Animal Research Statistics Tasmania

ANNUAL REPORT

Number 13 (2008)

September 2009

Department of Primary Industries, Parks, Water and Environment

Tasmania
Explore the possibilities

This report has been compiled in accordance with Section 35 of the *Animal Welfare Act 1993* from animal usage statistics submitted by institutions licensed under the Act for the period 1 January 2008 to 31 December 2008.

Compiled by Mary Lou Conway

On behalf of the Animal Health and Welfare Branch

Department of Primary Industries, Parks, Water and Environment

New Town Research Laboratories, 13 St Johns Avenue, New Town 7008

August 2009

SUMMARY

This report details animal use in Tasmania from 1st January to 31st December 2008. The summaries and analyses in this report are compiled from raw project data submitted by licensed institutions. Data was collected on live, non-human vertebrates and cephalopods including fully metamorphosed juveniles. The report complies with the nationally agreed definitions for the collation of statistics of animal use for scientific purposes.

A total of 38 institutions were licensed during the reporting period, of which 24 conducted animal research in Tasmania including 9 interstate institutions. No overseas institutions conducted research in Tasmania during 2008.

During 2008, 159 individual research and teaching projects used a total of 140087 animals. This is a substantial increase on 2007 (125 projects using 87,344 animals), reversing the decline in the number of animals used in research and teaching in Tasmania observed for the previous 3 years. Most of the increase was attributed to a single observational project involving 60,000 birds however.

Increases were recorded in all animal categories except aquatic animals which decreased 30%. Owing to the large bird project already mentioned, there was a dramatic increase in the number of birds involved in research with over 9 times the 2007 numbers used. Birds were also the most commonly used category in 2008 (47.5%) followed by aquatic animals (28.6 %). The increase in native animal research during 2008 continued the upward trend seen in 2007. Despite the substantial change in the number of animals within each category, the proportion of projects using each animal category did not change significantly in 2008 compared to 2007.

There was a large increase in the proportion of animals involved in environmental studies in 2008. Decreases were reported in the number of animals used for the purposes of Management and production and Understanding biology. While fewer projects were reported for educational purposes, the number of animals used increased in 2008. The proportion of animals that experienced relatively non-invasive procedures (Observation with minor interference, Minor conscious procedures and Minor physiological challenge) increased from 60% in 2007 to over 90% in 2008. There was one Death as an end point project conducted in 2008.

1. INTRODUCTION

1.1 Regulation of animal research in Tasmania

Animal research in Tasmania is regulated via several mechanisms.

(a) Animal Research Legislation

Part 4 of the *Animal Welfare Act 1993* (the Act) deals with animal research. Since its proclamation on 1st April 1996, all research institutions are required to be

licensed by the Minister to conduct animal research in Tasmania. Compliance with the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes* (the approved research Code of Practice) is a core condition of research licences nationally. The current edition of the Code (7th Edition 2004) was approved in November 2004 for use in Tasmania.

Provided research and teaching is properly approved and monitored within a licensed institution which complies with the Code, the use of animals for research and teaching is protected from sections 8 and 9 of the Act *(*Cruelty and Aggravated cruelty). Inspectors appointed under the Act ensure compliance with the Code*.*

The research Code of Practice provides guidance for investigators, teachers, institutions, AECs and all involved in the humane use of animals, and specifies safeguards. A decision to use animals must be properly justified. Animals may only be used after due consideration to the ***replacement*** of animals with other methods; the ***reduction*** in the number of animals used; and the ***refinement*** of techniques used to reduce the impact on animals (the essential "3Rs" of research).

Research project proposals are examined, approved and monitored by a duly constituted Animal Ethics Committee (AEC) of the Institution. Institutions that are too small to justify or be sufficiently resourced to have their own AEC may use the services of another institution's AEC. For instance, the DPIPWE AEC oversaw 22 other institutions in 2008 of which 12 used animals in the reporting period.

The Act allows animal research to be conducted by institutions in a self-regulatory environment. The institutions are, however subject to inspection by the Inspector of Animal Research at least on an annual basis.

The *Animal Welfare Act 1993* was amended in July 2008. The amendments redefined 'animal research' to mean

'a procedure, test, experiment, inquiry or study on an animal which –

(a) is undertaken to develop, demonstrate or acquire knowledge, or techniques, in an area of science or teaching; and

(b) is likely to have a significant adverse effect on the welfare of the animal.'

In addition, provision was made for the inclusion of additional species by regulation within the meaning of 'animal' under the Act. Subsequently cephalopods (octopus, cuttlefish, nautilus and squid) were included in January 2009. Thus, while cephalopods have been reported as an option in 2008, the reporting of cephalopod use will be mandatory for the 2009 report.

(b) Annual reporting

Institutions are required to provide an annual report to the Minister on their activities in relation to animal research according to section 35 of the *Animal Welfare Act 1993*. The report is to contain *the numbers and types of animals used*

and *the types of animal research carried out*. A report summarising the institutional reports is to be tabled in both Houses of Parliament annually.

(c) The Animal Research Inspector

The Minister appoints this person under section 36 of the Act. The inspector advises the Minister on matters relating to the granting and cancellation of licenses, the conduct of the AEC's and general compliance with the approved research Code of Practice. The monitoring of compliance includes the inspection of animal holding facilities within each institution, attendance of meetings of AECs and the collating of the annual State report.

(d) Scientific Permits for wildlife and fisheries

Institutions intending to use wildlife in research must also apply to the Resource Management and Conservation Division, DPIPWE and the Inland Fisheries Service for appropriate permits.

1.2 Reporting parameters used in Tasmania

The reporting parameters are covered in a statistics reporting format developed by the Code Liaison Group (CLG) of the National Health and Medical Research Council (NHMRC) for the purpose of compiling national statistics. It was endorsed by the Tasmanian Animal Welfare Advisory Committee as suitable for State reports to avoid any duplication of effort.

For reporting purposes the term 'animals' covers fully metamorphosed juveniles, embryos in the latter half of gestation, eggs in the latter half of incubation and larval fish that can feed independently. This definition complies with the National Statistics of Animal Use for Scientific Procedures. During 2007, regulators from all States and Territories agreed on an amended animal category and type list with animals grouped into more logical categories. This list was supported by the CLG and was used for the 2007 report in Tasmania and nationally from 2008. It should be noted that individual jurisdictions collect data on animals that fall within their legislative scope, for instance fish or cephalopods may not be reported by one or more jurisdictions.

Data is collated from annual project progress or final reports submitted by the responsible investigator for each project during the 2008 calendar year. The calendar year reporting period is now used by most agencies contributing to the national animal use statistics.

1.2.1 Explanation of the reporting format

The statistics format requires the selection of one option from the number of choices in each of the three main areas listed below (purposes, procedures and animals). Where animals are used in multiple projects, each project is reported separately. Where an animal undergoes multiple procedures within the same project, only the procedure with the highest impact on the animal is reported. A project may have multiple purposes and use multiple procedures and animal categories.

1.2.2 Notes on the application of various categories

Purpose of Project –categorises the reason/s for the study.

Understand Biology eg comparative anatomy studies, animal physiology, adaptations of wild animals, wildlife survival studies.

Health and Welfare eg cancer research, drug therapy, residue and toxin testing, vaccine development.

Management or Production eg effect of nutrition supplements, evaluating husbandry techniques, animal production trials, drug validation tests.

Education eg classroom studies on behaviour or physiology.

Environmental Study eg population surveys, acquisition of museum specimens.

Procedures used – categorises the severity of the procedures used (ie the impact on the animal).

The aim of the study will determine the most appropriate category eg if the aim is to kill mice for teaching purposes, then that activity will be categorised as 'animal unconscious no recovery'. If animals are euthanased when they start to show distress during a study where for example, an infection has been deliberately induced, then that study will be included under 'Major physiological challenge'. It will not be a 'Death as an endpoint' procedure since the aim of the study was not to deliberately use death as a parameter.

The following procedures were used during 2008:

Observation Involving Minor Interference: studies in which the normal activities of animals are impacted on.

Examples:
Wildlife studies involving repeated spotlighting or intrusion into groups of animals or nursing animals.
Feeding trial, such as Digestible Energy determination of feed in a balanced diet.
Behavioural study with minor environmental manipulation.
Teaching of normal, non-invasive husbandry such as handling, grooming, etc.
Production of products, such as hormones or drugs, in milk or eggs from genetically modified animals that are subject to normal husbandry procedures only.

Animal unconscious without Recovery: the animal is rendered unconscious under controlled circumstances (ie. not in a field situation) with as little pain or distress as possible. Capture methods are not required. Any pain is minor and brief and does not require analgesia. Procedures are carried out on the unconscious animal that is then killed without regaining consciousness.

Examples:
Laboratory animals killed humanely for dissection, biochemical analysis.
Teaching surgical techniques on live, anaesthetised animals that are not allowed to recover following the procedure.

Minor conscious procedure: animal is subjected to minor procedures that would normally not require anaesthesia or analgesia. Any pain is minor and analgesia usually unnecessary, although some distress may occur as a result of trapping or handling.

Examples:

Tail tipping and toe clipping for identification of new line GM animals.
Injections, blood sampling in conscious animal.
Minor dietary or environmental deprivation or manipulation, such as feeding nutrient-deficient diets for short periods.
Trapping and release as used in species impact studies, etc.
Trapping and humane euthanasia for collection of specimens.
Stomach tubing, branding, disbudding, shearing, etc.

Minor operative procedure with recovery: animal is rendered unconscious, with as little pain or distress as possible. A minor procedure such as cannulation or skin biopsy is carried out and the animal allowed to recover. Depending on the procedure, pain may be minor or moderate and post-operative analgesia may be appropriate.

Field capture using chemical restraint methods is also included here.

Examples:
Biopsies under anaesthesia or sedation.
Cannulations under anaesthesia or sedation.
Sedation/anaesthesia for relocation, examination or injections/blood sampling.

Major surgery with Recovery: generally animal is rendered unconscious, with as little pain or distress as possible. A major procedure such as abdominal or orthopaedic surgery is carried out and the animal allowed to recover. Post operative pain is usually considerable and at a level requiring analgesia.

Examples:
Orthopaedic surgery.
Abdominal or thoracic surgery.
Transplant surgery.
Mulesing, surgical castration without anaesthesia.

Minor physiological challenge: animal remains conscious for some or all of the procedure. There is interference with the animal's physiological or psychological processes. The challenge may cause only a small degree of pain/distress or any pain/distress is quickly and effectively alleviated.

Examples:
Minor infection, minor or moderate phenotypic modification, early oncogenesis.
Arthritis studies with pain alleviation.
Prolonged deficient diets, induction of metabolic disease.
Polyclonal antibody production.
Antiserum production.

Major physiological challenge: animal remains conscious for some or all of the procedure. There is interference with the animal's physiological or psychological processes. The challenge causes a moderate or large degree of pain/distress which is not quickly or effectively alleviated.

Examples:

Major infection, major phenotypic modification, oncogenesis without pain alleviation.
Arthritis studies with no pain alleviation, uncontrolled metabolic disease.
Isolation or environmental deprivation for extended periods.
Monoclonal antibody raising in mice.

Animal Categories used in the report

The following categories were used in the 2008 report.

Amphibians

Aquatic animals (non-mammalian)

Birds

Domestic mammals (including livestock species)

Exotic feral mammals

Exotic zoo animals

Native mammals (including marine mammals)

Primates

Reptiles

Within each category there are several types. The Tasmanian report also reports on 'sub-types' where it is considered they may be of particular interest to the State. Therefore Tasmanian devils, bandicoots and bats have been separately included in this report with other types (Tables 3 and 4).

2. LICENSED RESEARCH INSTITUTIONS

38 institutions were licensed to conduct animal research in Tasmania during 2008 and are listed below:

Applied Ecological Solutions, Victoria (no animal use in 2008)

Aquenal Pty Ltd (no animal use in 2008)

Australian Antarctic Division

Australian National University, Australian Capital Territory

Biosis Research Pty Ltd (no animal use in 2008)

Birds Tasmania

Bradley Law (independent researcher)

CSIRO Marine and Atmospherics Division

Curtin University (no animal use in 2008)

Department of Primary Industries and Water. The licence covers research conducted by various divisions within the Department which for the 2008 report were the Resource Management and Conservation Division; Primary Industries Division and Biosecurity and Product Integrity Division, Inland Fisheries Service and those projects conducted by the Tasmanian Institute of Agricultural Research that are not assessed by the University of Tasmania.

Richard Donaghey (independent researcher)

Forestry Tasmania (no animal use in 2008)

FRC Environmental

Freshwater Systems Pty Ltd (no animal use in 2008)

GHD Pty Ltd, Queensland

Hydro Tasmania

Jurox Pty Ltd, New South Wales (no animal use in 2008)

King Island Natural Resource Management Group

La Trobe University, Victoria

Monash University, Victoria

Murdoch University, Western Australia

Museum Victoria

Novartis Animal Health Australasia Pty Ltd, New South Wales

Tasmanian Parks and Wildlife Service, Department of Environment, Parks, Heritage and the Arts (no animal use in 2008)

Pfizer Australia Pty Ltd, Victoria (no animal use in 2008)

Reptile Rescue

Sinclair Knight Merz, Victoria (no animal use in 2008)

Taronga Conservation Society Australia

Tasmanian Field Naturalist's Club Inc. (no animal use in 2008)

Tasmanian Museum and Art Gallery (no animal use in 2008)

Tasmanian Plantation Management Services

Tyenna Peak Nursery

University of Queensland, Queensland (no animal use in 2008)

University of Sydney, New South Wales

University of Tasmania

University of Western Australia, Western Australia (no animal use in 2008)

Veterinary Health Research, New South Wales (no animal use in 2008)

William Wakefield (independent researcher)

3. ANIMAL RESEARCH ACTIVITIES FOR 2008

3.1 Institutions

A total of 38 institutions were licensed during the reporting period, of which 24 conducted research in Tasmania including 9 interstate institutions. No overseas institutions conducted research in Tasmania during 2008. Table 1 lists the institutions that used animals and the categories and numbers of animals involved.

The University of Tasmania was the most active institution in Tasmania during 2008 in terms of the number of projects reporting animal use (93). This was a small increase on 2007 project numbers (84). The actual number of animals used (32,377), was similar to the 2007 figures (29,551 animals) indicating a reduction in animals used per project. The number of laboratory animals increased substantially reflecting the increase in activity of the Menzies Research Institute.

The Department of Primary Industries and Water's (DPIW) Animal Ethics Committee (AEC) supervised 53 projects using a total of 91,334 animals. Of these, 33 projects were internal, reporting a total of 69,529 animals (49.6%) used. One project, an observational study of penguins on Macquarie Island, was the largest contributor to the DPIW's animal use, with 60,000 birds observed.

The DPIW AEC also reported for 13 external institutions that have approval to use that AEC. These institutions used a total of 21,805 animals in 20 projects. CSIRO Marine and Atmospherics Division were the largest contributors to animal use within this external group of institutions. During 2008, CSIRO used a total of 15,404 animals which were all aquatic animals as in previous reports. The next largest external user of animals was Birds Tasmania with 2000 birds observed during 2008.

The Australian Antarctic Division's AEC supervised one project within the Tasmanian jurisdiction during 2008 – an ongoing population study of southern elephant seals on Macquarie Island.

3.2 Animal categories

Table 2.1 summarises the animal categories used in 2008. During 2008, 159 individual research and teaching projects used a total of 140,087 live vertebrates and cephalopods. This is an increase of 27.2% in projects and 60.4% in animals on 2007 figures (125 projects using 87,344 animals). It should be noted, however, that the Macquarie Island penguin study already mentioned above, contributed over 42.8% (or 60,000 birds) of all animals reported. If this observational study is removed, the number of animals used within Tasmania in research and teaching continues to decline, a trend that has been evident since 2005. Figure 1 illustrates differences in the distribution of animal categories between 2007 and 2008. Fluctuations in the number of projects and animals used from year to year are common and reflect the relative level and type of research activity in the State for that year.

Birds were the most commonly reported category contributing 47.5% of all animals used. This was mainly due to the already mentioned Macquarie Island penguin project involving 60,000 birds. Aquatic animals were the second largest category (28.6%), followed by domestic mammals (12%), native mammals (6.2%), laboratory mammals (4.5%), reptiles (1.2%) and exotic feral animals (0.02%).

While 30.7% fewer aquatic animals were used in 2008, there were increases in all other categories reported (Figure 1) including a doubling of the native mammal number. Macropods (2,884) and Tasmanian devils (2,422) were the largest contributors to the higher native mammal numbers. No amphibians were used in 2008. Detail of animal types within categories used by the reporting institutions can be found in Table 3.

3.3 Purposes

Table 2.2 summarises the research and teaching purposes for which animals were used during 2008. Figure 2 illustrates differences in distribution of purposes between 2007 and 2008. Environmental studies accounted for 62.1% of all animals, and 26.4% of all projects. This was expected considering the large number of animals that may be reported in population surveys.

In terms of the distribution of projects, understanding biology at 42.1%, was the most common project purpose. The other purposes reported were health and welfare (15.7% projects), management and production (8.8% projects) and education (8.1% projects).

There were fewer projects reporting animal use for educational purposes, however there was a large increase in the number of animals used for this purpose compared to 2007 (Figure 2). The major contributor to the increase was a single project using aquatic animals in the area of wild fisheries training – a core activity of the University of Tasmania's National Centre for Marine Conservation and Resource Sustainability.

Table 4 presents detail on the purposes and procedures applied to animal types within categories.

3.4 Procedures

Table 2.3 summarises the procedures used on animals during 2008. Figure 3 illustrates differences in the distribution of procedures between 2007 and 2008. Observation with minor interference was the most commonly used procedure in terms of animals used (75,189 or 53.7%). The proportion of projects using this procedure was 33.3 % (or 53 projects). Minor conscious procedures were the second most used procedural category, involving 35,757 (25.5%) animals in 55 (34.6%) projects. Minor physiological challenge procedures used 15,043 (10.7%) animals. Most of these were attributed to a footrot vaccination project conducted by the University of Sydney, involving 13,503 sheep.

The number of animals that experienced relatively non-invasive procedures (Observation with minor interference, Minor conscious procedures and Minor

physiological challenge) increased from 60% in 2007 to over 90% (125,989 animals) in 2008.

Animals unconscious without recovery procedures were used on 5,285 (3.77%) animals and 35 (22%) projects. A browsing animal management study comparing two shooting techniques as part of the alternatives to 1080 program was responsible for the single death as an end point project.

Higher impact procedures (minor operative procedure with recovery, major physiological challenge, major surgery with recovery, animal unconscious without recovery and death as an end point) were used on a total of 14,098 animals (10%). This is less than half the number (34,937) subjected to these procedures in 2007.

4.TABLES AND FIGURES

All summarised data is tabulated in this section.

Table 1. Summary of animal categories used by institutions in 2008

Institution	Number of projects	Aquatic animals	Birds	Domestic mammals	Exotic Feral mammals	Lab mammals	Native mammals	Reptiles	Total	% of all animals
AAD	1						935		935	0.67%
ANU	4	6		72			32		110	0.08%
BirdsTas	1		2000						2000	1.43%
BLaw	1						17		17	0.01%
CSIRO	7	15404							15404	11.00%
Donaghey	1		134						134	0.10%
DPIW	33	1270	63382	1756	32		3089		69529	49.63%
FRC	1	59							59	0.04%
GHD	2	28					17	17	62	0.04%
Hydro	1	1436							1436	1.03%
IFS	1	25							25	0.02%
KIsNRM	1						933		933	0.67%
LaTrobe	2		474						474	0.34%
Monash	1			35					35	0.02%
Murdoch	1	129	10				45		184	0.13%
MusVic	1							15	15	0.01%
Novartis	1			1092					1092	0.78%
ReptileRes	1							9	9	0.01%
Taronga	1						28		28	0.02%
TPMS	1						871		871	0.62%
Tyenna	1						818		818	0.58%
U Syd	1			13503					13503	9.64%
U Tas	93	21720	549	342		6249	1864	1653	32377	23.11%
Wakefield	1		37						37	0.03%
Total	159	40077	66586	16800	32	6249	8649	1694	140087	100.00 %
% of categories		28.61%	47.53%	11.99%	0.02%	4.46%	6.17%	1.21%	100.00 %	
2007 numbers	125	57849	7316	12947	0	3865	4101	1121		
Change	27.2%	-30.7%	810.1%	29.8%	N/A	61.7%	110.9%	51.1%		

Table 2. Distribution of animal categories, purposes and procedures within projects in 2008

2.1 Animal categories used in 2008

Animal Category	Animals per Category	Number of projects per Category	% Animals	% Projects in 2008 (n=159)	% Projects in 2007 (n=125)
Amphibians	0	0	0	0	0.80%
Aquatic animals	40077	50	28.61%	31.45%	37.90%
Birds	66586	21	47.53%	13.21%	11.30%
Domestic mammals	16800	17	11.99%	10.69%	10.50%
Exotic Feral mammals	32	4	0.02%	2.52%	0.00%
Lab mammals	6249	28	4.46%	17.61%	18.50%
Native mammals	8649	42	6.17%	26.42%	20.00%
Reptiles	1694	15	1.21%	9.43%	6.50%
Totals	140087	177			

* A project may use multiple animal categories.

2.1 Research and teaching purposes used in 2008

Research Purpose	Animals per Purpose	Number of projects per Purpose	% Animals in 2008	% Projects in 2008 (n=159)	% Projects in 2007 (n=125)
Education	11173	13	7.98%	8.18%	13.70%
Environmental study	86999	42	62.10%	26.42%	15.30%
Health and welfare	23489	25	16.77%	15.72%	20.20%
Management or production	3828	14	2.73%	8.81%	13.60%
Understanding biology	14598	67	10.42%	42.14%	37.90%
Totals	140087	161*	100.00%		

* A project may have multiple purposes

2.3 Research and teaching procedures used in 2008

Research Procedure	Animals per Procedure	Number of projects per Procedure	% Animals in 2008	% Projects in 2008 (n=159)	% Projects in 2007 (n=125)
Observation with minor interference	75189	53	53.67%	33.33%	30.60%
Minor conscious procedure	35757	55	25.52%	34.59%	34.40%
Minor physiological challenge	15043	10	10.74%	6.29%	4.80%
Minor operative procedure with recovery	2186	13	1.56%	8.18%	10.50%
Major physiological challenge	5308	5	3.79%	3.14%	4.00%
Major surgery with recovery	448	3	0.32%	1.89%	0.80%
Animal unconscious no recovery	5285	35	3.77%	22.01%	27.40%
Death as end point	871	1	0.62%	0.63%	0.00%
Totals	12020	175*			

*A project may have multiple procedures.

Table 3. Summary of animal types used by institutions in 2008.

Institution	AAD	ANU	BirdsTas	BLaw	CSIRO	DPIW	FRC	GHD
Aquatic animals								
Cephalopods					306			
Fish		6			15098	1270	59	28
Birds								
Exotic wild								
Native captive								
Native wild			2000			63382		
Domestic mammals								
Cattle						42		
Dogs		72						
Sheep						1714		
Exotic feral animals								
Cats						6		
Mice						22		
Rats						4		
Lab mammals								
Mice								
Rabbits								
Rats								
Native mammals								
Bandicoot								
Bats				17				
Cetaceans		32				93		
Echidna						6		
Macropods						62		
Native Rats and Mice						48		
Other native mammals						200		
Platypus								1
Possums and gliders						76		9
Quoll						208		7
Seals	935							
Tas Devils						2316		
Wombats						80		
Reptiles								
Lizards								17
Snakes								

Table 3 continued

Institution	Hydro	IFS	KIsNRM	LaTrobe	Monash	Murdoch	MusVic	Novartis
Aquatic animals								
Cephalopods								
Fish	1436	25				129		
Birds								
Exotic wild								
Native captive								
Native wild				474		10		
Domestic mammals								
Cattle								
Dogs					35			
Sheep								1092
Exotic feral animals								
Cats								
Mice								
Rats								
Lab mammals								
Mice								
Rabbits								
Rats								
Native mammals								
Bandicoot								
Bats								
Cetaceans								
Echidna								
Macropods			803					
Native Rats and Mice						3		
Other native mammals								
Platypus						42		
Possums and gliders			130					
Quoll								
Seals								
Tas Devils								
Wombats								
Reptiles								
Lizards							15	
Snakes								

Table 3 continued

Institution	Reptile Res.	Donag -hey	Taron- ga	TPMS	Tyenna	U Syd	U Tas	Wake- field	Total
Aquatic animals									
Cephalopods							455		761
Fish							21265		39316
Birds									
Exotic wild		134							134
Native captive							2		2
Native wild							547	37	66450
Domestic mammals									
Cattle							74		116
Dogs									107
Sheep						13503	268		16577
Exotic feral animals									
Cats									6
Mice									22
Rats									4
Lab mammals									
Mice							4867		4867
Rabbits							18		18
Rats							1364		1364
Native mammals									
Bandicoot					3				3
Bats									17
Cetaceans							145		270
Echidna							31		37
Macropods				561	435		1023		2884
Native Rats and Mice							185		236
Other native mammals							4		204
Platypus							11		54
Possums and gliders				310	380		235		1140
Quoll							64		279
Seals							78		1013
Tas Devils			28				78		2422
Wombats							10		90
Reptiles									
Lizards							1653		1685
Snakes	9								9

Table 4. Purposes and procedures used for animal types in 2008.

	Aquatic animals		Birds			Domestic mammals		
	Cephalopods	**Fish**	**Exotic wild**	**Native captive**	**Native wild**	**Cattle**	**Dogs**	**Sheep**
Purposes								
Education		11004		2	3	4		20
Environmental study	341	16892	134		65887			2
Health and welfare		4487				38	107	14595
Management or production	110	1953				74		1620
Understanding biology	310	4980			560			340
Procedures								
Observation with minor interference	310	1128		2	66213	4	107	1956
Minor conscious procedure	341	29795	134		237	112		1092
Minor physiological challenge		1134						13503
Minor operative procedure with recovery		1679						5
Major physiological challenge		3061						
Major surgery with recovery		79						
Animal unconscious no recovery	110	2440						21
Death as end point								

Table 4 continued

	Exotic feral animals			Lab mammals		
	Cats	**Mice**	**Rats**	**Mice**	**Rabbits**	**Rats**
Purpose						
Education				45	15	5
Environmental study		22	4			
Health and welfare	6			812		242
Management or production				32	1	
Understanding biology				3978	2	1117
Procedure						
Observation with minor interference	2			92		
Minor conscious procedure	4	22	4	1523	1	84
Minor physiological challenge				110	2	263
Minor operative procedure with recovery				10		42
Major physiological challenge				2247		
Major surgery with recovery				335		34
Animal unconscious no recovery				550	15	941
Death as end point						

Table 4 continued

Native mammals								
	Bandicoot	**Bats**	**Cetaceans**	**Echidna**	**Macropods**	**Native Rats and Mice**	**Other native mammals**	**Platypus**
Purpose								
Education					13	39		
Environmental study		17	238	10	1819	168	204	1
Health and welfare	3			5	1000			
Management or production			16		22			
Understanding biology			16	22	30	29		53
Procedure								
Observation with minor interference	3	17	204	5	1755	149		
Minor conscious procedure			66	32	133	87	204	54
Minor physiological challenge								
Minor operative procedure with recovery								
Major physiological challenge								
Major surgery with recovery								
Animal unconscious no recovery					435			
Death as end point					561			

Table 4 continued

Native mammals cont.						Reptiles	
	Possums and gliders	**Quoll**	**Seals**	**Tas Devils**	**Wombats**	**Lizards**	**Snakes**
Purpose							
Education	13					10	
Environmental study	421	72		724	17	17	9
Health and welfare	703	201		1217	73		
Management or production							
Understanding biology	3	6	1013	481		1658	
Procedure							
Observation with minor interference	209	69	935	763	90	1176	
Minor conscious procedure	241	210	78	1100		194	9
Minor physiological challenge				31			
Minor operative procedure with recovery				450			
Major physiological challenge							
Major surgery with recovery							
Animal unconscious no recovery	380			78		315	
Death as end point	310						

Figure 1. Comparison of animal categories reported between 2007 and 2008.

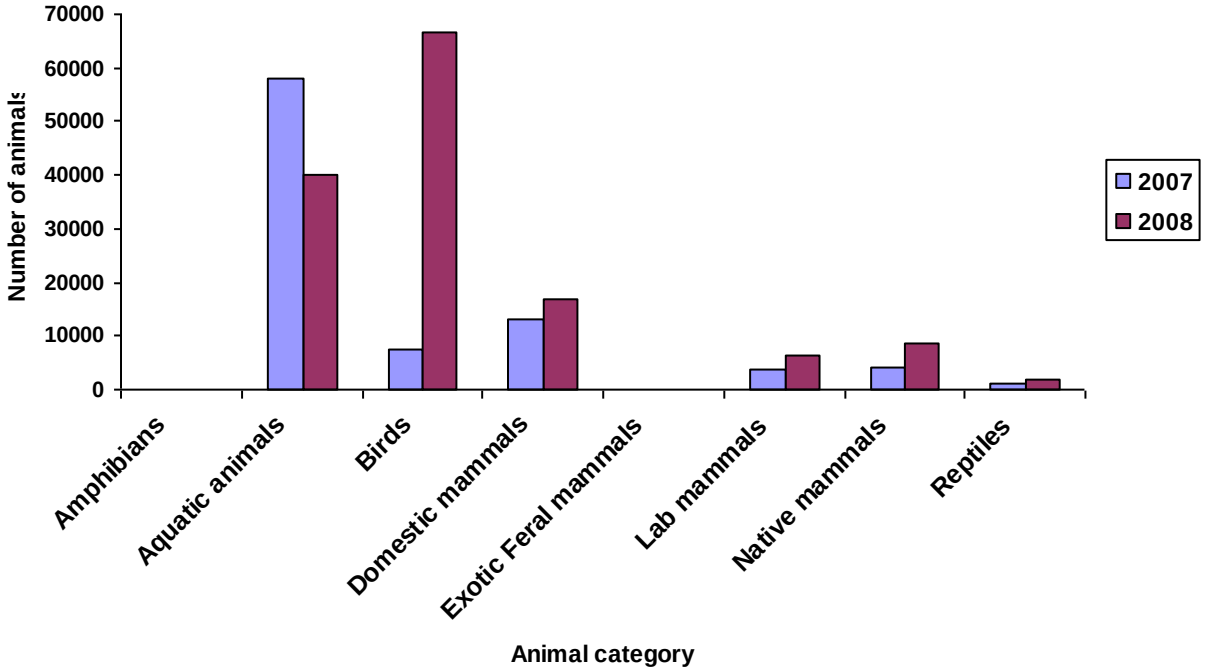


Figure 2. Comparison of research and teaching purposes used between 2007 and 2008.

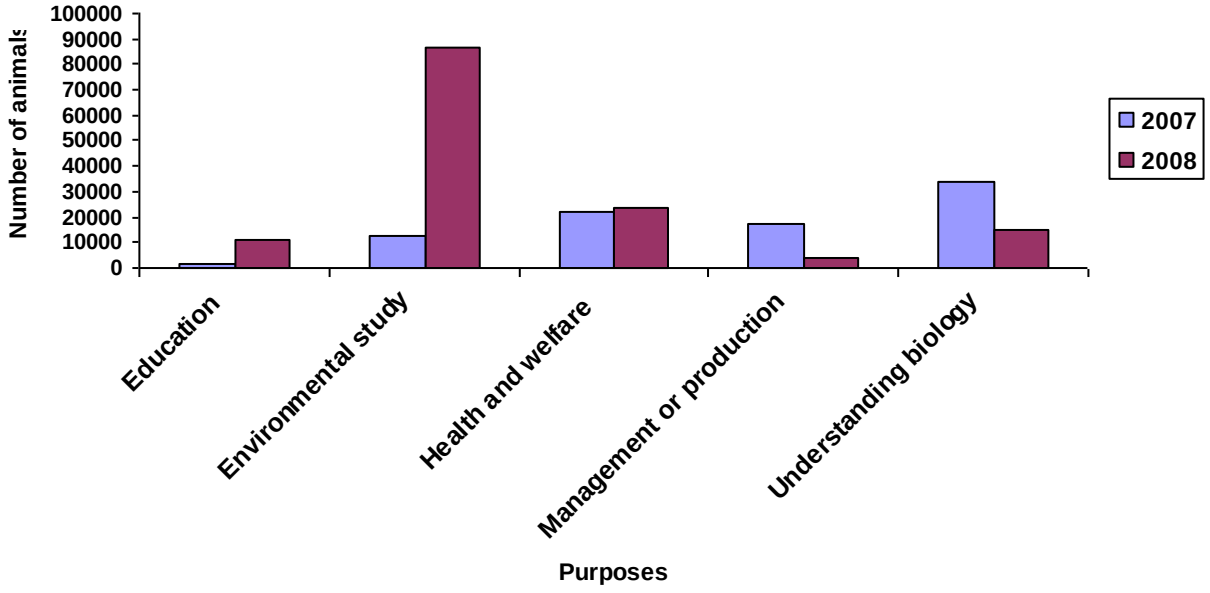
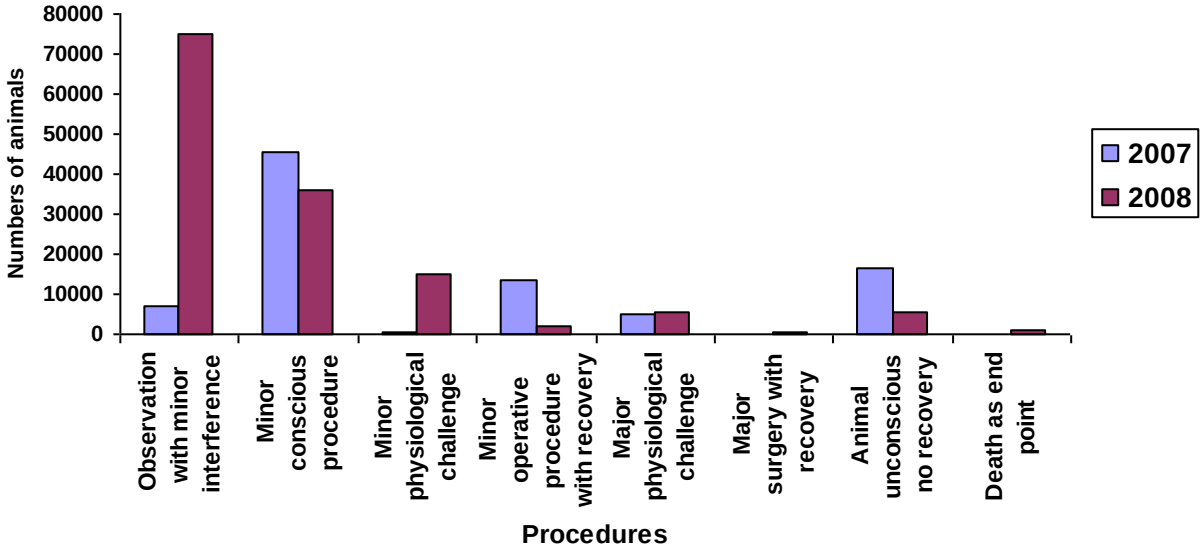


Figure 3. Comparison of procedures used between 2007 and 2008.



ABBREVIATIONS

AAD	Australian Antarctic Division
AEC	Animal Ethics Committee
ANU	Australian National University
AWAC	Animal Welfare Advisory Committee
BirdsTas	Birds Tasmania
BLaw	Bradley Law
CLG	Code Liaison Group
CSIRO	CSIRO Marine and Atmospheric Research
Donaghey	Richard Donaghey
DPIW	Department of Primary Industries and Water (now the Department of Primary Industries, Parks, Water and Environment)
FRC	FRC Environmental
GHD	GHD Pty Ltd
Hydro	Hydro Tasmania Consulting
IFS	Inland Fisheries Service
KIsNRM	King Island Natural Resource Management Group
LaTrobe	LaTrobe University, Victoria
Monash	Monash University, Victoria
Murdoch	Murdoch University, Western Australia
MusVic	Museum Victoria

NHMRC	National Health and Medical Research Council
Novartis	Novartis Animal Health Australasia Pty Ltd
ReptileRes	Reptile Rescue Inc.
Taronga	Taronga Conservation Society Australia
TPMS	Tasmanian Plantation Management Services
Tyenna	Tyenna Peak Nursery, TAS
USyd	University of Sydney
UTas	University of Tasmania
Wakefield	William Wakefield