

# Animal Research Statistics Tasmania

## Annual Report

Number 19 (2014)

**September 2015**



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 2014 to 31 December 2014.

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Animal Biosecurity and Welfare Branch  
Biosecurity Tasmania  
Department of Primary Industries, Parks, Water and Environment  
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## Summary

This report details animal use for research and teaching purposes in Tasmania from 1<sup>st</sup> January to 31<sup>st</sup> December 2014. The summaries and analyses in this report are compiled from project data submitted by licensed institutions. Data was collected on live, non-human vertebrates and cephalopods as required by the legislation. Crustacean use was also reported by one institution. The report complies with the nationally agreed definitions for the collation of statistics of animal use for scientific purposes.

A total of 39 licensed institutions were required to report their animal use. This included 22 interstate institutions and a single overseas institution.

Of the 39 reporting institutions, 22 used animals in Tasmania during 2014 which was 3 more than in 2013. There was also a small increase in the number of projects reported.

There were 2 animal ethics committees (AECs) resident in Tasmania supervising projects within the Tasmanian jurisdiction during 2014 – the Department of Primary Industries, Parks, Water and Environment's (DPIPWE) AEC and the University of Tasmania's (UTas) AEC.

During 2014, 201,090 animals were reported in 145 research and teaching projects. This is a 32.4% increase in animal use on 2013 figures.

UTas continued to be the most active research institution using animals in Tasmania, reporting data from 95 of the total 146 projects. The number of animals used by UTas declined, however from 53,747 in 2013 to 32,337 in 2014.

The DPIPWE AEC supervised 15 internal projects, and provided project assessment and monitoring services to 17 licensed external institutions. Of these external institutions, 10 reported animal use in 18 projects.

The *Domestic mammal* category was the largest in 2014 accounting for 71.4% of all animals used in 2014. An ongoing footrot vaccine trial involving 140,205 sheep contributed the vast majority (98%) of animals in this category. There were significant declines in the number of animals reported in the *Exotic feral animals* (nil for 2014), *Native mammals*, *Reptiles*, *Amphibia*, *Reptiles* and *Aquatic animals* categories.

There was an 88% increase in the number of birds reported; mainly in observational studies. The use of laboratory mammals also increased 15.8%. Despite these increases these categories represent a small proportion of the total use.

Most animal use was for the purpose of *Health and Welfare* owing to the already mentioned vaccine trial, followed by *Education* and *Understanding Biology*.

Relatively low impact procedures were conducted on 89.0% (or 178,985) of all animals in 2014 compared to 71.7% in 2013. As has been the case since 2010, no animals were subjected to *Death as the end point* procedures during 2014.

## I Introduction

### I.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 including teaching. Since its proclamation on 1<sup>st</sup> April 1996, institutions are required to be licensed by the Minister if they wish to use animals in research and teaching in Tasmania. Inspectors appointed under the Act ensure compliance with the animal research provisions.

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. In practice this is applied as an ongoing monitoring program with emphasis on ensuring the respective AECs are compliant and functioning and institutions are fulfilling their responsibilities according to the approved Code of practice.

The definition of 'animal research' in the Animal Welfare Act 1993 is:

'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.'

Regulation 7 of the Animal Welfare (General) Regulations 2013 provides for an inspector to determine whether an activity is or is not animal research. A precautionary approach is used in these determinations to ensure research and teaching activities that are likely to cause significant adverse effects on animals are approved and monitored by an AEC. It should be noted that a researcher may still seek AEC approval for a project that uses procedures that have been determined not to be research – an example would be the use of unbaited infrared camera traps – a technique in increasing use for observational studies.

There is also provision for the inclusion of additional species by regulation within the meaning of 'animal' under the Act for particular purposes under the Act. Cephalopods (octopus, cuttlefish, nautilus and squid) were included as 'animals' for the purposes of research in January 2009. The reporting of cephalopods has been mandatory since then.

#### (b) *The Code*

A core condition of licensing is compliance with the approved Code of practice. Currently this is the nationally agreed *Australian Code for the Care and Use of Animals for Scientific Purposes 8<sup>th</sup> edition (2013)* (the Code). The Code and associated reference documents are published by the National Health and Medical Research Council (NHMRC) and provide specific requirements and guidance for the use of animals for scientific purposes to investigators, teachers, institutions and Animal Ethics Committees (AECs). The eighth edition of the Code received Ministerial approval in October 2013, superseding the seventh edition. No change in statistical reporting came about as a result of the new Code coming into operation.

The Code requires that a decision to use animals must be properly justified, and animals may only be used after due consideration of the '3Rs' (replacement, reduction and refinement). The principles of the '3Rs' are, in brief, that animals may be used where there are no alternatives enabling **replacement** of animals with other methods; where **reduction** is applied

such that the number of animals used is absolutely necessary to achieve the aims of the project; and **refinement** of techniques used reduce the welfare impact on animals approved for use and promote the animals' wellbeing.

Provided research and teaching activities are properly approved and monitored within a licensed institution by its AEC, and the institution, its AEC and researchers and teachers comply 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). While sections 8, 9 and 10 of the Act do not apply to the reasonable use of fish in commercial and recreational activities, the research provisions apply to aquatic vertebrates and cephalopods as well as terrestrial vertebrates.

Research project proposals are examined, approved and monitored by a duly constituted AEC of the Institution. Institutions that have too few projects or are not sufficiently resourced to have their own AEC may use the services of another institution's AEC. For instance, in 2014 seventeen external institutions were approved to use the DPIPWE's AEC project assessment and monitoring services, of which 10 used animals in the reporting period.

*(c) Licensing*

Any individual or organisation may apply as an 'institution' for a licence to conduct animal research in Tasmania. The conditions of the licence require compliance of the institution and any persons under its auspices with the Tasmanian animal welfare legislation and the approved Code.

Licence applicants from outside Tasmania must agree to comply with the Code and provide evidence that they are equivalently licensed in their resident jurisdiction to ensure their AEC's compliance with the Code are adequately monitored by an equivalent regulator.

Institutions that either lack the resources or are otherwise unable to constitute their own AEC may share another institution's AEC provided a formal sharing agreement is in place that complies with the principles set down in the Code as well as addressing any other issue specific to the host or external institution.

*(d) Annual reporting*

Institutions are required to provide an annual report to the Minister on their activities in relation to animal research under 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 (this document) is to be tabled in both Houses of Parliament prior to the 30<sup>th</sup> September each year.

*(e) Inspectors*

The Minister appoints inspectors under section 36 of the Act. Inspectors advise the Minister on matters relating to the granting and cancellation of licenses, the conduct of the AECs 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 collation of the annual State report.

*(f) Scientific Permits for wildlife and fisheries*

Institutions intending to use wildlife, including native fish, must also apply to the Natural and Cultural Heritage Division, DPIPWE and the Inland Fisheries Service for appropriate permits.

## **1.2 Annual reporting format used in Tasmania**

A reporting format was developed by the then Code Liaison Group (now known as the Code Reference Group (CRG)) of the NHMRC for the purpose of compiling annual national statistics. It was endorsed by the Tasmanian Animal Welfare Advisory Committee as suitable for State reports to avoid duplication of effort.

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 CRG and was used for the 2007 report in Tasmania and nationally from 2008. Each jurisdiction collects data on animals that fall within its legislative scope. If comparing data across jurisdictions, it should be noted that, for example, fish or cephalopods may not be required to be reported in some jurisdictions. Similarly, Tasmania does not require reporting of decapod crustaceans although crustaceans are included if reported.

Data from annual project progress or final reports submitted by the responsible investigator for each project during the calendar year is collated into a standard spread sheet. The calendar year reporting period is used as it is consistent with most other agencies collecting animal use statistics.

Meaningful reporting of wild animals used in what may be described as an indirect fashion, such as the collection of feathers from vacated nests, remains a contentious area and is best resolved on a case by case basis by the AEC involved during the project approval process.

Only animals used in the Tasmanian jurisdiction are required to be noted in this report. There are however, animals used in other jurisdictions or Commonwealth waters that are reported by institutions where they have no alternative means of reporting. Where these reports impact significantly on the data or interpretations presented here they are noted.

A national repository of animal use statistics is no longer maintained. The Tasmanian statistics are published on the DPIPWE web site once they have been tabled in Parliament.

### **1.2.1 Explanation of the reporting format**

The reporting spread sheet requires the selection of one option from a drop-down menu 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. While a project rarely has multiple purposes, it is quite common to have multiple procedures and animal categories. Examples of the types of procedures that should be reported in each procedure category have been listed in the reporting spread sheet to improve reporting precision.

The term 'animal uses' would be a more accurate description of the data presented to account for the repeated use or observation of animals as mentioned above. This reuse of animals leads to a degree of double reporting that cannot be avoided in this or previous reports. For the sake of readability the terms 'use' and 'used' are employed interchangeably in this report.

The optional inclusion of comments within the reporting format enables some contextualisation of the animal use. For instance, over the past several years, a large proportion of native mammal numbers reported has been via the use of relatively low impact camera traps. These observations are recorded events rather than individual animals as it is difficult to accurately differentiate between individual animals.

### **1.2.2 Application of categories**

**Animal categories** - within each animal category there are several types. Sub-types may also be included where it is considered they are of particular interest to the State. 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.

The available categories are:

- Amphibians
- Aquatic animals (non-mammalian)
- Birds
- Domestic mammals (including livestock species)
- Exotic feral mammals
- Exotic zoo animals
- Native mammals (including marine mammals)
- Primates
- Reptiles

Projects involving exotic zoo animals or primates have not been conducted in Tasmania for some time; therefore these categories do not routinely appear in this report.

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

*Understanding 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.

*Education* eg classroom studies on animal behaviour or physiology.

*Environmental Study* eg population surveys, acquisition of museum specimens.

**Procedures used** – broadly describes the severity of the procedures used (ie the impact on the animal).

The following procedures are reported on:

*Camera Trapping Only:* (New category – previously included in Observation involving minor interference) studies exclusively using continuous or motion-triggered photographic recording of animals via fixed cameras with or without lures/baits in the aquatic or terrestrial environment.

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

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.

*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 is 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 unconscious without Recovery:* the animal is rendered unconscious under controlled circumstances with as little pain or distress as possible. 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.

Note that in Tasmania research involving trawling of wild fisheries is included within this procedure category as it is considered to describe more accurately the impact on the individual animal captured this way.

*Death as the end point:* the aim of the experiment requires the animal to die unassisted, ie not euthanased, as death is a critical measure of the experimental treatment.

Examples:

- Toxicological experiments (eg ascertaining LD50s)
- Assessing the relative resistance to the effects of infections if euthanasia cannot be provided at any stage to achieve the aim of the experiment.

## **2 Animal research activities for 2014**

### **2.1 Institutions**

There were 39 licensed institutions required to report animal use during 2014. They are listed below.

Australian National University, Australian Capital Territory

Biosis Research Pty Ltd, Victoria (no animal use in 2014)

Birdlife Tasmania, Tasmania

CSIRO Agricultural Flagship, Australian Capital Territory (no animal use in 2014)

CSIRO Oceans and Atmosphere Flagship, Tasmania

Charles Sturt University, New South Wales

Deakin University, Victoria

Department of Primary Industries, Parks, Water and Environment (includes the Inland Fisheries Service), Tasmania

Entura, Tasmania

Eurofins Agrisearch Pty Ltd, New South Wales (no animal use in 2014)

Fearn, Mr Simon (Independent researcher), Tasmania (no animal use in 2014)

FlyByNight Pty Ltd, New South Wales (no animal use in 2014)

Freshwater Systems Pty Ltd, Tasmania

Friends of Maatsuyker Island, Tasmania

GHD Pty Ltd, Tasmania (no animal use in 2014)

Huon Aquaculture Co Pty Ltd, Tasmania

Intervet Australia Pty Ltd, Victoria  
 Jurox Pty Ltd, New South Wales (no animal use in 2014)  
 King Island Natural Resource Management Group, Tasmania (no animal use in 2014)  
 Macquarie University, New South Wales  
 Monash University, Victoria (no animal use in 2014)  
 Murdoch University, Western Australia  
 North Barker Ecosystem Services, Tasmania (no animal use in 2014)  
 North East Bioregion Network, Tasmania (no animal use in 2014)  
 Novartis Animal Health Australasia Pty Ltd, New South Wales (no animal use in 2014)  
 Queensland University of Technology, Queensland  
 Regeneus Ltd, New South Wales (no animal use in 2014)  
 Robertson, Dr Bruce Cameron, New Zealand (Independent researcher)  
 Robertson, Dr Bruce Ingram, Victoria (Independent researcher)  
 SBScibus, New South Wales  
 Tasmanian Field Naturalist Club Inc., Tasmania (no animal use in 2014)  
 Tasmanian Irrigation Pty Ltd, Tasmania  
 Tas Nature (Peter Tonelli), Tasmania (no animal use in 2014)  
 University of Queensland, Queensland (no animal use in 2014)  
 University of Sydney, New South Wales  
 University of Tasmania, Tasmania  
 Veterinary Health Research, New South Wales (no animal use in 2014)  
 Victorian Wader Study Group Inc, Victoria  
 Virbac (Australia) Pty Ltd, Victoria

There were two AECs resident in Tasmania (DPIPWE and the University of Tasmania (UTas)) in 2014. While the Australian Antarctic Division's AEC is also resident in Tasmania, the Division was not licensed in Tasmania during 2014 as it was not conducting research within the Tasmanian jurisdiction.

Of the 39 licensed institutions, 22 used animals in Tasmania in 2014 including 6 interstate academic institutions, 3 animal health research and development companies and 2 interstate not-for-profit organisations. There was one overseas licensee - Dr Bruce Robertson of New Zealand. Table 1 lists the institutions that used animals and the categories and numbers of animals involved, including a comparison with 2013 figures.

In the 2014 calendar year, there was a 10% increase in the number of institutions reporting animal use and a 5% increase in the number of projects compared with 2013 figures. The number and variety of institutions conducting animal research in Tasmania fluctuates according to academic and commercial interests. Of the 10 not-for-profit licensees, 5 reported animal use in 2014 totalling 3,450 animals, composed entirely of birds.

UTas was the most active institution in Tasmania during 2014 with 95 projects. This accounted for 65% of all projects reported. Although the number of UTas projects was very

similar to 2013 (96), the number of animals used in 2014 was substantially less (32,337 or 21.29% in 2014 vs 53,747 or 35.38% in 2013).

The DPIPWE Divisions of Natural and Cultural Heritage and Biosecurity Tasmania and the Inland Fisheries Service conducted animal research reported under DPIPWE as internal projects. The DPIPWE's AEC supervised 15 internal projects using a total of 142,081 animals or 93.5% of all animals reported in 2014. This is almost 40% greater than that used by the Department in 2013 and was largely due to a broader application of a bivalent footrot vaccine in sheep that has been under trial for several years (140,205 in 2014 compared with 43,223 in 2013).

Of the 17 external licensees using the DPIPWE AEC in 2014, 10 reported animal use totalling 24,092 animals involved in 18 projects. CSIRO Oceans and Atmosphere Flagship and Huon Aquaculture Company were the largest external animal users with totals of 10,660 and 9000 animals respectively. Private enterprises engaged in environmental surveys (Entura, Freshwater Systems and Tasmanian Irrigation) reported 982 animals across 3 projects – mostly in the aquatic or amphibian categories.

The inspector attended a total of 12 AEC meetings (6 for DPIPWE and 6 for UTas) as well as participating in training sessions (2) for researchers and facility inspections (2).

The inspector conducted a comprehensive audit of the DPIPWE AEC's compliance with the 8<sup>th</sup> edition of the Code at the request of the institution during May-June 2014. Audit reports inform the terms of reference for independent external reviews of the institution which must be conducted according to section 6 of the Code at least every 4 years.

## **2.2 Animal categories**

A total of 201,090 animals were reported in research and teaching projects in Tasmania in 2014. This was a 32.4% increase on 2013.

Figure 1 illustrates a rolling 5 year distribution of animals within categories and it can be seen there has been a relative increase in animal numbers in both 2013 and 2014. As with the activity of individual institutions, the number of animals used and project distribution between animal categories fluctuate from year to year reflecting the level of interest in particular fields and types of research activity in the State for that year. The increase in total animal use numbers in 2014 is attributed mainly to the continuation of a footrot vaccine trial on commercial sheep properties. This trial has used 28,870 sheep in 2012, 43,223 sheep in 2013 and 140,205 sheep in 2014. The degree of fluctuation in animal categories is illustrated for the past 5 years in Figure 1.

Tables 1 and 2.1 summarises the number of animals and projects reported within animal categories.

*Domestic mammals* were the most commonly reported category contributing 71.4% of all animals used in 2014 with 143,645 individuals involved in 16 projects. As already mentioned the vast majority of this category were sheep involved in the commercial scale trial of a footrot vaccine accounting for 98% or 140,205 animals.

*Aquatic animals* usually feature in the top two categories and in 2014, 63 projects used 37,840 animals (or 18.8%); mainly fin fish. This is a 29.4% reduction on 2013 use of this category. That *Aquatic animal* projects have been the most numerous for several years indicates the high level of interest in aquaculture and wild fisheries research in Tasmania. Samples collected from the catch of commercial fishers for education and training purposes accounted for about 19% of the aquatic animals used for research in 2014. Over 50% of fish were used in projects directly related to aquaculture.

The number of *Birds* used in 2014 (11,816 or 5.9%) was 88% more than that reported in 2013 (6,284 individuals). There was also a similar increase in the number of bird projects (29 in 2014 compared to 16 in 2013). *Birds* were mainly reported in low impact, environmental studies.

*Laboratory mammal* use involved 5,008 animals (or 2.5%) in 51 projects. This equates to 15.8% more animals in the category than in 2013 (4,326 animals in 54 projects).

The number of *Native mammals* used in 2014 decreased dramatically from 37,560 in 2013 to 2,373 animals (or 1.2%) in 2014. A significant reduction in the number of macropods, possums and gliders reported accounted for most of the decrease (Table 4).

*Reptiles* (346 animals), *Amphibia* (62 animals) and *Exotic feral animals* (nil reported) also experienced significant reductions in reported use on 2013 figures (Table 1).

### 2.3 Purposes

Table 2.2 summarises the research and teaching purposes for which animals were used during 2014. Figure 2 illustrates a rolling 5 year distribution of purposes. Table 4 presents detail on the purposes and procedures applied to animal types within categories.

In terms of the number of animals reported against each purpose, the only purpose that recorded a significant increase on 2013 figures was *Health and Welfare* (163,058 or 81%) due to the large footrot vaccine project utilizing 140,205 sheep. Predictably this was also the purpose for which most animals were used.

The number of projects devoted to each purpose is more indicative of the reasons animals were used in research and teaching in Tasmania in 2014 (Table 2.2). The largest change (a decrease) was reported in the *Environmental study* category with 26 projects compared to 35 projects in 2013. There was some increase in the number of *Understanding biology* and *Management and production* projects in 2014 (by 19% and 36% respectively).

### 2.4 Procedures

This was the first year when projects that used camera traps alone rather than in combination with other procedures were to be reported specifically. However, only camera traps combined with other procedures were noted in the data presented.

Table 2.3 summarises the procedures used on animals during 2014. Figure 3 illustrates a rolling 5 year distribution of the number of animals subjected to the various procedural categories between 2010 and 2014. The distribution of projects between the procedural categories were not overly different to 2013 (Table 2.3).

The *Minor conscious* category was the most commonly reported procedure in 2014 with 149,946 animals (74.6%) across 45 projects. As this procedure was applied in the large footrot vaccine trail, sheep account for 94% of the animals reported in this category, followed by fish (4%).

*Observation with minor interference* was applied in 59 projects in 2014, compared with 38 projects in 2013 but the number of animals involved decreased from 51,610 in 2013 to 26,532 in 2014 (13.19% of all animals used).

As for previous years *Animal unconscious, no recovery* featured in the top three procedural categories. For 2014, 18,997 animals (9.45%) were reported in this category in 56 projects. This is a substantial decrease from 2013 (39,798 animals across 40 projects). This procedure

was applied predominantly to fish (82% of animals) which is consistent with previous years despite the lower numbers used.

*Minor physiological challenge* was applied to 2,507 animals (1.25%) in 2014, compared with 4,056 in 2013. Fish accounted for 83% of the animals subjected to this procedure in projects aimed at improving farmed fish disease resistance and productivity.

The number of animals in the *Minor operative procedures with recovery* category increased from 1,242 in 2013 to 2,201 animals in 2014. Nearly 81% of animals in this category were fish used in projects aimed at improving Atlantic salmon production.

*Major physiological challenge* was applied to a total of 713 animals (0.35%) in 2014, down from 1,628 in 2013.

*Major surgery with recovery* was little used in 2014 with 194 animals (or 0.1%) involving mainly mice in biomedical projects. In 2013, the number of animals used was 353.

There were no *Death as the end point* projects reported in Tasmania during 2014. This is the fourth year in a row that this procedural category has not been used.

There was a 48% reduction in the numbers of animals subjected to the higher impact procedures where significant pain or distress may be expected to occur with or without recovery from general anaesthesia or the procedure itself (*Animals unconscious no recovery*, *Major surgery with recovery*, *Major physiological challenge* and *Minor operative procedure with recovery*). In 2014 these procedures were applied to 22,105 animals compared to 42,986 animals in 2013.

The relatively low impact procedures (*Observation with minor interference*, *Minor conscious procedures* and *Minor physiological challenge*) were applied to 178,985 (or 89.0%) animals in 2014. This represented an increase in the proportion of animals experiencing this group of procedures compared to 2013 (71.7%). As for other aspects of this report, the difference between years is attributed mainly to the disproportionately large vaccine trial.

### 3 Tables and figures

All summarised data is displayed in this section.

**Table I Summary of animal categories used by institutions in 2014**

Institution	Project number	Amphibia	Aquatic animals	Birds	Domestic mammals	Exotic Feral animals	Lab mammals	Native mammals	Reptiles	Total	% of all animals
ANU	2			93						93	0.06
BCR NZ	1			9						9	0.01
BIR AUS	2			100						100	0.07
Birdlife	1			2474						2474	1.63
COAF	8		10660							10660	7.02
CSU	1			47						47	0.03
Deakin	1			596						596	0.39
DPIPWE	15		804	488	140763			20	6	142081	93.54
Entura	1		605							605	0.40
Freshwater	1		315							315	0.21
FoMI	1			717						717	0.47
HAC	1		9000							9000	5.93
Intervet	1		90							90	0.06
MacqU	1			101						101	0.07
Murdoch	3		2	1				17		20	0.01
QUT	1							7		7	0.00
SBScius	2				552					552	0.36
TasIrrig	1	62								62	0.04
U Syd	4				2			710		712	0.47
U Tas	95		16364	7040	1966		5008	1619	340	32337	21.29
VWSG	1			150						150	0.10
Virbac	1				362					362	0.24
<b>Total</b>	<b>145</b>	<b>62</b>	<b>37840</b>	<b>11816</b>	<b>143645</b>		<b>5008</b>	<b>2373</b>	<b>346</b>	<b>201090</b>	<b>132.39</b>
% of categories	N/A	0.03	18.8	5.9	71.4	0.0	2.5	1.2	0.2	100.0	
2013 numbers	138	266	53597	6284	44029	5197	4326	37560	635	151894	
% Change	5.1	76.7	-29.4	88.0	226.3	100.0	15.8	-93.7	-45.5	32.4	

**Table 2 Distribution of projects within animal categories, purposes and procedures in 2014**

**2.1 Animal categories used in 2014**

<b>Animal category</b>	<b>Animals per category</b>	<b>Projects per category</b>	<b>% Animals</b>	<b>% Projects in 2014 (n=195*)</b>	<b>% Projects in 2013 (n=210*)</b>
Amphibia	62	1	0.03%	0.51%	2.38%
Aquatic animals	37840	63	18.82%	32.31%	27.14%
Birds	11816	29	5.88%	14.87%	7.62%
Domestic mammals	143645	16	71.43%	8.21%	5.71%
Exotic Feral animals	0	0	0.00%	0.00%	5.24%
Lab mammals	5008	51	2.49%	26.15%	25.71%
Native mammals	2373	26	1.18%	13.33%	22.86%
Reptiles	346	9	0.17%	4.62%	3.33%
<b>Total</b>	<b>201090</b>	<b>195*</b>	<b>100.00%</b>		

\*A project may use multiple animal categories.

**2.2 Research and teaching purposes used in 2014**

<b>Purpose</b>	<b>Animals per purpose</b>	<b>Projects per purpose</b>	<b>% Animals</b>	<b>% Projects in 2014 (n= 145 )</b>	<b>% Projects in 2013 (n=138)</b>
Education	12700	7	6.32%	4.83%	3.62%
Environmental study	7494	26	3.73%	17.93%	25.36%
Health & welfare	163058	28	81.09%	19.31%	18.84%
Management & production	3642	15	1.81%	10.34%	8.70%
Understanding biology	11601	69	5.77%	47.59%	43.48%
<b>Total</b>	<b>201090</b>	<b>145</b>	<b>100.00%</b>		



### 2.3 Research and teaching procedures used in 2014

<b>Procedure</b>	<b>Animals per procedure</b>	<b>Projects per procedure</b>	<b>% Animals</b>	<b>% Projects in 2014 (n= 195** )</b>	<b>% Projects in 2013 (n=138)</b>
Observation with minor interference	26532	59	13.19%	30.26%	28.99%
Minor conscious procedure	149946	45	74.57%	23.08%	27.54%
Minor physiological challenge	2507	11	1.25%	5.64%	3.62%
Minor operative procedure with recovery	2201	16	1.09%	8.21%	13.04%
Major physiological challenge	713	3	0.35%	1.54%	3.62%
Major surgery with recovery	194	5	0.10%	2.56%	5.07%
Animal unconscious no recovery	18997	56	9.45%	28.72%	28.99%
<b>Total</b>	<b>201090</b>	<b>195**</b>	<b>100.00%</b>		

\*\*Projects may report several procedures

**Table 3 Summary of animal types used by institutions in 2014**

<b>Institution</b>	ANU	BCR NZ	BIR AUS	Birdlife	COAF	CSU	Deakin	DPIPWE	Entura	Fresh water	FoMI	HAC
<b>Amphibians</b>												
<b>Aquatic animals</b>												
Cephalopods					13							
Crustaceans*												
Fish					10647			804	605	315		9000
<b>Birds</b>												
Exotic wild												
Native non-endemic	38											
Native wild	55	9	100	2474		47	596	458			717	
Poultry								30				
<b>Domestic mammals</b>												
Cattle												
Dogs												
Sheep								140763				
<b>Lab mammals</b>												
Mice												
Rats												
<b>Native mammals</b>												
Cetaceans								18				
Echidna												
Macropods								2				
Native Rats and Mice												
Other native mammals												
Platypus												
Possums and gliders												
Seals												
Tas Devils												
Wombats												
<b>Reptiles</b>												
Lizards								6				
<b>Total</b>	<b>93</b>	<b>9</b>	<b>100</b>	<b>2474</b>	<b>10660</b>	<b>47</b>	<b>596</b>	<b>142081</b>	<b>605</b>	<b>315</b>	<b>717</b>	<b>9000</b>

\* Crustaceans are reported optionally

**Table 3 Summary of animal types used by institutions in 2014 continued**

<b>Institution</b>	Intervet	MacqU	Murdoch	QUT	SBSci bus	Tas Irrig	U Syd	U Tas	VWSG	Virbac
<b>Amphibians</b>						62				
<b>Aquatic animals</b>										
Cephalopods								30		
Crustaceans*								231		
Fish	90		2					16103		
<b>Birds</b>										
Exotic wild		101						5400		
Native non-endemic										
Native wild			1					1640	150	
Poultry										
<b>Domestic mammals</b>										
Cattle					552			667		362
Dogs							2			
Sheep								1299		
<b>Lab mammals</b>										
Mice								4287		
Rats								721		
<b>Native mammals</b>										
Cetaceans										
Echidna								14		
Macropods								1174		
Native Rats and Mice								30		
Other native mammals				7			109	5		
Platypus			17							
Possums and gliders								10		
Seals								130		
Tas Devils							601	48		
Wombats								208		
<b>Reptiles</b>										
Lizards								340		
<b>Total</b>	<b>90</b>	<b>101</b>	<b>20</b>	<b>7</b>	<b>552</b>	<b>62</b>	<b>712</b>	<b>32337</b>	<b>150</b>	<b>362</b>

**Table 4 Purposes and procedures used for animal types in 2014**

	Amphibi ans	Aquatic animals			Birds			
		Cephalo pods	Crusta ceans*	Fish	Exotic wild	Native non- endemic	Native wild	Poultry
<b>Purpose</b>								
Education				7220	5400			
Environmental study	62			1188	101	38	5788	
Health & welfare			231	19649			221	30
Management & production				1840				
Understanding biology		43		7669			238	
<b>Procedure</b>								
Observation with minor interference		30		11657	5400		5075	
Minor conscious procedure	62			5810	101	38	1172	30
Minor physiological challenge			231	2080				
Minor operative procedure with recovery				1777				
Major physiological challenge				690				
Major surgery with recovery				18				
Animal unconscious no recovery		13		15534				

\* Crustaceans are reported optionally

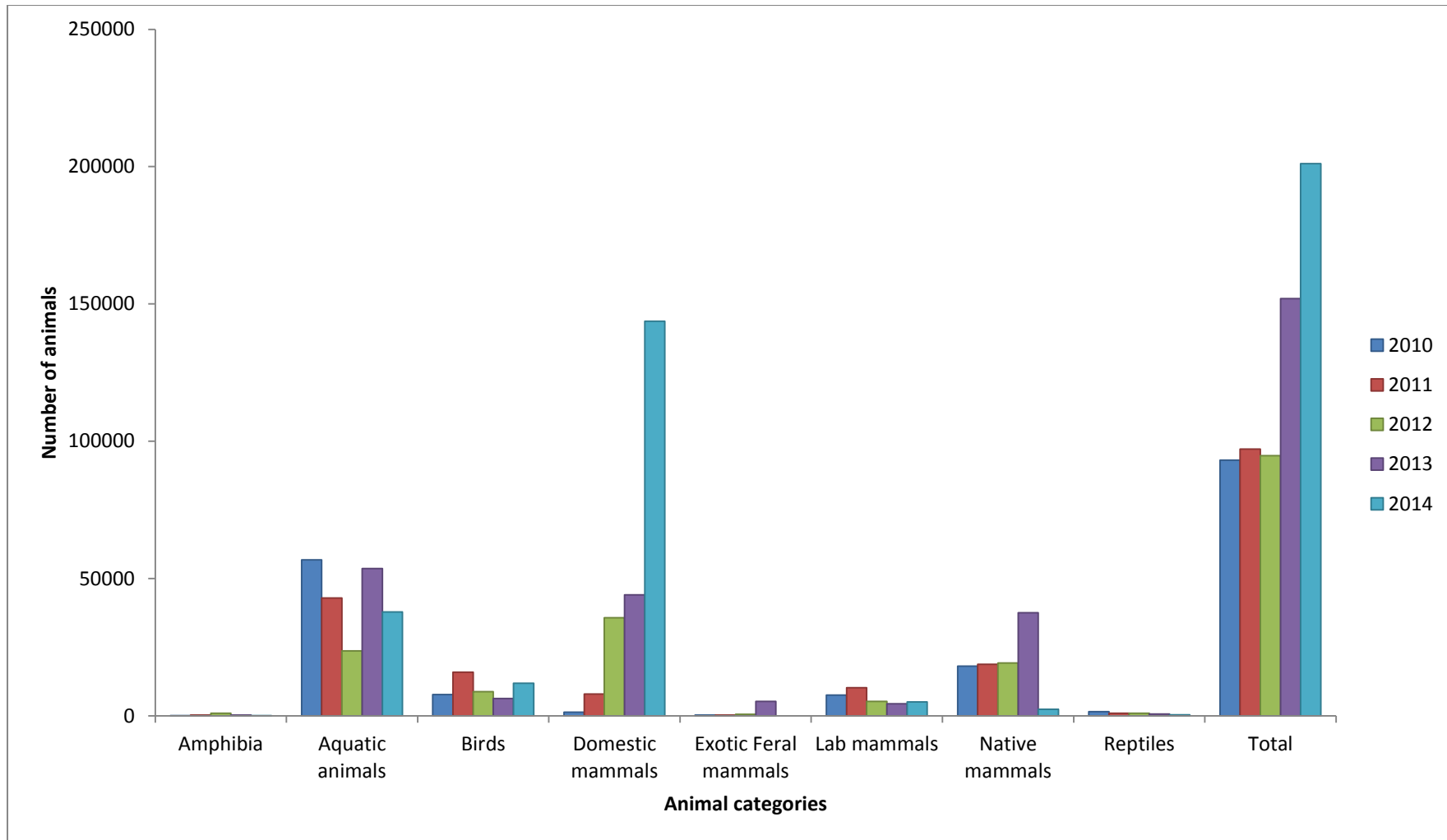
**Table 4 Purposes and procedures used for animal types in 2014 continued**

	Domestic mammals			Lab mammals		Native mammals		
	Cattle	Dogs	Sheep	Mice	Rats	Cetaceans	Echidna	Macropods
<b>Purpose</b>								
Education				84				1174
Environmental study						18		
Health & welfare	351		140763	1471	329			
Management & production	1160		1299					
Understanding biology	70	2		2732	392		14	2
<b>Procedure</b>								
Observation with minor interference	796	2	1299	84		16	9	1174
Minor conscious procedure	524		140751	1020		2	5	2
Minor physiological challenge	60			128				
Minor operative procedure with recovery	201			161				
Major physiological challenge				23				
Major surgery with recovery				176				
Animal unconscious no recovery			12	2695	721			

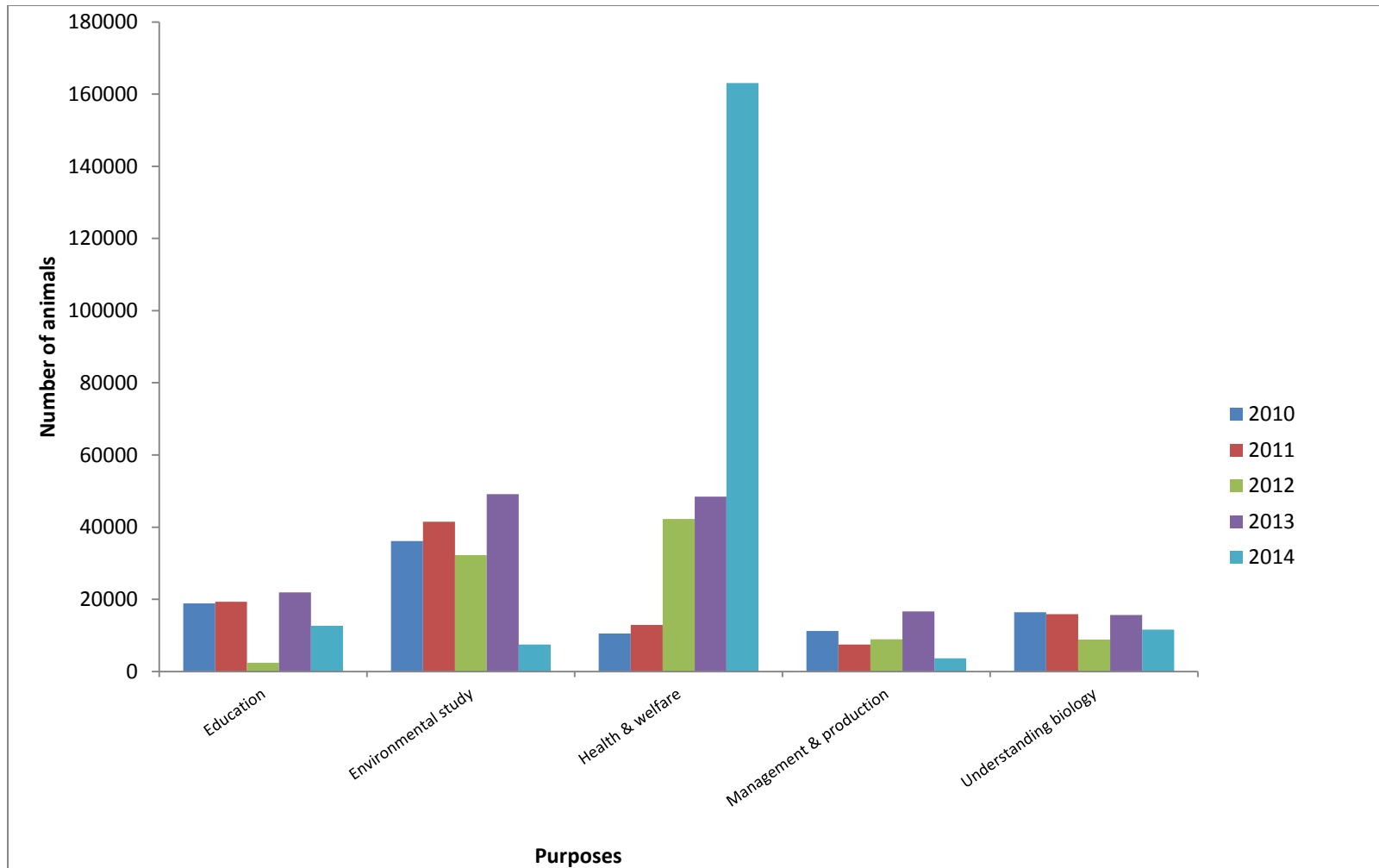
**Table 4 Purposes and procedures used for animal types in 2014 continued**

	Native mammals continued							Reptiles
	Native Rats and Mice	Other native mammals	Platypus	Possums and gliders	Seals	Tas Devils	Wombats	Lizards
<b>Purpose</b>								
Education		2	4		100		188	42
Environmental study		38				255		6
Health & welfare			13					
Management & production		78				346		
Understanding biology	30	3		10	30	48	20	298
<b>Procedure</b>								
Observation with minor interference	30	80		10	130	234	208	298
Minor conscious procedure		31				367		36
Minor physiological challenge						8		
Minor operative procedure with recovery			17			40		
Major physiological challenge								
Major surgery with recovery								
Animal unconscious no recovery		10						12

**Figure I Animal categories used between 2010 and 2014**

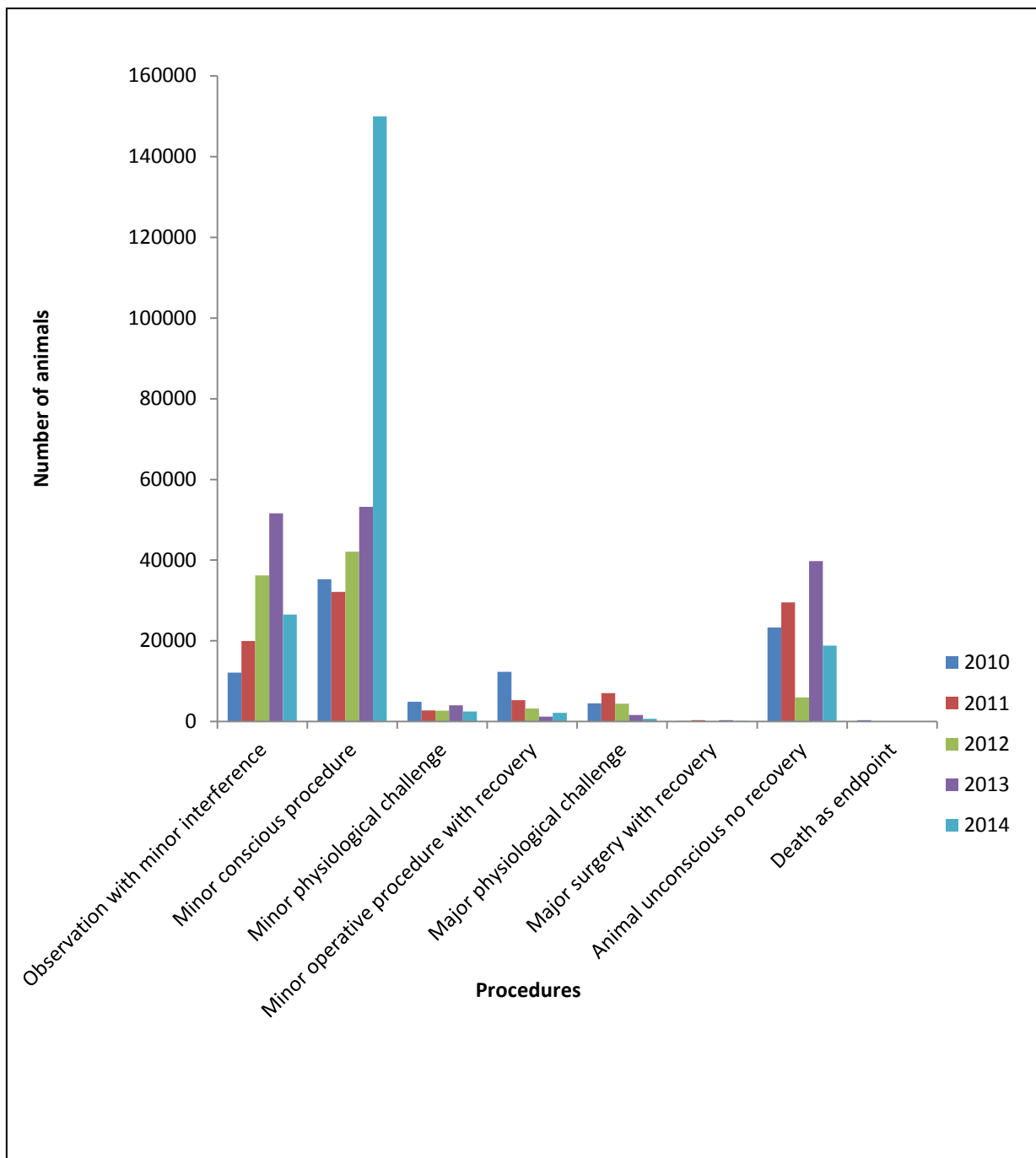


**Figure 2 Purposes for which animals were used between 2010 and 2014**





**Figure 3 Procedures used between 2010 and 2014**



## ABBREVIATIONS

AEC	Animal Ethics Committee
ANU	Australian National University
AWAC	Animal Welfare Advisory Committee
BCR NZ	Dr Bruce C Robertson
BIR AUS	Dr Bruce I Robertson
Birdlife	Birdlife Tasmania
COAF	CSIRO Oceans and Atmosphere Flagship (ex-CSIRO Marine and Atmospheric Research Division or CMAR)
CRG	Code Reference Group (NHMRC)
CSU	Charles Sturt University
Deakin	Deakin University, Victoria
DPIPWE	Department of Primary Industries, Parks, Water and Environment
Entura	Entura
FoMI	Friends of Maatsuyker Island
Freshwater	Freshwater Systems Pty Ltd
HAC	Huon Aquaculture Co Pty Ltd
Intervet	Intervet Australia Pty Ltd
MacqU	Macquarie University
Murdoch	Murdoch University, Western Australia
NHMRC	National Health and Medical Research Council
QUT	Queensland University of Technology
SBScibus	SBScibus
TasIrrig	Tasmanian Irrigation Pty Ltd
USyd	University of Sydney, New South Wales
UTas	University of Tasmania
Virbac	Virbac (Australia) Pty Ltd
VWSG	Victorian Wader Study Group Inc

END