



NSW DEPARTMENT OF PRIMARY INDUSTRIES

**FINAL REPORT FOR THE AUSTRALIAN GOVERNMENT DEPARTMENT
OF THE ENVIRONMENT AND HERITAGE**

**Development of an agreed code of practice and
standard operating procedures for the humane
capture, handling or destruction of feral animals in
Australia**

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1. PROJECT INFORMATION

Project Name

Development of an agreed code of practice and standard operating procedures for the humane capture, handling or destruction of feral animals in Australia.

Details of Applicant

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Period of Project

Commencement date: 20/08/2003 Completion Date: 20/08/2004

2. CONTRACTED OBJECTIVES

Stage 1:

- Undertake a desktop review (including contacting relevant government agencies, researchers and industry organisations) and evaluation of existing literature and legislation that is available in relation to the humane capture, handling or destruction of feral animals (primarily rabbits, goats, pigs, foxes and cats). This review and evaluation must focus on the animal welfare aspects of managing and undertaking scientific research on feral animals.

Stage 2:

- Identify and prioritise the gaps in existing knowledge (based on the review and evaluation completed in Stage 1);
- Provide recommendations as to areas of future research activity that will address those gaps identified in existing knowledge;

Stage 3:

- Prepare a draft code of practice and standard operating procedures for the humane capture, handling and destruction of feral animals (primarily rabbits, goats, pigs, foxes and cats) that can be used by land managers, land owners (including national parks staff, farmers, etc) and scientific research staff. The draft code of practice and standard operating procedures must also include consideration of the animal welfare aspects of managing and undertaking scientific research on feral animals.
- Seek comments and ‘in-principle’ endorsement on the draft code of practice and standard operating procedures from the relevant State and Local Government agencies, including the Vertebrate Pests Committee and key non-government, research and industry organisations.
- Collate all comments received on the draft code of practice and standard operating procedures.
- Highlight any concerns expressed about the draft code of practice and standard operating procedures.
- Clearly identify what needs to be done to address these concerns.

Stage 4:

- Prepare a final version of the code of practice and standard operating procedures. This will need to incorporate comments (where appropriate) that were received on the draft code of practice and standard operating procedures. The final version of the code of practice and standard operating procedures will need to be a final document that Environment Australia would be able to submit through the formal committee system under the Natural Resource Management Ministerial Council.

3. PROJECT OUTCOMES

Stage 1: Desktop Review

An ideal pest animal control method should be humane, target specific, efficient, cost-effective and safe for humans to use. Current approaches to pest animal control tend to focus primarily on lethality to the pest and cost-effectiveness, whilst humaneness receives little attention. Standard operating procedures (SOP's) that discuss animal welfare impacts for target and non-target species, describe the technique and its application, as well as covering health and safety aspects are required.

The aim of this review was to collect information on existing pest animal control methods and procedures used by government agencies, researchers and industry organisations. Current literature, legislation and codes of practice relating to humane pest animal control were also documented.

Initially, another objective of this project was to review existing protocols for research procedures performed on pest animals, and to write SOP's where needed. However, soon after the project began it was realised that since such a large number of control methods are required, the research methods will be left until sometime in the future.

Search for existing standard operating procedures

A range of government agencies, researchers and industry organisations were contacted to request SOP'S that had already been written. Suggestions on what information should be included in the standard methods and what format they should take were also requested. Only nine standard operating procedures, covering a narrow range of specific methods, were received. These included inoculation of rabbits with calicivirus, safe use of firearms, fox control for biodiversity and rabbit capture and handling techniques.

Some advice was received on how the SOP's should be constructed and what type of information should be included. Information was provided on relevant websites where codes of practice and other publication material can be found; organisations that may be able to provide useful information eg. Sporting Shooter Associations; organisations that may have SOP's on related topics eg. National Wildlife Research Centre, Colorado; and also risk assessments for some techniques were provided.

A number of websites were also accessed to search for methods, codes of practice and other relevant information. These are listed in Table 1. Journal articles do not usually describe specific techniques in great detail; however, some contain enough information to help with writing of SOP's. Relevant journal articles are listed in the Bibliography. Manuals, guidelines and training courses that describe vertebrate pest management techniques are available, some online, in most states and territories. For example:

South Australia

- Vertebrate Pest Control Technical Training Manual, Pest facts

Tasmania

- Vertebrate Pest Control Training Manual

Victoria

- Landcare Notes

New South Wales and ACT

- Vertebrate Pest Control Manual, Agfacts and Agnotes
- Feral Animal Aerial Shooting Team (FAAST) Manual

Western Australia

- Farmnotes

Queensland

- NRM facts pest series, Vertebrate Pesticide Manual

Table 1. List of websites accessed to search for methods, codes of practice, publications and other relevant information.

Animal Welfare Sites	
American Humane Association	http://www.americanhumane.org/
Animal Ethics Infolink	http://www.animalethics.org.au/
Animal Liberation NSW	http://www.animal-lib.org.au/
Animal Liberation South Australia	http://www.animalliberation.org.au/home.html
Animal Welfare and Bioethics Centre	http://animalwelfare.massey.ac.nz/
Animal Welfare Centre	http://www.animal-welfare.org.au/
Animal Welfare Information Centre	http://www.nal.usda.gov/awic/
Animal Welfare MAF NZ	http://www.maf.govt.nz/biosecurity/animal-welfare/index.htm
Animals Australia	http://www.animalsaustralia.org/
ANZCCART	http://www.adelaide.edu.au/ANZCCART/
ARMCANZ Model Codes of Practice for the Welfare of Animals	http://www.affa.gov.au/docs/operating_environment/armcanz/pubinfo/mcpwa/animal_welfare.html
Canadian Council on Animal Care	http://www.ccac.ca/
DEFRA, UK – Animal health and welfare	http://www.defra.gov.uk/animalh/animindx.htm
Humane Slaughter Association	http://www.hsa.org.uk/
Humane Society International	http://www.hsi.org.au/
The Humane Society of the United States	http://www.hsus.org/ace/352
International Fund for Animal Welfare	http://www.ifaw.org/ifaw/general/
Law Society Animal Rights Committee	http://www.lawsociety.com.au/page.asp?partid=6153
RSPCA Australia	http://www.rspca.org.au/
RSPCA NSW	http://www.rspcansw.org.au/rspca-homepage.htm
RSPCA QLD	http://www.rspcaqld.org.au/default.asp
University of British Columbia Canada Animal Welfare	http://www.agsci.ubc.ca/animalwelfare/
Universities Federation for Animal Welfare (UFAW)	http://www.ufaw.org.uk/index.htm
University of Edinburgh Animal Welfare Research Group	http://www.vet.ed.ac.uk/animalwelfare/default.htm
University of Syd. Vet. Education and Information Network	http://vein.library.usyd.edu.au/links/animalwelfare.html
World Society for the Protection of Animals (WSPA)	http://www.wspa.org.uk/index.php?locale=2
World League for the Protection of Animals	http://www.zipworld.com.au/~wlpai/index2.htm
World Wildlife Fund Australia	http://www.wwf.org.au/

Government Departments	
APVMA	http://www.apvma.gov.au/
Australian Government, Agriculture, Fisheries and Forestry	http://www.affa.gov.au/index.cfm
CSIRO Australia	http://www.csiro.au/
Environment ACT	http://www.environment.act.gov.au/
Department of the Environment and Heritage	http://www.deh.gov.au/index.html
Northern Territory Parks and Wildlife Commission	http://www.nt.gov.au/ipe/pwcnt/
NSW National Parks and Wildlife Service	http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Home
NSW Agriculture	http://www.agric.nsw.gov.au/
Pest Animal Control CRC	http://www.pestanimal.crc.org.au/
Queensland Dpt of Natural Resources and Mines	http://www.dnr.qld.gov.au/
South Australia Natural Resources	http://sustainableresources.pir.sa.gov.au/
South Australia Department for Environment and Heritage	http://www.environment.sa.gov.au/
South Australia Parks & Wildlife	http://www.environment.sa.gov.au/parks/
Tasmania Dpt of Primary Industries, Water & Environment	http://www.dpiwe.tas.gov.au/
Victorian Dpt Of Primary Industries	http://www.dpi.vic.gov.au/
Western Australia Conservation & Land Management	http://www.calm.wa.gov.au/
Western Australia Dpt of Agriculture	http://www.agric.wa.gov.au/default.pasp
State & Territory Animal Welfare Departments	
ACT Environment ACT	http://www.environment.act.gov.au/
NT Business, Industry & Resource Development	http://www.nt.gov.au/dbird/dpif/animals/animal_welfare.shtml
NSW Agriculture	http://www.agric.nsw.gov.au/reader/625
Queensland Primary Industries	http://www.dpi.qld.gov.au/animalwelfare/
South Australia Department for Environment and Heritage	http://www.environment.sa.gov.au/parks/about.html#Animal_Welfare
Tasmania Primary Industries, Water & Environment	http://www.dpiwe.tas.gov.au/inter.nsf/WebPages/EGIL-535VVF?open
Victoria Primary Industries	http://www.dpi.vic.gov.au/web/root/dominio/cm_da/nrenfa.nsf/frameset/NRE+Farming+and+Agriculture?OpenDocument
WA Local Government & Regional Development	http://www.dlgrd.wa.gov.au/pub/docs/AnimalWelfare/Animal_Welfare_Intro.shtml

Overseas	
American Society of Mammalogists	http://www.mammalsociety.org/
Canadian Agr-Food Research Council, Code of Practice Index	http://www.carc-crac.ca/english/codes_of_practice/
Environment Waikato NZ	http://www.ew.govt.nz/ourenvironment/pests/index.htm
Fur Institute of Canada – Institut de la fourrure du Canada	http://www.fur.ca/
New Zealand Landcare Research	http://www.landcareresearch.co.nz/
National Wildlife Research Centre USA	http://www.aphis.usda.gov/ws/nwrc/index.html
New Zealand Department of Conservation	http://www.doc.govt.nz/
Veterinary Sites	
Animal Health Australia	http://www.aahc.com.au/
Australian Veterinary Association	http://www.ava.com.au/
Merck Veterinary Manual	http://www.merckvetmanual.com/mvm/index.jsp
OIE – World Organisation for Animal Health	http://www.oie.int/eng/en_index.htm
UK Wildlife Casualty Management	http://212.187.155.84/wmv/Lists_Health&Man/FLOWCHARTUK_Wildlife/FLOWCHARTUK_Wildlife.htm
Wildlife Casualty Euthanasia	http://212.187.155.84/wmv/Subdirectories_for_Search/Health&Management_Contents/UKFistAidandCare/WildlifeCasualtyEuthanasia.htm#Mammal1
Miscellaneous Sites	
Australian Legislation	http://www.austlii.edu.au/databases.html#cth
AUSVETPLAN	http://www.aahc.com.au/ausvetplan/#wild
British Association for Shooting and Conservation	http://www.huntinginquiry.gov.uk/evidence/basc.htm
Coast to coast vermin traps	http://home.primus.com.au/panorama/
Denmark Wildlife Ecology and Biodiversity	http://www.dmu.dk/1_om_dmu/2_afdelinger/3_vibi/medarbejdere2_en.asp?PersonID=hn
Fox control in Victoria	http://www.nre.vic.gov.au/web/root/domino/cm_da/NRECPA.nsf/8ce6d41bed8143f14a2569a6002b0e7c/0ccfcb9e2d746b0a4a256a56001cc3ea/\$FILE/Redfox.pdf
Hunting with dogs VIC	http://www.nre.vic.gov.au/web/root/domino/cm_da/NRECRT.nsf/2fc3379bd0005bd64a2566cf00283d52/fb3c05053879666dca256ce6000071a9/\$FILE/HoundHuntingBooklet.pdf
National Training Information Service	http://www.ntis.gov.au/cgi-bin/waxhtml/~ntis2/std.wxh?page=82&inputRef=616
National Health & Medical Research Council – Publications	http://www.health.gov.au/nhmrc/publications/
NPWS - Predation by the Red fox	http://www.nationalparks.nsw.gov.au/PDFs/Redfox_approved.pdf
NT University Guidelines for Field Research on Vertebrates	http://www.mindii.ntu.edu.au/ntu/apps/ntuinfor/nsf/WWWView/Procedure_741
Pest Management Encyclopaedia	http://dekker.com/servlet/product/E-EPM/toc?s=a&nb=
Threat Abatement Plan for Predation by Feral Cats	http://www.deh.gov.au/biodiversity/threatened/tap/cats/index.html
Wild dog strategy QLD	http://www.nrm.qld.gov.au/pests/wildog/pdf/wdsstrategy.pdf

Existing Codes of Practice

Although there are numerous codes of practice that relate to the keeping and handling of stock and domestic animals, only a few exist that are directly relevant to pest animals. Table 2 identifies existing or draft codes of practice with relevance to capture, handling or destruction of pest animals in Australia:

Table 2: Australian codes of practice with relevance to vertebrate pest control.

Commonwealth	Model Code of Practice for the Welfare of Animals: Destruction or Capture, Handling and Marketing of Feral Livestock Animals (1991-currently under review). Covers pigs, donkeys, horses, goats, cattle, buffalo, camels and deer. Code of Practice for the Humane Shooting of Kangaroos (1998)
ACT	Code of Practice for the Humane Control of the Fox
New South Wales	Suggested Code of Practice for the Use of traps for Wild dogs (draft 1992) in Fleming, P.J.S. <i>Trapping for Wild Dog Management in NSW: a Review</i> . (draft)
South Australia	Code of Practice for Humane Destruction of Birds by Shooting in SA (2001)
Tasmania	Code of Practice for the Use of 1080 for Browsing Animal Control (2000) Code of Practice for the Capture, Handling, Transport and Slaughter of Brush-Tail Possums (<i>Trichosurus vulpecular</i>) (2000)
Victoria	Code of Practice for the Use of Small Steel-Jawed Traps (2001) Code of Practice for the Welfare of Animals in Hunting (2001)
Western Australia	Code of Practice for the Capture and Marketing of Feral Animals in WA (2003)

Legislation

A full review and evaluation of existing legislation relating to the control of pest animals in Australia was beyond the scope of this project although much of it was accessed in the course of the review. One aspect that became apparent is the legislation covering use of traps is inconsistent between states and needs to be addressed. Table 3 identifies the state and territory animal welfare legislation and highlights differences with regard to the use of traps for control of pest animals.

Table 3: Animal welfare legislation and use of traps.

ACT	<i>Animal Welfare Act 1992</i> Use of steel jaw traps is prohibited. Trapping with soft jaw traps, cage traps and treadle snares is permitted.
New South Wales	<i>Prevention of Cruelty to Animals Act 1979</i> Use of steel jaw traps is prohibited. Trapping with soft jaw traps, cage traps and treadle snares is permitted.
Northern Territory	<i>Animal Welfare Act 2000</i> Steel jawed traps are not prohibited traps.
Queensland	<i>Animal Care and Protection Act 2001</i> Steel jawed traps are not prohibited traps.
South Australia	<i>Prevention of Cruelty to Animals Act 1985</i> Small steel jaw traps are prohibited. Large steel jaw traps prohibited in most areas except for wild dog control along the dingo fence and for research purposes. The large steel jaw traps are required to be bound with cloth soaked strychnine or modified.
Tasmania	<i>Animal Welfare Act 1993</i> All leg-hold traps are banned
Victoria	<i>Prevention of Cruelty to Animals Act 1986</i> Large steel jaw traps and neck snares are prohibited, with exceptions for wild dog control in some areas. Snares and soft jaw traps are permitted, and small

	steel jaw traps are permitted for rabbit control.
Western Australia	<i>Animal Welfare Act 2002</i> Steel jawed traps are permitted for wild dog control. The jaws must be bound with cloth soaked strychnine. Only padded steel jawed traps are permitted for fox control and use in research programs. Permits are required to set traps in metropolitan areas.

Stage 2: Gaps in existing knowledge

Standard Operating Procedures

The review of existing pest animal control methods revealed that very few are currently available as standard procedures. Those that do exist do not adequately address the issues of humaneness and impact on target and non-target animals. A priority list of methods to be written was compiled in collaboration with members of NSW DPI Vertebrate Pest sub-program. It was decided not to write SOP's for methods that were considered inhumane, even if they are still in current use in some states, eg. use of steel jaw traps to capture wild dogs, use of strychnine baits for foxes. The SOP's take a standard format covering background of the technique, application, animal welfare considerations including impact on target and non-target species, health and safety aspects, equipment required, procedures, further information and references.

Codes of Practice

The existing codes of practice with relevance to pest animal control are inadequate. They cover only a small range of species and most do not contain sufficient information to be adopted as national standards for pest animal control. The objective of this project was to write a code of practice for each of the main pest species (primarily rabbits, goats, pigs, foxes and cats; and where appropriate other species such as feral goats, feral deer, pest birds, rodents, hares, feral horses and kangaroos). It was decided that each code would cover general information on best practice management, control strategies, species biology and impact and overview the different control methods available. An attempt to rank each method according to humaneness, efficacy, cost-efficiency and target specificity was made. The aim of a code of practice is to ensure the best and most appropriate application of techniques by pest animal managers and to identify techniques that need to be restricted or phased out.

Strategy for writing SOPs and identifying gaps in knowledge

The approach taken in writing the SOP's was as follows:

- Relevant information on the method obtained from pest animal control manuals/guidelines, journal articles, AVPMA approved labels and permits, other relevant publications etc.
- The SOP was written, taking into account animal welfare considerations and incorporating differences between state and territories.
- During the writing process, the SOP was reviewed from an animal welfare perspective and notes are made about concerns, inconsistencies and gaps in knowledge.

- A draft of the SOP was sent to relevant agencies and individuals for review.
- When all the SOPs for a species were completed, the code of practice was drafted.

Stage 3: Preparation of draft Codes of Practice and Standard Operating Procedures

Preparation of Model Codes of Practice (COPs)

Codes of Practice were written for the following pest animal species:

- Rabbits
- Foxes
- Feral Pigs
- Wild dogs
- Feral Cats
- Feral Goats
- Feral horses

Preparation of Model Standard Operating Procedures (SOPs)

Forty three standard operating procedures were written for ten pest animal species (Table 4). There are some methods where SOPs have been written, that are considered to be unacceptable on animal welfare grounds eg. use of strychnine on leg-hold traps for wild dogs; using dogs for flushing out feral pigs; and blasting of rabbit warrens. However for most of the situations where these techniques are used there is no alternative methods of control available. Writing SOPs for these methods will at least encourage their most humane application.

Table 4. List of standard operating procedures that have been written.

SOP No.	Title	Draft completed
GENERAL		
GEN001	Methods of euthanasia	yes
GEN002	Care and management of dogs used in the control of pest animals	yes
GEN	Methods of exclusion for a range of species	not done - out of time
GEN	Trapping of animals using the Ecotrap®	not done - out of time
RABBITS		
RAB001	Inoculation of rabbits with RHDV	yes
RAB002	Ground baiting of rabbits with 1080	yes
RAB003	Aerial baiting of rabbits with 1080	yes
RAB004	Ground baiting of rabbits with Pindone	yes
RAB005	Diffusion fumigation of rabbit warrens	yes
RAB006	Rabbit warren destruction using ripping	yes
RAB007	Rabbit warren destruction using explosives	yes
RAB008	Trapping of rabbits using padded-jaw traps	yes
RAB009	Ground shooting of rabbits	yes
FOXES		
FOX001	Ground baiting of foxes with 1080	yes
FOX002	Aerial baiting of foxes with 1080	yes
FOX003	Ground shooting of foxes	yes

SOP No.	Title	Draft completed
FOX004	Fumigation of fox dens	yes
FOX005	Trapping of foxes using padded-jaw traps	yes
FOX006	Trapping of foxes using cage traps	yes
PIGS		
PIG001	Trapping of feral pigs	yes
PIG002	Aerial shooting of feral pigs	yes
PIG003	Ground shooting of feral pigs	yes
PIG004	Use of Judas pigs	yes
PIG005	Poisoning of pigs with 1080	yes
DOGS		
DOG001	Trapping of wild dogs using padded-jaw traps	yes
DOG002	Trapping of wild dogs using cage traps	yes
DOG003	Ground shooting of wild dogs	yes
DOG004	Ground baiting of wild dogs with 1080	yes
DOG005	Aerial baiting of wild dogs with 1080	yes
CATS		
CAT001	Ground shooting of feral cats	yes
CAT002	Trapping of feral cats using cage traps	yes
CAT003	Trapping of feral cats using padded-jaw traps	yes
GOATS		
GOA001	Ground shooting of feral goats	yes
GOA002	Aerial shooting of feral goats	yes
GOA003	Mustering of feral goats	yes
GOA004	Trapping of feral goats	yes
GOA005	Use of Judas goats	yes
DEER		
DEE001	Ground shooting of feral deer	yes
BIRDS		
BIR001	Shooting of pest birds	yes
BIR002	Trapping of pest birds	yes
BIR003	Poisoning of pest birds	not done – out of time
RODENTS		
ROD001	Poisoning of rodents	not done – out of time
ROD002	Fumigation of rodents in grain storage	not done – out of time
ROD003	Trapping of rodents	not done – out of time
HARES		
HAR001	Shooting of hares	yes
HORSE		
HOR001	Ground shooting of feral horses	yes
HOR002	Aerial shooting of feral horses	yes
HOR003	Mustering of feral horses	yes
HOR004	Trapping of feral horses	yes
KANGAROO		
KAN001	Ground shooting of kangaroos	not done - COP already available
KAN002	Use of Finlayson troughs for kangaroo control	not done – out of time

Process used to seek and collate comments on initial drafts

Early in this project (September 2003) three samples of SOPs (Ground Baiting of Foxes with 1080, Inoculation of Rabbits with RHDV and Trapping of Feral Pigs) were circulated to members of the Vertebrate Pest Committee (Natural Resources Ministerial Council), representative animal welfare organisations, individuals who had recently attended an RSPCA workshop on humane vertebrate pest control (RSPCA 2004) and individuals who may have a general interest in the documents (Tables 5).

Table 5. Organisations or individuals providing comments on initial drafts of standard operating procedures.

Contact Name	Organisation
McGaw, Clyde	Executive Officer, Vertebrate Pest Committee
Paul, Amanda	Veterinary Officer, Animal Welfare Unit, NSW Agriculture
Pile, Andrew	Agricultural Protection Officer, NSW Agriculture
Croft, David	Agricultural Protection Officer, NSW Agriculture
Meany, John	Agricultural Protection Officer, NSW Agriculture
Barnes, Tony	Agricultural Protection Officer, NSW Agriculture
Balogh, Suzy	Agricultural Protection Officer, NSW Agriculture
Lane, Christopher	Manager Pest Animals and Insects, Rural Lands Protection Board
Neville, Jason	NSW NPWS
Marks, Clive	Nocturnal Wildlife Research
Jones, Bidda	Scientific Officer, RSPCA
Oogjes, Glenys	Executive Director, Animals Australia
Malcolm, Jane	Bureau of Animal Welfare, VIC
Tate, Steve	Animal Welfare Bureau, VIC
Thomson, Peter	DAWA
Thompson, Jim	EPA QLD
Woodruff, Bill	Environment ACT
Campbell, Shane	QLD
Harris, Stephen	University of Bristol, UK
Dorney, William	NRM, QLD
McPhee, Steve	DPI, VIC
Mahon, Paul	NSW NPWS
Meek, Paul	State Forests NSW
Lugton, Ian	Animal Welfare Unit, NSW Agriculture
Cantrill, Len	Animal Welfare Unit, NSW Agriculture
Hart, Sharelle	DEH
Moore, Robert	DEH
McRae, Damien	DEH
Allen, Lee	NRM, QLD
Gentle, Matthew	VPRU NSW Agriculture
Fleming, Peter	VPRU NSW Agriculture

Samples of draft SOPs and COPs were also presented for discussion at a meeting with staff at the Vertebrate Pest Research Department, Keith Turnbull Institute, Victorian Institute of Animal Science, Frankston and at a meeting of the Victorian Animal

Welfare Advisory Committee (AWAC) Wildlife and Pest Animals Working Group (WPAWG) during a visit to Melbourne in March 2004.

Process used to seek and collate comments on further drafts from key stakeholders

During March to April 2004, draft SOPs and COPs for a number of pest animal species (foxes, rabbits, feral pigs, wild dogs), along with a cover letter (*see Appendix I*) were sent out to relevant State, Territory and Local Government agencies, including the Vertebrate Pests Committee and key non-government, research and industry organisations for comment and “in-principle” endorsement (Table 6). Feedback on the documents was also sought through an article prepared by Robert Verhey, Strategy Manager for the Local Government Association and Shires Association of NSW. The article appeared in the 30th April Edition of the electronic newsletter “NRM update for local government in NSW”. Following the appearance of this article there were over a dozen requests for copies of SOPs and COPs. All comments received in this process were documented and provided to the Australian Government Department of the Environment & Heritage. These comments were then considered carefully in relation to the terms of reference for the SOPs and COPs, their relevance in comparison to established literature, legislation and of course the animal welfare implications. This process in turn determined if it was appropriate to modify the documents in light of the comments received.

Table 6. Organisations and committees contacted to review drafts of standard operating procedures and codes of practice

Organisation/Committee	Contact
Vertebrate Pest Committee	Clyde McGaw – Executive Officer
Natural Resource Policies and Programs Committee [#]	Carolyn Wood – Secretariat
Animal Health Committee – Animal Welfare Working Group	David Mitchell – Secretariat
VIC Animal Welfare Advisory Committee - WPAWG	Glenys Oogjes – Convener
National Consultative Committee on Animal Welfare	Ann Connolly – Secretariat
National Farmers Federation	Peter Arkle – Policy Manager, Rural Affairs
Australian Veterinary Association	Margaret Conley – Chief Executive Officer
RSPCA	Bidda Jones – Scientific Officer
NSW Rural Lands Protection Board	Steve Orr - Chief Executive Officer
Pest Animal CRC	Tony Peacock

[#]Note: The Natural Resource Policies and Programs Committee only received the first two mail outs (foxes and rabbits).

List of animal welfare concerns, inconsistencies, anomalies and gaps in knowledge

The following is a list of concerns, inconsistencies and gaps in knowledge compiled during writing of the SOPs and COPs. Some are general concerns whilst others are relevant to specific techniques:

- There needs to be uniformity of approach to pest animal control across jurisdictions. Different methods are used in different states and there is no reason why they cannot be standardised eg. strychnine is used in fox baits in QLD but not in other states, steel jaw traps are banned in NSW, Tasmania and the ACT but are still used in other states.
- There are apparent disparate welfare standards for the control of different species. For example, in general the methods used to control foxes are relatively humane compared to those used for pigs or rabbits. Much of the research into new humane techniques has tended to focus on fox control, but inhumane techniques used for pig and rabbit control, namely the use of anticoagulants, CSSP, chloropicrin and warren blasting and ripping are still being used.
- Although the SOP's recommend the most humane way to conduct the control methods, this may not necessarily correspond with 'approved label' instructions, eg. the approved label for Den-Co-Fume does not state how old fox cubs must be when they are fumigated, but this will be stipulated in the SOP. If SOP's are going to be followed, they must be cross linked with the approved labels and permits. There is no point having two separate sets of instructions for use.
- There are still many inconsistencies between states with regard to the use of 1080, despite the recommendations provided by the 1080 Working Group of the Vertebrate Pests Committee. Action needs to be taken to ensure these recommendations are phased in over the next 3 years.
- In NSW, the instructions for use on the approved label for 1080 fox baits are very specific. But the off-label permit for use of strychnine cloths on wild dog traps is vague and does not give specific instructions for use.
- 10 mg of 1080 per bait is still being used in some areas of QLD despite recommendations made in a report to the VPC in 1993 that they be standardised to 6 mg per bait.
- Leg-hold traps for foxes must be checked everyday, but when setting traps for wild dogs they are not required to be checked daily as long as strychnine cloths are used.
- There are conflicting methods for using strychnine cloths on foot-hold traps. The main concern is that the dosage of strychnine is inconsistent. Some operators soak the cloths in a standard solution of strychnine to obtain 1 gram per cloth, whilst others add ¼ to ½ of a teaspoon to the cloth. How do we know if the trapped dog is getting the optimum dose for a quick death if the amount of strychnine is not standardised? It is important that the dog gets a lethal dose of strychnine to ensure that death is quick (although still not painless). If it only ingests a small amount it can take up to 24 hours to die, which defeats the purpose of putting the cloths on the traps in the first place. Observations are required of dogs caught in strychnine bound traps to answer the questions: how long does it take for the dog to die; does this time vary

depending on the method used; and which method is more humane - the strychnine-soaked cloths used in NSW or the strychnine crystals used in other states?

- Research into a humane alternative to strychnine is needed. The use of strychnine as a toxicant is being phased out in most states, although it is still registered for use against foxes in Queensland, and for wild dogs in some states (mainly for the binding of leg-hold traps) Strychnine baits are viewed as inhumane because the affected animals remain conscious and appear to suffer pain and anxiety from the onset of clinical signs through to death from asphyxia and exhaustion.
- There has been a lot of research on the effect of 1080 on non-target species, but there is a lack of information on non-target effects of other poisons eg. CSSP, pindone.
- A system of reporting non-target poisoning incidents needs to be set up eg. poisoning of dogs with 1080 baits meant for foxes, or kangaroos from pindone baited carrots meant for rabbits. For example, incidents could be reported to the newly established Wildlife Health Network.
- It is more humane to receive a large dose of anticoagulant and die relatively quickly than to receive smaller doses over a period of time. Current pindone baiting methods for rabbits recommend the use of smaller doses, because it is more effective. This is a good example of the trade-off between humaneness and efficacy. There is a lot of confusion as to whether this is true. Studies need to be undertaken to assess the time to death and effects of dose rates with anticoagulants.
- The sensitivity to pindone of key non-target species (eg. bandicoots, macropods, quolls) has not been fully assessed. Also, the effect of secondary poisoning on populations of birds of prey is not fully known. Incident reports can provide valuable information on no-target impacts.
- Why are there no minimum distance requirements for laying pindone poisoned baits?
- There appears to be inconsistent doses of pindone being used. Most oats baits contain 0.5g/kg, but the concentration used in WA is 0.25g/kg. Carrot baits are meant to contain 0.25g/kg but the baits produced by DNRE, VIC are 0.5g/kg.
- Phosphine and chloropicrin are considered inhumane fumigants for foxes but they are still registered for use with rabbits. CO is considered to be more humane and is registered for foxes, why not for rabbits?
- It is recommended that inhalant agents not be used alone for euthanasia in animals less than 16 weeks of age. However, fumigation of fox cubs with carbon monoxide is currently occurring at much younger ages than this. The final report from the assessment of DEN-CO-FUME cartridges recommended that fumigation occur only when cubs > 4weeks of age are present, but there is no mention of this on the approved label and instructions for use. Also, the rates of application in this label are misleading. Following the approved label instructions may not produce optimum concentrations of CO. Like all control procedures, the humaneness of a technique lies in whether or not it is correctly done.
- Dogging of feral pigs is very controversial and needs to be addressed.
- Non-target poisoning would be reduced if meat baits were not used with 1080 for poisoning of feral pigs (this still occurs in Queensland).

- Behavioural observations of poisoned animals are required to assess many of the poisons currently used. For example:
 - wild dogs & strychnine cloths (how long until death, is time to death variable depending upon how much they chew on the cloth, do some dogs not chew as much as others)
 - feral pigs and 1080, warfarin, CSSP
 - rabbits (and ? hares) and pindone
- Much of the information we have on poisons is quite old and the research/observations has not been conducted under field conditions or only applies to one group of animals
- With the poisoning methods, should we be recommending that monitoring is performed to detect animals that show signs of sub-lethal intoxication, so that they can be humanely killed? This is stated in the draft COP for killing, capture, handling and marketing of feral livestock animals.
- With regard to shooting, dogs should not be allowed to catch and injure target animals but this seem to be accepted practice especially with feral pigs, rabbits, hares
- With regard to the mustering of goats, the draft COP for killing, capture, handling and marketing of feral livestock animals recommends that capture and handling should not occur over the 2-3 months in spring/summer when breeding is at its peak. This is also the hottest time of the year. However, best practice management recommends mustering when it is dry, so that groups of goats are congregated around water holes. Live goat exports peak during January. This is also the case with feral horses.
- Inappropriate firearms (as in the NSW NPWS shooting protocol) are currently being used to cull feral deer (i.e. .22 calibre rifles with silencers are used on hinds, yearlings and juveniles). Inappropriate ammunition was also used to cull horses in Guy Fawkes National Park – see English report on the cull. FFAST procedures and the Draft COP for killing, capture, handling and marketing of feral livestock animals state that 180 grain ammunition should be used for aerial shooting of horses, but only 150 grain was used (unless this is an error in the English report).
- In NSW, 1080 poisoned oats for rabbits are only permitted to be laid in trails (not broadcast), however in WA (and also ?Vic) they can be broadcast. Also one-shot oats can be distributed aerially which would seem to create a serious non-target risk. Why not standardise the method of bait distribution (oats - one-shot or conventional - in trails, carrots - in trails or broadcast on the ground or from the air).
- Post-mortems are needed on rabbits that have been killed by fumigation, ripping, blasting, LPG technology (Rid-a-Rabbit). Pathological lesions observed at post mortem can provide information as to whether the animal experienced pain, fear and distress before death (see Welfare of free-living wild animals paper – Kirkwood et al. 1994). Observations of rabbits killed by the above methods would help with an assessment of the humaneness of the technique. It is very difficult to know what the rabbit experiences during the control procedure as everything occurs underground. Anoxia, suffocation and infliction of severe injury are not thought to be humane ways to die.
- Are the poisons (esp. the long acting ones like anticoagulants) used for vertebrate pest control excreted in the milk of lactating females? Do dependent young get a dose of the poison from the mother or does she die and they are

- left to die of starvation. This is mostly applicable to young rabbits, piglets, rodents.
- Welfare standards are needed for the transport, handling, slaughter and export of live feral goats. These exist for some other species but there is little detailed, useful information on goats. There is a MCOP for the goat but it has not been updated since 1991 and is aimed at domesticated goats rather than feral goats.
 - Control methods are often carried out at time of the year when the welfare of animals will be most negatively affected e.g. trapping of goats at water is most effective during hot/dry periods however this is the time when they will be most affected by heat stress during yarding, transporting etc. and is usually when they are kidding. Also, poisoning of feral pigs with 1080 is recommended during dry seasons but this is when it is most likely that pigs will be farrowing. This trade-off between effectiveness of a control technique and animal welfare occurs often in pest animal control programs.
 - Freezing of fresh meat baits containing 1080 is not recommended because it is thought that during the process of thawing, the concentration of 1080 is diluted which can lead to sub-lethal dose rates (from NSW Agriculture Circular No. AI 2001/3050). This does not appear to have been substantiated by research. In fact, baits that are sent to laboratories for 1080 analysis are frozen until processed. Also dried meat baits are routinely frozen before use in WA.
 - Material safety data sheets (MSDS) for 1080 and 1080-containing manufactured baits recommend inducing vomiting for first-aid in cases of human poisoning. However, the Poisons Information Centre does *not* recommend vomiting. Many people have commented that they think it more sensible to induce vomiting if 1080 has been ingested. This is because during the latent period, before clinical signs of toxicosis appear, there would be little risk of the patient becoming unconscious and aspirating vomit.
 - Use of S4 drugs especially sodium pentobarbitone (e.g. Lethobarb) for euthanasia is a very grey area especially in field situations. Sedatives (e.g. ketamine, xylazine) are commonly used by researchers to immobilise large and/or aggressive feral animals e.g. feral pigs, so why is the use of barbiturate controversial? Both are S4 drugs and both are open to abuse – but sedatives seem to be accepted as current practice, and Lethobarb is not.

Stage 4: Prepare final versions (for DEH) of the codes of practice and standard operating procedures incorporating comments (where appropriate) from previous stages of the project.

All completed documents are included in Appendix 2 at the end of this report.

Bibliography

The following bibliography is not exhaustive but covers relevant literature that has been found in searches and/or referred to in the standard operating procedures. Further reference material is included with each COP and SOP.

- Agriculture and Resource Management Council of Australia and New Zealand (1996). AUSVETPLAN Operational Procedures Manual: Destruction of animals.
- American Veterinary Medical Association (2001). 2000 Report of the AVMA Panel on Euthanasia. *Journal of the American Veterinary Medical Association* 218, 669-696.
- Anon. (1991). Culling of large feral animals in the Northern Territory. Recommendations and major conclusions. Report by the Senate Select Committee on Animal Welfare, June 1991.
- Anon. (1995). Den-Co-Fume® carbon monoxide fumigant cartridge for the control of foxes in natal dens. Information update #13 Sept. 1995. Brooklyn, Victoria.
- Anon. (1995). Evaluation of carbon monoxide cartridges for the fumigation of fox natal dens (final report). Keith Turnbull Institute Research Institute and Applied Biotechnologies Ltd. Frankston, Victoria.
- Anon. (1997). Vertebrate Pesticide Manual: A guide to the use of vertebrate pesticides in Queensland. Department of Natural Resources, Queensland.
- Anon. (1998). Guidelines for the Capture, Handling and Care of Mammals. American Society of Mammalogists.
- Anon. (2002). Sodium fluoroacetate (1080). Department of Natural Resources and Mines, Queensland.
- Anon. (2002). SOP-001 Fox control for Biodiversity Conservation. Biodiversity Conservation Program, National Parks and Wildlife, South Australia.
- Anon. (2002). The NRA review of pindone. National Registration Authority for Agricultural and Veterinary Chemicals. Canberra.
- Anon. (2003). Farmnote no. 32/2003. Guide to the safe use of 1080 poison. Department of Agriculture. Bunbury, Western Australia.
- Anon. (2003). Vertebrate Pest Control Manual (Draft). Agriculture Protection Program, NSW Agriculture.
- Australasian Vertebrate Pest Conference (2001). Proceedings of the 12th Australasian Vertebrate Pest Conference 21-25 May, 2001, Melbourne, Australia. Natural Environment and Resources, Melbourne.
- Australian Veterinary Association (1997). Member's Directory and Policy Compendium.
- Australian and New Zealand Council for the Care of Animals in Research and Teaching (2001). Euthanasia of animals used for scientific purposes. ANZCCART, Glen Osmond, South Australia.
- Blackmore, D. K., Bowling, M. C., Madie, P., Nutman, A., Barnes, G. R. G., Davies, A. S., Donoghue, M., and Kirk, E. J. (1995). The use of a shotgun for the emergency slaughter or euthanasia of larger mature pigs. *New Zealand Veterinary Journal* 43, 134-137.
- Bloomfield, T. (2001). Landcare Notes. Rabbit control using pindone poison. Department of Natural Resources and Environment, Victoria.
- Bureau of Animal Welfare (2001). Code of accepted farming practice for the welfare of pigs. Department of Natural Resources and Environment, Attwood, Victoria.

- Caley, P. (1994). Factors affecting the success rate of traps for catching feral pigs in a tropical habitat. *Wildlife Research* **21**, 287-292. 1994.
- Canadian Council on Animal Care (2003). Guidelines on the care and use of wildlife. CCAC, Ottawa, Canada.
- Chasey, D. (1997). Rabbit haemorrhagic disease – the new scourge of *Oryctolagus cuniculus*. *Laboratory Animals* **31**, 33-44.
- Choquenot, D., McIlroy, J., and Korn, T. (1996). Managing vertebrate pests: feral pigs. Australian Government Publishing Services, Canberra, ACT.
- Commonwealth Scientific and Industrial Research Organisation (unknown). Rabbit Calicivirus Injection package leaflet. Division of Wildlife Ecology, CSIRO, Gungahlin, ACT.
- Cooper, D. W. (1995). Marsupials and animal welfare - the issues. ANZCCART News 8[4], 1-2.
- Decker, D. J. and Brown, T. L. (1987). How animal rightists view the wildlife management - hunting system. *Wildlife Society Bulletin* **15**, 599-607.
- DEFRA (2003). Getting it right, first time, every time: Practical guidance on the management and operation of large-scale humane killing of livestock during emergencies. Department for Environment, Food & Rural Affairs, United Kingdom.
- Eason, C. T. and Jolly, S.E. (1993). Anticoagulant effects of pindone in the rabbit and Australian brushtail possum. *Wildlife Research*, **20**, 371-374.
- Eason, C., Wickstrom, M., Milne, L., Warburton, B., and Gregory, N. (1998). Implications of animal welfare considerations for pest control research: the possum as a case study. Ethical approaches to animal-based science. Proceedings of the Joint ANZCCART-NAEAC Conference held in Auckland, New Zealand, 19-20 September 1997.
- Eason, C. T. and Wickstrom, M. (2001). Vertebrate Pesticide Toxicology Manual (Poisons): Information on poisons used as vertebrate pesticides. Technical Series 23. Department of Conservation, Wellington, New Zealand.
- Edwards, G. P., Piddington, K. C., and Paltridge, R. M. (1997). Field evaluation of olfactory lures for feral cats (*Felis catus* L) in Central Australia. *Wildlife Research* **24**, 173-183. 1997.
- Eldridge, S. R., Berman, D. M., and Walsh, B. (2000). Field evaluation of four 1080 baits for dingo control. *Wildlife Research* **27**, 495-500.
- Fisher, P. and Marks, C. A. (eds.). (1996). Humaneness and Vertebrate Pest Control: Proceedings of the seminar held on March 27th, 1996. Vertebrate Pest Research Unit, Report Series No. 2. Department of Natural Resources and Environment, Victoria.
- Fleming, P., Corbett, L., Harden, R., and Thomson, P. (2001). Managing the impacts of dingoes and other wild dogs. Bureau of Rural Sciences, Canberra.
- Fleming, P. J. S., Allen, L. R., Berghout, M. J., Meek, P. D., Pavlov, P. M., Stevens, P., Strong, K., Thompson, J. A., and Thomson, P. C. (1998). The performance of wild-canid traps in Australia: efficiency, selectivity and trap-related injuries. *Wildlife Research* **25**, 327-338.
- Gentle, J. R. The evolution of anti-trapping sentiment in the United States: a review and commentary. *Wildlife Society Bulletin* **15**, 490-503. 1987.
- Gould, A. R., Kattenbelt, J. A., Lenghaus, C., Morrissy, C., Chamberlain, T., Collins, B. J., and Westbury, H. A. (1997). The complete nucleotide sequence of rabbit haemorrhagic disease virus (Czech strain V351) - use of the polymerase chain

- reaction to detect replication in Australian vertebrates and analysis of viral population sequence variation. *Virus Research* **47**, 7-17.
- Grandin, T. (1994). Euthanasia and slaughter of livestock. *Journal of the American Veterinary Medical Association* **204**,1354-1360.
- Gregory, G. (1996). Perception of pain associated with 1080 poisoning. In Fisher, P.M. and Marks, C. A. (eds.). *Humaneness and Vertebrate Pest Control: Proceedings of the seminar held on March 27th, 1996*. Vertebrate Pest Research Unit, Report Series No. 2. Department of Natural Resources and Environment, Victoria. Ropet Printing. Tynong North, Victoria. pp. 62-66.
- Hart, S., Marks, C. A. and Staples, L. (1996). Den-Co-Fume – Humane control of foxes (*Vulpes vulpes*) in natal dens. In: Fisher, P. M. & Marks, C. A. (Eds.) *Humaneness and Vertebrate Pest Control*. Ropet Printing. Tynong North, Victoria. pp 58-61.
- Hubert, G. F., Hungerford, L. L., and Bluett, R. D. (1997). Injuries to coyotes captured in modified foothold traps. *Wildlife Society Bulletin* **25**, 858-863.
- Hubert, G. F. Jr., Wollenberg, G. K., Hungerford, L. L., and Bluett, R. D. (1999). Evaluation of injuries to Virginia opossums captured in the EGGTM trap. *Wildlife Society Bulletin* **27**, 301-305.
- Kay, B., Gifford, E., Perry, R., Ven, R. van de, and van de Ven, R. (2000). Trapping efficiency for foxes (*Vulpes vulpes*) in central New South Wales: age and sex biases and the effects of reduced fox abundance. *Wildlife Research* **27**[5], 547-552.
- Kirkwood, J. K., Sainsbury, A. W. and Bennet, P. M. (1994). The welfare of free-living wild animals: methods of assessment. *Animal Welfare* **3**, 257-273.
- Kreeger, T. J., White, P. J., Seal, U. S., and Tester, J. R. (1990). Pathological responses of red foxes to foothold traps. *Journal of Wildlife Management* **54**, 147-160.
- Lewis, A. R., Pinchin, A. M., and Kestin, S. C. (1997). Welfare implications of the night shooting of wild impala (*Aepyceros Melampus*). *Animal Welfare* **6**, 123-131.
- Linhart, B. and Dasch, G. J. (1992). Improved performance of padded jaw traps for capturing coyotes. *Wildlife Society Bulletin* **20**, 63-66.
- Linscombe, R. G. and Wright, V. L. (1988). Efficiency of padded foothold traps for capturing terrestrial furbearers. *Wildlife Society Bulletin* **16**, 307-309.
- Litten, K. E., Mellor, D. J., Warburton, B., and Eason, C. T (2004 - in press). Animal Welfare and Ethical Issues Relevant to the Humane Control of Vertebrate Pests. *New Zealand Veterinary Journal* .
- Loague, P. (1993). Pest control and animal welfare. *New Zealand Journal of Zoology* **20**, 253-255.
- Longair, J. A., Finley, G. G., Laniel, M. A., MacKay, C., Mould, K., Olfert, E. D., Rowsell, H. and Preston, A. (1991). Guidelines for euthanasia of domestic animals by firearms. *Canadian Veterinary Journal* **32**, 724-726.
- Ludders, J. W., Schmidt, R. H., Dein, F. J., and Klein, P. N. (1999) Drowning is not euthanasia. *Wildlife Society Bulletin* **27**, 666-670.
- Lukins, B. S. (1989). Feral pigs: trapping in New South Wales, Agfact A9.0.15. New South Wales Agriculture.
- MAF (1996). Code of recommendations and minimum standards for the emergency slaughter of farm livestock. Code of Animal Welfare no. 19. Ministry of Agriculture and Forestry, New Zealand.

- Marks, C. (2001). Field protocol for the handling and inoculation of wild rabbits with rabbit calicivirus (RCD). Victorian Institute of Animal Science, Vertebrate Pest Research Unit, Frankston, Victoria.
- Marks, C. A. (1996). A radiotelemetry system for monitoring the treadle snare in programs for control of wild canids. *Wildlife Research* **23**, 381-386.
- Marks, C. A. (1996). Research directions for humane burrow fumigation and 1080 predator baiting. In: Fisher, P. M. & Marks, C. A. (Eds.) *Humaneness and Vertebrate Pest Control*, Ropet Printing. Tynong North, Victoria. pp 50-57.
- Marks, C. A. (1998). Field assessment of electric fencing to reduce damage by the Common Wombat *Vombatus ursinus*. In 'Wombats'. (R. T. Wells and P. A. Pridmore (Eds.) pp. 298-304, Chapter 29. Surrey Beatty & Sons, Chipping Norton.
- Marks, C. A. (1998). Review of the humaneness of destruction techniques used on the Common Wombat *Vombatus ursinus* in Victoria. In 'Wombats'. (R. T. Wells and P. A. Pridmore (Eds.) pp. 287-297, Chapter 28. Surrey Beatty & Sons, Chipping Norton.
- Marks, C. A., Gigliotti, F., and Busana, F. (2002). Estimated 1080 dose rate for the M-44 ejector for the control of red foxes (*Vulpes vulpes*). *Wildlife Research* **29**, 291-294.
- Marks, C. A., Hackman, C., Busana, F., and Gigliotti, F. (2000). Assuring that 1080 toxicosis in the red fox (*Vulpes vulpes*) is humane: fluoroacetic acid (1080) and drug combinations. *Wildlife Research* **27**, 483-494.
- Martin, G. R., Sutherland, R. J., Robertson, I. D., Kirkpatrick, W. E., King, D. R. and Hood, P. J. (1991). Assessment of the potential toxicity of the anticoagulant pindone (2-pivalyl 1, 3 indandione), to domestic animals. *Australian Veterinary Journal*, **68**, 241-243.
- Martin, G. R., Kirkpatrick, W. E., King, D. R., Robertson, I. D., Hood, P. J and Sutherland, J. R. (1994). Assessment of the potential toxicity of the anticoagulant pindone (2-pivalyl 1, 3 indandione), to some Australian birds. *Wildlife Research*, **21**, 85-93.
- Mason, G. and Littin, K. E. (2003). The humaneness of rodent pest control. *Animal Welfare* **12**, 1-37.
- McGaw, C. C. and Mitchell, J. (1998). Feral pigs (*Sus scrofa*) in Queensland. Pest Status Review Series-Land Protection. Department of Natural Resources and Mines, Queensland.
- Mckenzie, A. (1989). Humane modification of steel foothold traps. *South African Journal of Wildlife Research* **19**, 53-56.
- Meek, P. D., Jenkins, D. J., Morris, B., Ardler, A. J., and Hawksby, R. J. (1995). Use of two humane leg-hold traps for catching pest species. *Wildlife Research* **22**, 733-739.
- Mellor, D. (ed.), Fisher, M. (ed.), and Sutherland, G. (1998). Ethical approaches to animal-based science. Proceedings of the Joint ANZCCART/NAEAC Conference held in Auckland, New Zealand, 19-20 September 1997.
- Moe, R. O. and Bakken, M. (1998). Anxiolytic drugs inhibit hyperthermia induced by handling in farmed silver foxes (*Vulpes vulpes*). *Animal Welfare* **7**, 97-100.
- Molsher, R. L. (2001). Trapping and demographics of feral cats (*Felis catus*) in central New South Wales. *Wildlife Research* **28**, 631-636.
- National Health and Medical Research Council (1997). Australian Code of Practice for the Care and Use of Animals for Scientific Purposes. Australian Government Publishing Service, Canberra.

- NSW Agriculture (1996). Division of Animal Industries Circular 96/39. Inoculation of wild rabbits with calicivirus.
- NSW Agriculture (1997). Animal care: NSW Agriculture Approved Procedures for the Use of Animals in Teaching, Research and Extension.
- NSW Agriculture, NSW National Parks & Wildlife Service, Rural Lands Protection Boards, NSW Police (2003). Feral Animal Aerial Shooting Team (FAAST) Management and Training System.
- OIE (2000) World Organisation for Animal Health, Manual of Standards, Diagnostic Techniques and Vaccines, Chapter 2.8.3 *Rabbit Haemorrhagic Disease*.
- Olfert, E. D., Cross, B. M. and McWilliam A.A. (eds.) (1993). Guide to the care and use of experimental animals. Vol.1, 2nd Ed. Canadian Council on Animal Care, Ottawa.
- Olsen, G. H., Linscombe, R. G., Wright, V. L., and Holmes, R. A. (1988). Reducing injuries to terrestrial furbearers by using padded foothold traps. *Wildlife Society Bulletin* **16**, 303-307.
- Onderka, D. K., Skinner, D. L., and Todd, A. W. (1990). Injuries to coyotes and other species caused by four models of footholding devices. *Wildlife Society Bulletin* **18**, 175-182.
- Phillips, R. L., Gruver, K. S., and Williams, E. S. (1996). Leg injuries to coyotes captured in three types of foothold traps. *Wildlife Society Bulletin* **24**, 260-263.
- Phillips, R. L. and Mullis, C. (1996). Expanded field testing of the no. 3 victor soft catch trap. *Wildlife Society Bulletin* **24**, 128-131.
- Rafferty, D. (2003). Farmnote no. 33/2002. Guide to the safe use of strychnine for jawed traps. Department of Agriculture, Bunbury, Western Australia.
- Remfry, J. (1996). Feral cats in the United Kingdom. *Journal of the American Veterinary Medical Association* **208**, 520-523.
- Ross, J., Page, R. J. C., Nadian, A. K. and Langton, S. D. (1998). The development of a carbon monoxide producing cartridge for rabbit control *Wildlife Research*, **25**, 305-314.
- RSPCA. (2003). Solutions for achieving humane vertebrate pest control. Proceedings of the 2003 RSPCA Australia Scientific Seminar held at the Telstra Theatre, Australian War Memorial, Canberra 25 February, 2003. (Draft April, 2003). Royal Society for the Prevention of Cruelty to Animals Australia, Deakin West, ACT.
- Rutherford, K. M. D.(2002).Assessing pain in animals. *Animal Welfare* **11**, 31-53.
- Sahr, D. P. and Knowlton, F. F. (2000). Evaluation of tranquilizer trap devices (TTDs) for foothold traps used to capture gray wolves. *Wildlife Society Bulletin* **28**, 597-605.
- Saunders, G., Coman, B., Kinnear, J. and Braysher, M. (1995). Managing vertebrate pests: foxes. Australian Government Publishing Service, Canberra.
- Saunders, G., Kay, B., and Nicol, H. (1993). Factors affecting bait uptake and trapping success for feral pigs (*Sus scrofa*) in Kosciusko National Park. *Wildlife Research* **20**, 653-665.
- Saunders, G., McLeod, S., and Kay, B. (2000). Degradation of sodium monofluoroacetate (1080) in buried fox baits. *Wildlife Research* **27**, 129-135.
- Short, J., Turner, B., and Risbey, D. (2002). Control of feral cats for nature conservation. III. Trapping. *Wildlife Research* **29**, 475-487.
- Skinner, D. L. and Todd, A. W. (1990). Evaluating efficiency of footholding devices for coyote capture. *Wildlife Society Bulletin* **18**, 166-175.

- Standing Committee on Agriculture Animal Health (1991). Model code of practice for the welfare of animals. Feral livestock: destruction or capture, handling and marketing. CSIRO, Melbourne Victoria.
- Thompson, P. (2003). Wild dog control: Facts behind the strategies. Department of Agriculture, South Perth, Western Australia.
- Thomson, P. (2002). Farmnote no. 29/2002. Wild dog control. Department of Agriculture, Forrestfield, Western Australia.
- Thomson, P. C. and Algar, D. (2000). The uptake of dried meat baits by foxes and investigations of baiting rates in Western Australia. *Wildlife Research* **27**, 451-456.
- Travaini, A., Laffitte, R., and Delibes, M. (1996). Leg-hold trapping red foxes (*Vulpes vulpes*) in Donana National Park: efficiency, selectivity and injuries. *Journal of Wildlife Research* **1**, 52-56.
- Tribe, A. and Spielman, D. (1996). Restraint and handling of wildlife. ANZCCART News 9[1], insert, 1-8.
- Turkowski, F. J., Armistead, A. R., and Linhart, S. B. (1984). Selectivity and effectiveness of pan tension devices for coyote foothold traps. *Journal of Wildlife Management* **48**, 700-708.
- Tuytens, F. A. M. and Macdonald, D. W. (1998). Fertility control – an option for non-lethal control of wild carnivores. *Animal Welfare* **7**, 339-364.
- Twigg, L. E., Lowe, T. J., Martin, G. R. and Gray, G. S. (1999). A review of the anticoagulant pesticide pindone. Vertebrate Pest Research Services. Department of Agriculture, Western Australia.
- Twigg, L. E., Eldridge, S. R., Edwards, G. P., Shakeshaft, B. J., dePreu, N. D., and Adams, N. (2000). The longevity and efficacy of 1080 meat baits used for dingo control in central Australia. *Wildlife Research* **27**, 473-481.
- Universities Federation for Animal Welfare (1980). The ecology and control of feral cats: Proceedings of a symposium held at Royal Holloway College, University of London 23rd and 24th September, 1980. UFAW, Potters Bar, England.
- Universities Federation for Animal Welfare (1985). Humane Control of Land Mammals and Birds: Proceedings of a symposium held at the University of Surrey, 17th to 19th September, 1984. UFAW, Potters Bar, England.
- Universities Federation for Animal Welfare (1988). Humane Killing of Animals (4th edition). UFAW, Potters Bar, England.
- Warburton, B. (1998). The ‘humane’ trap saga: a tale of competing ethical ideologies. Ethical approaches to animal-based science. Proceedings of the Joint ANZCCART-NAEAC Conference held in Auckland, New Zealand, 19-20 September 1997.
- Warburton, B. (1992). Victor foot-hold traps for catching Australian brushtail possums in New Zealand: capture efficiency and injuries. *Wildlife Society Bulletin* **20**, 67-73.
- White, P. C. L., Newton-Cross, G. A., Moberly, R. L., Smart, J. C. R., Baker, P. J., and Harris, S. (2003). The current and future management of wild mammals hunted with dogs in England and Wales. *Journal of Environmental Management* **67**, 187-197.
- White, P. J., Kreeger, T. J., Seal, U. S., and Tester, J. R. (1991). Pathological Responses of Red Foxes to Capture in Box Traps. *Journal of Wildlife Management* **55** (1), 75-80.
- Williams, K., Parer, I., Coman, B., Burley, J and Braysher, M. (1995). Managing vertebrate pests: rabbits. Australian Government Publishing Service, Canberra.

Appendix 1: Cover Letter



Vertebrate Pest Research Unit

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Development of an agreed code of practice and standard operating procedures for the humane capture, handling or destruction of pest animals in Australia.

An ideal vertebrate pest control method should be humane, target specific, efficient, cost-effective and safe for humans to use. Current approaches to feral animal control tend to focus primarily on lethality to the pest and cost-effectiveness, whilst humaneness receives little attention. Standard operating procedures (SOPs) that discuss animal welfare impacts for target and non-target species, describe the technique and its application, as well as covering health and safety aspects are required. These procedures are intended for all staff who are engaged in pest animal control; from researchers through to pest control officers and land managers.

Agreement on these procedures will produce a number of advantages including: uniform implementation of techniques; reducing adverse publicity associated with inhumane practices; documents which afford uniform training and proficiency in pest animal control and; reducing the need to continually justify to regulatory bodies why and how pest animal control is implemented. At the same time, the procedures need to reflect common sense and applicability across the range of situations and environments in which they are to be used.

To ignore the need to nationally address animal welfare concerns, particularly for the short-term protection of unacceptable practices, jeopardises the transparency, public acceptance and long-term implementation of effective pest animal control programs.

NSW Agriculture recently obtained Natural Heritage Trust funding through the Commonwealth Department of Environment and Heritage to undertake the writing of pest animal control SOPs. Trudy Sharp was subsequently employed to carry out this project. Trudy provided the necessary expertise in animal welfare while members of the Department's Agricultural Protection Program provided the necessary input on pest animal control techniques. Information and review has also been provided by many officers in equivalent State and Territory agencies.

Most of the documents have been prepared and we now seek comment and "in-principle" endorsement from relevant State, Territory and Local Government agencies, including the Vertebrate Pests Committee and key non-government, research and industry organisations. Rather than send all documents out at once we will stagger the forwarding of these by pest species; the first group being foxes. We urge everyone to participate in this process. Where applicable, it may help if the groups of documents are fostered out to the appropriate species specialists within each

organisation. Where comments are provided by individuals please identify who and where they can be contacted in case clarification or follow up is required. We would prefer comments to be provided electronically in 'track changes' mode where possible.

The writing of these documents has been a difficult task given inconsistencies across the various State, Territory and Commonwealth legislations. Trudy has tried to accommodate these inconsistencies by making SOPs generic wherever possible and cross referencing to specific State and Territory requirements. Legislation, technologies and techniques will always be changing – these documents will need to be updated regularly but importantly, this is where the process starts. We would appreciate constructive comment. If any agencies find particular issues unacceptable in terms of their pest animal control operations, please explain why rather than just ruling them out of hand. Part of the contracted process is to identify such issues and to provide comment on how any concerns might be addressed.

As well as the SOPs, a Code of Practice (COP) for each species had been drafted which covers general information on best practice management, control strategies, species biology/impact and an overview of the humaneness of current control methods. Six SOPs and the COP for foxes are attached separately. The documents for other species (i.e. rabbits, pigs, dogs, cats, goats, deer, birds, rodents etc.) will follow at weekly/fortnightly intervals.

Please provide comments on all documents to either myself glen.saunders@agric.nsw.gov.au or Trudy Sharp trudy.sharp@agric.nsw.gov.au by Friday the 28th May, 2004.

Many thanks for your participation in this important project.

Yours sincerely,

Glen Saunders
24.3.04

Appendix 2. COPs and SOPs