season and litter sizes range from 3-8 young. After a gestation period of 28 days, the young are born with pink skin and the eyes and ears are sealed. The eyes of the young open about a week after birth and the young will start leaving the nest within 2 weeks after birth. Early born juvenile females can reproduce late in the breeding season.

Diet: Eastern cottontails are herbivores. They feed on leafy plants such as grasses, forbs, flowers, and vegetables during the growing season and shrubs, vines and trees during the winter months.

Sign: Gnawing on older woody growth and clean-cut, angled clipping of young stems. Droppings are distinctively rounded.

Predators: Hawks, owls, foxes, raccoons, skunks, opossums, coyotes, bobcats, snakes, and both feral and domestic cats and dogs.

Diseases: Tularemia and staphylococcus.

Parasites: Fleas, ticks, roundworms, bots (warbles).

Prevention and Control:
Exclusion:

- Small mesh fencing that is at least two feet high and buried in the ground about eight inches.
- Cylinder barriers or tree guards around young trees.

Habitat Modification:

- Remove brush piles, weed patches, stone piles and other debris from the area.
- Trim lower limbs from young trees.

Trapping: Live traps or wooden box traps.

Baits and lures: Rolled barley, apples, carrots, cabbage, lettuce, and other fresh green vegetables, cob corn, dried leafy alfalfa, parsley, or clover.

Common Name – Eastern Gray Squirrel

Scientific Name – *Sciurus carolinensis*

Description: Eastern gray squirrels are between 15-20 inches long with half of their total length made up of a bushy tail. They are usually gray with reddish brown-coloration along the back, tail, face, and ears; and a whitish belly.

Protection Status: Non-native and a "Prohibited Species" in Oregon on both private and public property. On private property they are classified as a "Predatory Animal". Prohibited species must be euthanized.

Habitat: Eastern gray squirrels traditionally depend on deciduous trees but have easily adapted to both urban and suburban landscapes.

Habits: Eastern grays are diurnal, use tree cavities, leaf nests (dreys), attics or crawl spaces for dens and shelter.

Reproduction: During breeding season a female may be chased by several males. Eastern gray squirrels generally have 2 litters per year. Breeding takes place for the first time between January and March and the second time between July and October. Gestation is around 44 days and they have between 2-4 young in each litter. Young are weaned between 10-12 weeks of age. Look for young between March and December.

Diet: A variety of different nuts are both eaten and buried underground. Other food items are fruits, tree buds, flower bulbs, bird seed and occasionally bird eggs, nestlings and small birds.

Sign: A homeowner's first sign of squirrels present may be the scampering sounds in attics, crawl spaces or fireplaces.

Predators: Hawks, owls, coyotes, bobcats, snakes and both feral and domestic cats and dogs.

Diseases: Rabies, tularemia

Parasites: Ticks, mites, fleas and internal parasites.

Prevention and Control:

Exclusion:

- Place a metal collar around trees, place plastic pipe or collar around wires (electric wires should be done by professionals).
- Close opening to attics and other parts of structures.
- One-way doors.

Habitat Modification:

- Trim trees and tree limbs at least 6-8 feet away from structures.
- Provide alternative food sources or remove food sources such as bird feeders.
- Lights and/or radio may help to drive animals out of structures.
- Repair any holes or weak areas on the structure.

Trapping: Wire cage trap or box trap.

Baits and lures: Orange slices, apple slices, shelled nuts (peanuts, walnuts, hazelnuts), sunflower seeds, corn, and peanut butter.

Common Name – Eastern Fox Squirrel

Scientific Name – *Sciurus niger*

Description: Eastern fox squirrels are 15-27 inches long of which half of its total length is made up of a bushy tail. It is usually a rusty yellowish color with a pale yellow or orange belly. Ears are short and rounded and its tail flattens on the top

Protection Status: Non-native and a “Prohibited Species” in Oregon on both private and public property. On private property they are classified as a “Predatory Animal”. Prohibited species must be euthanized.

Habitat: Fox squirrels traditionally depend on deciduous trees but have easily adapted to both urban and suburban landscapes.

Habits: Fox squirrels are diurnal, use tree cavities, leaf nests (dreys), attics or crawl spaces for dens and shelter.

Reproduction: During breeding season, a female may be chased by several males. The fox squirrel generally has 2 litters per year. Breeding takes place for the first time between January and March and the second time between June and August. Gestation is around 44 days and they average between 2-3 young per litter. Young are weaned between 10-12 weeks of age. Look for young between March and October.

Diet: A variety of different nuts are both eaten and buried underground. Other food items are fruits, tree buds, flower bulbs, bird seed and occasionally bird eggs, nestlings and small birds.

Sign: A homeowner’s first sign of squirrels present may be the scampering sounds in attics, crawl spaces or fireplaces.

Predators: Hawks, owls, coyotes, bobcats, snakes and both feral and domestic cats and dogs.

Diseases: Rabies, tularemia

Parasites: Ticks, mites, fleas and internal parasites.

Prevention and Control:

Exclusion:

- Place a metal collar around trees.
- Place plastic pipe or collar around wires (electric wires should be done by professionals).
- Close openings to attics and other parts of structures.
- One-way doors.

Habitat Modification:

- Trim trees and tree limbs at least 6-8 feet away from structures.
- Provide alternate food sources or remove food sources such as bird feeders.
- Lights and/or radio may help to drive animals out of structures.
- Repair any holes or weak areas on structures.

Trapping: Wire cage trap or box trap.

Baits and lures: Orange slices, apple slices, shelled nuts (peanuts, walnuts, hazelnuts), sunflower seeds, corn and peanut butter.

Common Name – Western (Silver) Gray Squirrel

Scientific Name –*Sciurus griseus*

Description: The western gray squirrel is between 15-20 inches long. Half of its total length is made up of a bushy tail. It is usually grizzled gray to silver with numerous white-tipped hairs above and sharply distinct white underparts. The western gray also has large ears without tufts.

Protection Status: Native to Oregon, it is classified as a “Predatory Animal” on private property and "Game Mammal” on public property.

Habitat: Western gray squirrels traditionally are associated with mixed forested communities but have easily adapted to both urban and suburban landscapes.

Habits: Western grays are largely arboreal, using tree cavities, leaf nests (dreys), attics or crawl spaces for dens and shelter. Western grays are diurnal and can be active throughout the year.

Reproduction: During breeding season a female may be chased by several males. The western grays have one litter per year. Breeding takes place between March-June. Gestation is around 43 days and they have between two-three young in each litter. Young are weaned at about ten weeks of age.

Diet: A variety of different nuts are both eaten and buried underground; seeds of conifers, fruits, berries, tree buds, flower bulbs, bird seed, bark, cambium, fungi and insects.

Sign: A homeowner’s first sign of squirrels present may be the scampering sounds in attics, crawl spaces or fireplaces.

Predators: Hawks, owls, coyotes, bobcats, grey fox, fishers, martens and both feral and domestic cats and dogs.

Diseases: Rabies, tularemia

Parasites: Ticks, mites, fleas and internal parasites.

Prevention and Control:

Exclusion:

- Place a metal collar around trees.
- Place plastic pipe or collar around wires (electric wire should be done by professionals),
- Close openings to attics and other parts of building structures.
- One-way doors.

Habitat Modification:

- Trim trees and tree limbs at least 6-8 feet away from structures.
- Provide alternative food source or remove food source such as bird feeders.
- Lights and/or radio may help to drive animal out of structure.
- Strobes
- Repair any holes or weak areas on the structure.

Trapping: Wire cage trap or box trap.

Baits and lures: Orange slices, apple slices, shelled nuts (peanuts, walnuts, hazelnuts), sunflower seeds, corn and peanut butter.

Common Name – Gray Fox

Scientific Name – *Urocyon cinereoargenteus*

Description: The gray fox is slightly smaller than the red fox, weighing an average of 4-10 pounds. Its fur has a coarser texture than the red fox and is colored by alternate bands of black and white guard hairs. There is reddish-brown fur on the under parts of the body. The tail is gray with a ridge of coarse, black hair along the top and on the tip. The total length if the gray fox is 35-44 inches, with the tail being about 14 inches long.

Protection Status: Furbearer.

Habitat: The gray fox prefers dense cover such as thickets, riparian areas and swampland and can live in urban areas. The dens are located in hollow logs and trees, hollows under rock piles or occasionally in the ground.

Habits: The gray fox is primarily nocturnal, but it can be seen occasionally during the day. In contrast to the red fox, the gray fox may climb trees using the front feet to grasp the tree trunk and the hind feet to push upward. Gray foxes are very secretive and shy but when necessary are fierce fighters. They are often quite vocal, barking and growling when cornered or captured.

Reproduction: Gray foxes breed primarily in February with an average gestation period of 53 days. Two to five pups are born in April or May. Gray fox dens tend to be in areas of brushy cover and are much more difficult to locate than red fox dens. At birth the pups are blackish, blind and scantily furred. They open their eyes at about 10 days and remain near the den until they are approximately 3 months old.

Diet: Like the red fox, the gray fox's diet consists primarily of rodents. They are opportunistic animals, feeding upon available prey, fruits and berries as they become plentiful.

Sign: Gray fox tracks are smaller and rounder than those of the red fox. Scats are similar to those of the red fox.

Predators: People, dogs and coyotes.

Diseases: Canine distemper, parvovirus, pseudorabies and rabies.

Parasites: Mites, ticks, lice, fleas and roundworms.

Prevention and Control:

Exclusion:

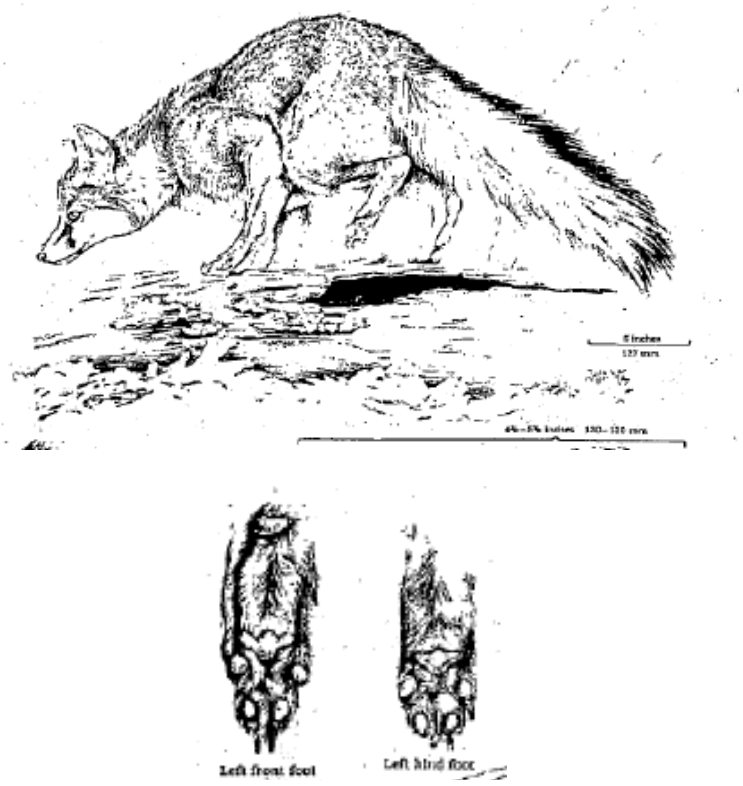
- Construct net wire fences with an opening of three inches or less to exclude gray foxes. Bury the bottom of the fence one-two feet with an apron of net wire extending at least 12 inches outward from the bottom. A top or roof of net wire may also be necessary.
- Three-wire electric fence spaced 6, 12 and 18 inches above the ground can repel gray foxes.

Habitat Modification:

- Remove pet food from outside.
- Clean up fruit off the ground.
- Keep poultry penned up.

Trapping: Foothold, snares or cage traps.

Baits and lures: Commercial lures, fox urine, tainted meat baits, rodent and skunk musk.



Common Name – Red Fox

Scientific Name –*Vulpes vulpes*

Description: The red fox is dog-like in appearance with an elongated, pointed muzzle; large pointed ears which are usually held erect and forward; moderately long legs; a long, heavily furred and bushy tail which is circular in cross section with a white tip and long, thick, soft body fur. The pupil of the eye is vertically elliptical, a characteristic which distinguishes it from the coyote and other young animals. Red foxes occur in many color phases including silver, gray, black and cross, but the red phase dominates. Adult foxes range from 36 to 46 inches in length and weigh between 8 and 15 pounds.

Protection Status: Furbearer

Habitat: The red fox is extremely adaptable and thrives under a variety of conditions. They occupy habitats within barren arctic regions, boreal forests, mountainous forest regions, agricultural and woodland habitats throughout their range, as well as suburban and urban areas.

Habits: Like most predators, red foxes are nocturnal or active at night, and “lay up” during the day. Their day is often spent on a hillside or somewhere with good visibility to observe potential danger. Red foxes often hunt along the border of fields and woodlots or along fence rows where rodents are abundant.

Reproduction: Pairing, mating and breeding activity begins in January and continues to early March. Three to seven pups are born between March and May, about 53 days after breeding. Pups, or kits, are grayish brown, blind and helpless when born. They open their eyes at 8 or 9 days and stay in or near the den until 4 or 5 weeks old. They are weaned at 8-10 weeks of age. Both male and female assist in rearing young.

Diet: Red foxes are carnivores, consuming animals ranging from insects to small mammals, rabbits and sometimes pets. They commonly take ground-nesting birds and bird eggs, turtles, frogs and snakes. Berries and fruits are eaten when available.

Sign: Red fox tracks are usually more or less in a straight line and the hind foot is narrower and more pointed than the larger front foot. The heel pad is narrow and, particularly in winter, little of the heel pad will show through the thick hair which covers the foot. Red fox scats are variable and similar to those of other canids, although noticeably smaller than most coyote scats.
Predators: People, dogs and coyotes.

Diseases: Mange, coccidiosis, distemper, parvovirus, pseudorabies and rabies.

Parasites: Mites, ticks, lice, fleas, roundworms and tapeworms.

Prevention and Control:

Exclusion:

- Construct net wire fences with opening of 3 inches or less to exclude red foxes. Bury the bottom of the fence 1 to 2 feet with an apron of net wire extending at least 12 inches outward from the bottom. A top or roof of net wire may also be necessary.
- 3-wire electric fence spaced 6, 12 and 18 inches above the ground can repel red foxes.

Habitat Modification:

- Remove pet food from outside
- Clean up fruit off the ground.
- Keep poultry penned up.

Trapping: Leg hold, snares and cage trap.

Baits and lures: Commercial lures, fox urine, tainted meat baits and skunk musk.

Common Name – Mountain Beaver (Boomer)

Scientific Name – *Aplodontia rufa*

Description: The mountain beaver is a medium sized rodent that averages about two pounds. The body is stout and compact with a small fur covered tail about one inch long. They are generally dark brown and have a small white spot at the base of each ear.

Protection Status: Unprotected mammal and have “Predatory Animal” status on private land.

Habitat: The mountain beaver ranges along the Pacific coastal region from British Columbia to northern California. The species is distributed westward from the Cascade Range and southward into the Sierras. Mountain beaver habitat is usually dominated by Douglas-fir and western hemlock on sites with considerable under-story vegetation.

Habits: Mountain beaver are generally more active in night hours than in daylight hours and dig extensive burrow systems. They also consume their own fecal material and do not hibernate.

Reproduction: Mountain beaver breed between February and May and produce one litter per year after a 29-day gestation period. The average litter size is 2-4 young and they are weaned in 8 weeks.

Diet: Sword fern and bracken fern are preferred foods but they also eat Douglas fir, western hemlock, western red cedar and red alder.

Sign: Clipped seedling and lateral branches, basal girdling of saplings, pulled bark in strip from trees, scattered horizontal tooth marks and irregular claw marks.

Predators: Bobcats, coyotes, mountain lions, great horned owls, minks, weasels and golden eagles.

Diseases: Little is known about diseases in mountain beavers.

Parasites: Fleas and mites.

Prevention and Control:

Exclusion:

- Use plastic mesh seedling protectors.

Habitat Modification:

- Plant large tree seedlings that will tolerate minor damage.
- Burn or remove slash and brush piles to reduce cover.
- Improve soil drainage.

Trapping: Body gripping traps or live traps.

Baits and lures: Suitable vegetation.

Common Name – Muskrat

Scientific Name – *Ondatra zibethicus*

Description: The muskrat is a member of the rodent family. The muskrat has a stocky appearance, with small eyes and very short, round ears that are almost completely covered with fur. Its front feet, which are much smaller than its hind feet, are adapted primarily for digging and feeding. Muskrats vary in total length from 16 to 25 inches. Muskrats are typically light brown to dark brown. The fur is medium length and quite dense. The tail is naked, laterally compressed to aid in swimming and approximately the same length as the body

Protection Status: Furbearer on public land, "Predatory Animal" on private land.

Habitat: Fresh-water marshes, streams, lakes, roadside ditches and ponds.

Habits: The muskrat prefers to build houses out of vegetation if it is present in sufficient quantities and the water will not wash it away. If no suitable place to construct houses exists, muskrats will make dens in stream banks. Muskrats will often use slides, toilets and feeding places repeatedly. They are nocturnal but may be active during the day in the spring and fall.

Reproduction: Muskrats are very prolific. A female may have two or three litters per year. Each litter commonly has 4-7 young. Breeding activity begins in March and peaks in May and June. The gestation period is about 30 days and the young become mature when approximately 6 months old.

Diet: Muskrats are primarily herbivores, feeding upon the most abundant vegetation. They also feed upon crayfish, mussels, turtles, frogs and fish in ponds.

Sign: Damage caused by muskrats is primarily due to burrowing activity. Look for narrow mudslides (runs), remains of mussels, crayfish or fish, dropping and tracks.

Predators: People, bobcats, fishers, minks, raccoons, great horned owls, hawks, coyotes, foxes and dogs.

Diseases: Tularemia, hemorrhagic diseases, leptospirosis, ring worm and pseudotuberculosis.

Parasites: Mites, fleas, roundworms, flukes and tapeworms.

Prevention and Control:

Exclusion:

- Contour the bank slope.
- Fencing where muskrats may be leaving pond or lake.

Habitat Modification:

- Draw down pond levels at least 2 feet below normal levels during the winter and fill dens, burrows and runs.

Trapping: Conibear, foothold traps, Stovepipe trap or cage traps

Baits and lures: Apples, carrots, celery, corn and fish are good baits. Anise, spearmint, sweetflag, fish oil and beaver castor are good lures.

Common Name – Nutria

Scientific Name – *Myocastor coypus*

Description: The nutria is a large, dark-colored, semi aquatic rodent that is native to South America and was brought into Oregon in the early 1930s for fur-farming enterprises. At first glance, a casual observer may misidentify nutria as a beaver or a muskrat, especially when it is swimming. Nutria has short legs and a robust, highly arched body that is approximately 24 inches long. Their round tail is from 13 to 16 inches long and scantily haired. Males are slightly larger than females; the average weight is about 12 pounds. The dense, grayish underfur is overlaid by long, glossy guard hairs that vary in color from dark brown to yellowish brown. The forepaws have four well-developed and clawed toes and one vestigial toe. Four of the five toes on the hind foot are interconnected by webbing; the fifth outer toe is free. The hind legs are much longer than the forelegs.

Protection Status: Non-native and a “Prohibited Species” in Oregon on both private and public land. On private property they are classified as a “Predatory Animal”. Prohibited species must be euthanized.

Habitat: Nutria are semi-aquatic bank dwellers, thus usually occur in or adjacent to rivers, lakes, sloughs, marshes, ponds and temporarily flooded fields. An area supporting both an abundant supply of succulent vegetation and fresh water is required for nutria. Although mild temperatures are preferred, some animals in southern Argentina and Chile thrive in cold climates and those colonies in eastern Oregon appear to have adapted to low winter temperatures. Muddy banks are preferred for home sites. The burrow entrance is located at the waterline and is connected by tunnel to an enlarged den well above the water level.

Habits: Nutria are nocturnal but can be seen feeding, resting and grooming during the day. Nutria has relatively poor eyesight and sense danger primarily by hearing. When cornered, nutria can be aggressive and can inflict serious injury to pets and humans by biting and scratching. Nutria can also cause serious problems by digging burrows in canals, dikes and stream banks.

Reproduction: Nutria breed in all seasons throughout most of their range and can be sexually mature at four months of age. Reproductive peaks occur in January, March, May and October. The gestation period is about 130 days, producing an

average of 4-5 young. Young are precocial and are born fully furred and active. They are weaned in about 7-8 weeks.

Diet: Nutria are almost entirely herbivorous, requiring large quantities of succulent vegetation. They are especially fond of alfalfa, clover, root crops, lawns and garden produce.

Sign: On-site observations of animals and their burrows are the best indicators of the presence of nutria. Crawl outs, slides, trails and exposed entrances to burrows often have tracks that can be used to identify the species. Droppings may be found floating in the water, along trails or at feeding sites. These are dark green to almost black in color, cylindrical and approximately two inches long and ½ inch in diameter. Additionally, each dropping usually has deep parallel grooves along its entire length.

Predators: Fox, bobcat, coyote, otter and human are among those which prey on adults, while mink, weasel and great horned owl take some of the younger animals.

Diseases: Leptospirosis, Chlaydophila psittaci, toxoplasma.

Parasites: Liver fluke, roundworms, fleas, lice and tapeworms.

Prevention and Control:

Exclusion:

- Protect small areas with partially buried fences.
- Tubes around seedlings.
- Sheet metal shields to prevent gnawing on wooden and Styrofoam structures and trees near aquatic habitat.
- Electric fencing near the ground.

Habitat Modification:

- Improve drainage to destroy travel lanes.
- Manage vegetation to eliminate food and cover.
- Contour stream banks to control burrowing.
- Restrict farming, building construction and other “high risk” activities to upland sites away from water to prevent damage.
- Manipulate water levels to stress nutria populations.

Trapping: Leghold traps, cage traps, body-gripping traps or snares.

Baits and lures: Carrots, apples slices, sweet potatoes and lettuce.

Common Name – Opossum

Scientific Name – *Didelphis virginiana*

Description: Opossums are North America's only marsupial or pouched mammals and were introduced to Oregon from the southern states during the 1930s. An adult opossum is about the size of a large house cat and resembles a cream- or gray-colored rat with a pointed snout and a long, naked tail. The gray color is from the white guard hairs over black-tipped underfur. The ears are naked, black at the base and lighter at the tips. The female has a fur-lined pouch on the belly, similar to that of a kangaroo. The tail is prehensile, meaning it can be used to grasp branches or other objects. Opossums range in weight from 4 to 12 pounds but average about 6 pounds. Males may be twice the size and length as females of the same age.

Protection Status: Non-native and a "Prohibited Species" in Oregon. Prohibited species must be euthanized.

Habitat: Opossums may prefer brushy areas near streams, forest communities or agricultural lands but they have easily adapted to both urban and suburban landscapes. Den sites include cavities in rocks, brush piles, trash heaps, hollow trees, fallen logs and old buildings.

Habits: Opossums are shy, secretive and primarily nocturnal. They tend to be somewhat nomadic and have no fixed home range. Opossums are not aggressive, but when threatened they may bare their teeth, growl, hiss, bite, screech and exude a smelly, greenish fluid from their anal glands and when pursued opossum often climb trees in an attempt to escape. A common means of defense is feigning death which is where the saying "playing opossum" comes from. The animal rolls over on its side, becomes limp, shuts its eyes and lets its tongue hang out. The heart beat is slowed. This reaction is a brief nervous shock, but the animal quickly recovers and escapes at the first opportunity. Although neither sex is particularly active when the temperature is below 20^0 F, the female shows a greater tendency than males to "hole up" during very cold weather. Their feet are adapted for climbing and the opposable toe on the hind foot assists in holding onto small branches. The have the ability to support themselves entirely by the tail if at least half of the tail can grasp a branch.

Reproduction: Most breeding occurs in February or March, but a second peak of breeding activity occurs in late May through June after the first litters are weaned. A

female may breed at either or both of these times. The average number of young is seven, but ranges from 5 to 11 after a gestation period of 13 days. Young are born blind and incompletely developed. Each is less than one-half inch long and weighs 1/175th of an ounce. The young climb up a fur pathway into the pouch and attach to a teat for about 60 days as they continue to develop. At 60 days of age the young are about the size of a mouse and the eyes are open. Young stay with the female for about 100 days. Breeding occurs the year following birth.

Diet: Opossums are omnivores; they eat fruits, vegetables, insects, small mammals, birds, eggs, carrion, garbage and pet food.

Sign: Opossum tracks are very distinctive; especially the wide angled "big toe" (opposable thumb) on the hind foot. Opossum dropping are not distinctive and vary according to the type of food eaten.

Predators: Predators of opossums include dogs, people, foxes, coyotes and great-horned owls.

Diseases: Tularemia and rabies. Opossums are very resistant to rabies; however it can occur in the species.

Parasites: Mites, ticks, lice, fleas, roundworms, flukes and tapeworms.

Prevention and Control:

Exclusion:

- Repair any holes of weak area on structures.
- Close openings to crawl spaces and other parts of the structures.
- One-way doors.

Habitat Modification:

- Remove pet food and water dish from outside at night.
- Secure garbage cans and compost bins.
- Keep areas around fruit trees picked up.

Trapping: Box or cage traps.

Baits and lures: Almost any strong-smelling food lure or bait will attract opossum, including tainted meat, fruit, or fish.

Common Name – Porcupine

Scientific Name – *Erethizon dorsatum*

Description: Slow moving, gray-brown, chunky body, high arching back, short legs and thousands of quills on back, rump and tail.

Protection Status: On private property it is considered a “Predatory Animal” and unprotected mammal on public property.

Habitat: The porcupine is a common resident of the mixed hardwood and coniferous forests of Oregon.

Habits: Porcupines are nocturnal and solitary animals and active year-round, often resting in trees during the day. They favor caves, rock slides and thick timber downfall for shelter. They can cause considerable damage to trees and plants by girdling, basal gnawing or branch clipping. A common myth is that porcupines throw their quills. This is a misconception. When approached, a porcupine normally presents it backside and may thrash their tail from side to side as a defensive move and sometimes a quill may come off, but they do not throw their quills.

Reproduction: Porcupines breed from September to November and usually produce one offspring between April and May after about a 211 day gestation period. The young can start climbing trees within a few days and are weaned within a week or two.

Diet: Porcupines eat herbaceous plants, inner tree bark, twigs and leaves with apparent preference for ponderosa pine, hemlock, Douglas fir, aspen, willow, cottonwood trees and mistletoe. They will also eat developing buds, roots, grasses, berries and fruits depending on the season. They are especially fond of salts and other minerals and will chisel away at the bones of dead animals and the shed antlers of deer and elk.

Sign: Clipped twigs, tracks and gnawing on trees.

Predators: Coyotes, bobcats, mountain lions, black bears, fishers, martins, foxes, great-horned owl, people and dogs.

Diseases: Rabies and leptospirosis.

Parasites: Fleas, ticks, mites and roundworms.

Prevention and Control:

Exclusion:

- Fencing with electric wire on top.
- Wire basket completely enclosing small trees
- Band of 30 inch aluminum flashing encircling the trunk of the tree.

Trapping: Cage traps, box traps and foothold traps.

Baits and lures: Salt baits and coyote urine.

Common Name – Raccoon

Scientific Name – *Procyon lotor*

Description: The raccoon is a stocky, medium-sized furbearer. The fur on the back is usually a grizzled black, washed with gray or yellow. The belly fur is lighter in color. All raccoons have distinctively darker hair around their eyes that forms what looks like a mask. Their tail is distinctive because it has alternating bands of light and dark fur. Raccoons have a broad head with a pointed muzzle. The feet are naked and possess five prominent toes. Adults have a total length in the range of 24 to 41 inches. They typically weigh from 8 to 20 pounds.

Protection Status: Furbearer.

Habitat: Raccoons appear throughout Oregon. They can be found just about anywhere that food, shelter and water are available. Raccoons den in a wide variety of locations, including hollow trees, junk piles, abandoned buildings, culverts, under houses and attic spaces.

Habits: Raccoons are generally nocturnal, but they may be seen out in the daytime, especially early in the spring and fall. Raccoons will try to gain as much weight as possible in the fall, storing up a fat reserve for the cold days of winter. For this reason, raccoons have a voracious appetite in the fall. Shifts in the raccoon's diet occur rapidly in the fall as different foods become available. Raccoons will often den up during extremely cold or severe weather and take a short winter sleep, but they do not hibernate.

Reproduction: Generally, 60 percent of the females breed as one year olds, while 90 percent of the females over one year old will breed. The number of yearling females that breed may fluctuate greatly depending on population density. Males may breed at one year of age, but rarely do so because older, more aggressive males out-compete them for mates. Males are sexually active from late December through May or June. Most breeding activity takes place in February. Gestations are typically 63 days and females have one litter per year. There are usually 3-4 young per litter. Most young are born in late March through early May. The young are weaned when 8-10 weeks old and may be seen out of the den at this time. Males do not help raise the young. The young may stay with the females as a loosely knit family until the following breeding season.

Diet: The raccoon is a true omnivore. Some of the wide variety of foods consumed by the raccoon include: birds, eggs of all kinds, crayfish, insects, fish, frogs, mice, rats, fruits, berries, corn, nuts and pet food.

Sign: Raccoon tracks are quite distinctive. Tracks may be found anywhere, but they are most easily seen and studied along muddy shorelines. Raccoon scats are also distinctive and may be found near denning areas.

Predators: Humans, cougars, bobcats, foxes, great-horned owls, coyotes and dogs.

Diseases: Canine and feline distemper, leptospirosis, parvovirus, pseudorabies, tuberculosis and rabies are all known to occur in raccoons.

Parasites: Ticks, lice, fleas, botfly, roundworms *(Baylisascaris*), flukes and tapeworms.

Prevention and Control:

A radio set to a talk station and/ or strobe light placed in an attic or crawl space in which a raccoon is denning is often sufficient to cause a raccoon to move from the area and take their young.

Exclusion:

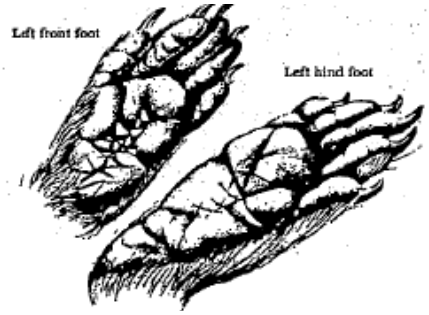
- Single-wired electric fence located 8 inches above the ground.
- Confine birds in an enclosed and covered area.
- Hardware cloth around decks and bury at least 6 inches down and 6 inches out from the building.
- Replace and reinforce damaged screen vents.
- Install metal guards (flashing) that are at least 18 inches wider, wrapped around trees at about five to six feet above the ground.
- Keep crawl spaces tightly covered.
- Secure pet doors at night or use electronic pet doors.
- Secure caps on chimneys.
- Raccoon eviction paste
- One-way doors

Habitat Modification:

- Remove pet food and water dishes during the evening through morning time period.
- Secure garbage can lids.
- Prune trees at least 3 feet above roof lines.
- Securely cover compost bins.
- Remove brush piles.

Trapping: Live or cage-type trap, foot-hold traps, specialty traps.

Baits and lures: Many baits and lures attract raccoons; apples, corn, fish, peanut butter and marshmallows are common baits. Honey, anise, apple juice and fish oils are common lures.



Common Name – Striped Skunk

Scientific Name – (*Mephitis mephitis*)

Description: A member of the weasel family, the striped skunk is black with white on its head and two stripes that begin at the neck and extend back toward the hip region. The length of theses stripes is quite variable, and a few skunks are completely black. The large bushy tail is mainly black, but is mixed with white to varying degrees. Skunks are wide-backed with a relatively small head. Most striped skunks weigh from four to ten pounds.

Protection Status: Unprotected mammal.

Habitat: Skunks are at home in a variety of habitats, but prefer timber borders, brushy field corners, fence rows, rock piles, old building sites and open grassy fields. They customarily den in the ground, but occasionally rock piles, refuse dumps, stumps and buildings will be used as denning sites.

Habits: Striped skunks may leave their dens at any time of day but usually begin foraging in the late afternoon and are active most of the night. Because of these nocturnal habits, they locate prey by their sense of smell and hearing rather than sight. Their winter activity depends upon temperature. They may go into a winter sleep for many weeks or months if cold weather persists. Skunks are generally not sociable animals but they will den together for warmth. Striped skunks will spray a very pungent musk when disturbed. Skunks are capable of spewing several shots of oily, yellowish spray at a target 10 to 12 feet away.

Reproduction: Mating occurs in February and March with a gestation period of 63 days. An average of 6 kits are born almost naked in April or May, but possessing the adult's characteristic black and white markings. Eyes open at about 3 weeks, and young assume a weakly defensive pose at that time. Weaning is completed at 2 months of age and at that time they are capable of spraying.

Diet: Skunks are omnivores and eat both plant and animal foods. Insects, insect larvae and earthworms are important food for skunks when in season. Skunks occasionally are nuisances for beehive owners, feeding on bees and honey with no

apparent concern for being stung. They will eat birds and bird eggs and small mammals, as well as scavenge on the carrion of larger animals.

Sign: Tracks (five toes on both front and back), the animal's distinctive smell and scat containing undigested insect parts. Digging usually results in small 3 to 4 inch cone-shaped holes or patches of upturned earth.

Predators: Great-horned owls, bobcats, foxes, coyotes, people and dogs.

Diseases: Pseudorabies, distemper, rabies, canine hepatitis and leptospirosis.

Parasites: Mites, lice, ticks, fleas, roundworms and tapeworms.

Prevention and Control:

Exclusion:

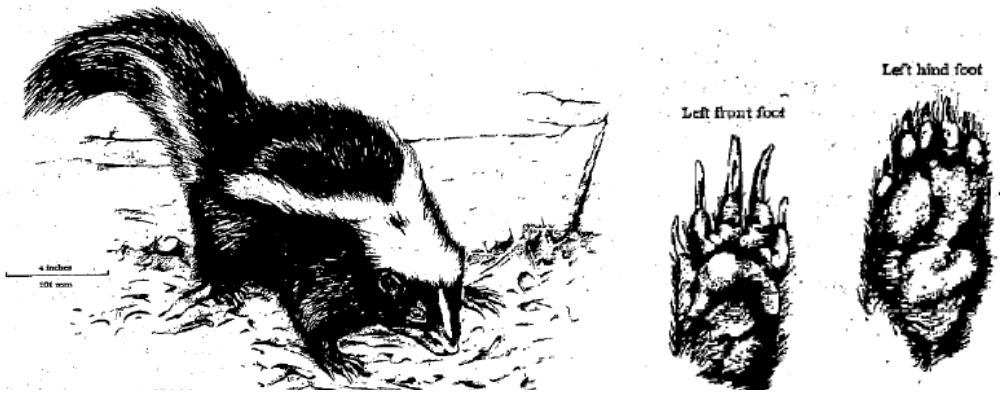
- Install fencing that extends 1 to 2 feet below ground.
- Seal foundation openings.

Habitat Modification:

- Remove lumber and junk piles.
- Store garbage in tightly sealed cans.
- Clean up pet food and bring pet food and water dishes in at night.
- Use insecticides to control grubs in lawns.
- Restrict use of birdseed.
- Never leave out food for wild animals.
- Remove fruit that has dropped to the ground.

Trapping: Cage traps, Box traps, Snares or Foothold traps.

Baits and lures: Commercial fox and coyote lure, scents and baits, fresh or tainted meat, fish, fish oil, eggs or peanut butter.



Oregon Species List

Common Name	*Family (subfamily)*	
Order Didelphimorphia		
Virginia Opossum	*Didelphidae*	*Didelphis virginiana*
Order Insectivora		
Broad-footed Mole	*Talpidae*	*Scapanus latimanus*
Coast Mole		*Scapanus orarius*
Townsend's Mole		*Scapanus townsendii*
Order Lagomorpha		
American Pika	*Ochotonidae*	*Ochotona princeps*
Pygmy Rabbit	*Leporidae*	*Brachylagus idahoensis*
Brush Rabbit		*Sylvilagus bachmani*
Eastern Cottontail		*Sylvilagus floridanus*
Mountain Cottontail		*Sylvilagus nuttallii*
Snowshoe Hare		*Lepus americanus*
Black-tailed Jackrabbit		*Lepus californicus*
White-tailed Jackrabbit		*Lepus townsendii*
Order Rodentia		
Mountain Beaver	*Aplodontidae*	*Aplodontia rufa*
Yellow-pine Chipmunk	*Sciuridae*	*Tamias amoenus*
Least Chipmunk		*Tamias minimus*
Allen's Chipmunk		*Tamias senex*
Siskiyou Chipmunk		*Tamias siskiyou*
Townsend's Chipmunk		*Tamias townsendii*
Yellow-bellied Marmot		*Marmota flaviventris*
White-tailed Antelope Squirrel		*Ammospermophilus leucurus*
California Ground Squirrel		*Spermophilus beecheyi*
Belding's Ground Squirrel		*Spermophilus beldingi*
Merriam's Ground Squirrel		*Spermophilus. canus*
Columbian Ground Squirrel		*Spermophilus columbianus*
Wyoming Ground Squirrel		*Spermophilus elegans*
Golden-mantled Ground Squirrel		*Spermophilus lateralis*
Piute Ground Squirrel		*Spermophilus mollis*
Washington Ground Squirrel		*Spermophilus washingtoni*
Eastern Gray Squirrel		*Sciurus carolinensis*
Western Gray Squirrel		*Sciurus griseus*
Eastern Gray Squirrel		*Sciurus niger*
Douglas' Squirrel		*Tamiasciurus douglasii*
Red Squirrel		*Tamiasciurus hudsonicus*
Northern Flying Squirrel		*Glaucomys sabrinus*
Botta's Pocket Gopher	*Geomyidae*	*Thomomys bottae*
Camas Pocket Gopher		*Thomomys bulbivorus*
Western Pocket Gopher		*Thomomys mazama*
Northern Pocket Gopher		*Thomomys talpoides*

Townsend's Pocket Gopher		*Thomomys townsendii*
Little Pocket Mouse	*Heteromyidae*	*Perognathus longimembris*
Great Basin Pocket Mouse		*Perognathus parvus*
Dark Kangaroo Mouse		*Microdipodops megacephalus*
California Kangaroo Rat		*Dipodomys californicus*
Chisel-toothed Kangaroo Rat		*Dipodomys microps*
Ord's Kangaroo Rat		*Dipodomys ordii*
American Beaver	*Castoridae*	*Castor canadensis*
Western Harvest Mouse	*Muridae Sigmodontinae*	*Reithrodontomys megalotis*
Canyon Mouse		*Peromyscus crinitus*
Deer Mouse		*Peromyscus maniculatus*
Pinon Mouse		*Peromyscus truei*
Northern Grasshopper Mouse		*Onychomys leucogaster*
Bushy-tailed Woodrat		*Neotoma cinerea*
Dusky-footed Woodrat		*Neotoma fuscipes*
Desert Woodrat		*Neotoma lepida*
Norway Rat	*Muridae Murinae*	*Rattus norvegicus*
Black Rat		*Rattus rattus*
House Mouse		*Mus musculus*
Western Red-backed Vole	*Muridae Arvicolinae*	*Clethrionomys californicus*
Southern Red-backed Vole		*Clethrionomys gapperi*
White-footed Vole		*Phenacomys albipes*
Heather Vole		*Phenacomys intermedius*
Red Tree Vole		*Phenacomys longicaudus*
California Vole		*Microtus californicus*
Gray-tailed Vole		*Microtus canicaudus*
Long-tailed Vole		*Microtus longicaudus*
Montane Vole		*Microtus montanus*
Creeping Vole		*Microtus oregoni*
Water Vole		*Microtus richardsoni*
Townsend's Vole		*Microtus townsendii*
Sagebrush Vole		*Lemmiscus curtatus*
Common Muskrat		*Ondatra zibethicus*
Western Jumping Mouse	*Dipodidae*	*Zapus princeps*
Pacific Jumping Mouse		*Zapus trinotatus*
Common Porcupine	*Erethizontidae*	*Erethizon dorsatum*
Nutria	*Myocastoridae*	*Myocastor coypus*
Order Carnivora		
Coyote	*Canidae*	*Canis latrans*
Gray Fox		*Urocyon cinereoargenteus*
Red Fox		*Vulpes vulpes*
Ringtail	*Procyonidae*	*Bassariscus astutus*
Raccoon		*Procyon lotor*
American Marten	*Mustelidae*	*Martes americana*
Fisher		*Martes pennant*

Ermine		*Mustela ermine*
Long-tailed Weasel		*Mustela frenata*
Mink		*Mustela vison*
American Badger		*Taxidea taxus*
River Otter		*Lutra canadensis*
Western Spotted Skunk	*Mephitidae*	*Spilogale gracilis*
Striped Skunk		*Mephitis mephitis*
Bobcat	*Felidae*	*Lynx rufus*

Part 8

Acknowledgements
References/Resources

Acknowledgements

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Rick Boatner, Oregon Department of Fish and Wildlife; Mike Marshall, Moondance Wildlife Control; Dr. Colin Gillin and Dr. Peregrine Wolff, Oregon Department of Fish and Wildlife, Veterinarian; Terry Brant, Aspen Wildlife Control; Jerry Wilson; Dr. Jon Boren, Extension Wildlife Specialist, New Mexico State University; Steve Dermand, Executive Officer Iowa Department of Natural Resources, Dr. Douglas Cottam, Keith Kohl, Kevin Blakely and Larry Cooper, Oregon Department of Fish and Wildlife.

Reviewers:
Jerry Wilson, Bob Sallinger, Tim Chambers, Ivan Hartert, Geoff Schmitt, Becky Richardson, Bob Gilman, Kelly Peterson, Lori Henning, Wes Lydell, Jeremy Thompson, David Nuzum, Michelle Dennehy and Brian Wolfer

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Revised: December 2015