

Zoo Biosecurity Management Planner



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**EMERGENCY ANIMAL
DISEASE WATCH HOTLINE
1800 675 888**

ZOO BIOSECURITY MANAGEMENT PLANNER

What is Biosecurity?

Biosecurity is the protection of our economy, environment and community from the negative impacts of pests, diseases, weeds and contaminants. Biosecurity is a set of precautionary measures taken to minimise the risk of a disease or pest being introduced, emerging or establishing. Being biosecure means that you take steps to prevent diseases, pests and weeds from spreading to new areas.

Why is biosecurity important for zoos?

Failing to address biosecurity has the potential to adversely impact animal welfare, staff well-being and the financial viability of a zoo. Sound biosecurity practices will decrease the risk of introducing disease and minimise the impact disease will have on the resident animals and business, including reducing the resources needed for treating and managing sick animals. Sick or dead animals can result in increased veterinary care, investigation, animal replacement and acquisition costs. They are also distressing for staff and the general public.

Zoo Biosecurity includes, but is not limited to:

- Appropriately constructed and maintained facilities.
- Management of stray and pest species entering the premises.
- Acquiring feed and bedding materials from known, reliable sources or accredited suppliers.
- Good hygiene and work practices.
- Appropriate quarantine of newly arrived and sick animals.
- Veterinary diagnosis and treatment of sick animals including post-mortem examinations.
- A preventative medicine program designed specifically for the premises and the species held.
- Weed control on the premises.
- Management of drainage and waste products from the premises.

What are emergency animal diseases?

Emergency animal diseases (EADs) are diseases that have been agreed by governments and industry in Australia as capable of having severe effects on trade, production, the environment and/or human health. An EAD outbreak in or adjacent to a zoo may have impacts including restriction of visitation and animal movements, animal management, decreasing availability of food and equipment, and increased veterinary requirements.

Who is this planner for?

This Zoo Biosecurity Management Planner (ZBMP) is a resource for zoos, fauna parks and mobile exhibitors to help improve general biosecurity. Completion of the ZBMP is not a compulsory requirement for NSW establishments but is recommended as a tool for helping to prevent and prepare for an EAD. The planner has been developed by NSW Department of Primary Industries (DPI) staff.

How to use this planner

The Zoo Biosecurity Management Planner (ZBMP) is a resource that zoos can use to prepare themselves prior to and during an outbreak of an EAD. It gives zoo managers, keepers and other staff across the business an understanding of how prepared they are and what measures they can take to increase their preparedness. The ZBMP provides general principles and specific advice about foot-and-mouth disease (FMD), as an example of a significant EAD.

Having a well-considered, site-specific and documented biosecurity plan will also give greater confidence to authorities, neighbouring properties and the community that your business or workplace is adequately prepared for an EAD outbreak. This is a proactive way to minimise the impacts an EAD might otherwise have on your animals, staff and business operations.

To read more about the role of NSW DPI in managing NSW biosecurity risks please visit the [NSW DPI website](#).

GLOSSARY

- **BIOSECURITY** is the protection of our economy, environment and community from the negative impacts of pests, diseases, weeds and contaminants.
- **BIOSECURITY MANAGEMENT PLANNER** is a document that outlines the measures put in place to protect against biosecurity threats and mitigate the risks of pests and diseases on your premises. This helps keep your animals, your staff and the local environment healthy.
- **CHIEF VETERINARY OFFICER (CVO)** leads the management of animal biosecurity threats and protection of animal health industries, community and environment from the impact of pests, diseases and residues.
- **CONTROL AREA (CA)** is a legally declared area where the disease controls, including surveillance and movement controls, applied are of lesser intensity than those in a restricted area (the limits of a control area and the conditions applying to it can be varied during an incident according to need).
- **CONTROLLED ENTRY POINT** is a visually defined entry point through which all traffic (such as workers, visitors, equipment and vehicles) enters a premises.
- **DANGEROUS CONTACT PREMISES** is defined as a premises, apart from an abattoir, knackery or milk processing plant (or other such facility) that, after investigation and based on a risk assessment, is considered to contain a susceptible animal(s) not showing clinical signs, but considered highly likely to contain an infected animal(s) and/or contaminated animal products, wastes or things that present an unacceptable risk to the response if the risk is not addressed, and that therefore requires action to address the risk.
- **EMERGENCY ANIMAL DISEASES (EADs)** are diseases that have been agreed by governments and industry in Australia as capable of having severe effects on trade, production, the environment and/or human health.
- **FOOT-AND-MOUTH DISEASE (FMD)** is a highly contagious viral disease that mainly affects cloven-hoofed animals.
- **INFECTED PREMISES (IP)** is a defined area (which may be all or part of a property) on which animals infected with an EAD are present, or the causative agent of an EAD is present, or there is a reasonable suspicion that either is present, and that the relevant CVO or their delegate has declared to be an infected premises.
- **INPUTS** are all those entities physically entering a premises.
- **OUTPUTS** are all those entities physically leaving a premises.
- **PROHIBITED PIG FEED (SWILL)** includes meat, bone, blood, offal and hide from a mammal or anything that comes into contact with these. You must not feed or allow any pigs access to:
 - » meat (raw, cooked or processed), bone, blood, offal or hides from a mammal.
 - » food or table scraps that contain mammalian meat, meat products or have been in contact with meat or any of these.
 - » household, commercial and industrial food wastes that contain a mammalian product including restaurant food and discarded cooking oils and fats.
 - » illegally imported dairy products, anything that has been in contact with these through collection, storage or transport particularly contaminated bins or containers such as take-away food containers.
 - » mammalian carcasses.
- **RECORDS** may be kept as hard copies or digitally (of resident animal details, vehicle registrations, documents, feed bags, veterinary inspections and treatments etc.). In some cases, photos are acceptable.
- **RESTRICTED ANIMAL MATERIAL (RAM)** means material derived from a vertebrate animal that must not be fed to a ruminant. Examples include animal material from mammals, fish and birds such as meat, fish, feathers, bone or blood meal, eggs, and pet foods. You must not feed any vertebrate animal material to ruminants (i.e. animals that have a rumen, including alpacas, camels, deer, giraffe and bovids, such as cattle, buffalo, bison, antelopes, goats and sheep) unless it is exempt. This also means you must prevent access to vertebrate animal material by ruminants unless it is not reasonable or practical (for example, stock licking each other, cow eating its placenta). Animal material that is exempt from the ban includes gelatine, milk and milk products, and tallows, including cooking oils, that have been treated to comply with a specified standard.
- **RESTRICTED AREA (RA)** is a relatively small legally declared area around infected premises and dangerous contact premises that is subject to disease controls, including intensive surveillance and movement controls.

ZOO BIOSECURITY MANAGEMENT PLANNER (ZBMP)

SECTION 1 – PREMISES DETAILS

If you, or your organisation, is authorised to keep animals at more than one premises, complete a separate ZBMP for each premises (including off-display premises and mobile exhibit operations).

It is recommended that the ZBMP be reviewed annually, or more frequently when relevant circumstances within or outside your premises change.

Planner completed by (name and role)	
Planner completed on (date)	
Review due date	

Premises details

Owner's name and contact details	
Manager's name and contact details	
Business name	
Premises name and address	
Veterinarian	
Government vet (e.g., LLS District Veterinarian)	

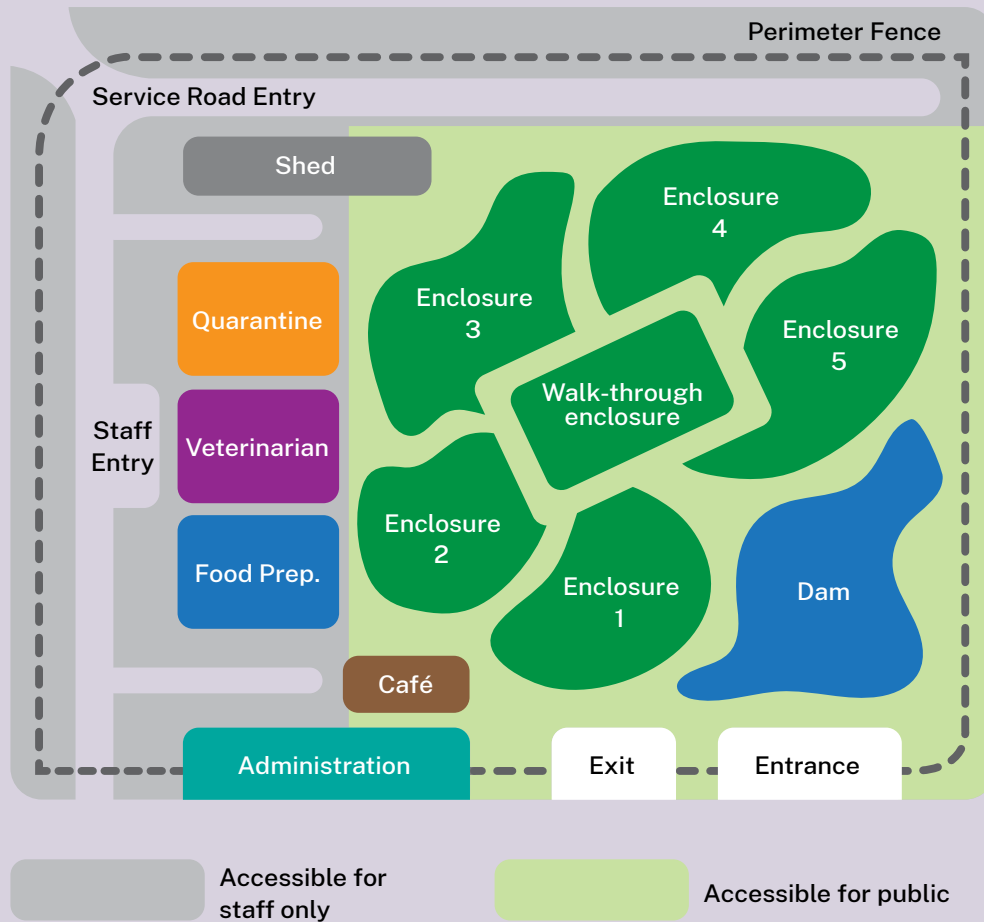
EMERGENCY ANIMAL DISEASE WATCH HOTLINE – 1800 675 888

Type of operation (tick all that apply)	Fixed establishment. Mobile exhibitor.
Visitor movement within the premises is (tick all that apply)	On foot, including prams/strollers/wheelchairs. Other: By bicycles or carts hired on site. By private bicycle. By private vehicle.

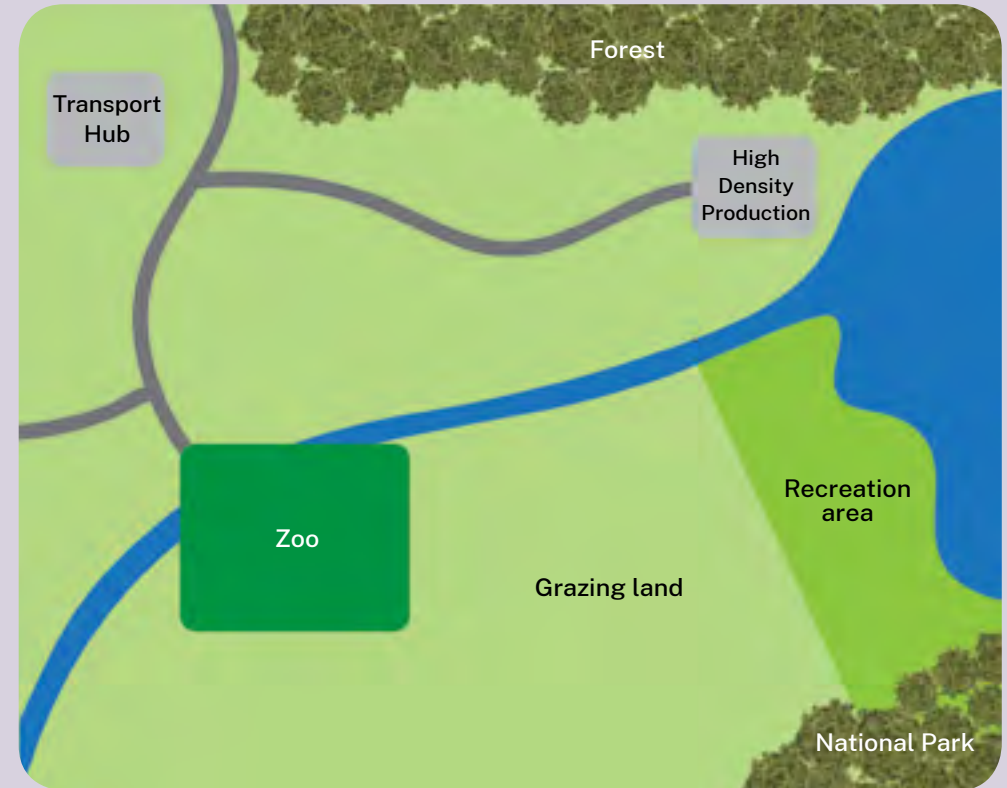
ZOO MAP

Example Zoo Map

a. Premises map showing key infrastructure -enclosures, sheds, fences, feed and water facilities, public access areas, staff only areas, access and exit points, fences, quarantine areas, veterinary facilities etc.



b. A map showing the premises in relation to the surrounding area.

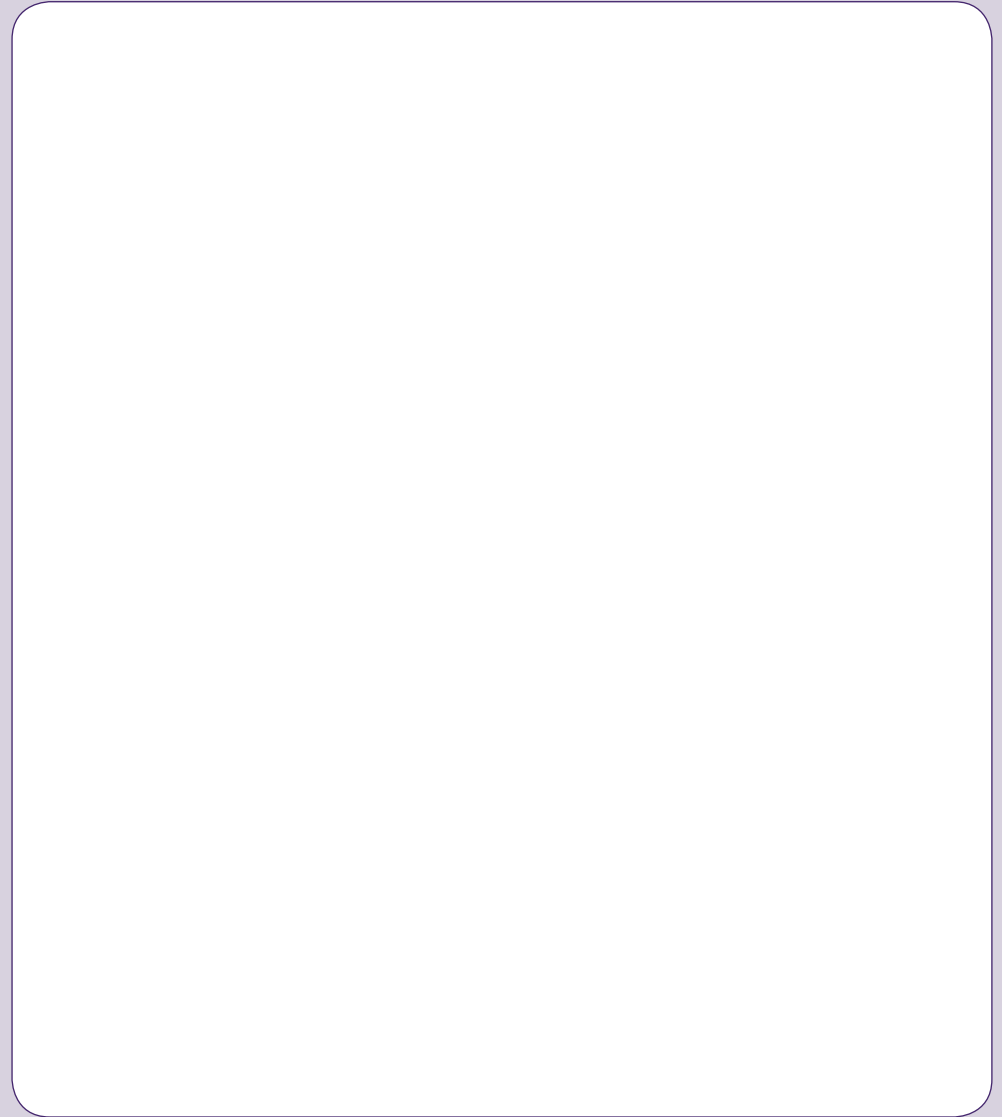


Your Premises Map

a. Your premises map showing key infrastructure.



b. Map showing your premises in relation to the surrounding area.



Insert, draw, attach or upload a copy of your premises maps here or note where these can be found.

SECTION 2 – BASIC BIOSECURITY AUDIT*

The basic biosecurity audit is divided into 3 sections: **General, Inputs and Outputs.**

- **2A GENERAL** includes management practices that will assist in preventing and preparing for an EAD outbreak
- **2B INPUTS** relates to all those entities physically entering the premises (see Figure 1 at the start of Section 2b)
- **2C OUTPUTS** relates to all those entities physically leaving the premises (see Figure 2 at the start of Section 2c)

Each section provides a series of questions to help you assess the general practices and specific inputs and outputs relevant to your property and the measures you currently employ to manage these.

This will help you understand your current level of biosecurity.

* This section of the ZBMP guides operators through a concise process of biosecurity risk mitigation for those without an existing general plan. It is not intended to replace the more detailed National Zoo Biosecurity Manual Self-audit Checklist for those who wish to use or are required to use that for accreditation or other purposes:
<https://www.farmbiosecurity.com.au/wp-content/uploads/2019/03/Australias-National-Zoo-Biosecurity-Manual-Self-audit-Checklist.pdf>.

Basic biosecurity audit instructions

Step 1

Answer each question in the Basic Biosecurity Audit with a Y, N or N/A.

N/A items are those that do not apply to your current premises. For example, if you do not house pigs, any question relating to the feeding of pigs on your property would be '**N/A**'. Should your operations model change in the future, these biosecurity items will need to be considered.

If you are not sure, answer **N** and include a follow up action at Steps 3-4 to find out.

Step 2

For each biosecurity item, outline the activities you currently undertake in the column labelled "Management Practices".

NOTE: Biosecurity items and management practices that are in **bold** text relate to mandatory requirements for NSW exhibitors.

Step 3

Considering Steps 1-2, **ask yourself if there are follow up actions** you could/should undertake on your premises to increase biosecurity? If so, add a tick in the right-hand column.

Step 4

For each tick at Step 3, **outline your follow-up actions** on page 32 in Section 3 or if completing digitally, enter the follow-up action in the text box below the tick – this will autopopulate Section 3 for you.



SECTION 2A. GENERAL

1.

DO YOU		Y	N	N/A	MANAGEMENT PRACTICES: <ul style="list-style-type: none"> ■ What do you currently do? ■ Enter details or tick box where applicable 	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
1.1	Have a map of the zoo, including where animals are displayed or held, quarantine facilities, public walk-through areas, feed storage areas, vehicle entry and exit points etc.? Insert your map in Section 1. on page 7.				<p>Schematic map of all areas including administration, quarantine, walk-through areas, parking areas, visitor and delivery/tradespeople entrances.</p> <p>Map showing the zoo in relation to neighboring properties (e.g., via Google Maps).</p> <p>Detailed map showing animal holding facilities with identification numbers/codes of each enclosure clearly outlined.</p>	Other -describe:
1.2	Have a complete animal inventory?				The current animal inventory is readily available.	Other -describe:
1.3	Ensure that all animals are individually identified?				<p>Identification methods used are (tick all that apply):</p> <p>Microchips (PIT tags).</p> <p>Ear/wing tags.</p> <p>Leg/wing bands.</p> <p>Tattoos or brands.</p> <p>Collars.</p> <p>Photographs of coat patterns and individual markings.</p>	Other -describe:

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable		FOLLOW UP ACTION REQUIRED? If yes, tick ✓
1.4 Monitor the health and welfare of your animals daily and seek prompt veterinary assistance for sick animals? <div data-bbox="185 443 524 900" style="background-color: #FFD700; padding: 5px;"> <p>i Health monitoring is important as it will allow you to recognise disease processes early which will assist in the treatment and diagnosis of disease and early implementation of measures to limit spread. Veterinarians have knowledge about disease significance and whether a disease may be transmissible to other animals.</p> </div>				<p>Formal documented procedures for monitoring animals daily.</p> <p>Having one or more veterinarians on staff.</p> <p>Having an on-going relationship with a local veterinary practice.</p> <p>Daily records of animal health are kept (location):</p>	<p>Other -describe:</p>	
1.5 Have an agreed preventative medical program that is overseen by a veterinarian? <div data-bbox="185 1110 524 1321" style="background-color: #FFD700; padding: 5px;"> <p>i A preventative medical program can include details of routine inspections, vaccinations, drenching, reproductive control etc.</p> </div>				<p>Routine veterinary inspections (e.g. at least annually).</p> <p>Vaccination program.</p> <p>Parasite monitoring and drenching program.</p> <p>Species-specific diet sheets.</p> <p>Safety inspections of enclosures.</p>	<p>Other -describe:</p>	

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
<p>1.6 Keep records of injuries, illness, treatments (including vaccinations), deaths (including the confirmed/ suspected cause) of your animals and animal movements within the zoo?</p> <div data-bbox="181 544 526 932" style="background-color: #FFD700; padding: 10px; border: 1px solid #FFD700;"> <p>i Records are a condition of licensing. Records of animal movements will assist with tracing in the event of a disease outbreak. Note: any suspected Emergency Animal Disease must be reported by calling 1800 675 888.</p> </div>				<p>The following details are formally documented:</p> <p>Individual animal medical records, including:</p> <p>Date.</p> <p>Weights.</p> <p>Vaccinations given.</p> <p>Injuries/illnesses.</p> <p>Treatments.</p> <p>Mortalities and post-mortem reports including reason (or suspected reason) for death.</p> <p>Other -describe:</p>	<p>Species for which group (rather than individual) records are kept:</p> <p>Have a system for identifying different enclosures and recording movements of animals between enclosures including paddock rotations.</p> <p>Other -describe:</p>

DO YOU		Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable		FOLLOW UP ACTION REQUIRED? If yes, tick ✓
1.7	Have the ability to restrain (physically or chemically) all of your animals? <div style="background-color: #FFD700; padding: 5px; border: 1px solid #FFD700; margin-top: 10px;"> <p>i Restraint will allow you and your veterinarian to examine animals closely, to collect diagnostic samples and to administer treatments including vaccinations.</p> </div>				Staff trained in appropriate restraint techniques for all species. Raceways, chutes and crushes. Conditioning of animals for close inspection. Projectile syringes and equipment for remote delivery (e.g., darting) of veterinary-prescribed anaesthetic agents (including staff and contractors licensed to use them).	Other -describe: List species with no/limited restraint options:	
1.8	Maintain records and information relevant to available disinfectant chemicals and cleaning products held on the premises and ensure appropriate storage?				List of products available to all staff. Staff trained in appropriate use of disinfection products. Clear instructions provided on appropriate storage and use of disinfection products.	Other - describe:	

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
1.9 Carry out post-mortem (prescribed species) examinations on dead animals? <div data-bbox="183 440 524 1007" style="background-color: #FFD700; padding: 10px;"> <p>i A post-mortem examination investigates the cause of an animal's death, evaluates general underlying health issues and can help determine whether the animal harboured an infectious disease. It may give staff the knowledge to prevent future health issues and mortalities.</p> <p>Note: any suspected Emergency Animal Disease must be reported by calling 1800 675 888.</p> </div>				<p>Post-mortem exams are conducted on the premises:</p> <p>Routinely on every animal.</p> <p>Only on valuable or important animals.</p> <p>Only on prescribed species or if there is a pattern of deaths.</p> <p>Never.</p> <p>Have separate dedicated area for post-mortem examinations.</p> <p>Restrict post-mortem examination area to essential people only.</p> <p>Policies and procedures for post-mortem room including dedicated clothing and footwear, footbaths, handwashing etc.</p> <p>Other -describe:</p>	

SECTION 2B. INPUTS

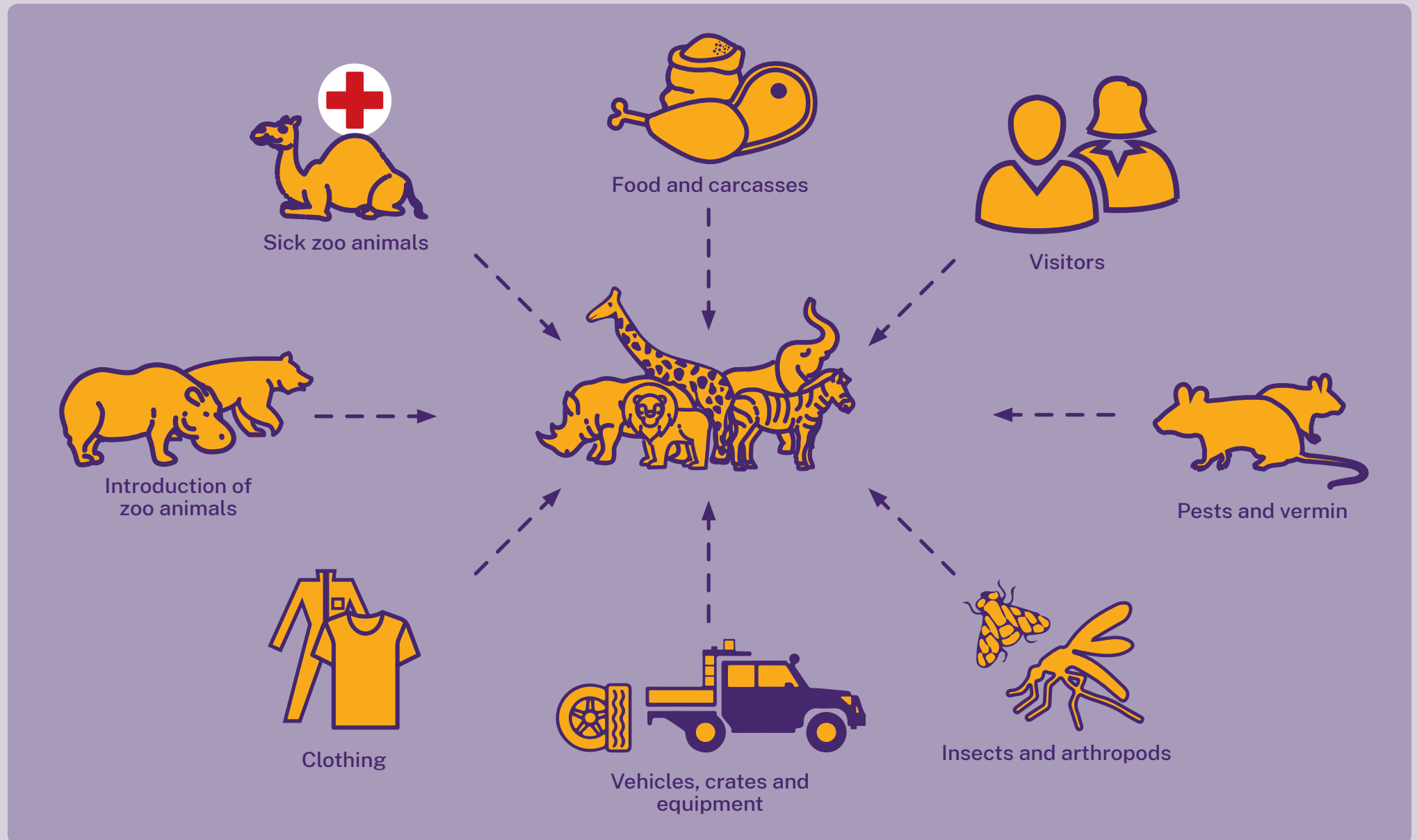


Fig 1. An overview of the potential biosecurity inputs to a zoo.

2. ANIMAL HEALTH INPUTS

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
<p>2.1 Have procedures in place for incoming animals entering the premises to ensure they do not introduce disease?</p> <p>Select the source of incoming animals (tick all that may apply in the next 12 months):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Australian zoos or fauna parks. <input type="checkbox"/> Overseas zoos. <input type="checkbox"/> Wild caught animals for conservation breeding programs. <input type="checkbox"/> Private breeders/pet shops. <input type="checkbox"/> Confiscated domestic and exotic animals. <input type="checkbox"/> Commercial farming operations. <div style="background-color: #FFD700; padding: 5px; border: 1px solid #000; margin-top: 10px;"> <p>i New animal arrivals can introduce disease. Quarantining animals before they enter your premises or before they mix with resident animals reduces the risk of introducing new diseases. The species and the origin of the animal(s) will determine the relative risk of introducing disease.</p> </div>				<p>Formal specific quarantine procedures for all species held on the premises and those being introduced to the premises.</p> <p>Undertake risk assessments to determine what level of quarantine is desirable. This may result in specific disease testing, treatment or euthanasia, prior to travelling to the premises (pre-arrival quarantine) and/or after entering the premises (post-arrival quarantine).</p> <p>Have dedicated quarantine facilities.</p> <p>Other – describe:</p>	



DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
2.4 Have a fauna rescue, treatment and/or rehabilitation facility? <div data-bbox="181 405 524 683" style="background-color: #FFD700; padding: 5px; border: 1px solid #FFD700;"> <p>i Wild fauna is a potential source for the introduction of diseases onto premises and released animals are a potential source of introduction of disease into wild populations.</p> </div>				<p>Have a license (from NSW National Parks and Wildlife Service) to conduct fauna rehabilitation activities.</p> <p>Other – describe:</p> <p>Keep rescued native fauna and zoo animals physically separated.</p> <p>Utilise strict disinfection and barrier keeping between rescued animals and resident animals e.g., coveralls, gloves, overboots, masks.</p> <p>Have formal testing procedures for diseases that may be transmitted from native fauna to zoo animals on arrival.</p> <p>Have a separate dedicated facility for rescued animals including veterinary facilities.</p>	
2.5 Do you have policies regarding visitors bringing animals onto the premises and for managing potential contact of assistance animals with your animals? <div data-bbox="181 1129 524 1310" style="background-color: #FFD700; padding: 5px; border: 1px solid #FFD700;"> <p>i Animals accompanying visitors to your premises are a potential source for the introduction of disease.</p> </div>				<p>Have a formal internal policy regarding visitors who wish to bring animals they care for onto your premises and ensure that admissions/gate staff are familiar with it.</p> <p>Have a formal internal policy for assistance animals accompanying visitors and ensure that admissions/gate staff are familiar with it.</p> <p>Assistance animals are considered within the preventative health program.</p> <p>Ensure no direct contact with zoo animals.</p> <p>Other – describe:</p>	

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: <ul style="list-style-type: none"> ■ What do you currently do? ■ Enter details or tick box where applicable 	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
2.6 If a mobile exhibitor (or approved to undertake temporary removals) have records of where you have visited, and which individual animals have been used for each visit?				Maintain itinerary records. Other –describe:	





3. ANIMAL FEEDING, BEDDING AND ENRICHMENT



DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
<p>3.1 Source feed products from reliable vendors/sources and inspect incoming food products to ensure food is unspoiled and free from chemical and bacterial contamination. Also ensure food is free from pests, weeds, damage and other visual contaminants and keep records of incoming feed fed to your animals?</p> <div data-bbox="174 759 517 1350" style="background-color: #FFD700; padding: 10px; border: 1px solid #FFD700;"> <p>i Animal feed from unknown or non-accredited sources can harbour disease and weeds and has the potential to introduce new diseases and weeds onto the premises.</p> <p>Food must be stored under correct conditions that minimise spoilage and contamination. This may include refrigeration or freezing.</p> <p>Non-pasteurised milk can be a source of some diseases.</p> </div>				<p>Buy feed or feed ingredients from an accredited supplier OR obtain a commodity vendor declaration that addresses biosecurity?</p> <p>Purchased feeds applicable to my operation (tick all that apply):</p> <p>Hay.</p> <p>Grain.</p> <p>Concentrates/pelleted feeds.</p> <p>Fruit and vegetables.</p> <p>Browse.</p> <p>Commercial by-products.</p> <p>Dairy products.</p> <p>Meat/carcasses/whole prey.</p> <p>Fish.</p> <p>Poultry.</p> <p>Supplements.</p> <p>Invertebrates.</p> <p>Other (please list):</p>	<p>Store meat, whole prey, poultry and fish frozen and thaw prior to being fed out.</p> <p>Collect browse for herbivores from an outside plantation.</p> <p>Have a policy on accepting donated food items.</p> <p>The following information is kept:</p> <p>Date.</p> <p>Type of feed received.</p> <p>Supplier (including when suppliers change).</p> <p>Have species-specific diet sheets and keep them updated.</p> <p>Keeper education on inspecting feed.</p> <p>Formal documented procedures for feed inspection.</p> <p>Other –describe:</p>

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
3.2 Keep meat products and associated equipment in a separate area from other feed? <div data-bbox="174 384 517 533" style="background-color: #FFD700; padding: 5px; border: 1px solid #FFD700;">  Meat products are a potential source of disease agents. </div>				Food storage and preparation areas designed to reduce contamination. Procedures for cleaning and disinfecting food preparation areas and equipment between each use. Other –describe:	
3.3 Ensure that everyone who feeds your animals knows not to feed <i>prohibited pig feed</i> (food waste containing meat or other mammalian by-products) to pigs and not to feed <i>restricted animal material</i> to ruminants and other FMD susceptible animals as well? <div data-bbox="174 842 517 1187" style="background-color: #FFD700; padding: 5px; border: 1px solid #FFD700;">  For more information on this legislation visit the NSW DPI website: https://www.dpi.nsw.gov.au/about-us/legislation/list/biosecurity-act-2015/Biosecurity-Amendment-Miscellaneous-Regulation-2023/faq </div>				The person/s who feeds the animals daily has: Undergone training which includes the legal requirements. Signed policies and procedures. Other –describe:	
3.4 Share browse between animal species. e.g., offering uneaten koala browse that is being replaced to ungulate browsers.				Ensure a risk assessment is undertaken before approving shared browse items. Other –describe:	

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
3.5 Have adequate food supplies or plans for alternate supply in case the movement of food is stopped during an EAD outbreak? <div data-bbox="174 472 517 654" style="background-color: #FFD700; padding: 5px; border-radius: 5px;"> <p>i There may be a disruption of usual feed supply during an EAD event.</p> </div>				<p>Plentiful supply of hay or purchased feed in a barn or shed.</p> <p>Plentiful freezer stocks.</p> <p>Maintain a list of potential alternate suppliers of food products.</p> <p>Other –describe:</p>	
3.6 Have procedures in place to ensure clean and fresh drinking water for animals is available at all times? Have the ability to restrict zoo animals from accessing watercourses that run through your premises? <div data-bbox="174 967 517 1222" style="background-color: #FFD700; padding: 5px; border-radius: 5px;"> <p>i If there is a disease outbreak upstream from your premises, it may be important to restrict your animals from accessing potentially contaminated watercourses.</p> </div>				<p>Ensure that drinking water troughs are available to all animal types and are cleaned regularly.</p> <p>Have the capacity to isolate the water supply to individual species and troughs from the remainder of the supply.</p> <p>Where possible, ensure water troughs and stock watering areas are placed in areas that are not easily contaminated by excreta from wild birds, bats and other non-zoo animals.</p> <p>Other –describe:</p>	



DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
3.7 Use animal bedding products such as sawdust, straw and natural enclosure furnishings? <div data-bbox="174 405 517 547" style="background-color: #FFD700; padding: 5px; border-radius: 10px;">  Animal bedding and exhibit furniture can harbour some diseases and weeds. </div>				<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Ensure bedding material is fit for the species it is intended for.</p> <p>Ensure bedding is sourced from reliable vendors.</p> <p>Ensure alternate suppliers are available in case supply is interrupted.</p> <p>Ensure bedding is stored in a clean, dry and pest free environment.</p> <p>Ensure bedding is changed regularly.</p> <p>Ensure introduced furniture items are clean and free from obvious contamination.</p> </div> <div style="width: 45%;"> <p>Keep records of where bedding and natural furnishings are acquired from.</p> <p>Other –describe:</p> </div> </div>	
3.8 Use biological products e.g., faeces, urine for behavioural enrichment. <div data-bbox="174 868 517 981" style="background-color: #FFD700; padding: 5px; border-radius: 10px;">  Biological products are a potential source of disease. </div>				<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Ensure a risk assessment is undertaken before using faeces and other biological products as enrichment.</p> <p>Maintain and regularly review an approved list of behavioural enrichment activities.</p> <p>Keep enrichment records.</p> </div> <div style="width: 45%;"> <p>Other –describe:</p> </div> </div>	

4. CONTROLLED ENTRY

DO YOU		Y	N	N/A	MANAGEMENT PRACTICES: <ul style="list-style-type: none"> ■ What do you currently do? ■ Enter details or tick box where applicable 	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
4.1	Control entry access to your premises by visitors, contractors, specialists, researchers and students? <div style="background-color: #FFD700; padding: 5px; border-radius: 5px; display: inline-block;">  Disease can enter the premises on clothing and boots. </div>				<p>Entry logs/sign-in sheets for contractors, researchers, students etc.</p> <p>Procedures for personnel entering animal facilities including quarantine facilities.</p> <p>Collect general visitor contact information.</p> <p>Other –describe:</p>	
4.2	Ensure vehicles, drivers and equipment do not access animal areas within the premises without approval? <div style="background-color: #FFD700; padding: 5px; border-radius: 5px; display: inline-block;">  Disease can enter your premises in soil adhering to tyres and equipment. </div>				<p>Limit vehicle and equipment access to animal areas to only those required for husbandry, construction and maintenance.</p> <p>Controlled entry points to animal areas or specific biosecurity zones.</p> <p>Log of vehicles, where practical, into and out of the premises.</p> <p>Wash bays and disinfection bays for site-specific and contractor vehicles well away from animal areas.</p> <p>Other –describe:</p>	
4.3	Have signage at different points around premises to advise visitors to refrain from interfering with and feeding the animals?				<p>Fit for purpose signs.</p> <p>Other –describe:</p>	




DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
4.4 Have zones with differing biosecurity risk levels on the property? Such as: <ul style="list-style-type: none"> ■ Quarantine areas. ■ Walk-through exhibits. ■ Drive-through exhibits. ■ Well demarcated zones with different types of animals (e.g., carnivores, ruminants, reptiles). <div style="background-color: #FFD700; padding: 10px; margin-top: 10px;"> <p>i Having staff dedicated to a given zone and/or providing staff with hand cleaning stations and a different set of boots for each zone within a facility may reduce the risk of disease spread.</p> <p>During an EAD outbreak certain areas of the premises may be able to remain open for visitation whilst some may be closed for visitor access.</p> </div>				<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Map of the zoo showing different areas e.g., quarantine, walk-throughs.</p> <p>Cleaning and disinfection of boots, clothes, vehicles into and out of certain higher risk areas.</p> <p>Alternative options for drive-through exhibits (where applicable), such as guided tours.</p> <p>Specific keepers for different animal types/species or keeper rounds that minimise disease risk between species or animal type e.g., visiting low risk animals first.</p> </div> <div style="width: 45%;"> <p>Other –describe:</p> </div> </div>	

5. WILD ANIMALS



DO YOU		Y	N	N/A	MANAGEMENT PRACTICES: <ul style="list-style-type: none"> ■ What do you currently do? ■ Enter details or tick box where applicable 	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
5.1	Actively exclude pests from your premises and investigate/report disease and mortality in populations of wild animals? <div style="background-color: #FFD700; padding: 5px; border-radius: 5px;">  Pest and free-range native species can introduce unwanted disease onto premises and potentially infect resident animals. </div>				List of pest species entering/present on zoo grounds. List of free-range native animals known to be on premises or in the adjacent areas. Premises securely fenced. Baiting/trapping/hunting feral animals on the premises. Examine sick animals and conduct post-mortem exams on deceased animals found within zoo grounds. Other –describe:	
5.2	Manage or minimise feral animal and pest attractants on the premises?				Careful animal feed management e.g. feeder design and placement to minimise feral animal access and minimise spillage. Disposal sites are securely fenced. Access to feed wastage is controlled. Deep burial of carcasses. Removal of carcasses from premises via licensed waste removal company. Other –describe:	
5.3	Monitor and control the presence and concentration of mosquitoes and other biting insects in and around the premises? <div style="background-color: #FFD700; padding: 5px; border-radius: 5px;">  Many diseases are spread via mosquitoes and flies. </div>				Visually inspect water bodies for presence of wrigglers and facilities for adult mosquitoes. Engage a professional to assist with monitoring. Trap insects. Physically minimise insect breeding areas such as removal of any stagnant water containers. Chemical treatment of water bodies or enclosures with insecticides (larvicides and adulticides). Use insect repellents around animal areas. Use prescribed insect repellent products on animals as directed by your veterinarian. Other –describe:	

6. HYGIENE

DO YOU		Y	N	N/A	MANAGEMENT PRACTICES: <ul style="list-style-type: none"> ■ What do you currently do? ■ Enter details or tick box where applicable 	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
6.1	<p>Ensure staff or visitors that are sick with a known infectious disease are not allowed direct contact with animals?</p> <p>i Disease can sometimes be spread to animals by contact with infected people.</p>				<p>Staff education about reverse zoonoses.</p> <p>Relevant policies and procedures.</p> <p>Other –describe:</p>	
6.2	<p>Ensure staff understand the risk of transfer of disease between animals at home or another workplace and zoo animals?</p> <p>i Disease can sometimes be spread to animals by contaminated people.</p>				<p>Staff education.</p> <p>Policies and procedures.</p> <p>Other –describe:</p>	
6.3	<p>Provide interactive or keeper supervised animal feeding opportunities for visitors?</p> <p>Remove animals from their enclosure for animal encounter activities on-site?</p> <p>i Disease can spread to animals in the zoo via clothing and boots.</p> <p>Disease can enter via illegal or unsafe foodstuffs brought onto the premises by visitors.</p> <p>Hand cleaning facilities must be provided to reduce the risk to your animals and guests during interactions.</p>				<p>Assess risk of removing animals from their enclosure for encounters based on species and the activity.</p> <p>Ensure there are hand wash stations and products available for visitors to practice personal hygiene.</p> <p>Require visitors to wash their hands before and after entering animal contact areas or feeding animals.</p> <p>Footbaths or overboots for higher risk biosecurity areas.</p> <p>Ensure food fed to animals is provided by the zoo.</p> <p>Other –describe:</p>	

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
6.4 Provide dedicated workwear/ footwear/outerwear (e.g., coveralls) and require staff, students, visitors and contractors to wear this on site or in particular animal areas?  Contaminated clothing and footwear can introduce disease.				Have a uniform policy that outlines whether, and under which circumstances, uniforms and footwear can be worn off site. Supply outerwear (clothing, coveralls) and boots for staff working in high-risk areas. On-site change and showering facilities for staff, volunteers, students etc. Other –describe:	
6.5 Wash and disinfect transport vehicles and crates, machinery and equipment on entry to the premises and before using with animals or in animal enclosures?  Contaminated vehicles, equipment and machinery can introduce disease.				Wash bay and disinfection area distant to animal enclosures. Wash down water is collected and treated. Dedicated equipment for high-risk biosecurity areas. Protocol for cleaning equipment that is shared between enclosures and handling facilities used for more than one species. Other –describe:	
6.6 Keep/hold zoo animal faeces on site?  Transferring faeces between locations has the potential to spread disease.				Animal faeces from this site is managed by: Procedures for on-site manure disposal/dispersal. Composting. Other –describe:	

7. ENVIRONMENT

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
7.1 Know the water sources (for irrigation and enclosure purposes) entering and leaving your premises? <div data-bbox="181 501 517 639" style="background-color: #FFD700; padding: 5px; border-radius: 10px;">  Many diseases can survive for a long time in water sources. </div>				<p>Drinking/swimming/misting water for animals is sourced from (tick all that apply):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Municipal source. <input type="checkbox"/> Rainwater collected on site. <input type="checkbox"/> On-site bore. <input type="checkbox"/> On-site dams. <input type="checkbox"/> Off-site rainwater/bore/dam. <input type="checkbox"/> Local river/reservoir. <input type="checkbox"/> Other –specify: <p>Maintain a water quality monitoring program.</p> <p>Have a map of water catchment areas.</p> <p>Risk assessment of contamination of water sources by farm animals on adjacent properties.</p>	<p>Prevent stagnation of water bodies by aerating.</p> <p>Remove wild animal carcasses and polluting debris from water sources as soon as practicable.</p> <p>Other –describe:</p>
7.2 Use soil, manure, mulch etc. from outside sources for on-site landscaping? <div data-bbox="181 1305 517 1422" style="background-color: #FFD700; padding: 5px; border-radius: 10px;">  Soil and manure can be a source of some diseases. </div>				<p>Ensure soil, manure and mulch is sourced from reliable vendors and known sites.</p> <p>Risk assessment of outside sourced landscaping materials.</p>	<p>Other –describe:</p>

SECTION 2C. OUTPUTS

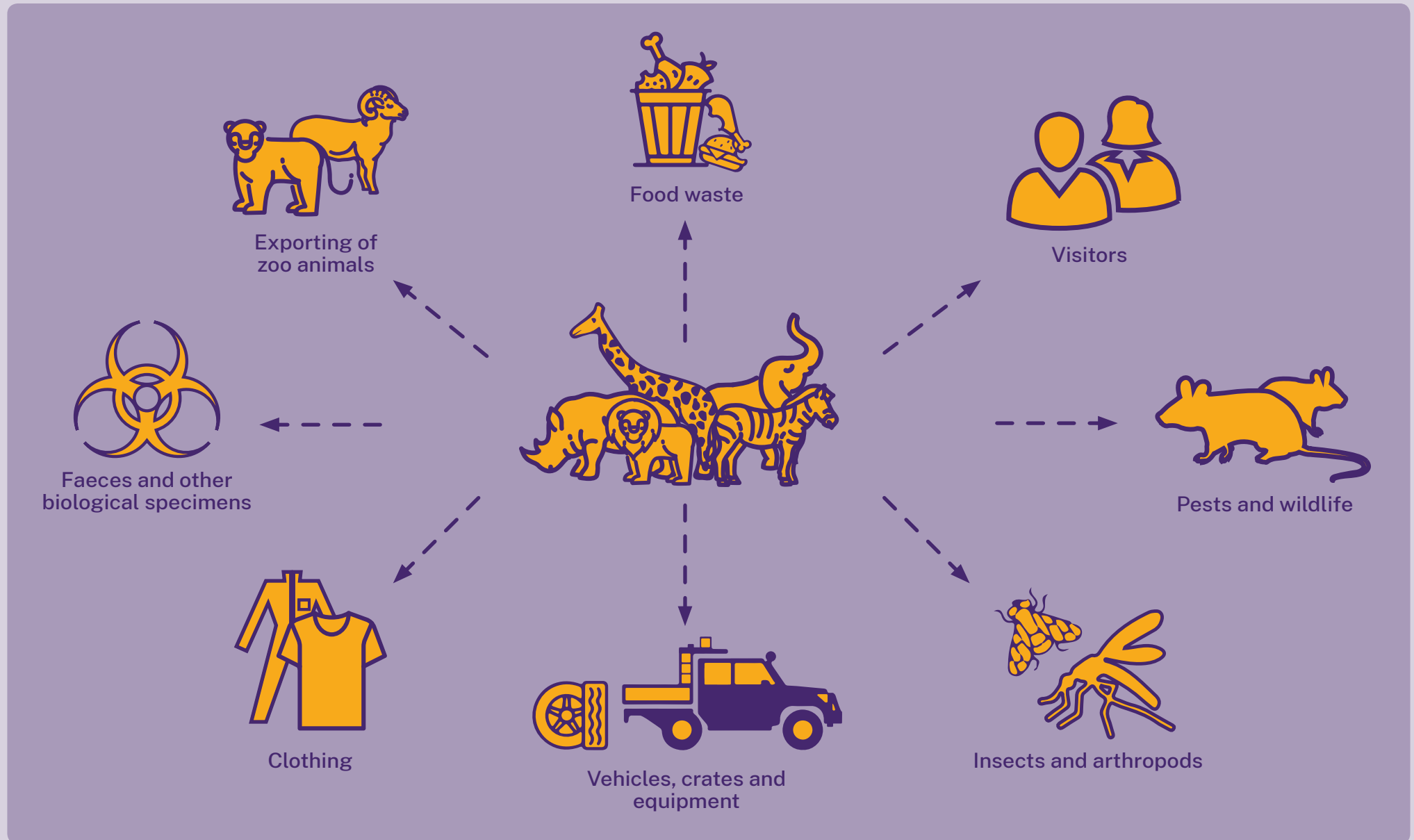



Fig 2. An overview of the potential biosecurity outputs from a zoo.

8. OUTPUTS

Many of the measures covered in Section 2B-Inputs, also protect against disease exiting your property. A few additional considerations are covered in this section.

DO YOU		Y	N	N/A	MANAGEMENT PRACTICES: <ul style="list-style-type: none"> ■ What do you currently do? ■ Enter details or tick box where applicable 	FOLLOW UP ACTION REQUIRED? If yes, tick ✓
8.1	Have procedures in place for animals departing the premises including when relocating to a new premises?				<p>Maintain current health records for all animals and ensure these are transferred to the recipient.</p> <p>Other –describe:</p> <p>Facilities and procedures for isolation /quarantine of departures including disease testing requirements, in consultation with receiving premises.</p> <p>Maintain itinerary records for temporary removals/mobile exhibitions.</p>	
8.2	Ensure biological specimens exiting premises (blood, urine, swabs etc.) adhere to legislative requirements?				<p>List of outgoing samples, their method of dispatch (e.g., post, courier) and recipients (e.g., laboratories).</p> <p>Procedure and training in place for appropriate storage/packaging/transport of biological samples.</p> <p>For animals in quarantine post arrival from overseas, request approval from the federal agriculture department before sending samples off-site.</p> <p>Other –describe:</p>	
8.3	Have established protocols for removing animal faeces and other waste from animal enclosures and the property?				<p>Excrement is disposed of appropriately by:</p> <ul style="list-style-type: none"> Licensed waste disposal contractors. Collection and sale as fertiliser. Composting. Other –describe: <p>Enclosures are cleaned daily including waste food removal and faeces removal.</p> <p>Procedures for rapid and safe removal of deceased animals (including wild animals in/near exhibited animal yards).</p> <p>Wild animal access is restricted from waste disposal areas.</p> <p>Other –describe:</p>	

 **Animal faeces and urine can carry disease.**

DO YOU	Y	N	N/A	MANAGEMENT PRACTICES: ■ What do you currently do? ■ Enter details or tick box where applicable		FOLLOW UP ACTION REQUIRED? If yes, tick ✓
8.4 Maintain a secure perimeter fence to prevent animals exiting the premises? <div data-bbox="181 405 521 676" style="background-color: #FFD700; padding: 5px; border: 1px solid #FFD700;"> <p>i Animals that exit the premises (including pest and free-range native species) can spread disease from the premises and potentially infect nearby animals.</p> </div>				Procedures and timetable for checking perimeter fence integrity.	Other –describe:	
8.5 Wash and disinfect transport vehicles and crates, machinery and equipment prior to exiting the premises and being used with other animals?				Wash bay and disinfection area distant to animal enclosures. Wash down water is collected and treated.	Other –describe:	
8.6 Have hygiene protocols for personnel exiting animal facilities? e.g., change of clothing and boots, handwashing, disinfection of equipment. <div data-bbox="181 1193 521 1337" style="background-color: #FFD700; padding: 5px; border: 1px solid #FFD700;"> <p>i Disease can exit the premises on clothing and boots.</p> </div>				Procedure in place for: Exiting all animal areas. Exiting high risk (e.g., quarantine) animal areas only (e.g., removal of coveralls and overboots, hand disinfection). Policy on minimising the risk of contaminated clothing and boots exiting the zoo.	Dedicated on-site clothing and boots are: Washed/disinfected on site. Disposed of on site. Taken off site for cleaning. Other –describe:	

SECTION 3 – INDIVIDUAL PREMISES BIOSECURITY ACTION LIST

Complete a row for each basic biosecurity audit item with a tick in the right-hand column.

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
1.1		
1.2		
1.3		
1.4		
1.5		
1.6		
1.7		
1.8		
1.9		

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
2.1		
2.2		
2.3		
2.4		
2.5		
2.6		

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
3.1		
3.2		
3.3		
3.4		

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
3.5		
3.6		
3.7		
3.8		

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
4.1		
4.2		
4.3		
4.4		

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
5.1		
5.2		
5.3		

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
6.1		
6.2		
6.3		
6.4		
6.5		
6.6		

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
7.1		
7.2		

AUDIT REF. #	ACTION REQUIRED	DATE TO BE COMPLETED
8.1		
8.2		
8.3		
8.4		
8.5		
8.6		

SECTION 4 – FOOT-AND-MOUTH DISEASE RISK MANAGEMENT

What is Foot-and-mouth disease?

Foot-and-mouth disease (FMD) is a highly contagious viral disease that mostly affects cloven-hoofed animals (those with a split toe). It does not affect horses or other equids e.g. zebras. Refer to Table 1 for species that are susceptible to FMD.

It is not currently present in Australia. Introduction of FMD into Australia will cause significant negative social, economic and animal impacts.

What are the clinical signs of FMD in animals?

The signs of FMD in susceptible animals include:

- Lameness or reluctance to walk.
- Fever.
- Salivation.
- Reduced appetite.
- Blisters (either intact or ruptured) on the tongue, lips, feet and teats.

Susceptible animals can show varying degrees of illness. Some animals can be carriers of the FMDv, which means they can be infected with the virus but do not develop symptoms or illness. This is important because animals that appear well can still be infected and introduce and spread the virus to your premises.

The incubation period (the time from infection to first symptoms) of FMD is variable, ranging from 1 to 14 days after exposure to the virus.

There are other diseases that demonstrate similar signs so rapid reporting to a veterinarian or NSW authorities (**EAD watch hotline: 1800 675 888**) and examination are important to ensure that FMD can be confirmed or excluded as quickly as possible.

People can be infected with FMD, but this is rare, and the clinical signs are generally mild and self-limiting. It is unlikely that people would contribute to the spread of FMD, however there is a small risk that contaminated personnel could transfer FMDv from infected animals to susceptible animals. It is recommended that people who have been in contact with an FMD infected animal, do not have contact with other susceptible animals for 72 hours after the last contact.



Goat – 2 day old mouth lesion



Interdigital lesion



Bovine – large lesion on the tongue



Vesicles on teat



Pig – snout lesions

All images source: EU FMD

How is FMD diagnosed?

FMD can be diagnosed in the laboratory after samples are taken from infected animals. Any animals showing symptoms of FMD should be examined by a veterinarian.

What might happen if FMD enters Australia?

If FMD infection is detected in one or more Australian animals, an emergency will be declared under the NSW Biosecurity Act 2015 and emergency measures will be enacted to contain and eradicate the outbreak.

An immediate **livestock standstill** will be called to help stop further spread of infection whilst the extent of the outbreak is determined. This means that movements of animals susceptible to FMD will cease including those already in transit. Personnel transporting such animals at the time a standstill is announced may be required to return the animals to the premises of origin or to off-load the animals at the nearest suitable premises.

Different zones may be established depending on the spread of the disease. These zones include Infected Premises (IP), Restricted Areas (RA) and Control Areas (CA). Restrictions on animal movements and associated animal equipment and feed will depend on what zone your premises is in.

Measures to eradicate FMD may include:

- Movement controls and enhanced biosecurity measures to minimise spread of disease.
- Tracing the movements of animals, animal products, people and vehicles/equipment to identify where the outbreak may have spread.
- Surveillance and testing to detect infected livestock and other animals.
- The humane destruction and biosecure disposal of livestock on infected premises.
- Decontamination of property and equipment to destroy the virus.
- A vaccination program may be implemented.

Animal food supplies and other animal product movements may be restricted and difficult to access. In addition, animal workers e.g., farriers, veterinarians, shearers may have limited availability as they may be involved in the response or pose a contamination risk to your premises. This may have implications for staff, animal procedures and animal welfare.

Visitation to the premises may be suspended or restricted, especially if the premises falls within a restricted or control area and a risk assessment determines the risk of allowing visitation to be too high.

Mobile animal exhibitors may be prohibited from travelling or restricted in their travel capabilities, especially if they have susceptible species.

If vaccination is deemed to be an appropriate response strategy for an FMD incursion in Australia, the relevant authorities will provide advice at that time.

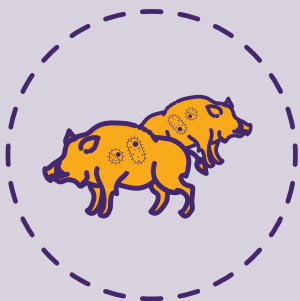
Information on FMD management in Australia can be found in the **Australian Veterinary Emergency Plan (AUSVETPLAN)** at https://animalhealthaustralia.com.au/wp-content/uploads/dlm_uploads/2022/12/AVP_FMD_v5.0_2022.pdf

How is it spread?

Foot-and-mouth disease virus (FMDv) is carried by live animals and can be spread by:



Wind, up to 10 km in distance



Direct contact between animals



Soil and organic material, on vehicles or clothing



Contact with infected animal products (such as meat, dairy products, bones and untreated hides), noting it can survive in frozen, chilled or freeze-dried foods

FMD and animal exhibitors

If FMDv does arrive in Australia, there are actions that can help animal exhibitors reduce their risk of the virus entering their premises and causing an infection.

Which animal species are susceptible to FMD?

Table 1 lists zoo species in NSW that are susceptible to FMD. The susceptibility rating (low, medium, high) is based on the best available information regarding the ability of the species to contract the virus, amplify the virus and spread the virus to other animals.

Table 1.

SPECIES	SUSCEPTIBILITY TO FMD VIRUS
Pigs	High
Cattle	High
Sheep	High
Goats	High
Camelids –e.g Camels, Alpacas, Llamas	High
Deer –all species	High
Non-domestic bovids e.g., all antelope species, Himalayan Tahr, Barbary Sheep, Bison, Water Buffalo, Banteng etc.	Medium to high
Elephants	Medium
Giraffe	Medium
Canids	Low
Ursids (bears)	Low
Macropods	Low
Wombats *	Low
Brush-tailed Possums *	Low
Long-nosed Potoroos *	Low
Long-nosed Bandicoots *	Low
Rats (including Australian Water Rats) *	Low
Brown Antechinus *	Low
Echidnas *	Low
Rabbits *	Low
Capybaras *	Low
Mice *	Low
Chickens *	Low

* Denotes species where evidence of susceptibility exists via experimental infections only.



What is the risk of FMD entering a zoo?

The first step in reducing risk to your premises is understanding the potential entry points.

The major entry risks for zoos include:

- **Infected animals:** clinically infected (diseased) or carriers including recent arrivals, feral pests such as pigs, deer, goats and rodents, and animals that have entered the premises for clinical care.
- **Mobile exhibits:** Animal contact with an infected animal when conducting a mobile display or temporary removal.
- **Feed:** FMD infected carcasses could introduce the virus to a zoo premises. The infected carcass could then contaminate the zoo environment or other feed types (such as produce, grain or fodder) if food storage hygiene is inadequate. Feed (non-carcass) sourced from unaccredited suppliers could also pose a contamination risk.

- **Bedding and landscaping materials:** materials such as straw, hay and mulch could be contaminated. These materials should be sourced from accredited disease-free suppliers.
- **Clothing and boots:** FMDv can survive in mud and organic matter and can be transferred to a new location on contaminated clothing and footwear.
- **People:** it is rare, but people can also become infected or carry the FMDv. Anyone that has worked with infected, or potentially infected, animals should not visit your premises for 72h.
- **Vehicles:** any vehicle could become contaminated before arriving at your premises, especially if it has made a delivery to a farm or travelled within a RA during an outbreak. In the case of an FMD outbreak, vehicles should always travel to low-risk destinations first and finish with high-risk destinations. Vehicles should be prevented from entering the premises unless they have undergone adequate surface cleaning and decontamination.

Visitor vehicles should not be allowed to enter the premises during an FMD outbreak.

- **Crates and other logistical equipment:** crates and other logistical or transport equipment can be contaminated by the animals, products and packaging they are carrying, or by the vehicle itself. The inside of transport vehicles should be cleaned before being loaded.
- **Other equipment:** heavy machinery, tools and animal handling equipment could be contaminated, and, if used with or near susceptible animals, cause an infection. Such equipment should be prevented from entering the premises unless it has undergone adequate surface cleaning and decontamination.
- **Water courses:** if there is a watercourse connecting the zoo with a high intensity agricultural property this may be a risk.
- **Wind:** the virus can travel up to 10 km on the wind. This has been a major source of spread in some outbreaks in other countries.

Assessing the risk to your premises

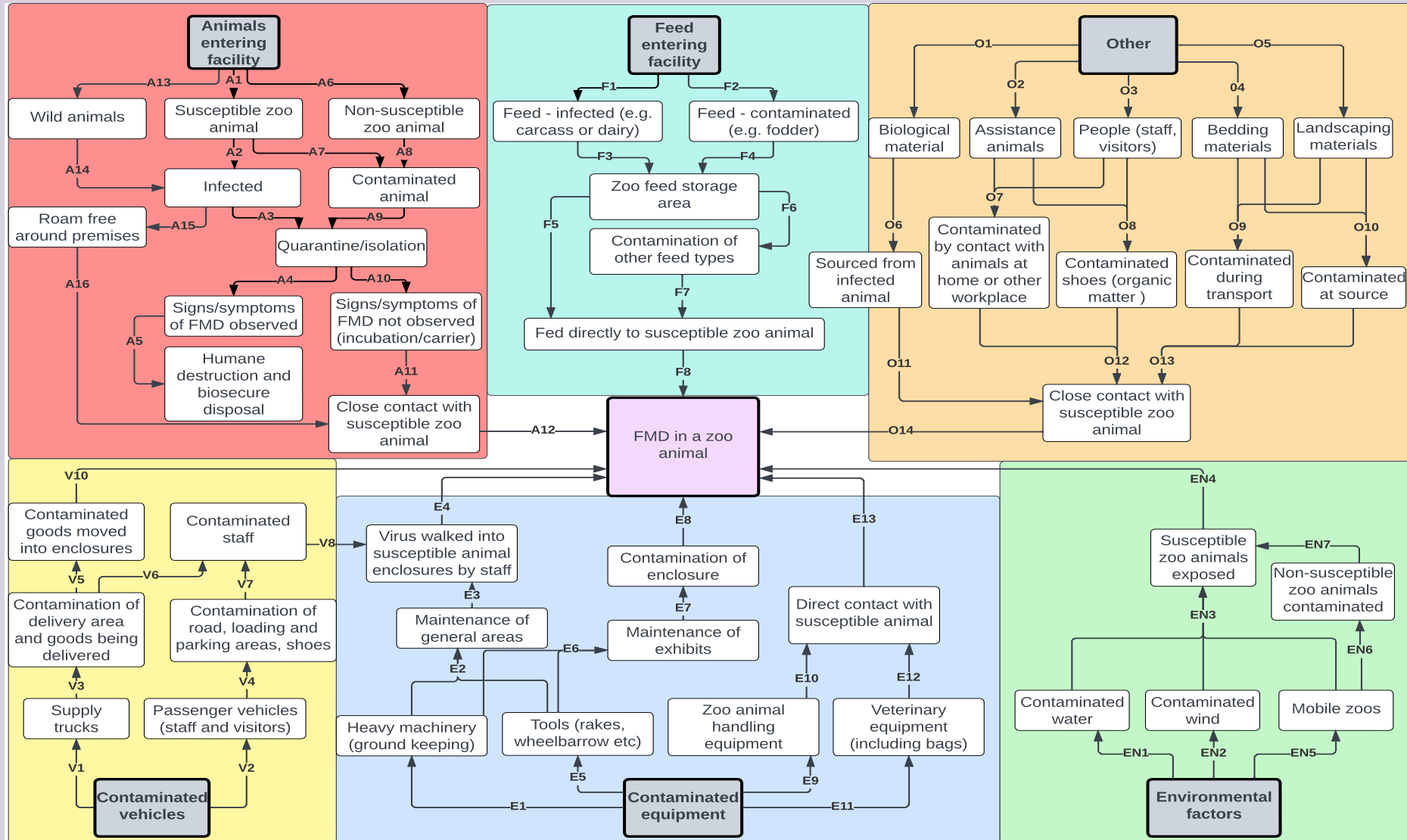
It is important to assess the risk of an FMD incursion on your property. **If you hold susceptible species, then your premises may be at risk.** If you hold susceptible species and answer yes to any of these additional questions, then your risk is increased.

- Are you located in a rural area with surrounding properties that hold FMD susceptible species?
- Are your premises directly adjacent to a property that holds farm animals with no buffer zone?
- Are you a mobile exhibitor? Where do you regularly travel to? In the event of an outbreak, have you recently visited a Restricted Area (RA)?
- Do you allow visitors to feed susceptible animals at your premises?
- Do you provide interactive programs for visitors? Are these with FMD susceptible species?
- Do you have FMD susceptible pest species within your boundary fence?
- Do you have a water course that runs through your premises? Do FMD susceptible species (zoo animals and pests) have access to this water?

Pathway analysis for entry of FMD to a zoo premises

The following diagram (Figure 3) and table (Table 2) describes the pathways for entry of FMDv to a zoo and how susceptible species could be exposed and infected*. The diagram and table should be read together.


Figure 3.



* This pathway analysis is an example and may not represent all of the FMD risks and entry points for your premises.

Table 2. Description of the pathway analysis in Figure 3.

FMD PATHWAY CODE (SEE FIGURE 3)	RISK DESCRIPTION	RECOMMENDED MITIGATIONS TO CONSIDER IN THE FACE OF AN FMD OUTBREAK
A1-A2-A3-A4-A5	<p>Introduction of disease by incoming susceptible zoo animals.</p> <p>Animals may have been exposed to the virus at their origin or during transit.</p> <p><i>Note: The incubation period can range from 1-14 days (most likely 2-5 days), and some animals could be carriers.</i></p>	<ul style="list-style-type: none"> ■ Review basic audit items 2.1, 2.4 – 2.6. ■ Extend quarantine periods and intensity of monitoring of animals already in quarantine. ■ Suspend entry to your facility of susceptible species during an FMD outbreak. ■ Any suspicious signs in susceptible species or animals originating from locations where FMD is known to be, or could be present, should be immediately reported to authorities on 1800 675 888 and your veterinarian. Euthanasia may be considered if the likelihood is deemed high.
A6-A8-A9-A10-A11-A12	<p>Introduction of disease by incoming non-susceptible zoo animals.</p> <p>Non-susceptible animals may be contaminated with the virus and introduce disease to the premises (e.g., contaminated hair or saliva, organic matter on hooves).</p> <p>Animals may be contaminated at the point of origin or during transport.</p>	<ul style="list-style-type: none"> ■ Review basic audit items 2.1, 2.4-2.6. ■ Suspend entry or risk assess entry of non-susceptible species from high-risk areas. ■ Apply adequate hygiene and quarantine practices for animals that are sourced from low-risk areas, ensuring the transport vehicle is clean and decontaminated.
A13-A14-A15-A16-A12 A13-A14-A3-A4-A5	<p>Introduction of disease by wild animals entering the premises.</p> <p>Wild animals can be diseased or carry the virus.</p> <p>Wild animals include free-living native wildlife, pest species and ill/injured/orphaned wildlife.</p>	<ul style="list-style-type: none"> ■ Review basic audit items 2.4, 5.1, 5.2. ■ Ensure perimeter fencing is secure. ■ Increase pest control and disease monitoring operations. ■ Increase post-mortem examinations of deceased pest and native animals. ■ Any animal showing suspicious signs of FMD should be immediately reported to authorities on 1800 675 888 and your veterinarian. Euthanasia may be considered if the likelihood is deemed high.
F1-F3-F5-F8	<p>Introduction of disease by feeding infected carcasses or animal products of susceptible species.</p> <p>Animal products may include dairy, meat products etc.</p>	<ul style="list-style-type: none"> ■ Review basic audit items 3.1-3.3, 3.5. ■ Source carcasses and animal products from low-risk areas and ensure material is accredited as safe and free from disease. See Table 3 for questions to ask a supplier. ■ Do not source carcasses from unaccredited sources (e.g., wild animals, donated carcasses etc.). ■ Do not source animal products from unaccredited sources (e.g., local dairy farm). ■ Carcasses should be kept and prepared in a separate, designated area away from other feed storage and preparation areas. ■ Staff that handle and prepare carcasses should not handle other feed types. ■ Carcasses of susceptible species should not be brought into the zoo during an FMD outbreak.

 **The FMD virus can survive in carcasses for significant amounts of time. Freezing carcasses will not kill the virus. FMD virus can be present in dairy products.**

FMD PATHWAY CODE

(SEE FIGURE 3)

RISK DESCRIPTION

RECOMMENDED MITIGATIONS TO CONSIDER

IN THE FACE OF AN FMD OUTBREAK


F2-F4-F6-F7-F8

Introduction of disease by contaminated animal feed and bedding.

04-09-013-014

Feed and bedding materials may become infected at the source of collection (contaminated field/paddock) or during transport (contaminated vehicle or storage facility).

Feed and bedding may also become contaminated if the storage areas for these items are not kept separate.

 FMD can survive in soil up to 9 months at 20°C and 14 weeks at 5°C. The freezing of meat, poultry and fish will not destroy FMD virus.

■ Review basic audit items 3.1 - 3.8.

- Source feed and bedding materials from low-risk areas.
- Ensure alternate suppliers have been identified and only source products obtained from outside infected areas.
- Buy pig or ruminant feed or feed ingredients from an accredited supplier OR obtain a commodity vendor declaration that addresses FMD biosecurity.
- Ensure feed types are stored separately in clearly designated areas.
- Carcasses should be kept and prepared in a separate, designated area away from other feed storage and preparation areas.
- Staff that handle and prepare carcasses should ensure adequate hygiene protocols are followed to reduce the risk of contamination of other feed types.

01-06-011-014

Introduction of disease by contaminated biological material.

Biological material, including reproductive material, can be a source of FMD.

Biological material may have been unknowingly sourced from an infected animal and be used in close contact with a zoo animal, causing an infection.

 FMD virus can survive chilling and freezing.

■ Review basic audit item 2.3.


- Suspend the entry of reproductive material and biological specimens from susceptible species.

03-07-08-012-014

Introduction of disease by entry of people.

Contractors, specialists, animal care workers, students, researchers, staff, and visitors can all introduce FMD on clothing, boots, and equipment. Visitors may also introduce disease by feeding contaminated human food items to susceptible zoo animals.

People can carry FMD in their nasal passages. There is a small risk that people who have been in close contact with diseased animals could transmit the virus.

 FMD virus can survive on surfaces for up to one month, depending on weather conditions.

■ Review basic audit items 4.1, 6.1 - 6.4.

- Suspend public access to high-risk animal areas where susceptible species are held, including walk-through areas and animal contact areas.
- Suspend animal visitor interactions with susceptible species.
- Minimise people entering and exiting animal exhibits.
- Supply additional protective clothing for staff and ensure it is being used appropriately with susceptible species.
- Risk assess staff contact with animals or contaminated areas outside of work. Consider altering staff rosters or house some staff on site temporarily to minimise travel in/out of the premises. Staff (or contractors) that have been in close proximity to infected animals (e.g., zoo staff that have their own herd that has been infected, or veterinarians that have been working with infected animals) should not be permitted onto the property for 72h in case of latent infection.

**FMD PATHWAY
CODE***(SEE FIGURE 3)***RISK DESCRIPTION****RECOMMENDED MITIGATIONS TO CONSIDER***IN THE FACE OF AN FMD OUTBREAK***O5-O9-O10-
O13-O14**

Introduction of disease by entry of landscaping materials, such as soil, mulch etc.

Landscaping materials may become contaminated at their origin or during transit (e.g., in a contaminated vehicle).

- **Review basic audit item 7.2.**
- Suspend entry of non-essential organic material onto premises.
- Ensure landscaping materials are not sourced from a Restricted Area.
- Source landscaping materials from reliable vendors/disease free locations and risk assess all deliveries before allowing entry onto the premises.

**V1-V3-V5-V10
V6-V8-E4**

Introduction of disease by entry of vehicles.

Vehicles may become contaminated at their origin or during transit.

i FMD virus can survive in soil up to 9 months at 20°C and 14 weeks at 5°C (including on roads). Vehicles should travel from areas of lowest risk to highest risk and avoid travelling through Restricted Areas.

- **Review basic audit items 4.1, 4.2, 6.5.**
- Restrict access of vehicles to the premises.
- Ensure vehicles enter via a Controlled Entry Point.
- Clean and disinfect vehicles, machinery, equipment and crates prior to entering and leaving the property with approved disinfectants.*
- Ensure cleaning area is well distanced from animal enclosures.

* See Table 4 for list of approved disinfectants for FMD.

**E1-E2-E3-E4
E5-E6-E7-E8**

Introduction of disease with heavy machinery and grounds keeping equipment.

Heavy machinery and equipment used for grounds keeping and maintenance could be contaminated if brought in from other premises (such as hired equipment).

- **Review basic audit items 4.1, 4.2, 6.5.**
- Restrict use of non-essential equipment on the premises.
- Source essential equipment from outside a Restricted Area.
- Ensure any machinery or equipment has been cleaned (free from organic matter) and disinfected prior to entering (and leaving) the property with approved disinfectants.*
- Ensure cleaning area is well distanced from animal enclosures.
- Consider keeping premises specific vehicles on site.

* See Table 4 for list of approved disinfectants for FMD.

**E9-E10-E13
E11-E12-E13**

Introduction of FMD by contaminated zoo handling or veterinary equipment.

Equipment used in direct contact with zoo animals could be contaminated if used on more than one premises.

If a zoo animal is infected, the infection may spread by sharing equipment.

- **Review basic audit items 6.2 - 6.5.**
- Ensure any equipment used directly with animals is cleaned (free of organic matter) and disinfected with approved disinfectants* before entering and leaving the premises and between animals.
- Other items used by animal handlers, veterinarians, contractors and specialists, such as carry bags, should be cleaned and disinfected before entering an animal enclosure.
- Complete a risk assessment on any essential equipment that cannot be completely cleaned and disinfected prior to arriving at the premises or being used between animals.

* See Table 4 for list of approved disinfectants for FMD.

**FMD PATHWAY
CODE***(SEE FIGURE 3)***RISK DESCRIPTION****EN1-EN3-EN4*****Introduction of FMD by contaminated water sources or by wind.*****EN2-EN3-EN4**

FMD can be transmitted by contaminated water or wind. If there is an FMD outbreak near your premises the risk of susceptible zoo animals being exposed to the virus is increased.



FMD can survive in water for up to one month.



FMD can be transported up to 10km by wind in ideal conditions.

EN5-EN3-EN4***Introduction of FMD by mobile exhibition or temporary removal of zoo animals.*****EN5-EN6-EN7-EN4**

Susceptible species are at increased risk when moved outside of a fixed enclosure.

The likelihood of exposure to contaminated environments and contaminated people is increased. These animals are also at greater risk of being inadvertently fed contaminated food during visitor interactions.

RECOMMENDED MITIGATIONS TO CONSIDER*IN THE FACE OF AN FMD OUTBREAK***■ Review basic audit items 7.1 and 7.2.**

- Take measures to prevent animals from accessing free-flowing water or water courses that may have originated from areas where there are susceptible animals.
- If water (used for irrigation or drinking) is sourced from a high-risk supply, employ a water treatment system prior to use.
- Do not allow susceptible animals to graze on land that has been recently flooded by a potentially contaminated watercourse.
- Infection by wind is difficult to mitigate. However, it is important to determine what windborne risks may apply to your premises and if there is a realistic contingency plan that could be implemented (e.g., can susceptible zoo animals be housed inside during a high-risk period?).

■ Review basic audit items 2.6, 3.3, 6.3.

- Suspend mobile exhibition and temporary removal of susceptible species.
- Complete risk assessment for mobile exhibition of non-susceptible species.
- Mobile exhibition of non-susceptible species may require increased documentation – permits, disinfection of cages, vehicles, clothing, footwear.

How can my zoo, mobile animal display establishment or wildlife care entity prepare for and help prevent FMD?

These questions can assist you to assess the risk of a product or service **before it enters your premises**.

Table 3. Questions to ask a supplier or contractor

FEED, BEDDING AND ORGANIC MATERIAL	
Abattoir carcass	<ul style="list-style-type: none"> ■ Is the food species susceptible to FMD? ■ What alternatives exist? e.g., non-susceptible species, fish?
Commercial stock feeds, bedding and landscaping materials	<ul style="list-style-type: none"> ■ Where was it sourced from? ■ Is it accredited as free from disease?
Non-commercial feed or bedding (hay/silage/straw)	<ul style="list-style-type: none"> ■ Have stock been able to access the harvested product? ■ Has the harvested product been sourced from an IP or RA (declared before or after harvest)? ■ Was the transport vehicle clean and free of organic matter prior to being loaded?
Dairy	<ul style="list-style-type: none"> ■ Has the product been pasteurised?
Locally sourced carcasses (e.g., licensed wild cull, roadkill, donations)	<ul style="list-style-type: none"> ■ How close is the nearest IP or RA from the location the carcass was found/culled? ■ Is there evidence of interaction with another animal e.g., pig? ■ Is the cause of death known?
EQUIPMENT	
Heavy machinery and landscaping equipment	<ul style="list-style-type: none"> ■ Where has the equipment been used? ■ Was it cleaned and disinfected after use and before being used on your property?
Trucks and other vehicles	<ul style="list-style-type: none"> ■ Where has the vehicle been? ■ Has it been to a rural property? ■ Has it been through a restricted area (RA)? ■ Has it transported any potentially infectious material and could be contaminated?

ADDITIONAL INFORMATION AND FURTHER READING

Table 4. List of disinfectants that FMD is sensitive to and approved by Australian Pesticides and Veterinary Medicines Authority (APVMA).

- Virkon®™ Ranvet Pty Ltd, Banksmeadow NSW Australia.
- ViralFx™ Spick n Clean Products, Revesby NSW Australia.
- Virugard™ Kilco TM (International) Ltd Lockerbie, UK.
- Viraban™ Bayer Pymble, NSW Australia.
- Dairy-Chlor™ Advanced Dairy Systems Cobram, Victoria Australia.
- Gea-Quantum Alkali Milking Machine Detergent™ Heidelberg Heights, Victoria Australia.
- Rua-Klenza RKL Low foam dairy detergent™ Ruakura Smeaton Grange, NSW Australia.
- Terminator broad spectrum disinfectant™ Bayer Pymble, NSW Australia.
- CSA Bactercide™, Chemical Systems Australia, NSW Australia.

Useful references that have been used in the development of, or referred to throughout, the planner:

- [Australia's National Zoo Biosecurity Manual self-audit Checklist](#) 🌐
- [AUSVETPLAN Enterprise manual Zoos Version 3.0, 2014](#) 🌐
- [AUSVETPLAN Response strategy Foot-and-mouth disease Version 5.0](#) 🌐
- [AUSVETPLAN Guidance document: risk-based assessment of disease control options for rare and valuable animals](#) 🌐
- [Deep burial of carcasses](#) 🌐
- [Farm Biosecurity Action Planner](#) 🌐
- [Information for zoos and petting zoos on foot and mouth disease](#) 🌐
- [Information on NSW Biosecurity Act 2015](#) 🌐
- [National Zoo Biosecurity Manual](#) 🌐
- [NSW DPI FMD information](#) 🌐
- [Wildlife Health Australia – Foot-and-mouth Disease \(General Information\)](#) 🌐
- [Wildlife Health Australia –Foot-and-mouth Disease \(Native Wildlife\)](#) 🌐





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