



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington D.C. 20240



From: Assistant Director, Migratory Bird Program

Chief, National Wildlife Refuge System

JEROME
FORD

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JEROME FORD
Date: 2025.07.17
08:48:11 -04'00'

Cynthia T. Martinez

Digitally signed by
CYNTHIA MARTINEZ
Date: 2025.07.18
10:53:30 -04'00'

Subject: Migratory Bird Banding Operations and Considerations during a Confirmed Highly Pathogenic Avian Influenza Outbreak – 2025 Update

Uses and Benefits of Migratory Bird Banding

Monitoring of migratory bird populations is foundational to modern, scientific approaches to harvest management of game species and conservation decision-making for all species. Banding of migratory birds is an important component of monitoring which aids in understanding species response to management actions and the environment. For several waterfowl and webless game species, banding data directly inform annual harvest management decisions. Specific management applications of banding data include:

- Description of migration routes and population delineation
- Estimation of harvest rates and survival rates
- Estimation of the vulnerability of age/sex classes to harvest
- Estimation of production rates
- Estimation of population size

In recent years, game bird banding operations have also facilitated national avian influenza surveillance programs in the U.S. and Canada that were designed to provide a system for early detection and warning to public health, wildlife management, and agricultural sectors (Canadian Wildlife Health Cooperative. 2016, U.S. Department of Agriculture, U.S. Department of the Interior, and National Flyway Council 2021)

Most game bird banding operations occur during summer months, prior to hunting seasons, although some banding also occurs during the winter and at migration stop-over/staging sites. Banding of non-game species can occur throughout the year. Banding operations for game birds typically target areas and time-periods when birds naturally aggregate at high density to achieve high capture and marking rates in a cost-efficient manner.

Capture techniques such as bait trapping, rocket-netting over bait, or drive trapping may further aggregate birds until they can be marked and released. Other techniques such as dip-netting at night from boats or mist-netting do not concentrate birds, however, all methods involve exposure of multiple birds to trapping and holding apparatus and handling of multiple birds by humans. All capture techniques induce physiological stress that may reduce immune response.

Avian Influenza

Low pathogenic avian influenza viruses (LPAI) are known to occur in wild bird populations across the globe, including North America, with little population impact. Highly pathogenic avian influenza virus (HPAI), in the past, had been considered of primary concern for domestic bird flocks, and virulence to domestic birds such as poultry is a primary criterion in classifying a virus as low or highly pathogenic. The last significant outbreak of HPAI in North America occurred in 2014-2015 and primarily affected poultry farms in the U.S. and Canada, necessitating depopulations (over 50 million domestic poultry) and causing damages in the billions of dollars. Limited wild bird detections and mortalities were recorded during this event (Veterinary Services Surveillance, Preparedness, and Response Services Animal and Plant Health Inspection Service U.S. Department of Agriculture. 2016).

The current outbreak, caused by a Eurasian HPAI (H5N1) strain, was first detected in December 2021 in wild birds (and subsequently domestic poultry) in Newfoundland. By June 2, 2022, HPAI detections in both domestic poultry and wild birds had been documented in 40 U.S. States and all four North American migratory bird flyways. Data on the extent and distribution of HPAI in both domestic poultry and wild birds in North America can be found at [U.S. Department of Agriculture \(USDA\) Animal and Plant Health Inspection Service \(APHIS\): Detections of Highly Pathogenic Avian Influenza in Wild Birds](#).

This HPAI strain appears to affect wild birds differently than previous strains in that it: 1) has caused illness and death in a higher number of bird species, 2) has rapidly spread within wild bird populations across a larger geographic region, 3) is associated with higher mortality rates in wild birds.

Banding and Risk to Wild and Domestic Birds

Banding operations that concentrate birds or expose birds to common capture or holding equipment have the potential to increase the transmission of HPAI among wild birds. Limited published data exist currently to adequately assess transmission risk and almost no data exist for the current strain of H5N1 HPAI circulating in North America. Data from a single study conducted in 2007 indicated that ducks captured in baited traps were 2.6 times more likely to show LPAI infection than birds captured by dip-netting from airboats, however, several limitations of this study limit inference about the effect of bait trapping (Soos et al. 2012).

Many banding operations occur in areas where birds are naturally concentrated and, for species like ducks, occur in waterbodies where oral- and fecal-shed virus may be transmitted more easily among individual birds. The extent to which bait trapping or other capture, holding, and processing techniques increase transmission of the virus and the overall population-level impacts are largely unknown.

There are initial indications that wild birds are not uniformly susceptible to the current strain of HPAI. Based on detections to date, certain species of waterfowl (e.g., snow geese) and raptors (e.g. bald eagles) appear to have elevated susceptibility to clinical disease associated with HPAI infection while detections in other birds such as passerines have not been observed or detections have been very rare. This could be due to innate resistance, differences in habitat use and behavior, or simply due to reduced carcass detectability or the taxonomic focus of surveillance programs.

With respect to domestic bird flocks, any activity that increases the probability of contact between wild and domestic birds, or that potentially exposes domestic flocks to people or equipment that has been used in capture and marking of wild birds, increases the risk of virus transmission.

Banding and Risk to Human Health

While CDC considers the current risk to the general public from the HPAI A(H5) virus detections in U.S. wild birds and poultry to be low, risk depends on exposure, and people with more exposure, such as bird banders, may have a greater risk of infection. All strains of HPAI should be treated as potentially zoonotic.

Avian influenza viruses enter the cells of the human upper respiratory tract or conjunctival mucosa, either by breathing in particles or self-inoculation with contaminated hands. Virus can be present in the following materials associated with birds: feces, saliva and mucous, blood, feathers, contaminated surfaces, and contaminated air droplets and dust/dander.

Mitigation Measures

Recognizing that considerable uncertainty exists, several mitigations may help reduce risk of banding operations to both wild and domestic birds and banding personnel. A hierarchy of controls and mitigations is summarized in Figure 1 by degree of anticipated effectiveness.

Discontinuation of banding activities, all of which involve capture and handling of birds, provides the greatest level of mitigation against HPAIV spread and possible bird to human transmission, however, obviously results in the greatest impact to monitoring and management processes.

A less disruptive mitigation would be to restrict banding operations to bird groups which are believed to have lower susceptibility to clinical disease associated with HPAI. This could ensure critical data are available for management decision-making for some priority species. Information on confirmed detections and mortalities in wild birds can be found at [USDA APHIS: Detections of Highly Pathogenic Avian Influenza in Wild Birds](#). At present waterfowl, raptors, and scavengers (e.g., gulls, corvids) appear to be more susceptible to HPAI exposure and infection than passerines for instance.

Another potential mitigation would be to avoid banding and/or capture and handling of wild birds in close proximity to domestic bird flocks (at least 20 km beyond the perimeter of an infected premise – this ensures that banding operations are occurring outside of the USDA-determined infected, buffer, and surveillance [zones](#), especially where wild and domestic birds could access the same waterbodies or feeding areas. This presumes that sufficient data on the location and composition of domestic flocks is available to wildlife managers.

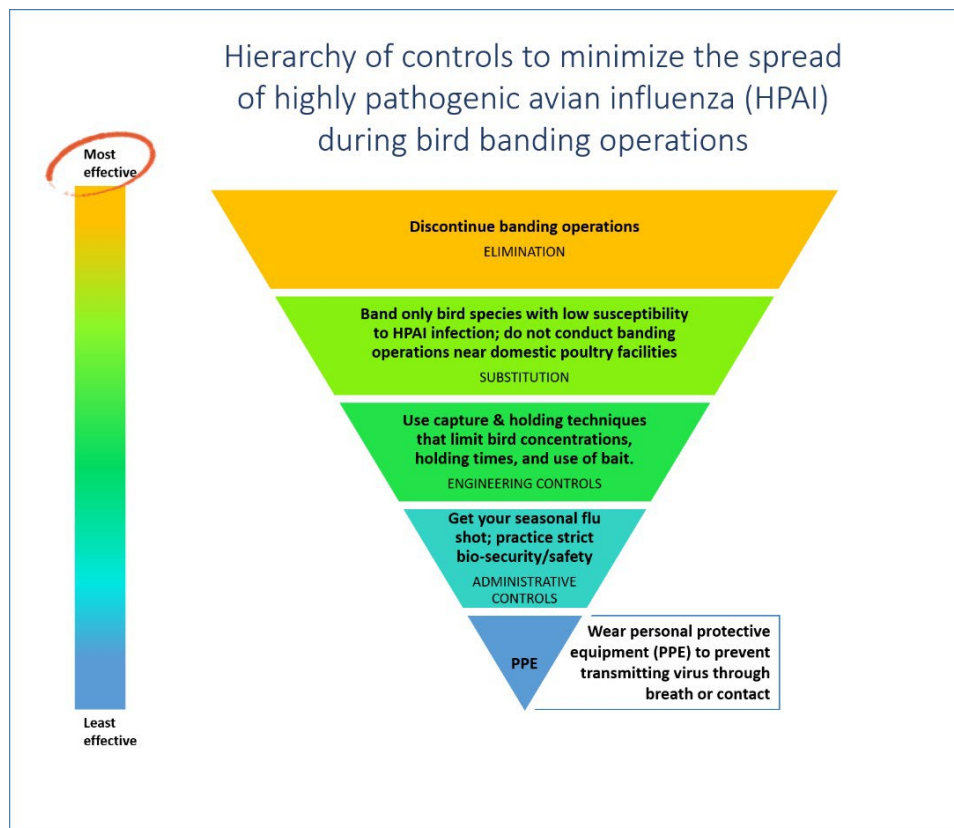


Fig. 1. Hierarchy of controls or mitigations adapted for bird banding.

Capture, holding, and handling methods associated with banding operations may be modified to reduce risk of HPAI transmission among birds. Baiting and associated capture methods such as baited traps and baited rocket net sites could be reduced or eliminated if HPAI is confirmed in wild birds in the region. If trapping is implemented, consider frequency and timing of trap visitation or periods of trap activity to minimize the time that birds are aggregated. The amount of bait applied could be reduced so that it does not persist as long in the environment. Trap size might be adjusted to allow for less aggregation of captured birds until they can be removed and processed. Traps placed in direct sunlight may reduce transmission due to the sanitization effects of ultra-violet light. For some species, drive trapping methods might be altered to reduce the number of birds concentrated in holding pens and holding pen sites may be moved between successive drive-capture events. Other capture and handling methods such as nocturnal dip-netting from boats and mist netting may be applicable for certain species and could aid in reducing concentration of birds.

Increased biosecurity measures applied in the field by banding crews to ensure equipment and clothing is changed and/or sanitized between trapping events will aid in reducing transmission among captured and handled birds. Thoroughly clean all equipment used for banding (e.g. catch boxes, pliers, band carousels) daily with soap and water to remove organic material, then disinfect with a 10% bleach solution or Virkon®).

Similarly, enhanced biosafety practices including use of Personal Protective Equipment (PPE) and practices to minimize contact with dust, dander, bird secretions, or potentially contaminated water should be considered depending on current HPAI outbreak status and whether the circulating strain(s) is known or suspected to be zoonotic. The Department of Interior has published guidelines for biosecurity and

biosafety practices when handling wild birds (see Attachment). These guidelines specify differing levels of mitigation depending on the field activity (handling apparently healthy birds or sick/dead birds) and disease conditions (zoonotic confirmed/suspected or not). These guidelines are presently under review and possible revision by the Department.

While it might be thought of as a primary option, the use of personal protective equipment (PPE) is actually the least effective mitigation strategy for minimizing the spread of HPAI to humans, domestic poultry, and wild birds. This is because it can be difficult to safely and effectively employ under field conditions, requires fit-testing and training of field crews, creates other hazards such as heat exhaustion, and relies on unmonitored compliance by crews. Significant PPE requirements (such as respirators) and other field mitigations may also reduce the availability of willing banding crew participants.

Utility of Banding Data Gathered During an HPAI Outbreak

Possible increase in transmission and prevalence of HPAI in birds captured during banding operations could affect the representativeness of the banded sample, violate assumptions of subsequent analyses, and bias demographic estimates derived from these data. Recording of capture methods may permit evaluation of these effects with sufficient sample size, replication, and control working in cooperation with the USGS Bird Banding Lab and other partners. Implications of possible increase in HPAI infection rates in the banded sample, and ability to account for effects in monitoring program design and analysis, should be considered when assessing risks and benefits of banding operations during a HPAI outbreak.

When Should a Return to Normal Banding Operations Resume?

Presently, we suggest that any special, elevated mitigations adopted for banding operations per guidance summarized here continue until USDA has declared the entire country free from HPAI in domestic poultry. We note again that there is considerable uncertainty regarding the present strain of HPAI now circulating in domestic poultry and wild birds in North America and this criterion, as well as mitigation guidance, may change in the future.

Recommendation

While limited published information is available, that information is consistent with the hypothesis that any activity that concentrates wild birds and involves handling of multiple birds increases bird stress and likely increases risk of disease transmission. Present detections in wild birds in North America do suggest, however, that not all bird groups or species are equally susceptible which may be due to innate resistance, habitat use, behaviors, or a combination of factors. Banding is a critical activity supporting migratory bird management and conservation; risk of transmission likely varies substantially by taxonomic groups, regions, time-periods, and banding methods. The wild bird population-level impacts of possible increased transmission associated with banding operations are largely unknown. We, therefore, recommend that decisions to proceed with, modify, or discontinue individual banding programs be evaluated on a case-by-case basis based on the criteria summarized here. Risk-benefit evaluations should be conducted in the context of the current HPAI outbreak status and whether current strain(s) are known to cause human morbidity and mortalities. In all cases, banding at a specific location should be suspended if bird mortalities of unknown cause are detected until the cause is determined. Banders should continue to report mortality events to the USGS National Wildlife Health Center (<https://www.usgs.gov/centers/nwhc/science/report-mortality-events-and-submit-specimens>) and consult with them on appropriate testing. The U.S. Fish and Wildlife Service, along with other Federal, state, and international partners continues to assess risk associated with this rapidly changing outbreak and will provide further information as it becomes available.

Literature Cited

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Veterinary Services Surveillance, Preparedness, and Response Services Animal and Plant Health Inspection Service U.S. Department of Agriculture. 2016. Final Report for the 2014–2015 Outbreak of Highly Pathogenic Avian Influenza (HPAI) in the United States: Revised August 11, 2016.



United States Department of the Interior
OFFICE OF THE SECRETARY
Washington DC 20240

Interior Health Information Bulletin
Avian Influenza and Safety Guidelines for Handling Wildlife and Domestic Animals

To: Bureau/Office Emergency Coordinators
Bureau/Office Safety Managers
Natural Resource/Conservation Manager

From: Thomas Balint
Director, Office of Emergency Management

Jonathan Thomas
Director, Office of Occupational Safety and Health

Digitally signed by
THOMAS BALINT
Date: 2024.12.13
09:16:13 -0500

JONATHAN
THOMAS

Digitally signed by
JONATHAN THOMAS
Date: 2024.12.12 16:52:19
-0700

Highly Pathogenic Avian Influenza (HPAI) virus is currently infecting wild bird populations worldwide. HPAI is also expanding to commercial poultry flocks and dairy herds resulting in outbreaks across the United States, Canada, and other countries. Some strains of avian influenza viruses, including the current strain (H5N1), can also infect humans and cause illness. These types of infections are termed zoonotic illnesses. Human HPAI infections associated with the current 2024 outbreak have been rare and limited to dairy and poultry workers who have had close or prolonged contact with infected birds, cattle, or virus contaminated environments. To date, approximately 60 human cases have been confirmed across seven states. These infections have ranged in severity from no symptoms or mild illness (e.g., eye infection and upper respiratory symptoms). However, previous avian influenza outbreak events have indicated the potential for severe human disease (e.g., pneumonia) and even death. Current risk to the general public related to H5N1 remains low and no cases of human-to-human transmission have been detected.

Interior is closely monitoring the HPAI outbreak and is updating its operational guidance to align the current risk levels. These actions include providing weekly HPAI updates via the [DOI Common Operating Picture](#) and enhanced communication and surveillance activities in coordination with interagency partners. Additionally, Interior has revised and expanded the attached document, *Highly Pathogenic Avian Influenza Biosafety Considerations for Personnel Conducting Activities Involving Wildlife or Domestic Animals, 2024*, which contains information about employee risk reduction and safe work practices. This guidance supersedes previous Interior safety guidance that only applied to handling wild birds. More specifically, this guidance provides updated information regarding the application of job hazard analysis, risk reduction, and use of protective equipment. It also contains links to additional resources and contact information for appropriate bureau and office support personnel.

Attachments (2)

Updated Employee Health and Safety Guidance:

Highly Pathogenic Avian Influenza Biosafety Considerations for Personnel Conducting Activities Involving Wildlife or Domestic Animals, 2024

In an effort to keep pace with the changing conditions of Highly Pathogenic Avian Influenza (HPAI), this document provides updated guidance for protecting Department of the Interior (Interior) employees involved in handling live or dead wildlife and domestic animals. The risk of exposure to avian influenza viruses, and consequent safety recommendations, are dependent on the particular HPAI virus genomes (or strains) that are present, which animal species are being handled, and the type of work activities that are being performed. Some employees may have job-related or other exposures that put them at greater risk for infection from avian influenza viruses than others. Personnel are encouraged to read the publication [Safe Work Practices for Working with Wildlife](#) and discuss any questions or concerns they may have with their appropriate bureau/office safety and health office, office of public health, and/or wildlife health staff. Guidance will continue to be re-evaluated as the current outbreak evolves and additional information becomes available. The following actions and evaluation processes are highly encouraged.

I. Job Hazard Analysis

- a. Conduct a Job Hazard Analysis (JHA) prior to all operations when close or prolonged contact with wildlife or domestic animals – alive or dead - is expected. This includes routine job tasks and short-term, non-routine operations such as mortality events.
- b. A JHA is a systematic process for identifying hazards and eliminating or minimizing their risks. The first step is to break the job task or activity down into basic steps. Larger or more complex operations may need to be divided into several activities or sub-steps. Next, each step is evaluated each for potential hazards. Finally, for each hazard identified, methods to control or eliminate the hazard must be identified.
- c. The general process for conducting a JHA is outlined in [485 DM 14 – Job Hazard Analyses](#). Additionally, most bureaus/offices have policies and guidance regarding the use and application of JHAs. A representative example from the U.S. Fish and Wildlife Service can be found here by clicking [here](#).

II. Hierarchy of Controls

- a. Utilize the [Hierarchy of Controls](#) to assess, eliminate, reduce, and/or mitigate potential exposures. Controlling exposures to occupational hazards is the fundamental method of protecting workers. This hierarchy is used to determine the preferred order for risk reduction and how to implement feasible and effective control solutions in a stepwise process. The control methods at the top of graphic are more effective and protective than those at the bottom. Following this hierarchy during operations results in inherently safer systems, where the risk of

illness or injury is substantially reduced. **Figure 1** provides a hierarchy of controls specific to controlling exposure to HPAI.

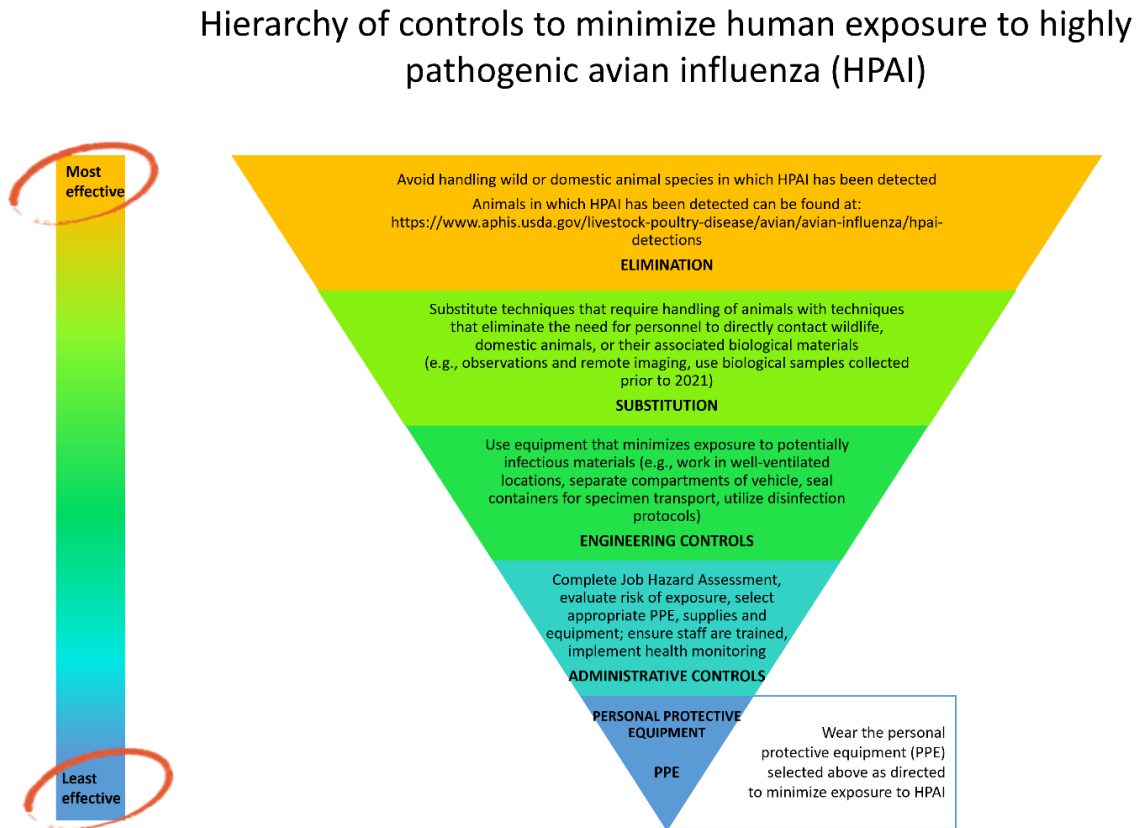


Figure 1. HPAI-specific Hierarchy of Controls.

III. Personal Protective Equipment

- a. Require employees who perform job tasks where close or prolonged contact with wildlife or domestic animals is required to utilize appropriate personal protective equipment (PPE). PPE selection should be based a JHA and required whenever exposure cannot be eliminated or otherwise reduced to an acceptable level via one of the higher order controls outlined with the above HPAI-specific hierarchy of controls.
- b. Provide instruction and up-to-date PPE-related information to personnel at risk of coming in contact with HPAI viruses while doing the following:

- i. Handling known or suspected infected animals, their parts, or products. This includes investigating animal mortality events, handling live or dead wildlife and domestic animals, euthanasia, collection of fecal/cloacal and/or oropharyngeal swabs, body fluids, or fecal samples, and carcass collection and disposal.
 - ii. Conducting routine field work activities. This includes monitoring animal health, conducting field research, and performing translocations.
 - iii. Working with potentially contaminated materials (e.g. saliva, blood, mucus, milk, feathers, dander, or animal droppings). This includes while handling animals, as well as cleaning and disinfecting equipment, vehicles, or non-PPE (e.g., boots).
- c. Interior bureaus and offices are required to provide necessary PPE to at-risk personnel at no cost. PPE use and training must be conducted in accordance with the Occupational Safety and Health Administration (OSHA) Personal Protective Equipment standards (29 CFR 1910.132 – 134), [485 DM 20 – Personal Protective Equipment](#), and applicable bureau/office requirements.
- d. Provide appropriate respiratory protection when PPE use is indicated. Use of respirators requires implementing a respiratory protection program in accordance with Occupational Safety and Health Administration's (OSHA) [29 CFR 1910.134 – Respiratory Protection Standard](#) and bureau/office policies. HPAI-related respirator guidance includes the following:
 - i. If employees are *required to wear a* respirator to prevent potential exposure to avian influenza viruses, OSHA advises, at a minimum, a NIOSH-approved N95 filtering facepiece respirator or higher as part of a comprehensive respiratory protection program that includes development of a written program, employee training, medical clearance, fit testing to ensure appropriate respirator selection and use, and an assigned Respiratory Protection Program Administrator. The voluntary use of N95 filtering facepiece respirators is **not authorized** when exposure to HPAI virus is anticipated.
 - ii. Under certain high-risk conditions such as handling large numbers of animals in a confined area confirmed to have HPAI virus, it may be necessary to utilize an alternate form of respiratory protection such as a Powered Air Purifying Respirators (PAPR) or other protection options.
 - iii. Contact the appropriate bureau/office safety and health office for questions and assistance regarding respirator use.

Table 1 describes conditions, general activities, and the minimal protective measures, including PPE, required reduce the risk of exposure to HPAI. However, additional PPE

and safety precautions may be necessary depending on specific risk factors and conditions of the worksite or tasks. Note that this guidance applies to the presence of avian influenza in North America and does not attempt to cover all tasks or geographic locations that may be assigned to Interior personnel. High exposure tasks not anticipated in the chart should be evaluated in consultation with servicing bureau/office safety and health office and wildlife health staff.

Table 1. PPE recommendations based on job task risk.

Assess your risk if working with birds or mammals when Highly Pathogenic Avian Influenza (HPAI) is present in North America		
Low Risk Activities	Conditions: <ul style="list-style-type: none"> • HPAI <u>has not</u> been detected previously in the animal species you are handling and, • HPAI <u>has not</u> been detected in any animal, wild or domestic, in the state where you're working during the past 21 days (HPAI incubation period) and, • You are handling animals or animal carcasses <u>outside (well-ventilated area)</u> 	Minimum PPE: <ul style="list-style-type: none"> • Perform thorough hand washing regularly and especially after removing PPE • Clothing worn only at that work location or disposable coveralls • Disposable gloves • Waterproof footwear that can be easily cleaned and disinfected and/or disposable boot covers
Moderate Risk Activities	Conditions: <ul style="list-style-type: none"> • HPAI <u>has</u> been detected previously in the animal species you are handling or, • HPAI <u>has</u> been detected in any animal (wild or domestic) in the state where you're working during the past 21 days and, • You are handling animals or animal carcasses <u>outside (well-ventilated area)</u> 	Minimum PPE: <ul style="list-style-type: none"> • Perform thorough hand washing regularly and especially after removing PPE • Eye protection (goggles or face shield) • Disposable gloves • Clothing worn only at that work location or disposable coveralls • Waterproof footwear that can be easily cleaned and disinfected • Optional to wear a NIOSH certified respirator for Moderate Risk Activities <i>See guidance within document regarding Voluntary Use versus Required Use of respirators.</i>
High Risk Activities	Conditions: <ul style="list-style-type: none"> • You are creating aerosols while cleaning items potentially contaminated with HPAI • The animals you are working with are known (or highly suspected due to other confirmed cases at your location) to be infected with HPAI • You are handling animals or animal carcasses <u>inside (poorly-ventilated area)</u> 	Minimum PPE: <ul style="list-style-type: none"> • Perform thorough hand washing regularly and especially after removing PPE • Eye protection (goggles or face shield) • Disposable gloves • Disposable coveralls • Waterproof footwear that can be easily cleaned and disinfected • A NIOSH certified respirator that will prevent transmission of avian influenza (such as an N95 respirator or a Positive Air Pressure Respirator – PAPR) <i>See guidance within document regarding Voluntary Use versus Required Use of respirators</i>

IV. Safe Work Practices

- a. Implement the safe work practices when conducting operations where contact with wildlife and/or domestic animals occurs and when HPAI exposure is anticipated.
- b. When preparing for field work:
 - i. Consult regional safety and health, public health, and/or wildlife health staff regarding HPAI and other zoonotic disease risks within work areas. Please see **Appendix A** for a list of bureau/office contacts.
- c. When conducting field work:
 - i. Do not eat, drink, smoke, use a cell phone, touch eyes, face, hair, or exposed skin.
 - ii. Thoroughly inspect all PPE prior to use for signs of damage and carefully remove worn PPE to prevent self-contamination. Ensure that contaminated PPE is segregated and treated as potentially infectious prior to disposal and/or decontamination.
 - iii. Clean surfaces of equipment and reusable PPE with detergent and water, then disinfect with a virucide that kills avian influenza viruses (such as Virkon). Follow all label instructions. This [EPA](#) site lists products registered for use against avian influenza. Decontaminate tools and other equipment prior to reuse.
 - iv. After contact with wildlife, remove gloves and wash hands thoroughly with soap and water for at least 20 seconds. If soap and water are not available, use an alcohol-based hand sanitizer with at least 60% alcohol.
 - v. Minimize dust by thoroughly wetting or misting contaminated surfaces and avoid generating mists during equipment decontamination.
 - vi. Do not touch exposed skin or other body parts (especially the face), with gloved hands. Replace torn or damaged gloves immediately.
 - vii. If there is known exposure to body fluids from a bird (e.g., fecal material splashed in eyes or mouth), follow proper occupational reporting protocols, contact a health care provider, and give a complete history of activities and potential for occupational exposure.
 - viii. **Do not** open carcasses or perform necropsies in the field for species that are considered higher risk for HPAI infection. Consult the servicing safety and health office, public health office, and wildlife health staff if unsure whether the species handled is considered high risk.

V. Vaccination

- a. Encourage seasonal influenza vaccination. Seasonal flu vaccination will not prevent infection with avian influenza viruses but can reduce the risk of getting sick with human and avian flu viruses at the same time. Dual infections could result in viral re-assortment resulting in new, previously unrecognized virus subtypes. It is recommended, but not required, that Interior personnel obtain the seasonal influenza.

VI. Medical Monitoring

- a. Support medical monitoring in alignment with current CDC recommendations. All persons with direct or close contact (within about 6 feet) to confirmed or suspected HPAI infected animals (wildlife or domestic species), or surfaces and equipment potentially contaminated with HPAI virus be monitored for illness for 10 days following their last exposure. Monitoring should occur regardless of the health status of the animal (well-appearing, sick, or dead) and regardless of whether appropriate PPE was worn.
- b. The following recommendations, which apply to **all individuals** with direct or close contact to confirmed or suspected HPAI infected animals. Please consult the CDC webpage – [Symptom Monitoring Among Persons Exposed to HPAI](#) – for further information. For 10 days, following close contact, perform daily monitoring for these signs and symptoms:
 - i. Fever (Temperature of 100°F [37.8°C] or greater) or feeling feverish/chills (fever may not always be present)
 - ii. Cough
 - iii. Sore throat
 - iv. Difficulty breathing/Shortness of breath
 - v. Eye tearing, redness, or irritation
 - vi. Headache
 - vii. Runny or stuffy nose
 - viii. Muscle or body aches
 - ix. Diarrhea (less common)
- c. If any of the above symptoms occur, it is recommended to contact a licensed medical provider as well as the servicing bureau/office safety and health manager immediately.

- d. Limit contact with others as much as possible and avoid handling live animals until 10 days after last known exposure and/or the results of any influenza testing are known. Practice good hygiene to reduce the risk of transmission of to others.
- e. If symptoms progress, seek medical attention immediately. Signs of moderate to severe illness may include shortness of breath or difficulty breathing, altered mental status, or seizures.

VII. Biosecurity

- a. Implement biosecurity measures to prevent the introduction of pathogens or invasive species and reduce spread outside their native range or to new environments.

Table 2 provides additional information regarding implementation of biosecurity protocols.

Table 2. Recommended HPAI biosafety protocols for wildlife.

Preparation and Planning	<ol style="list-style-type: none"> 1. Ensure that personnel have completed biosafety and biosecurity training appropriate to the exposure potential. 2. When planning for field work, include disease and invasive species biosecurity protocols in work plans. Protocols should include: <ol style="list-style-type: none"> a) biosecurity training courses for personnel, b) designate the clothing and footwear needed for a given disease and field situation (with special attention to appropriate selection of disposable PPE or reusable PPE that is capable of being cleaned and disinfected), c) identify the equipment that will be used and decontamination protocols for that equipment (including boats, trailers, and vehicles), d) plan for carcass disposal appropriate to the site (burial, incineration, landfilling, composting) 3. Refer to Job Hazard Analysis (JHA) to identify types of PPE (disposable versus reusable), supplies, equipment, and cleaning/disinfection protocols to be used. 4. Review work site to preliminarily identify work zones that may contain potentially infected material, including: <ol style="list-style-type: none"> a) Core work zone likely to contain biological material where the highest potential exposure work is conducted. b) Intermediate zone that may contain support personnel, extra supplies, and equipment. c) Outer "safe" zone that should have minimal risk of exposure to, and transport of, potentially contaminated materials. 5. Identify additional PPE, supplies and equipment needed to clean and disinfect all items by zone, and that will be removed from the work site. 6. Consider reducing the number of work sites and/or total work hours to allow for appropriate PPE donning and doffing, while reducing personnel fatigue under enhanced biosafety and biosecurity protocols.
On-site: Work Activities	<ol style="list-style-type: none"> 1. Review planned work zones and revise as needed on-site. 2. Ensure that the work zones are clearly delineated to prevent unnecessary entry and exit to prevent movement of biological material out of the work area.

	<ul style="list-style-type: none"> a) Ensure that all vehicles, equipment and supplies not required for immediate work in the core zone are properly located in the outer zones. Vehicles are best left in the outer zone if not directly used for work activities. b) Ensure that appropriate PPE donning stations, disinfectants and additional receptacles for potentially contaminated trash or disposable PPE are in the transition area between outer and intermediate zones. c) Ensure that additional receptacles for potentially contaminated trash or to contain changes of disposable PPE are located just inside the core work zone. d) If appropriate for the work activity, ensure that an additional receptacle for potentially contaminated trash or disposable PPE is located within the core work zone to minimize movement across zones. <p>3. Follow biosafety procedures outlined in the JHA, with extra attention to minimizing biological material transfer out of the immediate work area.</p>
On-site: Cleaning and Disinfection	<ul style="list-style-type: none"> 1. As cleaning and disinfection procedures begin, designate personnel in each zone to support transfer of cleaned and disinfected items outward from the core work area towards the outer zone. Personnel in the intermediate and outer zones should be wearing appropriate (progressively reduced) levels of clean PPE. 2. Ensure that each item moving out of the core work zone is sealed (sample bags, trash bags, coolers) and disinfected (spray bottle may be helpful). <ul style="list-style-type: none"> a) Heavily soiled items and reusable PPE (such as hard-sided coolers, rubber boots), must be cleaned to remove debris (scrub brush to clean out treads) prior to disinfection. b) Bagging heavily soiled reusable PPE is another option if proper cleaning and disinfection must be done in an alternate location. Dissolvable laundry bags are another option. 3. Before leaving the outer work zone, use a scrub brush and hand sprayer to remove biological material from vehicles, boats, and trailers, clean with soap and water and then apply approved disinfectant following the manufacturer's instructions.

Appendix A. Department of the Interior HPAI Contacts

Interior Office of Occupational Safety and Health:

- SharePoint site: [DOI Occupational Safety and Health Home](#)
- Phone: 303-236-7110
- Email: michael_quinn@ios.doi.gov

U.S. Fish and Wildlife Service

- *JAO Safety Operations:*
 - Email: fws_safety&health@fws.gov
 - SharePoint site: [JAO Safety Operations](#)
 - [SharePoint site: JAO Industrial Hygiene](#)
- *Wildlife Health Office:*
 - SharePoint site: [NWRS Wildlife Health office - Avian Influenza](#)
 - Phone: 970-278-7543
 - Email: darby_murphy@fws.gov or samantha_gibbs@fws.gov

National Park Service

- *Office of Health and Safety – Occupational Safety & Health Branch:*
 - SharePoint site: [NPS Occupational Safety and Health](#)
 - Email: risk_management@nps.gov
- *Office of Health and Safety – Public Health Services Branch:*
 - SharePoint site: [Avian Influenza](#)
 - Email: publichealthprogram@nps.gov
- *Wildlife Health Office:*
 - SharePoint site: [Avian Influenza](#)
 - Email: npsdiagnostics@nps.gov

U.S. Geological Survey

- *Health and Safety Office:*
 - Email: gs-oa_safety_ih@usgs.gov
 - SharePoint site: [Safety and Health Homepage](#)

Bureau of Indian Affairs

- *Division of Safety and Risk Management, Public Health and Safety Program*
 - SharePoint Site: <https://www.bia.gov/as-ia/ofpsm/public-health-safety-program-training>
 - Email: public.health@bia.gov

Bureau of Land Management

- SharePoint Site: [Business Management and Administration - Safety, Health, and Emergency Management - Home \(sharepoint.com\)](#)

Bureau of Reclamation

- *Safety and Occupational Health Office*
 - Email: email:akrake@usbr.gov