Animal Contact Program Handbook
Florida Institute of Technology

Office of Environmental & Regulatory Compliance
Academic Quad 407 room 710
321-674-7715 / 321-674-8283 / 321-674-7297
fax: 321-674-7586
150 W. University Blvd.; Melbourne, Fl; 32901

March 2015
1. OVERVIEW OF ANIMAL CONTACT PROGRAM

The Florida Institute of Technology’s Animal Contact Program for individuals who have animal contact includes a medical monitoring and an educational component. Medical monitoring is based on the type and frequency of exposure to animals and consists of a risk assessment, follow-up assessments and, tests/immunizations as needed. It is part of the University's Environmental & Regulatory Compliance (ERC) Office. The educational section provides individuals with health information specific to animal contact and promotes safe working practices.

The ERC and the Institutional Animal Use and Care Committee (IACUC) jointly oversee the Animal Contact Program. The Holzer Health Center (HHC) is the medical provider for the program, the ERC maintains the medical records.

This Animal Contact Program Handbook is intended to provide information for individuals working with or in proximity to animals.

Short term visitors from other institutions should provide to the ERC evidence of current participation in a medical surveillance program at their home institution. Without such documentation, visitors will be required to participate in the FIT Animal Contact Program. Individuals involved in isolated one-time, non-recurrent exposures shall be informed of potential dangers and medical precautions, but are not required to participate in the program. The primary responsible party (principal investigator, research director, student research coordinator, etc.) shall be responsible for assuring compliance with the notification requirements for these individuals.

Exemption is granted to those who work with outdoor observation studies of animals, since these projects do not present a workplace hazard.

2. MEDICAL MONITORING PROGRAM FOR ANIMAL CONTACT

The Florida Institute of Technology’s medical monitoring program is a comprehensive program for individuals having animal contact in association with University-sponsored activities. Individuals covered by the program include faculty, staff, students, and volunteers or visitors who work with vertebrate animals or in proximity to them, or who handle certain animal tissues, body fluids or wastes. The program is intended to comply with the recommendations made by the Committee on Occupational Safety and Health in Research Animal Facilities and the Institute for Laboratory Animal Resources. These recommendations have been published in the Guide for the Care and Use of Laboratory Animals, (National Research Council; National Academy Press;
The program requirements are based on the type of exposure to animals. Employee identification and tracking will be managed jointly by IACUC and the office of Environmental & Regulatory Compliance.

Individuals with animal contact shall be provided the animal contact program handbook. They shall be included in a risk assessment program that covers contact information, immunization history and a health questionnaire. The risk assessment will be updated on a periodic basis. An exit evaluation upon termination of an employee’s animal work will be offered by the Holzer Health Center.

### 3. SUMMARY OF IMMUNIZATION/TEST REQUIREMENTS

<table>
<thead>
<tr>
<th>Immunization/Tests</th>
<th>Procedure</th>
<th>Exposure Condition</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetanus Immunization</td>
<td>All individuals with animal contact</td>
<td>Current within 10 years*</td>
<td></td>
</tr>
<tr>
<td>Rabies Immunization Series</td>
<td>All employees handling unvaccinated carnivores or their tissue</td>
<td>Immunization, booster, or positive rabies titer current within 2 years</td>
<td></td>
</tr>
<tr>
<td>Serum Banking</td>
<td>If directed by physician, depending on exposures and/or concerns</td>
<td>As directed by physician</td>
<td></td>
</tr>
<tr>
<td>Respirator Clearance and Fit Test</td>
<td>When medically necessary to combat animal allergies</td>
<td>Clearance- before assignment Fit-test –annually – ERC may perform.</td>
<td></td>
</tr>
<tr>
<td>Medical Consultation</td>
<td>When deemed necessary by Occupational Medicine personnel</td>
<td>Before assignment and as determined by the HHC medical personnel.</td>
<td></td>
</tr>
</tbody>
</table>

* The Public Health Service Advisory Committee on Immunization Practices recommends immunization against tetanus every 10 years. An immunization is also recommended if a particularly tetanus-prone injury occurs in an employee where more than five years has elapsed since the last immunization.

### 4. OCCUPATIONAL INJURY REPORTING PROCEDURE

When an injury or illness occurs and medical treatment is necessary, the individual and/or the supervisor must phone the FIT Insurance Office (FITIO) at (321) 674-7297 to complete a First Report of Injury or Illness form. FITIO then will assist in selecting an authorized medical provider and will fax a copy of your First Report form to the authorized medical provider.
selected for treatment. FIT’s Insurance/risk Management web site has more information:
http://www.fit.edu/safety/liab_ins_management.php

Within 7 days of the injury, the Injury and Incident Investigation Report should be filled out and sent to the ERC. The Injury and Incident Investigation Report must be submitted whether the injured person receives medical treatment or not.

In addition, any injury must immediately be reported to the FIT security department at 321-674-8111. FIT security will come on scene and create an injury incident report and assist if any emergency is present. If the injury will result in loss of work time or require medical treatment additional reports will need to be completed with FITIO as needed for the filing of a Workers Compensation Claim. The report should be completed within 7 calendar days of the occurrence/filing of the injury with FITIO. The form, when completed, helps the University understand and analyze the causes of accidents and enhance the ability to take action to prevent recurrence.

NOTE: Venomous snake bites should follow the instructions contained in Section 7k (also posted at facility).

5. FORMS ASSOCIATED WITH THIS PROGRAM

Risk Assessment for Animal Contact

Renewal - Risk Assessment for Animal Contact

These forms & their instructions may be obtained from the Office of Environmental & Regulatory Compliance and must be completed as applicable.

6. PROGRAM CONTACTS

Additional information may be obtained from the sources listed below.

Questions regarding risks, precautions to be followed or the medical monitoring program should be directed to Environmental & Regulatory Compliance Office at 321-674-7715 or 321-674-8283 or 321-674-8493.

Questions regarding a specific situation should be directed to the principal investigator or employee supervisor.

Medical advice is available from the Holzer Student Health Center at 321-674-8078.
7. HEALTH INFORMATION

The Public Health Service of the U.S. Department of Health and Human Services directs research/teaching institutions to develop programs that promote the health and safety of employees who have animal contact. This document contains informational material about several specific conditions or practices with which animal workers should be familiar.

Any occupational injury, illness, or hazardous exposure must be reported at once to the immediate supervisor for instructions on procedures for obtaining medical treatment. Reporting all accidents and illness to the supervisor is necessary and must be prompt and accurate in order to assure proper handling of all claims. In the event of serious injury, medical assistance should be sought immediately.

Every person working with animals should be aware of the potential danger from animal bites. Although an animal scratch or bite might not seem serious, its occurrence should be reported to one's supervisor so that proper measures may be taken.

a. Personal Hygiene

There are a number of personal hygiene issues which apply to all workers with animal contact. Attention to personal hygiene protects not only the worker, but also prevents zoonotic diseases or allergens from being carried home whereby family members may be exposed.

1. There should be no eating, drinking, smoking, gum chewing, contact lens handling or applying of cosmetics in areas where animals are housed or used.

2. Laboratory coats or other protective clothing should be worn over street clothes when working with animals. This will minimize the contamination of street clothing. Protective clothing should be left in the lab or animal facility and should not be worn in common areas, lavatories, when eating, or in public eating areas.

3. Careful hand washing is required after handling of animals and prior to leaving the laboratory or animal facility.

4. All work surfaces should be decontaminated daily and after any spill of animal related material.

b. Tetanus

The Public Health Service Advisory Committee on Immunization Practices recommends immunization against tetanus every 10 years. An immunization is also recommended if a particularly tetanus-prone injury occurs in an employee where more than five years has elapsed since the last immunization. Every employee should have up-to-date tetanus immunizations. The current tetanus immunization given by the Student Health Care Center, Tdap, protects against tetanus, diphtheria and pertussis.
c. Leptospirosis

This is a contagious disease of animals and humans due to infection with Leptospira spp. The usual mode of transmission is contact with infected urine or the ingestion of urine-contaminated food or water or through a skin break. Clinical symptoms may be severe, mild or absent and may cause a wide variety of symptoms including fever, jaundice and general discomfort. The disease can usually be treated successfully with antibiotics. Dogs, domestic livestock and wild rats are commonly infected.

d. Human Allergies to Animals

Allergy to animal hair and dander is common and therefore one of the most important occupational problems occurring in workers exposed to animals. Allergic reactions are expressed in a number of ways including allergic rhinitis (a condition characterized by runny nose and sneezing similar to hay fever); by allergic conjunctivitis (irritation and tearing of the eyes); by asthma, or by atopic dermatitis (a skin condition which is caused by contact with a substance to which an individual is allergic). Allergy to animals is particularly common in workers exposed to animals such as cats, rabbits, mice, rats, gerbils and guinea pigs. There is still some controversy regarding exactly what substance causes the allergy in a certain individual. Previously it had been thought that most allergies were caused by dander and debris from the skin and fur of an animal. More recent studies seem to suggest that exposure to animal urine, saliva and fecal matter may be equally or more important. Exposure to animal urine may occur either through direct urine contact with skin or more commonly by inhaling dust from the bottom of a cage which has been contaminated with urine or fecal material.

Various studies show that 15 to 20% of workers exposed to animals will develop symptoms of allergy. This percentage may be even higher since some people are forced to leave their jobs because of the severity of the allergies that develop. Most of these reactions are of the allergic rhinitis and allergic conjunctivitis type. Less than half of these will actually be asthma. People who have a prior personal history or family history of asthma, hay fever, or eczema will be more likely to develop asthma after contact with animals, but these people do not seem any more likely to develop rhinitis and conjunctivitis than do people without such personal or family history. Everyone should exercise certain precautions to attempt to prevent animal allergy. These attempts should not be focused only on people with atopic history. Symptoms can develop anywhere from months to years after a person begins working with animals. A majority of the individuals who are going to develop symptoms will do so within the first year. It is extremely unusual to develop symptoms after more than two years of animal contact. Certain procedures should be routinely followed in order to prevent the development of animal allergy. Animals should be handled in extremely well ventilated areas to prevent build up of various particles in the air. Workers may want to wear gloves to prevent direct exposure to the animals. This applies to animal urine as well as to animal dander. In order to prevent inhaling contaminated material, cages should be changed frequently and masks should be worn during the changing of cages.

Despite the best preventive techniques, some individuals will develop allergies after contact with laboratory animals. Rarely, this will be so severe that a person is forced to change his line of work. More commonly, this can be controlled with the increased use of masks or respirators.
while working with animals and the possible use of medications. Desensitization therapy has been done for some individuals but this is not as effective for animal allergies as it is for some other types of allergies. Anyone with significant symptoms related to animal exposure should obtain medical advice.

e. **Ringworm (Dermatomycoses)**

Many species of animals are susceptible to fungi that cause the condition known as ringworm. The skin lesion usually spreads in a circular manner from the original point of infection, giving rise to the term "ringworm." The complicating factor is that cats and rabbits may be asymptomatic carriers of the pathogens which can cause the condition in humans.

In humans, the disease usually consists of small, scaly, semi-bald, grayish patches with broken, lusterless hairs, with itching. Transmission of the disease is by direct contact with an infected animal. Personal hygiene is the best method of prevention and one should obtain medical assistance if the lesions are noted.

f. **Psittacosis**

Psittacosis infection is common (1-20% of birds affected) in wild bird populations, but particularly so in pigeons and birds of the parrot family. Most infections in birds are unapparent. The infection is spread from bird to bird and from bird to humans via direct contact with infectious material or via aerosols, so direct contact with an affected bird is not necessary. One or two weeks after exposure, an infected human may develop a respiratory illness of varying severity. A mild case will appear to be the flu, while more severe cases can result in chills, fever, sweating, headaches and even pneumonia. The disease is readily treated with tetracycline-type antibiotics. Working in a dusty environment with high densities of birds is a much greater risk than working with birds outdoors or in clean, well-ventilated areas.

g. **Toxoplasmosis**

Toxoplasmosis is a disease which is caused by an organism called Toxoplasma gondii. Approximately 1/3 of the United States population has had this disease at some time. Usually this disease is quite mild and may be mistaken for a simple cold or viral infection. Swollen lymph nodes are common. In addition, it is common to have a mild fever, general tired feelings and mild headaches. Rarely, more serious illness can occur such that there can be an involvement of the tissues of the lungs, heart, brain or liver.

People acquire this disease by eating meat which is raw or has not been cooked properly or by contact with feces of an infected cat. At any one time, about 1% of all cats will be shedding the toxoplasma oocyst in their feces. In addition, this organism can be passed on to the fetus of a pregnant woman if she becomes infected during her pregnancy. **There are two situations in which toxoplasmosis can be extremely serious.** A person whose immune system is not working properly can contract a very severe form of the disease. This would include people with AIDS or a positive blood test for the AIDS virus, people on medications which suppress their immune systems, and people who have some other serious illness which affects their immune system.
system in the same way. In addition, an infection with toxoplasma can severely damage an unborn child. This can only occur if the mother gets an acute infection during the time she is carrying this child. This can result in miscarriages, still births, or various congenital defects. The disease is more serious if passed on to the fetus early in pregnancy but it is more common for the illness to be passed on later in pregnancy.

Certain simple precautions will prevent a person from acquiring toxoplasmosis. Obviously, meat should be thoroughly cooked before it is eaten, therefore preventing this form of transmission. Cats acquire the toxoplasma organism by eating raw meat or wild animals that have been infected with the organism. The cat then excretes an egg form in its feces. These do not become infective for approximately two days but after this they can persist for quite some time in the soil. Because of this, it is important that cats be fed only commercial cat food or well cooked meat. In addition, the litter box of a cat that goes outside should be changed daily. When a woman is pregnant, she should avoid any contact with cat litter and should avoid any close contact with any cats who have been allowed to roam outdoors.

Pregnant women should be cautioned about working with cats in the laboratory setting. Pregnant animal technicians who have been assigned to cat husbandry duties should be reassigned to other jobs during pregnancy. Pregnant research technicians who are exposed to cats in other ways would be best to avoid this exposure. There is no vaccine to protect humans from this parasite.

h. Rabies

Rabies is a relatively rare and devastating viral disease which results in severe neurological problems and death. Most cases of rabies occur in wild carnivores although any mammal can contract the disease. The disease is virtually unheard of in common laboratory animals. The exception to this is with dogs and cats. All bites of any type should be reported immediately to one's supervisor.

Rabies is an endemic disease in Florida, especially in skunks, foxes and bats. Note that up to 30% of the bats found on the ground are positive for rabies. Sporadic cases have been well-documented in other species of wildlife, as well as domestic animals. Animals and animal tissues field-collected in Florida should be handled with care. Precautions should take into account the fact that infected animals may shed the virus in the saliva before visible signs of illness appear and that rabies virus can remain viable in frozen tissues for an extended period. Persons handling neurologic tissues from unvaccinated carnivores or wild animals are at greatest risk. There is a human vaccine that offers protection for those persons working with this material or with unvaccinated animals. Vaccine titers are checked periodically to ensure adequate vaccine protection.

i. Bites & Scratches

Most animals are capable of inflicting bites or scratches. The bacteriology of bite wounds reflects the animals’ oral flora. Learning/applying the proper methods of handling the species with which you work may serve to prevent bites and scratches. Protective garments such as gloves and long-sleeved laboratory coats limit injury to the hands and arms.
Bites or scratches should be immediately washed with soap (preferably an antiseptic soap, such as chlorhexidine-Nolvasan® or Betadine®-povidone iodine) and running water. Bites or scratches that result in bleeding should be thoroughly scrubbed as above for at least 15 minutes. After cleansing, a topical disinfectant and bandage should be used on the wound to protect it. Individuals should notify their supervisor. Depending on the severity of the wound, individuals should seek medical treatment by reporting to the Holzer Health Center.

Laboratory rodents are purchased from laboratories which exclude zoonotic agents. For this reason, there is usually limited concern for disease from research rodents. Exceptions would include animals which have been inoculated with biohazardous material (e.g., LCMV) during the course of the research being performed with the animal. There is always concern about a secondary bacterial infection that may occur. Common skin and intestinal bacteria present on the individual or the animal can infect the bite or scratch wound and cause these secondary infections. The wound should have the above first aid procedures performed and medical treatment should be sought for severe or infected wounds and wounds from animals that have been exposed to a biohazardous material.

**j. Venomous spine injuries (Lionfish sting)**

1. Remove any obvious foreign material such as spines.
2. Rinse wound with clean water.
3. Lionfish venom is partly broken down by heat. Rapid application of hot water should therefore bring some pain relief and cannot be sufficiently stressed. The wound and surrounding area should be immersed in water as hot as the victim can stand (but NOT boiling water, and tested on non-injured body area) for about 30 to 90 minutes. Water should be no hotter than 45 degrees Celsius (114 degrees Fahrenheit) in order to prevent scalding and other heat related injuries.
4. Monitor circulation, airway and breathing.
5. Go to the nearest healthcare facility. A responsible person should accompany the victim to a healthcare facility and report: the approximate amount of time that has transpired from since the victim was envenomated; the exact nature of the first aid that was administered (including type and dosages of over-the-counter painkillers, if taken); and, whether or not the victim slowly ascended from depth underwater and adhered to the rules pertaining to planned safety/decompression stops. All of this information may be important in treating the victim.

**k. Venomous snake bites**

1. Call 911 and campus security (x8111).
2. Obtain cage card of animal that produced bite (emergency responders must know species).
3. Ensure that the snake(s) is safely contained so that there is no danger of additional bites.
4. Exit snake room, secure door.
5. Immobilize the bitten area.
6. Maintain the bitten area at a level below the heart.
7. Limit victim’s movement.
8. Remove all jewelry (rings, bracelets, watch, etc.), restrictive clothing and any constricting item before swelling occurs.

For bites from Bitis (gaboon and rhinoceros vipers), if bitten on a limb, wrap the limb tightly with an ACE bandage.

The preferred antivenin for Crotalus and Agkistrodon is CroFab (Crotalidae Polyvalent Immune Fab). Many people may be severely responsive (anaphylaxis) to USA Polyvalent. Local hospitals are unlikely to have antiserum to Bitis species. This can be obtained readily through the Miami-Dade Fire Rescue Venom Response Unit (786-331-4443).

What NOT to do:
DO NOT use a tourniquet (except for application of a bandage for Bitis bites; see above).
DO NOT drink or apply alcohol.
DO NOT cut or suck the wound
DO NOT apply ice
DO NOT wait for symptoms before calling 911

1. Safe practices in field/wildlife studies

Field work presents potential occupational health and safety hazards such as disease transmission and trauma related to conflict with wildlife. General field safety procedures include:

- Understand the hazards and follow safety precautions described to you by your course instructors, academic advisors, etc.
- Notify course instructors, academic advisors, etc. of any disability or medical condition that may impact your safety
- Carry first aid and antiseptic kits, allergy medication
- Use field PPE such as long pants and sleeves, close-toed shoes, sturdy gloves
- Make sure immunizations are current
- Carry identification with allergy information
- Immediately report any accident, injury, or illness

For additional information, see the following manual designed by the National Park Service as a guide for field staff to help prevent zoonotic disease exposure.
Safe Practices to Avoid Zoonotic Disease from Wildlife

Quick Reference Guide

Wildlife Health Branch and Office of Public Health
NATIONAL PARK SERVICE
Purpose

Working with wildlife can increase your risk of contracting a zoonotic disease, i.e., a disease that can be transmitted between humans and animals. This manual was designed for use by National Park Service resource managers and field staff as a guide to help prevent exposure to zoonotic disease. Please follow these, the guidelines outlined in Occupational Safety and Health Program RM50B 4.15, and training guidelines when working with wildlife. If you have any questions, contact the NPS Wildlife Health Branch, Office of Public Health, or Office of Risk Management (contact information found on inside back cover).

Before you begin working with or around wildlife, ask yourself:

- What are the potential **risks or hazards** in my area and/or with the species I’ll be working with? What are the symptoms of these diseases in humans and wildlife?

- Because of the risks, what **personal protective equipment** (PPE) will I need before beginning work? Do I have the necessary skills and resources?
  - Outline a plan in a job hazard analysis and discuss with supervisor.

- Do **specific health concerns** exist, such as pregnancy or a compromised immune system? Is there a need for pre-exposure vaccination?
  - Discuss specific health concerns with your physician.

- Do any **red flags exist**? If so, stop all activity and consult the Wildlife Health Branch.
  - Red flags include: multiple dead animals of unknown cause; blood coming from any orifice (nose, mouth, rectum, etc.) without obvious signs of trauma; a pus-filled lesion in the lungs; an animal exhibiting neurologic signs.

Contact the NPS Wildlife Health Branch or Office of Public Health for help with specific situations, concerns and updated guidelines, as new diseases may emerge that could change or inform recommendations.

Adapted from NPS Safe Work Practices for Employees Handling Wildlife 4.15 (RM50B 4.15)
1 STANDARD PRECAUTIONS

Always follow these standard precautions when working with wildlife or potentially infectious materials:

- Use protective barriers such as gloves and avoid bites, scratches, and physical injury.
- Wash hands thoroughly with soap and warm water after removing gloves.
- Disinfect soiled equipment and contaminated environmental surfaces or items.
- Do not eat, drink, or smoke while handling wildlife.
- Work in a well-ventilated area when indoors or upwind of specimens outdoors.
- Avoid needlesticks or cuts.
- Transport and store samples properly.
- Seek medical attention when ill and inform provider of potential disease exposures.

Additional precautions

Some activities and settings require additional precautions, including additional personal protective equipment (PPE). It is extremely important that you have a specific plan of your activities in a job hazard analysis (JHA) to identify these additional risks. It may be helpful to evaluate these additional risks by thinking about routes of exposure; this will help you select appropriate PPE. It is never inappropriate to utilize higher levels of PPE; the following represent minimum guidelines for routine scenarios.
Proper Handwashing Procedures:

- Wet your hands with water, then apply soap.
- Scrub for at least 20 seconds; be sure to get the backs of your hands, between your fingers, and under your nails.
- Rinse your hands well with clean water.
Selecting Personal Protective Equipment (PPE) based on routes of exposure

Pathogens from wildlife are transmitted by three major routes of exposure.

Consider each of these routes for your planned activity, and how you can protect yourself in each scenario.

1. **Contact**

   The single most common source of transmission is through contact, particularly touching your eyes, nose, or mouth with contaminated hands.

   The most effective tool for protection is good hand hygiene:

   1. **Wear gloves** when making contact with an animal, their fluids, or a contaminated environment.
   2. **Always wash hands** with soap and water after removing gloves, touching potentially contaminated surfaces or tools, and before eating, drinking, smoking, or using a cell phone.
   3. **Hand sanitizer**, while not a substitute for soap and water, can be useful in the field when you are unable to wash hands immediately.
   4. Contact precautions should be considered for situations where clothing or materials may be contaminated. If you are handling a larger animal, conducting a messy procedure, or working in a particularly contaminated environment, wear **dedicated coveralls** that can be laundered separately or **disposable coveralls** and boot covers.
   5. **Evaluate** if the activity could generate splashes or droplets. If the answer is ‘yes’ or ‘I don’t know’, wear **protective goggles** or a **splash guard** to prevent droplets from contacting your eyes, nose, or mouth.
2. Aerosol

While you should always work in a well-ventilated area and work upwind of a potentially contaminated area or carcass, extra precautions against aerosol transmission are needed in a few situations.

Understand the species that you are working with, the geographic range of the high-risk pathogens, and environments and activities that are likely to aerosolize these pathogens.

Situations requiring respiratory protection include:

- Conducting a necropsy on or handling a potential plague suspect animal
- Handling live mice that may be infected with hantavirus
- Cleaning a building heavily contaminated with rodent, bat, or bird droppings.

Rarely would an outdoor, small carcass collection require respiratory protection, but if you are conducting other procedures or in any way unsure of the risks present in your situation, consult with the Wildlife Health Branch, Office of Public Health, or Office of Risk Management.

Wearing any respirator requires prior medical clearance, and half-face or face-fitting respirators require annual fit testing to ensure a proper seal is formed between the respirator and the face. Otherwise, the respirator may not be protective. Ensure filter is appropriate to potential agent of concern and is replaced as needed. Consult with your park safety officer to obtain fit testing.

Dust masks and face-fitting respirators look very similar but differ greatly in their ability to protect you against infectious agents. A respirator will typically have a ‘NIOSH’ label on the front and two elastic straps (below left) while a dust mask only has one strap and no label (below right).
3. Vector

**Vector-borne diseases** exist throughout the United States and are a **significant risk** for NPS employees.

Be especially vigilant about fleas, ticks, and vector-borne diseases when working with wildlife or carcasses, as these diseases may be the reason for the death of the animal, placing you at higher risk. Ticks can be active at 43 degrees F.

Strategies to help **protect you** from **vector-borne disease**:

1. Wear an **insect repellent** containing DEET and/or wear permethrin-treated clothing
2. Wear **long pants and sleeves** and tuck pants into socks or wear dedicated or disposable coveralls with elastic wrist and ankle closures
3. Conduct **tick checks** immediately following field work
4. **Shower** within two hours of returning from the field
Using mosquito and tick repellents

Different repellents work against different arthropods, so it is important that you select the appropriate repellent for your task. The following guidelines can help you select the right repellent. All repellents should be washed from skin before sleeping for the night.

<table>
<thead>
<tr>
<th>Repellent</th>
<th>Ticks*</th>
<th>Mosquitoes</th>
<th>Concentration</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEET (N, N-diethyl-m-toluamide)*</td>
<td>x</td>
<td>x</td>
<td>30%</td>
<td>Do not use on infants under 2 months old. Do not use concentrations over 30% on children.</td>
</tr>
<tr>
<td>IR3535 (3-[N-butyl-N-acetyl]-aminopropionic acid)</td>
<td>x</td>
<td>x</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Picaridin (KBR 3023)</td>
<td></td>
<td>x</td>
<td>5-10% for ≤2 hours; 20% for longer</td>
<td></td>
</tr>
<tr>
<td>Oil of Lemon Eucalyptus [p-menthane 3, 8-diol (PMD)]</td>
<td>x</td>
<td>x</td>
<td>10% for ≤2 hours; 30-40 for longer</td>
<td>Do not use on children under 3 years old.</td>
</tr>
<tr>
<td>Permethrin</td>
<td>x</td>
<td>x</td>
<td>0.5%</td>
<td>Do not apply to skin; intended for use on clothing, shoes, bed nets, etc. only.</td>
</tr>
</tbody>
</table>

* Most products containing IR3535 and oil of lemon eucalyptus are EPA registered for use against ticks; however, the CDC currently recommends DEET and permethrin for protection against ticks. Be sure and read the label of any product you select for guidance on its usage. DEET concentrations above 30% do not significantly increase the level of protection, but do last longer.
Protective practices for exposure to zoonotic disease pathogens

Always use standard precautions. In addition, use the work practices outlined in the following Tables 1A-D.

**Personal Protective Equipment (PPE)**

- Clothing appropriate to the nature of the operation
- Eye protection
- Disposable and/or leather gloves
- Coveralls, lab coat, or dedicated clothing
- Respiratory protection as appropriate to the level of disease risk
- Shoe covers or boots, which can be disinfected

**Activity Risk**

- **Table 1A.** Risk is minimal or limited.
- **Table 1B.** Risk may increase with contact of body fluids or biological samples from animals; risk may differ if the mortality event is recurring vs. unexpected.
- **Table 1C.** Risk increases if a zoonotic disease is known to be present in the area, a species, or vector; because cause of illness may be zoonotic; and due to contact with body fluids and tissues.
- **Table 1D.** Risk is considerable if there is high risk of zoonotic disease or if mouse excreta or large quantities of bird or bat guano are present, particularly indoors.
**Table 1A.** Risk is minimal or limited.

<table>
<thead>
<tr>
<th>Activity and Condition</th>
<th>PPE</th>
<th>Safe Work Practice and Route(s) of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Handling apparently healthy live animals.</td>
<td>![Gloves] ![Shirt]</td>
<td>Routes of exposure: contact, vector</td>
</tr>
<tr>
<td>No substantial local zoonotic disease concerns or vectors; risk from casual contact is minimal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Handling biological samples from apparently healthy live animals.</td>
<td>![Gloves] ![Shirt]</td>
<td>• Contact with body fluids or biological samples may increase risk.</td>
</tr>
<tr>
<td>No substantial local zoonotic disease concerns or vectors.</td>
<td></td>
<td>Routes of exposure: contact, vector</td>
</tr>
<tr>
<td>If splashes may occur:</td>
<td>![Goggles]</td>
<td></td>
</tr>
<tr>
<td>3. Collection of biological samples (feces, urine) from the environment for management or research where no known zoonotic enzootic disease occurs.</td>
<td>![Gloves] ![Shirt]</td>
<td>• Store samples in approved, labeled, and dedicated specimen storage location according to protocols.</td>
</tr>
<tr>
<td>Risk exists from contact with body fluids and tissues, but no known disease risk is present.</td>
<td></td>
<td>Routes of exposure: contact, vector</td>
</tr>
<tr>
<td>If splashes may occur:</td>
<td>![Goggles]</td>
<td></td>
</tr>
<tr>
<td>4. Handling for disposal or submission of single animal found dead in area with no substantial local zoonotic disease or vectors.</td>
<td>![Gloves] ![Inverted Bag]</td>
<td>• Use appropriate precautions for transmission routes of diseases of concern.</td>
</tr>
<tr>
<td>Risk is minimal if barrier is used. Risk may increase with size of the animal handled due to increased chance of contamination.</td>
<td>![Shirt] ![Gloves]</td>
<td>• Transport outside passenger area of vehicle (i.e., truck bed or trunk).</td>
</tr>
<tr>
<td>Small animal: Gloves or inverted bag</td>
<td>![Large Animal]</td>
<td>• Bag carcass tightly if it must be placed in passenger compartment or to avoid leakage of body fluids into the environment.</td>
</tr>
<tr>
<td>Large animal:</td>
<td></td>
<td>• Cover all carcasses.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Routes of exposure: contact, vector</td>
</tr>
</tbody>
</table>
### Table 1B.
Risk may increase with contact of body fluids or biological samples from animals; risk may differ if the mortality event is recurring vs. unexpected.

<table>
<thead>
<tr>
<th>Activity and Condition</th>
<th>PPE</th>
<th>Safe Work Practice and Route(s) of Exposure</th>
</tr>
</thead>
</table>
| 5. Handling multiple animals found dead for disposal or submission in an area without substantial zoonotic disease risk or single animal in an area with substantial zoonotic disease risk. Risk may differ if the mortality event is recurring (e.g., juvenile birds washed ashore) versus unexpected. | Small animal: Gloves or inverted bag | Follow work practices in #4. In addition:  
- Inform wildlife biologist and consult with wildlife disease professional for potential causes of illness.  
- In an unexpected mortality event: Submit 1-5 animals for diagnostic evaluation and dispose of as appropriate.  
- Store labeled samples in approved locations.  
- Become familiar with disease symptoms in humans and seek medical attention if symptoms occur (inform health care provider of occupation and potential exposure).  
Routes of exposure: contact, vector, aerosol |
| | Large animal: |  |
| | If aerosols are a concern: |  |
| | |  |
| | Small animal: Gloves or inverted bag |  |
| | Large animal: |  |
| | |  |
| 6. Incidental exposure as a result of other indoor or outdoor duties. Briefly handling or contact with live or dead animals, incidental to other work assignments. | | • Communicate with Natural Resources, Risk Management, or Public Health staff as appropriate.  
• Transport outside passenger area of vehicle (i.e., truck bed or trunk).  
• Bag carcass tightly if it must be placed in passenger compartment to avoid leakage of body fluids into the environment.  
• Cover all carcasses.  
Routes of exposure: contact, vector |
| | |  |
| | |  |
Table 1C. Risk increases if a zoonotic disease is known to be present in the area, a species, or vector; because cause of illness may be zoonotic; and due to contact with body fluids and tissues.

<table>
<thead>
<tr>
<th>Activity and Condition</th>
<th>PPE</th>
<th>Safe Work Practice and Route(s) of Exposure</th>
</tr>
</thead>
</table>
| 7. Handling apparently healthy live animals (or samples) from areas with known zoonotic disease risks. Disease exists in (or spills into) handled species or associated vectors (e.g., plague, rabies, brucellosis). | ![PPE Icon] | • Use appropriate precautions for transmission routes of diseases of concern.  
• 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).  
Routes of exposure: contact, vector, aerosol |

Things to remember:
- Be familiar with diseases found in your area and their symptoms.
- Inform natural resources manager of sick or dead animals.
- Be familiar with warning signs for unusual mortality events:
  - Multiple dead animals
  - Blood coming from orifices (nose, rectum) without signs of trauma
  - Animals displaying neurologic signs prior to death.
- Know how to properly handle, store, and ship specimens.
- Ensure you have contact information for everyone who may have had contact with the animal so they can be contacted should a zoonotic disease be identified in the animal.
- Learn about the site prior to visiting to become aware of potential risks. This can protect both your and wildlife health.

continued ➔
8. Handling sick or injured live animals for euthanasia, sampling, or transportation.
Risk increases because animal movement may increase contact, illness may be zoonotic and increase sources of contaminants (e.g., diarrhea).

<table>
<thead>
<tr>
<th>Activity and Condition</th>
<th>PPE</th>
<th>Safe Work Practice and Route(s) of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling sick or injured live animals for euthanasia, sampling, or transportation.</td>
<td>• Use appropriate precautions for transmission routes of diseases of concern.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Submit diagnostic samples (if ill).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Prevent visitors or others from contacting a sick or injured animal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Collect contact info if exposure has occurred.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If euthanizing with gunshot, avoid head shot if neurologic signs present.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Routes of exposure: contact, vector, aerosol</td>
<td></td>
</tr>
</tbody>
</table>

9. Handling healthy appearing animal collected for management/research or found dead with no known zoonotic disease risk for necropsy, dissection, or food processing.
Risk is increased due to closer contact with body fluids and tissues, but no reason to suspect high-risk zoonotic pathogens.

<table>
<thead>
<tr>
<th>Activity and Condition</th>
<th>PPE</th>
<th>Safe Work Practice and Route(s) of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling healthy appearing animal collected for management/research or found dead with no known zoonotic disease risk for necropsy, dissection, or food processing.</td>
<td>• 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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Routes of exposure: contact, vector</td>
<td></td>
</tr>
</tbody>
</table>

continued ➔
10. Collection of biological samples (feces, urine) from the environment for management or research where zoonotic disease vectors occur. Risk from contact with body fluids and tissues from potentially infected animals or their parasites.

<table>
<thead>
<tr>
<th>Activity and Condition</th>
<th>PPE</th>
<th>Safe Work Practice and Route(s) of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Collection of biological samples (feces, urine) from the environment for management or research where zoonotic disease vectors occur. Risk from contact with body fluids and tissues from potentially infected animals or their parasites.</td>
<td>⚠️ ⚠️ ⚠️</td>
<td>• Use appropriate precautions for transmission routes of diseases of concern.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In addition:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consult wildlife health professional for potential causes of illness in the animals of concern.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Become familiar with disease symptoms in humans and seek medical attention if symptoms occur (inform health care provider of occupation and potential exposure).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consult with public health prior to use of samples for display or educational purposes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Routes of exposure: contact, vector, aerosol</td>
</tr>
</tbody>
</table>

powered air purifying respirator
### Table 1D

Risk is considerable if there is high risk of zoonotic disease or if mouse excreta or large quantities of bird or bat guano are present, particularly indoors.

<table>
<thead>
<tr>
<th>Activity and Condition</th>
<th>PPE</th>
<th>Safe Work Practice and Route(s) of Exposure</th>
</tr>
</thead>
</table>
| **11. Handling dead animal that was observed ill or a species with known zoonotic disease risk (e.g. ground squirrel) for necropsy or dissection.** Risk is increased due to closer contact with body fluids and tissues and unknown cause of death. | ![PPEs](image) | • Consult with public health prior to use of carcass or carcass parts for display or educational purposes.  
• Become familiar with disease symptoms in humans and seek medical attention if symptoms occur (inform health care provider of occupation and potential exposure).  
• Become familiar with warning signs for unusual mortality events:  
  - Multiple dead animals  
  - Blood coming from orifices (nose, rectum) without signs of trauma  
  - Animals displaying neurologic signs prior to death.  
Routes of exposure: contact, vector, aerosol |
| **12. Cleaning areas of animal excreta and handling rodents in traps in indoor or field locations with significant accumulation of organic matter.** Large quantities of mouse excreta or bird or bat guano are of considerable concern, especially in an indoor setting. | ![PPEs](image) | • See: NPS worker protection recommendations for hantavirus. [Link](http://www1.nrintra.nps.gov/BRMD/ipm/assets/docs/HantavirusRiskReductionDec2013.pdf)  
Routes of exposure: contact, vector, aerosol |
Pre-exposure rabies vaccinations

Pre-exposure rabies vaccination does not eliminate the need for medical evaluation after a rabies exposure; however, it does simplify and reduce the types, amounts, and costs of post-exposure treatment given. Importantly, pre-exposure vaccination may also offer some immunity if postexposure prophylaxis is delayed or an exposure event is unrecognized. Therefore, the Advisory Committee on Immunization Practices recommends that people at frequent risk of rabies exposure be vaccinated and have their titers checked every two years.*

Frequent risk individuals include persons handling rabies vectors on a routine basis, so many park biologists would qualify as frequent risk if they either handle potential rabies vectors in an area where terrestrial rabies exists or handle live bats as part of their regular job duties. The Office of Public Health, Wildlife Health Branch, and Risk Management Program can assist parks in making specific recommendations based on job titles and can assist in procuring the lowest cost options for pre-exposure vaccination. Vaccinated individuals should have their rabies titers checked every two years.

* Personnel working with rabies virus in a laboratory setting should have titers checked every six months.
How to safely put on and take off Personal Protective Equipment (PPE)

Safe donning of Personal Protective Equipment (PPE)

Before you begin an activity:

1. Define ‘dirty’ (highest risk), ‘clean’ (lowest risk), and ‘decontamination’ areas as needed.
2. Assemble all necessary disinfection and disposal materials.
3. Inspect all personal protective equipment to be sure it is in working order.
4. Put on eye protection and respirator if using these items. Ensure a proper seal between respirator and face has formed.

5. Pull on coveralls and inspect for any holes. If coveralls have a hood, pull hood over the straps of the respirator and eye protection.
6. Pull on boot covers or boots, pulling the coverall cuffs OVER the boots or boot covers. Tape coverall cuff/boot cover junction if concerned about biting fleas/ticks.
7. Pull on gloves and pull coverall cuffs OVER the cuffs of the gloves. If using a second layer of gloves, the cuffs of the second layer of gloves can be pulled over the coverall. Tape coverall/glove juncture if concerned about fleas/ticks.

Pull coverall cuff over first layer of gloves.  If using, second layer of gloves should be pulled over coverall sleeve.

Safe doffing of PPE

After completing the activity:

1. Move to decontamination area.

2. Unzip front of coveralls. Pull from shoulders and roll coveralls off of torso and downward toward ankles. Roll coveralls down over outside of boot covers. Remove second layer of gloves with coveralls, leaving first layer of gloves on.
3. Step out of boot covers into clean zone. If you are wearing reusable boots without covers, roll coveralls off of boots, disinfect boots, then step into clean zone. Place coveralls and boot covers in disposal bag.

4. Remove the first soiled glove by gripping the palm of one gloved hand with the fingers of the other gloved hand and pulling glove off. DO NOT slide a gloved thumb under the cuff of a glove the remove.

5. Once the first glove has been removed, keep removed glove in the remaining gloved hand. Slide ungloved thumb under the cuff of the gloved hand and pull down, pulling the glove inside out over the first glove. The first glove should end up in the inverted second glove. Dispose in bag.

6. Wash hands thoroughly with soap and water or hand sanitizer.
7. Remove eye protection and respirator, taking care to use the straps to remove and not touch the exposed front areas of the eye protection and respirator.

Incorrect – do not touch exposed front area of the respirator. Correct – remove respirator without touching its front.

8. Don a fresh pair of gloves to disinfect any remaining equipment or reusable PPE.

9. Wash hands thoroughly with soap and water once equipment is cleaned and waste has been sealed in a disposal bag.

**Disposal**

For any collected carcasses or tissues that will not be submitted for diagnostic testing, follow local and state regulations on waste disposal, as these will vary from state to state.
Sample collection of animal carcasses and tissues

✓ Any mammal with known human contact (i.e., scratched, flew into, or bit a visitor) must be humanely collected and euthanized and sent to the nearest state or county laboratory for rabies testing as soon as possible. Contact the Wildlife Health Branch or Office of Public Health for guidance on this process if needed. **Be sure to collect contact information for the person with whom the contact occurred.**

✓ Determine if the sample(s) are suitable for submission
  • Carcasses with a very strong odor or maggots may not be suitable for diagnostic testing. Consult with the Wildlife Health Branch prior to submitting questionable carcasses.

✓ Determine if forensic investigation is required (e.g., was the animal poached or potentially poisoned) or if additional assistance is needed.

Performing a field necropsy

✓ **PLEASE REMEMBER:** Performing a field necropsy can decrease the diagnostic utility of a specimen and increase the risk of zoonotic disease transmission, so only consider performing a field necropsy if carcass cannot be shipped whole or other park research is needed at the time.

✓ Obtain training in necropsy techniques, work with a trained individual, and/or consult an NPS veterinarian.

✓ Do NOT handle a specimen if blood is coming out of any orifice (eyes, nose, mouth, anus, etc.), unless the source is clearly apparent (e.g., hit by car, shot). Consult an NPS Veterinarian before proceeding.

✓ Choose a safe, well-ventilated location, preferably one that can be cleaned and disinfected after the necropsy. Consult with the park or regional safety manager as needed.
✓ Ensure contact information is available for all individuals present at the necropsy in the event a human health concern is identified that requires medical follow-up.

**Collecting carcasses**

✓ Wear appropriate PPE, as is outlined in Tables 1A-D.


**Two Methods for Collecting Small Carcasses**

1. Inverted bag technique.

- Invert bag and pull over gloved hand.
- Grasp carcass.
- Pull bag back over carcass.
- Close and seal bag.
- Place the first bag in another bag and close and seal that bag.
2. Inverted glove technique.

Grasp carcass and pull glove over it placing carcass inside inverted glove.

Knot inverted glove to seal it.

Place glove in a bag and close and seal it.

Transporting carcasses

✓ If immediate delivery to the diagnostic laboratory is not possible, keep the carcass/tissue cool but do not freeze unless instructed to do so. Keep the carcass away from scavengers or from areas where human exposure may occur.

✓ Disinfect hands and equipment.

Large carcasses:

✓ Ensure carcass is properly secured before moving. Be aware of the visibility of moving large carcasses.

Small carcasses:

✓ Place each carcass in a plastic bag and fasten securely. Place bagged carcasses into a second plastic bag and secure, to avoid leakage. Label each carcass with a unique identifier.
Shipping Instructions for animal carcasses and tissues

✓ Always call first to get permission for submission and to receive any special instructions.

✓ Complete BRD Veterinary Diagnostic Service Submission Form at: http://www1.nrintra.nps.gov/BRMD/wildlifehealth/surveillance.cfm

Packaging

Appropriate packaging is critical to assure sample quality and to avoid leakage and environmental contamination.

✓ Double or triple bag carcasses, tissues, or primary containers preferably in Ziploc®-type bags.

✓ Contain all liquids in leak proof receptacles with a screw top lid. Reinforce the lid with electrical or adhesive tape.

✓ Ship in a certified crush-resistant insulated shipping box placed inside a sturdy cardboard outer box (e.g. Polyfoam Packers) or a hard sided cooler.

✓ Place enough absorbent material (paper towels, absorbent padding, etc.) inside the secondary packaging (e.g., Ziploc® bag, garbage bag) to absorb the entire wet contents of the primary receptacles were they to be compromised during shipping and handling.

✓ Use enough blue ice packs to keep the samples cold during shipment. Wet ice should only be used in well-sealed containers (e.g., frozen water bottles). Medium to large already frozen carcasses may not need any additional ice packs, as they should remain frozen during overnight delivery in properly insulated containers.
Dry ice should be used only for small samples that are already frozen and need to remain frozen. Five pounds of Dry Ice is required for each 24-hour shipping period, and use requires additional labeling, notation on FedEx waybill, and shipper’s declaration requirements. Dry ice should only be used in well ventilated areas. Avoid skin and eye contact and always wear protective gloves.

Additional cushioning may be added (e.g., shredded paper, air cushion packaging) to reduce content shifting and/or help insulate contents.

Place Sample Submission form (and Necropsy Form, if applicable) outside of the Styrofoam shipper/inside cardboard box and submit electronic form at: http://www1.nrintra.nps.gov/BRMD/wildlifehealth/surveillance.cfm

Labeling

Label the outer cooler/box accordingly:

- Tape the “UN3373 Biological Substance Category B” label(s) to two sides of the box.
- Ensure that the name, address and phone number of the shipper and consignee are visible on the shipping waybill and the outside of the box.
If dry ice is used:

✓ Do **NOT** completely seal the box. Ensure that package allows for ventilation of carbon dioxide gas.

✓ Tape the “Class 9” label to two sides of the box.

✓ Write the net weight of dry ice in kilograms in the space provided and designate the use of dry ice on the FedEx shipping label: handwritten form or check box under Special Services on the electronic generated form as appropriate.

✓ Fill out both shipper’s and consignee’s name and address on the FedEx shipping label

**FedEx waybill/shipping label:**

✓ If generating FedEx label online, do **NOT** check box for Dangerous Goods under Special Services

✓ If handwriting FedEx waybill, check “Yes – Shipper’s Declaration not required” and write out the following adjacent to the box:

UN 3373 Biological substance
Category B, 1 package

✓ Ship Monday-Thursday via Priority Overnight (NOT First Overnight) delivery for shipment to BRD:

Name of Veterinary Contact/ Phone Number
NPS Biological Resources Division
1201 Oakridge Dr., Suite 200
Fort Collins, CO 80525

✓ If specimens are fresh and need to be shipped on Friday, call to see if special arrangements can be made.
Contacts

Wildlife Health Branch
Dr. Danielle Buttke, Public Health Veterinarian, One Health Coordinator
Office: (970) 267-2118
Cell: (970) 631-5084

Dr. Margaret Wild, Chief
Office: (970) 225-3593
Cell: (970) 214-2886

Diagnostic Service Lead
Office: (970) 267-2176

Wildlife Veterinarian
Office: (970) 267-2162

Dr. Jenny Powers, Wildlife Veterinarian
Office: (970) 267-2122
Cell: (970) 214-2933

Office of Public Health
Director
Office: (202) 513-7217
Cell: (202) 253-2289

Epidemiology Branch Chief
Cell: (202) 538-9969

One Health Coordinator
Office: (970) 267-2118
Cell: (970) 631-5084

Office of Risk Management
Occupational Safety and Health Program Manager
Office: 202-513-7214
Cell: (202) 280-9581
Wildlife Health Branch and Office of Public Health
NATIONAL PARK SERVICE

Adapted from NPS Safe Work Practices for Employees Handling Wildlife 4.15 (RM50B 4.15)