

## **RES003 HOLDING AND TRANSPORTATION OF PEST ANIMALS USED IN RESEARCH**

**Prepared by Trudy Sharp, Glen Saunders & Bruce Mitchell  
NSW Department of Primary Industries**

### **Background**

Research involving pest animals may require the holding and transportation of individual or groups of animals. Wild animals may try to avoid capture, handling and restraint during which they are capable of inflicting damage to themselves and their potential captors. When physical contact is necessary, the safety of animals and operators should be the primary consideration.

Holding and transportation techniques must be appropriate for the species and minimise distress and the risk of injury to the animal. Improper holding, transportation, housing or translocation, especially of already stressed animals, may lead to major and possibly fatal physiological disturbances.

This standard operating procedure (SOP) is a guide only; it does not replace or override the legislation that applies in the relevant State or Territory jurisdiction. The SOP should only be used subject to the applicable legal requirements (including OH&S) operating in the relevant jurisdiction.

### **Application**

- This document provides guidelines for research involving pest animals. It aims to ensure that holding and transportation procedures are performed humanely and effectively. The procedures can be applied to the transport and holding of animals:
  - in the field;
  - from the field to holding facilities (or vice versa); and
  - between holding facilities.
- The acquisition, care and use of animals for scientific purposes in Australia must be in accordance with the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes, and with Commonwealth, State and Territory legislation. All animal research must be approved by an Animal Ethics Committee (AEC) and covered by a valid animal research authority issued by an AEC.
- Personnel handling animals should be thoroughly trained in the planned procedure as well as in contingency methods of capture and restraint that may be required.
- The holding and transportation of animals requires that the animal be captured. Proper capture techniques are essential to minimise pain, fear, distress and anxiety experienced by the animal and also for the safety of the operator. For more information on capture techniques refer to ***RES001 Live Capture of Pest Animals used in Research***.

- The majority of live capture techniques require that animals be physically restrained. Proper handling and restraint is essential to minimise any pain, fear, distress and anxiety experienced by the animal and also for the safety of the operator. For more information on handling and restraint techniques refer to ***RES002 Restraint and Handling of Pest Animals used in Research***.
- Where capture and restraint may cause significant pain, injury, anxiety or distress to the animal or pose a danger to the operator, the use of sedative and/or immobilising drugs may be necessary. For more information on sedative and immobilising techniques refer to ***RES002 Restraint and Handling of Pest Animals used in Research***.
- The objectives of many wildlife studies depend upon the reliable identification of individual animals and therefore require some form of identifying mark be applied to the animal while it is restrained. For more information on marking techniques refer to ***RES004 Marking of Pest Animals used in Research***.
- The translocation and release of vertebrate pest animals is subject to restrictions in most states and territories and specific permission must usually be obtained from the relevant authority before carrying out such operations.

### **Animal Welfare Considerations**

- Evidence from behavioural and physiological studies indicates that holding and transportation are significant stressors for wild animals and also create a potential for injury. Holding and transportation techniques must therefore aim to minimise the stress on the animal and maximise the safety of the animal and also the operator.
- The potential welfare implications of transportation and holding of wild animals include:
  - Injury or trauma
  - Hypothermia
  - Heatstroke
  - Dehydration
  - Distress (due to confinement, discomfort, social isolation, noise, movement and vibration)
  - Malnutrition
  - Conflict when re-establishing social status in groups after an absence
  - Maladaption to long-term holding
- Holding and transportation should be avoided in animals already compromised by pre-existing stressors (such as pregnancy, lactation, lack of food and/or water, social factors or extremes of temperature) as they have a decreased ability to deal with more stress.
- To understand and potentially reduce the impact of transportation and holding on animals, personnel must be experienced in handling the species under study and have a thorough knowledge of its habits and behaviours (e.g. details of social structure, defensive capabilities and reaction to stress and pain).
- Personnel must anticipate and be prepared to deal with the range of conditions that may cause undue stress and/or injury to the animals. If an animal is injured during holding and transportation procedures it must receive appropriate treatment. Animals that are suffering intractable pain and/or distress should be euthanased using a technique that is suitable for the species.

For more information on euthanasia techniques refer to ***GEN001 Methods of Euthanasia***.

- Precautions must be taken to prevent the spread of infectious disease from one animal to another. Contaminated equipment should be disinfected between animals.

## **Health and Safety Considerations**

### **Animal handling**

- Operators need to be wary of the potential for serious injury when handling wild animals. Some species can be aggressive and may attack e.g. feral pigs.
- When working in the field, personnel should work in teams of at least two people.
- Protective clothing, footwear and gloves may reduce the chances of injury when handling wild animals. However, the use of heavy gloves decreases sensitivity and dexterity and may increase the risk of handling injuries to small species.

### **Zoonotic hazards**

- Care must be taken when handling live animals and carcasses as they may carry diseases that can affect humans and other animals e.g. hydatidosis, sarcoptic mange, leptospirosis, Q fever, brucellosis, melioidosis, tuberculosis, psittacosis (chlamydiosis / chlamydophilosis) etc.
- Routinely wash hands and other skin surfaces after handling all animals and also carcasses or bodily fluids.
- Operators must be protected by tetanus immunisation in case of infection of wounds.
- Bite wounds from some animals (eg. feral cats, foxes, wild dogs) can result in serious infections and should be treated by a doctor.
- Q fever can be transmitted to humans during contact with infected animals, or with infected uterine or placental tissue. A variety of animals may be infected including kangaroos, wallabies, dogs, cats, cattle, sheep and goats. Vaccination is recommended for people who come into regular contact with potentially infected animals. Blood testing of personnel is recommended to assess previous exposure, followed by vaccination for susceptible individuals.
- Zoonotic risks from birds include psittacosis (chlamydiosis), aspergillosis, erysipelas, yersiniosis and salmonellosis. Face masks, are recommended to reduce the risk of contracting disease.
- Some bird species can deliver painful bites and scratches. For example, parrots (eg. cockatoos, galahs, corellas) have large, heavy beaks and strong jaws that are capable of inflicting serious injury. Protective gloves can be used if required for handling large birds, although these may hinder dexterity. A towel is useful to place over the birds head.

## **General considerations for the transportation of animals**

- Animals captured in the wild are particularly susceptible to the stress of transportation. Investigators must therefore ensure that stress is minimised and

injury is avoided by using appropriate transportation methods that are suitable for the species.

- The transport process should be as brief as possible. Some species may require rest periods to allow the animals to feed undisturbed. Other species should only be transported during times of normal inactivity. In hot weather, long journeys should be postponed until it is cooler or undertaken during evening, night or early morning.
- Veterinary assistance may be required to prescribe or administer tranquillising agents to animals if the transport process is anticipated to be highly stressful. This is especially appropriate for species that are susceptible to capture myopathy (e.g. kangaroos, deer).
- Animals should only be transported in facilities, and by a method, which provide the following:
  - Sufficient ventilation;
  - Protection from the weather and extremes of temperature, noise, vibration, sudden movements;
  - Adequate food, water and bedding, or nesting material (where appropriate to the species);
  - Protection from injury by the use of secure, escape-proof, well-maintained containers;
  - Sufficient space to prevent overcrowding. Where animals are transported in cages or crates, these containers should be sufficiently large to allow the animal to stretch out, stand, lie down and groom itself;
  - Appropriate restraint where required;
  - A level of hygiene sufficient to prevent illness;
  - Minimal handling;
  - Physical and visual separation from other animals which are likely to cause injury or distress, e.g. animals of different species, age groups, size and reproductive status should be transported in separate containers or groups.
- Animals which are ill, very young or old, suckling young, in late pregnancy or have not recovered from general anaesthesia should not be transported.
- Animals should be inspected 30 mins after commencing the journey then at least once every two hours. Where possible, rest stops should be taken in order to carry this out (eg. when using road transport). However, repeated unloading and loading may be more detrimental to the animals' welfare.
- If an animal is showing signs of pain or a significant illness, veterinary attention should be sought to alleviate the condition.
- Contingency plans must be in place to deal with emergencies such as vehicle breakdown, collisions or extremes of weather.
- Receipt of animals should be arranged in advance into the custody of a person trained in the husbandry of the species and with suitable holding facilities.
- Animals should be inspected at the time of delivery.
- Transportation by air should be in accordance with the International Air Transport Association (IATA) regulations. Details on suitable transport containers for a range of species are given in the IATA Handbook on Live Animal Regulations (LAR). The IATA document is also a good resource for land transport of animals.

- Land and Sea Transport
  - Model codes of practice regarding land transport of a variety of species are produced by the Primary Industries Standing Committee (PISC) and published by CSIRO publishing. Some of these codes have been adopted into the animal welfare legislation of some states and territories.
  - Exportation of animals by sea is regulated by Commonwealth Marine Orders.

## **General considerations for holding of animals**

### **Short Term Holding**

- Animals held for a few hours must be placed in appropriate holding cages, yards etc. and provided with bedding and adequate sources of suitable food and water.
- A live cage type trap may be suitable for short term holding if it provides adequate space and ventilation. The cage should be covered or kept in a dark area to minimise stress. Animals should not be held in small cages for long periods as their mobility is restricted resulting in stress and impaired circulation.
- Animals should be regularly monitored, but with as little disturbance as possible.
- Holding areas and cages should be protected from direct sunlight, wind and precipitation and kept at a temperature appropriate to the species. The cages must be well-ventilated, hygienic and easily inspected. They must also be free from obstacles and fittings with the potential to cause injury.
- To minimise stress, animals should be shielded from excessive noise, light and human activities. A sheltered or enclosed area should be provided so that the animals can escape from view.
- Except for studies involving relocation, if animals are to be released, this must be done as close to the point of capture as possible at a time consistent with the animal's normal daily behaviour pattern. All reasonable steps must be taken at the time of release to protect animals from injury and predation.

### **Long term holding**

- Detailed guidelines on the care of animals in holding facilities can be found in a number of publications including: *The Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*. Suitable publications relating to the particular species under study should be consulted prior to housing animals. A number of relevant references can be found at the end of this document. Below is a summary of general principles that will apply to all species.
- Where animals are held for periods longer than a few hours, they should be held in secure facilities which provide the following:
  - Sufficient space and, where appropriate, others of the same species to permit most normal behaviours;
  - Sufficient quantities of appropriate food for the species, its age, sex and reproductive state;
  - A constantly available supply of clean, fresh drinking water;

- Shelter, shade, resting (with appropriate bedding) and defecation/urination areas;
  - Appropriate levels of ventilation, ambient light, noise, temperature and humidity;
  - Protection from predators and pests;
  - Protection from injury and escape by the use of safe, durable and well maintained construction materials;
  - A level of hygiene sufficient to prevent illness; and
  - A design which facilitates ease of handling.
- Personnel responsible for the care of the animals should be familiar with their normal appearance and behaviour so that abnormalities can be recognised quickly. Animals should be inspected at least once daily for signs of poor adaptation and stress by monitoring the following:
  - Health (*disease, mortality*);
  - Body condition (*change in bodyweight, food and water consumption*)
  - Production (*breeding success, growth*)
  - Behaviour (*activity, stereotypic behaviours and signs of fear, anxiety, boredom, etc.*).
  - Where blood samples are taken, it may be useful to use some of these samples to monitor physiological indicators of stress, e.g. total and differential white blood cell count, cortisol, glucose, etc.
- If an animal is showing signs of pain or a significant illness, veterinary attention should be sought to alleviate the condition.
- Plans to deal with any animals showing signs of poor adaptation, stress/distress should be developed prior to beginning the research.
- Housing for wild animals should approximate natural conditions as closely as possible. Diet and feeding schedules should also reflect the animal's normal foods and feeding behaviour.
- Animals must be identifiable, whether individually or in groups. This can be done by attaching a label to the cage, pen, yard etc. or by physically marking individual animals with a tag, neckband etc. (refer to **RES004 Marking of Pest Animals used in Research**).
- Each enclosure should be labelled on the outside with species information and the appropriate AEC approval details.
- For some species group housing will be necessary, but for others it will increase stress and risk of injuries. Where it is necessary to individually house animals of a species that normally exists in social groups, the period of social isolation should be kept to a minimum. Where appropriate, they should be allowed visual or auditory contact with compatible conspecifics.

### Species-specific information

- Prior to transporting and holding animals, investigators should consult species-appropriate literature and seek the advice of persons experienced with the particular species of interest.
- Below is a list of information sources where more detailed can be obtained. Although a number of these guidelines are aimed at common laboratory species or domestic animals, some of the advice may be applicable to, or

modified for, feral animals. Methods and types of housing, caging, feeding, and cleaning may be applied in a general sense to wild animals.

## **General**

*CCAC Guidelines on the Care and Use of Wildlife* (2003)

Canadian Council on Animal Care

[http://www.ccac.ca/en/CCAC\\_Programs/Guidelines\\_Policies/GDLINES/Wildlife/Wildlife.pdf](http://www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GDLINES/Wildlife/Wildlife.pdf)

*Guidelines for the Capture, Handling and Care of Mammals* (1998)

American Society of Mammalogists

<http://www.mammalsociety.org/committees/commanimalcareuse/98acucguidelines.pdf>

*CCAC Guide to the Care and Use of Experimental Animals* (1993)

Canadian Council on Animal Care

[http://www.ccac.ca/en/CCAC\\_Programs/Guidelines\\_Policies/GUIDES/ENGLISH/toc\\_v1.htm](http://www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GUIDES/ENGLISH/toc_v1.htm)

National Health and Medical Research Council (2004) *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*. 7th edition. Australian Government Publishing Service, Canberra.

[http://www.nhmrc.gov.au/publications/\\_files/ea16.pdf](http://www.nhmrc.gov.au/publications/_files/ea16.pdf)

## **Birds**

*Guidelines to the Use of Wild Birds in Research* (1999)

Ornithological Council

<http://www.nmnh.si.edu/BIRDNET/GuideToUse/index.html>

Lowe, K.W. (1989). *The Australian Bird Banders Manual*. Australian National Parks and Wildlife Service, Canberra

## **Dogs and Foxes**

Animal Research Review Panel (2003) Guidelines for the housing of dogs in scientific institutions, Guideline 14.

<http://www.animaethics.org.au/reader/animal-care/arrp-housingdogs-scientific-insts.pdf?MIvalObj=17599&doctype=document&MItypeObj=application/pdf&name=/arrp-housingdogs-scientific-insts.pdf>

NHMRC Policy on the care of dogs used for scientific purposes (1997). National Health and Medical Research Council

[http://www.nhmrc.gov.au/publications/\\_files/dogs.pdf](http://www.nhmrc.gov.au/publications/_files/dogs.pdf)

## **Cats**

James, A. E. (1995). The laboratory cat. ANZCCART Facts sheet, ANZCCART News Vol 8 No 1 March 1995

## **Goats**

Standing Committee on Agriculture, Animal Health Committee. (1991). Model Code of Practice for the Welfare of Animals: The Goat. CSIRO, Australia.  
<http://downloads.publish.csiro.au/books/download.cfm?ID=368>

## **Deer**

Standing Committee on Agriculture, Animal Health Committee. (1991). Model Code of Practice for the Welfare of Animals: The Farming of Deer. CSIRO, Australia.  
<http://downloads.publish.csiro.au/books/download.cfm?ID=366>

## **Pigs**

Standing Committee on Agriculture, Animal Health Committee. (1997). Model Code of Practice for the Welfare of Animals: Land Transport of Pigs. CSIRO, Australia.  
<http://downloads.publish.csiro.au/books/download.cfm?ID=1502>

Standing Committee on Agriculture, Animal Health Committee. (2003). Model Code of Practice for the Welfare of Animals: Pigs, 2<sup>nd</sup> ed. CSIRO, Australia.  
<http://downloads.publish.csiro.au/books/download.cfm?ID=1546>

## **Horses**

Standing Committee on Agriculture, Animal Health Committee. (2003). Model Code of Practice for the Welfare of Animals: Land Transport of Horses. CSIRO, Australia.  
<http://downloads.publish.csiro.au/books/download.cfm?ID=1501>

## **Rabbits**

Animal Research Review Panel (2003) Guidelines for the housing of rabbits in scientific institutions, Guideline 18.

<http://www.animaethics.org.au/reader/animal-care/arrp-rabbithousing.pdf?MIvalObj=17501&doctype=document&MItypeObj=application/pdf&ext=.pdf>

Standing Committee on Agriculture, Animal Health Committee. (1991). Model Code of Practice for the Welfare of Animals: Intensive Husbandry of Rabbits. CSIRO, Australia.  
<http://downloads.publish.csiro.au/books/download.cfm?ID=369>

## **Rodents**

Animal Research Review Panel (2004). Guidelines for the Housing of Rats in Scientific Institutions, Guideline 20.

<http://www.animaethics.org.au/reader/draft-rat-housing.pdf>



## **Macropods**

Jackson, S.M. (2003), *Australian mammals: biology and captive management*. CSIRO Publishing, Collingwood, Victoria.

Anon. (2006) Standards for exhibiting Australian mammals in New South Wales: Exhibited Animals Protection Act. NSW Agriculture, Orange.  
<http://www.agric.nsw.gov.au/reader/aw-exhibited/australian-mammal-standards--.pdf?MIvalObj=27960&doctype=document&MItypeObj=application/pdf&name=/australian-mammal-standards--.pdf>

DEH (2003) Conditions for the overseas transfer of macropods. Department of Environment and Heritage, Canberra.  
<http://www.deh.gov.au/biodiversity/trade-use/publications/export-conditions/macropods/index.html>

## **Cane toads**

CCAC Species-specific recommendations on: amphibians and reptiles  
Canadian Council on Animal Care  
[http://www.ccac.ca/en/CCAC\\_Programs/Guidelines\\_Policies/GDLINES/Amphibians Reptiles.htm](http://www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GDLINES/Amphibians_Reptiles.htm)

Tyler, M. J. (1999). Frogs and toads as experimental animals.  
ANZCCART Facts sheet, ANZCCART News Vol 12 No 1 March 1999  
[http://www.adelaide.edu.au/ANZCCART/publications/facts\\_sheet\\_mt.pdf](http://www.adelaide.edu.au/ANZCCART/publications/facts_sheet_mt.pdf)

Guidelines for use of live amphibians and reptiles in field research.  
Compiled by the American Society of Ichthyologists and Herpetologists,  
Herpetologists League and the Society for the Study of Amphibians and Reptiles.  
<http://aerg.canberra.edu.au/herps/docgular.htm>

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## References

- American Society of Mammalogists (1998) Guidelines for the capture, handling and care of mammals. Animal Care and Use Committee, American Society of Mammalogists. Document available electronically from the American Society of Mammalogists website:  
<http://www.mammalsociety.org/committees/commanimalcareuse/98acucguidelines.PDF>.
- Animal Behavior Society and Association for the Study of Animal Behaviour (1996) Guidelines for the treatment of animals in behavioural research and teaching. *Animal Behaviour* **51** : 241-246.
- Bourne, D.C., Lawson, B., and Boardman, S.I.(eds) (2004) UK Wildlife: First Aid and Care. Wildpro module, Wildlife Information Network, United Kingdom. Document available electronically from the Wildlife Information Network website: <http://www.wildlifeinformation.org>.
- Canadian Council on Animal Care (2003) *Guidelines on the care and use of wildlife*. Canadian Council on Animal Care, Ottawa, Canada.
- Friend, M., Toweill, D.E., Brownell, R.L., Nettles, V.F., Davis, D.S., and Foreyt, W.J. (1996) Guidelines for proper care and use of wildlife in field research. In *Research and management techniques for wildlife and habitats. 5th ed. rev.* Bookhout, T.A. (ed). The Wildlife Society, Bethesda, Maryland: pp. 96-105.
- Gaunt, A.S., Oring, L.W., Able, K.P., Anderson, D.W., Baptista, L.F., Barlow, J.C., and Wingfield, J.C. *Guidelines to the use of wild birds in research*. The Ornithological Council, Washington.
- International Air Transport Association (IATA). Live Animal Regulations (LAR). (Available from <http://www.iata.org/publications>)
- MELP (1998) Live animal capture and handling guidelines for wild mammals, birds, amphibians & reptiles. Ministry of Environment, Lands and Parks: Resources Inventory Committee, British Columbia, Canada. Document available electronically from the Ministry of Sustainable Resource Managements website: <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/capt/index.htm>.
- National Health and Medical Research Council (2004) *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*. 7th edition. Australian Government Publishing Service, Canberra.
- NTU AEEC (2000) Guidelines for field research on vertebrates. Animal Experimentation Ethics Committee, Northern Territory University. Document available electronically from the Charles Darwin University website: [http://eagle.cdu.edu.au/ntu/apps/ntuinfo.nsf/WWWView/Procedure\\_741](http://eagle.cdu.edu.au/ntu/apps/ntuinfo.nsf/WWWView/Procedure_741).
- Sharp, T. and Saunders, G. (2004) GEN001 Methods of euthanasia. NSW Department of Primary Industries and Department of Environment and Heritage. Document available electronically from the DEH website: <http://www.deh.gov.au/biodiversity/invasive/publications/humane-control/>.

Standing Committee on Agriculture, Animal Health Committee. (1995). Model Code of Practice for the Welfare of Animals: Feral Livestock animals – Destruction or Capture, Handling and Marketing. CSIRO, Australia.