

Ch. 4: A common sense approach to job safety

Overall learning objectives for this chapter

- Identify risks associated with the presence of nuisance wildlife and with wildlife control techniques.
- Understand how to protect yourself from falls, bites, heat stress, and wildlife diseases.
- Know which protective gear and safety equipment belongs in the NWCO “wardrobe.”
- Be familiar with the wildlife diseases that you’re most likely to encounter.
- Feel confident you can answer the common questions customers ask about wildlife diseases.
- Know who to contact if you’re dealing with a sick animal.

Relax, but don’t fall asleep at the wheel

“Had this squirrel job in an old house. I stepped off my ladder onto the metal roof, and pow! Those squirrels must have chewed through some wires that were touching the roof. The entire thing was electrified. I was lucky I didn’t fall off the roof.”

—Eric, NWCO in Connecticut

Throughout this chapter, we’ll discuss risks related to NWCO work or the presence of wild animals inside homes or businesses. In most cases, you’ll be called in after an animal has caused damage. The risk is easy to understand because the results are right there. What about those times when you see evidence of *possible* problems?

What’s the worst that could happen? How likely is it? Can the situation be prevented? These are the kinds of questions that will help you put things into perspective. For example, wildlife in the Northeast could potentially expose a person to about 200 different diseases. We’ll only discuss nine of them because the chances of being exposed to the others are very low.

NWCOs are more likely to be hurt by a car accident or a fall from a ladder than from a wildlife-related disease, but it’s West Nile that makes the news, isn’t it? We hope this chapter will help you better understand the risks posed by your work, so you can make good choices.

SECTION ONE: RISKS FACED BY YOUR CUSTOMERS

Learning objectives

- 4.1 List four risks that nuisance wildlife pose to your customers’ health and safety.
- 4.2 Identify an example of wildlife damage that might concern a: business owner, apartment dweller, wildlife biologist, home owner, farmer, or government official.
- 4.3 Name two ways a method used to remove wildlife pests can be dangerous to the environment and people.

Risks that may come with the pests

When some wild species move in, they can put your customers and their property at risk. Some people don’t understand the possibilities until it’s too late. Others overreact. By offering credible information in a professional manner, you can help your customers make sensible decisions.

There are safety risks. Rodents, raccoons, and birds can cause fires by chewing wires or blocking vents or fans with their nests (fan motors might overheat and ignite the highly flammable nest materials). If a nest blocks a chimney, dangerous fumes could be trapped inside. Chewed wires may also cause electronic systems to fail—imagine the consequences in a jail or hospital. As previously mentioned, wildlife may collide with airplanes and cars.

And health risks. You, your customers, their pets and livestock might be bitten, scratched, or exposed to a wildlife disease, such as rabies. NWCOs are more likely to encounter a wildlife disease than the average person, because they often handle wild animals, and spend a lot of time in disease hot spots such as attics and crawl spaces. The close presence of wild animals (and their fur, dander, droppings, or parasites) can also trigger allergies in some people. Wild animals are often noisy at night, which might deprive your customers of sleep. That doesn’t sound too bad, until it’s happened night after night after night.

Nuisance wildlife pose financial risks. To gain entrance to a building, some animals might destroy parts of the exterior. Once inside, they might chew or soil woodwork and many other materials; items stored in attics are particularly vulnerable. Raccoons and mice often ruin insulation, causing heating and cooling bills

to rise. Chewed wires, of course, might need replacement, which can be expensive. Remember some of the estimates of damage to crops, landscapes, dams, and roads mentioned in the introduction?

They may threaten other wildlife or change habitats. A nuisance animal may introduce a disease to another species. In large numbers, the nuisance species might kill and eat many of that other species, or destroy their habitat.

Some of the removal methods present their own dangers to people and the environment. An improperly set trap may capture or injure the wrong species, and could even be hazardous to people. If misused, pesticides can contaminate water, soil, and air. They can kill other species too, including beneficial organisms that help control pest populations. Certain pesticides and euthanasia products can also be dangerous to people. Even exclusion, one of the favored methods, has risks associated with it, because a highly motivated animal may damage the building to get back in, especially if it has young inside.



Has a giant alien worm invaded the lawn, ready to strike your customer's child? No, of course not. These are mole tunnels, made by a creature that poses few health or safety risks to people. If this happened to the greens of a golf course, the manager might consider it a financial risk. Whether or not your customers call this a nuisance depends on their perspectives.

Higher, deeper, further...

- Walk around your neighborhood and look for signs of wildlife damage.
- Start a file of newspaper clippings of stories about nuisance wildlife problems.
- Ask your friends, neighbors, or local business people if they've experienced any losses caused by wildlife.

Summary

Before you move on, you may wish to review the learning objectives for this section:

- 4.1 *List four risks that nuisance wildlife pose to your customers' health and safety.*
- 4.2 *Identify an example of wildlife damage that might concern a: business owner, apartment dweller, wildlife biologist, home owner, farmer, or government official.*
- 4.3 *Name two ways a method used to remove wildlife pests can be dangerous to the environment and people.*

SECTION TWO: RISKS THAT COME WITH YOUR JOB

Learning objectives

- 4.4 Draw a diagram showing the recommended way to position a ladder against a building.
- 4.5 List three tips for the safe use of ladders.
- 4.6 Define “zoonotic disease” and “zoonoses.”
- 4.7 Describe the type of clothing that will help you avoid being stung by insects.
- 4.8 Name six warning signs of heat stroke and one way to prevent it.
- 4.9 List three ways to quickly cool down someone who’s suffering from heat stress.
- 4.10 Identify the best way to protect yourself from a tetanus infection.

Even some of the equipment used to remove wildlife can be dangerous, so it’s sensible to stay alert to the latest information about the safe and effective use of traps, firearms, and ladders.

This section briefly discusses some of the safety issues you’ll confront on the job and describes tips for avoiding accidents. For more detailed information, check the U.S. OSHA (Occupational Health and Safety Authority) website at www.osha.gov, or some of the other resources listed in the appendix.

The most dangerous thing you handle isn’t furry

“I was working on this bird job in an equipment shed. We were nearly done; I just needed to treat one last area. I was using a 20-foot straight ladder, but the roof was about 15 feet in that spot. Instead of getting a shorter ladder, I set the long one against the rafter and started up. Just as I reached the rafter, the ladder slipped, and down I went. End result: cracked rotator cup in my elbow, dislocated toe, multiple fractures in my feet, large gash across my knee.”

—Wayne Langman, NWCO in Indiana

Like contractors, NWCOs spend a lot of time on ladders and roofs, but unlike roofers, NWCOs also contend with another hazard: the unpredictable actions of wild animals. Carrying a trap containing a scared or aggressive animal down a ladder is a bit more exciting than toting a bucket of nails. So NWCOs have a few more items to add to their list of safety issues.

Safety precautions can be a pain; they slow you down and inhibit your mobility. It’s hard to justify taking the time during the busy season, especially if you just need to quickly check a trap and you have so many other jobs waiting. Very few people die from diseases they caught from wildlife, but accidents associated with ladders are fairly frequent and often serious. In 1993, for example, falls accounted for 11% of the deaths from all job-related injuries in upstate New York (8% in New York City). When you include accidents at home, falls were the fourth leading cause of death from injury, and the number one cause of hospitalizations. [These statistics, from the New York State Department of Health, refer to all occupations, not just nuisance wildlife control].

Accidents usually happen when someone is hurried or distracted and not concentrating on safety. Sometimes the condition of the ladder is at fault. Sometimes it’s your shoes, or wet or icy conditions. Wind might overcome the stability of the ladder and tip you over.

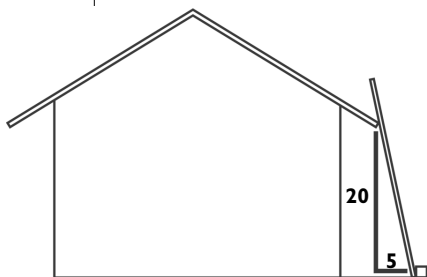
If you run a small business, it’s up to you to decide how much risk you’re comfortable with; however, if you have ten or more workers, you’re covered by OSHA regulations. Even if your business is exempt, you may still want to check out their website, www.osha.gov/SLTC/fallprotection/index.html. Here’s a basic summary of the OSHA recommendations for the safe use of ladders.

Setting up the job:

- First, make sure that the ladder is the right design and strength for the job.
- If using fall protection equipment, such as life lines, lanyards, and harnesses, seek proper training in the use and selection of those materials.
- Make sure you’re using a climbing rope that is rated for people.



This NWCO wears a safety harness attached to a retractable lanyard system that would arrest a fall. This protection still provides enough mobility to install the bird netting on the bridge.



- Follow the manufacturer's instructions for placing the ladder at a safe angle. There should be no more than a 4:1 ratio between the height to the roof's edge and the distance from the eave. In

this illustration, the roof edge is 20 feet up, which means that the base of the ladder needs to be 5 feet out from the eave to achieve the 4:1 ratio (not drawn to scale).

- The top of the ladder should extend 3 feet above the roof.
- Secure ladders properly to a strong structure, especially if you are going to step off the ladder onto the roof, or when you'll be working on the ladder for any length of time. Keep the bottom of the ladder from slipping using braces or an anchor board. Tie the "fly" section (the moveable part) and base together at their overlap. Secure the top of the ladder using ladder rungs or "ropes" (the types of ropes that are rated for this use are more properly called "life lines" and "lanyards").
- The ladder must be as firm as possible. The base must be flat, level, and secure. Use equipment to stabilize the base if the ladder's on uneven ground. If you can't secure the base, choose another spot for your ladder.
- Inspect equipment frequently and don't use damaged ladders. Replace lanyards and harness after a fall.
- Pad ropes so they don't chafe against the roof's edge.
- If using an aluminum ladder, watch out for electrical services to avoid electrocution.

Climbing and dismounting:

- The likelihood of falling is not directly related to your weight or size.
- Climb slowly and surely and always face the ladder. Avoid the temptation to lean off the side of the ladder because that may make you lose your balance.
- Keep three parts of your body in contact with the ladder (either both hands and a foot, or both feet and one hand).
- Don't carry heavy or bulky items as you climb. Pull them up on a towline, attach them to your tool belt, or have them handed up to you.

- Wear shoes with strong soles, and keep them clean for maximum traction.
- Dismount by stepping sideways onto the roof, don't step over the ladder.



Tips from NWCOs and safety experts:

- If you don't feel safe, don't do it. You can always rent a bucket lift. The rental costs can even make sense financially, because you could lose a lot more money if you had an accident that keeps you away from work for a long time.
- Watch out during the spring and fall, when temperatures fluctuate a lot. That can lead to condensation on the roof and very slippery conditions.
- Carry a cell phone with you, especially if you're working solo. That way, if you have an accident and need help, you can call someone.
- To check whether or not there's an animal in a trap without climbing onto the roof, try this simple device. Fasten a car's side-view mirror onto a long pole. Raise the pole to see the trap from the ground.
- For more details, see the OSHA website at www.osha.gov. Another great source of advice is the building industry. Roofers have a lot of relevant experience, and like you, they're up there trying to get their work done.

Wildlife diseases

"Zoonotic diseases" or "zoonoses" are illnesses that people can catch from animals or from contact with their habitats. There are about 200 zoonotic diseases. (Details for the zoonoses most relevant in the Northeast will be discussed later.)

As previously mentioned, risks associated with ladders are far more significant for NWCOs, but some wildlife diseases can also be fatal to people. Even if you're comfortable with your personal risk, you owe it to your customers to be cautious. You have no way of knowing how healthy they are; some may have compromised immune systems because they suffer from cancer, diabetes, AIDS, or other illnesses. A disease you could shrug off might be no laughing matter for them.

Diseases can also spread to other wildlife species and devastate their populations, a major worry if the affected species is endangered or a prized game species.

As a professional, behave in ways that minimize the risk of exposing others to disease and also help prevent the spread of the disease to other areas, or other species. This concern influences your animal handling and disposal procedures, your choice of gear, customer education, and clean-up strategies for the site and your equipment.

Rabies is a prime example of the important role NWCOs play in protecting public health. Rabies is so widespread in wildlife in New York and the Northeast that the state health department recommends treating any skunk, raccoon, or bat you approach as “rabid until proven innocent.” This disease is always fatal once symptoms appear. (Four people who had been given some vaccination—but not in the recommended way—did develop the disease and still survived, although they suffered severely). Yet there are only about one or two human deaths caused by rabies each year in the U.S., according to the CDC (Centers for Disease Control and Prevention). One reason for this remarkably low number is the vigilance of health department staff, NWCOs, veterinarians, and many others.

Want to read about a disease right away?

Rabies:	pg. 14
Raccoon roundworm:	pg. 19
Histoplasmosis:	pg. 21
Toxoplasmosis:	pg. 23
Hantavirus:	pg. 25
Mange:	pg. 27
Distemper:	pg. 27
West Nile virus:	pg. 29
Lyme disease:	pg. 31

Bites and stings

When practical, avoid situations in which you might get bitten or stung, especially if you’re allergic to wasp or bee stings. There’s gear that can help protect you from bites, such as animal handling gloves, catchpoles, and traps with protective plates around the carrying handle (gear will be discussed in more detail later). In

some cases, a strategic retreat may be in order. If holding onto the animal means you’re probably going to be bitten, maybe you just let it go and then try again. If you are bitten by a mammal or bird, call the Department of Health for advice.

To reduce your chance of being stung by an insect, wear light-colored but not colorful clothing. When you approach the nest, be careful not to vibrate it or shine a light directly on it. “Bee suits” may be warranted if you’re dealing with a large nest.

What about sprays? The DEC makes reasonable allowances for workers in dangerous situations, such as NWCOs who are up on ladders. You can use an over-the-counter spray to protect yourself from stinging insects. The DEC prefers that those who may encounter stinging insects on a regular basis seek certification as a pesticide applicator.

Heat-related illnesses

“I was removing a large starling nest from an attic. The nest was 6–8 feet tall and almost as big around. Because of the dust, I was wearing a respirator. I wasn’t moving around much, just bagging up the nest. After an hour, I noticed I was getting light-headed. As soon as I moved, the dizziness really hit me. It was all I could do to get to the ladder and get down in one piece. If I hadn’t recognized the symptoms I could have collapsed up there and maybe died from the heat.”

— Wayne Langman, NWCO in Indiana

NWCOs have to go where the animals are. Often, that takes you into an enclosed space that’s hot and stuffy. To make things worse, there’s a good chance you’ll be wearing protective gear that will make you even hotter. This can lead to a variety of heat-related conditions, such as heat rash, heat cramps, heat exhaustion, and heat stroke.

Heat stroke is the most serious condition—it’s a life-threatening emergency. Heat stroke can kill quickly or cause permanent brain damage. Your body temperature can rise to 106°F or higher within 10 to 15 minutes.

Milder forms of heat-related illnesses, such as heat exhaustion, can develop into heat stroke if untreated. Even the milder conditions can be serious for NWCOs because they might lead to accidents, especially falls. Dizziness, fogged safety glasses, slippery, sweaty palms, compromised balance, and outright fainting could make you fall off a ladder or beam.

Under hot conditions, some workers can lose as much as 2–3 gallons of water a day through sweat. You need to drink about as much water as you lose to sweat to avoid dehydration.

Don't count on thirstiness to signal when you need to drink because it's not a reliable indicator. Just plan on drinking 5–7 ounces of water every fifteen minutes, or one quart every hour.

Warning signs of heat stroke:

- hot skin, usually dry, red, or spotted
 - extremely high body temperature, 105°F or higher
 - no sweating
 - confusion or delirium
 - unconsciousness
 - convulsions
 - vomiting
-

Warning signs of heat exhaustion:

- moist, clammy skin
 - pale or flushed complexion
 - body temperature is normal or slightly high
 - heavy sweating
 - giddiness, dizziness, or fainting
 - headache, perhaps really throbbing
 - queasiness
 - extreme weakness or tiredness
 - in more serious cases, person may also vomit or become unconscious
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What to do:

Call 911 and seek immediate medical attention if: the symptoms are severe; you have heart problems or high blood pressure; the symptoms worsen; or the symptoms last more than an hour.

Cool down as fast as you can. Douse yourself with cool water from a shower or garden hose. Go to an air-conditioned room. Drink cool, nonalcoholic drinks; ideally, about 5–7 oz. of water every fifteen minutes. Do whatever it takes and continue until your body temperature drops to 101–102°F. Call the hospital emergency room or rescue squad for further instructions.

If the person is vomiting, turn him on his side to keep his airway open. **If he's experiencing convulsions,** make sure he doesn't hurt himself but don't place any objects in his mouth, and do not give him fluids.

Best ways to prevent heat-related problems:

- Give yourself a few days (ideally, 4–7 days) to get used to the heat by gradually increasing the amount of time you spend in hot areas. If you're out of the heat for more than a week, you need to do this again.
- Take a break every hour while you're working in a hot spot (80°F or hotter) especially if the humidity is high. Move to a cool spot.
- During your cool break, drink at least one quart of water.
- Eat light, cold meals, preferably those lower in fat, because fat is harder to digest in hot weather.
- No alcoholic drinks.
- Do the job early in the morning whenever possible, especially if it requires a lot of time in an attic or crawlspace.
- Work with another person if you can, so you can check each other for signs of heat stress.

For more information, see:

- "Working in hot environments," CDC report, at: www.cdc.gov/niosh/hotenvt.html#prepare
- "Protecting workers in hot environments," OSHA report 95-16, at: www.osha.gov/pls/oshaweb/owadis.show_document?p_table=FACT_SHEETS&p_id=167

Tetanus (a.k.a. “lockjaw”)

Tetanus is an infection caused when the toxin of the bacterium, *Clostridium tetani*, is released into a wound, usually through a deep puncture. It’s often fatal. This disease is also known as “lockjaw” because the muscles of the jaw and neck contract spasmodically.

NWCOs are most likely to suffer puncture wounds two ways: either through an animal’s bite or by accidentally impaling themselves on a nail, which is a common hazard in attics and barns. Be especially alert for nails in horse barns because many horses are infected with the tetanus bacteria.

The right gloves provide excellent protection from bites but they’re not foolproof. Some of the larger carnivores can bite through even heavy-duty gloves. To protect yourself from a tetanus infection, get a tetanus immunization every ten years. If you receive a puncture wound and it’s been more than five years since your last tetanus shot, your doctor may recommend another shot.

Electrocution and other safety risks

Many buildings contain old wiring systems, such as “post and tube.” If there was any insulation on the wires, it may have deteriorated. You could be working around bare wires that are “live.” Touch one and you could be electrocuted. (This also happens to rodents and birds.) Anything that is metal, such as a roof, can become electrified. Be especially alert for dangers when in an old or poorly maintained building. Will the attic floor bear your weight? Are the joists solid? Slate roofs can be very slippery, especially when wet. To learn how to recognize and avoid hazards associated with particular building styles, talk to those in the building trades.

Higher, deeper, further...

- Check the OSHA website for more information about fall protection. Write the best tips on an index card, laminate it, and attach it to the visor of your truck.
- Contact the Red Cross for more ideas about how to prevent or treat heat-related illnesses.
- Find out which types of wasps most frequently sting people. Are there any harmless insects that could be mistaken for them?
- Seek training in first-aid and CPR (cardiopulmonary resuscitation).

Summary

Before you answer the review questions, you may wish to think about the learning objectives for this section:

- 4.4 Draw a diagram showing the recommended way to position a ladder against a building.
- 4.5 List three tips for the safe use of ladders.
- 4.6 Define “zoonotic disease” and “zoonoses.”
- 4.7 Describe the type of clothing that will help you avoid being stung by insects.
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- 4.10 Identify the best way to protect yourself from a tetanus infection.

Review questions

1. Diseases that people can catch from animals or from contact with their habitats are called
 - a). “epinotic diseases”
 - b). “zooposies”
 - c). “zoonotic diseases”
 - d). “mammalian diseases”
2. If a ladder is placed 20 ft. high, the base of the ladder should be
 - a). 20 feet from the side of the building
 - b). 10 feet from the side of the building
 - c). 5 feet from the side of the building
 - d). firmly attached to the building

3. Wear colorful clothing to avoid being stung by insects. (Circle correct answer)

True False

4. The odds of falling are related to

- a). your weight and height
- b). the condition of the ladder
- c). weather conditions
- d). type of shoes worn
- e). more than one answer is correct

5. What's the best way to prevent suffering from heat stroke or heat exhaustion if you have to work in a hot attic?

- a). take a break every hour and drink one quart of water
- b). finish up the job quickly so you can go get a drink
- c). wear protective gear
- d). schedule jobs for late in the afternoon

Answers:

1—c

2—c (apply the 4:1 ratio. $20 \div 4 = 5$)

3—false

4—e (The condition of the ladder and weather conditions affect your chances of falling. Your height and weight don't. Shoes play a minor role. Some types might provide better traction on some kinds of roofs, but it would be impractical to change your shoes throughout the day.)

5—a

SECTION THREE: COMMON SENSE PRECAUTIONS REQUIRE SOME UNCOMMON GEAR

Learning objectives

- 4.1.1 List the safety equipment you're likely to use when working in an attic.
- 4.1.2 Identify the kind of gloves worn to handle: large mammals, small mammals, birds, and snakes.
- 4.1.3 Know which government agency rates respirators.

If you're running your own show, you can make personal decisions about whether or not to use certain precautions. But once you have ten employees, the government insists on certain standards that are enforced by OSHA regulations.

The smart, stylish NWCO wardrobe includes

- animal handling gloves (Kevlar™ or heavy leather gauntlets)
- disposable rubber or plastic gloves
- protective eyewear, such as goggles
- respirators and dust masks
- disposable coveralls with hoods
- disposable shoe covers
- rubber boots
- kneepads
- helmet, safety ropes, harnesses (to connect to all the devices used to secure ladders)

Gloves are an indispensable safety tool. The type needed depends on the situation, but disposable vinyl or latex gloves are the most versatile choice (some people are allergic to latex and must use vinyl). When applying certain chemicals, such as some pesticides, you may need to wear a specific type of gloves. You'll probably want to keep a variety of gloves handy.

Lightweight leather work gloves are usually adequate for handling small birds and snakes. With larger birds and mammals, wear thick, leather gloves or gloves made with Kevlar™ (the stuff in bulletproof vests), or perhaps even welder's gloves. This is especially

important if you think the mammal might be rabid, or if it's agitated. Unfortunately, some carnivores can bite through the strongest gloves, and no glove can protect you from a crushing injury.

Although safety will probably be the most important factor when you choose gloves, there are other things to think about, too. For comfort, mobility, and out of kindness to the animal, select the lightest pair you can. Thick, heavy gloves make it harder to feel how the animal is responding to being handled, and may cause you to grasp it too tightly.

Protective clothing can range from long-sleeved cotton shirts that help prevent scratches to disposable coveralls used in areas that could be contaminated with diseases, or when working with pesticides. (If you use pesticides, you'll have to pay added attention to your clothing, including the way you launder it.)

Knee pads protect you while you're crawling around in attics and crawlspaces.

Goggles or similar eye protection are important in many circumstances.

A *specialized respirator* will help protect you from inhaling such disease agents as fungal spores, viruses, and bacteria, but only if it fits properly. They're good precautions if you're in a disease hot spot (such as an attic, crawlspace, or an area near a large bat or bird roost) or if you are likely to disturb droppings or encounter contaminated soil or rodent nests.

There are many different kinds of respirators. Your choice will depend on many factors such as which disease you're trying to avoid, whether or not you have a beard or mustache, how much weight you can carry, and how much mobility you need. One of the most versatile designs is the half-face respirator with filter. Look for a NIOSH-approved respirator ("NIOSH" stands for "National Institute for Occupational Safety and Health." It's part of the CDC.) For the OSHA standards about respirators, check www.osha.gov/html/respirator.html.

Safety helmets range from "bump caps" to helmets with visors. Some helmet designs attach snugly to the head to give added protection in case of a fall.

When you're finished with your job, disinfect your gloves with a household or commercial disinfectant or a dilute bleach solution before you remove them. If the situation requires a respirator, keep it on until you've safely dealt with the rest of your clothing and gear. You may want to wear a respirator and goggles when you clean your truck, especially if you use a power washer, which could splash contaminants around.

Disposable clothing can be placed with other contaminated materials and double-bagged for removal to a landfill or other approved disposal facility. Then wash your hands thoroughly with warm water and soap.

Another good general precaution is to tell your doctor about what you do for a living. This will alert your doctor to consider some of the wildlife-related diseases, which probably wouldn't be considered otherwise.

Higher, deeper, further

- Imagine you are about to hire an employee. List the safety equipment you'll need to buy for that worker, and price it out.
- Find a few options for additional training in the safe use of ladders and respirators. Pursue whichever educational opportunity you like best.
- Attend an OSHA training program. They are some times offered by community colleges.

Summary

Before you move on to the next section, you may wish to review the learning objectives for this section:

- 4.11 List the safety equipment you're likely to use when working in an attic.
- 4.12 Identify the kind of gloves worn to handle: large mammals, small mammals, birds, and snakes.
- 4.13 Know which government agency rates respirators.

SECTION FOUR: WHAT YOU NEED TO KNOW ABOUT WILDLIFE DISEASES

Overall learning objectives for this section

- Know which zoonotic diseases are found in the Northeast, how they're spread, and which symptoms are seen in wildlife and people.
- Recognize the signs of a disease hot spot.
- Understand how to reduce your chances of catching a wildlife disease.
- Know which vaccinations you should receive because you're a NWCO.
- Understand what you are required to do by law when handling an animal that's likely to be rabid.

How do you catch them?

"I was scratched on the wrist while banding a Canada goose. About a week later, another goose scratched off the scab. It took me a few hours to notice that the open wound was completely covered in goose poop. Our field station was a day's helicopter flight away from the nearest hospital, and I'd forgotten a first-aid kit. So I washed the wound as best I could with snow. The next morning, the entire area was swollen and tender and I had difficulty bending the wrist." [He cleansed the wound with whiskey and recovered fully.]

—Arthur Smith, wildlife biologist, SD

Wildlife diseases can be caused by bacteria, viruses, fungi, or parasites. The ones that can be transmitted to people are called "zoonotic diseases" or "zoonoses." There are several different ways you can become infected. Most often, this happens when an infected animal bites or scratches you. Disease agents may enter your body through wounds, or through your eyes, nose, or mouth.

You can also pick up diseases indirectly, when you're bitten by a mosquito, tick, or flea that fed on an infected animal. Mosquitoes spread West Nile virus, ticks spread Lyme disease, and fleas carry plague and typhus.

Some diseases are transmitted through the air, such as hantavirus or histoplasmosis. You can breathe them in, especially while stirring up dust in a confined space. Touching your mouth after you've touched something that's contaminated, or eating infected meat that

hasn't been properly cooked, may also cause an infection. This is a significant problem for young children, especially when they're playing outdoors. Their sandboxes, play areas, or toys may become contaminated by the droppings or urine of wildlife. Kids may put soil, wood chips, or droppings into their mouths. Raccoon roundworm is spread this way; the parasite's eggs are found in contaminated soil.

Hopeless? Helpless? No way.

So how can you protect yourself, and make sure you don't bring diseases or parasites into your home? Practice good personal hygiene, wear protective gear such as disposable gloves, disinfect your equipment, maintain your rabies and tetanus vaccinations, and use safe animal capturing and handling techniques. Good hygiene and sanitation will also reduce the chance of developing allergies to animals.

Probably the single most important thing you can do to reduce your risk of catching a zoonotic disease is to wash your hands. Ordinary soap and water will do. Wash your hands the way your parents taught you to, thoroughly and often. And always wash your hands before you eat, drink, or smoke.

Another healthy habit is to avoid contact between your hands and your face, eyes, or mouth. Pay attention when you're eating, drinking, smoking, adjusting your glasses, applying cosmetics, taking medication, and when you sneeze.

Keep your gear clean, too. Many of the objects you handle are often fouled by blood, feces, urine, saliva, or body tissues. If your hands or gloves are dirty, it's easy to contaminate doorknobs, car doors, clipboards, telephones, computer keyboards, faucet handles, and many other objects. The nuisance animal may also have made quite a mess; if you don't offer clean-up services, you may want to tell your customers how to deal with it safely.

At the end of the day, clean and disinfect all of the equipment you used with dilute bleach water (a 10% chlorine bleach solution, which is one part bleach to nine parts water) or a household or commercial disinfectant. Wipe down your truck's seat, steering wheel, and door handles. Some NWCOs keep a quart spray bottle of disinfectant in the truck's cab because bleach solutions don't keep long, so it's better to work



When you see something like this in your customers' home, what crosses your mind? (After "good thing they called me.") This exclusion attempt could mean that the nuisance animals entered the living spaces. Ask if any person or pet came into contact with the wild animal. If that's true, consult with the health department. You may need to submit a specimen for a rabies test. That might change your approach to capturing and removing the animal.

with small batches. Just don't mix bleach and ammonia, or use bleach to clean up droppings, which contain ammonia. Use a household or commercial disinfectant instead. Antibacterial wipes may seem even more convenient but they weren't designed to kill parasites, fungi, or viruses. Those agents cause all but one of the diseases discussed later.

Consider the time you spend cleaning as marketing effort because some customers will interpret cleanliness as a sign of professionalism and competence.

Review questions

6. Which simple activity may be the most effective way to protect yourself from catching zoonoses?
 - a). use antibacterial wipes
 - b). become an accountant
 - c). wash your hands throughout the day
 - d). replace wooden traps with metal ones
 - e). exercise
7. Wildlife diseases are caused by
 - a). bacteria only
 - b). bacteria and viruses
 - c). germs and dirt
 - d). bacteria, viruses, parasites, and fungi

8. How do people catch "wildlife" diseases?
 - a). handle an infected animal
 - b). breathe in the disease organism
 - c). infected animal bites or scratches you
 - d). rub your eye, nose, or mouth when your hands are dirty
 - e). eat unwashed vegetables
 - f). all are true

Answers:

6—c

7—d

8—f

A few wildlife-related safety tips from the CDC that you may want to share with customers:

- Teach children never to handle unfamiliar animals, wild or domestic, even if they appear friendly. "Love your own, leave other animals alone."
- Enjoy wild animals from afar. Never adopt wild animals or bring them into your home. Do not handle, feed, or unintentionally attract wild animals to your home or yard (see below).
- Don't try to nurse sick animals to health. Do not "rescue" baby birds or other baby animals. They usually don't need it. (Direct questions to a wildlife rehabilitator or DEC Bureau of Wildlife staff.)
- Before traveling abroad, consult with a health care provider, travel clinic, or your health department about the risk of exposure to rabies. They can advise you about whether pre-exposure rabies vaccinations are sensible, and how you should handle an exposure in that country, should it arise.
- These CDC tips focus on disease prevention. As we mentioned earlier, you can take measures to prevent nuisance situations while leaving part of your landscape for wildlife. There are many things to consider when managing land for wildlife, including the risk of exposure to wildlife diseases.

Medically important or just media hype?

Consider this an *introduction* to some health concerns that affect NWCOs. For example, you'll often be cautioned to "wear a proper respirator." That's shorthand to alert you to the need to protect yourself from breathing in microscopic disease agents.

How much do you need to know? You're not a doctor, after all. You don't have to be able to throw around words like "sapro-zoonoses," but you do need to know enough to protect yourself and others, and to answer your customers' questions.

Sometimes our fears about these wildlife diseases are much greater than our actual risks of catching them, or the likely results of an infection. Even for an ethical NWCO who's not trying to sell a job by frightening customers with an overblown assessment of the risk of catching a wildlife disease, it can still be tricky to share the necessary information in the right context.

It's also important to resist jumping to conclusions. For example, distemper can cause symptoms that look like rabies. The only way to be sure is to test.

Some of these diseases are *potentially* fatal. That's something your customer will probably want to know—what's the worst-case scenario? But the chance of catching most of these diseases is low, and even then, many of them are treatable.

The trick is to have good, complete, and credible information from a trusted source. One extremely valuable source for current and accurate information is the national Centers for Disease Control (CDC). Most of the pages on their website about wildlife-related health issues are written in simple language and get right to the point. The addresses of the websites that focus on each disease are included at the end of each description.

Other good sources for information about wildlife diseases include physicians; veterinarians; medical entomologists; the state's health, wildlife, and agriculture departments; trade magazines; professional organizations; wildlife conferences; books; fact sheets; videos; listserves; and websites. (See the appendix.)

One last medically-related point: When you remove wildlife from people's homes, it's also important to plan

for the parasites that may be left behind. Birds and mammals are host to a variety of parasites including fleas, ticks, mites, lice, and bed bugs. Although these parasites generally prefer their original host species, if you remove those animals, the hungry parasites may enter the home looking for a meal. Many of these parasites will bite people and they can be extremely annoying. (And itchy customers are generally not happy, which isn't good for business.)

These pests may fly or crawl into the home through windows, ventilators, cracks, and crevices. Droppings, feathers, fur, food, and carcasses can also attract other pests such as flies and carpet beetles. This can be a significant problem if animals have died in inaccessible locations, such as in the walls. That can happen when an animal is poisoned, and it's one of the risks of using that management method.

Effective clean-up should remove any parasites present in the home. If a site is badly infested, you should wear protective clothing before entering. Even if you don't offer clean-up services, know how to properly advise your clients. Most states have an "integrated pest management" or "IPM" program, usually associated with the land grant university. (In New York, for example, that's Cornell University's "New York State Integrated Pest Management Program.") These programs offer information about how to deal with many pests, including the ones that fall off wildlife. IPM stresses a combination of practical, economical pest management methods that minimize the risks to people and the environment.

Now, on to the zoonoses. The zoonotic diseases that are potentially fatal for people are listed first. So, for example, we've listed hantavirus before mange, which a NWCO is far more likely to encounter, because hantavirus can become a much more serious health problem. At the tail end are two wildlife diseases that people generally encounter from contact with a "middleman," either a mosquito or tick.

There's a lot of information in this section. The next chart should help you remember the answers to three critical questions: who? what? how? **Who's** likely to transmit the disease to people. **What** disease. And **how** do people catch it.

How do you protect yourself from wildlife diseases?

How people catch them	Precautions for NWCOs
<p>Bites or scratches</p> <ul style="list-style-type: none"> • Rabies (mammal bites or scratches) • West Nile virus (mosquito bites) • Lyme disease (tick bites) • Hantavirus (possible from rodent bite but uncommon) <p>Note: boldface type indicates a common way that people catch that disease.</p>	<p><i>Mammal bites or scratches:</i></p> <ul style="list-style-type: none"> • Get rabies pre-exposure vaccine and keep it current • Wear animal handling gloves • Use a restraining device such as a catchpole • Capture animal in trap • Avoid contact with animal's mouth and saliva • Shower soon after work, every day <p><i>Mosquito or tick bites:</i></p> <ul style="list-style-type: none"> • Wear loose-fitting, light-colored clothing (harder to bite and makes it easier to see small ticks) • Use repellent • Tuck pant legs into socks (keeps ticks from crawling onto legs) • Check yourself for ticks at lunchtime; remove any you find
<p>Breathe it in</p> <ul style="list-style-type: none"> • Histoplasmosis • Hantavirus • Canine distemper? (not definitively established) 	<ul style="list-style-type: none"> • Wear a proper respirator, disposable clothing, goggles, gloves, and hood • Ventilate area, if possible • Dampen contaminated materials, wipe up with wet sponge • Spray contaminated area or dead animals with disinfectant • If possible, schedule job for cool, damp weather
<p>Dirty* hands touch mouth, eyes, or nose</p> <ul style="list-style-type: none"> • Raccoon roundworm (mouth) • Toxoplasmosis (mouth) • Rabies (infected saliva gets into mouth, eyes, or nose) • Hantavirus (mouth, eyes, or nose) <p><small>* "Dirty" means that the hand, glove, or object is contaminated with whatever causes that disease, such as a virus, bacterium, or a parasite's eggs. These agents are often microscopic.</small></p>	<ul style="list-style-type: none"> • Wear a proper respirator, disposable clothing, rubber gloves • Wash your hands thoroughly with soap and water, especially before eating, drinking, or smoking • Avoid contact between your hands and your face. Pay attention when you sneeze, eat, drink, smoke, adjust glasses or put in contacts, or take medication.
<p>Disease gets into wound</p> <ul style="list-style-type: none"> • Rabies • Hantavirus 	<ul style="list-style-type: none"> • Protect wounds with bandages, if practical • Wear gloves or clothing that covers wound • Check wounds and keep them clean
<p>Eat contaminated food or put dirty object into mouth</p> <ul style="list-style-type: none"> • Raccoon roundworm (dirty object) • Toxoplasmosis (contaminated meat or dirty object) • Hantavirus? (<i>may</i> be possible via contaminated food or water) 	<ul style="list-style-type: none"> • Wash your hands thoroughly after outdoor activities and especially before eating, drinking, or smoking • See advice for customers on pgs. 4-19, 4-20, and 4-24
<p>Handle infected animal or contaminated equipment</p> <ul style="list-style-type: none"> • Mange 	<ul style="list-style-type: none"> • Wear gloves • Minimize contact with mangy animal by using restraining devices • Minimize contact with contaminated clothing, equipment • Dry clothing at high heat to kill any mites on it

RABIES

Caused by: a virus.

Most common way people catch it: bite from an infected mammal.

Worst-case scenario: death.

How common in the Northeast? The virus is widespread. It cycles through wildlife populations, so at times, it may be common in some species, especially skunks, raccoons, and bats. On average, rabies causes only 1–2 human deaths in the U.S. each year.

Most vulnerable groups: people with unvaccinated pets; animal handlers, especially those working with wildlife.

Rabies is a viral infection that can affect any mammal, including humans. It's most common in skunks, bats, and raccoons in the Northeast. It's extremely rare in small rodents (such as squirrels, mice, and rats), opossums, rabbits, and hares.

Rabies attacks the nervous system and is always fatal once symptoms occur. But the good news is that people and pets can be protected beforehand with vaccinations. If unvaccinated people have been exposed, the disease can still be prevented—swift medical attention is critical.

HOW DO YOU CATCH IT?

Rabies virus is found primarily in saliva and in the tissues of the central nervous system, especially the brain. It's usually spread through the bite of an infected animal.

It can also be transmitted if the animal's saliva or nervous tissue gets into your eyes, nose, mouth, or an open wound or scratch. Airborne transmission is possible but rare—it's more of a concern for laboratory workers who handle animals, or in moist caves with little ventilation.

You **cannot** catch rabies from contact with blood, feces, urine, or scent glands. The rabies virus hitches a ride up the nerves, traveling directly from the bite wound to the brain. Later on, it may travel from the nerves to other organs, but it never enters the blood. That said, if the animal's head has been damaged, there could be spinal tissue or fluid mixed in with splattered blood.

Animals may catch rabies by eating infected animals. Rabies might be passed from mother to offspring in the womb. However, when people encounter very young animals that are rabid, it's more likely that they were infected after they were born, either from contact with their mother or another rabid animal.

Although deadly, the rabies virus is actually fragile. It can be destroyed by exposure to sunlight (UV light).

SYMPTOMS

An animal may be infected with rabies for a long time before it shows symptoms, anywhere from two weeks to many months. (The incubation period is usually two to three weeks.)

Different species show different signs of the disease. Expect variations even within the same species, because few animals show all of the signs of rabies. Some signs are subtle and easily missed.

Unfortunately, you can't tell whether or not an animal is rabid just by its behavior. Other diseases, such as distemper or toxoplasmosis, can also cause similar symptoms. An animal that's been poisoned by lead, mercury, or antifreeze may also act "rabid." The only way to prove that an animal is rabid is to test its brain tissue in a laboratory. That's why it's smart to take precautions.

Here are the rabies symptoms you may see in wild animals:

- unprovoked aggression ("furious" rabies). Some animals may attack anything that moves, or even inanimate objects.
- unusual friendliness ("dumb" rabies).
- animal may stumble, fall, appear disoriented or uncoordinated, or wander aimlessly.
- paralysis, often beginning in the hind legs or throat. Paralysis of the throat muscles can cause the animal to bark, whine, drool, choke, or froth at the mouth.
- vocalizations ranging from chattering to shrill screams.
- nocturnal animals may become *unusually* active during the day (remember, some daytime activity is normal, especially when nocturnal animals are feeding their young).
- raccoons walk as if they're on very hot pavement.

Skunks, raccoons, foxes, and dogs usually display furious rabies. Bats often display dumb rabies, and may be found on the ground, unable to fly. This can be very risky for children, who are more likely to handle wild animals than adults. In domestic animals, rabies should be suspected if you see a sudden change in disposition, failure to eat or drink, or if the animal becomes paralyzed or runs into objects.

You may become aware of another similarity between rabies and distemper. Both are “density dependent” diseases. That means they spread more easily when wildlife populations are higher, because there’s more contact between individual animals. When enough animals die from rabies or distemper, these viruses can’t spread as easily. That’s why the number of cases spikes and then drops off; this rollercoaster pattern repeats over time.

PROTECTION ON THE JOB (AND LEGALLY REQUIRED ACTIONS)

Situations involving potentially rabid animals should take priority over all other work.

Contact the local health department immediately (that’s your county health department or the district office of the State Health Department). **You must talk to them and follow their directions.** You must report bites or other exposures. (Even such details as how a specimen is packaged matter, because you don’t want to endanger anyone who may handle the package).

Contact doctors and veterinarians as needed. Local police and dog control officers may also help, especially in emergencies.

Follow these guidelines with all species:

- Use caution when approaching the suspect animal, because many are aggressive and can bite even if paralyzed. Wear animal handling gloves and use restraining devices to minimize contact with the animal. Avoid bites, scratches, and direct skin contact. Handle dead animals with care, too, especially when your hands are near their mouths.
- Restrain and isolate the suspect animal.
- The animal may be choking. Beware the impulse to clear the “obstruction” from its throat! Do not put your hand in or near the animal’s mouth.
- If rabies testing is required, you must kill the animal without damaging its head. Brain tissue is needed

for the rabies test; that’s why the test can’t be done on a live animal. Even with this restriction, it’s still possible to humanely dispatch animals in most circumstances. For example, raccoons and skunks can be captured in cage traps. The trap can then be placed in a CO₂ chamber and the animal can be euthanized. If the animal is aggressive, and you’re in an area where you can legally discharge a firearm, you may prefer to restrain the animal with a catchpole and then shoot it in the heart and lung area using a low caliber rifle or pistol. That method reduces contact with the animal and may be safer for the operator.

- If you can’t capture the suspect animal, describe the situation to the local health department and the doctor in as much detail as possible. They’ll want to know which species was involved, how the animal was behaving, whether or not the attack was provoked, and what type of first aid was administered. Immediate medical care should be sought for the exposed person or pet.
- When you’re done, disinfect any surfaces contaminated by the animal’s fluids or tissues with a 10% bleach solution (one part chlorine bleach to nine parts water). You may want to mist spray your gloves with the bleach solution. Wear protective gear, especially if using a power washer.
- Clean everything that might have been contaminated before you go to your next job.

Additional guidelines for wildlife:

- Quarantine is not an option. There’s no conclusive research data on safe quarantine periods. The only way to be sure whether or not the animal is rabid is to kill it and examine its brain tissue.
- Capture any bat that’s been found in a room with a sleeping person, an unattended child, a mentally impaired person, or an intoxicated person. That’s demanded by the NYS Health Department. Why? Children and impaired people might not be aware, or be able to tell you whether they were bitten. In these cases, talk to the local health department to determine if the bat needs to be killed and tested for rabies. Don’t release or discard any bat found in people’s living quarters, unless the possibility of human exposure has been absolutely ruled out.
- Individual bats will sometimes enter a home in the evening, especially during July or August. This doesn’t mean there’s a roost in that home. The bats

may just have wandered in, as wild animals, especially young ones, sometimes do while exploring their territories or feeding. If you're sure that no person or pet has had contact with the bat and it appears healthy, it can be released. (Use a soft-sided container to scoop up the bat after it's landed. Plastic yogurt containers or cardboard boxes are less likely to hurt the bat than a metal coffee can).

Additional guidelines for domestic animals (cats, dogs, ferrets) and livestock:

- There are vaccines to protect cats, dogs, ferrets, and livestock from rabies.
- A vaccinated domestic animal that's been exposed can receive a booster to prevent it from developing rabies.
- An unvaccinated pet that's been exposed can be quarantined for six months (at the owner's expense) and observed to determine whether or not it's infected. The other option is to have the animal killed to avoid the possibility of it developing rabies and exposing people or other animals later on.

Additional guidelines for exotic pets (such as monkeys, gerbils, guinea pigs, hamsters, snakes, iguanas, birds):

- Only mammals get rabies. Not birds. Not reptiles (such as snakes, iguanas, and turtles) or amphibians (frogs, salamanders).
- Even though they're living in a home, these are not domesticated species. They're wild species that are native to another country. Again, unfortunately, quarantine is not an option. If an exotic pet has been exposed, the health department may require that it be killed and tested.
- A few species of common exotic pets, such as gerbils and guinea pigs, *almost* never get rabies.

PREVENTION: RABIES VACCINATIONS

NWCOs and other people in high-risk jobs should get a rabies pre-exposure vaccine. This consists of three shots. Your doctor should test your blood every two years to determine whether you need a routine booster.

FIRST AID AND TREATMENT AFTER EXPOSURE

The importance of seeking immediate medical care for people and pets who have been exposed to a potentially rabid animal cannot be overemphasized.

This is especially true if you can't capture the suspect animal, and have no way to determine whether or not it was infected.

If anyone has been wounded, disinfect the wound by washing it *thoroughly* with soap and warm water. (You can then apply Betadine, a liquid surgical soap available in many drug stores). Cover the wound with a sterile bandage, then apply direct pressure to control bleeding.

Have the animal tested for rabies. If the animal was rabid, everyone who was exposed will need treatment (this includes pets and livestock). For someone who received pre-exposure rabies vaccinations, the post-exposure treatment amounts to two shots of rabies vaccine given three days apart.

Unvaccinated people who may have been exposed to the rabies virus will be given six shots in a span of 28 days. Again, treatment must begin as soon as possible. Emphasize to your customers that the shots are now given in the arm, not the stomach. There's a good chance that your customers have heard and believed scary stories about how horrible the rabies treatment is. That's not true! Calm them down and persuade them to call their doctors right away. Call the local health department and give them the contact information for anyone's who's been exposed.

WHAT YOUR CUSTOMERS MAY WANT TO KNOW:

- How are they most likely to encounter rabies? Through an unvaccinated pet, the most common link between rabid wildlife and people. Even indoor cats should be vaccinated because if an infected bat gets inside, the cat will probably chase it. If the bat's sick, the cat has a better chance of catching it and being exposed.
- A nocturnal animal that's active during the day is not necessarily rabid. Healthy female raccoons, for example, sometimes feed during the day, especially during the spring, when they're nursing their young.
- A shabby-looking animal is not necessarily rabid. Could be a nursing female. The young will sometimes pull at her fur as they feed.
- As with other diseases, exposure to the virus does not automatically mean that you are going to get the disease. But there is no way to test or tell whether or not you were infected, and only post-exposure vaccination will prevent rabies from developing.

- Antibiotics will not treat rabies because the disease is caused by a virus. Antibiotics are used to kill bacteria.

*What to expect from the rabies lab
(Wadsworth Center, in Albany)*

- You must contact the local health authority before submitting a specimen to the lab. If the specimen is going to be shipped, they'll explain how to package and send it.
- The Rabies Laboratory operates from 8:00 a.m. to 4:30 p.m. weekdays. Specimens received evenings, weekends, or holidays are processed the next regular workday. Emergency weekend or holiday examinations must be arranged by the local health authority.
- The lab routinely faxes results to the local health office the next morning (if it's a workday). The local health office notifies everyone else. Except for emergencies and late Friday submissions, local health offices are not supposed to call the laboratory for results.
- **Do not submit live animals.** The lab will only accept approved specimens, and then only the intact head. Exceptions include bats, which should be submitted whole, and livestock. Some veterinarians will offer to prepare the livestock specimen.
- Acceptable specimens include only:
 - a. rabies suspect mammals for which there has been a reported human exposure (bite, scratch, or contact with saliva or nervous tissue).
 - b. all bats encountered in situations where it's probable that people wouldn't realize they had contact with a bat.
 - c. rabies suspect mammals with reported bites to (or other "intimate" contact with) a domestic animal.
 - d. highly suspect animals that are under surveillance (but there have been no reported contacts), including (i) a member of a rabies vector species showing clear signs of rabies infection, from an area without previous confirmed cases; (ii) a mammal not commonly recognized as a rabies vector, but showing clear signs of rabies infection; (iii) a domestic animal with a neurological disorder that dies or is euthanized under the care of a veterinarian (if the vet suspects rabies).
 - e. specimens associated with approved surveillance programs that are part of wildlife vaccination trials.

- **Emergency specimens** may be delivered at all times directly to the Rabies Laboratory at Griffin Laboratory on Route 155 in the town of Guilderland (2 miles south of Route 20). Emergency examinations are performed by prior arrangement of the local health authority and the laboratory. Such specimens must arrive at the rabies laboratory before 11:00 a.m. to be tested the same day, and should be accompanied by telephone numbers of the after-hour contact to receive results.

What qualifies as a rabies emergency?

- All cases of direct human contact with a bat, when bite or mucous membrane contact cannot be ruled out;
- Cases in which an animal that is very likely infected with rabies has bitten a person, and the doctor is waiting for the results before beginning treatment. "Very likely infected" is determined by the animal's species, behavior, and the location of its capture.

Questions regarding submission of specimens should be directed to the Rabies Laboratory:
weekdays (8 a.m. to 4:30 p.m.): (518) 869-4527
after hours: (518) 527-7369 or (518) 527-7370

Questions about the handling of animal bites should first be directed to your local/county health department (see government listings in the phone book). The New York State Department of Health Zoonoses Program can also help, and can be reached at:
weekdays (8:30 a.m. to 4:45 p.m.): (518) 474-3186
after hours: (518) 527-7369 or (518) 465-9720

For more information about rabies:

- www.cdc.gov/ncidod/dvrd/rabies/
- www.wadsworth.org/rabies
- www.health.state.ny.us/nysdoh/rabies/rabies.htm
- www.health.state.ny.us/nysdoh/zoonoses/zoonoses.htm (Zoonoses Program home page)

Review questions

9. Rabies is usually spread through
- a). the bite of an infected animal
 - b). contact with blood
 - c). the air
 - d). skunk spray
10. You can tell whether or not an animal is rabid by its behavior. (Circle answer)
True False
11. In the Northeast, the wild species most likely to carry rabies are
- a). dogs and cats
 - b). raccoons, opossums, and skunks
 - c). skunks, pigeons, and rats
 - d). skunks, bats, raccoons, and foxes
12. If you think you're dealing with a rabid animal, you should
- a). wear heavy-duty gloves
 - b). call the local health department
 - c). shoot it in the head immediately
 - d). carefully restrain the animal
 - e). more than one answer is correct
13. What qualifies as a rabies emergency?
- a). raccoon walked through the customer's yard during the day
 - b). person was bitten by a bat
 - c). skunk is living under the deck
 - d). bat flew into house through an open window, fluttered around, and flew out a few minutes later

Answers:

- 9—a
10—false
11—d
12—e (answers a, b, and d are correct)
13—b

RACCOON ROUNDWORM

Caused by: A parasite.

Most common way people catch it: “Dirty” hand touches mouth. Put contaminated object directly into mouth.

Worst-case scenario: Death.

How common in the Northeast? Although the worm is common in raccoons, few people contract the disease.

Most vulnerable groups: Young children.

This disease is caused by a parasite, a roundworm called *Baylisascaris procyonis*. The roundworm larvae cause problems as they travel through the person’s muscles and various organs, including the liver, brain, lungs, and eyes. The severity of the infection depends on how many of the parasite’s eggs were ingested, and where the larvae migrate. Although serious infections are rare, raccoon roundworm can be fatal in people.

Raccoons are the primary host of this roundworm, which is commonly found in their small intestines. The parasite has also been found in mice, squirrels, rabbits, birds, woodchucks, and dogs.

HOW DO YOU CATCH IT?

Raccoons shed millions of the microscopic roundworm eggs in their feces. It takes about a month for newly deposited eggs to develop to the infective stage. The eggs can only develop into worms when they’re in an animal’s body, but the eggs are hardy and may survive for years in soil, sand, or water.

People may encounter the eggs through direct contact with raccoon droppings or by touching a contaminated area or object. If they don’t wash their hands, they may later transfer the eggs to their mouths. Small children are particularly vulnerable because they tend to put their hands, and other objects such as bark, wood chips, toys, soil, or even droppings, into their mouths.

Is it possible to become infected by breathing in raccoon roundworm eggs? Yes, but this is highly unlikely. The parasite’s eggs are sticky and relatively big (in comparison to other microscopic disease

agents) so they don’t easily become suspended in the air. If you shoveled up raccoon droppings with great enthusiasm, tossing dust left and right, then you might breathe in and later *swallow* some of the parasite’s eggs. (Generally, parasites of this type infest people by entering through our digestive tracts, not our respiratory systems.) But you’d need to swallow about 5,000 eggs to receive a dose that could infect you. Inhalation is a minor risk and you may wish to take precautions against it, but the major risk for contracting raccoon roundworm is through hand-to-mouth contact.

Other animals may become infected by eating an infected animal or through contact with the feces of an infected animal.

SYMPTOMS

Symptoms in people may include nausea, skin irritations, tiredness, liver enlargement, loss of coordination and muscle control, blindness, inattentiveness, and coma.

Raccoons rarely show symptoms of the disease but the species that don’t usually play host to this worm (such as woodchucks, squirrels, birds) tend to show abnormal behaviors when infested. They’ll tilt their heads and have difficulty walking or climbing. They may lose their fear of people, circle, roll on the ground, fall over, lay on their sides and paddle their feet, or fall into a coma.

TREATMENT

If someone’s been exposed, or even suspects exposure to raccoon roundworm, seek immediate medical care. If the worms can be killed before they migrate through the body, there’s a very good chance that the disease will be prevented. But if the condition is not treated early, recovery is less assured. Raccoon roundworm infections are very difficult to diagnose in people.

PROTECTION ON THE JOB

If you’re working in an area that’s contaminated with raccoon feces, wear a proper respirator, rubber gloves, rubber boots, and disposable coveralls.

Because the roundworm’s outer shell is so sticky, you have to change your clean-up method to make sure the cleaning agent can break through this coating to kill the developing worm. Disinfectants alone will not

do the trick. Intense heat is the best option for anything that can withstand open flames. Use a handheld propane torch (weed burner) to flame the droppings, contaminated areas of soil or concrete, and your traps. If that's impractical, give those eggs a "one-two punch" by dousing them with boiling water AND bleach. The bleach works on that sticky coating, while the boiling water kills the egg. And if that's not feasible, double-bag the materials and bury them deeply.

Contaminated clothing can be double-bagged and discarded or washed in boiling water with bleach. Clean your gear while the feces are still fresh and easier to remove. Scrub rubber boots with bleach and a scrub brush.

ADVICE FOR CUSTOMERS

- Have your pets "wormed" three to four times each year.
- To prevent your children from encountering roundworm eggs, keep them away from areas that are frequented by raccoons. Cover their sandboxes. Train them to wash their hands and scrub their fingernails after playing outdoors, especially if they were in your garden or the sandbox.
- Discourage raccoons from living in and around your home (management techniques are discussed in Appendix B).
- Prompt removal and destruction of raccoon feces will reduce the risk of human exposure. Raccoons typically defecate at the base of trees, on fallen logs, on large rocks, and wood piles, and in barns or other outbuildings. Raccoon feces may also be found in children's sandboxes, attics, fireplaces, garages, decks, rooftops, haylofts, and compost piles.
- Areas of soil or concrete are best decontaminated by a thorough flaming using a handheld propane torch (weed burner). Wooden decks and patios can be cleaned with boiling water. Soil can be turned over with a rake or shovel, then flamed. Repeat this process several times. To decontaminate a fireplace or woodstove and chimney, build a roaring fire.

For more info. about raccoon roundworm:

- www.cdc.gov/ncidod/dpd/parasites/baylisascaris/default.htm
- www.michigan.gov/dnr/0,1607,7-153-10370_12150_12220-27261--,00.html

Review questions

14. You can see from the outside if a raccoon is infested with *Baylisascaris* roundworms. (Circle correct answer)
true false
15. Young children are most vulnerable to this disease because
a). they're more likely to put contaminated objects and their hands into their mouths
b). they have small bodies, so the worms reach their brains faster
c). raccoons prefer them
d). their immune systems haven't been exposed to the disease yet
16. There were many raccoons living in your customer's backyard. They want to know how to clean up so their kids can play outdoors again. You tell them
a). forget it, and buy them a computer game
b). clean the deck with boiling water and bleach. Soil should be raked and flamed repeatedly. Replace the sand in the sandbox. Build a roaring fire to clean out the fireplace, stove, and chimney.
c). don't worry, the rain will take care of it
d). those full body protection "bunny suits" are very fashionable—remember the computer commercials?

Answers:

- 14—false
15—a
16—b

HISTOPLASMOSIS

Caused by: A fungus (mold).

Most common way people catch it: The only way it can be caught is through breathing in the mold spores.

Worst-case scenario: Death.

How common in the Northeast? Common. The CDC estimates that 80% of people living in areas where the mold spores are common have been exposed to histoplasmosis. Most cases are mild. Causes about 800 deaths in the U.S. each year.

Most vulnerable groups: Very young or very old people, and people with compromised immune systems, because they're more likely to develop the most dangerous form of the disease. Construction workers, NWCOs, and cavers, because they're more likely to encounter the spores.

Histoplasmosis is a lung infection caused by inhaling the spores of the fungus, *Histoplasma capsulatum*. There are three forms of this disease.

Most people experience its mildest form, usually showing no symptoms or suffering a minor, flu-like illness that gets better on its own. In fact, many people are unaware they've been infected. The disease can develop into a chronic form that resembles tuberculosis, with the patient's condition worsening over months or years. The most serious version, which affects the fewest people, is called "disseminated histoplasmosis." This means the fungal infection has spread to other organs, and unless treated, it's usually fatal.

Why do some people become so much sicker than others? It probably depends on the number of spores inhaled and the person's age and health. Young children, long-term smokers, and elders, especially those already suffering from a lung disease, are more likely to show symptoms of histoplasmosis. People with compromised immune systems (such as those with diabetes, cancer, HIV or AIDS, and transplant recipients) are at the greatest risk for developing the most dangerous form of this infection. Histoplasmosis is one of the most frequent opportunistic infections afflicting people who are HIV-positive.

The *Histoplasma* fungus is common in the central and eastern U.S., especially along the Ohio, Mississippi, and St. Lawrence River Valleys and the Rio Grande. The CDC estimates that as many as 80% of the people living in these areas have been exposed to histoplasmosis. And 10-25% of those residents who are HIV-infected develop the most severe form of the infection. Overall, each year in the U.S., there are about 500,000 infections, 5,000 people hospitalized, and 800 deaths due to histoplasmosis.

HOW DO YOU CATCH IT?

You must inhale the mold spores to catch histoplasmosis. (If symptoms occur, they usually begin about 10 days after exposure.) Spores are often encountered in old or abandoned bird or bat roosts, especially those that are outside or exposed to rain; in chicken coops; and in caves. The spores are airborne. They may be inhaled when contaminated soil or droppings are disturbed.

The disease is not contagious; it's not spread from person to person, or by other animals. Birds and bats do not carry this disease but they are associated with it because their dropping enrich soil and promote the growth of the fungus.

The fungus is naturally occurring and can grow in various soils, with or without droppings. Although it's almost always associated with soil, the fungus has, in rare cases, been found in droppings alone. It grows readily in the soil beneath bird roosts, but it cannot form spores under the acidic conditions of fresh droppings; this means that an active roost may only give off a few spores. The droppings must dry out and then get wet before spores can be released. Generally, droppings need to accumulate for three or more years before the spores increase to significant levels underneath a roost.

If the soil is stirred up under dusty conditions, massive numbers of spores may be released. Severe epidemics have occurred in association with bird roosts that were bulldozed during construction projects. Once airborne, spores can easily be carried long distances by the wind.

TREATMENT

Antifungal medications are used to treat severe cases of histoplasmosis. Mild cases usually resolve themselves without treatment.

PROTECTION ON THE JOB

Precautions should be taken when working around old or abandoned roost sites, especially if they've been exposed to rain. Avoid stirring up dust and inhaling spores. If at all possible, schedule jobs when the weather is cool and damp. Wear a proper respirator, disposable coveralls, goggles, gloves, and disposable shoe coverings. If materials are likely to fall from overhead, wear a hood.

Ventilate the area, if possible. Dampen contaminated materials to reduce the amount of dust, and keep them damp as you're working. The droppings can be wiped up with a damp sponge. Double-bag them for disposal. Any dead birds or bats should also be sprayed with a household disinfectant, then double-bagged.

An industrial vacuum with a high-efficiency filter can also be used to clean up the site.

ADVICE FOR CUSTOMERS:

- The fungus is common in our area, so it's smart to protect yourself before going near bird or bat droppings. If you're concerned about exposure, avoid dusty places that might be contaminated with the mold, such as construction and demolition sites, caves, attics, and poultry barns with dirt floors.
- If you develop flu-like symptoms anywhere from 3–18 days after a potential exposure to the spores, you may want to see a doctor for testing.
- The best way to prevent exposure to histoplasmosis is to discourage birds and bats from roosting within buildings.

For more information about histoplasmosis:

- www.cdc.gov/ncidod/dbmd/diseaseinfo/histoplasmosis_g.htm
- www.cdc.gov/niosh/97146eng.html ("Histoplasmosis: Protecting Workers at Risk")
- www.nlm.nih.gov/medlineplus/ency/article/001082.htm
- www.aegis.org (AIDS education global information system)

Review questions

17. People catch histoplasmosis from
 - a). sexual contact with an infected person
 - b). breathing in the mold spores
 - c). rubbing their eyes after they've touched an area contaminated with bat droppings
 - d). cleaning the cat's litter box
 - e). birds
18. Histoplasmosis is common in the Northeast. (Circle correct answer)
True False
19. Typical hot spots for this disease include
 - a). caves
 - b). attics that are inhabited by rodents
 - c). old, abandoned bird or bat roosts
 - d). poultry barns
 - e). answers "a," "b," and "c" are correct
 - f). answers "a," "c," and "d" are correct

Answers:

17—b

18—true

19—f

TOXOPLASMOSIS

Caused by: A parasite.

Most common way people catch it: Touch contaminated object, then unwashed hands touch mouth. Put contaminated object directly into mouth.

Worst-case scenario: Can cause miscarriages or serious birth defects.

How common in the Northeast? Common.

Most vulnerable groups: People with compromised immune systems; pregnant women; fetuses. Most infections are mild. Pregnant women can transfer the disease to their fetuses, but it usually doesn't cause problems. Miscarriages and severe birth defects are possible.

Toxoplasmosis is an infection in mammals caused by a microscopic parasite, a protozoan called *Toxoplasma gondii*. Usually, the disease is mild and is often mistaken for a simple cold or viral infection.

There are several ways in which toxoplasmosis resembles histoplasmosis: most people who are infected never realize it; it often causes flu-like symptoms; people with compromised immune systems are at greater risk for developing a much more severe infection; and severe infections may result in brain damage or death.

But there's a significant difference between the two diseases. A pregnant woman can pass the toxoplasmosis infection to her unborn baby. Miscarriages, stillbirths, and severe birth defects, including blindness, cerebral palsy, and mental retardation, are possible. (The disease is more serious if passed on to the fetus in the first three months, however, it's more commonly transmitted later in the pregnancy.)

On average in the U.S., one out of a thousand babies is born with toxoplasmosis each year. But that doesn't tell the whole story. The March of Dimes reports that up to 90% of infected babies appear normal at birth, and 55-85% of them develop symptoms months to years later, suffering from eye infections, hearing loss, and learning disabilities.

Toxoplasmosis is common, but very few people have symptoms because the immune system usually keeps the parasite from causing illness. Symptoms in adults include swollen lymph glands, mild fevers, muscle aches, headaches, tiredness, confusion, and pains that last for a few days to several weeks. Severe infections can result in brain damage and damage to the eyes, and may become chronic.

HOW DO YOU CATCH IT?

People catch toxoplasmosis by eating or handling raw or undercooked meat that's infected with the parasite's eggs (especially pork, lamb, or venison) or through direct contact with infected feces (usually from cats) or contaminated soil. Most people are likely to become infected after cleaning a cat's litter box or gardening. They may touch contaminated soil or other fouled objects, forget to wash their hands, and then transfer the eggs to their mouths. Rarely, people contract toxoplasmosis through organ transplantation or transfusion.

Cats acquire the *Toxoplasma* parasite by eating infected wild animals or raw meat. Most mammals can be infected with this parasite. The eggs take about two days to become infective.

According to the American Veterinary Medical Association, infected cats only shed the eggs for one to two weeks of their lives, right after their first exposure to the parasite. Like humans, cats rarely have symptoms when first infected, so most people don't know if their cat has been exposed to *Toxoplasma*. There are no good tests available to determine if your cat is passing *Toxoplasma* in its feces.

TREATMENT

In an otherwise healthy person who is not pregnant, treatment is often not needed. Symptoms will usually go away within a few weeks. For pregnant women or people who have weakened immune systems, drugs are available to treat toxoplasmosis. There are tests to determine if a fetus is infected; if so, medication may prevent or reduce the severity of the effects of the infection.

PROTECTION ON THE JOB

Even NWCOs who never handle a nuisance complaint involving cats might encounter this disease. Cats and wild animals frequent some of the same areas. Use your

standard precautions to avoid contact with cat feces, and, as always, wash your hands well with soap and warm water, especially before you eat, smoke, or prepare any food.

ADVICE FOR CUSTOMERS:

- Relax, and consider this in perspective. First, toxoplasmosis is more of a concern if you're pregnant or have a compromised immune system. Even if you fit either of those categories, you can still wash your hands! That's a pretty simple way to avoid contracting this disease; no need to call out the cavalry.
- There's no need to get rid of pet cats or avoid adopting a cat. To prevent infections, keep cats indoors and feed them dry or canned cat food.
- Feral cats, stray cats, and pets who are allowed to roam outdoors may eat infected small mammals and defecate on your property. Remove food sources to discourage stray cats.
- Avoid handling stray cats, especially kittens. If you want to adopt a stray, or don't know whether or not a cat you'd like to adopt roamed outdoors or was fed raw meat, talk to your veterinarian before you bring the cat into your home.
- Cover sandboxes, and carefully wash your hands after working in your garden (or wear gloves).
- If the litter box is cleaned daily, any eggs present would still be in the non-infective stage.
- Ideally, someone who's healthy and not pregnant should clean the litter box and handle raw meat. If this isn't possible, wear gloves while doing either activity, then wash your hands well with soap and warm water. Remember to wash any cutting boards, sinks, knives, and other utensils that might have touched raw meat or unwashed vegetables.
- Cook all meat thoroughly, at least to 150 degrees (no longer pink in the center, or until the juices run clear). Don't sample meat before it is fully cooked. Red meat that's been smoked, cured, or frozen for at least 24 hours is also safe from this parasite. Chicken, other fowl, and eggs almost never contain this parasite, according to the CDC.

For more information about toxoplasmosis:

- www.cdc.gov/ncidod/dpd/parasites/toxoplasmosis/factsht_toxoplasmosis.htm
- www.cdc.gov/hiv/pubs/brochure/oi_toxo.htm
- www.modimes.org/HealthLibrary/. On this March of Dimes site, click "quick reference and fact sheet," then choose "toxoplasmosis."
- www.avma.org/careforanimals/animatedjourneys/pethealth/pethealth.asp#6

Review questions

20. Toxoplasmosis is like histoplasmosis because

- a). they're both caused by a parasite
- b). both cause flu-like symptoms that are often mistaken for something else
- c). with both diseases, people with compromised immune systems are more likely to develop a severe infection than others
- d). a pregnant woman can pass either disease to her unborn child
- e). answers "b" and "c" are correct
- f). answers "a," and "c" are correct

21. How do people catch toxo?

- a). direct contact with cat feces
- b). eating or handling raw or undercooked meat
- c). breathe in the spores
- d). gardening
- e). answers "b" and "c" are correct
- f). answers "a," "b," and "d" are correct

22. NWCs just need to know how to answer customers' questions about this disease, because they're not likely to be exposed to it. (Circle correct answer)

True False

Answers:

20.—e

21.—f

22.—false (cats and wildlife use some of the same areas. Feral cats, strays, and pets that roam outdoors are also more likely to be infected than indoor house cats, because they eat more wild animals.)

HANTAVIRUS

(disease name: “Hantavirus pulmonary syndrome”)

Caused by: A virus.

Most common way people catch it: Cleaning, working, or living in area that was infested by rodents.

Worst-case scenario: Death.

How common in the Northeast? Fairly uncommon.

Most vulnerable groups: People in close contact with rodent nesting areas (such as those whose homes are infested, agricultural workers, NWCOs, and people who clean out buildings that are only used seasonally).

There are several hantaviruses that cause a respiratory disease in people. The disease, called “Hantavirus pulmonary syndrome,” was first officially recognized in the U.S. in 1993, but it’s not new. Medical records confirmed a 1959 case, and much earlier, Navajos identified a similar disease that might have been hantavirus. So far, it’s fairly uncommon and the chances of becoming infected are low. But it’s potentially deadly.

The first signs of sickness, especially fever and muscle aches, appear 1 to 5 weeks after exposure, followed by shortness of breath and coughing. Once this phase begins, the disease progresses rapidly and hospitalization is often needed within 24 hours.

HOW DO YOU CATCH IT?

The hantavirus strain present in the Northeast (called “New York-1”) is spread by wild mice, specifically the deer mouse, *Peromyscus maniculatus*, and the white-footed mouse, *Peromyscus leucopus*. Both may invade homes. (Rodents that spread other hantavirus strains in other areas include the rice rat and the cotton rat.)

Rodents shed the virus in their urine, droppings, and saliva. The virus can then become airborne, and people catch it by breathing in these microscopic particles. It’s also possible, although less common, for someone to catch the disease from the bite of an infected rodent. If you touch an object that’s contaminated with rodent urine, droppings, or saliva and then touch an open wound or your eyes, you could also become infected.

It may be possible to catch the disease by eating food or drinking water that’s been contaminated by mice.

Hantavirus is not transmitted from person to person in the U.S.

NWCOs are in a higher risk category than many other people because they frequently enter areas that are infested by mice, such as crawl spaces and attics. They’re more likely to disturb the materials that contain the virus, too. Other hot spots for the disease include buildings that are only used seasonally. When people open up cabins, sheds, barns, garages, or storage facilities for farm and construction equipment, they are likely to encounter rodent infestations. Rodents also infest homes, and sometimes people are unaware of their presence. Sharing a home with rodents puts the residents at higher risk for this disease.

Rodents catch hantaviruses by touching other rodents. Transmission is probably associated with fighting. Rodents are a vector; there’s little evidence that they suffer from the disease. No other animals are known to have a direct role in the transmission of hantaviruses.

TREATMENT

Patients receive supportive treatment, often in the intensive care unit, and antibiotics to prevent secondary bacterial infections.

PROTECTION ON THE JOB

Ventilate the area before entering, if possible. This is particularly important if the building has been closed for a while, such as a seasonal cabin.

Wear rubber gloves and a proper respirator while handling traps containing rodents or cleaning up their droppings, urine, or nest materials. Avoid stirring up dust because it may contain hantavirus. Wet contaminated materials with a 10% bleach solution or household disinfectant. Let this soak in, then wipe up with a damp towel or sponge. Mop or sponge the area with disinfectant. Double-bag for disposal. (Any dead rodents should also be sprayed with disinfectant, then double-bagged for disposal). Disinfect your gear and traps following standard guidelines.

ADVICE FOR CUSTOMERS:

- Toys, silverware, and such items can be disinfected, but it's best to discard contaminated foods, drinks, napkins, paper plates, or cups.
- There are several good reasons to exclude mice from your home. They spread diseases, such as hantavirus. They chew on wires and sometimes make their nests in fans or vents, which could lead to fires. They may destroy insulation and cause your heating and cooling bills to increase. Once they're removed, repairs may be needed to ensure that they can't get back in.

For more information about hantaviruses:

- www.cdc.gov/ncidod/diseases/hanta/hps/index.htm

Review questions

23. In the Northeast, hantavirus is spread by deer mice and white-footed mice, not rats.

(Circle correct answer)

true false

24. Hot spots for hantavirus include

- a). crawl spaces and attics
- b). buildings that are only used seasonally, such as farm equipment storage sheds, summer camps, barns
- c). "a" and "b" are correct
- d). abandoned bird and bat roosts

25. To protect themselves from exposure to hantavirus, many NWCOs wear respirators. Which other diseases are commonly caught by airborne transmission?

- a). histoplasmosis
- b). West Nile virus
- c). rabies
- d). toxoplasmosis
- e). raccoon roundworm

Answers:

23—true

24—c

25—a

MANGE and DISTEMPER

These two diseases aren't a serious medical concern for people, but they do commonly affect wildlife and pets. People can catch mange and canine distemper, but canine distemper doesn't cause symptoms in humans. So why are we including these diseases in the manual?

Distemper can be mistaken for rabies. You could pick up the mites that cause mange from contact with a mangy animal or contaminated equipment. Both diseases can be fatal to wildlife, so NWCOs should try to avoid spreading either disease. For example, if you deal with a mangy animal, clean your equipment carefully before moving on to your next job (handle carcasses with care, too). Do your best to avoid giving the mange mites a free ride into a new area.

MANGE

The term "mange" applies to several skin diseases in mammals that are caused by microscopic burrowing mites. It's a contagious infestation that affects many species, including wildlife and domestic animals. Two forms, "sarcoptic mange" (also known as "scabies") and "chorioptic mange" can be transmitted to people.

New hosts pick up the parasites from direct contact with an infested animal or its nesting area, or when the mites leave an abandoned nest in search of a new host. So, for example, if squirrels are removed from an attic but no one's cleaned up after them, their mites might wander into the home looking for another source of food and shelter (a new host).

Mange is almost always fatal to red foxes and takes a heavy toll on coyotes, too. It may be a significant cause of death among squirrels during the winter. Although rare in well-fed, well-kept cats, mange is a problem in domestic dogs.

Sarcoptic mange in wildlife and domestic animals usually causes itchiness, hair loss, crusty scabs (often seen first on the head), and thick, wrinkly skin. The skin changes can cause blindness, impaired hearing, and difficulty in eating. In advanced cases, the animal may be weak and emaciated and smell foul, a result of secondary infections caused by scratching. If untreated,

the animal may die of exhaustion, dehydration, or a secondary infection.

In people, this infestation causes a rash that usually looks like pimples, but may look like blisters or an inflammation; it usually appears on the forearms, thighs, and abdomen. Reactions vary. Generally, the mites die off, because they don't do as well on people. Although doctors don't often attempt to kill the mites with drugs, they may offer patients medication to control the itchiness so the patient doesn't scratch constantly, which could invite other infections.

PROTECTION ON THE JOB

- Wear disposable gloves.
- Minimize contact with mangy animals, by using restraining devices. Wash promptly afterwards.
- Minimize contact with potentially infected gear or clothing. Clean your gear if you think it may have picked up mites.
- Freezing kills the mites and may be useful for decontaminating clothing or other gear.

ADVICE FOR CUSTOMERS:

- If your pet is scratching a lot or developing bald spots, take it to a veterinarian. Mange is treatable. Treatment for pets usually includes clipping, medicated baths or sprays, and medication.
- The dog's bedding, and household furniture, may need to be treated, removed, or burned.

DISTEMPER

"Distemper" is often used to refer to two diseases that show some of the same symptoms but are caused by different viruses. These diseases affect dogs and cats and many carnivorous species of wildlife, such as raccoons, foxes, and coyotes. **The symptoms can be confused with rabies.** In fact, many raccoons that are tested for rabies actually prove to be suffering from canine distemper.

Dogs suffer from "canine distemper," characterized mostly by respiratory and neurological symptoms. The cat version is called "feline distemper" or "panleukopenia" (previous names included "cat fever" and "cat typhoid"). Members of the raccoon and weasel families may also catch feline distemper.

Panleukopenia symptoms are usually related to diarrhea and anemia. The term “panleukopenia” means “total loss of white blood cells.” That should give you a sense of the seriousness of this disease. Panleukopenia is a complex disease. Its symptoms can range from very mild to extreme and are sometimes atypical. It has been mistaken for poisoning or swallowing a foreign object.

Neither disease has been shown to cause illness in people.

Canine distemper is the greatest single disease threat to the world’s dog population. It’s highly infectious and it’s nearly impossible for a dog to avoid exposure to this virus. More than 50% of the adult dogs and 80% of puppies that contract it die. Other effects include permanent problems with vision, hearing, sense of smell, and partial or total paralysis. Younger dogs and puppies are the most vulnerable (in wildlife, most cases are seen in the spring and summer, when wild canids, such as foxes and coyotes, bear their young).

Panleukopenia is also a highly contagious and common viral disease. Cats may catch distemper from contact with the blood, urine, droppings, nasal secretions, or fleas of infected cats or from contact with contaminated bedding, cages, food dishes, and the hands or clothing of handlers. Young kittens, sick cats, and indoor cats that have not been given boosters recently are most susceptible; older cats are more likely to have acquired some immunity. Pregnant females that contract the disease, even in its mildest form, may give birth to kittens with severe brain damage. Kittens less than 16 weeks of age may die at a rate of about 75%, and others at a rate of 50%.

ADVICE FOR CUSTOMERS:

- Vaccinate your pets. Vaccinate your pets. Vaccinate your pets. (Think they’ll get it?)
- Both diseases are so common and the symptoms are so varied that any sick young dog or sick cat should be taken to a veterinarian.
- The virus that causes feline distemper is resistant to many chemicals and may remain infectious at room temperature for as long as one year.
- Indoor cats can catch this disease because you may bring the virus into the house, if you’ve petted an infected cat or if it’s brushed against your clothing. Hand-me-down cat carriers, beds, or food dishes could be contaminated.

For more information:

Mange:

- http://edis.ifas.ufl.edu/scripts/htmlgen.exe?DOCUMENT_MG118
- www.michigan.gov/dnr/0,1607,7-153-10370_12150_12220-26949--,00.html

Canine distemper:

- www.avma.org/careforanimals/animatedjourneys/pethealth/canine.asp#3
- www.michigan.gov/dnr/0,1607,7-153-10370_12150_12220-26505--,00.html

Feline panleukopenia:

- www.avma.org/careforanimals/animatedjourneys/pethealth/feline.asp#4
- www.michigan.gov/dnr/0,1607,7-153-10370_12150_12220-26505--,00.html#Feline

Review questions

26. People can catch mange, but they can’t catch distemper. (Circle correct answer)
True False
27. Distemper can be confused with rabies because the symptoms are similar.
(Circle correct answer)
True False

Answers:

- 26—false
27—true

WEST NILE VIRUS

(disease name: “West Nile virus-associated illness”)

Caused by: A virus.

Most common way people catch it: Mosquito bite.

Worst-case scenario: Death.

How common in the Northeast? The disease is relatively uncommon in people and most infections are mild. The range of the virus is expanding. Because it's mosquito-borne, many people can be exposed to the virus.

Most vulnerable groups: Elders and those with compromised immune systems.

Please note: Researchers are currently seeking answers to some important questions about this virus.

West Nile virus affects more than 70 species of domestic and wild birds (especially American crows, jays, hawks, and owls) and mammals (especially people and horses). It's also been found in bats, chipmunks, raccoons, skunks, squirrels, domestic rabbits, mountain goats, and reindeer—and was recently identified as the cause of death of a few American alligators, although we don't yet know how susceptible reptiles are to this virus. Most mammal species do not become sick if infected with West Nile virus.

The virus causes a variety of symptoms, which usually appear in 3–14 days (although the precise incubation period is not yet known). Most common are a group of mild, flu-like symptoms including fever, rash, tiredness, and loss of appetite. A small percentage of people develop a more serious condition, an infection of the central nervous system that may cause encephalitis and meningitis, and in an even smaller group, paralysis or death.

Here's how the numbers are playing out so far: of all the people infected with West Nile virus, about 20–30% become sick. Many fewer, about 1 out of 150, develop a central nervous system infection. Of this unlucky group, about half will experience muscle weakness and about 10% will suffer paralysis—and about 10% will die. Fatalities have been highest among the elderly. Overall, the fatality rate for those infected with West Nile virus is about 1 out of 1500 people (that's less than 0.1% of the people who were infected).

The disease was first reported in the eastern United States in the summer of 1999, although it may have been present before then. It's now believed to be permanently established in the U.S. There's good evidence that birds spread the disease as they migrate.

HOW DO YOU CATCH IT?

People primarily catch West Nile virus from the bite of infected mosquitoes. The disease lives in the insects' salivary glands.

Mosquitoes are vectors of West Nile virus, which means that they can transmit the disease, but do not suffer from it themselves. The northern house mosquito, *Culex pipiens*, is an important vector of West Nile virus but we're not sure what role it may play in the transmission of the virus to mammals. In the Northeast, this is the most common mosquito around the home. There are other ways a person might be exposed to West Nile virus, such as from blood transfusions, organ transplants, and breast milk, or by handling infected birds (the virus may be present in feathers, feces, or dander).

Normally, the virus cycles between mosquitoes and birds. When an infected mosquito bites a bird, it transmits the virus to the bird. The virus circulates in the bird's blood for a few days. Uninfected mosquitoes that bite an infected bird may then pick up the virus, which reproduces in the mosquito's body. Once there's a certain amount of virus in the mosquito's body, it can transmit the virus to another animal.

Mosquitoes don't bite only birds, of course. When an infected mosquito bites a person, horse, or other mammal, it transmits the virus to that animal. The virus then multiplies and may cause illness. But the virus doesn't reproduce effectively in mammals, so later on, an uninfected mosquito biting an infected mammal probably can't pick up the virus. That's why mammals are currently considered “dead-end” hosts for the West Nile virus.

Some species of mosquito prefer to feed on birds, some tend to bite large mammals such as horses, and others bite people. Which mosquitoes find which animals tastiest? Do their preferences change during the season? Researchers are trying to answer these questions, which will help us better understand how, when, and where people are most likely to catch West Nile virus.

Right now, West Nile virus is infecting many birds and horses (in 2002, for example, almost five times as many horses were infected as people). Some wildlife biologists are concerned that West Nile virus could seriously affect the populations of some rare or endangered birds. When dogs and cats are infected, the virus doesn't appear to cause serious illness in them.

TREATMENT

People infected with West Nile virus receive general supportive treatment. There is no vaccine for people yet, but specific medications and a vaccine are under development. There is a West Nile virus vaccine for horses produced by Fort Dodge under a conditional license, pending results from studies of its effectiveness and potential side effects. Other equine vaccines are under development. Horses vaccinated against other related viruses, such as eastern equine encephalitis, western equine encephalitis, and Venezuelan equine encephalitis, are not protected against West Nile virus.

PROTECTION ON THE JOB

Until we have a better understanding of which mosquitoes are most likely to transmit the virus to people, we can't offer a strategy that takes advantage of the particular habits of the vector. For example, some mosquitoes feed during the day while others are active from dusk to dawn. They're found in different habitats. And mosquitoes may not be the only vector of West Nile virus. Scientists are currently studying whether or not the bird louse can transmit the virus to people.

With all these unknowns, what should you do? Avoid mosquito bites and don't handle dead birds with bare hands (wrap them in layers of plastic instead). Wear loose-fitting clothing or mosquito repellent to reduce your chance of being bitten by an infected mosquito. Light colors are less likely to attract mosquitoes. Long sleeves aren't a bad idea, either. And stay tuned!

ADVICE FOR CUSTOMERS:

- If you notice conditions at your customer's home that would encourage mosquito breeding, you may wish to point these out. The *Culex* mosquito has a small home range. It usually doesn't fly more than 300 feet from its breeding site, so it's possible to dramatically reduce the number of *Culex* mosquitoes near the home. These mosquitoes breed in small pools of water that contain leaves or other debris.

- Dump out standing water from rain gutters, recycling bins, tires, tarps, children's pools, garbage can lids... wherever it collects.
- Turn over items that might collect water, like wheel barrows and pools.
- Change the water in bird baths at least once a week.
- Clean the debris from rain gutters early in the spring. Clean up any garbage piles.
- Keep roadside ditches clear, so water can flow freely through them.
- Remove decaying plants and any other floating debris from garden ponds.
- Stock ornamental ponds with mosquito predators such as dragonflies and goldfish to reduce mosquito populations. Or aerate the pond by adding a fountain. There are a variety of pesticides that will kill mosquito larvae in water; read the labels.

For more info. about West Nile virus:

- www.cdc.gov/ncidod/dvbid/westnile/index.htm
- www.cfe.cornell.edu/ERAP/WNV

Review questions

28. People generally catch West Nile virus from

- a). birds
- b). bats
- c). mosquitoes
- d). breathing in spores

29. NWCOs are not at greater risk for this disease than the average dog owner.

(Circle correct answer)

True False

30. This disease is more deadly than people realize.

(Circle correct answer)

True False

Answers:

28—c

29—false (although primarily spread by mosquito bites, it is possible to be exposed through handling infected birds, which NWCOs may do, but most people don't.)

30—false

LYME DISEASE

Caused by: A bacterium.

Most common way people catch it: Bite from the deer tick—only way it is caught.

Worst-case scenario: Can lead to disabling conditions including arthritis, problems with the heart and nervous systems, and personality changes.

How common in the Northeast? Common. (In 1999, for example, 92% of the cases reported to the CDC were from Connecticut, Rhode Island, New York, Pennsylvania, Delaware, New Jersey, Maryland, Massachusetts, and Wisconsin).

Most vulnerable groups: People who spend more time outdoors and those who work in landscaping, forestry, and related jobs.

Lyme disease is caused by a bacterium, *Borrelia burgdorferi*. The bacteria are transmitted to people by bites from the deer (a.k.a. “black-legged”) tick, *Ixodes scapularis*. There are more than 16,000 infections in the United States each year. If untreated, Lyme disease can cause arthritis, especially in the knees; heart problems; cognitive disorders; sleep disturbance; fatigue; and personality changes. Infrequently, Lyme disease may be severe, chronic, and disabling but it’s rarely if ever fatal.

Some infected individuals show no symptoms, or only mild, flu-like symptoms such as fever, headache, fatigue, and muscle pain. Symptoms often begin 7 days after infection, although they may be noticeable 3–30 days afterwards.

Early symptoms include a flu-like illness with headache, slight fever, muscle or joint pain, neck stiffness, swollen glands, jaw discomfort, and inflammation of the eyelids. A diagnostic rash appears in 65–75% of cases. This red rash starts at the site of the tick bite. It often has a bulls-eye appearance. The rash grows quickly, often forming a nearly circular lesion of about 1–8 inches, and may burn or itch. Additional smaller skin lesions may appear at other sites of the body and may last for days or weeks.

Additional symptoms may develop in untreated patients. These often include arthritis, especially of

the knees. The joint pain and swelling usually occur one or more months after infection, may involve one or more joints, and may recur in different joints. Problems might develop with the heart, muscles, and nervous system, causing cognitive disorders, sleep disturbance, fatigue, and personality changes.

The disease is more common in coastal areas with sandy soils. People who spend more time outdoors and those who work in landscaping, forestry, and related jobs are at higher risk for the disease. Gardening, hiking, camping, fishing, and hunting may expose you to Lyme disease. NWCOs are not necessarily in a higher risk category, but should take precautions, especially if working in an area favored by ticks.

The disease’s name comes from its discovery in Lyme, Connecticut in 1977.

HOW DO YOU CATCH IT?

People catch the disease when an infected tick feeds on them—if the tick has remained attached to their bodies long enough to transmit the disease. That usually takes about two days. If the tick is located and removed within 24 hours, infection is unlikely.

For Lyme disease to exist in an area, at least three things must be present outdoors: the Lyme disease bacteria; deer ticks that can transmit the bacteria; and host mammals such as mice and deer that provide a blood meal for the ticks through their various life stages.

Lyme disease has a more complicated transmission cycle than the wildlife diseases discussed earlier because the life cycle of the vector, the deer tick, takes two years to complete. Although the deer tick may be infected with the Lyme disease bacteria in three of its four life stages, **it’s almost always a nymph tick that transmits the disease to people**. That’s because larval ticks are rarely infected when they’re feeding. And adult ticks are much larger, so they’re more likely to be removed before they’ve had a chance to transmit the bacteria to the person.

Lyme disease affects humans and dogs but doesn’t cause illness in deer.

TREATMENT

Patients treated with antibiotics during the early stages of the disease usually recover quickly and completely.

Even patients treated during later stages generally respond well and recover. A vaccine is available for dogs, but there's no reliable vaccine for people yet.

PROTECTION ON THE JOB

When possible, avoid tick-infested areas, especially from May through July. Deer ticks in the Northeast prefer deciduous forests and habitats that contain leaf litter. They need moist cover from the wind and other elements. Suburbs often contain prime habitats (forested areas interspersed with residential development); ticks also prefer overgrown brushy areas, particularly along forest edges.

To see them better, wear light-colored clothing and tuck your pant legs into your socks. You could also tape the tops of the socks over the pant legs with duct tape for added protection. If you decide to use tick repellent, follow the label's instructions carefully.

Check yourself for ticks while you're outdoors, and remove any you find. (Try doing this during your lunch break). Once indoors and naked, inspect your body carefully and remove ticks. Make sure to do this by bedtime. Showering, with vigorous scrubbing, may also help to remove ticks.

Place the tick in alcohol or a vial for identification. Note the date of removal. If it proves to be a deer tick, see a doctor.

After outdoor activity, remove and wash your clothing promptly and dry the clothes at a high temperature.

ADVICE FOR CUSTOMERS:

- Research has shown that tick populations can be reduced by 72–100% when leaf litter is removed. Clean up your yard and keep it well-trimmed. Remove brush piles and wood piles from areas right around the house.
- Hunting helps to reduce deer populations, which may reduce populations of the deer tick because deer are one of the hosts of this parasite.
- Carefully inspect yourself and your pets for ticks soon after going indoors, and remove any ticks right away.
- To remove feeding ticks, dab them with alcohol. If feeding has just started the ticks may release easily. If they don't let go in a few minutes, take a pair of tweezers with a pointed tip and grasp the tick close to your skin. Pull steadily until the tick is removed.

- Don't be alarmed if the tick's mouthparts remain in the skin. The bacteria that cause Lyme disease are contained in the tick's midgut, not its mouth. Just cleanse the area with an antiseptic to prevent infection.
- Don't use petroleum jelly, a hot match, nail polish, or other products to remove ticks. Grasping the tick at its back end, or heating it, can force disease organisms into the wound.

For more info. about Lyme disease:

- www.cdc.gov/ncidod/dvbid/lyme/index.htm

Review questions

31. What's the best way to remove a tick from your body?
- a). hold a lit cigarette or hot match next to the tick
 - b). smother it with petroleum jelly ("Vaseline")
 - c). dab it with alcohol, then pull it out with a pair of tweezers
 - d). shower and scrub furiously
32. If you remove the tick soon enough, you're not likely to get the disease. (Circle answer)
- True False

Answers:

- 31—c
32—true

What do you do with contaminated materials and dead animals?

Most NWCOs do a certain amount of clean-up of the site as part of their service. If the site presents a formidable mess, some NWCOs contract for clean-up separately while others recommend a cleaning service. Whether you do a little or a lot of cleaning on site, you'll still need to clean your gear and your truck.

Clean and disinfect your equipment with a commercial disinfectant or a 10% chlorine bleach solution—that's one part bleach to nine parts water. This doesn't last long, so mix up a new batch every day. Many NWCOs keep a 10% bleach solution in a quart-sized spray bottle in the truck, for quick, small cleaning jobs. (Always read the label on any cleaning product or disinfectant before using it.)

NEVER mix bleach and ammonia! A toxic gas will result. A similar gas may be produced when bleach is applied to bird droppings.

Remember, if you're working around bird, bat, or rodent droppings or nest materials, don't stir up dust. Wear the proper safety gear. Use disinfectant to wet down anything that might have been contaminated, including any dead animals. Wipe up with a damp towel or sponge, or use a commercial, heavy-duty vacuum.

Cleaning up after raccoons is a bit trickier. The eggs of the parasite that causes raccoon roundworm are resistant to disinfectants. Contaminated materials, feces, and soil should be burned, if possible. Flame your metal traps using a propane torch, or use boiling water and bleach. For those materials that can't be burned, either wash with boiling water and bleach (a good option for decks, porches, and contaminated clothing) or double-bag the material and bury it deeply.

To refresh your memory for safety protocols, here are the diseases you're more likely to encounter when working with:

Birds:	histoplasmosis
Bats:	histoplasmosis, rabies
Rodents:	hantavirus (squirrels often get mange)
Raccoons:	rabies, raccoon roundworm, feline distemper, canine distemper
Foxes, coyotes:	rabies, mange, canine distemper

All of these species attract a variety of parasites, too. And although they don't catch it as often, woodchucks, squirrels, and birds may suffer from raccoon roundworm. Any mammal can be infected with rabies.

Carcasses and other potentially contaminated materials (gloves, protective clothing, nesting materials) must be disposed of properly, because they can also spread diseases. In New York State, the health department may give you specific disposal instructions, which you must follow. Otherwise, these items may be buried, burned, or sent to a landfill.

Basic tips to reduce risks from wildlife diseases

What you need to know:

- Which wildlife diseases are present in your area.
- How they're spread.
- Symptoms in wildlife and in people.
- How to recognize disease hot spots.
- Recommended safety gear for different situations.

Before you start a job:

- Get pre-exposure rabies vaccinations and tetanus shots. Stay current.
- Have emergency phone numbers handy—local police, animal control, department of health, state wildlife department, your doctor.
- Vaccinate your pets.
- Wear protective gear when needed, and know how to use it properly.

While you're working:

- Wash your hands thoroughly and often, especially before you eat, drink, or smoke.
- Keep your gear clean, too.
- Record all animal contact in your daily log.
- Be even more careful when handling a sick animal or one that's behaving oddly.
- If you've been bitten or scratched, or are sick, go to the doctor promptly. Tell your doctor about your work.
- Dispose of animals and any contaminated materials safely.

After you're done for the day:

- Clean your gear, truck, and clothing.
- Shower and scrub well.

Here are some points to consider for each disposal method, based on recommendations proposed by the National Wildlife Control Operators Association:

Burial

- Secure the landowner's permission.
- Pick a location that will protect both surface water and ground water from contamination. The grave should be at least 200 feet away from any wells used to supply drinking water.
- Ideally, the carcass should be covered with two feet of soil within a day of burial. (This can be extremely difficult during the winter, so you may need to switch to another method).
- If using a common grave, it should not be located within a 100-year floodplain zone or a wetland area.

Incineration

The incinerator must have approval from both state and local authorities to burn pathological wastes. A local veterinary hospital or pet cemetery may be willing to dispose of your carcasses, but may charge a fee.

Removal to a standard landfill (Type II licensed solid waste disposal facility, a.k.a. "the dump")

- Double-bag the carcass and any contaminated materials in heavy-duty plastic garbage bags, or use other suitable air-tight containers.
- Follow state and local regulations for solid waste disposal.



Overturned trash cans are a nuisance, but is the situation dangerous? Depends on whether the culprit is a bear or a mouse. To use the best practices approach, you need to think like a detective. Imagine if you saw this scene after the bear left. A careless NWCO might blame the problem on a raccoon and suggest ways to make the cans raccoon-proof. Those measures might not slow down a bear. So the problem, and the safety risk, could continue.

Higher, deeper, further...

- Develop a short talk about rabies prevention, and offer it during a community safety fair (police departments often sponsor these events). Speak to your local county health department's rabies coordinator, or to staff from the NYS Dep't. of Health Zoonoses Program, for help in preparing your talk. They may be able to offer brochures or videos.
- Write a short piece for a local newspaper (often known as an editorial, or "op-ed") explaining why it's important to vaccinate your pets. Check with a local veterinarian or the NYS Veterinary Medical Society for more information on pet vaccination.
- Create tip cards for your customers that explain which diseases are carried by a particular species, how those diseases are spread, and how to lower your chances of catching the disease. For example, the raccoon card might list rabies, canine distemper, feline distemper, and raccoon roundworm, give the CDC and rabies lab websites for more information, explain how people and pets catch these diseases, and then how to clean up afterwards.

Summary

Before you answer these review questions for this section, you may wish to review the overall learning objectives for this chapter:

- *Identify risks associated with the presence of nuisance wildlife and with wildlife control techniques.*
- *Understand how to protect yourself from falls, bites, heat stress, and wildlife diseases.*
- *Know which protective gear and safety equipment belongs in the NWCO "wardrobe."*
- *Be familiar with the wildlife diseases that you're most likely to encounter.*
- *Feel confident you can answer the common questions customers ask about wildlife diseases.*
- *Know who to contact if you're dealing with a sick animal.*

Chapter review questions

33a: You've been hired to remove a raccoon from the rafters of a warehouse that's located in a city. Which safety issues should you consider when setting up the job? (Check all those that apply.)

- ☐ mange
- ☐ tetanus
- ☐ rabies
- ☐ bites
- ☐ toxoplasmosis
- ☐ raccoon roundworm
- ☐ falls
- ☐ distemper
- ☐ heat stress
- ☐ histoplasmosis
- ☐ hantavirus
- ☐ Lyme disease
- ☐ West Nile virus

33b. And what safety equipment would you use to protect yourself in this situation? (Again, check all that apply.)

- ☐ respirator
- ☐ helmet
- ☐ gloves
- ☐ restraining device
- ☐ water bottle
- ☐ trap
- ☐ ladder brace
- ☐ ropes or bungee cords
- ☐ disposable clothing

34. There are no animals currently present, but which of these wildlife diseases might you still encounter while working in an attic?

- ☐ mange
- ☐ tetanus
- ☐ rabies
- ☐ toxoplasmosis
- ☐ raccoon roundworm
- ☐ distemper
- ☐ heat stress
- ☐ histoplasmosis
- ☐ hantavirus
- ☐ Lyme disease
- ☐ West Nile virus

35. While working on a roof trapping squirrels, you notice children taunting a dog on the street below. Even from this distance, you can see that the dog is skinny, its fur is patchy, and it's uncoordinated. The dog runs into a fire hydrant. You have a bad feeling about this situation. Who would you call?

- a). university professor
- b). veterinarian
- c). animal control officer
- d). health department
- e). police
- f). doctor
- g). another NWCO
- h). animal shelter
- i). wildlife rehabilitator
- j). TV station—this could be your fifteen minutes of fame!

36. A business owner hires you to remove pigeons that have been fouling cars in her parking lot. She's worried that her customers might be exposed to rabies. You tell her:

- a). The customers probably didn't get too close to the pigeons, so the chance of exposure is low. I wouldn't worry about it.
- b). Birds don't carry rabies.
- c). Pigeons are nocturnal, so the customers won't be nearby when the birds are active.
- d). I drive past this lot every day and hardly ever see a car. And by the way, can I have a deposit?
- e). To play it safe, call the health department. They'll probably want to interview all of your customers.

37. Airport staff are worried about risks posed by wildlife. They've written the following list. Briefly explain how one of these problems might happen.

- Financial: potential damage to airplanes
- Safety: plane crashes; failure of traffic control system
- Health: sparrows flying inside buildings; disease? mice droppings in kitchen; worker safety?

Answers:

33a—Things to consider include tetanus, rabies, bites, raccoon roundworm, falls, heat stress, histoplasmosis, and hantavirus.

Tetanus: because of the chance of hurting yourself on a nail

Rabies: raccoons are commonly infected, so you should approach all raccoons with caution

Bites: especially if you use something other than a trap to capture the animal

Raccoon roundworm: if you clean up raccoon droppings, watch out for later hand-to-mouth contact

Falls: if you need to use a ladder to get into the attic

Heat stress: a concern in a confined space, especially during the summer

Histoplasmosis and hantavirus: raccoons don't carry either of these diseases, but it's possible that an attic that's infested by raccoons is also home to mice, birds, or bats. Be cautious around any droppings, whether they're from rodents, birds, or bats.

33b—There's a certain degree of personal choice in this answer, unless you're covered by OSHA regulations. All of the listed items might be useful for some situations. There's no universal approach, so you may wish to have a variety of safety devices in your truck, so you can choose the ones best suited for each job.

To protect yourself from falls: ladder brace, ropes or bungee cords, helmet (but you might not need any of them if there's a staircase to the attic)

To reduce the risk of exposure to wildlife diseases: gloves, respirator, disposable clothing, restraining device, trap

To prevent heat stress: water bottle

34—histoplasmosis, hantavirus, raccoon roundworm

Histoplasmosis: this is an airborne disease. The mold spores are microscopic and could be present in bird or bat droppings.

Hantavirus: another airborne disease that could be encountered if you disturb mouse nesting materials or droppings, especially under dry conditions.

Raccoon roundworm: the parasite's eggs, which are microscopic, are found in raccoon droppings.

Rabies: Transmission usually occurs through bites, or when handling the animal.

Mange: people usually pick up the mites by handling a mangy animal.

Tetanus: not a wildlife disease.

Toxoplasmosis: transmitted by the "dirty hand-to-mouth," "put dirty object in mouth," or "eat contaminated food" routes. This is the disease that most people catch through direct contact with cat litter, contaminated soil, or by eating raw or undercooked meat. You're not likely to encounter this parasite in an attic.

Distemper: probably an airborne disease.

Heat stress: not a wildlife disease.

Lyme disease: not likely to find the deer tick in an attic.

West Nile virus: not likely to be bitten by a mosquito in an attic.

35—c,d,e,g are correct.

Sounds like you're dealing with a stray dog that could have mange (fur loss) and rabies (running into an object). The kids are provoking the dog, which could cause even a healthy animal to attack. It's important to quickly restrain and isolate the animal.

Many of the people listed could provide information about these wildlife diseases, but some are better equipped to respond to the actual emergency than others. For assistance, try calling: the local animal control officer; police; health department; another NWCO.

36—b

All of the other answers are false. People sometimes walk right up to pigeons. Pigeons are diurnal (active during the day). We know you wouldn't say that (even if you're thinking it). A deposit's not a bad idea. Some NWCOs require that of all their customers. The health department wouldn't waste its time talking to people about rabies transmission from birds because it doesn't happen.

37. *Financial risk:* bird strikes a plane and damages it.

Safety risks:

- bird strike causes pilot to lose control of plane, resulting in accident.
- rodents chew wires, causing electrical failure, so traffic control system fails.

Health risk:

- workers are exposed to birds, rodents, in planes or airport buildings. Severe infestations might expose workers to wildlife diseases.

Zoonotic diseases in the Northeast

This list features the zoonotic diseases that are more likely to be encountered in the Northeast. The names of the more significant diseases are shown in all capitals and boldface type.

Sample listing:

Disease name

Agent (what causes disease)

Vectors (animal carriers in the Northeast)

Route (how people catch the disease)—see box

Symptoms in people

Ancylostomiasis, Cutaneous larval migrans, Creeping eruptions

Agent: Parasite (hookworm)

Vectors: People, dogs, cats

Route: Worm burrows into skin; ingestion

Symptoms: Meandering, itchy red lines on skin

Anthrax

Agent: Bacteria (spores)

Vectors: Most mammals, mostly food animals, rabbits, mice

Route: Inhalation; ingestion; wound/eye/nose/mouth via contact with infected carcass

Symptoms: (Two forms) Flu-like. Pustules on skin. Cough, respiratory failure. Vomiting, diarrhea. Can be fatal.

Aspergillosis

Agent: Fungal spores

Vectors: None, but grows in soil enriched by bird and bat droppings (esp. pigeons, poultry)

Route: Inhalation

Symptoms: Mild, flu-like, pneumonia

Babesiosis

Agent: Parasite (protozoa)

Vectors: Wild and domestic animals, white-footed mouse, meadow vole, and white-tailed deer (via tick)

Route: Tick bite

Symptoms: Irregular fever, chills, headache, muscle pain, fatigue

Transmission routes (how people catch disease):

Fecal-oral: Person touches contaminant and then, with unwashed hands, touches mouth.

Ingestion: Person eats or drinks contaminated product.

Inhalation: Person breathes in disease agent.

Wound/eye/nose/mouth: The contaminant invades a person's wound, eyes, nose, or mouth.

Botulism (food poisoning)

Agent: Bacterial toxin

Vectors: Birds, mammals

Route: Ingestion

Symptoms: Nausea, vomiting, disturbed vision, weakness.

Brucellosis

Agent: Bacteria

Vectors: Hoofed animals

Route: Ingestion (milk); fecal-oral; wound/eye/nose/mouth

Symptoms: Intermittent fever, chills, headache, body aches, weakness, weight loss

Campylobacteriosis

Agent: Bacteria

Vectors: Hoofed animals, feral cats and dogs, birds, young animals

Route: Fecal-oral

Symptoms: Sudden gastrointestinal disease, diarrhea, abdominal pain, fever. Pseudoappendicitis.

Cat scratch disease

Agent: Bacteria

Vectors: Feral cats, dogs, squirrels

Route: Cat bites, scratches, or licks person

Symptoms: Fever, malaise, swollen lymph nodes

Cryptococcosis

Agent: Fungal spores

Vectors: Pigeons, starlings

Route: Inhalation; ingestion

Symptoms: Meningitis. Can be fatal.

Cryptosporidiosis

Agent: Parasite (protozoa)

Vectors: Rodents, birds (poultry), ruminants, fish, reptiles, domestic animals

Route: Fecal-oral; waterborne; wound/eye/nose/mouth

Symptoms: Enteritis, diarrhea, low fever, malaise, nausea, vomiting, abdominal cramps

Dermatomycosis

Agent: Fungus (ringworm)

Vectors: Dog, cat, cattle, horses, coyote, fox, other mammals, birds

Route: Wound/eye/nose/mouth

Symptoms: Ring-like lesion, scaling, redness

ENCEPHALITIS (several related diseases, including West Nile, Eastern, Western, and St. Louis encephalitis)

Agent: Viruses

Vectors: Birds, bats, some rodents, jackrabbits (via mosquitoes)

Route: Mosquito bites

Symptoms: Mild flu-like to severe. Can be fatal. (There's a high fatality rate in horses afflicted with Eastern equine encephalitis.)

Ehrlichiosis (two forms)

Agent: Bacteria (rickettsia)

Vectors: Dog, cattle, other mammals (probably via tick)

Route: Tick bite?

Symptoms: Flu-like, sometimes a rash appears.

Giardiasis

Agent: Parasite (protozoa)

Vectors: People, dogs, beaver

Route: Fecal-oral; ingestion; environmental contamination (water)

Symptoms: Diarrhea, greasy, frothy, smelly feces, cramps, flatulence.

HANTAVIRUS PULMONARY SYNDROME

Agent: Virus

Vectors: Deer mice, white-footed mice

Route: Inhalation, rodent bite

Symptoms: Flu-like. Can be fatal.

HISTOPLASMOSIS

Agent: Fungal spores

Vectors: None, but grows in soil enriched by bird and bat droppings (especially pigeons)

Route: Inhalation

Symptoms: Mild, flu-like, pneumonia. Can be fatal.

Leptospirosis (Weil's disease)

Agent: Bacteria

Vectors: Rodents, rabbits, fox, skunk, raccoon, opossum, deer

Route: Fecal-oral; ingestion; wound/eye/nose/mouth

Symptoms: Fever, jaundice, pain in stomach, joints, or muscles, nausea. Can be fatal.

LYME DISEASE

Agent: Bacteria

Vectors: Wild rodents (some mice, chipmunks), raccoon, deer, rabbits, birds (via deer/black-legged tick)

Route: Tick bite

Symptoms: Flu-like, rash, arthritis

Lymphocytic-choriomeningitis

Agent: Virus

Vectors: House mouse and rats

Route: Inhalation; fecal-oral; rodent bites

Symptoms: Flu-like. Inflammation of testes, joint pain, paralysis, coma.

Mange

Agent: Parasites (mites)

Vectors: Dog, cat, fox, coyote, rodents, other mammals

Route: Mite bites; wound/eye/nose/mouth

Symptoms: Crusty, red rash between fingers, on back of hands and arms.

Psittacosis

Agent: Bacteria

Vectors: Birds (especially pigeons), parakeets, poultry, waterfowl

Route: Inhalation, especially from dry feces

Symptoms: Flu-like, anorexia, pneumonia. Can be fatal.

Q (query) fever

Agent: Bacteria

Vectors: Mammals (especially sheep, goats), birds

Route: Wound/eye/nose/mouth

Symptoms: Flu-like, high fevers. Pneumonia. Hepatitis.

Can be fatal (rarely).

RABIES

Agent: Virus

Vectors: Mammals, especially raccoon, striped skunk, foxes, bats

Route: Animal bite or scratch; wound/eye/nose/mouth; rarely, inhalation

Symptoms: Paralysis, convulsions, coma. Nearly always fatal.

RACCOON ROUNDWORM

Agent: Parasite (roundworm)

Vectors: Raccoons

Route: Fecal-oral

Symptoms: Nausea, tiredness, enlarged liver, loss of coordination, coma. Can be fatal.

Rickettsial pox

Agent: Bacteria (rickettsia)

Vector: House mice

Route: Mite bite

Symptoms: resemble chicken pox.

Rocky mountain spotted fever

Agent: Bacteria (rickettsia)

Vectors: Wild rodents, rabbits, hares, carnivores, birds (via tick)

Route: Tick bite

Transmission routes (how people catch disease):

Fecal-oral: Person touches contaminant and then, with unwashed hands, touches mouth.

Ingestion: Person eats or drinks contaminated product.

Inhalation: Person breathes in disease agent.

Wound/eye/nose/mouth: The contaminant invades a person's wound, eyes, nose, or mouth.

Symptoms: Rapid onset fever, headache, muscle aches, nausea, vomiting, abdominal pain, rash, loss of muscle control. Can be fatal.

Salmonellosis (food poisoning)

Agent: Bacteria

Vectors: Rodents, swine, cattle, wild birds, poultry, pet reptiles (turtles, iguanas, etc.)

Route: Ingestion; wound/eye/nose/mouth

Symptoms: Sudden headache, fever, abdominal pain, nausea, diarrhea, vomiting

Schistosomiasis (Swimmer's itch)

Agent: Parasite

Vectors: Rodents, waterfowl

Route: Waterborne (can penetrate intact skin)

Symptoms: Rash

Sporothrichosis

Agent: Fungal spores

Vectors: Cats, dogs, horses, soil, plants

Route: wound/eye/nose/mouth via soil or plants

Symptoms: Skin lesions, spreads along lymph nodes.

Toxocariasis, Visceral larval migrans

Agent: Parasite (roundworm)

Vectors: Dog, cat, raccoon, other mammals

Route: Ingestion of eggs (soil, contam. Items)

Symptoms: Fever, cough, wheezing. Eye problems, brain damage.

TOXOPLASMOSIS

Agent: Parasite (protozoa)

Vectors: Cats

Route: Fecal-oral; ingestion (of contaminated eggs in meat)

Symptoms: Fever, malaise, muscle pain, headache. Can be fatal.

Tularemia

Agent: Bacteria

Vectors: Wild rodents, rabbits, hares, muskrats, carnivores, birds, hoofed animals (deer), bull snakes

Route: Bites from ticks or biting insects; Inhalation;

Ingestion. Can penetrate intact skin.

Symptoms: Mild to severe. Pneumonia, ulcer at bite site, swollen lymph nodes, death.

Typhus

Agent: Bacteria (rickettsia)

Vector: Rodents (inc. rats, mice, squirrels), opossum (via rat flea or body louse)

Route: Flea or lice bites; inhalation; wound/eye/nose/mouth

Symptoms: Fever, severe headache, chills, general pains, possible rash.

In the Northeast, these are the diseases you'd most likely be exposed to by...

MAMMALS

- Rabies (any mammal, but most commonly from skunks, raccoons, foxes, bats)
- Raccoon roundworm (mostly raccoons. Also: mice, squirrels, woodchucks, rabbits)
- Histoplasmosis (from bat roosts and caves, not directly from bats)
- Hantavirus (deer mouse, white-footed mouse)
- Mange (foxes, coyotes, squirrels)
- Toxoplasmosis (contact with contaminated meat, cat feces, or soil)

BIRDS

- Histoplasmosis (from bird roosts, poultry barns, not directly from birds)

REPTILES

- Salmonellosis
- There are some venomous snakes in the Northeast.

PARASITES AND INSECTS

- West Nile virus (mostly from mosquito bites)
- Lyme disease (from ticks. People are most likely to be infected from May through July).

HEALTH ISSUES FROM OTHER NWCO JOB HAZARDS

- Falls
- Car accidents
- Heat-related illnesses
- Tetanus infection (puncture wound, contact with infected nail) or other infections from wounds
- Exposure to toxic substances such as pesticides, and fiberglass, that are often found in attics
- Electrocutation, and other hazards caused by dangerous sites