Wildlife

AVIAN INFLUENZA PREPAREDNESS TRAINING

Veterinary Professionals 2025-26

NSW

NSW GOVERNMENT

TARONGA CONSERVATION SOCIETY AUSTRALIA

Australian Registry of Wildlife Health

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

Emergency Animal Disease Watch Hotline, 24 hours / 7-days

1-800-675-888

If you suspect that the event may be the result of 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 was co-delivered by the NSW Department of Primary Industries and Regional Development (DPIRD) 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 Registry 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) and DPIRD.

The following information was designed to enhance your confidence and identify the resources you will need to prepare your colleagues and clinic for the potential arrival of highly pathogenic avian influenza (HPAI) in NSW safely.

Via consultation, these procedures may vary as Australia's regulations or disease-status changes adapt to situational management. Please regularly review your processes and stay up to date on current recommendations. These notes were last reviewed 6 February 2026.

Contents

Introduction

Since 2021 there have been expanding outbreaks of a high pathogenicity strain of avian influenza (also known as HPAI, H5N1, H5 clade 2.3.4.4b, and H5 bird flu) circulating in free-ranging wildlife overseas. This group of viruses is now prevalent across Asia, Europe, the Middle East, Africa, North and South America with recent detections on the Antarctic mainland and sub-Antarctic Islands, including Heard Island (Australian Territory).

This influenza virus clade has not yet been reported on Australia's mainland or nearby islands.

Where the HPAI H5 clade 2.3.4.4b occurs, it has caused significant disease and death in poultry, wild birds, and marine mammals. Sporadic cases have also been reported in an expanding range of other 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 HPAI. Public servants and veterinary professionals across NSW are being asked to assist by:

1) being familiar with signs and symptoms,

2) knowing how to report their observations and findings to the Emergency Animal Disease (EAD) Hotline and the NSW DPIRD.

3) knowing how to collect samples from wildlife and dispose of animal remains safely.

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. PPE will protect personnel from infectious agents and from toxins, if the animals have been poisoned.

These workshop notes are relevant to preparedness for an incursion of H5 avian influenza but are also suitable for veterinary practitioners working at the margins of control zones established around other biosecurity events, such as HPAI detections in domestic poultry.

Additional resources

Additional information and resources regarding HPAI are available from NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW), NSW DPIRD, Wildlife Health Australia (WHA), Australian Registry of Wildlife Health (Registry), World Organisation for Animal Health (WOAH) and Australian Interim Centre for Disease Control websites:

www.youtube.com/watch?v=_kNWfqPsz3s

www.dpi.nsw.gov.au/dpi/bfs/animal-biosecurity/avian-influenza

www.dpi.nsw.gov.au/about-us/services/laboratory-services/veterinary/avian-influenzawww.woah.org/en/disease/avian-influenza/

wildlifehealthaustralia.com.au/Incidents/Incident-Information/high-pathogenicity-avian-influenza-information

https://arwh.org/resources/

www.cdc.gov.au/resources/publications/bird-flu-toolkit-people-who-work-birds

What does HPAI in wildlife look like?

Often individual or clustered dead birds or mammals are the first sign of HPAI.

Birds or mammals infected with HPAI may have:

- Lethargy, depression, fluffed feathers
- incoordination, tremors, twisted neck, seizure, inability to stand or fly, unusual vocalisations
- diarrhoea or regurgitation
- rapid or laboured breathing, coughing or sneezing
- swelling or redness of the head
- eye cloudiness or change in eye colour
- oral, ocular or nasal discharge
- sudden death, mass mortality, increased individual animal mortality
- emaciation and abortions have been reported in seals and sea lions
- whales and dolphins may strand with or without neurological signs.

Clinically normal birds or mammals may carry influenza viruses.

Videos of wild birds affected by H5 avian influenza are available from the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) via this QR code:

How does HPAI spread?

HPAI viruses are shed in:

- faeces and
- respiratory secretions (including 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.

It can also travel short distances by air if there are large congregations of infected animals.

How will the NSW government respond to an outbreak of HPAI?

As HPAI can affect animals, people and the environment, a One Health response is required. A co-ordinated approach by government agencies that have responsibilities around human, animal and environmental health will be undertaken.

The response will aim to minimise the impacts of HPAI on people, animals and the environment. Eradication of HPAI in wildlife is not feasible and will not be attempted. Culling of free-ranging wildlife for disease control is not anticipated.

Roles and responsibilities during an outbreak of HPAI 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 HPAI 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 HPAI 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 HPAI outbreak?

- Surveillance for HPAI 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 from areas where there are/have been suspected or confirmed cases of HPAI
- Collecting samples from carcasses to test for HPAI when requested by NSW DPIRD
- Disposing of carcasses when required.

What will veterinarians be required to do in an HPAI outbreak?

In 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.

In the presence of an animal that is injured or suffering, 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 or wildlife population health.

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

Human Health considerations when handling wild birds

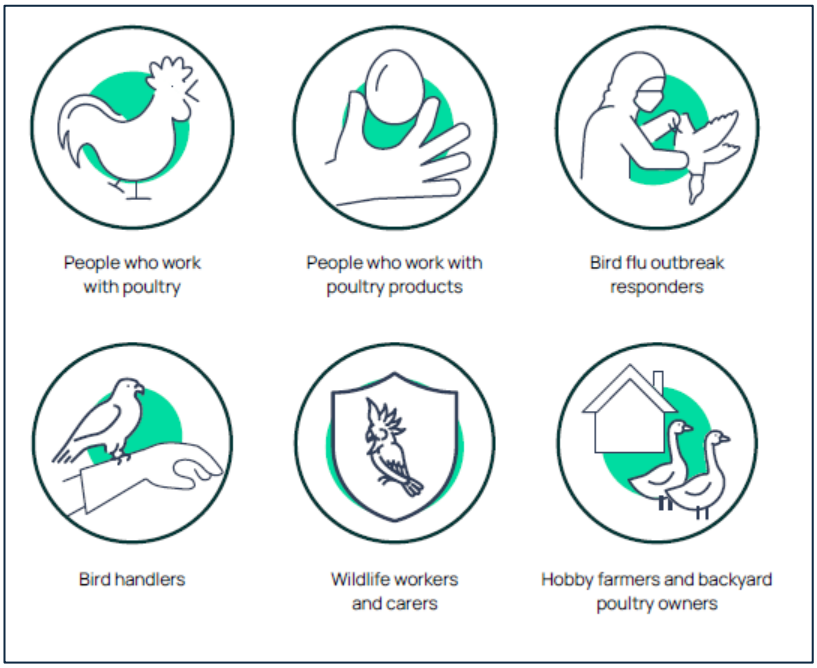
Wildlife can carry a range of zoonoses, and steps should always be taken to prevent infection whenever anyone is handling wildlife. Pregnant and immunocompromised personnel should discuss risks with their regular medical practitioner, or a medical practitioner recommended by their employer prior to undertaking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

Consult the NSW DPIRD, NSW Health and NSW SafeWork websites to learn more about diseases that can be transmitted from wildlife to people and how to protect yourself when interacting with wildlife.
www.dpi.nsw.gov.au/biosecurity/animal/humans
www.health.nsw.gov.au/Infectious/Pages/zoonoses.aspx
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
www.safework.nsw.gov.au/hazards-a-z/biological-hazards-and-diseases/avian-influenza

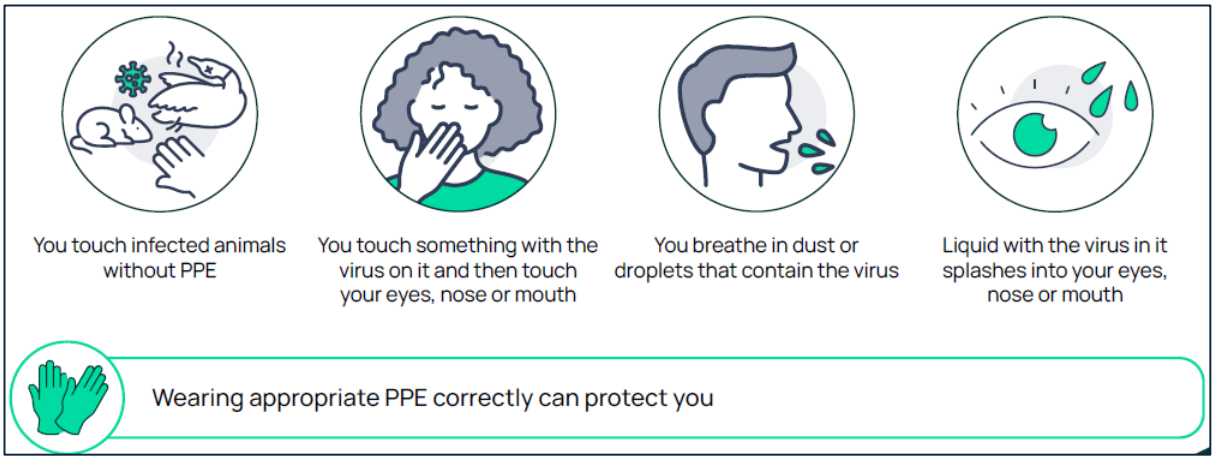
Avian Influenza

Human infection with HPAI H5N1 clade 2.3.4.4b has occurred sporadically. Most cases have been mild, however in very rare cases it has caused severe disease.

Who is at risk?



How do you catch avian influenza?



What are the symptoms of avian influenza?

How to prevent infection with avian influenza?

IMAGES ABOVE ARE AVAILABLE WITHIN THE INTERIM AUSTRALIAN CENTRE FOR DISEASE CONTROL'S BIRD FLU TOOLKIT AVAILABLE VIA: 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 were 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:

- **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 (*Chlamydia psittaci*). Human psittacosis may include symptoms such as fever, headache, chills, muscle pain, cough and breathing problems.
www.health.nsw.gov.au/Infectious/factsheets/Pages/Psittacosis.aspx

Mosquito-borne diseases

Mosquitoes can transmit serious diseases such as Ross River Fever, Barmah Forest virus infection, and Japanese Encephalitis, 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!
www.health.nsw.gov.au/Infectious/mosquito-borne/Pages/default.aspx

Japanese Encephalitis Virus (JEV)

People working outdoors / in wild bird environments in inland 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 LGAs, 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 LGAs, that you / your networks speak to your GP, pharmacist or Aboriginal Medical Service about getting vaccinated.

For further information, including a list of high-risk geographic areas, visit:
www.health.nsw.gov.au/Infectious/jev/Pages/default.aspx
www.health.nsw.gov.au/Infectious/jev/Pages/vaccination.aspx

Q fever

Q fever, a disease caused by the bacterium *Coxiella burnetiid*, 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: www.health.nsw.gov.au/Infectious/factsheets/Pages/q-fever-vaccine.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 soap and clean water 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 and below.

When washing your hands, make sure the backs and palms of both hands are wet with clean 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.

Wear PPE.

There are five key items of 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 large marine mammals or waterbirds). 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 contaminated. Disposable gloves, coveralls, shoe covers, masks and hair covering should be used once only. Disposal guidelines may change with the incursion of HPAI, H5 clade 2.3.4.4b, 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 clean water 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.

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

Mental Health

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: 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 being impacted 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 HPAI must be reported immediately to the EAD Hotline on **1800 675 888** (24 hours a day, 7 days a week).

Alternatively, reports of less than five 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:

- 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.

You will be provided with guidance and clear instructions on next steps.

It is always best to ring the Hotline to make the report as soon possible, even when you are not certain.

Preparing for the arrival of HPAI

Once HPAI H5 avian influenza arrives in NSW, effective practice biosecurity will be essential to meet legal obligations to attend to injured or suffering animals whilst preventing the accidental transmission of H5 avian influenza.

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

NSW DPIRD has compiled a very useful document entitled "Avian Influenza Information for Private Veterinarians. A guide for case management." This document provides veterinary professionals with resources, clear guidance and best practice for the management of potential cases of avian influenza and other zoonoses in alignment with professional standards and legal obligations. The advice is relevant now and will become an essential source of information once H5 avian influenza is present in NSW. The document includes factors and a mechanism to assess (page 14) the likelihood and risk of HPAI infection to support decision making in case management - during an emergency and routine operations. www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/1607673/Avian-Influenza-Information-for-Private-Veterinarians-A-guide-to-case-management-FINAL.pdf

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. 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

Before HPAI arrives in Australia, 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

Once HPAI is present in NSW, bring avian patients into your veterinary clinic only when you are confident that can be done in a manner that minimises the risk of HPAI 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 communication 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).

Develop a CLINIC BIOSECURITY PLAN that suits your facilities, practice, and personnel. You 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.

Include communications in your PLAN and ensure that you have a list of the current contact information for avian-owner clientele to facilitate communications of any change of HPAI status in your area.

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

Encouraging direct communication (e.g. a phone call in advance) prior to people and animals physically arriving at your clinic, could be crucial in preventing HPAI 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. Owners should, in the first instance, be instructed not to move the animal, and to report the situation to the EAD Hotline (1800 675 888), to support HPAI surveillance in NSW. *Avoid, Record, Report* are the actions to be communicated to those in the community who encounter dead wildlife.

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 zoonoses. 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 HPAI must be documented in accordance with WHS regulations. In the event of staff illness, 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 have 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 were infected with avian influenza and seasonal influenza at the same time.

Resources exist to help you develop and document a clinic-specific plan to balance your duties to wildlife welfare and biosecurity. An **HPAI Clinic Biosecurity Plan Template** has been provided in addition to these workshop notes (https://arwh.org/resources/). Take a few moments with your staff to discuss scenarios and modify this template to suit an individual plan 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

Once HPAI is confirmed as present in NSW, a Biosecurity Emergency Order will 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 HPAI Biosecurity Order in NSW will also be available on the BioResponse NSW App, (www.digital.nsw.gov.au/strategy/case-studies/bioresponse-nsw-app) to which all staff should have access on their personal devices for situational awareness.

Avian influenza has the capacity to infect a variety of bird and mammal species, but waterbirds, birds of prey and marine mammals have most commonly been affected overseas.

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 the EAD Hotline staff.

Wild birds should be assessed outside 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 GPS 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 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. Once HPAI is in NSW, 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 once HPAI is present in NSW.

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 HPAI, control measures will apply to all animals in that unit.

Key Clinic biosecurity considerations for isolation areas:

- 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.
- Disinfect with hospital-grade disinfectants known to be active against avian influenza:
    - 1% sodium hypochlorite (200mL of 5% solution into 800mL potable 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.

- Laundry management from wildlife handling:
  - Use hot water (>71°C) for at least 25 minutes with a biological detergent and laundry-safe bleach or hydrogen peroxide
  - 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

Key biosecurity considerations for clinic operations:

- Once HPAI is in NSW, consider how you will assess the risks posed by clients who may have contact with birds or wild mammals
- 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 HPAI and that they report any suspicious illnesses to the Hotline. Once HPAI is in NSW, decontamination (showering) prior to entering and upon leaving the practice may limit the potential spread of viral pathogens
- Clinic cleaning and disinfection processes and roster should be documented and reviewed regularly.
- Staff and volunteer training should be an ongoing process
- Communicate with clients, wildlife rehabilitators, NSW DPIRD, and community members regularly
- Environmentally sensitive disposal of disinfectants and other chemicals
- Identify animals individually and keep 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
- If possible, collect samples (oropharyngeal, cloacal swabs in PBGS) from new patient admisions and keep those frozen, even if the animal appears healthy, in case tracing is necessary

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 to 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 is 2-14 days. In conjunction with swabbing and testing birds, barrier nursing and isolation should continue throughout this period.

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 HPAI. Animals in Australia carry a variety of diseases, some of which may pose risks to humans.

Consult NSW NPWS personnel before approaching or handling live marine mammals (and before handling or collecting samples from marine mammals). When marine mammals are stranded, keep people and their pets away. 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 decontaminate thoroughly 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, returning 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 once HPAI is 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 for the animal, with everything needed 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 uncontrolled flapping of wings. Identify the hazardous elements of the species you are about to handle and define a strategy to simultaneously 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 faces and fingers of you and your 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 gather it in a towel safely 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 it being 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.

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 HPAI sample collection in the field

DPIRD Animal Biosecurity may contact you regarding collecting samples for HPAI testing. 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 clinic or 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** 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 about what you have been asked to do
- Ensure you are 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 and extras
- Decontamination kit
- Sampling supplies
- Record keeping and sample packaging materials
- Animal handling equipment
- Chemical restraint and euthanasia drugs
- Animal identification equipment (reference books, etc.)
- Consider bringing necropsy equipment in the event that you are asked by NSW DPIRD to collect additional samples: instruments, sterile vials and formalin – in a bunded container with absorbent material between the primary and secondary containers
- Additional set of clean clothing and footwear.

Situational Awareness & Principles of Biosecurity

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

Clothing, boots, tyre treads and equipment can become contaminated with disease agents or weed seeds, while many insect pests 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.

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

Setting up clean and dirty zones

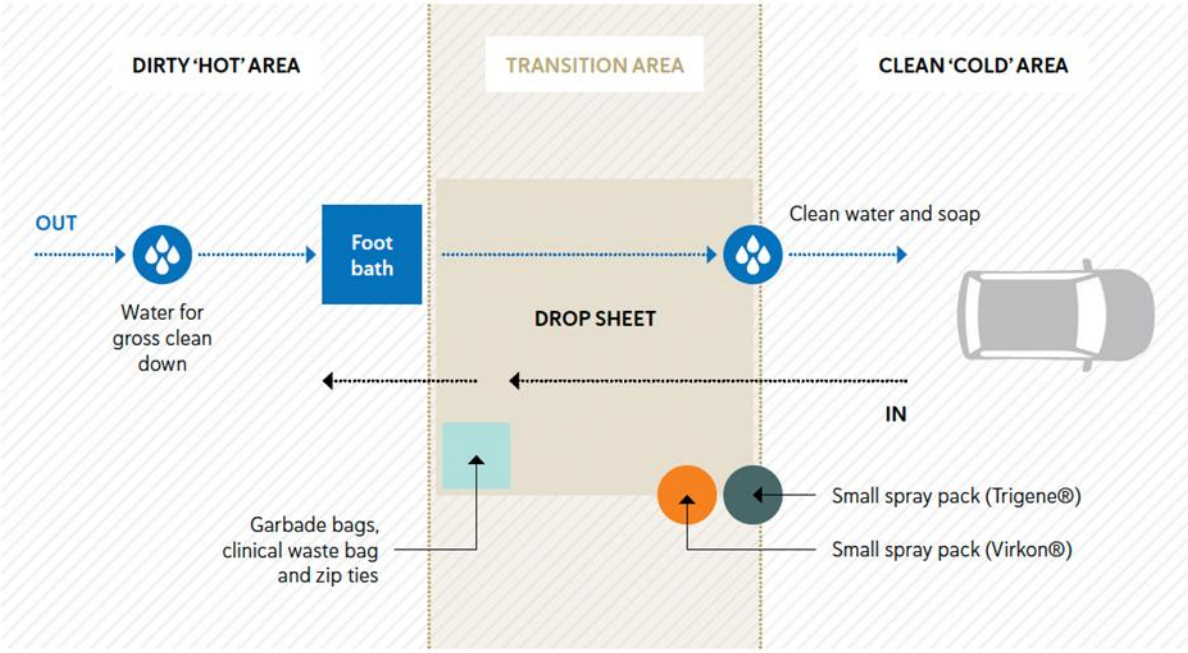


Figure 1 is reproduced with permission from Guidelines for veterinarians handling potential Hendra virus infection in horses Version 4 (2010) published by Biosecurity Queensland **www.dpi.qld.gov.au/4790_2900.htm**.

Park your vehicle in a safe space, pointing towards the exit of the property. Leave your jewellery and other valuables in the vehicle (or at home). Wash or use disinfectant gel to clean your hands.

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, two plastic bags to put samples in, plastic bags with ties, for waste, 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 some buckets with water now.
3. Set up the transition zone ready for decontamination when you move from the dirty zone back into the clean zone:
    - Lay out a tarp as a ground sheet.

- On the dirty side place a footbath full of disinfectant, a bucket and/or spray bottle of disinfectant, a scrubbing brush and 2 x large plastic bags with ties for waste.
- On the clean side place a bucket and/or spray bottle of disinfectant 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 spray 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 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:
    - Decontaminate boots by scrubbing in a footbath of disinfectant.
    - Spray disinfectant on outer gloves or dip into bucket of disinfectant.
    - Decontaminate samples and other equipment to the clean side by dipping them in 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.
    - Put your removed PPE in a rubbish or contaminated waste bag.
    - Remove inner pair of gloves and put in contaminated waste bag. Tie off bag.
    - Disinfect bag by spraying or dipping in disinfectant then put in a second bag and repeat disinfection prior to disposal. Place in clean area for disposal.
    - Wash hands and dry.
    - Before leaving the property talk to the owner or manager about biosecurity procedures for the property. Ensure they know what PPE they will require for handling affected animals and where to source PPE.
    - Notify the relevant authorities and dispatch the samples.
    - If accidental exposure to blood or body fluid or a sharps injury occur, 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 wildlife for avian influenza viruses should be conducted under the direction of your District Veterinarian 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. Do not place these into Ames or other commercial media. If PBGS is not available, swabs can be placed into a vial with 2 mL of sterile saline.

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 will be conducted only upon a negative avian influenza result.

Swabs should be sent for exclusionary testing for HPAI, 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.

In a potential 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 first.

Avian swabbing technique

Two swabs are required for HPAI 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 person experienced in 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 below - top row) by extending the animal's head and neck, then rolling the swab around the roof of the mouth (choanal slit), 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 ¾ 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 (Figure below – bottom right).
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 used to cut the swab stem with 70% alcohol.
8. Record sample tube number on your 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.
9. Repeat step 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 (Figure below – bottom left). Repeat steps 4-8.

11. Spray the collection containers with F10, or similar disinfectant, and allow them to air dry before placing 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.

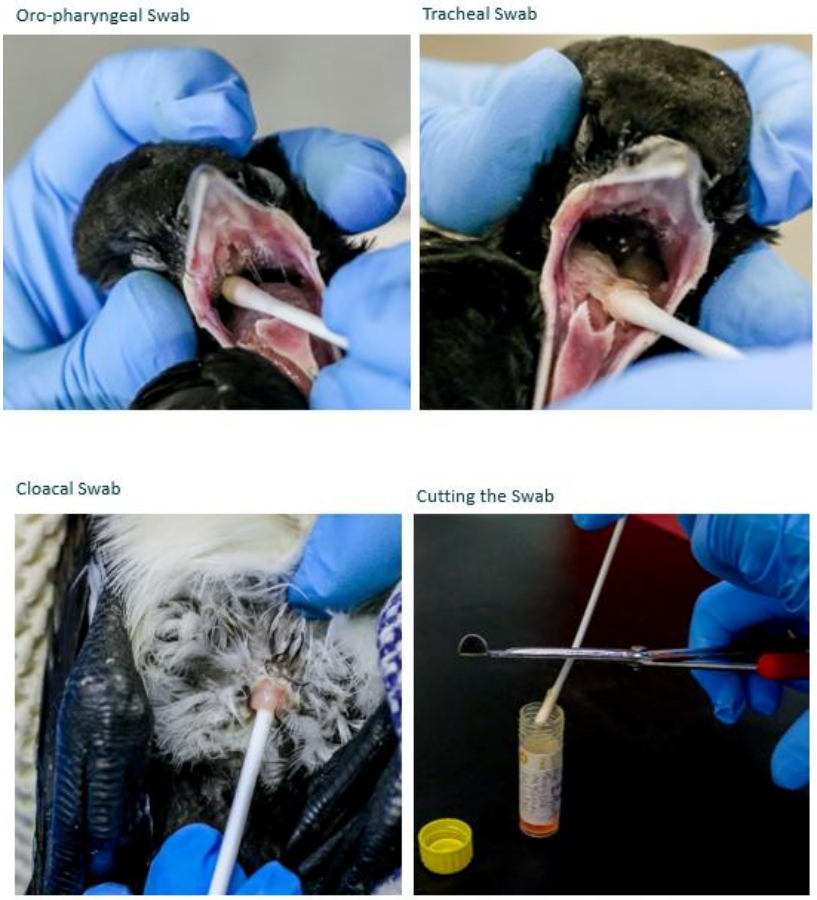


IMAGE: SWABBING THE CHOANAL SLIT (TOP LEFT), SWABBING THE GLOTTIS (TOP RIGHT), SWABBING THE CLOACA (BOTTOM LEFT), CUTTING THE SWAB INTO THE LABELLED VIAL OF PBGS (BOTTOM RIGHT0.

If directed to collect the carcass for further testing (e.g. 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 testing of marine mammals.

It can be challenging to detect the signs of HPAI in marine mammals. Testing should be considered even 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 (nostrils) or blow hole, and rectum. When possible, use long swabs to collect samples from the deep oropharynx.

H5 avian influenza can be neurotropic in marine fauna, and a diagnosis could be missed if only externally collected swabs are submitted. In addition to the swabs above, consider collecting a brain swab and a lung swab from deceased 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 HPAI Outbreaks in Marine Mammals. WOAH. www.woah.org/app/uploads/2024/02/woah-practicalguide-forauthorisedfieldresponders-hpaimarinemammals-feb24.pdf

See: https://arwh.org/h5-hpai-fieldofficertraining/

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 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 occur within 24-48 hours, store refrigerated and transport the samples on ice blocks. If samples cannot be shipped to an appropriate laboratory within two days of collection, they should be stored in a -20°C freezer prior to shipping on ice blocks. Always keep samples out of human or animal food coolers. Samples can remain in an esky on ice pending transport. Please note that specimens should never be shipped using wet ice, such as ice bags from a service station.

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 NSW DPIRD's Elizabeth Macarthur Agricultural Institute (EMAI) and carcasses may be directed to the Registry.

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 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 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

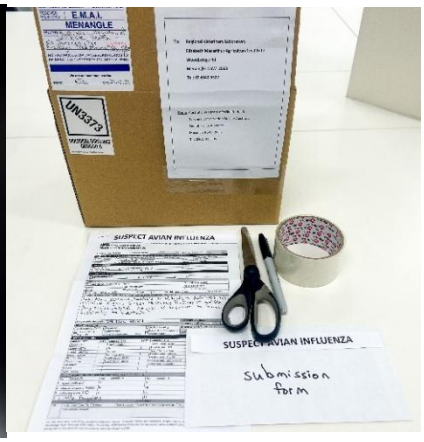


IMAGE: BAGGED AND LABELLED SAMPLES IN THE ESKY WITH AN ICE BRICK (LEFT), LABELS ON THE OUTSIDE OF THE BOX, AND PAPERWORK READY TO PLACE BETWEEN THE ESKY AND THE BOX (MIDDLE), BIOLOGICAL SUBSTANCE CATEGORY B LABEL (RIGHT).

Additional notes for suspected intoxication events

Intoxication events often present as mixed species mass mortalities, and in these instances it is important to rule out avian influenza at the beginning of the investigation.

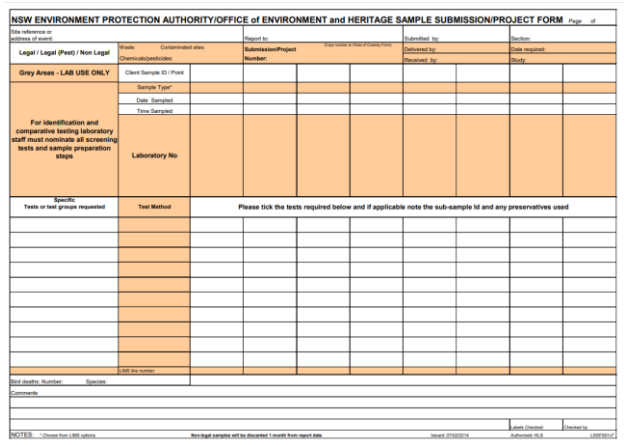
Medico-legal sample management is important when an investigation may involve civil or criminal proceedings. A Chain of Custody form is an important element of this process and is most often employed when investigations may relate to an animal welfare matter or malicious intoxication. Multiple species or specimens can be recorded on one form. Ensure that you and the submitter sign the form as you accept the remains or samples, and that you sign and date the form again along with the person collecting the samples from you.

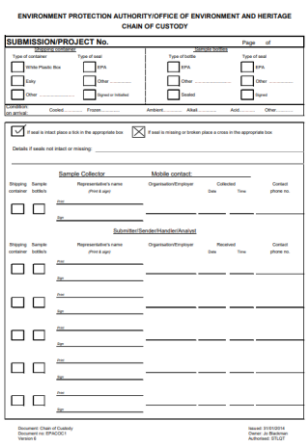
During a medicolegal investigation, each sample container is sealed with masking tape and the edges of the tape are initialed and dated.

If you have a case reference number please place this number on each specimen and all associated paperwork. Retain all radiographs, sketches, notes, images and frozen animal remains pending finalisation of legal procedures.

Seal the outer layer of the esky with masking tape, or similar, including the date and your signature.

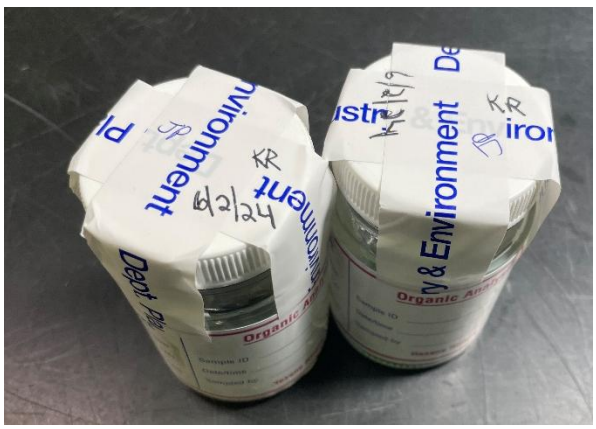
Whenever possible, keep samples in a locked fridge or freezer pending transport. Discuss chilling versus freezing remains with the laboratory team.


NSW ENVIRONMENT PROTECTION AUTHORITY/OFFICE of ENVIRONMENT and HERITAGE SAMPLE SUBMISSION/PROJECT FORM


ENVIRONMENT PROTECTION AUTHORITY/OFFICE OF ENVIRONMENT AND HERITAGE
CHAIN OF CUSTODY

SUBMISSION/PROJECT No.

EXEMPLAR CHAIN OF CUSTODY FORM WITH A SAMPLE INVENTORY AND SUBMITTER DETAILS ON THE FIRST PAGE, AND A PAGE FOR EACH PARTY TO SIGN AND DATE AS THE REMAINS OR SAMPLES ARE TRANSFERRED.



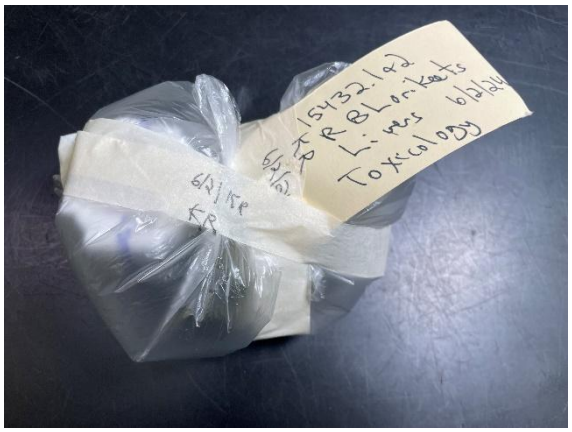


IMAGE: SEALED, SIGNED AND DATED SAMPLE VIALS (LEFT). SEALED, SIGNED AND LABELLED GROUP OF SAMPLES (RIGHT)

Wildlife triage

Once HPAI is in NSW, testing of wild birds and mammals that are dead, or are alive and exhibiting signs of illness or injury should be considered. Consult the EAD Hotline or your nearest District Veterinarian or NSW DPIRD representative. Moving animals or samples that are highly likely to contain H5 avian influenza virus (Prohibited Matter) should be done only after such consultation.

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 HPAI should be maintained in isolation pending test results.

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.

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, 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 take a few hours.

Thorough examination of most wild animals is achieved by sedating the animal to reduce the stress and likelihood of further injury of the animal. Injectable anaesthetic agents are recommended until HPAI has been excluded.

Wildlife triage in the context of HPAI will involve the following Stages:

1. Reporting the event to the EAD 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 HPAI 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 HPAI-negative, healthy and assessed as able to survive and thrive independently.

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

Currently there is no effective treatment for HPAI 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 HPAI 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 HPAI is highly likely, euthanasia by experienced and qualified staff may be considered prior to the return of a 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 EAD 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.).

Wildlife First Aid

When a decision is made to quarantine and treat an animal while HPAI 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 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 and providing an appropriate environment, fluid therapy as necessary, nutritional support, 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 classed as 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 HPAI) 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.

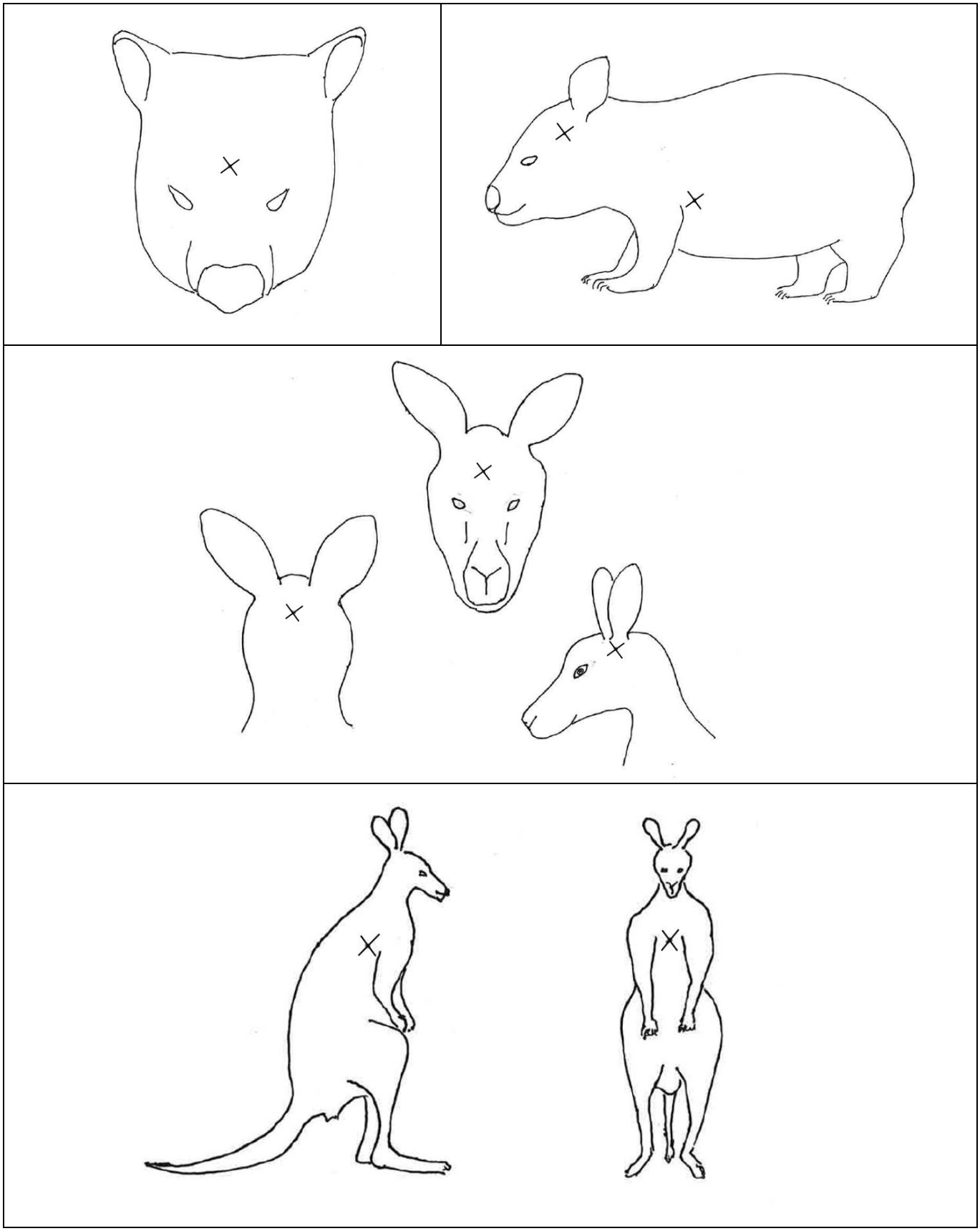


IMAGE: PICTORIAL IMAGES GUIDING THE SHOOTING OF KANGAROOS AND WOMBATS, MODIFIED BY DR. BRYN LYNAR BASED ON ILLUSTRATIONS WITHIN GUIDES FOR SHOOTING KANGAROOS AND WOMBATS: WWW.DCCEEW.GOV.AU/SITES/DEFAULT/FILES/DOCUMENTS/CODE-CONDUCT-NON-COMMERCIAL.PDF - SCHEDULE 2, AND CDN.ENVIRONMENT.SA.GOV.AU/ENVIRONMENT/DOCS/COP-WOMBAT-2018.PDF

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 cm^2 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 cm^2 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 cm^2 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-wringing, 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]

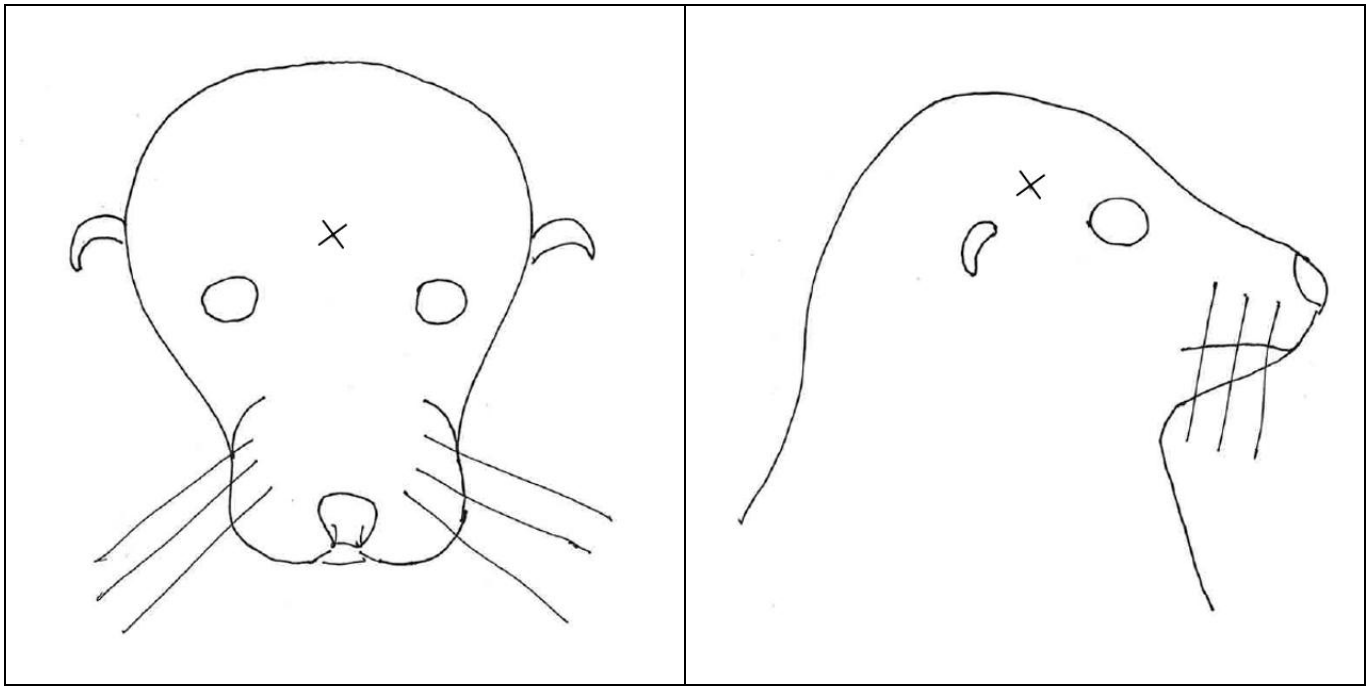


IMAGE: PICTORIAL IMAGES GUIDING THE SHOOTING OF PINNIPEDS, MODIFIED BY DR. BRYN LYNAR BASED ON ILLUSTRATIONS WITHIN "MARINE MAMMAL BEST PRACTICES"[5]

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 6^{th} -7^{th}, or 7^{th}-8^{th} 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 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.

References

1) AVMA Panel. 2020. AVMA Guidelines for the Euthanasia of Animals: (2020) Edition. https://cec.ufro.cl/images/documentos/marco_normativo/2020_Euthanasia_Final_1-15-20.pdf

2) Reilly, J. (Editor). (1993). Euthanasia of Animals used for Scientific Purposes. Australia & New Zealand Council for the Care of Animals in Research & Teaching (ANZCCART).

https://nre.tas.gov.au/Documents/ANZCCART-Guidelines-for-Euthanasia-of-Animals.pdf

3) Hampton, J. O., Mawson, P. R., Coughran, D. K., & Vitali, S. D. (2014). Validation of the use of firearms for euthanising stranded cetaceans. *J. Cetacean Res. Manage.*, *14*, 117-123.

4) Department of Biodiversity, Conservation and Attractions. (2017). Standard Operating Procedure. Euthanasia of small stranded cetaceans using firearms. www.cdu.edu.au/files/2024-07/Euthanasia%20of%20small%20stranded%20cetaceans%20using%20firearms%20%28DBCA%2007_2024%29.pdf

5) United States National Marine Fisheries Service. (2022). Marine Mammal Euthanasia Best Practice DOI: 10.25923/1rgg-b283 library.oarcloud.noaa.gov/noaa_documents.lib/NMFS/OfcProtectedResources/MMHSRP/Marine_Mammal_Euthanasia_Best_Practices.pdf

6) Haulena, M. and T. Schmitt. (2018). Anesthesia. In: CRC Handbook of Marine Mammal Medicine, Third Edition, L.A. Dierauf, F.M.D. Gulland, and K. L. Whitman (eds.), CRC Press LLC, Boca Raton. Pp. 587-606; Plumb, D.C. 2008.

7) Blye, D., In: Vogelnest, L., Portas, T. (editors). (2025). *Current therapy in medicine of Australian mammals* / revised edition: CSIRO Publishing, Clayton South, VIC.

8) Whitmer, E.R., Trumbull, E.J., Harris, H.S., Whoriskey S.T., Field C.L. (2021) Use of potassium chloride for low-residue euthanasia of California sea lions (*Zalophus californianus*) and northern elephant seals (*Mirounga angustrirostris*) with life threatening injury or disease. JAVMA. 259(2): 197-201. www.marinemammalcenter.org/storage/app/media/Misc/PDF/Research%20Publications/2021/Whitmer_et_al_2021_CSL_KCl_euthanasia_JAVMA.pdf

9) Department of Climate Change, Energy, the Environment and Water. (2024) The National Guidelines for Euthanasia of Stranded Large Whales, Department of Climate Change, Energy, the Environment and Water, Canberra. CC BY 4.0. www.dcceew.gov.au/sites/default/files/documents/national-guidelines-euthanasia-stranded-large-whales.pdf

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

Carcass Disposal

Pre-incursion

- The following guidance relates to the current situation, where H5N1 has not been detected in Australia.
- The disposal of bird carcasses should proceed per current council and/or EPA procedures and guidelines.
- NSW DPIRD currently has neither imposed biosecurity restrictions nor requires permits for the movement and disposal of bird and animal carcasses.
- Disposing of remains of an animal that has been euthanased with barbiturates or other chemicals must be undertaken with care to prevent secondary poisoning events.

Responsibilities

- The collection and disposal of wild bird carcasses is the responsibility of each respective landholder and/or land manager. e.g. 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 property if they want them removed.
- Where possible, leave the carcasses to decompose naturally and prevent access by people, livestock or pets.
- 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 in areas where wild birds regularly feed, breed or roost

Disposal Guidelines

Full disposal guidelines are available on the NSW DPIRD website:
www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1588811/Disposal-of-bird-carcasses-from-public-and-private-land-Public-Version.pdf

If carcasses must be handled:

1. Do not touch carcasses with your bare hands
2. Either wear PPE as described for sampling, or, if not available, wear a face mask, long-sleeved clothing, disposable gloves or gloves that can be disinfected, and shoes that can be cleaned
3. Use tongs, shovels or other appropriate equipment to handle the carcasses
4. Alternatively, lift the bird(s) using an inverted bag. Once the carcass is grasped, the bag can be turned back on itself and tied off
5. The bag should then be placed in a second leak proof plastic bag, ensuring not to contaminate the outside of the outer bag
6. Remove any gloves and place them in the second bag as well and tie it shut
7. Clean and disinfect any materials and equipment used
8. Wash hands with soap and clean water or an alcohol-based hand sanitiser before and after handling carcasses.

Disposal options

1. Double bag the carcasses and place them in the general waste bin (“red bin”)
2. Bury carcasses to a depth of 60 cm, covered with rocks or other materials over the filled-in hole to prevent animals from digging up the carcasses. Burial is only permitted on your own property. It may be an offence to bury carcasses on land you don’t own or manage.

3. Take the double-bagged carcasses in a sealed container to an EPA-licensed landfill that is permitted to accept animal wastes for burial or composting.

Disposal: Post-incursion

- These guidelines are subject to change if HPAI H5N1 is detected in Australia
- Any changes to this guidance will be made available on the NSW Government Avian Influenza webpage (https://www.nsw.gov.au/emergency/h5-avian-influenza-preparedness)
- Disposal guidelines may depend on biosecurity zoning and associated risk assessments
- Disposal guidelines will be aligned with nationally developed guidelines currently under development.

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 (goggles or face shield)
- ☐ Water impermeable coveralls
- ☐ Gumboots (preferred) or boot covers
- ☐ Additional set of clean clothing and footwear

Decontamination kit

- ☐ Tarp
- ☐ Buckets
- ☐ Scrubbing brushes
- ☐ Paper towel
- ☐ Footbath pan (containing water and detergent)
- ☐ Hand soap
- ☐ Detergent
- ☐ Alcohol-based hand gel
- ☐ Rubbish bags
- ☐ Disinfectant in a spray bottle (for use on sample bags, laundry/waste bags, equipment and cleaned boots)

Sampling equipment

- ☐ 2 x 2.5 ml screw-top vials per animal 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)

Animal handling, identification, euthanasia equipment

- ☐ Cloth bags, pillowcases, towels, plastic corrugated boxes
- ☐ Chemical restraint and euthanasia drugs and consumables - in a locked case
- ☐ Leg bands, microchips, nail polish
- ☐ Instruments, sterile vials and 10% Neutral Buffered Formalin – in a bunded container with absorbent material between the primary and secondary containers – in the event that you are asked by NSW DPIRD to collect additional samples

Recording and packaging materials

- ☐ Masking tape and 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).

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)
- 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 protection (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.

[#] If inner gloves become visibly soiled, they should be cleaned with an approved disinfectant. Additionally, perform hand hygiene by disinfecting the inner gloves with an alcohol-based hand rub.

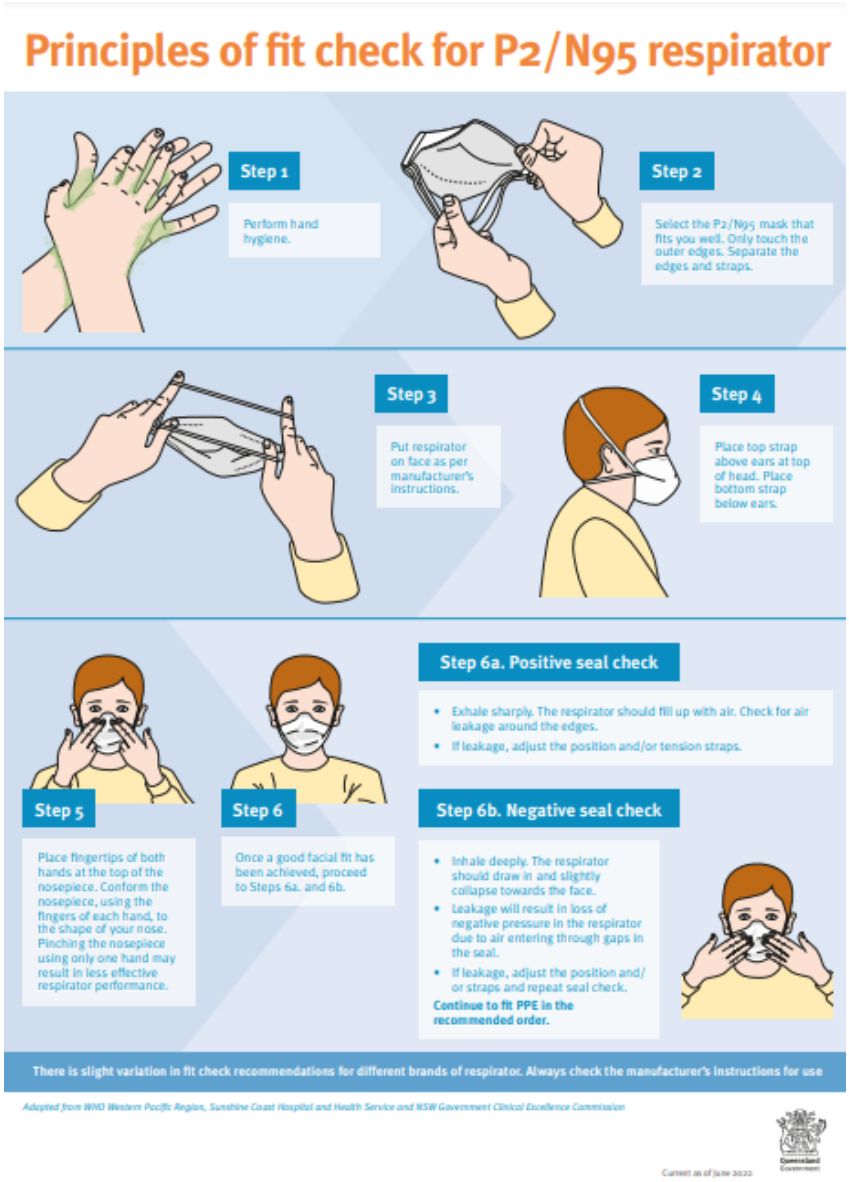
**Sequence of removal may be dependent on the type of coverall and boots used. It may be necessary to step out of coveralls and boots in one motion within the same process.

^If hands are visibly soiled, wash hands with soap and water. Where hands are not visibly soiled, an approved alcohol-based hand rub 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. 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 is also recommended.



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

APPENDIX C: Vehicle cleaning and disinfection

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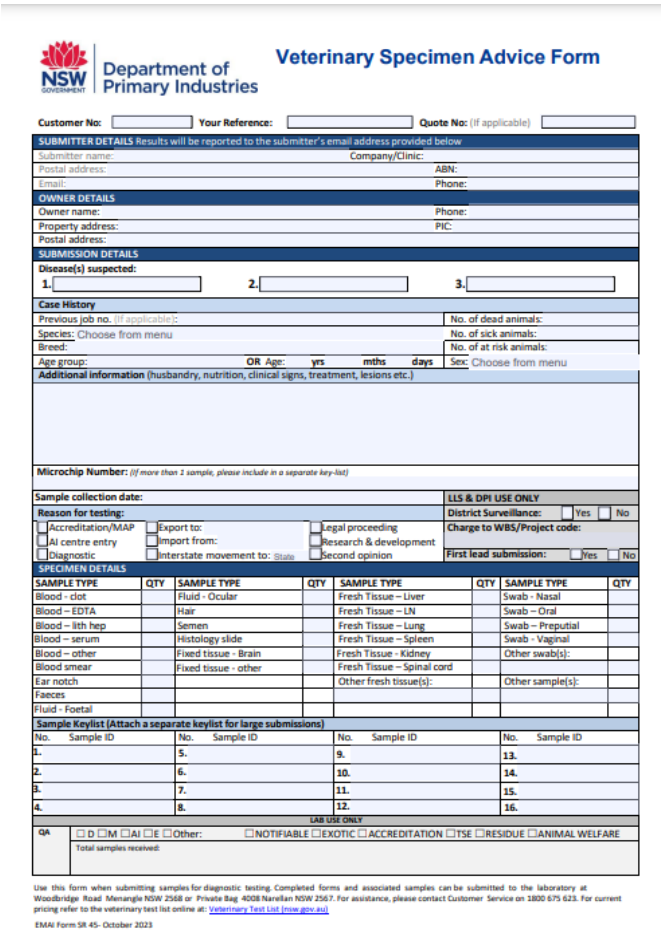
APPENDIX D: Specimen Advice Form: EMAI

Download the EMAI Specimen Advice form from the NSW DPIRD WEBSITE:
www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/680425/Vet-specimen-advice-form-Oct-2023.pdf

Include the following information on the form:

- Location
- Species affected, species present
- Number sick, dead, healthy
- Sex and age
- Distribution of remains
- Condition of the carcasses (how decomposed?)
- Clinical signs
- Sudden death or prolonged illness
- Nutritional condition
- Recent changes in environment, weather
- When did this start?
- Water and food supply — any changes?
- Proximity to livestock – any sick?
- Endemic diseases – what's known in the area
- Exposure to toxins – pesticides, sprays, poisons in use?



Department of Primary Industries

Veterinary Specimen Advice Form

Customer No: Your Reference: Quote No: (If applicable)

SUBMITTER DETAILS Results will be reported to the submitter's email address provided below

Submitter name: Company/Clinic:
Postal address: ABN:
Email: Phone:

OWNER DETAILS

Owner name: Phone:
Property address: PIC:
Postal address:

SUBMISSION DETAILS

Disease(s) suspected:
1. 2. 3.

Case History

Previous job no. (If applicable): No. of dead animals:
Species: Choose from menu No. of sick animals:
Breed: No. of at risk animals:
Age group: OR Age: yrs mths days Sex: Choose from menu

Additional information (husbandry, nutrition, clinical signs, treatment, lesions etc.)

Microchip Number: *(If more than 1 sample, please include in a separate key-list)*

Sample collection date:

LLS & DPI USE ONLY

Reason for testing:
☐ Accreditation/MAP ☐ Export to:
☐ AI centre entry ☐ Import from:
☐ Diagnostic ☐ Interstate movement to: State
☐ Legal proceeding
☐ Research & development
☐ Second opinion

District Surveillance: ☐ Yes ☐ No
Charge to WBS/Project code:
First lead submission: ☐ Yes ☐ No

SPECIMEN DETAILS

SAMPLE TYPE	QTY	SAMPLE TYPE	QTY	SAMPLE TYPE	QTY	SAMPLE TYPE	QTY
Blood - clot		Fluid - Ocular		Fresh Tissue – Liver		Swab - Nasal	
Blood – EDTA		Hair		Fresh Tissue – LN		Swab – Oral	
Blood – lith hep		Semen		Fresh Tissue – Lung		Swab – Preputial	
Blood – serum		Histology slide		Fresh Tissue – Spleen		Swab - Vaginal	
Blood – other		Fixed tissue - Brain		Fresh Tissue - Kidney		Other swab(s):	
Blood smear		Fixed tissue - other		Fresh Tissue – Spinal cord			
Ear notch				Other fresh tissue(s):		Other sample(s):	
Faeces							
Fluid - Foetal							

Sample Keylist (Attach a separate keylist for large submissions)

No.	Sample ID	No.	Sample ID	No.	Sample ID	No.	Sample ID
1.		5.		9.		13.	
2.		6.		10.		14.	
3.		7.		11.		15.	
4.		8.		12.		16.	

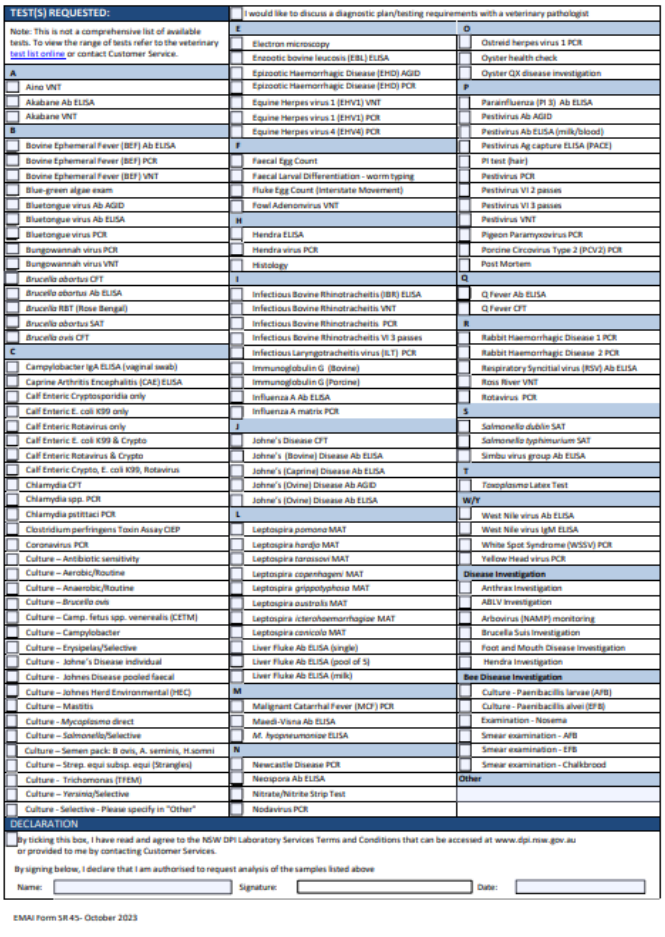
LAB USE ONLY

QA ☐ D ☐ M ☐ AI ☐ E ☐ Other: ☐ NOTIFIABLE ☐ EXOTIC ☐ ACCREDITATION ☐ TSE ☐ RESIDUE ☐ ANIMAL WELFARE

Total samples received:

Use this form when submitting samples for diagnostic testing. Completed forms and associated samples can be submitted to the laboratory at Woodbridge Road Menangle NSW 2568 or Private Bag 4008 Narellan NSW 2567. For assistance, please contact Customer Service on 1800 675 623. For current pricing refer to the veterinary test list online at: Veterinary Test List (nsw.gov.au)

EMAI Form SR 45- October 2023



TEST(S) REQUESTED: ☐ I would like to discuss a diagnostic plan/testing requirements with a veterinary pathologist

Note: This is not a comprehensive list of available tests. To view the range of tests refer to the veterinary test list online or contact Customer Service.

A
☐ Aino VNT
☐ Akabane Ab ELISA
☐ Akabane VNT

B
☐ Bovine Ephemeral Fever (BEF) Ab ELISA
☐ Bovine Ephemeral Fever (BEF) PCR
☐ Bovine Ephemeral Fever (BEF) VNT
☐ Blue-green algae exam
☐ Bluetongue virus Ab AGID
☐ Bluetongue virus Ab ELISA
☐ Bluetongue virus PCR
☐ Bungowannah virus PCR
☐ Bungowannah virus VNT
☐ *Brucella abortus* CFT
☐ *Brucella abortus* Ab ELISA
☐ *Brucella* RBT (Rose Bengal)
☐ *Brucella abortus* SAT
☐ *Brucella ovis* CFT

C
☐ Campylobacter IgA ELISA (vaginal swab)
☐ Caprine Arthritis Encephalitis (CAE) ELISA
☐ Calf Enteric Cryptosporidia only
☐ Calf Enteric E. coli K99 only
☐ Calf Enteric Rotavirus only
☐ Calf Enteric E. coli K99 & Crypto
☐ Calf Enteric Rotavirus & Crypto
☐ Calf Enteric Crypto, E. coli K99, Rotavirus
☐ Chlamydia CFT
☐ Chlamydia spp. PCR
☐ Chlamydia psittaci PCR
☐ Clostridium perfringens Toxin Assay CIEP
☐ Coronavirus PCR
☐ Culture – Antibiotic sensitivity
☐ Culture – Aerobic/Routine
☐ Culture – Anaerobic/Routine
☐ Culture – *Brucella ovis*
☐ Culture – Camp. fetus spp. venerealis (CETM)
☐ Culture – Campylobacter
☐ Culture – Erysipelas/Selective
☐ Culture - Johne's Disease individual
☐ Culture - Johnes Disease pooled faecal
☐ Culture – Johnes Herd Environmental (HEC)
☐ Culture – Mastitis
☐ Culture - *Mycoplasma* direct
☐ Culture – *Salmonella*/Selective
☐ Culture – Semen pack: B ovis, A. seminis, H.somni
☐ Culture – Strep. equi subsp. equi (Strangles)
☐ Culture - Trichomonas (TFEM)
☐ Culture – Yersinia/Selective
☐ Culture - Selective - Please specify in "Other"

E
☐ Electron microscopy
☐ Enzootic bovine leucosis (EBL) ELISA
☐ Epizootic Haemorrhagic Disease (EHD) AGID
☐ Epizootic Haemorrhagic Disease (EHD) PCR

F
☐ Faecal Egg Count
☐ Faecal Larval Differentiation - worm typing
☐ Fluke Egg Count (Interstate Movement)
☐ Fowl Adenovirus VNT

H
☐ Hendra ELISA
☐ Hendra virus PCR
☐ Histology

I
☐ Infectious Bovine Rhinotracheitis (IBR) ELISA
☐ Infectious Bovine Rhinotracheitis VNT
☐ Infectious Bovine Rhinotracheitis PCR
☐ Infectious Bovine Rhinotracheitis VI 3 passes
☐ Infectious Laryngotracheitis virus (ILT) PCR
☐ Immunoglobulin G (Bovine)
☐ Immunoglobulin G (Porcine)
☐ Influenza A Ab ELISA
☐ Influenza A matrix PCR

J
☐ Johne's Disease CFT
☐ Johne's (Bovine) Disease Ab ELISA
☐ Johne's (Caprine) Disease Ab ELISA
☐ Johne's (Ovine) Disease Ab AGID
☐ Johne's (Ovine) Disease Ab ELISA

L
☐ Leptospira *pomona* MAT
☐ Leptospira *hardjo* MAT
☐ Leptospira *tarassovi* MAT
☐ Leptospira *copenhageni* MAT
☐ Leptospira *grippotyphosa* MAT
☐ Leptospira *australis* MAT
☐ Leptospira *icterohaemorrhagiae* MAT
☐ Leptospira *canicola* MAT
☐ Liver Fluke Ab ELISA (single)
☐ Liver Fluke Ab ELISA (pool of 5)
☐ Liver Fluke Ab ELISA (milk)

M
☐ Malignant Catarrhal Fever (MCF) PCR
☐ Maedi-Visna Ab ELISA
☐ *M. hyopneumoniae* ELISA

N
☐ Newcastle Disease PCR
☐ Neospora Ab ELISA
☐ Nitrate/Nitrite Strip Test
☐ Nodavirus PCR

O
☐ Ostreid herpes virus 1 PCR
☐ Oyster health check
☐ Oyster QX disease investigation

P
☐ Parainfluenza (PI 3) Ab ELISA
☐ Pestivirus Ab AGID
☐ Pestivirus Ab ELISA (milk/blood)
☐ Pestivirus Ag capture ELISA (PACE)
☐ PI test (hair)
☐ Pestivirus PCR
☐ Pestivirus VI 2 passes
☐ Pestivirus VI 3 passes
☐ Pestivirus VNT
☐ Pigeon Paramyxovirus PCR
☐ Porcine Circovirus Type 2 (PCV2) PCR
☐ Post Mortem

Q
☐ Q Fever Ab ELISA
☐ Q Fever CFT

R
☐ Rabbit Haemorrhagic Disease 1 PCR
☐ Rabbit Haemorrhagic Disease 2 PCR
☐ Respiratory Syncitial virus (RSV) Ab ELISA
☐ Ross River VNT
☐ Rotavirus PCR

S
☐ *Salmonella dublin* SAT
☐ *Salmonella typhimurium* SAT
☐ Simbu virus group Ab ELISA

T
☐ *Toxoplasma* Latex Test

W/Y
☐ West Nile virus Ab ELISA
☐ West Nile virus IgM ELISA
☐ White Spot Syndrome (WSSV) PCR
☐ Yellow Head virus PCR

Disease Investigation
☐ Anthrax Investigation
☐ ABLV Investigation
☐ Arbovirus (NAMP) monitoring
☐ Brucella Suis Investigation
☐ Foot and Mouth Disease Investigation
☐ Hendra Investigation

Bee Disease Investigation
☐ Culture - Paenibacillis larvae (AFB)
☐ Culture - Paenibacillis alvei (EFB)
☐ Examination - Nosema
☐ Smear examination - AFB
☐ Smear examination - EFB
☐ Smear examination - Chalkbrood

Other

DECLARATION

☐ By ticking this box, I have read and agree to the NSW DPI Laboratory Services Terms and Conditions that can be accessed at www.dpi.nsw.gov.au or provided to me by contacting Customer Services.

By signing below, I declare that I am authorised to request analysis of the samples listed above

Name: Signature: Date:

EMAI Form SR 45- October 2023

DOWNLOAD THIS FORM FROM THE NSW DPIRD WEBSITE: WWW.DPI.NSW.GOV.AU/__DATA/ASSETS/PDF_FILE/0007/680425/VET-SPECIMEN-ADVICE-FORM-OCT-2023.PDF

APPENDIX E: Morbidity and Mortality Log

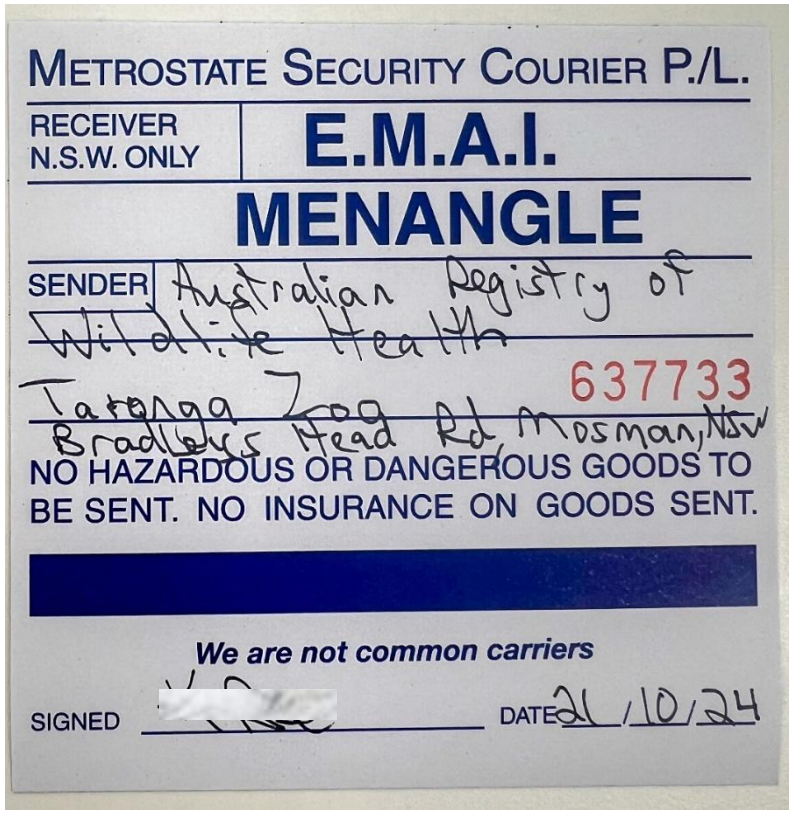
Accession Number	Species	Location (suburb, property name, GPS locators)	Age	Sex	ID (Band/Tag #)	Clinical signs or postmortem findings	Live/Treated and Died/Found Dead / Euthanased	Date Death	Date Collected	Treatment Provided	Disposition (released, necropsy, frozen, etc)	Samples collected

APPENDIX F: EMAI Metrostate Label

The label on the left is a sticker 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

637733

Taronga Zoo Bradleys Head Rd Mosman, NSW

NO HAZARDOUS OR DANGEROUS GOODS TO BE SENT. NO INSURANCE ON GOODS SENT.

We are not common carriers

SIGNED [redacted] 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:

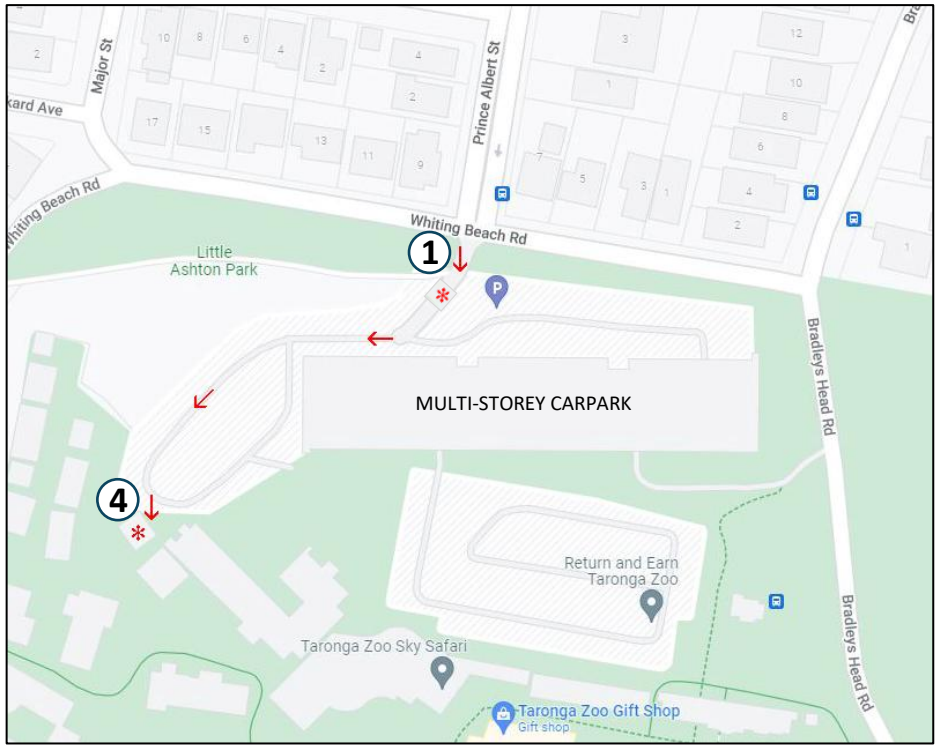
APPENDIX G: Courier shipping label for the Australian Registry of Wildlife Health

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

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

Entrance at the end of Prince Albert Street



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).