Preventing Zoonotic and Vectorborne Diseases in the Intermountain Region

As we enter the 2024 summer season, the NPS Office of Public Health would like to share some recommendations on the prevention of zoonotic and vectorborne diseases. Zoonotic diseases are diseases that can spread between humans and animals. Vectorborne diseases include diseases spread by mosquitoes, ticks, and fleas. NPS employees and visitors may be at increased risk for these diseases because of time spent outdoors, but these diseases are preventable through safe work practices.

Take General Precautions at All Times

We recommend that prior to completing a job, employees should:

- Determine whether there is a zoonotic or vectorborne disease exposure risk. It may be helpful to discuss this possibility with others, including the supervisor.
- Conduct a Job Hazard Analysis to identify and evaluate potential hazards and establish procedures to minimize or eliminate the hazards.
- When a hazard is identified, utilize the Hierarchy of Controls to determine how to minimize or eliminate the hazards.
- Stay up to date with available vaccinations, including seasonal influenza and COVID-19 vaccines, which have zoonotic potential. Anyone who works with mammals, particularly bats, should consider rabies pre-exposure vaccination. Although this does not eliminate the need for rabies post-exposure prophylaxis in the event of an exposure, it makes the post-exposure prophylaxis treatment much simpler, shorter, and inexpensive.

Practice Integrated Pest Management

Integrated pest management can lower the risk of exposure to vectors like mosquitoes, ticks, fleas, and rodents and help reduce disease exposure.

- Facility managers and building occupants should work closely with their IPM coordinator to ensure all human-occupied structures are tightly sealed to exclude rodents and bats. Additional information is available on the NPS IPM Sharepoint site.
- A NOTE ABOUT RODENTS: Pay particular attention to rodent management, as rodents directly transmit multiple pathogens that can cause human disease, including hantavirus, leptospirosis, rat bite fever, and salmonellosis. These pathogens can infect humans through handling of rodents, contact with rodent feces, urine, or saliva (including through breathing in air or eating contaminated food), or bites. Rodents and their burrows/nests also carry ticks and fleas and other vectors that can spread other diseases. These precautions are especially important as employees open facilities at the start of the season, when there can be buildup of droppings. To prevent infection, employees should:
    - Avoid contact with rodents, their droppings, urine, saliva, and nesting materials.
    - Properly store and dispose of food and trash.
    - Report information about rodents inside buildings to park maintenance staff or a supervisor immediately.
    - Exclude rodents from areas in which people live, work, and eat. Seal any gap greater than one-quarter of an inch. Keep vegetation at least 18 inches from buildings. Additional guidance is available in the NPS Rodent Exclusion Manual.
    - Utilize snap traps to both remove and monitor rodents.
    - Take precautions when cleaning up after rodent infestations or opening/cleaning buildings that have been unoccupied. Instructions for cleaning a light infestation are available here. Heavy infestations should be handled by a specialist and require the use of a respirator and enrollment in a respiratory protection program. Employees should be aware of the risk of dried droppings

becoming airborne when opening facilities at the start of the season and prepare PPE (including respirator use) accordingly.
    - Additional information on rodent-borne diseases can be found on the NPS Rodent-borne Disease page.

Take Contact Precautions

Many zoonotic diseases (which in the IMR include anthrax, plague, and rabies) can be spread through direct contact with a sick animal or with contaminated surfaces. Examples include petting or touching sick animals, and bites or scratches. To prevent infections, employees should:

- Always wear gloves when handling wild animals. Consider the additional use of dedicated clothing, eye protection, and shoe covering or boots based on the activity and the condition of the animal. More information on personal protective equipment is available in Table 2 of Safe Work Practices for Working with Wildlife.
- Wash hands after being around animals. If soap and water are not readily available, use an alcohol-based sanitizer that contains at least 60% alcohol.
- Avoid eating, drinking, or smoking when handling animals.
- Prevent bites, scratches, and needle sticks.
- Wear eye protection and a mask if splashes are a concern.
- Transport carcasses and store tissue samples properly.
- Disinfect soiled equipment and contaminated surfaces.
- After any bite or scratch, wash the wound and contact healthcare immediately.
- A NOTE ABOUT RABIES: Many pathogens can spread through a bite or a scratch, but one of the biggest concerns is rabies, which is essentially 100% fatal but preventable through post-exposure prophylaxis. Rabies can affect any mammal but is often seen among wild animals such as bats, raccoons, skunks, foxes, and coyotes. Rabies exposure should also be considered when a person wakes up in a room with a bat, as a bite or scratch could have occurred without them knowing. See the NPS Action Steps to Prevent Human Rabies Following Animal-Human Contact and the NPS Bats in Buildings Guidance for additional information. Additional information is also available on the NPS Rabies page. (As the documents are sometimes updated, please go the NPS Rabies page for the most updated versions.)

Prevent Airborne/Droplet Borne Infections

Diseases that can be carried in air or droplets include hantavirus (which is carried in rodent feces/saliva), avian influenza (which is carried in bird saliva, mucous, and feces), and histoplasmosis (which is carried in bat guano and bird feces). To prevent infections, employees should:

- Work in well-ventilated areas when inside and try to stay upwind from potentially infected animals or contaminated areas when outside.
- Be prepared to use a respirator in situations of high risk, including opening a cabin that has been sealed for the off-season, cleaning up a heavy rodent infestation, cleaning up guano or bird feces, and working with sick birds. The use of a respirator requires enrollment in a respiratory protection program and should be done in collaboration with the park safety officer.

Use Safe Food Practices to Prevent Zoonotic Foodborne Infections

Some zoonotic infections (such as *Salmonella*, *Campylobacter*, *Listeria*, and *E. coli*) can be spread through food. To prevent infections, employees should:

- Avoid unpasteurized milk.
- Ensure raw fruits and vegetables are washed.

- Store foods safely at recommended temperatures and cook food properly (see the FDA Food Code for additional information.)

Prevent Tick Bites

Although the majority of tickborne diseases occur in the Northeast and upper Midwest, tickborne diseases exist across the country. In the IMR, tickborne diseases include Rocky Mountain spotted fever, tularemia, and Colorado tick fever.

- When working in tick habitats, wear protective clothing and footwear. This may include wearing long sleeves and long pants, tucking pants into socks, and wearing a hat or cap.
- Hike in the center of trails to avoid brushing up against vegetation and avoid sitting on logs.
- Wear light-colored clothes so you can easily spot ticks.
- Use repellent: This EPA resource can help you find the repellent that is right for you.
- Treat clothing and gear with permethrin.
- Perform tick checks on your body, clothing (including shoelaces), gear, and pets after being outdoors. Focus on the areas ticks often hide: under the arms, in and around the ears, inside the belly button, back of the knees, in and around the hair, between the legs, and around the waist.
- Shower soon after spending time in tick habitat.
- Put clothing on high in the dryer for at least 10 minutes to kill ticks.
- Prepare and utilize a tick kit: a small first-aid kit that contains everything you need to prevent or remove ticks. Components of a tick kit may include: DEET or another EPA-approved repellent, Permethrin (0.5%) to apply to shoes and clothing, tweezers to remove an embedded tick, rubbing alcohol or soap and water to clean skin after removing tick, and mirrors for employees to inspect themselves for ticks.
- More information is available in the RM50B chapter "Tickborne Disease Prevention" and the NPS Ticks and Tickborne Diseases page.

Prevent Mosquito Bites

West Nile virus is the most common mosquito-borne infection in the United States and exists within the IMR. To prevent mosquito-borne infections, employees should:

- Wear loose-fitting long-sleeved shirts and pants, high socks, and a hat/head net to help prevent mosquito bites.
- Use an EPA-registered personal mosquito repellent when working outside (see EPA's "Find the Repellent that is Right for You.").
- Treat clothing and gear with products containing permethrin.
- Work with your IPM coordinator to reduce the mosquito burden.
- More information is available at the NPS Mosquito-borne Diseases page.

Highly Pathogenic Avian Influenza Update

Highly Pathogenic Avian Influenza (HPAI), also called H5N1 and sometimes referred to as bird flu, first emerged in 1996 and has been associated with a high fatality rate in poultry and with sporadic spillover from poultry to humans. In 2022, the virus emerged in the United States, where it has been circulating in wild birds and affecting domestic poultry operations, with dairy herds in at least 8 states becoming infected in April 2024. There have also been reports of HPAI infecting other wild and domestic mammal species across the United States. At this time, CDC considers the public health risk from HPAI to the general public to be low. However, NPS employees who have contact with animals or environments contaminated by infected animals may be at increased risk.

Employees that handle wild birds should follow the 2022 DOI Guidance for Wild Bird Management Activities, which includes enrollment in a respiratory protection program and use of a respirator when handling sick or dead birds or mammals that may be infected with HPAI. Additionally, CDC has interim guidance for employees that are exposed to any sick or dead animals.

Any employees that contact sick or dead animals regardless of species, and in particular animals that display neurologic symptoms, should:

- Be aware of HPAI symptoms, patterns, and risk. Many infected mammals have lost their fear of humans, been lethargic, or had seizures and unusual vocalization. These symptoms cannot be differentiated from rabies.
- Contact the park or regional occupational health specialist for specific guidance.
- Monitor their health for 10 days after their last potential exposure, in particular for respiratory symptoms and conjunctivitis (eye redness).

Seek Healthcare and Report Exposures/Illness

- Seek healthcare if you become sick and inform your doctor of any potential exposure. The NPS Office of Public Health has prepared a wallet card that employees can provide to healthcare providers to alert them to an increased risk of zoonotic/vectorborne diseases.
- Report work-related exposures and illnesses in the Safety Management Information System (SMIS) (restricted access). All known disease exposures should be reported in SMIS as well.
- Report public health concerns to the NPS Office of Public Health, through your NPS Public Health Consultant or through publichealthprogram@nps.gov, including:
    - Single reports of rare or reportable diseases (see this list),
    - Incidents in which 3 or more visitors, employees, or volunteers have similar symptoms or illness,
    - Incidents that result in death, cause serious injury or illness, and/or lead to overnight hospitalization,
    - Wildlife encounters of concern, such as bites, scratches, or attacks.
- Report concerns about sick or dead wildlife to the park resource manager and the NPS Wildlife Health Branch.

Additional Information

- NPS. NPS A-Z Health Topics Index.
- NPS Office of Public Health. Your NPS Public Health Consultant or publichealthprogram@nps.gov.
- CDC. CDC website
- USGS. Safe Work Practices for Working with Wildlife (usgs.gov)