

4.15 SAFE WORK PRACTICES FOR EMPLOYEES HANDLING WILDLIFE

Purpose

The purpose of this document is to provide guidance that will assist National Park Service (NPS) staff in identifying and mitigating risks associated with handling wildlife so that important natural resource management and visitor protection activities can be performed in a safe manner.

Even if only brief and incidental to primary duties, any park unit employee may come into contact with live or dead animals. All employees are encouraged to review this document and consider when and how to protect themselves from the potential hazards of handling wildlife.

Background

NPS staff handle a wide range of wildlife species under a variety of circumstances in efforts to manage park resources, maintain park facilities, provide for visitor experiences, and protect human health and safety. Wildlife biologists may be the most recognized animal-handlers due to their work in wildlife capture, tagging, sampling, monitoring, translocation, and research. In addition to handling live animals, biologists also may handle dead animals for diagnostic submission, [necropsy](#), or disposal. These investigations on both live and dead wildlife are critical because they contribute to a better understanding of park resources and help managers make informed decisions.

While biologists may handle wildlife most frequently, they are not the only employees who come into contact with wildlife. Maintenance workers and others deal with wildlife as well, often for removal from structures or for disposal. In fact, the mission of the NPS to conserve natural resources while providing for their enjoyment inherently brings wildlife and people, both staff and visitors, into closer proximity in parks than most other areas. These management activities and human-wildlife interactions often are vital to meeting park objectives and fulfilling NPS mandates; however, they are not without some risk.

Although an inherent risk to human health and safety exists with each wildlife encounter, this risk should be viewed in perspective with other hazards and a comprehensive approach to occupational safety used to reduce a variety of risks. This prudent approach to minimizing risks of injury or illness includes an understanding of basic safety measures and disease transmission, common sense, and awareness of surroundings. Basic safety measures may mean implementing the use of proper protective equipment for a particular job, or traveling in pairs and informing a supervisor of activities, especially if traveling alone. An understanding of potential [zoonotic](#) diseases – those diseases that can be transferred between humans and animals – not only can help prevent illness, but also aid in the identification of symptoms that can lead to timely medical attention.

Equally important to implementing basic safety measures and becoming informed on potential zoonotic disease risks, is having an awareness of the general environment. Planning for expected terrain, weather, or wildlife interactions, informs decisions on what personal protective equipment (PPE) to bring to the field. Although it is unreasonable to contain all risks or control the natural environment, deliberate **Planning, Preparation, and Execution** of safety measures, as appropriate for the situation, can reduce the chances of illness or injury.

Objectives

To assist NPS staff in preparing [Job Hazard Analyses](#) (JHA) for handling wildlife by:

- Identifying types of risks that may be encountered when handling wildlife, *and*
- Introducing appropriate levels of precautions based on specific activities.

A thorough understanding of potential hazards associated with different activities performed by employees working with wildlife is essential in providing a safe work environment. When conducting wildlife studies, analyzing and mitigating risks are integral parts of every job.

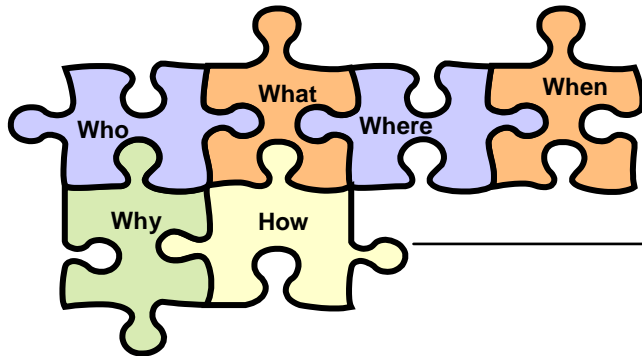
A JHA is a multi-step process designed to study and analyze a job in a particular working environment. It breaks a task down into steps, identifies potential risks associated with each component, and may reveal ways of reducing or eliminating these hazards. JHAs result in a detailed written procedure for safely completing a particular job. ([See Reference Manual 50B Section 3.1 Job Hazard Analysis](#))

The key to a successful Job Hazard Analysis is avoiding a “one size fits all” approach. The process is meant to stimulate constructive conversation between supervisors, employees, and others involved in the task. The outcome is a written document outlining the steps of the job, the potential hazards, and proposed actions to avoid or mitigate these hazards.

Visual Guide for Safe Work Practices

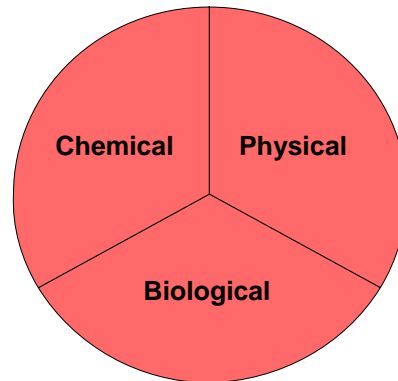
Plan

(Define the task and the context in which it will occur)



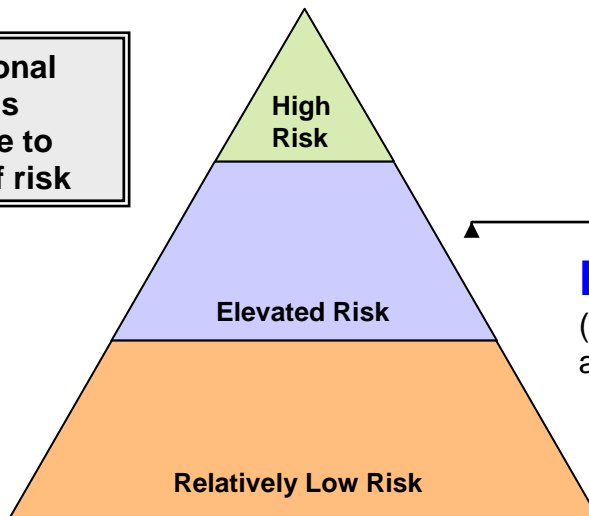
Prepare

(Understand the hazards; this may require outside assistance)



Use additional precautions appropriate to the level of risk

Use Standard Precautions



Execute

(Carry out the protective actions appropriate to the level of risk)

Plan

A number of physical, chemical, and biological risks are present in everyday field work, but these threats can be increased when focus is being placed on handling wildlife. Handling wildlife is inherently risky to human health and safety in part due to the level of uncertainty and unpredictability associated with the activity. To better understand, prepare for, and moderate these risks, the tasks must be well defined and each component carefully considered. This may be accomplished by describing who, what, where, when, why, and how each part of the job will be completed (see [Table 1](#)). By clearly explaining each of these components, as well as identifying the equipment and personnel needed to complete them, the analysis can uncover potentially hazardous situations and allow for appropriate mitigation.

Table 1. Defining the task

Who	<ul style="list-style-type: none">• who assumes responsibility for supervision of the overall project• who completes the collection, transport, or shipping of an animal, or of wildlife samples
What	<ul style="list-style-type: none">• what parts of animal collection, sampling, or transport present a hazard• what training is necessary• what recourses are available for additional information
When	<ul style="list-style-type: none">• when are these actions appropriate (does the benefit outweigh the potential risks)• when should specific actions be performed
Where	<ul style="list-style-type: none">• where should these tasks be completed• where should animals/samples be transported to
Why	<ul style="list-style-type: none">• why is the task necessary• why is the task potentially hazardous
How	<ul style="list-style-type: none">• how should the task be completed (a detailed explanation)• how breaches in safe work practices will be handled

Prepare

Perhaps the most critical element of the JHA is having an appreciation of potential hazards of working with wildlife. Hazards may be grouped into three general categories: physical, chemical, and biological. Examples of each hazard type may be found in [Table 2](#). While chemical and physical hazards may be relatively easily identified, biological hazards are more likely to be unrecognized or misunderstood. Therefore, this document provides proportionately more information and resources to assist managers in identifying biological hazards, primarily sources of infectious zoonotic disease.

Table 2. Potential Risks

Category	Specific Risk
Physical	<ul style="list-style-type: none"> • Environmental <ul style="list-style-type: none"> ○ Uneven or Extreme Terrain (e.g., slips, trips, falls, avalanche, wind) ○ Elevation (e.g., altitude sickness) ○ Climate (e.g., dehydration, drowning) ○ Weather (e.g., lightning, exposure to heat, cold, UV radiation) • Animals <ul style="list-style-type: none"> ○ Predators ○ Handled animal (e.g., kicks, bites, crushing, strains) ○ Associated animal (e.g., attack from another member of the group) • Equipment <ul style="list-style-type: none"> ○ Firearms ○ Helicopters ○ Biomedical sharps (e.g., needles, scalpels, necropsy knives) ○ Vehicles, live-capture traps, transport cages • Man-Made <ul style="list-style-type: none"> ○ Traffic ○ Noise ○ Electrical
Chemical	<ul style="list-style-type: none"> • Task Specific <ul style="list-style-type: none"> ○ Pharmaceuticals (e.g., anesthetics, antibiotics) ○ Chemicals used for specimen preservation (e.g., formalin) ○ Disinfectants (e.g., bactericides, viricides) • Environmental <ul style="list-style-type: none"> ○ Toxins (e.g., pesticides, herbicides) ○ Gases (e.g., hydrogen sulfide, sulfur dioxide) ○ Chemical spills (e.g., gasoline, oil)
Biological	<ul style="list-style-type: none"> • Infectious zoonotic disease • Exposure to venomous animals or allergic reaction to any animal • Poisonous plants

A. Physical

Employees working outdoors are exposed to many types of physical hazards depending on the type of work, geographic region, season, and duration of time spent outside. In addition, man-made hazards such as electrical overhangs, utilities, canals, and various types of infrastructure, should be identified and assessed prior to work.

1. Injury (due to animals or equipment)

Wild animals can inflict injury on humans unintentionally or as an act of aggression or defense. While mammalian predators and venomous reptiles often are thought of as dangerous, most wildlife can injure humans through biting, kicking, scratching, stomping, or crushing. An understanding of animal behavior is essential for safely handling wildlife.

In addition to hazards associated with direct animal handling, much of the equipment, if improperly used, can be dangerous to humans. Traditional firearms, remote delivery systems (i.e., dart guns), traps, and snares can cause trauma to humans. Knives, needles, and other sharps can also cause injury. Use of aircraft for animal capture and monitoring poses an additional risk. Department of the Interior policies on use of firearms by non-law enforcement personnel and ACETA (Aerial Capture, Eradication, and Tagging of Animals) are under development.

2. *Injury (due to environment)*

Although the allure of working outdoors attracts many people to the NPS, there are unique hazards employees encounter when working outdoors. The basic hazards that need consideration when working outside are:

- Exposure to:
 - Heat Stress
 - Cold Stress
 - Dehydration
 - UV Radiation (Sun)
 - Lightning
 - Wind (falling trees/limbs)
- Topography
 - Elevation
 - Water hazards

B. *Chemical*

Chemical hazards can be divided into those associated directly with wildlife capture or handling, and those already part of the environment. Chemicals related to handling wildlife include pharmaceuticals (e.g., anesthetics), reagents used to preserve biological samples (e.g., formalin), and disinfectants (e.g., bleach). Pharmaceuticals used to immobilize wildlife can be dangerous and potentially life-threatening. Exposure to drugs may occur through accidental injection, ingestion, or absorption through mucous membranes or breaks in the skin. See Kreeger et al., 2002, for an overview of human safety associated with chemical immobilization; see [Draft Director's Order #77-4, Use of Pharmaceuticals for Wildlife](#), for NPS requirements on use of wildlife pharmaceuticals. Material safety data sheets (MSDS) for many chemicals used in laboratory analysis of samples can be found at [MSDS Search](#) (www.msdssearch.com).

Environmental chemical hazards may be either naturally occurring (e.g., sulfur dioxide), may be intentionally applied (e.g., pesticides, herbicides), or could be accidentally spilled (e.g., gasoline, oil). Exposure to these substances from [dermal](#) contact (either direct or indirect) or inhalation may result when working in contaminated environments. If the substance is known, obtain an MSDS and evaluate the activity to be conducted and determine the likely risk exposure.

C. *Biological*

There are a variety of biological hazards associated with handling wildlife. Some of the most common are exposure to venomous animals (e.g., snakes) and hypersensitivity type allergic reactions due to contact with any plant or animal a person is responsive to (e.g., bee stings, pollen, poison ivy). While less common and potentially less well understood, transmission of infectious diseases between wildlife and humans also poses an important biological hazard. Diseases that are shared between animals and humans are termed zoonotic diseases. Zoonotic diseases are generally uncommon; however, the consequences of disease may be high. This can lead to an increase in concern and dread about infection. There are a number of established zoonotic diseases of importance (see the ZED website at <http://inside.nps.gov/publichealth/zed/zed.htm>) and new zoonotic diseases continue to emerge (e.g., highly pathogenic avian influenza Asian strain H5N1). Concern at some level is prudent. Further, many zoonotic diseases (e.g., plague, West Nile virus, brucellosis, bovine tuberculosis, and in most areas, rabies) are exotic to park systems and impart negative impacts not just on human health, but also on the health of native wildlife species. Therefore, management of these diseases may be warranted.

Transmission of zoonotic diseases requires three elements: an infection source, a susceptible host, and a route of transmission for the [pathogen](#) (Siegel et al., 2007). Potential zoonotic infection sources include animals, carcasses, body fluids (e.g., blood, urine, and saliva), feces, aborted fetuses, and environments (e.g., water, soil, burrows) contaminated by infected animals. Besides humans, susceptible hosts can include other species or animals of the same species. Transmission routes for zoonotic diseases are varied and depend on many factors, including the biological properties of the pathogen and the way in which the pathogen leaves the infected host.

There are three main routes of transmission for zoonotic pathogens: contact, through the air, and via [vectors](#) (see [Table 3](#)). It is possible for the same pathogen to be transmitted by multiple routes. Contact transmission occurs when pathogens enter the human host by ingestion, mucous membrane contamination, or through breaks in the skin. Direct contact transmission occurs when the pathogen is transferred after handling infected animal or biological samples from an infected animal. Indirect contact transmission may occur by handling contaminated objects, touching contaminated surfaces, or from the environment. Transmission via air occurs when pathogens from animals or their environments travel through the air and are inhaled or deposited on mucous membranes. Pathogens may become [aerosolized](#) when an infected animal coughs or sneezes, when contaminated dust particles are disturbed, or through aggressive handling of infected animal tissues. Some pathogens (e.g., plague) may be transmitted by respiratory droplets or splashing of contaminated fluids. These pathogens travel only short distances through the air in droplet form and require close proximity (<2 meters) to the infected animal or environment. Other pathogens (e.g., hantaviruses) may be transmitted as ultra-small particles and can travel longer distances by air currents. Vector-borne transmission occurs when a biting [arthropod](#) (e.g., mosquitoes, ticks, fleas) transfers the pathogen from an infected animal to a human host. Vectors may be encountered when handling wild animals and when working in field settings.

Table 3. Disease Transmission Routes

Transmission Route	Entry Into Body	Risk Activity Examples	Disease Examples
Contact-Direct	Ingestion, mucous membrane contamination, breaks in the skin	Trapping, handling, sampling live or dead animals; handling animal samples (e.g., blood)	Rabies, <i>Salmonella</i> , plague, tularemia, brucellosis, anthrax, scabies
Contact-Indirect	Ingestion, mucous membrane contamination, breaks in the skin	Handling contaminated equipment such as traps, lab or field equipment, needles, pencils, soiled laundry, vehicle interiors, countertops	Same as above
Aerosol	Inhaled small particles or droplets deposited on mucous membranes	Disturbing contaminated dust particles (e.g., cleaning buildings), close contact with animals	Small particulate: hantaviruses, highly pathogenic avian influenza Droplet: Plague
Vector-borne	Bite of infected invertebrate animal (e.g., tick, flea, mosquito)	Working in environment with vectors; handling carcasses infested with vectors	Lyme disease, plague, tularemia, Rocky Mountain spotted fever, relapsing fever, West Nile virus

Execute (applying strategies for mitigation)

Once potential chemical, physical, and biological hazards are identified, mitigation strategies may be implemented. Excellent communication between supervisors, employees, and others participating in the task, is the first step in mitigating a hazard. Each party plays a role in taking responsibility for creating and maintaining a safe working environment. Part of this communication requires a working knowledge of potential hazards, familiarity with appropriate working conditions, and recognition of the need for additional training. Management support for training, clear description of the scope of work, development of standard operating procedures (SOPs), and on-the-job monitoring are necessary to reap the benefits of JHAs. It is important to remember that familiarity with an activity or expertise in a subject area can lead to complacency by employees and supervisors. The key is to always think through the task, identify the potential hazards, and provide for reasonable safety precautions, no matter how often a job has been performed. For resources related to mitigating general hazards, see [Table 4](#).

The types of approaches used to prevent human injury or illness during wildlife capture and/or handling vary with factors such as the species, sex, age of the animal, behavior of animal (wild, habituated, food-conditioned), reason for animal handling, level of employee experience, and presence of [enzootic](#) zoonotic disease(s). In general, handling devices (e.g., squeeze chambers in traps and other restraint mechanisms) and/or animal anesthesia can decrease the risk of physical injury from animals that are not easily restrained; however, training and familiarity are required for the safe use of these tools. These techniques may not be appropriate under all conditions or may not be sufficient for hazard reduction if used alone. Reducing biological risks generally requires an

appropriate barrier between the animal, or animal samples, and the handler (e.g., gloves, coveralls, or eye/respiratory protection). Additional methods for hazard reduction may include the following:

- Development and review of protocols or SOPs on animal handling
- Daily or periodic project safety briefings and post-handling debriefing
- Training on appropriate techniques for chemical or physical restraint
- Awareness of intentional or accidental trauma from animals
- Awareness of potential zoonotic diseases in the area or handled species
- Vaccination against potential pathogens as appropriate to the level of risk (e.g., [rabies](#), tetanus)
- Training on when and how to use PPE
- Contingency plans (e.g., escape route, contact information for medical advice)

While human safety is the primary goal, these techniques should not be used in a manner that puts animals at undue risk of injury, excessive stress, or capture-related death.

Training employees in the essential components outlined in this document is critical to protecting workers from injuries and illnesses when conducting wildlife management or research, nuisance animal removal, and pest control. Training is an important part of the NPS safety and health program. If employees are unfamiliar with specific job hazards and proper work practices, this may be a cause for higher injury rate, and training may provide a solution. The NPS regularly produces a variety of training courses that can be useful in providing information for working safely. Information may be found on the DOI Learn website at <https://doilearn.doi.gov>, and the [ZED](#) website.

SOPs are appropriate for jobs where the same basic actions will be repeated regularly, and are particularly helpful when consistency is needed to ensure suitable outcomes. They need not be onerously detailed or prohibit deviations for unique circumstances in the field. SOPs are often indirectly incorporated into wildlife capture or management plans. For example, an SOP for necropsy procedures may be particularly helpful to direct use of PPE, ensure consistent sampling, explain correct shipping, provide for adequate sanitation, and describe situations that may indicate high risk wildlife mortality events. For sample submission instructions, see the [NPS Wildlife Health](#) website.

A. *Mitigating General Hazards*

There are general safe work practices that provide protection against a variety of the most common hazards (see [Table 4](#)).

Table 4. General Hazard Mitigation

Hazard	Exposure	PPE and Safe Work Practices
Physical	Contact	<ul style="list-style-type: none"> • NOAA's National Weather Service Heat Index • Heat Stress Facts • Protect Yourself from the Sun • Cold Stress Facts • Cold Card • Hazard from Mudslides • Landslides • Flashflood Warning System • NIOSH Slips, Trips, Falls • Work Zone Traffic Safety • RM 50 B Section 4.2 • Hearing Loss Prevention • Lightning • Proper Biomedical Sharps Disposal
Chemical	<ul style="list-style-type: none"> • Inhalation • Ingestion • Dermal absorption • Injection 	<ul style="list-style-type: none"> • RM 50 B Section 4.4 Hazard Communications • OSHA Hazardous Communication Standard • MSDS Search • NIOSH Pocket Guide to Chemicals • NIOSH Respirator Topic Page • Formalin MSDS
Biological	No high risk exposure anticipated	<p>Standard Precautions:</p> <ul style="list-style-type: none"> • Hand Hygiene – Hand washing with soap and water is the single most important measure for reducing the risk of disease transmission. Alcohol-based sanitizers can be used as an adjuvant to hand washing (particularly when running water is not available), but is not a substitute for hand washing. • Promptly disinfect soiled equipment, environmental surfaces, and other contaminated items using an appropriate disinfection agent; dispose of biological waste properly. • Do not eat, drink, or smoke when handling animals. • When working with wildlife indoors, be sure to work in a well-ventilated area. • Avoid needle sticks or cuts during handling; report injuries. • Take care to avoid and/or use physical barriers for protection from wildlife defense mechanisms (e.g., bites, scratches, stings). • Transport, ship, and store samples according to applicable regulations (do not store samples with food). • Discuss need for prophylactic vaccination (e.g., rabies, tetanus) with physician. • Carry appropriate medications/tools to treat allergic hypersensitivities and mitigate venomous bites (e.g., epinephrine auto-injector, snake bite kit). • Seek medical attention if concerned about an exposure to a zoonotic disease or if ill, inform physician of potential exposures.
	Contact	<p>Add to Standard Precautions:</p> <ul style="list-style-type: none"> • Disposable gloves should be readily available and worn when touching blood, body fluids, secretions, excretions, mucous membranes, and non-intact or diseased skin. • Coveralls, lab coat, or dedicated clothing. • Goggles if splash risk exists. • Impermeable gloves (e.g., leather) if handling animals that may bite or scratch.

Table 4. General Hazard Mitigation

Hazard	Exposure	PPE and Safe Work Practices
	Aerosol	Add to Standard and Contact Precautions: <ul style="list-style-type: none"> • Mask (droplet hazards) or respirator (inhaled particulate hazards). Use of respirator requires specific program elements (See Reference Manual 50 B Section 4.3 Respiratory Protection) • Eye protection: Goggles appropriate to the disease risk.
	Vector	Add to Standard Precautions: <ul style="list-style-type: none"> • Insect repellents on body and clothing. • Wear light colored long-sleeved clothing and long pants. • Wear coveralls or dedicated clothing if ticks or fleas are a concern. • Minimize activities at dawn and dusk if mosquitoes are a concern. • Tick checks. • Bag animal carcass with insecticide if arthropods observed.

B. Mitigating Specific Zoonotic Disease Risks

Standard Precautions (see [Table 4](#)) are infection control measures that should be applied at all times by all persons when working with or exposed to wildlife. Standard precautions alone are likely adequate protective measures for low-risk situations, such as working with apparently healthy animals in areas without enzootic disease.

Beyond these Standard Precautions, certain situations may present additional risks for zoonotic disease transmission that require other protective work measures and practices. The first step in mitigating disease hazards is to identify if a zoonotic pathogen may exist in the species of wildlife being handled and in the region of the country where the work is being done. Additionally, it is important to assess the relative likelihood of pathogen presence. An abbreviated list of zoonotic disease pathogens is available on the [ZED](#) website. This website also contains links and reprints of publications on specific safe work practices for some of the most serious zoonotic diseases. Several zoonotic disease handbooks also are available (e.g., Heymann 2004). Additionally, consultation with a wildlife disease professional is warranted and encouraged if there are questions or uncertainty about zoonotic disease risk in a given area or species. Once a disease risk has been recognized, a transmission route(s) can be determined and appropriate safe work practices and PPE selected for the job. See [Table 5](#) for recommendations on appropriate PPE for specific tasks and conditions.

The keys to preventing exposure to zoonotic diseases are:

- 1. Use available resources to identify potential zoonotic pathogens.***
- 2. Determine potential route(s) of transmission (contact, aerosol, vector-borne).***
- 3. Determine appropriate safe work practices and PPE to prevent exposure.***
- 4. Implement these measures when working in potential exposure situations.***

Table 5. Specific Activities with Exposure to Zoonotic Disease Pathogens and Protective Practices

Activity	Conditions	Activity Risk	PPE	Work Practice
1. Handling apparently healthy live animals.	No substantial local zoonotic disease concerns or vectors.	Zoonotic disease risk from casual contact is minimal.	<ul style="list-style-type: none"> • Clothing appropriate to the nature of the operation <i>Except:</i> <ul style="list-style-type: none"> • Disposable gloves and eye protection when handling healthy birds¹ 	1. Use Standard Precautions.
2. Handling biological samples from apparently healthy live animals.	No substantial local zoonotic disease concerns or vectors.	Zoonotic disease risk may increase with contact of body fluids or biological samples from animals.	<ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing 	1. Use Standard and Contact Precautions.
3. Handling apparently healthy live animals (or samples) from areas with known zoonotic disease risks.	Disease exists (or spills into) handled species or vectors associated with handled species.	Risk increases if a zoonotic disease is known to be present in the area, a species, or vector (e.g., plague, rabies, brucellosis).	<ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing • Eye and respiratory protection as appropriate to the level of disease risk 	<ol style="list-style-type: none"> 1. Use Standard and Contact Precautions plus appropriate precautions for transmission routes of diseases of concern. 2. Become familiar with symptoms of the disease in humans and seek medical attention if symptoms occur (inform health care provider of occupation and potential exposure).
4. Handling sick or injured live animals.	For euthanasia, sampling, or transportation.	Risk increases because cause of illness may be zoonotic and sources of contaminations may increase (e.g., diarrhea)	<ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing • Eye and respiratory protection as appropriate to the level of disease risk 	<ol style="list-style-type: none"> 1. Use Standard and Contact Precautions plus appropriate precautions for transmission routes of diseases of concern. 2. Submit diagnostic samples (if ill). 3. Prevent visitors or others from contacting a sick or injured animal.
5. Handling for disposal or submission of animal found dead.	Single dead animal in area with no substantial local zoonotic disease or vectors.	<p>Small animal: Risk is minimal if barrier is used.</p> <p>Large animal: Risk is limited but may increase with size of animal being handled due to potential for contamination</p>	<p>Small animal:</p> <ul style="list-style-type: none"> • Disposable gloves or inverted bag for collection <p>Large animal:</p> <ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing • Eye and respiratory protection as appropriate to the level of disease risk 	<ol style="list-style-type: none"> 1. Use Standard and Contact Precautions plus appropriate precautions for transmission routes of diseases of concern. 2. Transport outside passenger area of vehicle (i.e., bed of truck or trunk). 3. Bag carcass tightly if it must be placed in passenger compartment or to avoid leakage of blood or other body fluids into the environment. 4. Cover all carcasses.
6. Handling for disposal or submission of	Multiple dead animals in any event or single	Risk may differ if the mortality event is	<p>Small animal:</p> <ul style="list-style-type: none"> • Disposable gloves or inverted bag for 	<p>Follow work practices described in #5 above.</p> <p><i>In addition:</i></p>

¹ DOI memorandum on: [Employee Health and Safety Guidance for Avian Influenza Surveillance And Control Activities in Wild Bird Populations](#)

Table 5. Specific Activities with Exposure to Zoonotic Disease Pathogens and Protective Practices

Activity	Conditions	Activity Risk	PPE	Work Practice
multiple animals found dead.	dead animal in an area of substantial zoonotic disease or vector risk.	recurring (e.g., juvenile birds washed ashore) vs. unexpected.	collection Large animal: <ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing • Eye and respiratory protection as appropriate to the level of disease risk 	<ol style="list-style-type: none"> 1. Inform wildlife biologist of finding and consult with wildlife disease professional for potential causes of illness. 2. In an unexpected mortality event: Submit 1-5 animals for diagnostic evaluation and dispose of remaining carcasses in landfill or other approved means. 3. Store samples in approved locations according to protocols. 4. Become familiar with symptoms of diseases of concern in humans and seek medical attention if symptoms occur (inform health care provider of occupation and potential exposure).
7. Handling dead animal for necropsy, dissection, or food processing.	Healthy appearing animal that is collected for management or research or animal found dead with no known zoonotic disease risk.	Risk is increased due to closer contact with a variety of body fluids and tissues, but no reason to suspect presence of pathogens or vectors.	<ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing 	<ol style="list-style-type: none"> 1. Use Standard and Contact Precautions. 2. If an animal has received any drugs (anesthetics, euthanasia agent), it is unfit for human consumption and must be removed from the human food chain.
8. Handling dead animal for necropsy or dissection.	Animal found dead, animal that has been observed ill, or species with known zoonotic risk (e.g., bat, ground squirrel).	Risk is increased due to closer contact with a variety of body fluids and tissues and unknown cause of death.	<ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing • Eye and respiratory protection as appropriate to the level of disease risk • Shoe covers or boots which can be disinfected 	<ol style="list-style-type: none"> 1. Consult with public health prior to use of carcass or carcass parts for display or educational purposes. 2. Become familiar with symptoms of the disease in humans and seek medical attention if symptoms occur (inform health care provider of occupation and potential exposure). 3. Become familiar with warning signs for unusual mortality events: <ul style="list-style-type: none"> - Multiple dead animals - Blood coming from body orifices (nose, rectum) without obvious signs of trauma - Animals displaying neurologic signs prior to death.
9. Collection of biological samples from the environment for management or research.	Collection of samples (feces, urine, fetuses) from the environment where no known zoonotic enzootic disease occurs.	Risk from contact with body fluids and tissues, but no known disease is present.	<ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing 	<ol style="list-style-type: none"> 1. Use Standard and Contact Precautions. <i>In addition:</i> 2. Store samples in approved and dedicated specimen storage location according to protocols.

Table 5. Specific Activities with Exposure to Zoonotic Disease Pathogens and Protective Practices

Activity	Conditions	Activity Risk	PPE	Work Practice
10. Collection of biological samples from the environment for management or research.	Collection of samples (feces, urine, fetuses) from the environment where zoonotic disease or vectors occur.	Risk from contact with body fluids and tissues from potentially infected animals or their parasites.	<ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing • Eye and respiratory protection as appropriate to the level of disease risk • Shoe covers or boots which can be disinfected 	<ol style="list-style-type: none"> 1. Use Standard and Contact Precautions plus appropriate precautions for transmission routes of diseases of concern. <p><i>In addition:</i></p> <ol style="list-style-type: none"> 2. Consult a wildlife health professional for potential causes of illness. 3. Become familiar with symptoms of the disease in humans and seek medical attention if symptoms occur (inform health care provider of occupation and potential exposure). 4. Consult with public health prior to use of samples for display or educational purposes.
11. Cleaning areas of animal excreta and handling rodents in traps.	Indoor or field locations with significant accumulation of organic matter.	Mouse excreta or large quantities of bird or bat guano are of considerable concern, particularly in indoor facilities.	<ul style="list-style-type: none"> • Disposable gloves • Disposable coveralls • Eye and respiratory protection as appropriate to the level of disease risk • Shoe covers or boots which can be disinfected 	See: NPS worker protection recommendations for hantaviruses .
12. Incidental exposure as a result of other duties.	Indoor or outdoor.	Briefly handling or contact with live or dead animals incidental to any work assignments.	<p>Small animal:</p> <ul style="list-style-type: none"> • Disposable gloves or inverted bag for collection <p>Large animal:</p> <ul style="list-style-type: none"> • Disposable gloves • Coveralls, lab coat, or dedicated clothing 	<ol style="list-style-type: none"> 1. Communicate with Natural Resources, Risk Management, or Public Health staff as appropriate. 2. Transport outside passenger area of vehicle (i.e., bed of truck or trunk). 3. Bag carcass tightly if it must be placed in passenger compartment or to avoid leakage of blood or other body fluids into the environment. 4. Cover all carcasses.

References

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3. Centers for Disease Control and Prevention. What Does Rabies Pre-exposure Prophylaxis Involve?, Retrieved 01/08/08
<http://www.cdc.gov/rabies/exposure/preexposure.html>
4. Kreeger, T. J., J. M. Arnemo, and J. P. Raath. 2002. Handbook of Wildlife Chemical Immobilization, International Edition. Wildlife Pharmaceuticals Inc., Fort Collins, CO. 412 pp.
5. Heymann, D. L. 2004. Control of Communicable Diseases Manual, Eighteenth Edition. American Public Health Association, Washington D.C. 700 pp.
6. Training Requirements in OSHA Standards and Training Guidelines. U.S. Department of Labor Occupational Safety and Health Administration OSHA 2254 1998 (Revised).
7. Siegel J.D., Rhinehart E., Jackson M., Chiarello L., and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, June 2007.
8. Material safety and data sheets for many chemicals used in laboratory, www.msdssearch.com.
9. A number of established zoonotic diseases of importance, ZED website at <http://inside.nps.gov/publichealth/zed/zed.htm>

Definitions

Aerosol – Solid particles or liquid droplets suspended in a gas (generally air).

Aerosolized – When liquid droplets or solid particles become suspended in air.

Arthropod – Animals belonging to the phylum Arthropoda which includes insects (e.g., mosquitoes, fleas, gnats) and arachnids (e.g., ticks, mites).

CDC – Centers for Disease Control and Prevention, a part of the U.S. Department of Health and Human Services, is the primary Federal agency responsible for conducting and supporting public health activities in the United States.

Dedicated clothing – Garments worn only during specific work activities which are not to be worn for office/personal activities (e.g., in offices, at home, in public venues).

Dermal – Referring to the skin. For example, dermal absorption means passing through the skin.

Enzootic – A disease that occurs at a regular, predictable, or expected rate in an animal population or area.

Job Hazard Analysis (JHA) – A JHA is a multi-step process designed to study and analyze a job.

Mask – A barrier worn over the nose and mouth to prevent droplet contamination of mucous membranes.

Respirator – A barrier worn over the nose and mouth that filters particulates of certain sizes from inhaled air. Particulate respirators are also known as "air-purifying respirators."

Necropsy – An examination and dissection of a dead animal to determine cause of death or the changes produced by disease.

Pathogen – A biological agent that causes disease or illness to its host (e.g., bacteria, viruses, or fungi).

PPE – Personal protective equipment.

Vector – For the purpose of this document: An arthropod capable of transmitting an infectious agent to other host species.

Zoonoses – Infectious diseases that can be transferred between domestic or wild animals and humans.

Consultation

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