



Wildlife

AVIAN INFLUENZA PREPAREDNESS TRAINING
Veterinary Professionals 2026
NSW



To report wildlife disease or a mass mortality event please ring the:

Emergency Animal Disease Hotline, 24 hours / 7-days

1-800-675-888

If you suspect that the event may be the result of a pollution, please also ring the:

Environment Line, 24 hours / 7-days

131 555

If you are reporting deaths of short-tailed shearwaters on NSW beaches, use the sick or dead wild bird reporting form:

<https://forms.bfs.dpi.nsw.gov.au/forms/23970>

To enquire about wildlife sample collection and submission, please contact the:

Australian Registry of Wildlife Health

arwh@taronga.org.au

Thank you for participating in this wildlife avian influenza preparedness training workshop.

This workshop is co-delivered by the NSW Department of Primary Industries and Regional Development (DPIRD), NSW Health and the Australian Registry of Wildlife Health (Registry). DPIRD is dedicated to growing primary industries and supporting regional economic development to deliver long term benefits to regional NSW, and our state. The department also has a range of responsibilities to prepare, respond to and assist in recovery from animal and plant biosecurity emergencies, food safety events, natural disasters and other emergencies affecting the sector.

The Australian Registry of Wildlife Health is a conservation science program of Taronga Conservation Society Australia. We provide a diagnostic service for free-ranging wildlife throughout NSW in partnership with NSW Department of Climate Change, Energy, the Environment, and Water (DCCEEW), DPIRD and the NSW Environment Protection Authority (EPA).

The following information is designed to enhance your confidence and identify the resources that you will need to safely go into the field to collect high quality information, images, and samples to contribute to a wildlife morbidity or mortality event investigation.

These procedures are subject to variation through consultation and as Australia's regulations or disease status change associated with adaptive situational management. Please stay up to date on current recommendations. These notes were last reviewed August 2026.

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Introduction

Since 2021 there have been expanding outbreaks of a high pathogenicity strain of avian influenza (HPAI, H5N1, H5 clade 2.3.4.4b, referred to as H5 bird flu) that is circulating in free-ranging wildlife. This virus is now prevalent across Asia, Europe, the Middle East, Africa, North and South America. More recently the virus has spread to sub-Antarctic Islands, the Antarctic mainland, and then to Australia's mainland (June 2026).

Where the HPAI, H5 clade 2.3.4.4b occurs it has caused significant disease and death in poultry, and a wide range of wild birds, and mammals. This virus is unusual due to its spread in wildlife in a highly pathogenic form. Sporadic cases have also been reported in an expanding range of mammals, including rare, mostly mild illness in humans. This virus poses a threat to Australia's agricultural industry, economy, and biodiversity.

Early detection, diagnosis and response are critical to mitigating the impacts of H5 bird flu. NSW veterinary professionals play an important role in emergency animal disease response and may be asked to assist by:

- 1) being familiar with clinical signs and symptoms,
- 2) knowing how to report their observations and findings to the Emergency Animal Disease Hotline,
- 3) knowing how to safely collect samples from wildlife and dispose of animal remains,
- 4) providing accurate information to the community.

Remain aware of current Emergency Animal Disease (EAD) responses, as you may be asked to contribute to a response, and any control measures may impact your business and community. In NSW the BioResponse NSW (<https://www.dpi.nsw.gov.au/dpi/biosecurity/emergency-management/bioresponse-nsw>) app is a free tool that provides accurate alerts and guidance on emergency responses, disease outbreaks, and control orders. If your practice is located near a declared control zone exercise increased caution and remain in communications with NSW Department of Primary Industries and Regional Development (NSW DPIRD) personnel before handling wildlife.

There are a range of diseases found in birds and other wildlife that can cause human illness. Ensure that you wear appropriate personal protective equipment (PPE) while handling sick or dead wildlife, and samples derived from them. This protective equipment will also protect you from toxins, if the animals have been poisoned.

If you haven't already done so, develop a Clinic Biosecurity Plan to protect your staff, clientele and business. A template document is available (<https://arwh.org/resources/> H5N1 Clinic Biosecurity Plan Template). It may be useful to develop your plan through a scenario-based process undertaken with your staff. Tracing the flow of people, animals, foodstuff, samples, laundry and waste through your facilities, and examining the daily routines of each staff member may help to identify opportunities to limit risks and enhance biosecurity measures. Reviewing and bolstering baseline hygiene, PPE and hand-washing stations will also contribute to enhanced biosecurity. Once plans and protocols are established, conduct regular reviews and training across teams.

Fact sheets, posters, and biosecurity signage are available from NSW DPIRD to foster your communications with staff, clients and the greater community. <https://www.dpi.nsw.gov.au/dpi/biosecurity/animal-biosecurity/avian-influenza/resources-for-h5-bird-flu-preparedness>

Additional Resources

Additional information and resources regarding H5 bird flu are available from NSW DCCEEW, NSW DPIRD, Wildlife Health Australia, World Organisation for Animal Health websites and Australian Interim Centre for Disease Control websites:

<https://www.ava.com.au/wp-content/uploads/National-H5-HPAI-guidelines-for-veterinarians-FINAL.pdf> -

Australia's Animal Health committee – National H5 high pathogenicity influenza guidelines for veterinarians

<https://www.ava.com.au/resources-hub/emergency-and-disaster-response/high-pathogenicity-avian-influenza> -

Australian Veterinary Association high pathogenicity avian influenza resources.

<https://www.agriculture.gov.au/campaigns/birdflu> - resources and a national situation report

<https://www.dpi.nsw.gov.au/dpi/bfs/animal-biosecurity/avian-influenza> - NSW situation report, resources and details on how to report sick or dead wildlife

<https://www.dpi.nsw.gov.au/dpi/biosecurity/emergency-management/bioresponse-nsw> – current information on NSW emergency zone locations and restrictions

<https://www.dpi.nsw.gov.au/about-us/services/laboratory-services/veterinary/avian-influenza> – NSW laboratory testing information

<https://wildlifehealthaustralia.com.au/Incidents/Incident-Information/incident-h5n1-high-pathogenicity-avian-influenza-h5-bird-flu-in-migratory-seabirds-australia-ongoing> - ongoing situation reports

https://wildlifehealthaustralia.com.au/Portals/0/ResourceCentre/H5BirdFlu/WHA_HPAI_Risk_mitigation_toolbox_WCP.pdf - Risk Mitigation Toolbox for Wildlife Care Providers

<https://www.woah.org/en/disease/avian-influenza/> - International guidance on avian influenza

<https://www.cdc.gov.au/resources/publications/bird-flu-toolkit-people-who-work-birds> - human health protection

<https://www.cdc.gov.au/resources/publications/cdna-national-guidelines-avian-influenza-workers> - human health protection

<https://arwh.org/resources/> - H5N1 Clinic Biosecurity Plan Template, training manuals, training videos (PPE donning and doffing, sample collection, sample transport)

<https://www.agriculture.gov.au/sites/default/files/documents/national-guidance-document-engagement-private-vets-emergency-disease-response.pdf> - National Guidance document on how private veterinarians may be formally engaged in emergency animal disease response

What does H5 bird flu in wildlife look like?

Often individual or clustered dead birds or mammals are the first sign of H5 bird flu.

This virus can affect a broad range of wild avian and mammalian species, either causing rapid individual animal death, mass mortality events, neurological, respiratory or gastrointestinal signs. The range and severity of clinical signs may vary by species or individual. It is unclear how H5 bird flu infection may be expressed by our endemic wildlife.

Birds or mammals infected with H5 bird flu may have:

- **Neurological signs:** incoordination, tremors, seizures, head tilt or twisted neck, inability to stand or fly, unusual vocalisations or other behavioural changes
- **Respiratory signs:** rapid or laboured breathing, coughing or sneezing, ocular, nasal or oral discharges,
- **Gastrointestinal signs:** diarrhoea or regurgitation
- **Miscellaneous signs:** lethargy, depression, fluffed feathers, swelling or redness of the head, eye cloudiness or change in eye colour
- **Reproductive signs:** emaciation and abortions are reported in seals and sea lions

Clinically normal birds or mammals may carry and shed influenza viruses.

Predatory and scavenging wild species, and those that may have contact with infected seabirds may be at greater risk of contracting H5 bird flu.

Videos of wild birds affected by H5 avian influenza are available from the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) and videos of affected Australian native species are available via social media outlets.

How does H5 bird flu spread?

H5 bird flu viruses are shed in:

- faeces and
- respiratory secretions (e.g., nasal secretions, saliva).

The virus can be spread through:

- direct contact with infected animals (which may be clinically normal), or their faeces
- contaminated feed and untreated water
- contaminated equipment and clothing
- air via aerosolised secretions, droppings or dust

The virus can travel short distances by air (100-200 m), particularly when there are large congregations of infected animals.

Human Health Considerations When Handling Wild Birds

Wildlife can carry a range of diseases that can infect humans, and steps should always be taken to prevent infection whenever anyone is handling wildlife. Pregnant and immunocompromised personnel should discuss risks with their regular medical practitioner, or a medical practitioner recommended by their employer prior to undertaking work with wildlife.

Human infection with H5 bird flu 2.3.4.4b has occurred sporadically, often after close, prolonged or unprotected contact with infected animals or environments. Most human infections with this group of viruses have been mild. The human health risk posed by this virus is considered low, nonetheless there are some health risks, particularly in those who may be immunocompromised. In rare cases, human infection with H5 bird flu has resulted in severe disease and death.

Protect yourself and others through the regular use of PPE (gloves, P2 mask, eye protection, lab coat/coveralls, boots) whenever and wherever you handle wildlife. Consider having kits containing PPE, sample collection materials, and remains disposal equipment (Appendix A) in vehicles and other areas where you may encounter wildlife. Apply and remove PPE in the sequential manner described in Appendix B.

Consult the NSW DPIRD or NSW Health websites to learn more about diseases that can be transmitted from wildlife to people and how to be careful around wildlife -

<https://www.dpi.nsw.gov.au/biosecurity/animal/humans>

<https://www.health.nsw.gov.au/Infectious/Pages/zoonoses.aspx>

[https://www.health.nsw.gov.au/Infectious/factsheets/Pages/be-careful-around-](https://www.health.nsw.gov.au/Infectious/factsheets/Pages/be-careful-around-wildlife.aspx#:~:text=ensure%20you%20are%20safe%20(away,between%20yourself%20and%20the%20animal)

[wildlife.aspx#:~:text=ensure%20you%20are%20safe%20\(away,between%20yourself%20and%20the%20animal](https://www.health.nsw.gov.au/Infectious/factsheets/Pages/be-careful-around-wildlife.aspx#:~:text=ensure%20you%20are%20safe%20(away,between%20yourself%20and%20the%20animal)

Consult SafeWork websites for guidelines on Workplace Health and Safety Obligations

<https://www.safeworkaustralia.gov.au/safety-topic/hazards/biological-hazards/avian-influenza-bird-flu>

<https://www.safework.nsw.gov.au/hazards-a-z/biological-hazards-and-diseases/avian-influenza>

National Guidance is also available through the Australian Centre for Disease Control

<https://www.cdc.gov.au/diseases/bird-flu-avian-influenza>

[Communicable Disease Network Australia – Protecting People Who Work with Birds and Wildlife](https://www.cdc.gov.au/resources/publications/cdna-national-guidelines-avian-influenza-workers)

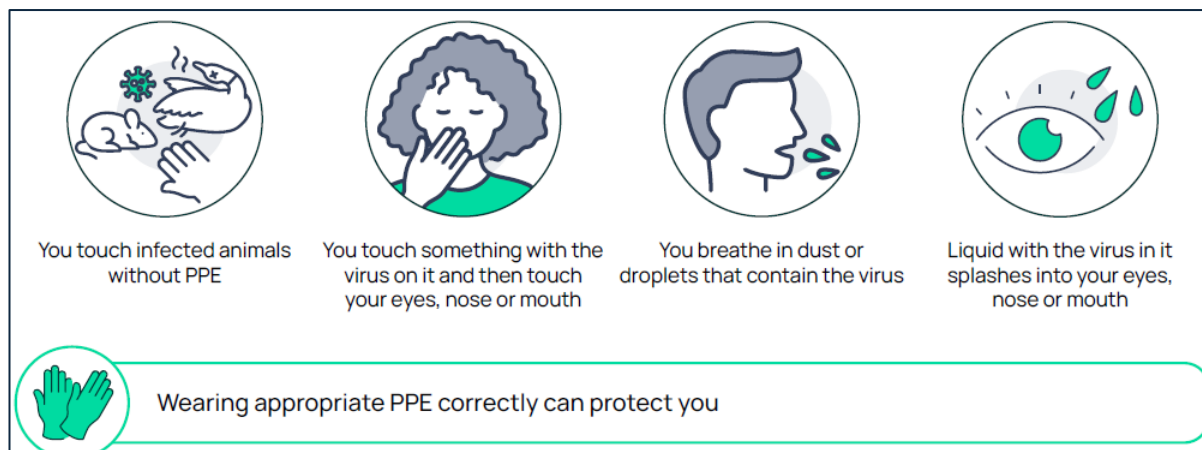
<https://www.cdc.gov.au/resources/publications/cdna-national-guidelines-avian-influenza-workers>

Avian Influenza

Who is at risk?



How do you catch avian influenza?



What are the symptoms of avian influenza in people?



How to prevent human infection with avian influenza?



IMAGES ABOVE ARE AVAILABLE WITHIN THE INTERIM AUSTRALIAN CENTRE FOR DISEASE CONTROL'S BIRD FLU TOOLKIT AVAILABLE VIA:
[HTTPS://WWW.CDC.GOV.AU/RESOURCES/PUBLICATIONS/BIRD-FLU-TOOLKIT-PEOPLE-WHO-WORK-BIRDS](https://www.cdc.gov.au/resources/publications/bird-flu-toolkit-people-who-work-birds)

NSW Health recommends getting the seasonal flu vaccine every year. It does not protect against avian influenza infection; however, it can help prevent changes to the virus that could occur if you got infected with avian influenza and seasonal influenza at the same time.

What to do if you have been in contact with avian influenza

If you have been in close contact with infected poultry, wild birds, livestock, wildlife, their secretions, their contaminated environments or contaminated materials, or people infected with avian influenza, you should carefully **monitor your health (including symptoms) for 10 days after contact.**

If you remain well, you will not be required to isolate. Your local public health unit may contact you to check how you are going.

What to do if you develop symptoms of avian influenza

If you develop symptoms:

- **Contact your doctor and mention possible bird flu exposure**
- **Isolate** yourself from others until seen by a doctor. Wear a mask if you cannot isolate from other people
- Tell your employer
- **Practice good hygiene.** Cover your mouth when coughing / sneezing, wash hands often and dispose of used tissues properly
- **Report your illness to your local Public Health Unit (1300 066 055)**

Other health considerations when in contact with sick and dead wildlife

Psittacosis

Wild birds may carry the bacterium that causes psittacosis in people. Human psittacosis may include symptoms such as fever, headache, chills, muscle pain, cough and breathing problems.

<https://www.health.nsw.gov.au/Infectious/factsheets/Pages/Psittacosis.aspx>

Mosquito-borne diseases

Mosquitoes can transmit serious diseases such as Ross River Virus, Barmah Forest virus, and Japanese Encephalitis virus, that are spread to humans. The best prevention for all mosquito-borne diseases is to avoid mosquito bites.

Spray up, Cover up, Clean up, Screen up!

<https://www.health.nsw.gov.au/Infectious/mosquito-borne/Pages/default.aspx>

Japanese Encephalitis Virus (JEV)

People working outdoors / in wild bird environments in NSW may be at risk of Japanese Encephalitis Virus (JEV) infection.

JEV is a rare but serious illness and is spread to humans by infected mosquitoes. A safe, effective and free vaccine is available for people who live or work in any of the 55 high-risk local government areas, or to people based on certain occupation risks. Once vaccinated, it takes 2-4 weeks to build immunity.

We strongly recommend if you live or work in the high-risk local government areas, that you / your networks speak to your GP, pharmacist, or Aboriginal Medical Service about getting vaccinated.

For further information, visit:

<https://www.health.nsw.gov.au/Infectious/jev/Pages/default.aspx>

<https://www.health.nsw.gov.au/Infectious/jev/Pages/vaccination.aspx>

Q fever

Q fever can cause prolonged illness in humans. Although Q fever is most often contracted from contact with livestock, wildlife can also be a source.

Q Fever vaccine is recommended for some people who work with animals. For more information, visit the NSW Health Q Fever vaccination webpage: <https://www.health.nsw.gov.au/Infectious/jev/Pages/vaccination.aspx>

How to protect yourself when handling sick and dead wildlife

Do not eat, drink, or smoke while working with sick or dead animals.

Wash your hands!

- Wash your hands with hot water and soap before putting on gloves and after removing them.
- Always wash your hands before and after eating, smoking, and using the toilet.
- Do not handle cigarettes, lighters, cell phones before thoroughly washing your hands.
- If clean running water is not available, use an alcohol-based hand rub and wash as described above.

When washing your hands, make sure the backs and palms of both hands are wet with warm water, apply soap, detergent or hospital grade antiseptics, lather and wash the backs, between the fingers and the palms of each hand. Rinse well and dry using a paper towel. Be careful when turning taps on and off if there is no automatic sensor or foot-operated system in place. Ensure tap handles are clean.

<https://www.healthdirect.gov.au/hand-washing>

Wear personal protective equipment

There are five key items of personal protective equipment (PPE) that will keep you safe:

- **Gloves** (need not be sterile), consider double gloving so that outer dirty gloves can be replaced without exposing skin. Wear nitrile gloves if animals may have been exposed to intoxicants.
- **Overalls or disposable coveralls** (consider an impermeable suit or apron if splashing is foreseen e. g. for wet water birds or large marine mammals). Protective clothing should be disposable or easily cleaned after handling a sick or dead wild animal.
- **Disposable shoe covers** or dedicated washable boots (i.e. gumboots)
- **Respiratory protection** (N-95 or P2 respirator masks are recommended)
- **Eye protection** - glasses, goggles, or face shield.

Treat waste, used clothing and equipment with special care.

All waste must be treated as potentially contaminated. Disposable gloves, coveralls, shoe covers, masks and hair covers should be used once only. Disposal guidelines may change with the incursion of H5 bird flu, but current guidelines are outlined below.

It is important that disinfection procedures are followed at each field site so as not to relocate virus to other sites. In field situations, clothing, footwear, and other reusable equipment should be washed with detergent, hot soapy water, and treated with an appropriate disinfectant once it is clean. It is important to wash and rinse all materials

thoroughly to remove organic material prior to disinfection. If possible, shower and change clothes before you contact live animals, food, colleagues, or family.

Wash hands with soap and hot water (preferable) or an alcohol-based hand sanitiser before and after handling carcasses.

Special Considerations: Rodent Plague Zones

Take care when collecting animals or carcasses in areas where there are active mouse plagues. Zinc phosphide rodenticides can accumulate in the crop of wild birds and may be a source of toxic phosphine gases. Consult the EPA “*guidance on handling native wildlife in areas where zinc phosphide has been deployed*” prior to collecting or transporting animals or animal remains.



<https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/news/21p3074-handling-wildlife-where-zinc-phosphide-used.pdf>

Guidance on handling native wildlife in areas where zinc phosphide has been deployed

(part of the digestive system) may store enough undigested zinc phosphide to expose a person to risk during procedures such as dissection because they are likely to have undigested pellets in their crop. In addition, predatory and scavenging native wildlife may also be impacted directly by the poison.

Clinical signs in native wildlife

After ingestion of lethal doses of the rodenticide, death is sudden, resulting from heart failure, pulmonary oedema and kidney failure. Anorexia, debility and death in animals may occur from 15 minutes to hours after ingestion but may be delayed for up to 18 hours.

Mental Health

The NSW Government acknowledges that the response to an avian influenza outbreak can impact mental health.

For mental health support:

- Talk to your GP or other primary health care provider
- Mental Health Line: **1800 011 511**
- Visit: <https://www.health.nsw.gov.au/mentalhealth/Pages/mental-health-line.aspx>

Emotional Resilience

Seeing and handling dead wildlife can be confronting and can take a toll over time.

Critical incident stress is a normal reaction of the body to an abnormal event. Be self-aware and alert for the signs of critical incident stress in your colleagues.

Physical signs of incident stress can include fatigue, headaches, chills, unusual thirst, chest pain, dizziness, elevated heart rate, fainting, twitching, profuse sweating, and difficulty breathing.

Cognitive and psychological signs of incident stress can include confusion, fear, grief, panic, poor concentration, poor decision making, increased or decreased situational awareness, agitation, depression, feeling overwhelmed, loss of emotional control, rash, gastrointestinal upset, and sleep disturbance.

Being alert to these signs may help to enact early interventions to build resilience. Being resilient does not mean you become hardened or immune to the distress of sick or injured animals.

Resilience is having the ability to recover quicker from getting knocked down by stressful situations and be less likely to be knocked down by them in the first place.

The ABCs of resilience are:

- Awareness - of yourself, your strengths, your stress signals and how you cope under stress
- Balance - of your life, through home vs work, rest vs exercise, communication vs concentration, work vs entertainment, holidays away from caring, and remind yourself what an immense job you do that helps maintain our wildlife populations
- Connections – with friends, carers, family, organisations, mentors. Talk to them of your experiences and efforts to help, as well as the joys and sadness associated with your work.

How to Report Sick and Dead Wildlife

Any animal showing signs of disease consistent with H5 bird flu must be reported immediately to the Emergency Animal Disease (EAD) Hotline on **1800 675 888** (24 hours a day, 7 days a week).

Reports of shearwaters on NSW beaches, or individual sick or dead wild birds can be made online at the NSW DPIRD website <https://forms.bfs.dpi.nsw.gov.au/forms/23970>.



When reporting, include the following information (if known):

- Location (GPS co-ordinates)
- Species affected, species present. Take photographs to assist with species identification.
- Number sick, dead, healthy
- Condition of the carcasses (fresh, mild decomposition, decomposed)
- Clinical signs
- Died or euthanased
- When did this start - sudden death or prolonged illness
- Any recent changes in environment e.g. weather, use of poisons (pesticides, sprays etc.), change in food or water supplies
- Proximity to livestock – any sick?

H5 avian influenza viruses are listed as Prohibited Matter and everyone in NSW has a legal duty to notify any suspicion or a notifiable pest, disease or biosecurity event (Biosecurity Act 2015, Section 2, Sections 30 and 38, and Biosecurity Regulation 2019, clause 7). This notification is as simple as ringing the EAD Hotline – 1800 675 888.

As soon as you ring the Hotline, you will be provided with guidance and clear instructions on next steps.

It is always better to ring the Hotline to make the report as soon possible, even when you aren't certain.

Preparing for H5 bird flu

Roles and responsibilities during an outbreak of H5 bird flu in wildlife?

The roles of different NSW government agencies in emergency responses are outlined in the NSW State Emergency Management Plan (EMPLAN). The combat agency for biosecurity responses such as H5 bird flu in animals is NSW DPIRD.

- The Environmental Services Functional Area (EnvSFA) provides support for native wildlife in emergencies.
- The Health Services Functional Area co-ordinates public health resources around human health risk.
- If the strain of H5 bird flu changes to become more capable of causing disease in people, and a human health emergency is declared, NSW Health will become the combat agency for human health.

What will staff members from EnvSFA agencies be required to do in an H5 Bird Flu outbreak?

- Surveillance for H5 bird flu in wildlife, on land that they manage. E.g. observing wildlife for signs of illness.
- Reporting of sick or dead wildlife to the EAD Hotline.
- Restricting access of people and domestic animals to areas where there are/have been suspected or confirmed cases of H5 bird flu. Collecting samples from carcasses to test for H5 bird flu when requested by NSW DPIRD.
- Disposing of carcasses when required.

What are the Roles and Responsibilities of Veterinary Professionals During H5 Bird Flu Response?

In New South Wales (NSW), veterinarians are obligated to alleviate an animal's suffering under the Veterinary Practice Regulation 2013 (schedule 2-3), and the Prevention of Cruelty to Animals Act 1979. It is a legal requirement for veterinary practitioners to provide either:

- first aid treatment
- timely referral to another veterinary practitioner or
- euthanasia.

Be aware that there may be situations where you are directed by NSW DPIRD or DCCEEW personnel to refrain from action, due to the prioritisation of human health or wildlife population health.

Always assess situational safety yourself, and do not proceed if you deem the situation to be unsafe.

Preparing for H5 Bird Flu in a Clinic

NSW veterinary professionals will play a critical role in mitigating the spread of H5 bird flu while providing timely and effective response to potential cases of avian influenza and other zoonotic diseases of wildlife.

Effective practice biosecurity will be essential to meet legal obligations to attend to injured or suffering animals whilst preventing the accidental transmission of H5 bird flu.

Prior to handling wildlife, make yourself familiar with the NSW National Parks and Wildlife Service (NPWS) Codes of Practice, which provide consistent standards for wildlife welfare, rehabilitation and care.

www.environment.nsw.gov.au/topics/animals-and-plants/native-animals/rehabilitating-native-animals/wildlife-rehabilitation-standards

The Codes of Practice provide guidelines for wildlife assessment, monitoring, transport, housing, record keeping, euthanasia and release. Throughout the NSW Codes of Practice, enforceable provisions are identified by the word **'Standards'** and they must be followed (non-compliance is an offence under the NSW Biodiversity Conservation Act 2016). www.environment.nsw.gov.au/resources/wildlifelicences/110004faunarehab.pdf

Take a moment to familiarise yourself with the notifiable animal pests and diseases in NSW.

www.dpi.nsw.gov.au/_data/assets/pdf_file/0009/1469835/PUB20-Primefact-Notifiable-pests-and-diseases-of-animals-in-NSW-Fifth-edition-2023.pdf

Organise a system to bring avian patients into your veterinary clinic only when you are confident that can be done in a manner that minimises the risk of H5 bird flu spread. Direct avian clientele to veterinary clinics or another appropriate facility in your referral network when not confident about risk management.

Forward planning, clinic-wide cooperation, and effective client and community communications will be required to mount effective barriers to the transmission of a virus that can spread by direct contact, mechanical vectors such as equipment, vehicles, clothing, skin and hair, and through aerosols (potential for 100+ metre dispersal).

As previously mentioned, develop a CLINIC BIOSECURITY PLAN (Template available via <https://arwh.org/resources/>) that suits your facilities, practice, and personnel. Your plan will likely include standard procedures for reception staff, and procedures to guide the flow of ventilation (air), personnel, animals, animal food, equipment, waste, laundry, and samples. Mapping out these movements on a floorplan can be insightful. Take a few moments with your staff to discuss scenarios and modify this template to suite plans for your clinic. Wildlife Health Australia's "High Pathogenicity Avian Influenza (HPAI) and Wildlife in Australia – A Risk Mitigation Toolbox for Wildlife Care Providers" also includes a checklist that can bolster your planning.

wildlifehealthaustralia.com.au/Portals/0/Incidents/WHA_HPAI_Risk_mitigation_toolbox_WCP.pdf

Include communications in your PLAN and ensure that you have a list of the current contact information for owners of avian clientele to facilitate communications of any change of H5 bird flu status in your area.

Encouraging direct communication prior to people and animals physically arriving at your clinic could be crucial in preventing H5 bird flu from reaching your clinic. Reception staff should enquire whether any wild or domestic animals on the source property have clinical signs suggestive of infectious disease, and when there are concerns regarding the potential presence of avian influenza. Animal or property owners should, in the first instance, be instructed not to move the animal, and to report the situation to the Emergency Animal Disease Hotline (1800 675 888), to support H5 bird flu surveillance in NSW. Avoid, Record, Report are the actions to be communicated to those in the community who encounter dead wildlife.

If you have not already done so, reach out to your nearest Local Land Services District Veterinarian or Biosecurity Officer to exchange contact details and discuss biosecurity planning and action.

www.lls.nsw.gov.au/biosecurity/emergency-animal-disease/district-vet-contact-details

Consider your obligations under Workplace Health and Safety (WHS) Legislation when developing your CLINIC BIOSECURITY PLAN. Veterinary professionals and ancillary staff have a duty of care to always ensure a safe working environment, including when handling wildlife and managing animals with suspected or confirmed zoonotic diseases. Consult the NSW WorkSafe website for additional information:

www.safework.nsw.gov.au/hazards-a-z/biological-hazards-and-diseases/avian-influenza

Biosecurity and WHS policies, procedures, personnel training and actions should meet professional standards for infection control and the health protection of staff, clients, students, volunteers and the public. Ensure that PPE is available and that protocols include its use, fit testing, and safe, timely disposal of used items. Establish hand hygiene stations with instructional signage. Ensure that alcohol-based hand rub (60-80% alcohol) is available at each workstation. Thorough and effective hand hygiene should be integrated into clinic practices and regularly audited and reviewed.

Occupational exposure to, or illness from, a potentially zoonotic agent such as H5 bird flu must be documented in accordance with WHS regulations. In the event of illness of staff, you may be required to notify SafeWork NSW. Unwell employees should seek medical evaluation and follow advice provided by their medical practitioner or their Local Public Health Unit (NSW Health).

NSW Health recommends that people handling birds get the seasonal flu vaccine every year. It does not protect against avian influenza infection; however, it can help prevent changes to the virus that could occur if you got infected with avian influenza and seasonal influenza at the same time.

Under certain circumstances where H5 bird flu is confirmed in NSW, a Biosecurity Emergency Order may be issued via: www.nsw.gov.au/departments-and-agencies/dpird/our-agencies/agriculture-and-biosecurity Information relevant to this notice may also be circulated via email by the Registrar of the Veterinary Practitioners Board of NSW. The Emergency Order and follow-up communications will set out control measures, including movement restrictions, permits required for certain actions, and any declared emergency zones.

Updates to the relevant H5 bird flu Biosecurity Order in NSW will also be available on the BioResponse NSW App, (www.digital.nsw.gov.au/strategy/case-studies/bioresponse-nsw-app) which all staff should have access to on their personal devices for situational awareness.

Government advice remains that members of the public should not touch, handle, or transport any sick or dead bird. However, to facilitate triage of cases on welfare grounds, options to manage WHS risks should be discussed with clinic staff, landowners and Emergency Animal Disease Hotline staff.

Wild birds should be assessed outside of a veterinary practice whenever possible.

Dead wild birds should not be taken into a veterinary practice. The remains should be double-bagged, and the exterior of the outer bag should be disinfected by staff wearing appropriate PPE (P2 mask, gloves, eye protection, coveralls or long-sleeved lab coat/shirt, washable boots). Record the species, date, fate (i.e. treated, died, or euthanased), and map coordinates of where the animal was found prior to calling the Hotline. These details should also be affixed to the outer bag once dry. Not all remains will be collected and disposal through clinical waste or other methods described below may be required.

While effective PPE is essential to protect human and animal health, it will not be sufficient to prevent movement of this virus in a clinic context. You and your staff may choose to consider the timely referral of clients or other animals to other veterinary practitioners in your network.

Veterinary practices are rarely suitable places for wildlife rehabilitation. You may wish to connect with others in your local veterinary practice network to consider how veterinary services will be delivered to support wildlife triage and rehabilitation. Strategies may involve the creation of triage centres, or the use of outbuildings, triage tents or other facilities that are separated from veterinary clinic operations. Management and movement of people, animals, samples, laundry, equipment, air, and waste should be considered and tracked when delivering veterinary care at triage centres, and this should be included in your CLINIC BIOSECURITY PLAN. It may also be worth consulting with veterinary professionals not currently active in the workforce to assist with wildlife operations, to facilitate biosecure operations within the clinic, whilst providing relief of pain or suffering of an animal in your presence.

Clinic Biosecurity

Biosecurity in a veterinary setting involves measures to contain and control the spread of pathogens between animals, people, and the environment. Pre-defined and designated isolation spaces, zones or facilities are recommended for handling wildlife in the context of H5 bird flu.

An anteroom, or transition space marked out with masking tape on the floor, should be instituted between designated areas.

Wherever possible, the isolation space should have running water or other means to disinfect equipment and wash or sanitise hands.

Clean PPE should be available and donned prior to entering the anteroom and then the isolation area. A footbath with scrub brush, and hand-wash or sanitising area should be installed just inside the isolation region. Sealed laundry and garbage bags, disinfectant spray, and hand sanitiser should be stationed inside the transitional zone, near the door to the isolation region. As you emerge from the isolation region, doff PPE in the recommended order into a sealed disposal container or bag, spray disinfectant on boots, goggles, face shields and other re-usable forms of PPE and leave these in the transitional zone. Sanitise hands prior to moving back into clean areas of the clinic.

Remember that animals in the biosecure area should be managed either as individual quarantine units, each with their own housing, cleaning and feeding equipment, veterinary consumables and equipment and disinfectant sprays. PPE is changed between animals. If all animals are from one event or location, you may consider treating the group as one quarantine unit, remaining cognisant that if one animal tests positive for H5 bird flu, control measures will apply to all animals in that unit.



A WILDLIFE TRIAGE AND ISOLATION TENT ERECTED OUTSIDE OF A VETERINARY PRACTICE. CLEAN AND DIRTY ZONES IN FRONT OF THE TENT FACILITATE EFFECTIVE PPE DONNING AND DOFFING. IMAGE USED WITH THE PERMISSION OF NORTHERN RIVERS WILDLIFE HOSPITAL.

Key Clinic biosecurity considerations for isolation areas include:

- Location – as far from treatment and food preparation areas as possible
- Signage – clearly demarcating the isolation and transitional zones and “Zoonotic Agent - Airborne and Contact Precaution” signage
- Ventilation – how does air move through the clinic and the biosecure area? Can fans be installed to move air from clean areas into the biosecure area and then out of the clinic in a safe manner that will not contaminate food, humans and other animals. Isolation areas should have separate air ducting from the rest of the clinic
- Drainage – where does water go when heading down drains or when rooms or enclosures are hosed?
- Proximity to domestic animals and agriculture (preferably > 200 m)
- Placement of hand hygiene stations and reminders for proper handwashing technique
- Consider wrapping some equipment in plastic bags for easier decontamination between animals (microchip scanners, thermometers, scales)
- Thorough cleaning of surfaces, equipment, animal housing, laundry, floors and surfaces. Clean with detergent to remove organic matter and oils that may repel disinfectants. Allow the material to dry and then inspect to ensure that it is clean.
- Be aware of the potential toxicity of cleaning and disinfecting agents. Select a disinfectant that is safe for humans and the environment, effective, stable, and minimally corrosive. Dispose of disinfectants in an appropriate manner, consistent with your local council guidelines.
- Consider using surface wipes, brushes or baths rather than spray bottles whenever possible to reduce exposure to aerosolised chemicals that may pose a health and safety risk. Biodegradable disinfecting wipes are commercially available.
- Disinfect with hospital-grade disinfectants known to be active against avian influenza:
 - sodium hypochlorite (domestic bleach) – 40 mL per L water (10-30 minutes contact time)
 - 1% Virkon S™
 - Phenols (Surfex™)
 - 80% ethanol (10 – 20 minutes contact time)
 - 60-90% isopropyl alcohol
 - 3% Hydrogen peroxide (30 minutes contact time)
 - Effective, although perhaps less than those above: Quaternary ammonium compound, F10 or Safe4™ - detergent and disinfectant (10-30 minutes contact time).

Have a copy of the disinfectant’s Safety Data Sheet on hand to ensure effective usage and institution of appropriate human health controls.

Take care to ensure that the disinfectant is freshly made, the dilution is correct, and it is applied for the recommended contact time.

The AUSVET PLAN Operation Manual on Decontamination provides additional details on appropriate cleaning and disinfection methods and products (table 6.1). https://animalhealthaustralia.com.au/wp-content/uploads/dlm_uploads/2026/06/AUSVETPLAN-Operational-Manual-Decontamination-v5.2.pdf

- Laundry management from wildlife handling:
 - Use the hottest water cycle available (>71°C) for at least 25 minutes with a biological detergent, along with laundry-safe bleach or hydrogen peroxide if possible
 - Wear PPE when removing the laundry from the sealed bag
 - Seal the bag and dispose with other biohazardous material

- Wash this laundry separately to other clinic laundry
 - Run the machine with bleach, hydrogen peroxide or one of the disinfectants described above and disinfect the outside of the machine prior to use for other purposes
 - Dry the laundry on a hot cycle in a drier or in the sun until thoroughly dry
- Clinic cleaning and disinfection processes and roster should be documented and reviewed regularly.
 - Staff and volunteer training.
 - Communication with clients, wildlife rehabilitators, NSW DPIRD, and community members.
 - Environmentally sensitive disposal of disinfectants and other chemicals.
 - Identifying animals individually and keeping written records for each animal in a manner that documents their location and lists any in-contact animals so that all animal movements can be traced if necessary.
 - Identify incoming feed, bedding, equipment or other supplies that could be contaminated with virus, or that could be delivered by a vehicle or personnel that have recently visited infected premises.
 - Discuss availability and storage of viral transport medium and swabs with your District Veterinarian.
 - Collect samples (oropharyngeal, cloacal swabs in PBGS, and serum) and keep those frozen, even if animals examined or admitted appear healthy, in case tracing is necessary.
 - Keep a register of staff, students and volunteers who have contact with wild or captive birds, including poultry, outside of work. Ensure that these individuals are aware of the clinical signs of H5 bird flu and that they report any suspicious illnesses to the Hotline. Decontamination (showering) prior to entering and upon leaving the practice may limit the potential spread of viral pathogens.
 - Consider how you will assess the risks posed by clients who may have contact with birds or wild mammals.

Detailed information on cleaning and disinfecting a range of animal husbandry and veterinary equipment is available in the AUSVET PLAN Operational Manual - Decontamination. https://animalhealthaustralia.com.au/wp-content/uploads/dlm_uploads/2020/04/AUSVETPLAN-Operational-manual-Decontamination.pdf

Be cognisant of the potential risk of aerosolisation of virus particles that may occur with gas anaesthesia, and the challenges of disinfecting anaesthetic machines and lines.

Carefully consider the flow of diagnostic samples to control the movement of virus with samples (as potential fomites). Communicate the risk of zoonotic potential related to any sample submitted for laboratory testing in-house or at an external lab.

Showering and changing into clean clothes are recommended after high-risk work, prior to handling other animals or returning home.

The incubation period for Avian Influenza can range between 2-14 days. Isolation, testing birds, and barrier nursing should continue for at least 14 days.

When a clinic has had a high-risk patient on site, NSW DPIRD recommends complete cessation of admitting avian clientele until testing has returned negative results, or further information has been provided by DPIRD staff.

Ensure that all staff are aware that all diagnostic testing for Notifiable Animal Diseases must be undertaken at NSW DPIRD laboratories – EMAI (www.dpi.nsw.gov.au/about-us/services/laboratory-services/veterinary). Costs for these tests are only covered by the state government when the testing has been requested by NSW DPIRD personnel.

Safe Wildlife Handling

Most birds and mammals should be considered susceptible to H5 bird flu. Animals in Australia carry a variety of diseases, some of which may pose risks to humans. Take steps to protect your safety from injury and disease before handling wild animals.

Consult NSW National Parks and Wildlife Service personnel before approaching or handling live marine mammals (and before handling or collecting samples from marine mammals). When marine mammals are stranded on a beach, keep people and their pets from approaching. Be aware of the legislated minimum approach distances (in water or on land) for marine mammals.

Prioritise your health and safety, and that of your colleagues and community. Take the time to be prepared in advance, to don full PPE before handling wildlife, and to thoroughly decontaminate after handling wildlife. If you are bitten or scratched, clean the injury with clean water and soap (or disinfectant), and seek medical advice, telling medical staff that you have been handling wildlife. After personal safety, the next priorities are animal welfare and avoiding harm to wildlife populations.

Do not handle live or dead bats unless you are recently vaccinated against Lyssavirus or have had serology within the previous 24 months to establish that you have a protective titre. Even when vaccinated, those handling bats should wear two layers of puncture resistant nitrile gloves, wrist guards that extend to the elbow, leather gloves, P2 mask, goggles and a lab coat. Any potential exposure (bat scratch, bite or mucous membrane exposure) requires urgent first aid (wash the wound with soap and running water for at least 15 minutes and apply antiseptic solution with antiviral action) and seek medical attention, **even in people who are previously vaccinated**.

If you are not yet confident handling wildlife, consider consulting with your local wildlife rehabilitation group to obtain hands-on training and experience for yourself and your staff. If you do not feel comfortable handling a particular species or individual animal, seek advice or ask for assistance before attempting handling.

You can locate your nearest wildlife rehabilitator in NSW via the Backyard Buddies website:

www.ifaw.org/au/resources/wildlife-rescue-app

Registered veterinarians in NSW can handle and possess sick, injured or orphaned protected animals for the purposes of providing veterinary care under the Biodiversity Conservation Act (NSW 2016). Wildlife rehabilitators require training and membership to a group that is licensed by NSW National Parks and Wildlife Service under this act to rehabilitate wildlife.

Ensure that those working at your reception desk are familiar with the presentation of young, fledgling animals that in most cases should be left in the wild, as they do not require care. If unsure, monitor the animal from a distance and contact the local wildlife rehabilitation provider for advice.

The Wildlife Heroes program, delivered through the NSW National Parks and Wildlife Foundation, offers online access to videos, training opportunities, webinars, podcasts and other excellent resources

<https://wildlifeheroes.org.au/>. Their Wildlife Rescue Handbook provides excellent advice that veterinary professionals may share with the public. Some of this advice is subject to change depending on the current H5 bird flu situation in NSW. <https://wildlifeheroes.org.au/wp-content/uploads/2023/06/WildlifeHeroesWildlifeRescueHandbookFinal.pdf>

Taronga Conservation Society Australia also offers training for veterinary professionals, offering opportunities for face-to-face training.

<https://taronga.org.au/education/veterinary-professional-training>

An online training module for the care of bushfire affected wildlife is also available via:

<https://taronga.org.au/education/study-taronga/assessment-triage-and-treatment-bushfire-affected-wildlife>

As a general approach, stay calm and try to keep the environment quiet.

Have a secure, warm, dark place ready to put the animal, and have everything that you need to examine, swab and provide care ready prior to handling. If the animal cannot be examined right away, make sure that it has access to appropriate food and water (if it is able to hold its head up, and if general anaesthesia is not imminent). Ensure that the animal has a safe hiding place (pouch, den, box, twigs with leaves) in a shaded, but warm area.

Take a moment to identify the species of animal, so that you can better understand the potential threats of handling and understand the natural history and requirements of caring for the species.

Teeth, beaks and claws are the most hazardous portions of wildlife. Large birds can cause injury through flapping of uncontrolled wings. Take a moment to identify the hazardous elements of the species you are about to handle and define a strategy to control the hazardous elements. Communicate your plan with others so that they know what is about to happen and if they should attempt to assist.

Be aware that birds with sharp beaks and long necks pose a threat to faces and eyes. Even little penguins, with a relatively short neck, can suddenly project their beaks forward to grasp a lip, nose or puncture a cornea. Wear goggles or face shield with your P2 mask and work in pairs to ensure that one person is focused on animal restraint.

Birds do not have a diaphragm, and they need to expand their chest to draw in air. It is important that restraint of birds does not constrict the chest cavity. Ensure that you know where the nares (nostrils) are, as their location along the beak varies by species and if these are covered during restraint the bird will suffocate. Some birds, such as gannets and boobies, do not have external nares (nostrils) and instead rely on their epiglottis for breathing. It is therefore important to restrain the head securely without holding the beak completely closed. For additional information refer to the NPWS initial treatment and care guidelines for rescued native birds:

www.environment.nsw.gov.au/publications/initial-treatment-and-care-guidelines-rescued-native-birds

Approach the animal from behind if possible. In one rapid, confident and firm, yet gentle action attempt to restrain the head and the hind limbs. For larger creatures, one person may be required for the head, while the other grasps the hind limbs. If working in a team, clearly articulate roles prior to acting. When handing an animal from one person to another, communicate clearly that you have control of the animal, or that you are about to release control of the animal.

Small to medium sized heads are held with the thumb on the ramus of one mandible, the hand wrapped around the back of the neck and the third and fourth fingers on the ramus of the other mandible. The index finger wraps over the top of the head. This hold allows you to move the head in any direction (away from your faces and fingers of colleagues), without any risk of compressing or restricting the airway. Heads of larger animals may require two hands, and a separate operator may be required to control the limbs.

Birds can be handled by holding the head in one hand, the legs in the other and then gathering and tucking the wings into the hand holding the legs, in a position called the “ice cream cone hold”. The talons of raptors can pose more of a threat of injury than the beak, and a focus on leg restraint is crucial. Long, thick leather gloves may be required to handle larger birds of prey. A finger should always be kept between the legs to prevent inadvertent crushing injury. This restraint method can be used for large or small birds. Experienced individuals can hold small birds with one hand.

If a bird or small mammal will not allow you to approach from its back, you may need to drop a towel over the animal to allow you to safely gather it in a towel and secure the head and limbs. Ensure that the towel does not have any loose threads and that it does not compress the chest.

Nets can be used to gain control of an animal and gently pin it to the ground in a manner that allows another individual to grab the head with one hand, the hind legs with another.

Conscious birds and other wildlife are at risk of biting off the end of a swab placed in the mouth. Care must be taken to avoid the swab from being bitten off and swallowed. A finger or gag that gently wedges the beak or mouth open to allow safe and gentle swabbing might be useful in this situation.

You can ask for larger animals to be brought to the clinic in a cloth or hessian bag so that injectable sedatives can be administered through the bag to make handling safer for the animal and humans. Invert the bag or check it to ensure that no loose threads are exposed that may entangle toes, beaks or wings. Monitor the animal carefully before and after drug administration to ensure that their neck is not bent, and they are able to breathe through the bag.

Please do not forget to check the pouch of any deceased female marsupials. If the joey is still attached to the teat of a deceased dam, be very gentle using a finger, or cotton bud soaked in warm water to tease the teat out of the mouth. If that does not work, you may need to cut the teat and secure the end with a large safety pin to prevent the joey from choking on it. Eventually the teat will be released. Once free of the teat, cup the entire animal with two hands and slowly lift it from the pouch. Young marsupials are very fragile and should not be lifted by the limbs.

Preparing for H5 Bird Flu Sample Collection in the Field

DPIRD Animal Biosecurity may contact you regarding collecting samples for H5 bird flu. Only collect samples if directed.

Being prepared to collect samples

Each participant has been provided with a sample collection kit containing

- PPE
- Swabs and transport medium
- Disinfection supplies

Please have these kits accessible in your field office and use them when appropriate. Ensure kits are restocked after use.

Samples will need to be kept cold prior to transport, so ensure that there is a suitable fridge and freezer where samples can be stored. An ice brick will be required for sampling and transport, so ensure that some are frozen.

Swabs and transport medium

The liquid transport medium should be **stored frozen** (in a standard freezer) prior to use. The medium can be re-frozen after sample collection if there is likely to be a delay while transport is organised. Ideally, the medium should be transported in a small esky with an ice brick until it can be frozen.

Sample collection swabs and transport medium (Phosphate Buffered Gelatine Saline - PBGS – viral transport medium) can be ordered from the NSW DPIRD website: www.dpi.nsw.gov.au/about-us/services/laboratory-services/kits-and-media/order-media.

Please make sure to ask for swabs in addition to the medium in the comment box.

Before leaving to collect samples

Key areas to consider before responding to a suspect case:

Logistics & communication

- Ensure you are clear on what you have been asked to do
- Be authorised to enter the site
- Discuss the visit with the site owner/manager
- Have access to relevant procedures, risk assessments and chemical safety data sheets needed

What to pack (See sampling equipment checklist in Appendix A)

- PPE kit
- Decontamination kit
- Sampling supplies
- Recording and packaging materials

Attending the site

Situational Awareness & Principles of Biosecurity

Movement of animals, plants, people, vehicles, and equipment can act as vectors for many endemic and exotic biosecurity threats.

Minimising these risks is a shared responsibility for all of us.

Clothing, boots, tyre treads and equipment can become contaminated with disease agents or weed seeds, while many insect pests are known to hitch rides in the undercarriages of vehicles or within containers. When people, vehicles and equipment move from property to property, those contaminants can be carried with them, making biosecurity an important barrier for preventing big problems from spreading.

Many of these risks can be handled by the simplest of biosecurity measures – the ‘come clean, go clean’ philosophy.

Setting up clean and dirty zones

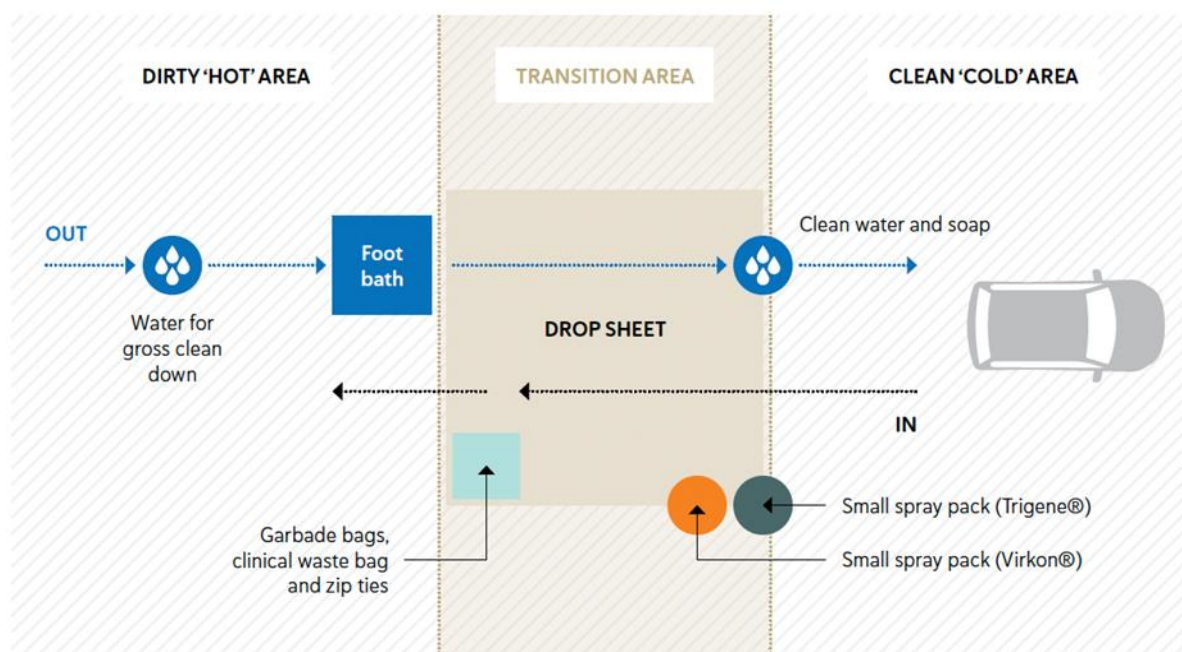


Figure 1 is reproduced with permission from Guidelines for veterinarians handling potential Hendra virus infection in horses Version 4 (2010) published by Biosecurity Queensland www.dpi.qld.gov.au/4790_2900.htm.

1. Identify the dirty area (where the suspected case is located) and the clean area outside this. Select an entry/exit point between the clean and dirty areas. Designate a small transition area at the entry/exit point where actions will be taken to move back and forth between the clean and dirty areas (Figure 1, above).
2. In the clean area lay out all PPE and equipment to be taken with you into the dirty zone. Ensure you have everything you need including overalls, boots, eye protection, mask or respirator, two pairs of gloves, sampling equipment, 2 plastic bags to put samples in, disinfectant wipe, bucket, soap or detergent and scrubbing brush for gross decontamination. If no water is available in the dirty area you will need to fill the bucket with water now.
3. Set up the transition zone ready for decontamination when you move from the dirty zone back into the clean zone:
 - a. Lay out a tarp as a ground sheet if you have one.
 - b. On the dirty side place a footbath full of disinfectant, a bucket with soap and water, disinfectant wipes or spray bottle, a scrubbing brush and 2 x large plastic bags with ties for waste.
 - c. On the clean side place a bucket with soap and water, disinfectant wipes or spray bottle and 2 x large plastic bags with ties for contaminated PPE.
4. Put on PPE as described below (and as outlined in Appendix B). Ensure to fit check your mask.
5. Pick up sampling equipment, bucket, soap or detergent and scrubbing brush, disinfectant wipes or spray or wipes and enter the dirty area.
6. Undertake sampling as per sample collection protocol below.
7. Decontaminate the primary sample containers by wiping or spraying with disinfectant after collection and place in a plastic bag and seal. Repeat this step so that the sample is double-bagged. This is important to

protect the sample during decontamination into the clean area as disinfectants may leach into the sample and destroy it.

8. Remove any gross contamination from you and your equipment while in the dirty area using the brush, soap or detergent and water you have brought with you. Clean the treads on your boots.
9. Leave the bucket, soap or detergent and scrubbing brush in the dirty area if they will be needed again or otherwise take them with you and return to the dirty side of the transition area.
10. Place waste in a plastic bag and seal. Decontaminate the outside by dipping in, wiping or spraying with disinfectant. Place it in a second plastic bag, seal and decontaminate the outside. Place the double-bagged waste in the clean area.
11. Decontaminate you and your equipment:
 - a. Decontaminate boots by scrubbing in a footbath of disinfectant.
 - b. Wipe or spray disinfectant on outer gloves or dip into bucket of disinfectant.
 - c. Decontaminate samples and other equipment to the clean side by dipping them in or wiping or spraying with disinfectant.
12. Move to the clean side of the transition area and remove PPE as described below, leaving the inner pair of gloves on.
 - a. Put your removed PPE in a rubbish or contaminated waste bag.
 - b. Remove inner pair of gloves and put in contaminated waste bag. Tie off bag.
 - c. Disinfect bag by wiping, spraying or dipping in disinfectant then put in a second bag and repeat disinfection prior to disposal. Place in clean area for disposal.
 - d. Wash hands and dry.
 - e. Before leaving the property talk to the owner or manager on biosecurity procedures for use on the property. Ensure they know what PPE they will require for handling affected animals and where to get this PPE from.
 - f. Notify the relevant authorities and dispatch the samples.

If accidental exposure to blood or body fluid or sharps injury occurs, wash the affected area of skin thoroughly with soap and water and/or irrigate mucous membranes with water or saline. If the suspected disease is zoonotic, seek prompt medical advice.

See Appendix C for guidance on the cleaning and disinfection of vehicles, machinery and equipment.

Sample collection protocol

Testing of wildlife for avian influenza viruses should be conducted under the direction of a District Veterinarian, the EAD Hotline or other NSW DPIRD personnel.

Please use swabs and PBGS transport medium provided by NSW DPIRD. If these are not available, paediatric or regular cotton tipped sterile swabs with a wood or plastic shaft can be used. If PBGS is not available, swabs can be placed into a vial with 2 mL of sterile saline. Do Not place these into Ames or other commercial medium.

The cost of avian influenza and other notifiable animal disease testing is paid by NSW DPIRD. Additional testing may be paid for by the submitter and may only be conducted upon a negative avian influenza result.

Swabs should be sent for exclusionary testing for H5 bird flu, and dead birds should be double-bagged, clearly labelled, and retained in a refrigerator or freezer in a veterinary clinic, or at a state agency, pending test results, unless otherwise directed by a District Veterinarian, the EAD Hotline or other NSW DPIRD personnel.

In the face of a mass mortality event, samples are generally collected from 5-10 animals per location (5 km radius), although this should be discussed with Hotline or NSW DPIRD staff.

Swabbing technique

Two swabs are required for H5 bird flu testing. Take the first swab by moving the swab along the roof of mouth and down the back of throat to collect a tracheal or oropharyngeal swab. Blowhole and/or tracheal swabs can be taken from cetaceans. Collect the second swab by inserting the swab into the cloaca (vent) or rectum. Place each swab in a separate, labelled, vial containing the orange (PBGS) transport medium.

If a veterinarian or other person experienced with necropsies is present, a brain swab in transport medium is also recommended, especially in cetaceans.

The vials with medium can be challenging to write on. It is easiest to label the vials while the medium is still frozen, as the labels get soft with condensation. Use pencil as many disinfectants contain solvents that will blur permanent ink.

1. **Wear appropriate PPE when handling birds and mammals and when opening sample vials.**
2. Unwrap a swab from the stem-end of the packaging and be careful not to touch the swab tip.
3. Gently collect an **oropharyngeal swab (Figure 1)** by extending the animal's head and neck, then rolling the swab around the roof of the mouth, the back of the throat, and the cartilaginous glottis at the base of the tongue. In larger birds, or dead birds, it may be possible to swab the trachea, by waiting for the bird to inhale (live bird) or manually opening the airway (dead animal) at the base of the tongue, then pass the swab a short distance into the airway, gently contacting the sides.
4. Open the vial and place the swab tip in the transport media approximately $\frac{3}{4}$ of the way towards the bottom of the cryovial.
5. Cut or snap the stem of the swab so that the swab remains in the vial and the cap can be screwed on tightly (see Figure 3 below).
6. Label the tube with a pencil (alcohol in some disinfectants will remove ink). Include the sample ID and type of sample (cloacal vs oral), making sure that the ID on the tube can be cross referenced to the datasheet where additional information about the sample exists (see Figure 4 below).
7. Wipe scissors with 70% alcohol if they were used to cut the swab stem.
8. Record sample tube number on data sheet along with ID number, date, species, type of sample (cloacal vs oral), age, sex, location (GPS coordinates preferred), band number, comments, or other information (Figure 4).
9. Repeat steps 1, 2.

10. Collect a **cloacal or rectal swab** by inserting the entire tip of the swab into the cloaca (vent/rectum). Use gentle pressure and in a circular motion, swab the inside of the cloaca two to four times (see Figure 2 below). Repeat steps 4-8.
11. Spray the collection containers with F10, or similar disinfectant, and allow it to air dry before placing it in two to three layers of zip-lock bag for transport. Place some absorbent material such as paper towel in the first zip-lock bag to absorb any liquid if the containers leak or break.

Oro-pharyngeal Swab



Tracheal Swab



Cloacal Swab



Cutting the Swab



If directed to collect the carcass for further testing (e.g. testing for toxins), double bag the animal carcass, if small enough to do so, and retain frozen pending test results.

Marine mammal swabbing technique

Deep sedation or euthanasia may be required for the safe handling and humane management of marine mammals.

It can be challenging to detect the signs of H5 bird flu in marine mammals. Testing should be considered in the absence of known clinical signs.

Testing of live pinnipeds and cetaceans involves the collection of three swabs into separate vials, as described above, from the oral cavity, nares or blow hole, and rectum. When possible, use long swabs to collect samples from the deep oropharynx.

H5 avian influenza can be very neurotropic in marine fauna, and a diagnosis may be missed in externally collected swabs. In addition to the swabs above, consider collecting a brain swab and a lung swab from high-risk marine mammals. These samples can be collected quickly through deep intercostal incision, and through the foramen magnum of a disarticulated skull.*

*World Organisation for Animal Health (WOAH) (2024). Practical Guide for Authorised Field Responders to H5 bird flu Outbreaks in Marine Mammals. WOAH. www.woah.org/app/uploads/2024/02/woah-practicalguide-forauthorisedfieldresponders-hpaimarinemammals-feb24.pdf

Collecting Dead Animals for Post Mortem Examination

- Wear PPE (gloves, P2 mask, washable boots)
- Use a “no touch technique” by using a shovel or other instrument to handle the remains, or invert a plastic bag around the remains
- Bag and label each animal individually, then double bag the group
- Use masking tape to label each bag with the species (if known), date, location, and any animal identification (ear tag, microchip number)
- Collect as many fresh carcasses as possible. Aim for up to 10 small animals, and 5-10 medium to large animals. Prioritise fresh remains and a mixture of animals that have died and those that have been euthanased. Ensure the label includes if the animal died vs was euthanased.
- Clean and disinfect equipment, laundry and materials used.
- Safely bag waste generated from the procedure for disposal.

Record Keeping

To enable further investigation into wildlife diseases events it is important to record details about the place, time, location the animal was found and whether it received any treatment, died or was euthanased. It is essential that this information is included in a Specimen Advice Form to accompany the samples to the laboratory. A sample Specimen Advice Form is included as Appendix D, along with a list of information that should be included in the Additional Information Section. A Morbidity and Mortality Log may be useful to track animals that are not sampled (Appendix E).

Sample Transport and Shipping

If transport to the laboratory will take place within 24-48 hours, store refrigerated and transport the samples on ice blocks. If samples cannot be shipped to an appropriate laboratory within 2 days of collection, they should be stored in a -20°C freezer, or colder if possible, prior to shipping on ice blocks. Always keep samples out of devices that chill human or animal foods. If need be, the samples can remain in an esky on ice pending transport.

Sample Shipping

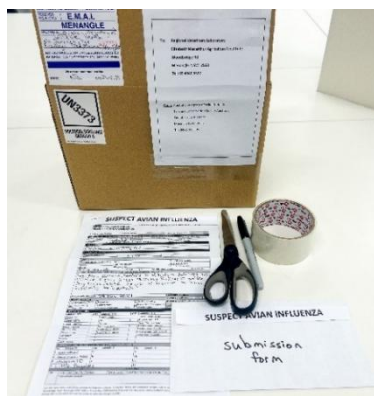
The EAD Hotline Staff and the Registry can help you direct the samples to the appropriate laboratory. It is a dynamic situation, but typically, the swabs in PBGS media are directed to EMAI and carcasses may be directed to the Registry after receipt or negative results. Ideally, the samples should be sent to the lab as soon as possible, and ensure the receiving laboratory is aware that samples are on the way. In some cases it may be better to freeze samples and carcasses over a weekend prior to shipment the following week.

If EAD Hotline Staff ask you to submit samples:

- Complete, and have a veterinarian sign, a Specimen Advice Form (Sample submission form) available via: www.dpi.nsw.gov.au/_data/assets/pdf_file/0007/680425/Vet-specimen-advice-form-Oct-2023.pdf
- Inform the receiving laboratory of your intent to submit AI samples (EMAI customer service – 1800 675 623, or laboratory.services@dpi.nsw.gov.au) prior to courier departure. “SUSPECT AVIAN INFLUENZA” needs to be marked on a piece of paper or label under the lid of the outer packaging with the Specimen Advice Form.
- Place the labelled samples/remains that have been double wrapped in tightly sealed plastic bags in an esky containing ice or ice packs. Frozen water in recycled plastic drink bottles with well-fitting lids, or gloves filled and knotted like a balloon, are excellent, cheap, makeshift icepacks for transport. Foam eskies should be shipped inside a cardboard box or inside a hard-sided esky, when possible, to avoid crushing.
- Keep the samples cool and out of the sun at a minimum. If the samples are frozen, storage in a freezer pending courier collection is ideal.
- A completed Metrostate Courier Label and EMAI Address Label are fixed to the outside of the box (Appendix F). EAD Hotline Staff will provide a blank courier label when appropriate. If you do not have a Metrostate Courier Label on hand, EAD hotline personnel or the NSW DPIRD Customer Service Line (1800 675 623) will be able to provide one.
- If samples are directed to the Registry, a courier shipping label is attached (Appendix G).
- A Suspect Avian Influenza warning should be placed between the cardboard box and the esky. This will ensure specific biosecurity precautions are employed as the sample is unpackaged at the laboratory.
- A Category B Shipping Label for Biological Substances must also be affixed to the outside of the package (Appendix H).

Excellent resources on sample shipment are available on Department of Primary Industries website:

www.dpi.nsw.gov.au/about-us/services/laboratory-services/veterinary/veterinary-test-list/collecting-and-submitting-samples-for-veterinary-testing

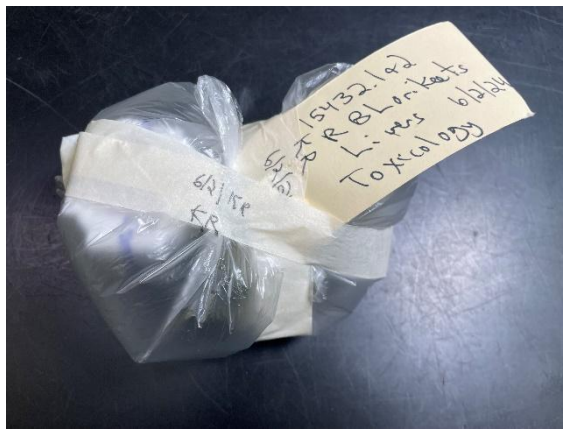
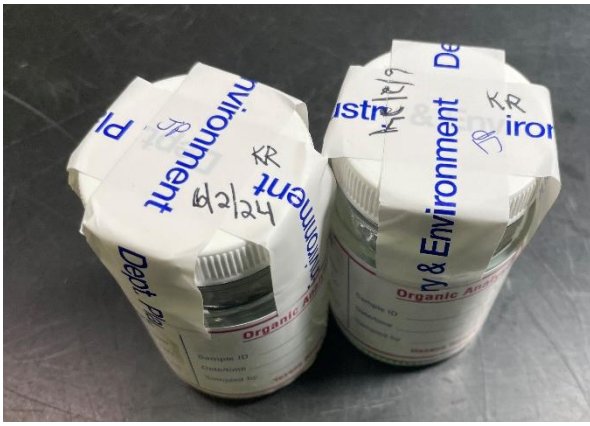


Additional Notes for Suspected Intoxication Events

Whenever possible, keep samples in a locked fridge or freezer pending transport. Discuss chilling versus freezing remains with the laboratory team.

[illegible]

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SEALED, SIGNED AND DATED SAMPLE VIALS (LEFT). SEALED, SIGNED AND LABELLED GROU OF SAMPLES (RIGHT)



LOCKED FREEZER (LEFT). SEALED ESKY WITH LABELS AND CHAIN OF CUSTODY FORM – READY FOR SHIPPING (RIGHT).

Wildlife Triage

Cases of suspected H5 bird flu should be reported to the EAD hotline before an animal is moved to triage facilities. Consult the Emergency Animal Disease Hotline or your nearest District Veterinarian or NSW DPIRD representative if you are uncertain that wildlife should be moved for treatment or euthanasia.

It may take two business days to obtain test results from EMAI after the samples are received by the laboratory. Any animal that is tested for H5 bird flu should be maintained in isolation pending test results and up to the 14-day incubation period for H5 bird flu.

Many wildlife rehabilitators already restrict their practice to the care of injured or orphaned animals. Euthanasia should be considered when wild animals have signs of infectious disease.

Currently there is no effective treatment for H5 bird flu in wildlife. The virus can be highly neurotropic, causing irreversible damage to the brain and other organs. The prognosis for animals that test positive for H5 bird flu is grave and instead of individual animal treatment, the focus will be on preventing disease in other animals through strict biosecurity practices.

Based on the presenting situation or clinical signs of the individual animal, if H5 bird flu is highly likely, euthanasia by experienced and qualified staff may be considered prior to the return of a positive test result.

In the event of a mass morbidity or mortality event, the testing, examination and assessment steps are best conducted at the site where the animals are found. NSW NPWS and the Emergency Animal Disease Hotline should be consulted prior to approaching the event location to ensure that the action is done in a safe and sensitive manner (so that nesting birds do not abandon eggs or young, seals do not injure people, etc.).

Principles of Triage

Wildlife triage is the process of rapidly assessing injured or sick wild animals for pain and their likelihood of recovering to the stage where they will actively contribute to their population upon release.

In mass morbidity events, resource allocation must also be considered, as insufficient resources may be detrimental to the quality of care, the pain experienced or the likely outcome for the animal.

Licensed wildlife rescuers in NSW must arrange for an assessment by a veterinarian or experienced wildlife rehabilitator within 24 hours. In remote locations, this may occur via telephone, web-meeting or email.

At all times, rescuers and veterinary personnel should take all steps to protect fauna from additional stressors such as noise, direct observation, other animals, and extreme temperatures.

Obtain a full history of the event as soon as possible, as it can be challenging to find information about the animals and the contact details for people involved and potentially exposed (landowners, wildlife rehabilitators, and members of the public) later.

Transport to a triage location should occur in a safe and ventilated carrier that is appropriate for the species, that minimises light, noise and vibration. The transport container should be adequately labelled with the species, location found, and date. The animal must be transported inside the cabin of the vehicle. Food and water should not be provided during transport unless that will be a few hours.

Thorough examination of most wild animals is achieved by sedating the animal, as it reduces the stress and likelihood of further injury of the animal. Injectable anaesthetic agents are recommended until H5 bird flu has been excluded.

Wildlife Triage in the context of H5 bird flu will involve the following Stages:

1. Report the event to the Emergency Animal Disease Hotline
2. Capture of live animals if approved by hotline personnel
3. Collecting samples from live or dead animals as instructed by the Hotline staff
4. Examination and assessment of live animals to categorise further actions: first aid, recuperation and rehabilitation care, intensive veterinary intervention, immediate euthanasia, immediate release.
Assessment may be facilitated by sedation, but avoid gas anaesthesia until H5 bird flu has been excluded. Pain, wounds, fractures, trauma, intoxication, and hydration are priority assessment criteria. Although radiographs are often a component of wildlife assessment (to exclude the presence of ingested hooks or subtle fractures), ensure that this can be done in a biosecure manner.
5. First aid and stabilisation
6. Consider movement of animals to a referral service, or suitable rehabilitation centre with appropriate veterinary care – if approved by Hotline staff
7. Treatment and quarantine pending test results
8. Release if H5 bird flu negative, healthy and assessed as able to survive and thrive independently.

Pest animals should be euthanased rather than cared for and released to the wild.

Wildlife First Aid

When a decision is made to quarantine and treat an animal while H5 bird flu testing, the biosecurity practices outlined above should already be implemented.

General principles of wildlife first aid involve keeping calm and quiet, assessing for potential exposure to danger for you, your staff and the animal, minimising stress that the animal may experience, and beginning to assess the animal's condition, with particular attention to life-threatening bleeding, wounds or pain.

Food and water should not be provided during transport and should wait until the animal has been assessed as stable, able to keep its head up and its food and water down.

Address any bleeding by direct pressure with a clean cloth, bandage or sterile dressing (if available). Minor bleeding may benefit from the use of styptic powder (some combination of zinc sulfate, aluminium chloride, ammonium chloride, cupric sulfate, ferric subsulfate, and colloidal agents). Baby powder or corn starch is a less expensive alternative that may provide a framework for clot formation. Larger bleeding may require the use of haemostats, vessel ligation or cautery.

First aid initially focuses on good nursing care with providing an appropriate environment, fluid therapy as necessary, nutritional support appropriate for the animal, a safe den, wound management and pain relief.

Generally, you can estimate that wild birds or mammals are likely to be 5-8% dehydrated on presentation. If the animal is unlikely to drink right away, warm Hartmann's fluids delivered subcutaneously at 5% of body weight is generally safe, if you avoid the air sacs of birds (rump and dorsal thorax are generally safe). Pain relief should be considered and may include the use of anti-inflammatory and analgesic agents (meloxicam, butorphanol, tramadol, butorphanol).

Euthanasia should be seen as a POSITIVE welfare outcome, and a service to wildlife and the community. The NSW Code of Practice for Injured, Sick and Orphaned Protected Fauna lists the following criteria for considering the euthanasia of a protected species:

- an assessment of imminent death
- high likelihood of death regardless of care
- poor likelihood for successful reintegration to the wild population and no suitable long-term care option
- low suitability for rehabilitation and insufficient facilities and resources available
- no suitable options for care in proper facilities by a trained and licensed rehabilitator and the species is not threatened, endangered or critically endangered
- NSW NPWS policy or recognised practice prohibiting the release of the species.

Humane Euthanasia – Principles and Practice

When using barbiturates or other chemicals for animal euthanasia it is important to dispose of remains with care to prevent secondary poisoning events.

Acceptable methods for the euthanasia or humane killing of wildlife have now been considered and published by animal research and welfare organisations: state agriculture agencies, the Royal Society for the Prevention of Cruelty to Animals (RSPCA), and the Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART).¹ A very useful reference guiding the humane euthanasia of a variety of taxa is the American Veterinary Medical Association Euthanasia Guidelines – 2020 Edition.² Acceptable methods of euthanasia of common Australian fauna are summarised in Table 1 at the end of this section.

The following factors should be considered prior to undertaking euthanasia of wildlife:

- Consultation with Traditional Owners to ensure cultural protocols are observed
- Your safety and the safety of your co-workers and volunteers (conduct a safety risk assessment)
- Humane treatment of the animal
- Minimal distress and anxiety prior to loss of consciousness (appropriate method for species and situation)
- Rapid and pain-free death (rapid loss of consciousness followed by respiratory and cardiac arrest)
- The method should not destroy tissues that are critical for diagnostic testing
- The method should not cause undue stress to human observers, and if possible, should be conducted away from members of the public (may require use a sheet or tarp to block visual access)
- The procedure should only be performed by qualified, competent and experienced persons
- If possible, the procedure should be conducted in a quiet environment, away from other animals
- Dependent offspring should have care provided or be euthanased also (always check the pouch of marsupials being euthanased)
- Death must be confirmed in every animal (lack of respiration and cardiac function, corneal and withdrawal reflexes absent, pupils fixed and dilated, no tongue tone or retraction)
- Secondary poisoning of predators and scavengers must be avoided by proper disposal (incineration or deep burial) of the remains of animals euthanased by chemical means. Potassium chloride euthanasia may negate some of these concerns
- Animals euthanised with pharmaceutical agents (e.g. barbiturates) or suspected to have an infectious disease (such as H5 bird flu) must be disposed of appropriately (biological/contaminated waste) and are not fit for human or animal consumption
- Biosecurity and decontamination procedures must be maintained and monitored
- Animal welfare practices should be documented, communicated and, when possible and appropriate, monitored by animal welfare officers

If remains are to be left in the field, mark the remains with fluoro spray paint or marker (avoid red, which can be confused with blood) to indicate that death has been confirmed and, where relevant, that the pouch has been checked.

Make yourself familiar with the legislation governing animal euthanasia. The legislation will vary from state to state, but generally should encompass:

- Prevention of Cruelty to Animals Act
- Veterinary Surgeons Act
- Biodiversity and Conservation Act
- Firearms Act, Poisonous and Therapeutic Goods Act

Wild animals are often capable of inflicting serious injuries as they try to escape handling. Effective animal restraint will facilitate euthanasia techniques. Wildlife restraint skills can be learned from zookeepers, zoo veterinarians, and wildlife rehabilitators.

Operating procedures should be written to clearly define the criteria used to determine when euthanasia is appropriate, and the methods to deliver a humane death. These pre-agreed and trained procedures may reduce the mental stress faced by personnel. Each animal and situation must be carefully and thoughtfully evaluated. The operating procedures, staff training, and the program itself should be conducted with the supervision of an experienced wildlife veterinarian.

In a veterinary facility, anaesthesia of wildlife prior to euthanasia is often the best means of reducing anxiety and pain experienced by an animal during euthanasia. Chemical immobilisation of animals will also reduce stress and risk of injury to personnel. Injectable anaesthetics are preferable to gas anaesthetics, due to their fast action, low resource requirement (no need to have nor clean and disinfect anaesthetic equipment), and high doses reduce the likelihood of an excitation phase during induction. An appropriate level of anaesthesia to allow the injection of barbiturates includes: recumbency, loss of muscle and cloacal or anal tone, loss of blink reflex and lack of vocalisation.

Chemical methods of euthanasia

Barbiturate injection (pentobarbitone) is a common means of inducing a rapid and pain-free death. Barbiturates are very acidic, and extravascular injection can be very painful. Intravenous barbiturate injection in a sedated animal is considered gold standard for veterinary euthanasia. If barbiturates are to be delivered via intra-cardiac, intra-peritoneal, or intra-coelomic injection the animal **must be** under general anaesthesia at the time of injection.

Visual references to assist finding blood vessels in birds are available via:

www.theveterinarynurse.com/content/practical/practical-avian-venipuncture-how-to-take-blood-from-birds/
www.youtube.com/watch?v=o7ezee1WST4

When animals are in circulatory collapse (shock) it can be challenging to access a blood vessel for injection. In these cases, intramuscular injection of anaesthetic agents to achieve a plane of surgical anaesthesia can be followed by intra-cardiac, intra-peritoneal, or intra-coelomic injection of barbiturates.

The acidic nature of barbiturates makes them very caustic to animal tissues. The acidity is not reduced by dilution. When the aim of the euthanasia is to provide an animal suitable for post-mortem examination, it is important to titrate the dose of barbiturates. It is often tempting to rapidly inject a very large volume of barbiturates into an animal during euthanasia. However, this practice can interfere with the diagnostic integrity of tissues. The injection site of barbiturates should be considered, along with the tissues of most interest for a diagnostic investigation. Intracardiac injection should be avoided in animals with clinical signs of cardiac or respiratory disease.

Barbiturates and anaesthetic agents are controlled drugs and must be administered and stored in accordance with the guidelines set out by the state veterinary licensing board. These agents must be used by or under the direct supervision of a veterinarian.

The humane euthanasia of wildlife in a field situation can be difficult due to logistical concerns with available personnel, equipment and drugs. Logistical difficulties, however, do not absolve responsibility to minimise pain and distress during the procedure.

Physical methods of euthanasia

The Victorian government has developed a Safe Work Procedure related to the Field Euthanasia of Animals, which provides a template and excellent information on mechanical methods of euthanasia.

www.wildlife.vic.gov.au/data/assets/pdf_file/0039/698529/SWP-180-Field-euthanasia-of-animals.pdf

Gunshot can deliver a rapid and pain-free death. Shooting an animal can be safer than manual restraint for the delivery of chemical euthanasia, and this method pre-empts considerations regarding barbiturate-laden remains, which have the potential to cause secondary poisoning.

When shooting is the method of euthanasia, consider the following:

- Personnel must be trained and licensed for the safe completion of their task
- Local police and the NSW RSPCA should be informed
- The landowner must be informed and approve
- Firearms and ammunition should be appropriate for the task
- The path of the bullet should not be through the tissues of most importance for reaching a diagnosis
- At close range, the brain or upper spinal cord of the neck will produce a more rapid loss of consciousness and death
- At longer range, a shot through the heart is more likely to be accurately placed and produce a reliable means of euthanasia.
- PPE should be worn by all personnel: high visibility vests, P2 mask, washable boots, coveralls, gloves, hearing protection and face shields and goggles suitable for firearm use should be donned when there is any potential for splashback of animal fluids
- The shooter is responsible for planning the sequence of shots and designating safe locations for other personnel
- Briefing all personnel in the area regarding the method being undertaken, safe areas, invitation to leave if preferred, and how the events will unfold.

A gunshot through the brain or heart is the most reliable means of bringing on a rapid and pain-free death. If the animal was exhibiting behavioural abnormalities, however, it would be important to leave the brain intact for examination. In these cases, a shot through the heart, or through the spine (where the neck and skull meet) is preferred. A spinal shot should only be attempted by experienced personnel who are aware of the anatomy of the animal.

When aiming at the head, one can approach the animal from the front, side or back of the animal. The exact landmarks will vary for each species, but the following guidelines may be useful for most mammals.

- Poll shot – approaching from the back of the animal. Shoot at the base of the skull, along the mid-line (midway between the ears), along a line that leads to the nose.
- Side shot – the landmarks for this method will vary from species to species.
- Front shot – this shot is often taken from above the animal. An imaginary X is drawn on the animal with each line going from the base of one ear to the outer corner of the eye on the opposite side of the body. The shot is then aimed where the two lines cross, and it is directed along the line of the animal's neck.

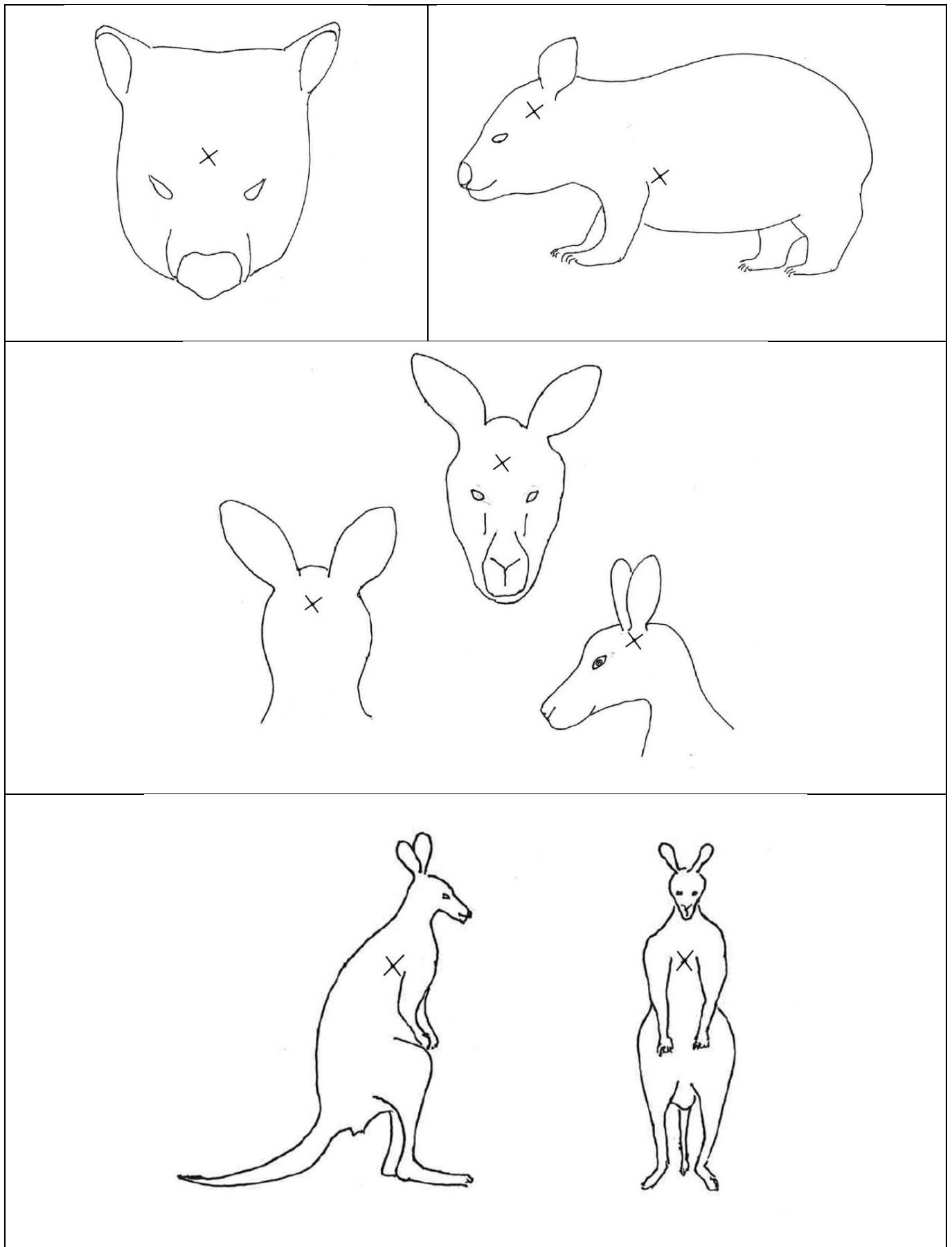


IMAGE: PICTORIAL IMAGES GUIDING THE SHOOTING OF KANGAROOS AND WOMBATS, MODIFIED BY DR. BRYN LYNAR BASED ON ILLUSTRATIONS WITHIN GUIDES FOR SHOOTING KANGAROOS AND WOMBATS: WWW.DCCEEW.GOV.AU/SITES/DEFAULT/FILES/DOCUMENTS/CODE-CONDUCT-NON-COMMERCIAL.PDF - SCHEDULE 2, AND CDN.ENVIRONMENT.SA.GOV.AU/ENVIRONMENT/DOCS/COP-WOMBAT-2018.PDF

Always be aware of where the bullet may exit the animal, even when firing into the skull. If there is any concern for the safety of humans in the area, other means of euthanasia must be used. Do not place the barrel of the gun immediately up against the skin and skull, even in a recumbent animal. Leave a gap of at least 5 cm to avoid explosion in the gun barrel.

Records must be kept of the details of animal euthanasia, the use of controlled chemicals and firearms. Records must be sufficient to account for the volume of chemical and the number of rounds of ammunition used.

Blunt trauma or commercial captive bolt equipment can be a humane form of euthanasia for birds and small to medium sized mammals. A secondary step, such as a second blow, exsanguination or decapitation can be used to ensure a rapid loss of consciousness and death.

All personnel in the vicinity should wear PPE: P2 mask, washable boots, coveralls, gloves, eye protection and face shield. Bystanders should be invited to leave, briefed on the process and visual expectations, and if remaining should be directed to stand back at least 2-3 metres.

Commercially available captive bolt equipment should be operated according to manufacturer's instructions by personnel trained and experienced in their use.

The aim of blunt force is to deliver a swift blow to the base of the skull, near the junction with the neck with sufficient force to destroy the brainstem and other components of the central nervous system to effect immediate loss of consciousness and death.

The animal should be restrained physically in a blanket, bag or with a restraint pole, so that only the operator of the blunt tool is within 2 m of the animal. If possible, cover the animal's eyes, but keep the base of the skull visible or clearly marked. The animal should be placed on a firm surface (compacted dirt, wood stump, etc) that will not bounce or give way upon impact.

Small birds and mammals (less than 150 grams) can be struck at the base of the skull with a small hammer (2 cm² face). These animals will have a thin skull, and minimal force will be required in addition to the weight of the falling hammer.

Euthanasia of larger birds and medium sized mammals (150 grams and 1 kg) can be euthanased with a large hammer or mallet (4 cm² face), with moderate to significant force (depending on the size and age of the animal).

Larger mammals (>1 kg) can be euthanased with a larger mallet or wood splitter (8 cm² face) with significant force.

Cervical dislocation and decapitation may be used for the humane, on-site euthanasia of small to medium sized birds or small mammals (less than 200 grams). Decapitation can be used as a secondary mechanism of euthanasia for animals of any size, if the effects of the primary method are uncertain. A burdizzo (castration forceps) or sharp garden shears may be safer for the handler than a large knife, although a knife will be required to ensure decapitation and exsanguination.

All personnel in the vicinity should wear PPE: P2 mask, washable boots, coveralls, gloves, eye protection and face shield. Bystanders should be invited to leave and briefed on the process and visual expectations.

Decapitation and cervical dislocation are approved within the Australian Animal Welfare Standards and Guidelines for Poultry for the euthanasia of poultry up to 5 kg. Instructions have been prepared by Chicken Farmers Canada: www.chickenfarmers.ca/wp-content/uploads/2014/05/CFC-Euthanasia-Guidelines.pdf

Cervical dislocation is a specialised technique and should be conducted by, or under the direct supervision of trained and experienced individuals. Cervical dislocation of birds can be conducted by holding the legs in one hand, with the other hand, pinch the beak closed so that your thumb is positioned under the beak. Quickly and sharply pull each hand in opposite directions, while bending the beak upwards to snap the skull backwards. Palpate to confirm that there is separation between the base the head and the cervical spine and consider decapitation or blunt force trauma if there is any uncertainty.

Cervical dislocation in small mammals (<200 grams) can be conducted by holding the animal down on a solid surface, grasping the back of the neck and skull with the thumb and forefinger of one hand, and with the other hand grasp the hind quarters to rapidly and sharply pull the body away from the head. Again, confirm separation of the base of the skull and cervical spine through palpation.

Decapitation can be achieved in a similar manner to cervical dislocation. Ensure that operators are wearing the PPE described above, that the instrument is very sharp and that the animal can be restrained in a manner that provides control while leaving a safe distance from the path of the blade. Consider the use of chain-mail glove on the hand restraining the animal/nearest the path of the blade. Use a single, firm, swift movement of the blade to penetrate the joint between the skull and cervical spine.

Specialised gas chambers, stunning systems or other euthanasia equipment may be employed by state government agency staff based on need, risk assessments and the availability of trained and experienced personnel.

Carbon dioxide and other gases can produce humane euthanasia, but generally the chambers should be gradually flooded with gas to deliver a longer, but more gentle induction. If animals are to be placed into a chamber already flooded with carbon dioxide, they should first be sedated or anaesthetised.¹ Gas chambers of any kind have the potential to concentrate noxious gases and viruses. These devices must be used by trained and experienced personnel, and the methods should be regularly monitored.

Inappropriate methods of euthanasia

The methods of euthanasia that are considered humane have changed dramatically over the years.

The following methods of euthanasia are no longer considered to be humane:

- Cooling or freezing reptiles, amphibians and fish
- Intra-cardiac, intra-hepatic, or intra-celomic barbiturates in conscious animals
- Ether inhalation
- Drowning
- Decapitation of conscious animals
- Death through the administration of neuromuscular blocking agents that paralyse the muscles controlling respiration
- Exsanguination or cardiac injection in a conscious animal
- A captive bolt gun or stunning blow to the head that will only temporarily stun the animal. These methods must be followed immediately by exsanguination, or pentobarbitone administration.
- Neck-wrangling, or a “windmill technique” for avian euthanasia
- Thoracic compression
- Succinyl chloride, and other pesticides or household chemicals that are not intended for use animal euthanasia

Regular reviews of procedures and situation debriefings are recommended to provide an opportunity to check-in on the level of stress or distress that personnel may be experiencing.

Marine Mammal Euthanasia

Marine mammals are protected under the *Biodiversity Conservation Act 2016* and marine mammal incidents are managed by NPWS. Criteria, techniques and required NPWS approvals for the euthanasia of marine mammals, are outlined in the Code of Practice for Injured, Sick and Orphaned Marine Mammals, which can be found at www.environment.nsw.gov.au/sites/default/files/marine-mammals-code-of-practice-220349.pdf.

The NSW NPWS Marine Wildlife Management Manual 2021 – Policy and Procedures for Marine Wildlife Management also provide criteria and protocols for marine mammal euthanasia.

www.environment.nsw.gov.au/sites/default/files/marine-wildlife-management-manual-2021-policies-procedures-marine-wildlife-management.pdf

Before undertaking marine mammal euthanasia, receive approval from an appropriate NPWS delegate, and assess human safety risks and animal welfare. In some cases, euthanasia may be required on animal welfare grounds but may not be possible due to human safety risks. Consider sea state, animal location, lighting, tides, animal activity, number of people available, ability to exclude bystanders, risk of needle-stick injury or other accidental exposure to drugs.

Public communications, with talking points, should be pre-established and at hand, and cultural protocols facilitated where possible.

Drug and or gun safety protocols and zones of safety should be established. Team members should be trained, experienced, have assigned roles and have participated in a safety briefing.

Euthanasia via firearms

If firearms are used, gunshot methods should be undertaken by suitably licenced and experienced personnel, under the approval of NPWS staff. The appropriate calibre of firearm needs to be paired with the appropriate ammunition to ensure effective euthanasia.³ Euthanasia via firearm is not appropriate for cetaceans greater than 6 m in length, or where the cranial anatomy precludes destruction of the brainstem, such as sperm whales.

In pinnipeds, gunshot through the skull is recommended, using one of the following three target areas: 1) frontal – slightly caudal to a line between the eyes, 2) poll - from the rear or crown of the skull downwards and rostral, towards the mid-palatine region, 3) temporal – from the side of the skull, just caudal and dorsal to the eye.⁵

In cetaceans, a series of three shots, delivered from a position in front and above the animal is recommended. Shots should enter the dorsal midline just caudal to the blowhole, with the downward trajectory at 45 degrees.^{3,4,5} If circumstances prevent a headshot, the heart is located in the ventral aspect of the chest cavity at approximately the caudal margin of the base of the pelvic flipper.⁵

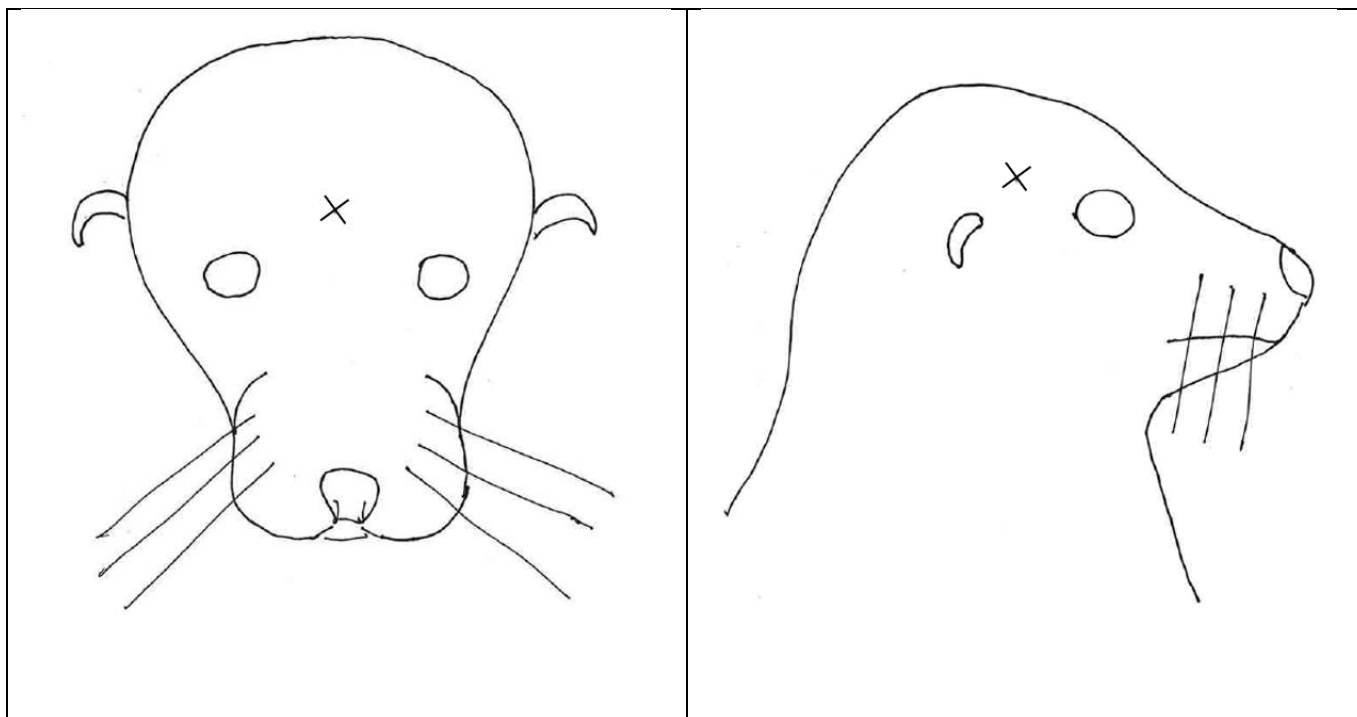


IMAGE: PICTORIAL IMAGES GUIDING THE SHOOTING OF PINNIPEDS, MODIFIED BY DR. BRYN LYNAR BASED ON ILLUSTRATIONS WITHIN "MARINE MAMMAL BEST PRACTICES"⁵

Chemical Euthanasia

It may be difficult to safely get close enough to an injured pinniped to deliver chemical restraint. Where possible, the animal should be restrained by appropriately trained personnel to facilitate controlled intramuscular injection of anaesthetic agents, prior to euthanasia. The safest muscles to target in a manually restrained pinniped are the gluteal muscles. If a pinniped cannot be restrained, delivery of intramuscular sedation via pole syringes may be required. To facilitate safe intramuscular injection, it is recommended that additional personnel stand between the person administering the sedation and the head of the animal. Use of remote tranquilization such as dart gun or blow dart may only be conducted by personnel accredited by NPWS.

In pinnipeds, intramuscular delivery of an overdose of one or more anaesthetic agents, such as butorphanol (1-5 mg/kg), diazepam (0.5 – 1 mg/kg), midazolam (0.15 – 0.3 mg/kg) or tiletamine-zolazepam (5-10 mg/kg) may be considered to immobilise the animal to a plane where they can be approached and assessed to determine level of consciousness and signs of life (respiration, heart beat detected on ultrasound or auscultation, corneal reflex).^{5,6}

Intravenous access to sedate pinnipeds can be gained via the caudal gluteal or brachial vein. The caudal gluteal vein can be accessed via inserting the needle adjacent to the sacrum and walking the needle laterally. In smaller pinnipeds with reduced gluteal musculature, the colon could be perforated with this technique, and it is recommended to use the brachial vein. The brachial vein runs parallel to the caudal edge of the pectoral flipper on the ventral surface.^{5,7}

In small cetaceans, sedatives should be delivered into the epaxial muscles. Anatomical landmarks for injection include the caudal edge of the dorsal fin and the top third of the lateral body wall, avoiding the fibrous tissue associated with the vertebral bodies along the dorsal midline.^{4,6} A surgical plane of anaesthesia can be achieved using acepromazine (1 mg/kg) and followed 10 minutes later by xylazine (2 mg/kg), or midazolam (0.1 mg/kg), followed in 10 minutes by acepromazine (1 mg/kg), and 10 minutes later by xylazine (3-4 mg/kg).^{5,6} To ensure that these drugs are delivered deep enough to penetrate the entire blubber layer, it is recommended to use at least 21 gauge 1 ½ inch needle. Aim to achieve a surgical plane of anaesthesia, as assessed by poor muscle tone, slow corneal reflexes and no response to a strong pinch of fin or flukes.

Once a surgical plane of anaesthesia has been achieved, euthanasia can be affected through intravenous or intracardiac pentobarbitone (150 mg/kg). Alternatively, potassium chloride (100 mg/kg, saturated solution of 300 mg/mL) can be delivered intravenously or intracardiac, resulting in low residue remains.⁸

Intravenous access in small cetaceans can be achieved via a vascular bundle located parallel to the cranial edge of the tail fluke on both dorsal and ventral surfaces. The tissue overlying the vascular bundle may have slightly lighter pigment or be marked by a depression in the otherwise fibrous tail fluke.⁵

Long, 18-gauge needles, or metal cannulas are used to deliver intracardiac injections and specialised equipment is required to euthanise larger cetaceans. Use Luer lock syringes to prevent needle detachment and splash-back of chemicals. Landmarks for intracardiac injection are between either the 6th-7th, or 7th-8th intercostal space, just lateral to the sternum. Aspirate blood to ensure that the needle tip is in a cardiac chamber prior to injection. Be aware that large agonal breaths, muscle fasciculations and neck arching may occur as the drugs begin to take effect.

Always evaluate whether the animal is dead by assessing lack of respiratory and cardiac function, loss of muscle/jaw/anal tone, presence of fixed and dilated pupils with no corneal reflex.

National Guidelines for the Euthanasia of Large Stranded Whales are available and should be consulted when dealing with cetaceans greater than 6 metres in length.⁹ An educational video demonstrating techniques will be available shortly.

Table 1: Methods of Euthanasia

DRUG DOSAGES USED IN THIS TABLE ARE SUITABLE FOR EUTHANASIA ONLY

ip = intraperitoneal, iv =intravenous, ic =intracardiac, ico=intracoelomic

Wild & Feral Mammals

Preferred Method

A two-stage method of euthanasia is generally preferred. The animal is first physically or chemically restrained, and then an injection of pentobarbitone (100 - 150 mg/kg) is delivered ip, iv, or ic.

Two people will be required: one to restrain the animal and the other to administer the pentobarbitone. Covering an animal's face with a calico bag or a towel may reduce its stress response during restraint. An open-weave Hessian sack is recommended for holding larger animals so that they can obtain enough air.

Small-to-medium-sized marsupials can be manually restrained, usually within a towel or inside a calico bag. One of the animal's limb or the tail is pulled out of the towel or bag so that pentobarbitone can be injected directly into a blood vessel.

Preferably, chemical restraint can be provided with injectable anaesthesia, possibly through the handling bag, to a surgical plane of anaesthesia prior to pentobarbitone administration.

Fractious and larger animals can be more easily euthanased with pentobarbitone after chemical restrained using one of the following:

- alfaxalone 2-4 mg/kg
- tiletamine and zolazepam 10 -15 mg/kg im
- ketamine hydrochloride 15 mg/kg + xylazine 5 mg/kg im
- ketamine alone 20 - 30 mg/kg im

Pentobarbitone can be administered through a cephalic vein, saphenous vein, femoral vein, ventral tail vein, lateral tail vein, jugular vein, or ear vein (in long eared species).

Alternatively, medium to large animals can be humanely shot.

Acceptable Method

Cervical dislocation can be a humane method of euthanasia for rodents and small marsupials weighing less than 200 g if the handler is well trained. Larger animals should be anaesthetised prior to cervical dislocation.

Be aware that intracardiac injections in koalas can be difficult due to the barrel shaped chest cavity. A longer needle and possibly ultrasound guidance may be required.

Unacceptable Method

Drowning.

Carbon dioxide administration in restrained animals.

Neuromuscular blocking agents (unless used only for restraint just prior to euthanasia by other methods).

Intrahepatic or intracardiac injection of barbiturates in a conscious animal.

Pinnipeds

Preferred Method

Smaller pinnipeds can be caught in a net and then hand-injected with anaesthetic. Larger pinnipeds should be injected via syringe pole at close range.

Injectable anaesthetics that can be delivered by intramuscular injection to provide a surgical plane of anaesthesia to allow safe delivery of pentobarbitone include:

- butorphanol 1-5 mg/kg
- diazepam 0.5 - 1 mg/kg
- midazolam .15 - 0.3 mg/kg
- tiletamine-zolazepam 5-10 mg/kg

Pentobarbitone overdose can then be given iv by experienced wildlife veterinarians. In otariid (eared) seals the caudal gluteal vein is the recommended site, whilst in phocid (no ears) seals the extradural intravertebral sinus can be accessed for injection. Alternative injection sites include the brachial and the metatarsal veins.

See United States Marine Fisheries Service - Marine Mammal Euthanasia Best Practice (in the references) for blood vessel and shooting landmarks.

Acceptable Method

Shooting is effective & humane, but personnel must be an accredited shooter with NPWS. The site is located at the side of the head, midway along and just above an imaginary line drawn between the eye & ear (where the skull is thinnest).

Cetaceans

Preferred Method

Barbiturates can be administered iv, ic, or ip. Elongated needles can be manufactured to allow direct cardiac drug administration in larger animals.

Injectable anaesthetics that can provide a surgical plane of anaesthesia to allow safe delivery of pentobarbitone include:

- acepromazine 1 mg/kg im, followed in 10 minutes by xylazine 2mg/kg im
- midazolam 0.1 mg/kg im, followed in 10 minutes by 1 mg/kg acepromazine, and 10 minutes later by xylazine 3-4 mg/kg im.⁵

Gunshot is acceptable, when conducted by accredited shooters, when animals are less than 6 metres in length, when the landmarks for the brain can be accurately identified for the species, and when an adequate calibre gun is available for the job.

See United States Marine Fisheries Service - Marine Mammal Euthanasia Best Practice (in the references) for blood vessel and shooting landmarks.

Unacceptable Method

Succinylcholine Chloride +

Potassium Chloride administered intravenously or intra-peritoneal are no longer considered acceptable methods of euthanasia, since paralysis of respiratory musculature and death due to hypoxemia is slow and painful. These agents can be humanely delivered once the animal is in a surgical plane of anaesthesia through the delivery of injectable anaesthetics

Birds

Preferred Method

Physical restraint and iv administration of pentobarbitone (100 - 150 mg/kg) is a satisfactory method to euthanase many birds.

Injectable anaesthetics that can provide a surgical plane of anaesthesia to allow safe delivery of pentobarbitone include:

- midazolam 1-3 mg/kg im
- ketamine 10-40 mg/kg +midazolam 0.2-2 mg/kg im
- butorphanol 2-4 mg/kg + midazolam 1-3 mg/kg im
- alfaxalone 20 - 30 mg/kg im

Pentobarbitone can be given via the cutaneous ulnar vein, medial metatarsal vein, or right jugular vein if accessible.

Larger birds, such as emus, can be shot through the head or heart.

Acceptable Method

For small-to-medium-sized birds, less than approximate 200 grams, cervical dislocation by trained personnel can be an effective means of euthanasia. If available, larger birds should be anaesthetised prior to cervical dislocation.

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Carcass Disposal

Cultural Considerations

Management of infected carcasses to mitigate or eliminate human health risks and the spread of infection may need to be balanced with cultural considerations. Whenever possible, early relationship building with relevant Traditional Owners is recommended to protect culturally significant sites and species. Ongoing consultation can then include acknowledgements, access to land, and sensitive carcass management.

The disposal of bird carcasses should proceed in accordance with local council and EPA guidelines, and any NSW DPIRD Control Orders that may require a permit for movement or disposal of animal carcasses. Refer to ongoing guidance from appropriate agencies as guidance is subject to change.

General Approach to Disposal

Where possible, leave carcasses to decompose naturally and prevent access by people, livestock or pets. Handling wildlife remains introduces the risk of viral spread and disturbance to other wildlife.

Signage is available from NSW DPIRD to notify the community of possible wildlife remains in the area.

https://www.dpiird.nsw.gov.au/data/assets/pdf_file/0010/1644229/Before-H5N1-is-confirmed-but-reports-of-sick-or-dead-wildlife.pdf

It is recommended to collect and dispose of carcasses where they are likely to be encountered by members of the public, such as areas used by children or pets, on a public right of way or an area frequented by the public, or in areas where wild birds regularly feed, breed or roost.

The collection and disposal of wild bird carcasses is the responsibility of each respective landholder and/or land manager. E.g. When removal is necessary, the local council is responsible for carcass removal on council land, NPWS is responsible for carcass removal in National Parks. Members of the public are responsible for disposal of carcasses on their own properties if they want them removed.

Persons who may be collecting carcasses should understand the human health risks. While this virus rarely spreads to people, infection is possible following close contact with infected carcasses and the places they've contaminated.

Infected animals may become very sick and might appear dead. Such animals may pose a risk to personnel from bites or scratches as they react to approach or touch. Furthermore, it is important to ensure that animals are dead before being disposed of for animal welfare reasons. Before approaching a carcass, look for signs of death, including absence of breathing, rigor mortis, dry eyes, and lack of response to stimulation - if you gently poke the animal, they should not react or show any signs of alertness. If in doubt, seek the assistance of a veterinarian.

Disposal Considerations and Steps:

- Undertake a risk assessment and refer to Standard Work Procedures/Job Safety Analyses
- Ensure that you are authorised to conduct the task and that your employer is aware
- Focus on safety and biosecurity. Conduct a risk assessment prior to undertaking carcass disposal.
- Contact the Emergency Animal Disease Hotline if you are not certain that an event involving more than 5 birds has been reported.
- Minimise the people involved
- Minimise disturbance of nearby wildlife
- Wear PPE (gloves, coveralls, gumboots, eye protection, P2 mask)
- Minimise disturbance of nearby wildlife
- Ensure that the animal is dead (not breathing). Ensure that you are authorised to conduct the task and that your employer is aware.
- Minimise disturbance of other animals nearby
- Do not touch the carcass with your bare hands

- Wear appropriate PPE
- Use tongs, shovels or other appropriate equipment to handle the carcass when possible
- Alternatively, lift the remains using an inverted bag. Once the carcass is grasped, the bag can be turned back on itself and tied off.
- The bag should then be placed in a second leak proof plastic bag, ensuring not to contaminate the outside of the outer bag
- Clean and disinfect any materials and equipment used
- Disinfect the outside of the outer bag
- Dispose of double-bagged remains in a “red topped” disposal bin.
- Alternatively bury a small number of carcasses (not bagged or wrapped in plastic) ensuring that the remains sit 60 cm deep, and that the burial site is not near waterways. The hole must be re-filled with soil and then covered in rocks or other materials that will deter predators.
- Double bagged remains can be taken to a local landfill that is licensed by EPA to manage animal waste.
- Bag and dispose of single use PPE in the same manner as the remains.
- Wash and dry hands thoroughly with soap and water (preferable), or an alcohol based (>60% alcohol) sanitiser.
- Wash clothing, equipment and reusable PPE. Shower prior to contact with people, pets and other animals.
- If you feel unwell after handling sick or dead wildlife, contact your GP and let them know that you have been working with wildlife potentially infected with H5 bird flu. Notify your employer. Stay home. Consult the NSW Health website: <https://www.health.nsw.gov.au/Infectious/bird-flu/Pages/default.aspx>

Do:

- ✓ Keep yourself and those around you safe. Conduct a risk assessment or seek advice if uncertain.
- ✓ Limit access to the area where the carcasses are located, and keep domesticated animals, children and people away
- ✓ Wear personal protective equipment (PPE) – disposable waterproof gloves, disposable overalls or long-sleeved clothing, gumboots or other washable protective footwear, a face mask (must be P2/N95 grade) and eye protection.
- ✓ Wash or sanitise hands regularly, especially before and after wearing gloves. Wash clothing and clean and disinfect any footwear, reusable equipment or other items that may have been in contact with animal carcasses or contaminated environment.

Do Not:

- ✗ Touch without PPE any parts of dead wildlife or anything in contact with wildlife remains
- ✗ Transport wildlife or their remains in the passenger sections of vehicles, or take them into buildings
- ✗ Touch your face or put any item near your mouth until PPE is removed and hands have been thoroughly washed.
- ✗ Do not enter unsafe places, for example dark, rocky areas, beaches with rising tides. Do not lift heavy objects.
- ✗ Do not attempt to handle sick wildlife without experience and PPE.

Equipment Required to Bag Dead Wildlife

Public land managers should consider having pre-packed kits containing PPE and equipment for collection and disposal that can be carried in vehicles or collected from work depots as required.

Useful resources that include biosecurity measures and donning and doffing PPE are available on the Registry Website (<https://arwh.org/resources/>) and an online training module is available on the NSW Emergency Management Capability Hub (<https://emtraining.nsw.gov.au/course/view/hpai-field-officer-training-76219>).

Items required for carcass disposal to gather before starting:

- Soap and water for hand washing (preferable) or appropriate alcohol-based hand sanitiser (80% ethanol or 60% isopropyl alcohol)
- Disposable, waterproof gloves (a plastic bag on each hand can be used as make-shift hand protection)
- Washable shoes (gumboots) and a pair of clean shoes
- Disposable overalls or long-sleeved clothing
- A disposable P2/N95 face mask
- Eye protection
- Thick leakproof plastic bags that are large enough to enclose the dead wildlife. A minimum of four bags: 2 for carcasses (unless burying), one for clothing and reusable PPE requiring further washing and disinfection, and one for single use PPE and other waste.
- A disposal tool such as dustpan, shovel or other garden tool to move the remains
- Strong tape, string, or something to seal the second bag shut
- Soap, water and a bucket to clean reusable PPE and tools
- Sray bottle with disinfectant such as bleach (5-10%) or a disinfectant that states that it kills viruses or “hospital-grade” on its label. See Appendix A.
- Large containers to place the bagged carcass for transport
- A long handled scrub brush and a tub to stand in to clean boots.
- A tarp to keep your equipment clean – preferably divided to a clean and dirty side.

Avoid driving vehicles onto contaminated sites (where the carcasses are lying). Where this is not possible, ensure that vehicles are decontaminated before leaving the site. Guidelines for the decontamination of vehicles can be found at <https://www.farmbiosecurity.com.au/essentialstoolkit/people-vehicles-equipment/>

If moving between sites, vehicles and equipment must be decontaminated on leaving one site and moving to the next site. PPE should be changed between sites.

If you did not use disposable overalls then, as soon as possible, wash the clothes that were worn during disposal (separately from any other clothing) in a washing machine, with laundry detergent, colour-safe bleach if possible, and on the hottest cycle appropriate for the material.

If shoes cannot be cleaned and disinfected or clothes washed immediately, seal them in a tied plastic bag until it can be done.

Disposal Options

There are several options for the disposal of the bagged carcasses and disposable PPE, and the choice of method is likely to be influenced by:

- the quantity of material
- access to council or private putrescible waste collection services (‘red bin’)
- availability of lidded skip bins, or other suitable containment vessels

- capacity to safely transport the material to an appropriate landfill facility

Unless specific alternate arrangements have been established by government authorities, small numbers of carcasses and any contaminated materials should be double-bagged (leakproof plastic bags), securely sealed and externally decontaminated with an appropriate disinfectant. Disposal of sealed bags should comply with clinical/hazardous waste protocols.

For large numbers of carcasses that cannot be practically managed through normal waste disposal options, seek advice from the NSW DPIRD.

- **Leave in situ** if they don't pose a risk to the public, or other animals. However, consideration should be given to the risk of further contamination or transmission from predators or scavengers.
- **Restrict public access** to facilitate collection. Contact DPIRD Animal Biosecurity. Use available signage templates https://www.dpiird.nsw.gov.au/_data/assets/pdf_file/0010/1644229/Before-H5N1-is-confirmed-but-reports-of-sick-or-dead-wildlife.pdf
- Double or triple bag small numbers of carcasses and place them in the **general waste bin ("red bin")** and disinfect the outside of the bag. Lids should be secured, inaccessible to children or scavenging animals. The bins should also be taken to a landfill that practices daily covering of waste.
- **Disposal direct to landfill** may be an option for larger volumes, but carcasses still need to be double bagged in leak-proof tub or sealed container, and should not be transported in the passenger section of the vehicle. The landfill site needs to cover the waste daily. It is strongly recommended to contact the facility prior to transporting carcasses to clarify procedures.

If you are using a commercial waste collection service, ensure that they are aware of the risks associated with the waste and confirm that the remains will be buried as soon as possible following disposal to the landfill site, but no later than at close of business of the same day.

- **On-site burial** could be suitable for small numbers of carcasses and only permitted with the permission of the landowner or manager. Do not bury the birds in plastic bags. Bury to a depth of 60 cm, handle the carcasses with gloves and include the gloves with the carcasses and then covered with the excavated soil. Place rocks or other materials over the filled-in hole to prevent animals from digging up the carcasses. Do not bury near any watercourses or in a place where it could contaminate local water supplies. Clean and disinfect any materials and equipment.

Undertake a site assessment for larger carcass numbers. In these instances, public land managers should seek the advice of the NSW EPA or Emergency Animal Disease hotline.

Records of burial locations and volume of carcasses buried should be kept.

Public land managers are advised to prepare in advance the resources necessary to complete each step of the burial process.

Composting of organic material occurs through heat and microbial activity. This method can be an effective form of decontaminating and managing animal carcasses. This process is complex and requires the construction of an appropriate containment piles, protection from predators or vermin, and regular monitoring of temperature and conditions. This method should only be considered by landowners or managers who have skills and experience in composting animal remains and waste. Notify NSW DPIRD and the NSW EPA of your intention to use this process in a H5 bird flu response and obtain written approval.

Incineration of animal remains by a licensed commercial service provider can be an effective means of carcass disposal. Ensure that the service provider is aware of the materials being disposed of and the risks associated with transportation and possible handling of the remains.

Record Keeping

Records should be kept by the land manager of any carcass management activities conducted in an H5 bird flu response. Recorded details should include:

- Time, date and place
- Species types and numbers of each species
- Condition (state of preservation) of the remains – these details contribute to an understanding of timelines of viral spread, the likelihood of viral presence (reduced in older remains) and decision making regarding other potential mitigation actions.
- Other observations – such as the presence of any other sick wildlife nearby and their clinical signs, again to inform decision making on whether additional action is required.
- Disposal methods
- If removed, location of disposal (e.g. landfill) of the remains and disposable PPE.

Online Resources for Carcass Disposal

Full disposal guidelines are available on the NSW DPIRD website with a risk assessment tool. These guidelines are actively being updated:

Public Advice for carcass Disposal:

https://www.dpiird.nsw.gov.au/_data/assets/pdf_file/0005/1588811/Disposal-of-bird-carcasses-from-public-and-private-land-Public-Version.pdf

Disposal Advice for Public Land Managers, including a risk assessment tool (Appendix 1): [Guidance-for-disposal-of-dead-wildlife-following-the-detection-of-high-pathogenicity-avian-influenza-H5N1-12-2025.pdf](https://www.dpiird.nsw.gov.au/_data/assets/pdf_file/0004/1588828/Disposal-of-bird-carcasses-from-public-and-private-land-Local-Government.pdf)

Public and Private Land Managers:

https://www.dpiird.nsw.gov.au/_data/assets/pdf_file/0004/1588828/Disposal-of-bird-carcasses-from-public-and-private-land-Local-Government.pdf

Disposal guidelines will be aligned with nationally developed guidelines.

H5 bird flu – public guidance for carcass disposal:

<https://www.agriculture.gov.au/sites/default/files/documents/public-guidance-disposal-dead-wildlife.pdf>

National principles for wildlife carcass management, with a management assessment framework (Appendix A)

<https://www.agriculture.gov.au/sites/default/files/documents/national-principles-wildlife-carcass-management.pdf>

Also refer to guidance from NSW Health: <https://www.health.nsw.gov.au/Infectious/factsheets/Pages/be-careful-around-wildlife.aspx>

APPENDIX A: Sample Collection Equipment List

PPE kit

Latex, vinyl or nitrile gloves (wear nitrile gloves if poisoning is suspected)

- ☐ N95 or P2 mask
- ☐ Protective eyewear
- ☐ Water impermeable coveralls
- ☐ Gumboots (preferred) or boot covers

Decontamination kit

- ☐ Tarp
- ☐ Buckets
- ☐ Scrubbing brushes
- ☐ Paper towel
- ☐ Footbath pan
- ☐ Hand soap
- ☐ Detergent
- ☐ Alcohol-based hand gel
- ☐ Rubbish bags
- ☐ Disinfectant in a spray bottle

Sampling equipment

- ☐ 2 x 2.5 ml screw-top vials containing swab transport media (Phosphate Buffered Glucose Saline - PBGS)
- ☐ Sterile swabs
- ☐ 2 X zip-lock bags for the samples
- ☐ Esky and ice bricks
- ☐ Larger container to collect water, soil, poisoned bait (EPA officers only)

Recording and packaging materials

- ☐ Masking tape
- ☐ Scissors
- ☐ Permanent marker/pencil/sample labels
- ☐ Courier labels, Specimen Advice Form
- ☐ Camera/phone

Consider: hat, sunscreen, insect repellent, first aid kit, shade-tent, drinking water.

DO NOT use commercially prepared swabs with plastic sleeves that contain transport medium. In an emergency if PBGS is not available, swabs should be placed in 2 mL of sterile saline or stored dry in a sterile container (e.g. cryovial or whirl pak bag).

Appendix B: PPE Donning and Doffing

The recommended PPE includes:

- disposable gloves
- overalls or disposable impermeable coveralls
- disposable shoes or shoe covers or washable boots (i.e. gumboots)
- respiratory protection (P2/N95 respirator mask) and
- eye protection (goggles or face shield).

Donning

Put on PPE in the following order (consider using a buddy system and/or a checklist):

1. Perform hand hygiene. Check for any cuts and apply waterproof dressings.
2. Put on coveralls.
3. Put on boots or shoe covers. Coveralls should be pulled down over boots leaving as little of the boot exposed as possible.
4. Put on apron (if used).
5. Put on respirator, which should be at minimum, an N95/P2 face mask. Do a fit check to ensure a proper seal has been established see Figure 1.
6. Put on eye protection (goggles/face shield).
7. Put on single-use disposable gloves.
8. Put on reusable, heavy-duty gloves.

Doffing

1. Clean and disinfect boots.
2. Remove outer gloves.
3. Decontaminate inner gloves (using disinfectant wipe or equivalent). #
4. Decontaminate and disinfect surfaces, samples, and equipment.
5. Seal the disinfected samples into a small plastic bag, spray disinfectant on the outside of that plastic bag.
6. Remove apron (if used).
7. Remove boots. **
8. Remove coveralls. **
9. Decontaminate inner gloves (using disinfectant wipe or equivalent). #
10. Remove eye protections (face shield, goggles).
11. Decontaminate inner gloves (using disinfectant wipe or equivalent). #
12. Remove respirator.
13. Remove inner gloves.
14. Perform hand hygiene. ^
15. Shower, wash hair, and change into clean clothing when possible.

**Sequence of removal may be dependent on the type of coverall and boots used. It may be necessary to step out of coveralls and boots in one motion within the same process.

If inner gloves become visibly soiled, they should be cleaned with an approved disinfectant wipe. Additionally, perform hand hygiene by disinfecting the inner gloves with ABHR.

^If hands are visibly soiled, wash hands with soap and water. Where hands are not visibly soiled, an approved alcohol-based hand rub (ABHR) with 60-80% ethanol concentration may be used.

In circumstances where all these PPE items are not available or appropriate, NSW Health advises that at a minimum:

- Disposable gloves or gloves that can be disinfected
- Respirator (P2/N95)
- Boots that can be cleaned
- No touch technique (e.g. use of equipment to pick up and dispose of carcass)
- Proper cleaning and disinfection of equipment and materials

Perform hand hygiene, either with alcohol-based hand rub or by washing hands with soap and water if visibly soiled. This should be done regularly – but especially before and after contact with animals/carcasses and their environments. Efforts should be made to avoid touching the nose, eyes or mouth with the hands during work/collecting and disposing of carcasses. Showering and changing into clean clothes after work, if feasible, is also recommended.

Principles of fit check for P2/N95 respirator

Step 1

Perform hand hygiene.

Step 2

Select the P2/N95 mask that fits you well. Only touch the outer edges. Separate the edges and straps.

Step 3

Put respirator on face as per manufacturer's instructions.

Step 4

Place top strap above ears at top of head. Place bottom strap below ears.

Step 5

Place fingertips of both hands at the top of the nose piece. Conform the nose piece, using the fingers of each hand, to the shape of your nose. Pinching the nose piece using only one hand may result in less effective respirator performance.

Step 6

Once a good facial fit has been achieved, proceed to Steps 6a. and 6b.

Step 6a. Positive seal check

- Exhale sharply. The respirator should fill up with air. Check for air leakage around the edges.
- If leakage, adjust the position and/or tension straps.

Step 6b. Negative seal check

- Inhale deeply. The respirator should draw in and slightly collapse towards the face.
- Leakage will result in loss of negative pressure in the respirator due to air entering through gaps in the seal.
- If leakage, adjust the position and/or straps and repeat seal check.

Continue to fit PPE in the recommended order.

There is slight variation in fit check recommendations for different brands of respirator. Always check the manufacturer's instructions for use

Adapted from WHO Western Pacific Region, Sunshine Coast Hospital and Health Service and NSW Government Clinical Excellence Commission



Current as of June 2022

POSTER AVAILABLE FROM QUEENSLAND HEALTH VIA WWW.HEALTH.QLD.GOV.AU/_DATA/ASSETS/PDF_FILE/0035/974294/P2-N95-FIT-CHECK.PDF

Come Clean. Go Clean.

Dirty vehicles, machinery and equipment carry diseases, pests and weeds.



A GUIDE TO EFFECTIVE WASH DOWN OF VEHICLES AND MACHINERY

1 WASH DOWN

- Use compressed air or high pressure water to remove caked on debris and mud
- Get into crevices where mud or debris might be trapped
- Clean out the inside of the car, particularly foot pedals and mats regularly in contact with dirty footwear

WHERE

- ✓ On a clean wash down pad with a hard surface
- ✓ Located away from production areas
- ✓ Where wash off contaminants can be trapped



2 CLEAN

- Use a sponge or spray to cover all surfaces with an agricultural detergent
- Leave the detergent to work as per label instructions before rinsing, making sure to remove any remaining soil or plant material



REMEMBER

To wash all equipment, floor mats, tools and footwear kept in the vehicle as well

3 DISINFECT

- After removing physical dirt, consider using an agricultural disinfectant to kill any remaining pests or pathogens
- Refer to the APVMA for registered disinfectant and follow label instructions
- An additional rinse step may be necessary following disinfection

NOTE

Make sure vehicles and equipment are clean and free of mud and debris before applying a disinfectant



4 RINSE

- Rinse off vehicle, machine and/or other washed equipment
- Use high pressure water to remove mud and debris from the wash down area so it is clean for the next person



CHECK

Equipment that has not been cleaned on farm should be thoroughly cleaned and disinfected before being used elsewhere

Images courtesy of Sharna Holman, QDIAF, unless otherwise stated

www.dpi.nsw.gov.au

APPENDIX E: Morbidity and Mortality Log

Accession Number	Species	Location (suburb, property name, GPS locators)	Age	Sex	ID (Band/Tag #)	Clinical signs or postmortem findings	Live/Treated and Died/Found Dead / Euthanased	Date Death	Date Collected	Treatment Provided	Disposition (released, necropsy, frozen, etc)	Samples collected

APPENDIX F: EMAI Metrostate Label

The label on the left below is a sticker that is obtained from EMAI that charges the courier costs back to NSW DPIRD. This label is required to be affixed to the outside of the box prior to sending.

Ensure that the sender details are correct and that you have signed and dated the sticker.

The label on the right is an address label to tape to the outside of the box to ensure that the courier finds their way to EMAI.

METROSTATE SECURITY COURIER P./L.	
RECEIVER N.S.W. ONLY	E.M.A.I.
MENANGLE	
SENDER	Australian Registry of Wildlife Health
Taronga Zoo Bradleys Head Rd Mosman, NSW	
637733	
NO HAZARDOUS OR DANGEROUS GOODS TO BE SENT. NO INSURANCE ON GOODS SENT.	
We are not common carriers	
SIGNED	K. Roe
DATE	21/10/24

NSW EMAI ADDRESS LABEL:

TO: Regional Veterinary Laboratory

Elizabeth Macarthur Agricultural Institute

Woodbridge Road

Menangle NSW 2568

Telephone: 02-4640-6327

FROM:

APPENDIX G: Courier shipping label for the Australian Registry of Wildlife Health

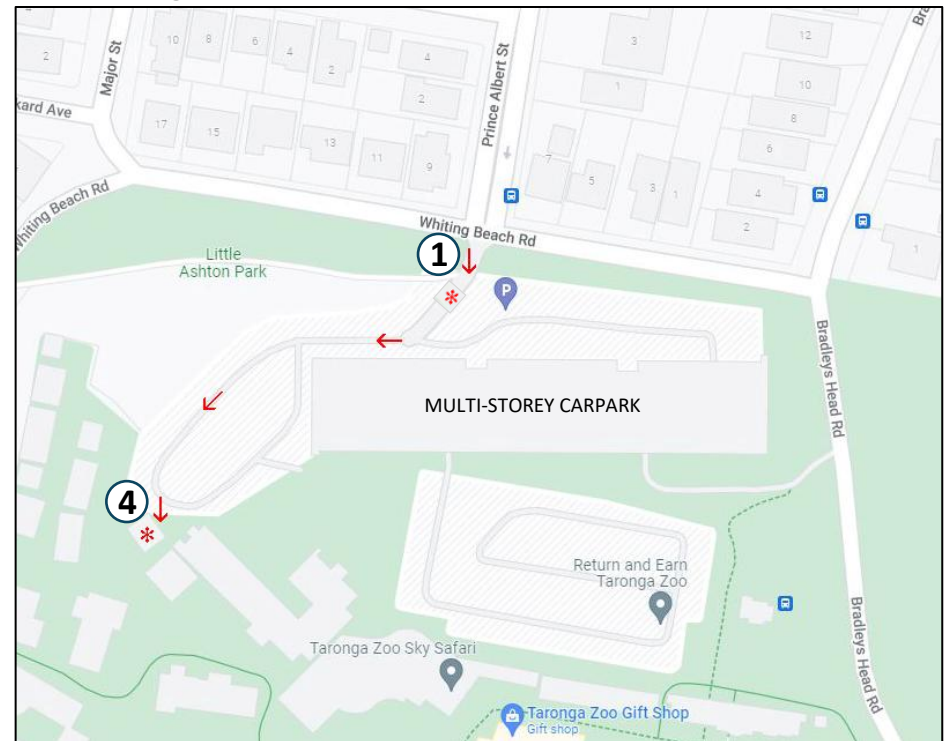
Send carcasses for further testing here.

Australian Registry of Wildlife Health
Taronga Conservation Society Australia
End of Prince Albert Street
(opposite 9 Whiting Beach Road)
Mosman NSW 2088
Phone 0481 468 505



Entrance at the end of Prince Albert Street

1. Approach Taronga Zoo security boom gate at the end of Prince Albert Street
2. Press button on yellow intercom (*)
3. Enter and proceed right along road and park vehicle near security portal
4. Deliver package to security portal
5. Taronga staff to call 0481 468 505 on arrival



APPENDIX H: Category B: Shipping Label for Biological Substances

The label below should print with the proper dimension of an Infectious Substance label (minimum dimensions: 50 mm on a side, and the proper shipping name, “Biological Substance, Category B” must be in letters at least 6 mm high).

Affix the label to the package by covering with clear plastic tape, so that moisture will not cause printer ink to run.

Ensure all samples are double bagged and shipped in a hard-sided container (a hard esky or a foam esky inside a cardboard box).

