

**Rural and Regional Affairs and Transport Legislation Committee**

ANSWERS TO QUESTIONS ON NOTICE

Budget Estimates May 2015

**Agriculture**

**Question:** 153

**Division/Agency:** Rural Industries Research and Development Corporation

**Topic:** Staff salaries

**Proof Hansard page:** 120 (25.5.2015)

**Senator EDWARDS asked:**

**Senator EDWARDS:** I just had a look at your organisational chart. You have 18.7 staff including a CEO, a communications director, a research manager, an IT manager, a finance manager, an administration officer, a general manager corporate and an executive office manager. Are these skills available in Albury?

**Mr Burns:** I have always been of the view that nobody is irreplaceable, so I would imagine that, even if the skills were not available, if you were paying the right price you would attract them.

**Senator EDWARDS:** Albury is a big place though.

**Mr Burns:** Sure.

**Senator EDWARDS:** You can take this on notice. I would be interested to know the salaries of each of the ones I have just mentioned.

**Mr Burns:** I will take it on notice.

**Answer:**

CEO - \$307 308.25

Communications Manager - \$137 363

Research Manager - \$141 783

IT Manager - \$132 942

Finance Manager - \$119 965

Administration Officer (Part-time) - \$81 930.80 (\$87 783 FTE)

General Manager Corporate - \$219 286.50

Executive Officer Manager - \$90 417

**Rural and Regional Affairs and Transport Legislation Committee**

ANSWERS TO QUESTIONS ON NOTICE

Budget Estimates May 2015

**Agriculture**

**Question:** 154

**Division/Agency:** Rural Industries Research and Development Corporation

**Topic:** RIRDC reports

**Proof Hansard page:** Written

**Senator RIHANNON asked:**

1. I've previously been provided with a collated list of all RIRDC projects and reports about kangaroos, including the following details for each project: project ID and name, research organisation and researchers, Objective Summary, and funding/cost for each project and finish date(see RIRDC QoN 174, Budget Estimates May 2014):
  - a. Please provide links or copies of each of the reports listed in the May 2014 list provided.
  - b. Please advise which projects have not yet been publically released, and why not – including whose decision this is – understanding that the KIAA has final say on the public release of any report .
  - c. May I have an updated list with the mentioned details, as well as the stage of each project, and whether the resulting report has been publically released – and if not, why not.
2. I have previously been advised that RIRDC kangaroo projects are not marketing or strategic communications strategy research, when according to the list of RIRDC kangaroo research projects – every one of its documents is market research and communications strategy to identify market barriers and threats, and how to overcome those threats.
  - a. The project “Characterising the Australian public and communicating about kangaroo management” ([http://devweb.rirdc.gov.au/research-project-details/custr10\\_KAN/PRJ-008967](http://devweb.rirdc.gov.au/research-project-details/custr10_KAN/PRJ-008967)) aims to “**provide practical information on how to design specific communications** (e.g. policies, informational or persuasive messages) **relating to the management of kangaroos**”, that is, it aims to provide market research to shape messaging to each targeted group mindset. The example given is that the kangaroo industry provides targeted messaging and, I emphasise, “**a government environmental/conservation agency could present information on a specific culling program in order to gain more public acceptance**”.

**Question:** 154 (continued)

I also note this project is also listed as an RD&E priority in “Reinforcing the licence to operate” (RIRDC report *Animal Industries – New, Developing and Maturing. Five Year RD&E Plan 2013-2018*. pg 22)

- i. Please provide a copy of this report.
  - ii. Is there a requirement RIRDC marketing and advertising messages are identified by the receiver of the messages as such? If not, why not?
  - iii. Are relevant government agencies and conservation agencies advised that they are effectively delivering targeted market messaging contracted by the industry with the specific aim of “gaining more public acceptance”? If not, why not?
  - iv. Are overseas governments advised that the RIRDC/KIAA based information they are being presented by government Ministers and agencies in fact marketed messaging?
- b. The project (DAFF ID No: GMS-2085) was completed in June 2014. Please provide a copy of the report and any articles from the project, noting that there are no confidentiality provisions for the report as noted in a Department spreadsheet at this link: <http://bit.ly/1h3u6T>
- c. Note, please refer this question to the appropriate agency or program if needed: I note the project’s original budgeted cost was \$60,000. According to a DAFF 2014-15 spreadsheet PBS Program “Sustainable Management – Natural Resources” provided an ad-hoc grant of \$82,500 to the RIRDC for this project. (<http://bit.ly/1h3u6T> )
- i. Is this \$82,500 additional to the original RIRDC funding of \$60,000?
  - ii. Please provide details of the specific reasons, purpose and outcomes expected from this additional “ad-hoc” funding.

**Answer:**

1.

- a. The attached spreadsheet contains the links to reports that are available on RIRDC’s website. Electronic copies of reports for which there is no web-link or where not published will be provided separately (if available), as will reports that are only available in hard copy.
- b. Advice as to the reports of projects that have not been publically released, and why, is contained in the attached spreadsheet. RIRDC, not the KIAA, decides whether to publish reports from projects.
- c. This information is contained in the attached spreadsheet.

**Question:** 154 (continued)

2.

a.

i. An electronic copy of report is attached.

ii-iv This is not a marketing report, but rather provides market intelligence.

b. GMS-2085 is 'Characterising the Australian public and communicating about kangaroo management'. This report is attached.

c.

i. No. The Department of Agriculture entered into an agreement with RIRDC for \$82 500 inclusive of GST to deliver the project. RIRDC entered into an agreement for \$60 000 exclusive of GST with the research organisation to the project. RIRDC acquitted the expenditure to the Department.

ii. No additional funds were provided.

ID	Project	Principal Investigator (researcher)	Project Total	Published Report	Research Organisation (name of the recipient)	Project Aims/Objectives Summary
PRJ-00089	<a href="#">Kangaroo meat awareness marketing research for foodservice and consumer</a>	Nathan, Mel	\$84,900.00	The outputs of the project were "improving communication with Kangaroo meat via magazine editorials, in foodservice and consumer publications, trade fair participation and chef discussions". Roocipes is an output of this project <a href="https://rirdc.infoservices.com.au/items/10-186">https://rirdc.infoservices.com.au/items/10-186</a>	Food Companion International	Would see kangaroo meat editorial and marketing research and analysis into a cross section of various foodservice and cooking magazines, newsletters, chefs association newsletters and chef focus groups.
PRJ-000303	<a href="#">Kangaroo and the China Free Trade Agreement</a>	Kelly, John	\$32,100.00	No RIRDC publication due to nature of project	Lenah Consulting	Creating the most favourable possible regulatory environment in China for the sale of kangaroo products.
PRJ-000315	<a href="#">Obtain perceptions of consumers &amp; foodservice operators regarding Kangaroo meat</a>	Ellis, Mark	\$32,000.00	<a href="https://rirdc.infoservices.com.au/items/09-126">https://rirdc.infoservices.com.au/items/09-126</a>	Sensory Solutions Pty Ltd	To research Foodservice decision makers in the mainstream restaurant trade to establish barriers/opportunities to be addressed in marketing to this important market sector. To provide insights to two objectives as outlined in the Kangaroo Industry Strategic Plan 2005-2010: 1) Informing Chefs about the Industry and it's products 2) Develop improved product image via increased communication within various industry publications.
PRJ-000681	<a href="#">Choosing kangaroo: product and industry attributes and consumer choice beha</a>	Ampt, Peter	\$81,000.00	<a href="https://rirdc.infoservices.com.au/items/08-026">https://rirdc.infoservices.com.au/items/08-026</a>	University of New South Wales	1. Identify key attitudes and issues concerning the use of kangaroo meat by smallgoods and other meat manufacturers. 2. Ascertain which attributes of meat and smallgoods in general are important for consumer choice and determine how kangaroo is perceived on these attributes. 3. Investigate choice behaviour and potential demand among meat consumer segments to identify the triggers for increased consumption of kangaroo based on the attributes identified in objective 2. 4. Determine the change in the choice behaviour of smallgoods manufacturers based on the previous findings.
PRJ-000693	<a href="#">Kangaroo Meat Marketing Support</a>	Nathan, Mel	\$5,000.00	No RIRDC publication as awareness raising article in the Food Companion International was deemed appropriate	Food Companion International	Support domestic kangaroo meat market development To raise awareness with chefs and epicureans in the Australian meat. Campaign will include launch of Spring edition of Food Companion international + front cover feature on kangaroo including full summary on 'culinary name for Kangaroo giveaway' competition recipes interviews and nutritional advice.
PRJ-000694	<a href="#">Extending the sustainable management of kangaroo</a>	Kelly, John	\$46,440.00	<a href="https://rirdc.infoservices.com.au/items/09-056">https://rirdc.infoservices.com.au/items/09-056</a>	Lenah Consulting	The project will seek to extend the sustainable management of kangaroo populations into regions not currently covered by Federally approved Management Plans such as Victoria the Northern Territory and parts of NSW and SA.
PRJ-000695	<a href="#">Maintaining the kangaroo industries freedom to operate</a>	Kelly, John	\$71,609.00	No RIRDC publication. Industry were considering publishing.	Lenah Consulting	Ongoing dissemination of positive media and factual information on the kangaroo industry to improve its public image and enable further growth in market size and value. In particular the project will ensure key personnel and decision makers in government and major industry clients (such as Adidas) are regularly updated with factual information on industry developments in order to maintain a positive impression of the kangaroo industry. This project addresses an Objective in the current Kangaroo Industry Strategic Plan given a highest priority ranking.
PRJ-000854	<a href="#">Nutritional Composition of Kangaroo Meat</a>	Turne, Ron	\$48,514.00	<a href="https://rirdc.infoservices.com.au/items/08-142">https://rirdc.infoservices.com.au/items/08-142</a>	CSIRO Food and Nutritional Sciences	Determining the nutrient composition of specific fat components in four muscle cuts of two different species of kangaroo from two geographic locations. The work will provide the industry with information they require regarding specific nutrients in their products.
PRJ-000855	<a href="#">Research and Development for the US Market for Kangaroo meat and skins</a>	Topper, Brian	\$34,481.00	No RIRDC publication due to nature of project	AI Topper & Co	Assist the researching and development of effective material dealing with the history and lack of need for this legislation
PRJ-002302	<a href="#">Taking the Kangaroo Industry to the internet community</a>	Kelly, John	\$110,000.00	No RIRDC publication as outcome of project included cooking demonstration videos, industry video, photos on photobucket, 6 industry newsletters, facebook groups.	Lenah Consulting	The new wave of threat to the kangaroo industry comes from unchallenged material on contributor generated internet sites such as Youtube, Myspace, photobucket, Wikipedia and others. Or is this in fact an opportunity? This project will enable the kangaroo industry to ensure these types of sites are loaded with positive messages about the kangaroo industry and its products. It will also ensure ongoing resources are available to counter anti-industry campaigns and spread positive industry messages in more traditional media.
PRJ-002352	<a href="#">Comparative carbon footprint for kangaroo products</a>	Begley, Richard	\$40,180.00	No RIRDC publication as it was decided that the results had not been peer reviewed and could not be substantiated at the time.	ACIL Tasman Pty Ltd	To assess the greenhouse gas emissions of kangaroo products – focusing on table meat and leather production. To compare these to more traditional sources of red meat and leather.
PRJ-003120	<a href="#">Research to assist market development for kangaroo products in California &amp; NY</a>	Kelly, John	\$236,664.00	<a href="https://rirdc.infoservices.com.au/items/10-220">https://rirdc.infoservices.com.au/items/10-220</a>	Lenah Consulting	California is the largest single economy in the US. Sale of kangaroo products has been legalized in California via a short term amendment to their laws. This expires at the end of 2009, at which time the legislation will revert to its previous prohibition. This project aims to research mechanisms and provide supportive documentation to enable continuing sale of kangaroo products past 2000.
PRJ-003129	<a href="#">Kangaroo survey in south east South Australia</a>	Stokes, Peter	\$6,305.00	No RIRDC publication. Results of this project published by SA Govt. Report can be found <a href="http://www.environment.sa.gov.au/Home/Search_Results?dlv_Site_Wide_Search_Results=&amp;keyword=2012%20commercial%20kangaroo">http://www.environment.sa.gov.au/Home/Search_Results?dlv_Site_Wide_Search_Results=&amp;keyword=2012 commercial kangaroo</a>	Department for Environment and Heritage, SA government	To determine kangaroo density in the south east To use this density information to support a trial extension of the commercial harvest zone
PRJ-004103	<a href="#">Improving the welfare and humaneness of commercially harvested kangaroos.</a>	McLeod, Steven	\$240,068.00	<a href="https://rirdc.infoservices.com.au/items/13-116">https://rirdc.infoservices.com.au/items/13-116</a>	The Department of Primary Industries, an office of the Department of Trade and Investment, Regional Infrastructure and Services, NSW	To provide scientific knowledge and other information on the animal welfare impact of kangaroo harvesting methods with the aim of determining the most appropriate euthanasia methods for young kangaroos which reduce, as much as possible, unnecessary pain, distress and suffering. This will be achieved by: • Reviewing the literature, with an emphasis on current understanding of acceptable methods of euthanasia. The review will aim to address issues that were not covered adequately by the 2006 Hopwood report and will include current information on the development of conscious perception of pain and the implications for humane killing; • Determining the humaneness of current methods used to euthanase pouch young and young-at-foot including decapitation and a heavy blow to head; • Comparing currently used methods of stunning with a spring-operated captive bolt gun that has the potential for use in the field by kangaroo harvesters; • Determining the fate of orphaned young-at-foot that escape capture. Note that although this objective is essential if we are to provide practical strategies to reduce the welfare impact on orphaned young-at-foot, because of the experimental methods used RSPCA Australia cannot endorse it, in its present form. Therefore completion of this component is dependent upon securing additional funding from DEWHA and the Australian Animal Welfare Strategy (AAWS). We have included it here for completeness; • Evaluating the attitudes of commercial kangaroo harvesters as well as the general public and other relevant stakeholders (e.g. hunters, animal protection groups) toward animal welfare and humane killing; • Making recommendations to the kangaroo industry and Government management agencies to improve the welfare of euthanased pouch young and orphaned young-at-foot; and • Provide information for education of the general public.
PRJ-004385	<a href="#">Advanced Meat Hygiene Training for Kangaroo Harvesters</a>	Kelly, John	\$89,105.00	This project was terminated and unspent funds transferred to PRJ-005549	Lenah Consulting	Maximising kangaroo meat hygiene standards.
PRJ-005198	<a href="#">Exploring new products, technologies and markets for kangaroo leather</a>	Bois, Michael	\$20,000.00	Project Terminated	Swarvie Saint	To increase the trade of kangaroo skins to these manufacturers for use in their existing product offering To develop the world's first completely kangaroo leather shoe sole
PRJ-005549	<a href="#">Kangaroo wildlife industry training initiative</a>	Mawson, Amanda	\$420,000.00	<a href="https://rirdc.infoservices.com.au/items/11-123">https://rirdc.infoservices.com.au/items/11-123</a>	Safe Food Production Queensland	The funding would be used to extend the Rural Industries Research and Development Corporation's current kangaroo harvester training program. The additional funds will be used to accelerate training delivery, update and enhance training materials, develop a competency-based qualification and on-the-job assessment framework to facilitate ongoing training, and retrain and assess skills and knowledge of harvesters This training will ensure that kangaroo harvesters have the skills to meet international requirements and changing market conditions. All kangaroo harvesters receive training before they are first licensed—this program builds on that training to upgrade their skills on an on-going basis. A key part of the training will be the inclusion of a practical skills assessment where harvesters will need to demonstrate their competency through one of a number of assessment methods, such as an on-the-job demonstration. The project objectives include: 1. To provide extension training for wild game field harvesters and field depot operators on hygienic dressing and storage and handling of carcasses that links into a competency based framework for demonstration of skills and knowledge; 2. To develop and implement an on-the-job assessment framework for assessment and verification of wild game field harvester skills and knowledge; and 3. To identify national wild game field harvester and field depot operator competencies / identified Industry Skill Sets to be used as the basis for future training programs and industry development.
PRJ-007258	<a href="#">The effect of Sulphur Dioxide on the Thiamine content of fresh kangaroo meat</a>	Hall, Duncan	\$52,000.00	<a href="https://rirdc.infoservices.com.au/items/13-006">https://rirdc.infoservices.com.au/items/13-006</a>	BIOLOGIC PTY LTD	1. To provide guidance regarding the concentration of SO2 required to achieve an acceptable shelf life for fresh kangaroo meat. 2. To measure the impact of various concentrations of SO2 on thiamine in kangaroo meat over the normal product shelf life. 3. To indicate the degree of thiamine supplementation necessary to counter the inactivation of thiamine in kangaroo meats preserved with SO2, to ensure that the minimum nutrient level for thiamine in pet meat is met, as specified by the globally accepted nutrient guidelines for dogs and cats (AAFCO 2009b; AAFCO 2009a). 4. To provide the Kangaroo Industry Association of Australia (KIAA) with a selection of communication resources to allow efficient and widespread communication of the research findings within the industry.
PRJ-008154	<a href="#">Kangaroo Meat Sulphite and Thiamine</a>	Hall, Duncan	\$49,924.00	<a href="https://rirdc.infoservices.com.au/items/13-006">https://rirdc.infoservices.com.au/items/13-006</a>	BIOLOGIC PTY LTD	1. To assess the relationship between various concentrations of SO2 and thiamine concentrations in kangaroo meat over the normal product shelf life (deemed 28 days). 2. To explore the degree of thiamine supplementation necessary to counter the inactivation of thiamine in kangaroo meats preserved with SO2, to ensure that the minimum nutrient level for thiamine in pet meat is met at levels consistent with current industry practice.
PRJ-008402	<a href="#">Kangaroo sulphur dioxide and thiamine relationship study (supplement)</a>	Hall, Duncan	\$24,400.00	<a href="https://rirdc.infoservices.com.au/items/13-006">https://rirdc.infoservices.com.au/items/13-006</a>	BIOLOGIC PTY LTD	To elucidate the relationship of sulphur dioxide and thiamine in chilled kangaroo meat for pet consumption, building upon the previous RIRDC funded study (RIRDC project: PRJ-007258), completed in August 2011.
PRJ-008460	<a href="#">Kangaroo sulphur dioxide and thiamine relationship study Supplemental study # 2</a>	Hall, Duncan	\$30,000.00	<a href="https://rirdc.infoservices.com.au/items/13-006">https://rirdc.infoservices.com.au/items/13-006</a>	BIOLOGIC PTY LTD	To elucidate the relationship of sulphur dioxide and thiamine in chilled kangaroo meat for pet consumption, building upon the previous RIRDC funded studies (RIRDC project: PRJ-007258 and PRJ-008420)

PRJ-008557	<a href="#">Building confidence in kangaroo meat for pet nutrition</a>	Hall, Duncan	\$17,860.00	<a href="https://rirdc.infoservices.com.au/items/13-006">https://rirdc.infoservices.com.au/items/13-006</a>	BIOLOGIC PTY LTD	<p>Widespread awareness throughout the kangaroo industry about the importance of adequate dietary thiamine in pet meat being fed to dogs and cats to support pet wellbeing. •Awareness across the industry of recognized nutritional guidelines for the (minimum) levels of thiamine in dog and cat foods (AAFCO nutrient guidelines), and the importance of thiamine as a key nutrient consideration for cats and dogs. •Enhanced pet health status, through reduced incidence of clinical thiamine deficiency in pets fed kangaroo meat as industry members include levels of thiamine supplementation and sulphite inclusion that have been shown in studies to result in levels that meet AAFCO nutrient guideline recommendation for inclusion of thiamine in foods for dogs and cats throughout the expected shelf life of chilled pet food products.</p> <p>•Presentation of the KIAA (and RIRDC) as a proactive industry organisation, attuned to consumer concerns and interest in regards to the issue of thiamine sufficiency and pet health when feeding uncooked kangaroo meat to companion animals. •Provide empirical, research-based data regarding thiamine and sulphites inclusion in kangaroo meat to key influencers including: veterinarians, pet owners, organisations within the kangaroo industry supply chain and regulators to enable more informed discussion and agreement regarding appropriate meat processing to achieve adequate thiamine levels in kangaroo meat for pet nutrition for the duration of the shelf life of kangaroo meat products. •Enhanced confidence in the thiamine status of (thiamine supplemented) uncooked kangaroo meat as pet food.</p>
PRJ-008967	<a href="#">Characterising the Australian public and communicating about kangaroo management</a>	Sharp, Trudy	\$60,000.00	Project funded by the Department of Agriculture under the "Short-form funding deed for the kangaroo industry social licence project". The project material and intellectual property created as a result of this project is the final report which will be made available to the Department and industry association.	Animal Welfare Science Consultants	The objective of this study is to provide two essential pieces of information that are required for effective communication of the issues surrounding kangaroo management. These are: i) an awareness of different 'kangaroo management mindsets' within the community, and ii) an understanding of specific characteristics of kangaroo management messages that are likely to influence these different mindsets.
PRJ-010037	<a href="#">Kangaroo meat export market access analysis</a>	Barnard, Agnes	\$39,400.00	Due for completion in July 2015	Oliver & Doam	The Kangaroo industry is seeking to not only open new export markets but to expand trade into markets where there is agreed certification but little to no trade, they are also looking to improve trade to current markets. The project objectives are: 1. Data Scoping 2. Consultation 3. Industry Export Market Access Analysis - Draft * Export trade environment analysis, * Industry situation analysis and * Export Market Analysis 4. Presentation and Workshop 5. Submission of the final Kangaroo Meat Export Market Access Analysis Report.
None	<a href="#">Roocipes</a>	Mel Nathan		<a href="https://rirdc.infoservices.com.au/items/10-186">https://rirdc.infoservices.com.au/items/10-186</a>	Food Companion International	This project will attempt to identify and prioritise potential new kangaroo meat markets and opportunities in current markets, along with providing analysis required for the development of a kangaroo meat export plan.
UA-59A	<a href="#">People and the Kangaroo Harvest in the South Australian Rangelands</a>	Dana Thompson		<a href="https://rirdc.infoservices.com.au/items/07-039">https://rirdc.infoservices.com.au/items/07-039</a>	The University of Adelaide	The purpose of this research was to develop understanding of the social, institutional and cultural factors that influence the use of commercial kangaroo harvesting as a strategy for promoting sustainable rangeland landscapes. In-depth information gathered through interviews with industry stakeholders in South Australia has highlighted issues which are important to designing effective institutions for management of commercial harvest which are not revealed in any other research on kangaroo management or industry development.
LEC-4A	Kangaroo Industry Strategic Plan	Kelly, John		<a href="https://rirdc.infoservices.com.au/items/05-108">https://rirdc.infoservices.com.au/items/05-108</a>	Lenah Consulting	To develop strategies and R&D priorities to overcome key industry issues.
US-94A	Meat quality of kangaroos	Wynn, Peter		<a href="https://rirdc.infoservices.com.au/items/04-151">https://rirdc.infoservices.com.au/items/04-151</a>	University of Sydney	The aims of this research were: 1. To develop relationships between genotype, sex and age of kangaroo at slaughter with the key meat quality parameters of tenderness, flavour and juiciness. 2. To establish an understanding of the effect of harvesting and post-slaughter carcass storage methods on the rate of change of muscle pH, the ultimate pH, muscle shortening, losses due to drip from meat, cooking losses and ultimately consumer evaluation of the product. 3. To develop a series of recommendations will be developed in close collaboration with the industry partners to establish the major factors controlling kangaroo meat quality for human consumption.
LEC-1A	Kangaroo Industry-Its image & market	John Kelly		<a href="https://rirdc.infoservices.com.au/items/02-166">https://rirdc.infoservices.com.au/items/02-166</a>	Lenah Consulting	This project focused on: 1) Generating positive media coverage on the kangaroo industry 2) Informing the Australian government and environmental academic community of the responsible and ethical nature of the kangaroo industry. 3) Facilitating incorporation of kangaroo industry information into environmental management curricula in Australian tertiary training.
PAC-2A	Kangaroo pet meat survey	Trevor Cook		<a href="https://rirdc.infoservices.com.au/items/02-145">https://rirdc.infoservices.com.au/items/02-145</a>	PacALLIANCE (Australia) Pty Ltd	The objective of this study, flowing from an earlier industry workshop (RIRDC Report PACNo1), is to examine opportunities to increase consumer acceptance of Kangaroo meat as a valuable addition to a pet's diet: In particular the opportunity to gain endorsement from vets and breeders to such a proposition.
CWT-1A	Enhancing the Unique Properties of Kangaroo Leather	Mark Looney		<a href="https://rirdc.infoservices.com.au/items/02-105">https://rirdc.infoservices.com.au/items/02-105</a>	CSIRO Textile and Fibre Technology	This collaborative project funded by CSIRO Textile and Fibre Technology, Packer Tanning and RIRDC aimed to determine the factors during the various stages of the processing of raw skins through to the final leather which have a significant effect on the strength. This report identifies components related to preservation and the chemical and mechanical operations that influence the strength of the finished leather.
None	Kangaroo Specifications and Selected Meat Cuts	Peter Evans		<a href="http://www.kangaroo-industry.asn.au/products/PDFs/Kangaroo%2020">http://www.kangaroo-industry.asn.au/products/PDFs/Kangaroo 20</a>	AUS-MEAT	To review, research, and communicate with the Kangaroo Industry operators to revise and develop the next edition of the Kangaroo Specifications for Selected Meat Cuts publication. Prepare a proposal for RIRDC to consider funding the development and printing of the next edition of the meat manual. Communicate with a selected group of the Australian Kangaroo Industry organisation (KIAA) to evaluate the extent of the review. Produce draft version of the next edition for review by the evaluation group. Print hard copy for stocks and prepare web-site files for the Industry to use on their web-site.
None	Improving Consumer Perceptions of Kangaroo Products	Des Purtell		<a href="https://rirdc.infoservices.com.au/items/97-036">https://rirdc.infoservices.com.au/items/97-036</a>	Des Purtell & Associates	To analyse and assess perceptions of the kangaroo industry and its products and formulate strategies to exploit market opportunities.
None	Kangaroo industry Commercial Practices	Macarthur Consulting Pty Ltd		<a href="https://rirdc.infoservices.com.au/items/97-035">https://rirdc.infoservices.com.au/items/97-035</a>	Macarthur Consulting Pty Ltd	To provide a review of all State and Federal Government policy initiatives, rules and regulations that have both a positive and negative impact on industry development. To identify the level of policy inconsistency and/or consistency across states in light of mutual recognition legislation.
None	Profitable Marketing of Kangaroo Products	Macarthur Consulting Pty Ltd		Hard Copy only - 95/19 Posted via Express Post on 15 June	Macarthur Consulting Pty Ltd	Examine the marketing research and development priorities for the kangaroo industry across the prime product groupings of game meat, pet meat, skins and leather.



**Australian Government**  

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**Rural Industries Research and  
Development Corporation**

# **Characterising the Australian public and communicating about kangaroo management**

by Trudy M. Sharp, Steven R. McLeod and Donald W. Hine

October 2014

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*Characterising the Australian public and communicating about kangaroo management*  
Project No. PRJ-008967

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# Contents

- About the Authors ..... iii**
- Acknowledgments..... iii**
- Executive Summary..... vii**
- Introduction ..... 1**
  - What is the report about? ..... 1
  - A brief overview of kangaroo management ..... 1
    - Commercial kangaroo harvesting..... 2
    - Killing for conservation or damage mitigation..... 2
    - Other types of management..... 2
  - Public perceptions and attitudes towards kangaroos and their management ..... 3
  - Social marketing and audience segmentation ..... 5
  - Persuasive communication and the elaboration likelihood model of persuasion..... 6
- Objectives ..... 8**
  - Overview ..... 8
  - Achieving the objectives ..... 8
    - 1. Identifying ‘kangaroo management profiles (or groups)’ in the community ..... 8
    - 2. Determining how each profile (or group) responds to messages about kangaroo management..... 11
- Methodology..... 12**
  - Summary ..... 12
  - Design and procedural overview..... 12
  - Participants..... 12
  - Profiling variables ..... 12
    - Affective associations..... 12
    - Knowledge about kangaroos and their management..... 13
    - Attitudes towards different methods used to kill kangaroos ..... 13
    - Cultural cognition..... 13
    - Environmental concern..... 13
  - Profile validation variables ..... 14
    - Acceptability ratings for nine kangaroo management methods ..... 14
    - Purchase of kangaroo products..... 15
    - Information seeking/awareness of kangaroo management issues ..... 15
    - Kangaroo activism..... 15
  - Kangaroo management messages ..... 15
    - Communication cues ..... 21
    - Judgement dimensions ..... 21
    - Statistical methods..... 21
- Results..... 23**
  - Audience segmentation analysis: generation of profiles..... 23
    - Correlations and descriptive statistics ..... 23
    - Kangaroo management profiles within the Australian community ..... 25

Demographic and geographic characteristics of the kangaroo management profiles .....	28
Validation of the kangaroo management profiles.....	30
Evaluation of kangaroo management messages.....	31
Qualitative judgement analysis.....	31
Message engagement.....	31
Message rejection .....	33
<b>Implications.....</b>	<b>44</b>
<b>Appendix .....</b>	<b>45</b>
<b>References .....</b>	<b>70</b>

## Tables

Table 1	A taxonomy of attitudes towards kangaroos (from Shepherd and Caughley, 1987).....	4
Table 2	Communication cues and cue categories.....	21
Table 3	Correlations between psychological profile variables.....	24
Table 4	Model fit indices for two to four profile solutions.....	25
Table 5	Psychological variables – means with 95% confidence intervals across the profiles.....	27
Table 6	Demographic and geographic characteristics of the different kangaroo management profiles – means and distributions.....	29
Table 7	Outcome variables – acceptability of nine different kangaroo management methods – Means ± 95% confidence intervals and mean differences across the profiles.....	30
Table 8	Outcome variables – purchasing of kangaroo products, information seeking, activism – Means ± 95% confidence intervals and mean differences across the profiles.....	31
Table 9	Kangaroo management messages with highest and lowest scores for engagement and rejection for total sample and across the profiles.....	36
Table 10	Kangaroo management messages with message engagement and rejection scores across the profiles.....	37

## Figures

Figure 1	Example of an animal protection message (message no. 40) (Photo source: <a href="http://social-news.net/news.org/campagna-anti-adidas-massacrati-brutalmente-milioni-di-canguri.html">http://social-news.net/news.org/campagna-anti-adidas-massacrati-brutalmente-milioni-di-canguri.html</a> ).....	16
Figure 2	Example of an animal protection message (message no. 41) (Photo source: <a href="http://www.scribd.com/doc/28284712/Adidas-and-kangaroo-killing">http://www.scribd.com/doc/28284712/Adidas-and-kangaroo-killing</a> ).....	17
Figure 3	Example of an animal protection message (message no. 39) (Source: <a href="http://kb.rspca.org.au/What-happens-to-joeys-when-female-kangaroos-are-shot_76.html">http://kb.rspca.org.au/What-happens-to-joeys-when-female-kangaroos-are-shot_76.html</a> ).....	18
Figure 4	Example of a kangaroo management message (message no. 20) (Source: <a href="http://www.gamemeats.com.au/kangaroo.html">http://www.gamemeats.com.au/kangaroo.html</a> ).....	18
Figure 5	Example of a kangaroo management message (message no. 22) (Source: <a href="http://www.ssaa.org.au/press-releases/2014-01-20_barbecue-roo-for-australia-day.html#.U6t1aqjamUZ">http://www.ssaa.org.au/press-releases/2014-01-20_barbecue-roo-for-australia-day.html#.U6t1aqjamUZ</a> ).....	19
Figure 6	Example of a kangaroo management message (message no. 2).(Source: <a href="http://www.environment.gov.au/system/files/resources/11b7d7c8-7a25-45fc-81ea-f672e14d1fec/files/kangaroo-harvest-factsheet.pdf">http://www.environment.gov.au/system/files/resources/11b7d7c8-7a25-45fc-81ea-f672e14d1fec/files/kangaroo-harvest-factsheet.pdf</a> ).....	20
Figure 7	Psychological characteristics of the kangaroo management profiles.....	26
Figure 8	Scatterplot of engagement and rejection scores for kangaroo messages, across profiles (Concerned, Neutral and Accepting) and message type (kangaroo management and animal protection). The number represents message number presented in Table 10. ....	35

# Executive Summary

## What the report is about

The research outlined in this report provides practical information that can be used in the development of communications (e.g. policies, informational or persuasive messages) relating to the management of kangaroos. We identified three groups (or profiles) within the Australian public who share similar views and perceptions about kangaroo management and then evaluated how each of these groups responded to different types of messages about how kangaroos are managed.

## Who is the report targeted at?

The information from this study can be used by a range of communicators to tailor specific messages relating to the management of kangaroos. For example, the kangaroo industry could provide information on how harvesting is done whilst promoting their products to a particular targeted audience or, a government environmental/conservation agency could present information in order to educate the public on a culling program.

## Background

The management of kangaroos is often the subject of considerable controversy, both within Australia and abroad, yet there has been very little research to determine why this issue attracts such a high level of concern, or how extensive the concern is. There is also confusion about how best to communicate with the public about this sensitive issue. This report presents the results from formative research that identifies the different kangaroo management mindsets within the Australian community and how these different groups respond to different forms of kangaroo management messages.

## Aims/objectives

The specific objective of this study was to provide two essential pieces of information that are required for effective communication of the issues surrounding kangaroo management. These are: 1) an awareness of different 'kangaroo management mindsets' within the community, and 2) an understanding of specific characteristics of kangaroo management messages that are likely to influence these different mindsets.

## Methods used

We used 'audience segmentation analysis' methodology, a technique commonly used in social marketing, to gain an insight into the distinctive groups or 'mindsets' within the Australian public that share similar views and understandings with regard to management of kangaroos. This involved conducting an on-line survey of 1000 Australian residents and asking them to answer a range of questions to assess knowledge, attitudes and beliefs etc. relating to kangaroos and their management. We also asked participants to view a sample of kangaroo management messages and then used a qualitative variation of 'judgement analysis' methodology to determine how the public interprets and responds to different information about kangaroos and their management.

## Results/key findings

Latent profile analysis using a range of psychological and behavioural variables revealed three distinctive groups who share similar views and understandings about kangaroo management. These groups were labelled Concerned (23%), Neutral (67%) and Accepting (10%). Validation analysis revealed that these three groups differed in their levels of acceptability of a range of kangaroo management methods and also on demographic variables such as age and gender. There was also variation in how the groups responded to a range of different kangaroo management messages. The *Concerned* group exhibited a higher level of 'engagement' with all types of messages compared with

the *Accepting* and *Neutral* groups. The *Accepting* and *Neutral* groups scored animal protection messages much higher on ‘rejection’ compared to the *Concerned* group.

In general, the participants distinguished between the two types of messages (management and protection) and reacted very differently to them. For the kangaroo management messages, as rejection increased, engagement with the message also increased. This could indicate that people may realise they don’t know that much about the issue but will seek out further information. The opposite was true for the animal protection messages—as rejection increased, message engagement decreased. That is to say, they reject the message but are not motivated by it to seek out any further information.

### **Implications for relevant stakeholders**

The information in this report will be useful to a wide range of stakeholders who wish to understand the views of the Australian public, and wish to communicate with them about kangaroos and their management.

# Introduction

## What is the report about?

The management of kangaroos is a sensitive issue in Australia, and it is common to encounter (often heated) disagreement over appropriate management options in a range of situations where kangaroo numbers need to be controlled. The controversy usually stems from concern within the general public about why kangaroos need to be managed, and the methods used to control them.

Although the opinions and concerns of some groups may be based on knowledge or practical experience with managing kangaroos, many of the general public are likely to form their attitudes based on limited knowledge or direct experience. Thus, they are likely to be more susceptible to the sometimes biased, factually incorrect or one-sided information presented by the media and animal activists. To improve our integration of scientific knowledge with community concerns we need to understand what drives people to support or oppose a range of kangaroo management methods, including lethal methods such as commercial harvesting. What do the public think, what do they feel and how do they behave with regard to the management of kangaroos? The answers to these questions can help to develop and deliver effective messages that raise public awareness and understanding about the issues, generate higher levels of acceptability of some methods and build public confidence in the governments that are required to make the decisions about when and how kangaroos are managed.

Understanding why some within the public support kangaroo management, and why others do not, is an important step toward navigating the divide between the experts and public.

If we don't try to understand and address public misperceptions about kangaroo management, decisions and policies may be made on the basis of what the public demands rather than scientific understanding of the best options. For example, calls by animal rights groups to translocate animals from the Belconnen Naval Transmitting Station in the ACT rather than cull them would have resulted in poorer welfare outcomes for those animals at a substantially greater cost, and may have simply have moved the problem from one area to another. Also, the recent decision by some kangaroo processors to accept only male kangaroo carcasses was made mainly in response to public concerns over the perceived cruelty to joeys when females are shot. However, there is very little information on the long-term outcomes of a male-only harvest strategy and recent research has shown that the current methods that are used by harvesters for euthanasing in-pouch joeys are quick, effective and relatively humane.

## A brief overview of kangaroo management

In 1987, Shepherd & Caughley, stated that there are only three ways to manage a population of wildlife: 'control (or even exterminate) it, utilise it to provide a continuing yield or cherish it for its intrinsic worth'. They proposed that the decision as to the right option to take is determined mainly by what we consider to be appropriate use of the land where the animals live. This view still encompasses the approach to management of kangaroos in Australia today.

On the sheep rangelands where kangaroos are the most concentrated, culling of kangaroos is undertaken to reduce competition with sheep (and also to prevent damage to crops and fences) but in some states it is also justified entirely as the harvesting of a renewable resource (Shepherd & Caughley, 1987). In national parks and other conservation areas, culling is usually defended on the grounds that heavy grazing causes environmental damage. Less often, management is used when kangaroos are a threat to human safety (e.g. causing vehicle collisions) or to reduce animal suffering (e.g. large populations of kangaroos in overgrazed enclosures).

## **Commercial kangaroo harvesting**

Commercial kangaroo harvesting is shooting wild, free-ranging kangaroos to gain an economic return from the sale of their meat and hides. By far, this form of management has the most impact on kangaroo populations with an average of 2 to 3 million killed annually. Adult kangaroos, predominantly males, are killed with a shot to the head by professional shooters who hold the necessary permits and licences. Shooters must comply with the National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (Commonwealth of Australia, 2008).

Commercial harvesting operates under state-based management plans approved by the Commonwealth Government under provisions of the Environment Protection and Biodiversity Act 1999. The ACT, Tasmania, Victoria and the Northern Territory, do not currently participate in the commercial kangaroo harvesting industry, although Victoria recently announced a two-year trial to use the carcasses of kangaroos killed under an authorities to control wildlife for pet food (Department of Environment and Primary Industries, 2014).

Originally kangaroo harvesting was seen as pest control, aimed at reducing kangaroo numbers—and thus mitigating damage to crops, pasture and fences—however there is increasing recognition that kangaroos are a valuable resource whose commercial use is in tune with ideas about gaining conservation benefit from the sustainable use of wildlife (Pople & Grigg, 1999). For example, the goal of the current NSW commercial harvest plan is ‘to maintain viable populations of kangaroos throughout their ranges in accordance with the principles of ecologically sustainable development’ (Herbert & Elzer, 2011). In order to ensure ecological sustainability, the harvest strategy in all states is based on a percentage of the kangaroo population (generally 15–20% depending on the species).

## **Killing for conservation or damage mitigation**

In some states and in certain situations kangaroos are killed solely for conservation or damage mitigation purposes and their carcasses are not used commercially. Relevant state authorities can issue landholders (which includes farmers and park managers) with authorities or permits to kill specified numbers of kangaroos in order to achieve specific objectives, such as reducing grazing pressure.

Kangaroo culling for conservation purposes has been undertaken in several national parks in Victoria and the ACT. For example, in Hattah-Kulkyne National Park, Victoria, the response of native vegetation to kangaroo grazing pressure have been studied since 1984 and annual culls have been undertaken for 20 years since 1990. Biodiversity monitoring undertaken following a cull at Hattah-Kulkyne recorded increased abundance of 20 rare or threatened plant species in culled areas compared with uncultured areas. In the ACT, kangaroos are culled in a number of reserves to maintain kangaroos at sustainable densities to minimise the impact of heavy grazing on other native fauna and flora, many of which form components of endangered grassland and woodland (Territory and Municipal Services, 2010).

Farmers can apply for a licence to harm kangaroos if they are shown to be damaging property and/or causing economic hardship. Although the exact number of animals actually killed under damage mitigation licences is unknown, it is considered to be only a small proportion of the total number killed (Olsen & Braysher, 2000).

## **Other types of management**

### **Fertility control**

Fertility control includes a range of methods with the aim being to reduce population growth rate. Methods include surgery (castration or vasectomy of males, ovariectomy or tubal ligation of females), contraceptive implants, immunocontraceptives and chemical sterilisation.

Controlling the fertility of female kangaroos has been the focus of a number of research projects, with long-acting contraceptive implants containing the gonadotrophin-releasing hormone agonist deslorelin or the synthetic progestin, levonorgestrel showing promise (Herbert et al., 2010). Because of the relatively high costs per kangaroo, and limited period of fertility control, these methods are not considered suitable for broad-scale kangaroo management and are better suited to closed or semi-closed populations where kangaroos are habituated to the presence of humans and/or are easy to capture (Olsen & Low, 2006).

### **Exclusion from water**

Electrical fencing to restrict access to water has been used in the past however it is not considered effective for kangaroo control over large areas and has only limited potential to reduce the impact of kangaroo grazing locally (Olsen & Braysher, 2000). The Finlayson trough is a low-lying electrical conductor set around a waterpoint to selectively exclude kangaroos from water.

Closing off waterpoints has also been examined as a management tool but is not a viable method for large-scale control of kangaroos, since kangaroos are highly mobile and capable of travelling to drink, and water will often still be available (Olsen & Low, 2006) .

### **Exclusion fencing**

Kangaroo proof fencing is used on some properties but it is expensive to erect and maintain. Electric fencing, although less expensive, becomes ineffective over time and in times of drought. Fencing also has adverse impacts on other wildlife (Olsen & Braysher, 2000). A number of fencing designs that prevent kangaroos passing under as well as over have been used, but their effectiveness has not been evaluated (Hacker & McLeod, 2003).

### **Capture and translocation**

Translocation involves the capture of kangaroos, usually by darting, and then moving them whilst sedated to another area for release. Translocation may be a feasible option for moving individuals or low numbers of animals as a last resort option, however is not considered a practical solution to the widespread management of overabundant kangaroos since there are only low numbers of potential release sites that would meet the criteria for relocation and it is expensive and time consuming (Higginbottom & Page, 2010). Under the ACT kangaroo management plan, translocation of eastern grey kangaroos is not permitted due to animal welfare concerns, lack of known conservation benefits, ineffectiveness in reducing large source populations and the expense and logistical requirements involved (Territory and Municipal Services, 2010).

### **Capture and euthanasia**

This involves herding kangaroos into yards, darting animals at close range to render them unconscious and then administering an overdose of barbiturate to kill them before they regain consciousness. This method was used on an enclosed population of 500 kangaroos at the Belconnen Naval Transmitting Site in the ACT in 2008. The method is expensive, time consuming and challenging to perform correctly (Territory and Municipal Services, 2010).

## **Public perceptions and attitudes towards kangaroos and their management**

The kangaroo is often referred to as an icon, a unique symbol of Australia that takes pride of place on the Australian Coat of Arms. Being such a strange and intriguing animal, it is the subject of numerous popular science books (e.g. Jackson & Vernes, 2010; Dawson, 2012; Richardson, 2012; Simons, 2013) and hundreds of scientific studies, yet there has been surprisingly little academic study to quantify and examine the attitudes of the Australian public towards the kangaroo and its management. A number of studies have examined the general attitudes of the Australian public towards animal use and animal

welfare (Signal & Taylor, 2006, 2007; Southwell et al, 2006; Taylor & Signal, 2009) and also wildlife management (e.g. Aslin & Bennett, 2000; Nimmo et al. 2007) however, only a few published studies specifically focus on kangaroos.

A taxonomy of attitudes toward kangaroo management has previously been proposed by Shepherd and Caughley (1987). This classification comprises three broad standpoints of the public with regards to the shooting of kangaroos. The three categories are: 1) all shooting to stop; 2) shooting allowed for damage mitigation; and 3) shooting allowed for commercial gain (see Table 1). They describe which groups (e.g. animal liberationists, kangaroo protectionists, pastoralists, wildlife authorities etc.) fit into each category with an explanation of why they have assigned them to each category. Although useful in presenting background information on the debate, this categorisation represents the authors view only and is not based on data from the Australian public.

**Table 1 A taxonomy of attitudes towards kangaroos (from Shepherd and Caughley, 1987)**

<p><b>All shooting to stop</b></p> <ul style="list-style-type: none"> <li>a) Animal liberationists: kangaroos, together with other species of animals, deserve much the same consideration as we extend to members of our own species; to shoot them is immoral.</li> <li>b) Kangaroo protectionists: shooting kangaroos is undesirable. Often linked with kangaroos being a national symbol.</li> <li>c) Some conservationists: there is insufficient scientific evidence that kangaroos cause significant agricultural damage. Killing cannot be justified.</li> </ul>
<p><b>Shooting allowed for damage mitigation</b></p> <ul style="list-style-type: none"> <li>a) Pastoralists: kangaroos compete with livestock, at least at some times and in some places. They should therefore be controlled. Regulation should be minimal and commercialisation should be allowed.</li> <li>b) Some conservationists: where actual or potential damage can be demonstrated kangaroos may be controlled. Regulation should be tight. Commercialisation is a much debated issue.</li> <li>c) Some wildlife authorities. NSW National Parks and Wildlife Service. SA National Parks and Wildlife Service. Victorian Fisheries and Wildlife Service.</li> </ul>
<p><b>Shooting allowed for commercial gain</b></p> <ul style="list-style-type: none"> <li>a) Some resource ecologists: kangaroos can be treated as a renewable resource and harvested accordingly. Most require regulation of the harvest.</li> <li>b) Some pastoralists: probably a minority because kangaroo products may affect markets for livestock products. Minimal regulation is required.</li> <li>c) Kangaroo industry: wildlife authorities may view the industry as a management tool but the industry is quite clear as to its priorities. Regulations that enhance the orderly flow of operations are welcomed.</li> <li>d) Some wildlife authorities. QLD National Parks and Wildlife Service and perhaps also the WA Department of Fisheries and Wildlife. Regulation is considered necessary.</li> </ul>

In 2008, a study was conducted to examine Australian consumers' current beliefs and attitudes towards kangaroo meat (Ampt & Owen, 2008). This research involved interviews with retailers/manufacturers to identify key attitudes and issues, consumer focus groups and an online consumer survey of over 1500 meat consumers which examined consumers' meat and smallgoods consumption behaviour and the role kangaroo might play in their choices, as well as their attitudes to eating kangaroo. The study revealed that although there is an increasing acceptance of kangaroo meat, there are still incorrect assumptions about how kangaroos are managed and harvested. The most common concern amongst consumers was for the welfare of harvested animals, specifically that they are killed humanely.

Recently, a survey of the Australian public was undertaken to assess the attitudes towards the management of kangaroos. Management methods were rated on the basis of acceptability, humaneness, effectiveness, safety to the public, and the likelihood of contributing to the extinction of kangaroos. In addition, attitudes towards three methods of killing (lethal injection, shooting and blunt trauma) were also assessed, along with a measure of general knowledge about kangaroos (McLeod & Sharp, 2014). The results from this survey indicated that the majority of the general public prefer non-lethal methods to lethal methods but when lethal methods are used, commercial harvesting is preferred over other methods. The authors concluded that although the public view kangaroos with strong affection, there is scope for improving peoples' general knowledge regarding kangaroo biology, ecology and management.

The ACT government has also undertaken research to determine the opinions of ACT residents towards kangaroos and kangaroo management. In 2008, 600 residents were asked via a phone survey their opinion on a range of issues. With one question, respondents were asked which of three statements best described their opinion with regards to the killing of kangaroos. Seventy-six per cent of respondents said they believe that the killing of kangaroos is appropriate under certain circumstances, 19% were unsure about the subject and 6% were against the killing of kangaroos under any circumstances (Micromex Research, 2008).

In 2011, 600 ACT residents were again surveyed and asked similar questions to those in the 2008 survey. One of these was 'which of the following statements best describes your opinion with regards to kangaroo culling?' This time the word *killing* was replaced with *culling*. Seventy-nine per cent of respondents said they believe that the culling of kangaroos is appropriate under certain circumstances, 8% were unsure about the subject and 13% were against the culling of kangaroos under any circumstances (Micromex Research, 2012). Thus, there appears to be a significant decrease in people who are *unsure* about the issue and an increase in people *opposed* to killing/culling over the 3-year period. Opinion polls are useful in demonstrating trends and changes in attitudes, however they cannot provide information as to why changes have occurred or provide guidance as to how to communicate about management with those who are unsure and are looking for information to help make up their mind.

In this current study we have taken a different approach. We have used 'audience segmentation' methodology—a technique commonly used in 'social marketing'—to identify groups of Australians that share similar attitudes, knowledge and beliefs about kangaroos and their management.

## **Social marketing and audience segmentation**

Social marketing is a process that uses marketing principles and techniques that promote behaviours that will benefit society as well as the individual (Lee & Kotler, 2011). It differs from commercial marketing in that the focus is on influencing behaviour for societal gain rather than selling goods and services for profit. Social marketing involves strategically creating, communicating, delivering and exchanging offerings that have positive value for individuals, clients, partners and society at large. It has been used in the areas of public health (e.g. smoking prevention, increase physical activity), public safety (e.g. promote transportation safety), environmental protection (e.g. recycling, water protection and reduction in energy use) and also tourism and leisure (Truong, 2014).

A common starting point in social marketing is to conduct formative research to identify the target audience's motives, attitudes and beliefs with regard to the issue of interest and then to identify segments (or groups) of like-minded individuals within the target population (Slater et al., 2006). This process is called 'audience segmentation'. Once an audience has been segmented, interventions can then be tailored to match the profile of the targeted group.

It is common for social marketers to start segmenting their target audience using demographic (i.e. gender, age, nationality, income, education etc.) or geographic (i.e. urban, rural, city) variables. However to gain a better understanding of the factors that influence behaviour, psychological (or behavioural) variables (i.e. attitudes, values, beliefs, knowledge etc.) can be the most powerful

profiling variables and are becoming much more widely used (Slater et al., 2006). For example, climate change audience segmentation studies in Australia have used variables such as knowledge and concern about climate change (Ashworth et al. 2011) as well as concern about the environment, green self-identity, emotional connection with nature, perceived spatial proximity of potential effects, trust in authorities and distress (Hine et al., 2013).

The climate change segmentation studies undertaken in the USA and Australia have indicated that populations tend to comprise groups of individuals who share similar views and understandings about climate change and that the groups can be determined by specific cognitive, emotional or behavioural characteristics. A study by Hine et al. (2013) of 1,031 Australian residents revealed three climate change interpretive communities: Alarmed (34%), Uncommitted (45%) and Dismissive (20%). Characteristics of the 'alarmed' group included a strong belief in climate change; high levels of distress, outrage and concern; better knowledge of climate change, strong environmental values; and trust in climate change authorities. On the other hand, the dismissive group had very little belief in climate change; very low levels of distress and concern; low levels of outrage and knowledge; weak environmental values; and very little trust in climate change authorities. The 'uncommitted' group exhibited attitudes, concerns and feeling that were close to the sample average.

In this study we followed a similar approach to audience segmentation as that used by Hine et al. (2013) in their climate change study. We selected a range of psychological variables (see descriptions of these below in Objectives and Methodology) that have the potential to provide a more detailed understanding of the different views and interpretations of the public with regards to kangaroo and their management, much more than the few previous kangaroo attitude studies have revealed.

## **Persuasive communication and the elaboration likelihood model of persuasion**

A persuasive communication is a message intended to change an attitude/s and related behaviours/s of an audience. The field of persuasion research and practice is usually associated with advertising, but persuasive messages can not only be used to sell products, they can raise awareness of an issue, build confidence in policy, establish social norms, engage audiences emotionally and ultimately, influence a wide range of behaviours (Behaviour Works Australia, undated). There is a large body of research examining the relationships between persuasive messages and attitude and behaviour. Earlier work by Hovland, Janis and Kelley conducted at Yale University during the 1950's suggested that the key to understanding why people would attend to, understand, remember and accept a persuasive message was to study the characteristics of the person presenting the message (the source), the contents of the message (the message) and the characteristics of the receiver of the message (the audience) (Hogg & Vaughan, 2008).

The general model of the Yale approach has been extensively tested and expanded on over the decades and today there are numerous important determinants of effective persuasion (i.e. a positive and desired change in audience attitude and behaviours). These include the attractiveness and credibility of the message source, the level of complexity of the message, whether the message contains a one- or two-sided argument, or contains an appeal to emotion versus reason. The mood of the recipient is also important, along his or her level of intelligence and personal relevance of the issue. Additionally, the context in which the message is presented (e.g. type of media, level of distraction) can affect message acceptance (Petty et al., 2009). However, the interaction of these variables in bringing about attitude change has been shown to be quite complex. Dual process models of information processing were developed in the 1970's and 80's to provide a cognitive-based framework for understanding and predicting the multiple ways in which messages are understood and attitudes are formed and changed. The most influential of these has been the elaboration likelihood model of persuasion (Petty & Cacioppo, 1981; 1996).

The elaboration likelihood model (ELM) of persuasion is a theory that explains how persuasion operates by focusing on two routes to persuasion: a relatively thoughtful route in which people focus

on the issue-relevant information presented (called the *central route*) and a less thoughtful route in which attitudes can be changed as a result of simple associations and cues (called the *peripheral route*). How much thinking a person does about a message can vary from high to low along an elaboration continuum and this amount of thinking will help to explain how (or if) they will be persuaded by a message. Where people fall along this continuum is determined by considering their *motivation* and *ability* to process the presented message. When both motivation and ability to think are present, elaboration is high and individuals are inclined to use a central route to persuasion however, as either motivation or ability decreases, elaboration is likely to be low and people will use the peripheral route (Rucker & Petty, 2006).

Motivations can be influenced by several variables, such as the perceived personal relevance of an issue, general enjoyment of thinking and also being personally responsible for processing the message. Regarding ability, a person must have the resources to understand and attend to the information. Several factors can influence a person's ability to process a message, such as his or her level of actual or perceived knowledge, the amount of distraction in the environment, intelligence and the number of message repetitions (Rucker & Petty, 2006).

With central route processing (high elaboration), people will carefully scrutinise a message to determine if it makes sense and assess the merits of supporting such a proposal (e.g. stopping smoking). Specifically, people *think* about the available information (whether it is part of the message, the source, or their own internal state) and assess whether the information provides convincing support for the proposal. If people generate predominantly positive issue-relevant thoughts as a result of considering the available information, a positive attitude will follow; if people generate predominantly negative thoughts, a negative attitude will result; and if people generate a mix of positive and negative thoughts, a moderate attitude will result. Furthermore, the greater confidence people have in the thoughts generated under central route processing, the more these thoughts will determine their attitudes (Petty & Cacioppo, 1996).

On the other hand, peripheral route processing (low elaboration) involves the use of simple cues or mental shortcuts as a way of processing the information contained within a message. This means that people do not carefully consider the arguments in a message but instead might agree with it based on whether the source of the message is an expert, the emotion created by the message, or how many arguments are presented. Although thoughtful consideration is not involved, peripheral processing of messages can still be very effective in changing attitudes and guiding behaviour, at least in the short run.

According to the ELM, both central and peripheral processing can influence attitudes simultaneously, but as elaboration likelihood increases central route processes are likely to dominate in their impact on attitudes over the more peripheral processes (Petty et al., 2009). A key contribution of the ELM is the importance of understanding how a person's attitudes were changed or initially formed. A large body of research has demonstrated that high levels of elaboration are associated with attitudes that are more persistent, resistant, and predictive of behaviour, whereas those created by the peripheral route involve a more passive acceptance or rejection of simple cues and have a less well entrenched base (Rucker & Petty, 2006).

The effective communication of issues surrounding the management of kangaroos will help the public to improve their decision-making with regards to this controversial topic. Persuasive communication is likely to play an important role in gaining the confidence of the public in policy decisions regarding the management of kangaroos however prior to this study there has been no research to examine this in detail. In this project we have used the ELM as an overarching conceptual framework for assessing the effectiveness of existing kangaroo management messages.

# Objectives

## Overview

This research aimed to provide practical information that can be used to develop specific communications (e.g. policies, informational or persuasive messages) relating to the management and welfare of kangaroos. This was achieved by identifying the main groups within Australia who share similar views and perceptions about kangaroo management and welfare and then evaluating how each of these groups responded to different types of messages about how kangaroos are managed.

Using ‘audience segmentation analysis’ methodology, a technique commonly used in social marketing, we have gained an insight into the distinctive groups or ‘mindsets’ within the Australian public that share similar views and understandings with regard to management of kangaroos. We used a qualitative form of ‘judgement analysis’ methodology to determine how the public interprets and respond to different information about kangaroos and their management and to identify the characteristics of the messages that are the most effective for each of the identified kangaroo mindsets.

The information from this study can be used by a range of communicators to tailor specific messages relating to the management of kangaroos. For example, the kangaroo industry could provide information on how harvesting is done whilst promoting their products to a particular targeted audience or, a government environmental/conservation agency could present information on a culling program in order to gain more public acceptance.

The specific objective of this study was to provide two essential pieces of information that are required for effective communication of the issues surrounding kangaroo management. These are: 1) an awareness of different ‘kangaroo management mindsets’ within the community, and 2) an understanding of specific characteristics of kangaroo management messages that are likely to influence these different mindsets.

## Achieving the objectives

### 1. Identifying ‘kangaroo management profiles (or groups)’ in the community

#### Audience segmentation

With audience segmentation the aim is to select specific criteria (or variables) to characterise each segment (or profile) so that communication can be tailored to the particular segment/s of interest. These groups will end up having something in common (e.g. higher or lower concern for animal welfare or the environment) that will make them respond in a similar way to messages about kangaroo management. In this research we decided to focus on peoples’ attitudes toward animal use and animal welfare, environmental concern, emotional association with kangaroos, cultural worldview, knowledge about kangaroos and attitudes toward three kangaroo killing methods.

When designing survey questions it is preferable to use multi-item scales since they are better than single items in terms of predictive validity (Diamantopoulos et al. 2012). Thus, we used internally consistent multi-scale items for most of the psychological constructs in the study. We briefly provide some background information on each of the variables used below:

#### Psychological profiling variables

##### *Affective associations*

The term affect has typically been used to refer to the positive and/or negative feelings and emotions that an individual associates with an attitude object (Fabrigar & Petty, 1999). Reliance on these

feelings to guide judgements and decisions about a particular object or situation has been characterised as ‘the affect heuristic’ (Slovic et al. 2007). These emotional responses occur rapidly and automatically, and are considered to be an important component of human judgment and decision-making. Thus, affective or emotional responses to kangaroos may be a potentially useful profile variable as it may have a role in guiding peoples’ decisions about the complex issue of kangaroo management.

### *Cultural worldviews (cognition)*

A persons’ worldview also plays an important role in guiding decisions about complex issues. Worldviews have been defined by Dake (1991) as generalized attitudes toward the world and its social organisation. They are ‘orienting dispositions’ serving to guide people’s responses in complex situations. People’s identities and worldviews are closely related to their social group. With regard to beliefs about right and wrong, about who should be in control, and about responsibilities to others, some people are more group-oriented whereas others are more individual-oriented. Also, some people believe that many rules are needed to control behaviour and that these rules should be different across society, others think that only a few socially stratified rules are necessary.

Cultural cognition is a relatively new approach to studying peoples’ worldviews and risk perception. It refers to the influence of group values - ones relating to equality and authority, individualism and community – on risk perceptions and related beliefs (Kahan, 2010). A number of studies have demonstrated that people will endorse whichever position reinforces their connection with others whom they share important commitments and it is because of this cognitive process that debate about scientific issues such as climate change, nuclear energy, vaccination, nanotechnology etc. can become highly polarised.

The cultural cognition approach characterises worldviews along two cross-cutting dimensions: ‘group’, which refers to individualistic or community-oriented values; and ‘grid’, which refers to hierarchical or egalitarian values (Kahan et al. 2007). People with a ‘low group’ or ‘individualistic’ orientation expect individuals to fend for themselves and therefore tend to be competitive. Those with a ‘high group’ or ‘communitarian’ worldview assume that individuals need to frequently interact and that they must depend on one another—a condition that promotes values of solidarity. Persons who have a ‘high grid’ or ‘hierarchical’ orientation expect resources, opportunities, respect etc. to be distributed based on social classifications, such as gender, race etc. whereas ‘low grid’ or ‘egalitarian’ orientation prefer that no one is prevented from participating in any social role because he or she is the wrong sex, or is too old, or does not have the right family connections” and so forth.

With this study we wanted to determine if cultural values or worldviews influence peoples’ perceptions about kangaroo management.

### *Kangaroo knowledge and attitudes*

Knowledge about kangaroos and their management may also be an important aspect of the psychological profiles. It is sometimes argued that the public's lack of understanding of kangaroo management issues may explain why the public and experts often view the same issues in different ways. The knowledge deficit model (KDM) asserts that scientists and experts have an understanding of specific issues that the public does not, and this allows them to better evaluate the risk associated with that issue (Stoutenborough & Vedlitz, 2014). When members of the public do not possess the same knowledge as experts, it is unlikely they will view the issue in the same manner as experts. According to the KDM, if this knowledge gap was reduced there may be greater agreement between public attitudes and those of experts. Furthermore, since policy maker attitudes are likely to reflect the view of their constituents rather than experts, the knowledge of the public is likely to play a very important role in decision-making on any particular issue.

However, the KDM has been criticised for presenting a simplistic view of the dynamics between the public's perceptions and those held by experts and some studies have demonstrated that having

knowledge on an issue does not lead to better assessment of risk with regard to that issue (Kellstedt et al., 2008). However, recently, Stoutenborough & Vedlitz (2014) have argued that if knowledge is accurately measured, the KDM does provide a good explanation of the differences between the public and experts. They demonstrated that scientific (or objective) knowledge, defined as one's assessed understanding of an issue is different from one's subjective perceived knowledge. Put simply, what someone actually knows is different from what they think they know. Interestingly, with regard to climate change, those that self-report high levels of knowledge on this issue are more likely to actually have a low knowledge score (and more likely to be male, trust the media but not experts and show less concern about climate change). Those with higher assessed knowledge scores are less likely to self-report being knowledgeable (and have greater ecological values, trust in climate science and experts and have greater concern about climate change).

In this survey we measured peoples' scientific or objective knowledge about kangaroos and their management using eight statements which required a true, false or don't know response.

### *Environmental concern*

To measure environmental concern we used the 15-item revised version of the New Ecological Paradigm (NEP) scale (Dunlap et al. 2000). Of the several available measures of environmental concern, the NEP is the most widely used and has been subjected to the most methodological assessment. It is considered to be a measure of generalised beliefs about the nature of human-environment interactions (Stern et al., 1995).

The NEP measures the degree to which a person views humans as an integral part of the natural environment, rather than as separate from nature. Within this new paradigm, the earth's resources are viewed as limited and the ecological balance is seen as fragile and easily disrupted by human behaviour (Schultz, 2001). The NEP has been used extensively (especially in the USA) in environmental education, outdoor recreation, and other areas where differences in behaviour or attitudes are believed to be explained by underlying values, a worldview, or a paradigm.

### *Animal welfare attitudes*

We used the Animal Attitude Scale (AAS), developed by Herzog, Betchart, & Pittman (1991), to assess individual differences in attitudes toward the treatment of animals. This scale is composed of 20-items, which subjects rate on a five-point Likert scale (strongly agree to strongly disagree). Sample items include, 'I do not think that there is anything wrong with using animals in medical research', and 'It is morally wrong to hunt wild animals just for sport'. A high score on this scale indicates pro-welfare attitudes. The scale has been found to have high internal consistency (Cronbach's alpha = .91; Mathews & Herzog, 1997) and is considered a statistically robust measure of general attitudes towards the treatment of animals (Taylor & Signal, 2009).

A number of factors have been found to influence scores on the AAS including gender (females have been found to score significantly higher than males) (Herzog et al., 1991); empathy (Taylor & Signal, 2005; Signal & Taylor, 2007b); personality factors (Mathews & Herzog, 1997); and occupation and income (Signal & Taylor, 2006b).

### **Validating the profiles**

To validate the predictive utility of the kangaroo management profiles that are generated from the audience segmentation analysis, we also included questions to be used as outcome or validation variables. To determine if the profiles differ in their support for a range of kangaroo management methods we asked respondents to rate the acceptability of nine different methods (including the option 'do nothing – no management'). We also wanted to determine if they varied in behaviour relating to purchasing kangaroo products, seeking out information on the topic and participating in anti-kangaroo management activities such as signing petitions and writing to politicians.

## **2. Determining how each profile (or group) responds to messages about kangaroo management**

### **Judgement analysis**

Judgement analysis refers to a methodology for understanding cognitive judgement tasks and making these tasks open to public inspection. It is used for learning about, analysing, and improving how people make judgments and decisions (Cooksey, 1996). In this study, we used judgement analysis to learn about people's differing opinions on a range of kangaroo management and animal protection messages.

Respondents were asked to view six kangaroo management messages that were randomly allocated from a pool of 44 messages sourced from the Internet. For half of the messages the primary aim was to increase public support/action for kangaroo management (lethal methods only i.e. commercial harvesting or culling for conservation/damage control). For the other half, the primary aim of the messages was to increase public support/action to protect kangaroo welfare and/or rights. The messages were pre-coded on seven communication cues. The respondents were asked to rate each message on 13 items to enable us to determine levels of message engagement or acceptance and message rejection.

# Methodology

## Summary

To achieve the two main objectives of (1) identifying the different kangaroo management mindsets in Australia and (2) determining which specific characteristics of kangaroo management messages influence each group, we collected data from a national sample (N=1000), via an online survey.

Participants were presented with a set of questions containing measures to identify the audience segments or profiles (i.e. different mindset relating to kangaroo management) as well as outcome variables which, measured behaviour relating to kangaroos (e.g. purchasing kangaroo products, seeking information) and acceptability of 9 different kangaroo management methods. Participants then viewed a set of six kangaroo management messages that aimed to either increase public support/action for kangaroo management or increase public support/action to protect kangaroo welfare and/or rights. After viewing/reading each message they answered questions to determine their level of engagement with the message.

The survey is included in the Appendix.

## Design and procedural overview

Data were gathered during June, 2014 via a web-based survey (see Appendix) administered by Qualtrics (Australia) to panel participants aged 18 years and older who resided in Australia. The data collection provider was asked to specifically recruit a panel sample that was representative of the Australian public based on demographic and geographic specifications from Australian census figures for 2011.

## Participants

The sample comprised 1000 participants (49% male, 51% female). Ages ranged from 20 to 84 years, which included 83% aged between 18 and 64 and 17% aged 65 years and over. Seventeen per cent of participants reported that the highest level of education completed was Year 10 (or below) at high school, 20% had completed Year 12 at high school, whilst 33% had completed a TAFE certificate of diploma. Twenty-five per cent had completed a Bachelor degree or above.

Sixty eight per cent described their current residential circumstances as residing in a metropolitan area of a major city (over 100,000 people), 15% reported that they lived in a large town (over 25,000 people), and 18% resided in a country town or rural area or village. All of these figures closely correspond with statistics collected during the 2011 national census (Australian Bureau of Statistics, 2011).

## Profiling variables

### Affective associations

Affective associations with kangaroos were assessed using an approach developed by Peters and Slovic (1996) and used by Hine et al. (2007). Participants were asked to list the first three thoughts or images that came to mind when presented with the cue word “kangaroo” and then rate each thought/image on a scale ranging from 1 (very negative) to 5 (very positive). The three affect ratings were then averaged to form a composite index of affect valence. This scale displayed adequate internal consistency ( $\alpha=.55$ ).

## Knowledge about kangaroos and their management

Objective knowledge about kangaroos was assessed by responses to eight statements. Five statements were accurate facts about kangaroos ('During periods of severe drought many kangaroos still die of starvation even though they are well-adapted to live in the Australian environment') and three statements were incorrect (e.g. 'Kangaroos are farmed just like sheep and cattle'). Participants selected *true*, *false*, or *don't know*. Correct responses scored one point, and incorrect and don't know responses scored zero. Total scores were created by summing all item scores, resulting in a possible range from zero to 8. The objective knowledge composite variable had adequate internal consistency (KR-20 = .55).

Attitudes towards the treatment of animals were examined using the Animal Attitudes Scale (Herzog et al., 1991) consisting of 20 items (e.g. 'It is morally wrong to hunt wild animals for sport'), rated on a 5-point scale ranging from 1 (strongly agree) to 7 (strongly disagree). Scores on this scale can range from 20 to 100, with higher scores indicating a greater concern for animal welfare and lower scores indicating more negative attitudes towards animals. This scale exhibited high internal consistency ( $\alpha=.89$ ).

## Attitudes towards different methods used to kill kangaroos

Attitudes towards three killing methods (shooting, blunt trauma to the head and capture followed by lethal injection) were assessed using the semantic differential technique. Eleven adjective pairs (e.g. good/bad, cruel/compassionate, brutal/humane, violent/gentle, quick/slow) were presented and respondents were asked to rate the killing methods on each of the dimensions using a 7-point scale. Each adjective pair was scored from 1 (unfavourable) to 7 (favourable) and the scores were averaged to give an overall score for each killing method. A higher score represents a more favourable attitude towards that method. All three of these scales exhibited excellent reliability (shooting,  $\alpha=.95$ ; blunt trauma,  $\alpha=.95$ ; capture followed by lethal injection,  $\alpha=.96$ ).

## Cultural cognition

The Cultural Cognition Worldview Scale (short form) was used to measure latent cultural predispositions associated with the cultural theory of risk. Respondents were asked to indicate the strength of their agreement or disagreement with each of 12 statements (strongly agree, agree, neither agree or disagree, disagree, strongly disagree). These items characterise subjects' worldviews along two cross-cutting dimensions: hierarchy-egalitarianism ('hierarchy') and individualism-communitarianism ('individualism'). The 'hierarchy' dimension refers to attitudes toward social orderings that connect authority to stratified and social roles such as gender, race and class. Items from the 'individualism' scale reflect attitudes towards social orderings in which the individual is expected to secure his or her own well-being without assistance or interference from society versus ones in which society is obliged and empowered to secure collective welfare in the face of competing individual interests (Kahan, 2012).

We computed continuous worldview scores ('individualism' and 'hierarchy') by averaging the items for each subscale, with high scores indicating a more individualistic and a more hierarchical orientation, respectively. Both of the scales had adequate internal consistency ('hierarchy'  $\alpha=.74$  and 'individualism'  $\alpha=.67$ ).

## Environmental concern

The New Ecological Paradigm (NEP) Scale was used to measure environmental worldviews. Respondents were asked to indicate the strength of their agreement or disagreement with each of 15 statements (strongly agree, agree, neither agree or disagree, disagree, strongly disagree). Agreement with the eight odd-numbered items and disagreement with the seven even-numbered items reflect endorsement of a 'new ecological paradigm' or greater environmental concern. Whereas, agreement

with the 7 even-numbered items represent endorsement of a ‘dominant social paradigm’, i.e. a world view that is less concerned with environmental issues.

Participants were asked to rate the level of agreement for each statement on a 5-point scale. The responses were averaged to form an overall NEP score, with higher overall scores indicating stronger pro- environmental attitudes (on a scale of 1-5). The scale was highly internally consistent ( $\alpha=.86$ ).

## **Profile validation variables**

### **Acceptability ratings for nine kangaroo management methods**

Nine single item variables assessed support for a range of different kangaroo management methods. A short description of nine different kangaroo management methods (see below) were provided and respondents were asked to rate the level of *acceptability* of each of these methods on a 5-point scale from very acceptable to very unacceptable.

#### *Shooting by professional shooters (commercial harvesting)*

Kangaroos are shot by an experienced shooter who has passed an accuracy test. A national code of practice requires that all kangaroos must be head-shot (i.e. killed by a shot to the head that destroys the brain). Meat and skin from carcasses are used commercially. Animals that have been shot in the body are not accepted by buyers.

#### *Shooting by professional shooters (animals shot and carcasses ‘let lie’)*

Shot by an experienced shooter. A national code of practice requires that in most circumstances kangaroos must be head -shot (i.e. killed by a shot to the head that destroys the brain). Meat and skin of the carcass are NOT used commercially and the carcass is left where it was shot.

#### *Shooting by non-professional shooters (animals shot and carcasses ‘let lie’)*

Shot by a shooter whose level of experience may range from inexperienced to highly experienced. A national code of practice requires that in most circumstances kangaroos must be head-shot (i.e. killed by a shot to the head that destroys the brain). Meat and skin of the carcass are NOT used commercially and the carcass is left where it was shot.

#### *Capture followed by euthanasia*

Kangaroos are approached (to a distance no more than 50 metres) and captured using a dart containing an anaesthetic. While kangaroos are unconscious they are killed by a lethal injection.

#### *Capture followed by translocation*

Kangaroos are approached (to a distance no more than 50 metres) and captured using a dart containing an anaesthetic. While kangaroos are unconscious they are transported to another location and released.

#### *Fertility control*

Kangaroos are approached (to a distance no more than 50 metres) and captured using a dart containing an anaesthetic. While kangaroos are unconscious they are injected with a drug that makes them infertile or are surgically sterilised and then released.

#### *Exclusion from water points*

A fence or other barrier is placed around a water source (dam or trough). Kangaroos are prevented from drinking.

### *Exclusion fencing*

A fence or other barrier is placed around a resource (e.g. a crop or pasture). Kangaroos are prevented from accessing the resource.

### *Do nothing – no management*

No human intervention.

### **Purchase of kangaroo products**

Four items assessed how often participants purchased kangaroo meat or skin products during the last 12 months. One item asked how often they purchased kangaroo meat for consumption by family, friends or colleagues, one asked if they purchased kangaroo products to feed to pets and another if they had eaten kangaroo meat at a restaurant or café. Participants also indicated how often they had knowingly bought or used products made from kangaroo skin. Response options ranged from 1 (never) to 5 (very often). A total purchasing score was achieved by averaging the four items. This scale showed good internal consistency ( $\alpha=.73$ ).

### **Information seeking/awareness of kangaroo management issues**

One item was used to assess how closely participants attended to news reports, discussions or other information about the management of kangaroos. Response options ranged from 1 (not at all) to 5 (a great deal).

### **Kangaroo activism**

Five items assessed whether or not participants would take action to protest against the killing of kangaroos (e.g. sign a petition against killing kangaroos, write to a politician to express concern about the killing of kangaroos). Response options ranged from 1 (very unlikely) to 5 (very likely). After reverse scoring one item ('Convince a friend, colleague or family member that killing kangaroos is the best method in some situations') total activism score was obtained by averaging the five items. This scale showed good internal consistency ( $\alpha=.74$ ).

### **Kangaroo management messages**

Forty-four kangaroo management messages were sourced from the Internet. A sample of relevant stakeholders (e.g. Kangaroo Industry Association of Australia (KIAA), Macro Meats, RSPCA Australia, Animals Australia, Voiceless, AgForce QLD, state kangaroo management agencies) were contacted by email and some provided advice about types of messages that could be used or supplied links to messages that may be relevant.

The messages we selected were classified into either of two categories:

- 1) *Animal protection*: Primary aim of message is to increase public support/action to protect kangaroo welfare and/or rights. See Figure 1, Figure 2 and Figure 3 for examples.
- 2) *Kangaroo management*: Primary aim of message is to increase public support/action for kangaroo control/management/use (lethal methods only i.e. commercial harvesting, non-commercial culling). See **Figure 4**, Figure 5 and Figure 6 for examples.

Mode of delivery included video presentations (29%), radio items (5%), websites (32%) and materials designed to be printed (e.g. factsheet, media release, news article, pdf document) (34%). Message reading/viewing times ranged from approximately 1 to 4.5 minutes.



Figure 1 Example of an animal protection message (message no. 40) (Photo source: <http://social-news.net1news.org/campagna-anti-adidas-massacrati-brutalmente-milioni-di-canguri.html>)

# Kangaroos Killed for Sport

Sports shoe makers cause the slaughter of many of these gentle animals. Chief offender is Adidas, who promotes kangaroo skin soccer cleats around the world. Help *Viva!* blow the whistle on this sickening trade.



**Adidas: Killing for Kicks**

**Viva!**  
Tel: 530/759-8482  
www.savethekangaroo.com

## Adidas Predator - Preying on Kangaroos

A million baby "joeys" will be slaughtered this year, torn from their dying mothers' pouches and shot, stomped on, clubbed to death or left to die of starvation. They are considered the discarded "trash" of Australia's new growth industry - kangaroo meat and skin. This year's kill quota has been set at six and a half million adult kangaroos.

The company most eagerly supporting this mass slaughter is Adidas, by heavily marketing its highly-priced, kangaroo skin, Predator soccer cleats around the world.

*A baby joey, rescued after her mother was shot.*



Australia's government sees kangaroos as an export earner - justifying the massacre with well-rehearsed myths. They claim that kangaroos destroy wheat crops and degrade grazing land. New scientific studies show that 90 percent of wheat fields never see a kangaroo and they have little impact on grazing. Even worse, the big skins demanded by Adidas and other shoe makers already pose a threat to the largest species of kangaroo - the Red kangaroo. Targeting the biggest, fittest animals for their skin has the potential to cause extinction.

The killing takes place at night in the outback and is unmonitored. Nobody knows how many animals are badly injured and escape to die in agony. It is the biggest massacre of land wildlife ever known.

Viva!USA, P.O. Box 4398, Davis, CA 95617  
Tel: 530/759-8482 www.vivausa.org



For all these reasons, we are calling on Adidas to stop using kangaroo skin. You can help:

- Boycott Adidas and complain: E-mail: Consumer.Relations@adidasus.com  
Call: 800/448-1796  
Write: Ross McMullin, CEO/President, Adidas, 5055 North Greeley Avenue, Portland, OR 97217
- Don't buy kangaroo leather! Choose state of the art, synthetic cleats which are widely available.
- Contact *Viva!* for a free kangaroo action pack and check out our website for a detailed report and video of this bloody trade at [www.savethekangaroo.com](http://www.savethekangaroo.com)

Please send me a free kangaroo action packet

First name .....

Last name .....

Address .....

City .....

State: ..... Zip .....

Email: .....

Age (if under 18) .....

Figure 2 Example of an animal protection message (message no. 41) (Photo source: <http://www.scribd.com/doc/28284712/Adidas-and-kangaroo-killing>)

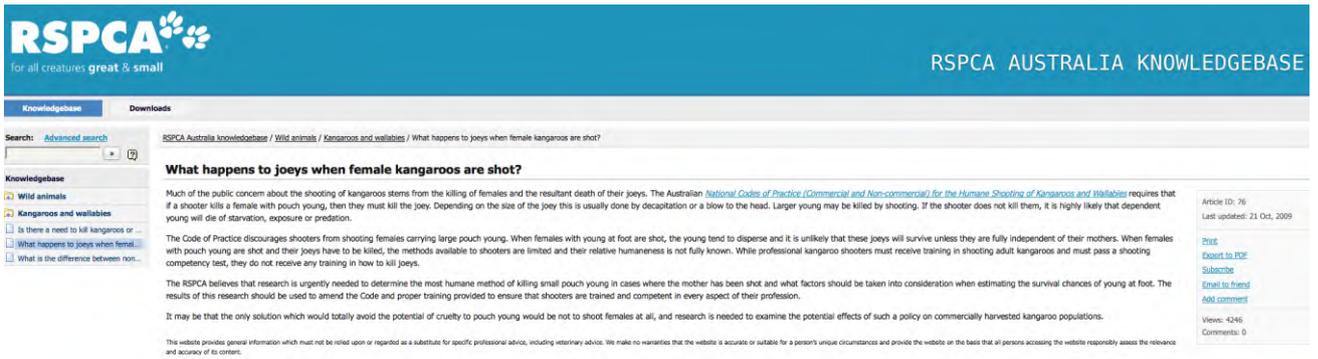


Figure 3 Example of an animal protection message (message no. 39) (Source: [http://kb.rspca.org.au/What-happens-to-joeys-when-female-kangaroos-are-shot\\_76.html](http://kb.rspca.org.au/What-happens-to-joeys-when-female-kangaroos-are-shot_76.html))

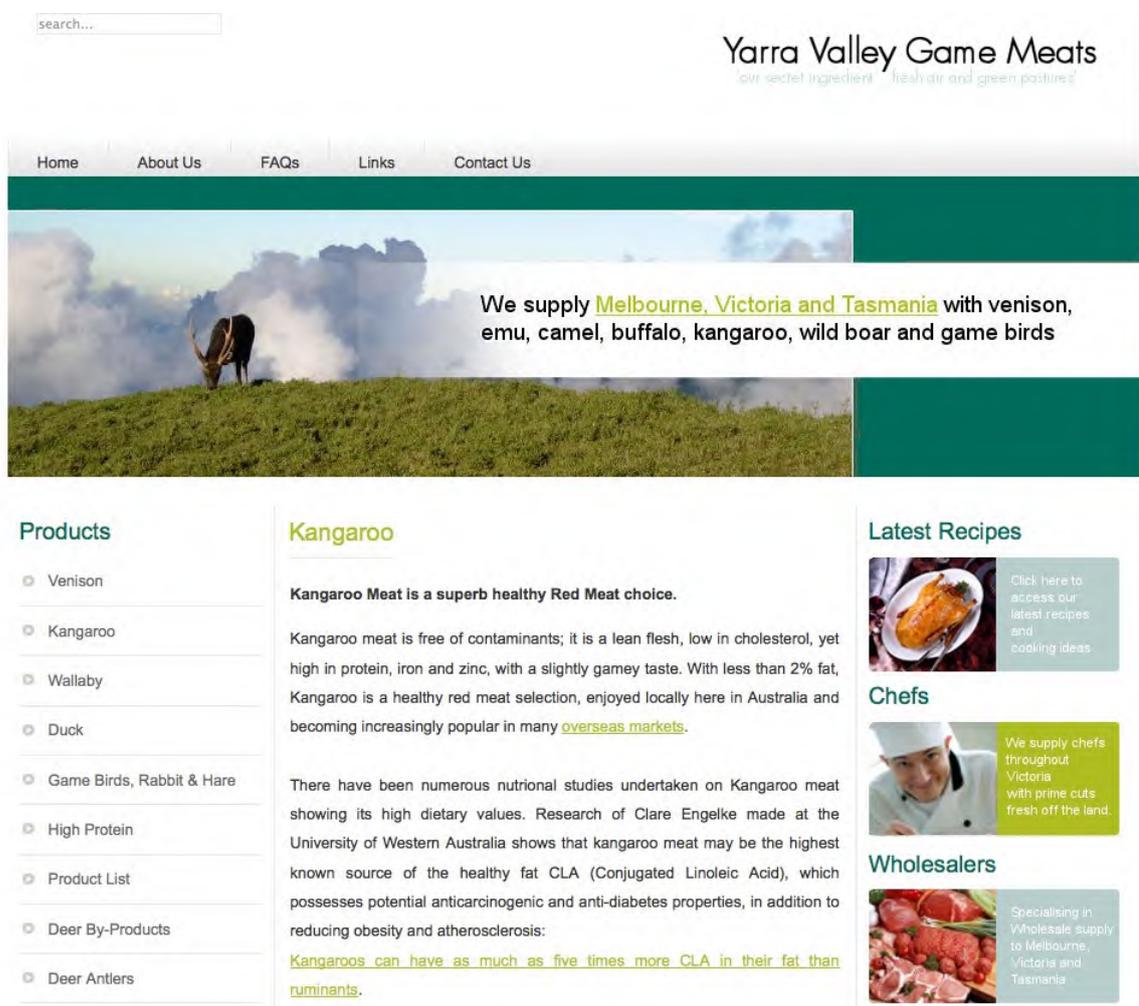


Figure 4 Example of a kangaroo management message (message no. 20) (Source: <http://www.gamemeats.com.au/kangaroo.html>)

The image shows a screenshot of the Sporting Shooters' Association of Australia (SSAA) website. At the top, there is a banner with three images of shooters and the SSAA logo. Below the banner is a navigation menu on the left with links such as 'Become a shooter', 'Join or renew', 'State offices', 'Competition info', 'Hunting', 'Farmer Assist', 'Junior shooters', 'Our magazines', 'Store', 'Insurance', 'Licensing & security', 'Press releases', 'Industry news', 'Media monitoring', 'Capital news', 'Research archive', 'Notice board archive', and 'Media centre'. The main content area features a red header for 'Press releases' and a title 'Barbecue roo for Australia Day' dated '20 January 2014'. The text of the press release encourages celebrating Australia Day with kangaroo barbecue, highlighting the sustainability of kangaroo meat. It includes quotes from Matthew Godson and Rachael Andrews. At the bottom of the page, there is a footer with links for 'SSAA Home', 'Contact us', 'About us', 'Site map', and 'Search'.

Figure 5 Example of a kangaroo management message (message no. 22) (Source: [http://www.ssaa.org.au/press-releases/2014-01-20\\_barbecue-roo-for-australia-day.html#.U6t1aqjamUZ](http://www.ssaa.org.au/press-releases/2014-01-20_barbecue-roo-for-australia-day.html#.U6t1aqjamUZ))



# COMMERCIAL KANGAROO HARVESTING FACT SHEET

## Government roles in kangaroo harvesting

Under national environment law—the *Environment Protection and Biodiversity Conservation Act 1999*—the Australian Government has responsibility for providing for the protection of the environment, promoting ecologically sustainable development and the conservation of biodiversity.

While Australia's laws concerning wildlife trade are some of the most stringent in the world, they are not intended to obstruct the sustainable activities of legitimate organisations and individuals. Instead, they have been designed to demonstrate that when managed effectively wildlife trade contributes to, and is entirely compatible with, the objectives of wildlife conservation.

The commercial kangaroo harvest industry in Australia is one of the world's best practice wild harvest operations, with management goals based firmly on principles of sustainability.

Both the Australian Government and state governments have a role in the conservation of kangaroo populations. The states have responsibilities for regulating the harvest and processing industry, while the Australian Government controls the export of kangaroo products through the approval of kangaroo management programs and the granting of export permits.

Under national environment law, the Australian Government has approved management plans for the harvest of four kangaroo species in four states: Queensland, New South Wales, South Australia, and Western Australia. Before approving any management plans that allow for the commercial harvest and export of

**Figure 6** Example of a kangaroo management message (message no. 2). (Source: <http://www.environment.gov.au/system/files/resources/11b7d7c8-7a25-45fc-81ea-f672e14d1fec/files/kangaroo-harvest-factsheet.pdf>)

## Communication cues

Before survey launch each message was coded on 7 communication cues considered likely to influence participant's responses. These are listed in Table 2. Two researchers performed the coding.

**Table 2 Communication cues and cue categories**

Communication cue	Cue category	Guidance for coding
Appeal to emotions	Yes/No	Was it apparent that the message was constructed with the specific aim of eliciting an emotional response?
Use graphic or striking image/s	Yes/No	Did the message use image/s of kangaroos being killed or harmed or any other image that is likely to elicit a strong emotional response?
Use neutral image/s	Yes/No	Did the message use image/s of kangaroos (including carcasses), people, landscapes etc. that would NOT be considered gruesome, concerning or difficult to view?
Information dense (more than 5 'facts' presented per message)	Yes/No	Did the message present more than 5 specific and different 'facts' (which may or not be accurate)?
Explicit reference to <i>killing</i> or <i>shooting</i> kangaroos (rather than just harvesting or culling)	Yes/No	Did the message make reference to killing or shooting kangaroos and not just the more ambiguous terms harvesting or culling?
Explicit reference to <i>impact</i> of kangaroos on environment/farming etc.	Yes/No	Did the message make reference to the negative impact that kangaroos can have on the environment or agricultural production or any other impact?
Provide specific action advice	Yes/No	Did the message provide any guidance on what action (e.g. purchasing, protesting, boycotting etc.) could be done by the target audience?

## Judgement dimensions

### Message engagement

Two items addressed participants' engagement with each message and intention to follow up any of the messages recommendations or to seek further information. They were asked to rate the extent to which each message 'motivated you to seek out more information on the topic and 'make you feel motivated to take immediate action'. Variable scores were created by summing the items.

### Message rejection

Four items addressed participants' rejection of each message by defensive avoidance, message minimisation, perceived manipulation and perceived credibility of the message. They were asked to rate the extent to which each message made them 'not want to think about the issue it addressed', 'find the information in the message was exaggerated', 'feel that the message tried to manipulate their views or feelings', and if they found the message credible. After reversing the score for the message credibility, variable scores were created by summing the items.

## Statistical methods

Latent profile analysis (LPA) was done using Mplus 7.11 (Muthén & Muthén, 2012) to classify respondents into 'kangaroo management' profiles or mindsets. Mplus is a statistical modelling

program that uses a framework based on latent variables. Latent profile analysis is an analysis that can be used to classify groups (or profiles) of individuals according to their responses across a set of continuous variables. With this study we have grouped participants according to a range of psychological measures relating to kangaroos and their management. All profiling variables were standardised to a mean of zero with a standard deviation of 1 to allow comparison of scales and to simplify computation and interpretation of the profiles. Correlations between psychological profiling variables were done using IBM SPSS Statistics, version 22.0 (IBM Corp., 2013).

Multivariate analysis of variance (MANOVA) was used to identify statistically different characteristics of the latent profile classes and to validate the solution. Univariate analysis of variance (ANOVA) was used to identify statistically significant differences between profiles if a MANOVA indicated a statistically significant difference between the multivariate components. Statistically significant differences in the mean values of independent variables used in the univariate ANOVAs were further examined using Tukey's Honest Significant Difference test (Tukey's HSD). MANOVA, ANOVA and Tukey's HSD tests were performed in R 3.1.0 (R Core Team, 2014) using the 'manova', 'aov' and 'TukeyHSD' functions of the 'stats' package.

# Results

## **Audience segmentation analysis: generation of profiles**

### **Correlations and descriptive statistics**

The means, standard deviations and correlations between the profiling variables are presented in Table 3.

**Table 3 Correlations between psychological profile variables**

Variables	2	3	4	5	6	7	8	9	Mean	SD
1 Affective associations	-.06*	.14**	.02	-.04	.11**	-.05	-.070*	-.05	4.20	.80
2 Kangaroo knowledge		-.22**	.03	.11**	-.03	.38**	.13**	.21**	4.22	1.87
3 Attitudes towards animals			.06*	-.36*	.56**	-.49**	-.37**	-.32**	66.08	11.35
4 Cultural worldviews – Individualism-Communitarianism axis				.15**	.01	.07*	-.06*	-.05	22.24	4.84
5 Cultural worldviews – Hierarchy-Egalitarian axis					-.40**	.20**	.11**	.13**	18.19	5.85
6 Environmental concern						-.19**	-.19**	-.16**	3.55	.55
7 Attitudes toward shooting							.26**	.49**	4.50	1.49
8 Attitudes toward blunt trauma								.17**	1.91	1.05
9 Attitudes toward capture and lethal injection									4.66	1.55

Notes. N=1000. Correlation describes the degree of linear relationship between two variables on a scale from -1 to +1. The closer the relationship is to -1 or +1 the stronger the relationship. A perfect positive relationship is indicated by a +1 and a perfect negative relationship is indicated by -1. Zero indicates no relationship.

\*Correlation is significant at  $p < .05$ . \*\* Correlation is significant at  $p < .01$ .

## Kangaroo management profiles within the Australian community

Table 4 shows the fit indices for 2-through 4-profile solutions generated by LPA. A combination of Bayesian Information Criterion (BIC), Lo-Mendell-Rubin likelihood ratio test and entropy were used to determine the best model (Geiser, 2012). Entropy is a summary statistic of the quality of the classification accuracy—values close to 1 indicate good classification accuracy while values close to 0 indicate poor accuracy. The Bootstrapped likelihood ratio test was not useful for distinguishing models.

The best profile solution included three classes (Table 4 and Table 5).

**Table 4 Model fit indices for two to four profile solutions**

Profile solution	BIC	LMR	BLRT	Entropy
2	24878.93	<0.0001	<0.0001	0.774
<b>3</b>	<b>24580.05</b>	<b>0.0027</b>	<b>&lt;0.0001</b>	0.826
4	24445.62	.0197	<0.0001	0.737

Note. BIC = Bayesian information criterion, LMR = Lo-Mendell-Rubin likelihood ratio test, BLRT = Bootstrapped likelihood ratio test.

*Profile 1* comprised 23.4% (n=226) of respondents whose responses could be characterised as *Concerned* about kangaroo management. They report more positive affective associations with kangaroos and scored higher than the sample means on the animal attitudes scale indicating a greater concern for animal welfare compared with the other 2 groups. They are also characterised by higher concern for the environment as well as negative attitudes towards all three of the kangaroo killing methods (shooting, blunt trauma and capture followed by lethal injection). Mean knowledge scores for this group were below the sample average. All three of the profiles exhibited a slight preference toward individualism on the on the individualism-communitarianism scale, however on the hierarchy–egalitarianism scale this profile had lower scores indicating a more egalitarianism orientation.

*Profile 2* included 66.2% (n=675) of respondents whose responses could be classified as *Neutral* with regard to kangaroo management. Mean scores on most of the profiling variables were close to the sample average. This group scored higher on kangaroo knowledge compared with the concerned group and had more positive attitudes towards shooting and lethal injection. As for profile 1, this profile also exhibited a slight preference toward individualism on the individualism-communitarianism scale, however on the hierarchy–egalitarianism scale the scores were close to the mean suggesting they have no strong preference between hierarchy and egalitarianism.

*Profile 3* included 10.4% (n=99) of respondents who were labelled as *Accepting* of kangaroo management. This group was characterised by less concern for animal welfare and the environment but on average more knowledge about kangaroos than the other 2 profiles. They reported negative affective association with kangaroos and well above average attitudes toward all three of the kangaroo killing methods (shooting, blunt trauma and capture followed by lethal injection). As for profiles 1 and 2, profile 3 also showed a slight preference toward individualism on the individualism-communitarianism scale, however on the hierarchy–egalitarianism scale they had higher scores indicating a more hierarchical orientation.

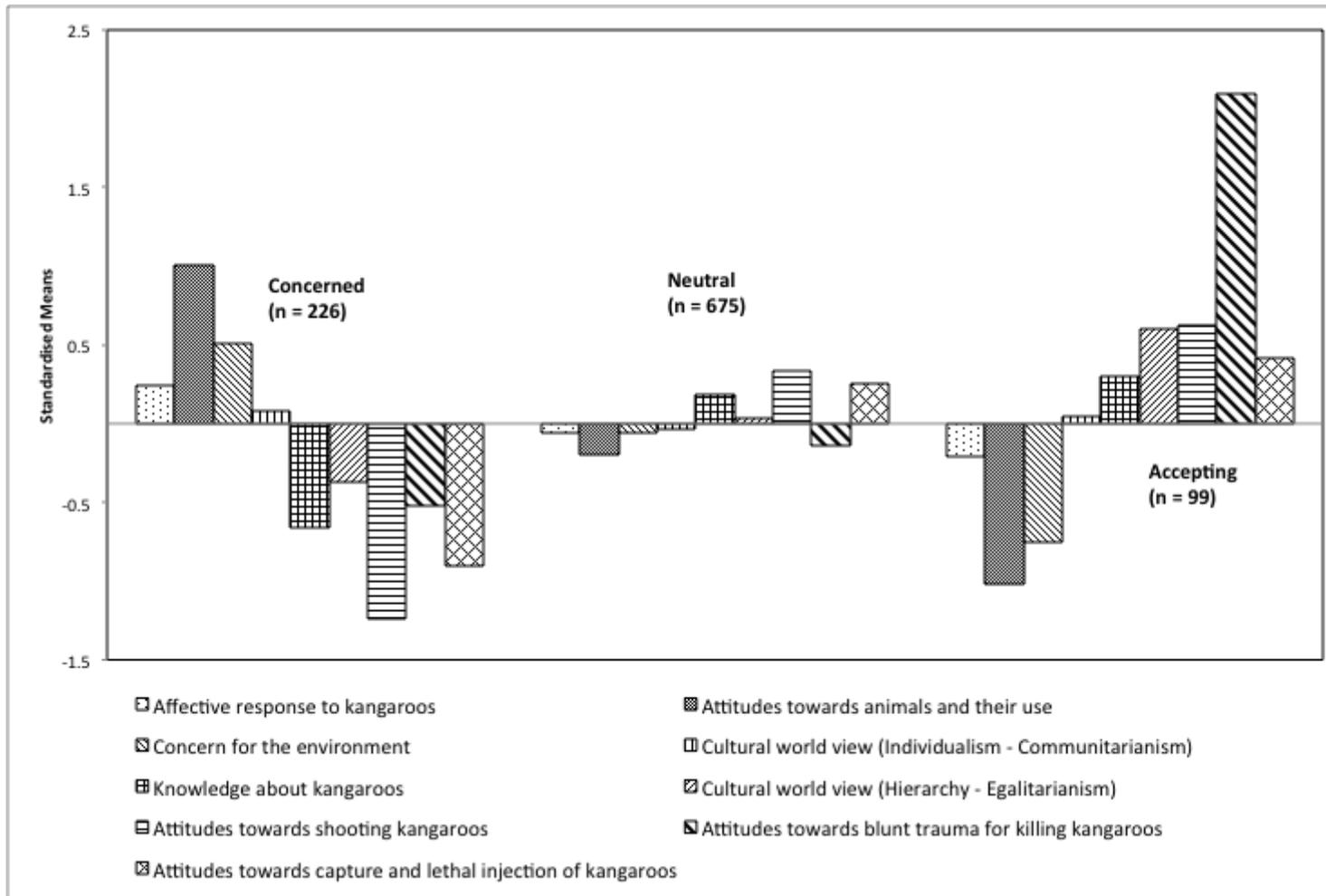


Figure 7 Psychological characteristics of the kangaroo management profiles

**Table 5 Psychological variables – means with 95% confidence intervals across the profiles**

Profile variables	Profile 1 Concerned	Profile 2 Neutral	Profile 3 Accepting	Variable range	Univariate F	Partial $\eta^2$
Affective associations	4.40 <sup>a</sup> ( $\pm$ 0.09)	4.16 <sup>b</sup> ( $\pm$ 0.06)	4.02 <sup>b</sup> ( $\pm$ 0.17)	1 to 5	20.21***	0.02
Kangaroo knowledge	2.99 <sup>a</sup> ( $\pm$ 0.22)	4.47 <sup>b</sup> ( $\pm$ 0.13)	4.76 <sup>b</sup> ( $\pm$ 0.32)	0 to 8	113.79***	0.10
Attitudes towards animals	77.95 <sup>a</sup> ( $\pm$ 1.21)	63.85 <sup>b</sup> ( $\pm$ 0.66)	54.18 <sup>c</sup> ( $\pm$ 1.82)	20 to 100	599.56***	0.38
Cultural worldviews – Individualism-Communitarianism axis	22.73 <sup>a</sup> ( $\pm$ 0.69)	22.02 <sup>a</sup> ( $\pm$ 0.35)	22.66 <sup>a</sup> ( $\pm$ 0.98)	6 to 36	0.64	0.00
Cultural worldviews – Hierarchy-Egalitarian axis	16.09 <sup>a</sup> ( $\pm$ 0.68)	18.36 <sup>b</sup> ( $\pm$ 0.43)	21.80 <sup>c</sup> ( $\pm$ 1.25)	6 to 36	69.79***	0.07
Environmental concern	3.84 <sup>a</sup> ( $\pm$ 0.07)	3.51 <sup>b</sup> ( $\pm$ 0.04)	3.12 <sup>c</sup> ( $\pm$ 0.11)	1 to 5	140.9***	0.12
Attitudes toward shooting	2.54 <sup>a</sup> ( $\pm$ 0.14)	5.02 <sup>b</sup> ( $\pm$ 0.08)	5.43 <sup>c</sup> ( $\pm$ 0.21)	1 to 7	720.46***	0.42
Attitudes toward blunt trauma	1.34 <sup>a</sup> ( $\pm$ 0.07)	1.76 <sup>b</sup> ( $\pm$ 0.05)	4.22 <sup>c</sup> ( $\pm$ 0.19)	1 to 7	595.49***	0.37
Attitudes toward capture and lethal injection	3.17 <sup>a</sup> ( $\pm$ 0.18)	5.06 <sup>b</sup> ( $\pm$ 0.10)	5.34 <sup>b</sup> ( $\pm$ 0.24)	1 to 7	279.34***	0.22

Note. N=1000. Wilk's  $\Lambda = .30$ ,  $F(9,990) = 258.31$ ,  $p < .001$ ,  $\eta^2 = 0.70$

\*\*\*significant at  $p < .001$

Means with different superscripts (in rows) differ significantly at  $p < .05$  (Tukey's HSD).

## **Demographic and geographic characteristics of the kangaroo management profiles**

A comparison of the demographic and geographic variables across profiles is presented in Table 6. ANOVAs revealed a significant difference amongst the profiles with regard to gender, age, and region of residence, but not state (or territory) of residence or level of education. The *Concerned* profile has a higher proportion of females than the other two profiles and the members are younger. The *Accepting* profile members are older and include more males than females.

In general, there is a higher proportion of inner city dwellers in the *Concerned* profile whereas the proportion of respondents living in rural areas or villages and larger country town is highest in the *Accepting* group.

**Table 6 Demographic and geographic characteristics of the different kangaroo management profiles – means and distributions**

Variables	Profile 1 <i>Concerned</i>	Profile 2 <i>Neutral</i>	Profile 3 <i>Accepting</i>	Univariate F	Partial $\eta^2$
<i>Gender</i>				56.35***	0.05
Male	27.9% (63)	53.6% (362)	65.7% (65)		
Female	72.1% (163)	46.4% (313)	34.3% (34)		
<i>Mean age (years)</i>	47.3	53.6	54.4	32.51***	0.03
<i>State of residence</i>				0.33	0.00
ACT	2.6% (6)	1.04% (7)	3.0% (3)		
NSW	28.3% (64)	31.4% (212)	28.3% (28)		
NT	0.44% (1)	0.89% (6)	3.0% (3)		
QLD	19.0% (43)	21.0% (142)	22.2% (22)		
SA	11.1% (25)	7.7% (52)	5.0% (5)		
TAS	2.2% (5)	2.4% (16)	2.0% (2)		
VIC	25.7% (58)	24.0% (162)	28.3% (28)		
WA	10.6% (24)	11.0% (74)	8.1% (8)		
Unknown		0.59% (4)			
<i>Education level</i>				0.073	0.00
Did not complete high school	4.0% (9)	5.8% (39)	5.1% (5)		
School certificate (Year 10) or equivalent	15.5% (35)	17.8% (120)	11.1% (11)		
Higher School Certificate (Year 12) or equivalent	19.5% (44)	19.9% (134)	22.2% (22)		
TAFE certificate or Diploma	36.3% (82)	31.3% (211)	38.4% (38)		
Bachelors Degree	13.7% (31)	14.0% (95)	14.1% (14)		
Post Graduate Diploma	4.0% (9)	3.9% (26)	3.0% (3)		
Masters Degree	6.6% (15)	5.9% (40)	4.0% (4)		
Doctoral Degree	0.4% (1)	1.5% (10)	2.0% (2)		
<i>Region – current</i>				11.28***	0.01
A rural area or village (under 1,000 people)	4.4% (10)	5.8% (39)	9.1% (9)		
A small country town (under 10,000 people)	4.9% (11)	7.3% (49)	7.1% (7)		
A larger country town (over 10,000 people)	2.7% (6)	5.0% (34)	8.1% (8)		
A large town (over 25,000 people)	12.8% (29)	14.8% (100)	18.2% (18)		
Outer metro area of a major city (over 100,00 people)	42.9% (97)	40.7% (275)	38.4% (38)		
Inner metro area of a major city (over 100,00 people)	32.3% (73)	26.4% (178)	19.2% (19)		

Note. N=1000. \*\*\*significant at  $p < .001$

## Validation of the kangaroo management profiles

To validate the predictive utility of the kangaroo management profiles we examined the relationship between profile membership and acceptability of nine kangaroo management methods (Table 7) and also purchasing of kangaroo products, information seeking/awareness of kangaroo management issues and kangaroo activism (Table 8).

With regard to the acceptability ratings for the nine different kangaroo management messages, MANOVA revealed that the three profiles explained a significant 38% of the variance in the acceptability ratings. Univariate analyses revealed that all of the management methods, apart from capture and translocation, differed significantly across profiles at  $p < .001$ .

A separate MANOVA also revealed that the other outcome variables used in this study (purchasing of kangaroo products, information seeking/awareness and kangaroo activism) varied across profiles and explained a significant 26% of variance at  $p < .001$ . Univariate analyses indicated that purchasing kangaroo products and kangaroo activism, but not information seeking/awareness of kangaroo management issues, varied across profiles

Overall, respondents in the *Concerned* group reported lower scores for all the management methods and had the highest score for the ‘do nothing’ option. Both the *Neutral* and *Accepting* groups prefer kangaroo harvesting to the other methods, but also rated fertility control quite highly. The *Concerned* and *Neutral* groups rated shooting by non-professional shooters (carcasses not utilised) as the least acceptable method. On the other hand, for the *Accepting* group, the least acceptable management option was to ‘do nothing’. The *Accepting* group reported higher levels of kangaroo product purchasing behaviour and the lowest levels of kangaroo activism. Conversely, the *Concerned* group had lower scores for purchasing and higher scores for activism behaviours.

**Table 7 Outcome variables – acceptability of nine different kangaroo management methods – Means  $\pm$  95% confidence intervals and mean differences across the profiles**

Management method	Profile 1 Concerned	Profile 2 Neutral	Profile 3 Accepting	Univariate F	Partial $\eta^2$
Exclusion from water sources	1.74 <sup>a</sup> ( $\pm 0.14$ )	2.17 <sup>b</sup> ( $\pm 0.10$ )	3.18 <sup>c</sup> ( $\pm 0.26$ )	80.81***	0.08
Harvesting (shooting by professional shooter)	2.45 <sup>a</sup> ( $\pm 1.70$ )	4.33 <sup>b</sup> ( $\pm 0.70$ )	4.32 <sup>b</sup> ( $\pm 0.22$ )	369.08***	0.27
Do nothing – no management	3.46 <sup>a</sup> ( $\pm 0.15$ )	2.39 <sup>b</sup> ( $\pm 0.09$ )	2.31 <sup>b</sup> ( $\pm 0.22$ )	112.52***	0.10
Fertility control	3.40 <sup>a</sup> ( $\pm 0.17$ )	4.00 <sup>b</sup> ( $\pm 0.08$ )	4.04 <sup>b</sup> ( $\pm 0.22$ )	36.35***	0.04
Exclusion fencing	2.97 <sup>a</sup> ( $\pm 0.18$ )	3.61 <sup>b</sup> ( $\pm 0.10$ )	4.12 <sup>c</sup> ( $\pm 0.22$ )	67.36***	0.06
Capture and translocation	3.80 <sup>a</sup> ( $\pm 0.15$ )	3.88 <sup>a</sup> ( $\pm 0.08$ )	3.85 <sup>a</sup> ( $\pm 0.23$ )	0.35	0.00
Capture and euthanasia	2.02 <sup>a</sup> ( $\pm 0.16$ )	3.51 <sup>b</sup> ( $\pm 0.10$ )	4.00 <sup>c</sup> ( $\pm 0.20$ )	244.70***	0.20
Shooting and let lie (by non-professional shooter)	1.19 <sup>a</sup> ( $\pm 0.07$ )	1.60 <sup>b</sup> ( $\pm 0.07$ )	2.55 <sup>c</sup> ( $\pm 0.26$ )	134.63***	0.12
Shooting and let lie (by professional shooter)	1.52 <sup>a</sup> ( $\pm 0.11$ )	2.41 <sup>b</sup> ( $\pm 0.10$ )	3.22 <sup>c</sup> ( $\pm 0.26$ )	155.35***	0.14

Note. N=1000. Wilk's  $\Lambda = .62$ ,  $F(9,990) = 67.32$ ,  $p < .001$ ,  $\eta^2 = 0.38$

\*\*\*significant at  $p < .001$

Means with different superscripts (in rows) differ significantly at  $p < .05$  (Tukey's HSD).

Score range 1-5.

**Table 8 Outcome variables – purchasing of kangaroo products, information seeking, activism – Means  $\pm$  95% confidence intervals and mean differences across the profiles**

Outcome variables	Profile 1 Concerned	Profile 2 Neutral	Profile 3 Accepting	Univariate F	Partial $\eta^2$
Purchasing of kangaroo products	1.22 <sup>a</sup> ( $\pm 0.06$ )	1.50 <sup>b</sup> ( $\pm 0.05$ )	1.83 <sup>c</sup> ( $\pm 0.17$ )	72.81***	0.07
Information seeking/awareness	2.49 <sup>a</sup> ( $\pm 0.15$ )	2.45 <sup>a</sup> ( $\pm 0.08$ )	2.64 <sup>a</sup> ( $\pm 0.24$ )	0.54	0.00
Kangaroo activism	2.99 <sup>a</sup> ( $\pm 0.10$ )	2.09 <sup>b</sup> ( $\pm 0.05$ )	1.87 <sup>c</sup> ( $\pm 0.12$ )	309.35***	0.24

Note. N=1000. Wilk's  $\Lambda = .74$ ,  $F(3,996) = 114.89$ ,  $p < .001$ ,  $\eta^2 = 0.26$ , \*\*\* significant at  $p < .001$ .

Means with different superscripts (in rows) differ significantly at  $p < .05$  (Tukey's HSD).

Score range 1-5.

## Evaluation of kangaroo management messages

### Qualitative judgement analysis

Between 79 and 219 participants viewed each kangaroo management message. Each participant was asked to rate six randomly chosen messages on two judgments: *message engagement*, or to what extent the message motivated them to seek out more information on the message topic and/ or to take action; and *message rejection*, or to what extent the message made them not want to think about the topic, and if they thought the information was exaggerated, credible or tried to manipulate their views or feelings about the topic. A summary of the message engagement and message rejection scores obtained for each of the 44 messages is included in Table 10.

Based on the scatterplot of engagement and rejection scores for kangaroo messages, across profiles and message type (see Figure 8), the *Concerned* profile reported a higher level of message engagement for both the kangaroo management and animal protection messages compared with the other two profiles. However, there was more engagement with the animal protection messages. Both the *Neutral* and *Accepting* profiles exhibited higher levels of rejection for the animal protection messages compared with the management messages, and this was highest for the *Accepting* group.

If we view the sample as a whole (and ignore the different profiles), it is evident that people are clearly distinguishing between the two types of messages (management and protection) and react very differently to them. For the kangaroo management messages, as rejection increases, engagement with the message also increases. Potentially indicating that people may realise they don't know that much about the issue but will seek out further information. The opposite is true for the animal protection messages—as rejection increases, message engagement decreases. They reject the message and are not motivated by it to seek out any further information.

### Message engagement

We closely examined the individual messages that achieved the highest and lowest score for engagement across all respondents and for the three profiles (see Table 9). The message that was scored highest for engagement across all respondents was message number 44, a 3-minute video produced by the American animal rights organisation People for the Ethical Treatment of Animals (PETA) called 'Kangaroo Slaughter for Fur'. This video contained graphic images of kangaroos being shot and killed. It appealed to emotions, contained very little factual information, made explicit reference to killing/shooting but not to impact of kangaroos and did not provide any specific action advice.

The message that had the lowest engagement score across the total sample was message number 22, a short press release for the Sporting Shooters Association of Australia (SSAA) called 'BBQ roo for

Australia Day’ (see Figure 5). This message contained only text. It did not appeal to emotions, did not use any images, made no reference to killing or shooting, but did mention kangaroo impact and was not information dense. It asked the reader to ‘...celebrate your country and respect its environment this January 26...’ by eating kangaroo meat.

For the *Concerned* profile, the message with the highest engagement score was again message number 44, the video described above produced by PETA called ‘Kangaroo Slaughter for Fur’. The message with the lowest engagement score for this profile was message number 19, a website article written by a naturopath on the health benefits of kangaroo meat titled ‘Kangaroo - get into it’. This message did not include an emotional appeal, contained only neutral images and made no reference to killing/shooting or kangaroo impact. It did include some factual information but no action advice.

The *Neutral* profile scored message number 31 the highest for engagement. This was a 4-minute video titled ‘Killing for Kicks’ produced by the UK-based animals rights organisation, Vegetarians International Voice for Animals (Viva). This message contained information on the use of kangaroo skin to make leather football boots. It included an emotional appeal, graphic and neutral images, was information dense and made reference to killing/shooting kangaroos as well as their impact. It did not include any specific action advice. The message with the lowest engagement score for this profile was again message number 22 (described above), the press release from the Sporting Shooters Association of Australia (SSAA) called ‘BBQ roo for Australia Day’.

For the *Accepting* profile, the message with the highest engagement score was message 20, a website article on the health benefits of kangaroo meat written by Yarra Valley Game Meats (see Figure 4). This message contained only neutral images and factual information. There was no appeal to emotions, no graphic images or reference to killing/shooting or kangaroo impact and it did not contain action advice. The message with the lowest engagement score for this profile was message number 2, a factsheet on commercial kangaroo harvesting produced by the Australian Government Department of Sustainability, Environment Water, Population and Communities (see Figure 6). This message contained only text. It was information dense, however it did not appeal to emotions, use any images or provide action advice. It made specific reference to killing or shooting, but not to the impact of kangaroos.

Just focusing on *kangaroo management* messages, those with the highest level of engagement were:

- *Concerned* profile – message no. 13. This message was a news article about a recently announced trial in Victoria to use culled kangaroos for pet food.
- *Neutral* profile – message no. 10. This message was an ABC news item about kangaroos in drought.
- *Accepting* profile – message no 20. This message was the website containing information on the health benefits of kangaroo meat.

For the *animal protection* messages, those with the highest level of engagement were:

- *Concerned* profile – message no. 44. The video by PETA titled ‘Kangaroo slaughter for fur’.
- *Neutral* profile – message no. 31. The video by Viva titled ‘Killing for kicks’
- *Accepting* profile – message no. 40. A still photograph of an unfurred joey with the caption ‘Boycott Adidas’ (see Figure 1).

## Message rejection

The message that was scored highest for rejection across all respondents was message number 41. This was a brochure titled ‘Kangaroos killed for sport’ produced by Viva (see Figure 2). It asks the readers to boycott Adidas because they use kangaroo skins to produce sports shoes. As well as containing this specific action advice, the article included emotive language, graphic and neutral images and made reference to killing/shooting and kangaroo impact. It also contained a number of ‘facts’, but many were not correct.

The message that had the lowest rejection score across the total sample was message number 18, a media release from the ACT Government announcing the commencement of a conservation cull in some of Canberra’s nature reserves to reduce overpopulation of eastern grey kangaroos and protect biodiversity. This article was information dense and did not include any images, emotional appeals or action advice. It did not make reference to killing or shooting kangaroos (but did include the term ‘culling’) and discussed the impact that kangaroos have on the environment.

For the *Concerned* profile, the message with the highest rejection score was message number 14, an opinion piece written by a representative of the Kangaroo Industries Association of Australia (KIAA) which appeared in the Brisbane Times newspaper. The article was titled ‘Food for thought: Why Skippy should be our steak of choice’ and it discussed the reasons why kangaroos should be considered an ‘extraordinary resource’. This message does not contain an emotional appeal, or graphic images nor does it make explicit reference to killing/shooting kangaroos. It does talk about kangaroo impact, contains specific action advice and is information dense.

Participants from the *Concerned* profile rated message number 8 the lowest on rejection. This was also a news article and the subject was the kangaroo cull in the ACT. “Inside the territory roo cull”, appeared in The Canberra Times and included a short video clip embedded in the news article. The report was written by a journalist who was allowed access (by ACT Parks and Conservation) to a post-cull inspection of carcasses. The news article contained both graphic and neutral images but did not include an emotional appeal or action advice. It made reference to killing/shooting kangaroos, but not to their impact, and it also contained numerous facts.

The *Neutral* profile scored message number 41 the highest for rejection. This was the brochure titled ‘Kangaroos killed for sport’ produced by Viva described above. For this profile message number 2 was rated lowest on rejection. This was the factsheet, also described above, on commercial kangaroo harvesting produced by the Australian Government Department of Sustainability, Environment Water, Population and Communities (SEWPAC). Interestingly the *Accepting* group rated this message as the lowest for message engagement.

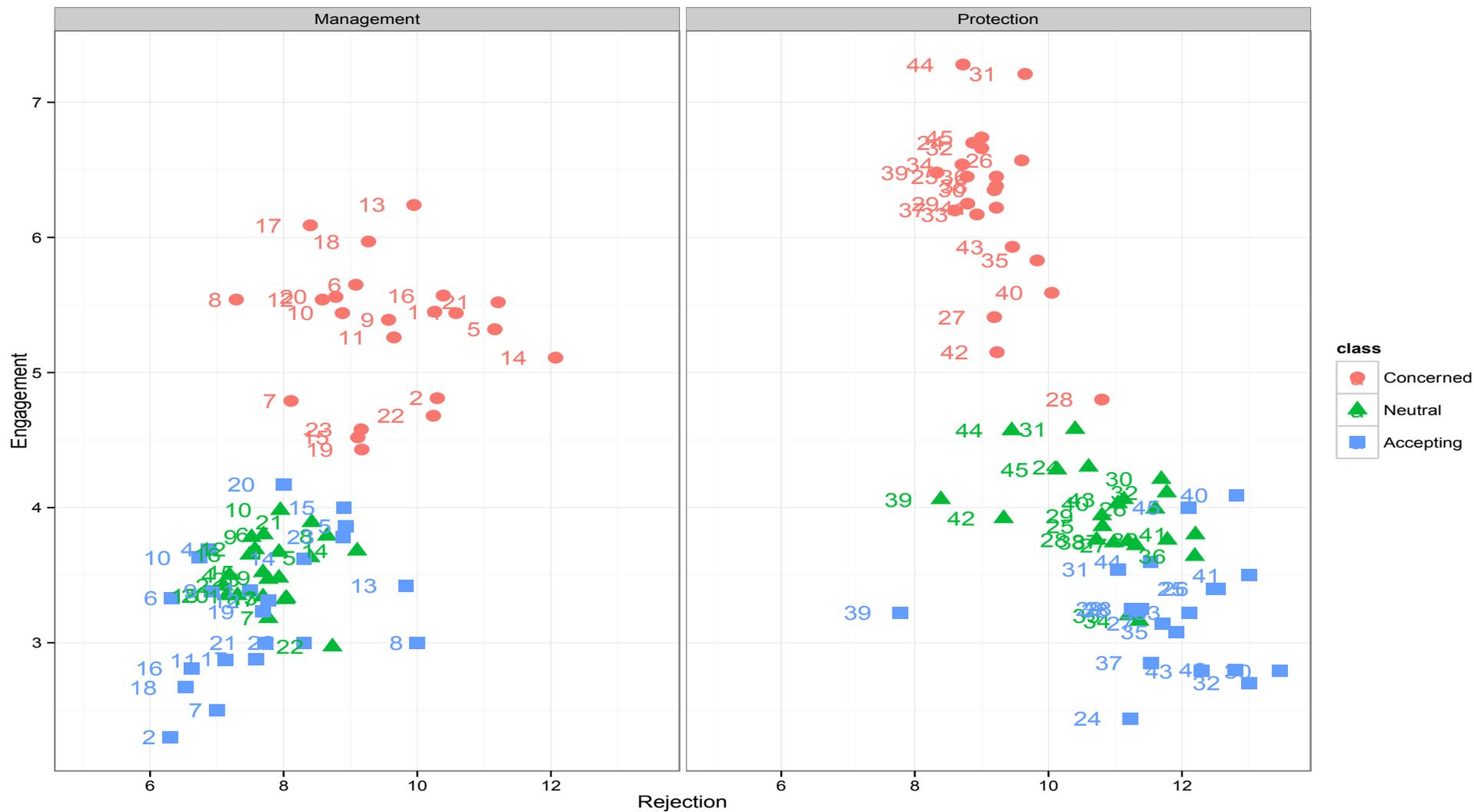
For participants in the *Accepting* profile, message number 34 had the highest rejection score. This was an article on the UK animal rights organisation, Viva’s website titled ‘Save the kangaroo – kick cruelty out’. Similar to message 41, it too asks readers to take action against Adidas (and other sports shoe manufacturers) because they use kangaroo skins to produce sports shoes. Message number 2—the factsheet on harvesting produced by SEWPAC—was also rated as the message with the lowest rejection score for the *Accepting* profile.

Focusing on the *kangaroo management messages*, those with the highest level of rejection were:

- *Concerned* profile – message no 14. Brisbane Time news article title “Food for thought: Why Skippy should be our steak of choice”.
- *Neutral* profile – message no. 14. Brisbane Time news article title “Food for thought: Why Skippy should be our steak of choice”.
- *Accepting* profile – message no. 8. Canberra Times news article ‘Inside the territory’s roo cull’.

The *animal protection messages* with the highest level of rejection were:

- *Concerned* profile – message no. 28. Animal Justice Party Website - Kangaroo mass slaughter in the ACT.
- *Neutral* profile - message no. 41. This was a brochure titled ‘Kangaroos killed for sport’ produced by Viva.
- *Accepting* profile - message no. 34. Viva’s website article titled ‘Save the kangaroo – kick cruelty out’.



**Figure 8** Scatterplot of engagement and rejection scores for kangaroo messages, across profiles (Concerned, Neutral and Accepting) and message type (kangaroo management and animal protection). The number represents message number presented in Table 10.

**Table 9 Kangaroo management messages with highest and lowest scores for engagement and rejection for total sample and across the profiles**

	Message with lowest engagement score	Message with highest engagement score	Message with lowest rejection score	Message with highest rejection score
Total sample (n=1000)	22	44	18	41
Profile 1 <i>Concerned</i> (n=226)	19	44	8	14
Profile 2 <i>Neutral</i> (n=675)	22	31	2	41
Profile 3 <i>Accepting</i> (n=99)	2	20	2	34

**Table 10 Kangaroo management messages with message engagement and rejection scores across the profiles**

Message type	Message number	Message Name	URL	Profile 1 <i>Concerned</i>		Profile 2 <i>Neutral</i>		Profile 3 <i>Accepting</i>	
				Engagement score	Rejection score	Engagement score	Rejection score	Engagement score	Rejection score
1	1	Kangaroo plague hits south-west Queensland	<a href="http://www.abc.net.au/pm/content/2013/s3868822.htm">http://www.abc.net.au/pm/content/2013/s3868822.htm</a>	5.45	10.26	3.67	7.93	3.39	7.50
1	2	Commercial kangaroo harvesting factsheet	<a href="http://www.environment.gov.au/system/files/resources/11b7d7c8-7a25-45fc-81ea-f672e14d1fec/files/kangaroo-harvest-factsheet.pdf">http://www.environment.gov.au/system/files/resources/11b7d7c8-7a25-45fc-81ea-f672e14d1fec/files/kangaroo-harvest-factsheet.pdf</a>	4.81	10.30	3.42	7.10	2.30	6.30
1	4	Kangaroo industry documentary justification and monitoring	<a href="https://www.youtube.com/watch?v=1JXpTPT2YFA">https://www.youtube.com/watch?v=1JXpTPT2YFA</a>	5.44	10.58	3.50	7.19	3.69	6.88
1	5	Exploding kangaroo population	<a href="https://www.youtube.com/watch?v=rH3MSspgVZY#t=117">https://www.youtube.com/watch?v=rH3MSspgVZY#t=117</a>	5.32	11.16	3.63	8.40	3.86	8.93
1	6	Kangaroo conservation and management	<a href="http://www.environment.sa.gov.au/managing-natural-resources/Plants_Animals/Abundant_species/Kangaroo_conservation_management">http://www.environment.sa.gov.au/managing-natural-resources/Plants_Animals/Abundant_species/Kangaroo_conservation_management</a>	5.65	9.08	3.80	7.70	3.33	6.33
1	7	How the kangaroo	<a href="http://www.kangaroo-industry.asn.au/industry">http://www.kangaroo-industry.asn.au/industry</a>	4.79	8.11	3.18	7.77	2.50	7.00

Message type	Message number	Message Name	URL	Profile 1 <i>Concerned</i>		Profile 2 <i>Neutral</i>		Profile 3 <i>Accepting</i>	
				Engagement score	Rejection score	Engagement score	Rejection score	Engagement score	Rejection score
1	8	industry works Inside the territory's roo cull	y.html <a href="http://www.canberrati-mes.com.au/act-news/inside-the-territorys-roo-cull-20130730-2qynd.html">http://www.canberrati-mes.com.au/act-news/inside-the-territorys-roo-cull-20130730-2qynd.html</a>	5.54	7.29	3.79	8.65	3.00	10.00
1	9	Roo 'plague' hits QLD	<a href="https://www.youtube.com/watch?v=mywcZ1du-vQ">https://www.youtube.com/watch?v=mywcZ1du-vQ</a>	5.39	9.57	3.78	7.52	3.38	6.92
1	10	Kangaroos in drought	<a href="https://www.youtube.com/watch?v=WRIqhfVaGBw">https://www.youtube.com/watch?v=WRIqhfVaGBw</a>	5.44	8.88	3.98	7.95	3.63	6.74
1	11	Australian Kangaroo Harvesting Industry Shooters view	<a href="https://www.youtube.com/watch?v=z_xpCyeztzl">https://www.youtube.com/watch?v=z_xpCyeztzl</a>	5.26	9.65	3.34	7.69	2.87	7.13
1	12	Australian Kangaroo Harvesting Industry Processors view	<a href="https://www.youtube.com/watch?v=z_xpCyeztzl">https://www.youtube.com/watch?v=z_xpCyeztzl</a>	5.54	8.58	3.69	7.57	3.31	7.77
1	13	Culled kangaroos to be harvested in Victoria for pet food sale	<a href="http://www.smh.com.au/victoria/culled-kangaroos-to-be-harvested-in-victoria-for-pet-food-sale-20140318-350g8.html">http://www.smh.com.au/victoria/culled-kangaroos-to-be-harvested-in-victoria-for-pet-food-sale-20140318-350g8.html</a>	6.24	9.95	3.33	8.04	3.42	9.83
1	14	Food for	<a href="http://www.brisbaneti">http://www.brisbaneti</a>	5.11	12.07	3.68	9.10	3.62	8.31

Message type	Message number	Message Name	URL	Profile 1 <i>Concerned</i>		Profile 2 <i>Neutral</i>		Profile 3 <i>Accepting</i>	
				Engagement score	Rejection score	Engagement score	Rejection score	Engagement score	Rejection score
		thought: Why Skippy should be our steak of choice	mes.com.au/federal-politics/food-for-thought-why-skippy-should-be-our-steak-of-choice-20110708-1h5I6.html						
1	15	From pests to profits: making kangaroos valuable to farmers	http://theconversation.com/from-pests-to-profits-making-kangaroos-valuable-to-farmers-9	4.52	9.11	3.52	7.69	4.00	8.90
1	16	Pet food trial Victoria	http://www.abc.net.au/news/2014-03-19/culled-kangaroos-to-be-processed-as-pet-food/5330318	5.57	10.39	3.65	7.49	2.81	6.62
1	17	Kangaroo-cull in ACT	http://mpegmedia.abc.net.au/news/audio/201307/rural-nsw-kangaroo-cull-3107.mp3	6.09	8.40	3.32	8.02	2.88	7.59
1	18	Kangaroo conservation cull commencement	http://www.cmd.act.gov.au/open_government/inform/act_government_media_releases/tamsd/2014/kangaroo-conservation-cull-commencement	5.97	9.27	3.35	7.15	2.67	6.53
1	19	Kangaroo...Get	http://simplypurelyhea	4.43	9.17	3.48	7.93	3.23	7.69

Message type	Message number	Message Name	URL	Profile 1 <i>Concerned</i>		Profile 2 <i>Neutral</i>		Profile 3 <i>Accepting</i>	
				Engagement score	Rejection score	Engagement score	Rejection score	Engagement score	Rejection score
		into it	lthy.wordpress.com/2011/09/04/kangaroo%E2%80%A6-get-into-it/						
1	20	Yarra Valley Kangaroo Meat	http://www.gamemeats.com.au/kangaroo.html	5.56	8.78	3.35	7.31	4.17	8.00
1	21	Roo meat export the answer to animal welfare issues	http://www.cqnews.com.au/news/roo-meat-export-answer-animal-welfare-issues-scott/2051315/	5.52	11.21	3.89	8.42	3.00	7.73
1	22	BBQ roo for Australia Day	http://www.ssaa.org.au/press-releases/2014-01-20_barbecue-roo-for-australia-day.html#.U3cfES_amUY	4.68	10.24	2.97	8.73	3.00	8.30
1	23	Russian embassy opens door to Agforce	http://www.agforceqld.org.au/file.php?id=288&open=yes	4.58	9.16	3.47	7.77	3.78	8.89
2	24	The issues for commercially killed kangaroos	http://animal-lib.org.au/campaigns/animals-for-food/kangaroos	6.70	8.87	4.30	10.60	2.44	11.22
2	25	Non-commercial culls	http://www.al-act.org/issues/native-animals/kangaroos	6.45	8.78	3.86	10.81	3.40	12.47
2	26	Stop the roo kills campaign	http://www.al-act.org/campaigns/13-	6.57	9.60	3.99	11.60	3.40	12.53

Message type	Message number	Message Name	URL	Profile 1 <i>Concerned</i>		Profile 2 <i>Neutral</i>		Profile 3 <i>Accepting</i>	
				Engagement score	Rejection score	Engagement score	Rejection score	Engagement score	Rejection score
2	27	Kangaroos heading for quasi extinction in Canberra nature reserves	stop-the-roo-cull <a href="http://www.animaljusticeparty.org/2011/06/18/kangaroos-heading-for-quasi-extinction-in-canberra-nature-reserves/">http://www.animaljusticeparty.org/2011/06/18/kangaroos-heading-for-quasi-extinction-in-canberra-nature-reserves/</a>	5.41	9.19	3.72	11.31	3.14	11.71
2	28	Kangaroo mass slaughter in ACT	<a href="http://www.animaljusticeparty.org/2010/07/16/ajp-condemns-%E2%80%98bush-capital%E2%80%99-kangaroo-mass-slaughter/">http://www.animaljusticeparty.org/2010/07/16/ajp-condemns-%E2%80%98bush-capital%E2%80%99-kangaroo-mass-slaughter/</a>	4.80	10.80	3.76	10.72	3.25	11.38
2	29	Kangaroo joey ad	<a href="https://www.youtube.com/watch?v=6oqKPEd6AX0">https://www.youtube.com/watch?v=6oqKPEd6AX0</a>	6.25	8.79	3.94	10.80	3.25	11.25
2	30	Viva - Gellately	<a href="http://www.savethekangaroo.com/resources/video.shtml">http://www.savethekangaroo.com/resources/video.shtml</a>	6.35	9.19	4.21	11.69	2.79	13.47
2	31	Killing for kicks	<a href="http://www.savethekangaroo.com/resources/video.shtml">http://www.savethekangaroo.com/resources/video.shtml</a>	7.21	9.65	4.58	10.40	3.54	11.04
2	32	440, 000 joeys	<a href="http://www.savethekangaroo.com/resources/video.shtml">http://www.savethekangaroo.com/resources/video.shtml</a>	6.66	9.00	4.11	11.77	2.70	13.00
2	33	Drive by shooting	<a href="http://www.savethekangaroo.com/resources/video.shtml">http://www.savethekangaroo.com/resources/video.shtml</a>	6.17	8.93	3.76	11.78	3.22	12.11

Message type	Message number	Message Name	URL	Profile 1 <i>Concerned</i>		Profile 2 <i>Neutral</i>		Profile 3 <i>Accepting</i>	
				Engagement score	Rejection score	Engagement score	Rejection score	Engagement score	Rejection score
2	34	Save the kangaroo	<a href="http://savethekangaroo.com/what_you_can_do/kickcrueltyout.shtml">http://savethekangaroo.com/what_you_can_do/kickcrueltyout.shtml</a>	6.54	8.71	3.16	11.36	2.57	14.14
2	35	Save our skins ad for petition	<a href="http://h24-original.s3.amazonaws.com/93051/7802643-95H9a.jpg">http://h24-original.s3.amazonaws.com/93051/7802643-95H9a.jpg</a>	5.83	9.83	3.20	11.20	3.08	11.92
2	36	Why we and our pets should not eat kangaroo meat	<a href="http://www.nokangaroo.com/Teresa-RooMeat%20copy.pdf">http://www.nokangaroo.com/Teresa-RooMeat%20copy.pdf</a>	6.45	9.22	3.64	12.19	3.09	13.57
2	37	Pet food company Purina implicated in kangaroo cruelty	<a href="http://www.animalsaustralia.org/features/purina-implicated-in-roo-cruelty.php">http://www.animalsaustralia.org/features/purina-implicated-in-roo-cruelty.php</a>	6.20	8.60	3.75	11.19	2.85	11.54
2	38	Kangaroo shooting	<a href="http://www.animalsaustralia.org/issues/kangaroo_shooting.php">http://www.animalsaustralia.org/issues/kangaroo_shooting.php</a>	6.38	9.22	3.74	10.98	3.24	11.33
2	39	What happens to joeys when female kangaroos are shot?	<a href="http://kb.rspca.org.au/What-happens-to-joeys-when-female-kangaroos-are-shot_76.html">http://kb.rspca.org.au/What-happens-to-joeys-when-female-kangaroos-are-shot_76.html</a>	6.48	8.33	4.06	8.39	3.22	7.78
2	40	Boycott Adidas (in Italian)	<a href="http://social-news.net1news.org/campagna-anti-adidas-massacrati-brutalmente-milioni-di">http://social-news.net1news.org/campagna-anti-adidas-massacrati-brutalmente-milioni-di</a>	5.59	10.05	4.03	11.04	4.09	12.82

Message type	Message number	Message Name	URL	Profile 1 <i>Concerned</i>		Profile 2 <i>Neutral</i>		Profile 3 <i>Accepting</i>	
				Engagement score	Rejection score	Engagement score	Rejection score	Engagement score	Rejection score
			canguri.html						
2	41	Kangaroos killed for sport	<a href="http://www.scribd.com/doc/28284712/Adidas-and-kangaroo-killing">http://www.scribd.com/doc/28284712/Adidas-and-kangaroo-killing</a>	6.22	9.22	3.80	12.20	3.50	13.00
2	42	Save a joey	<a href="http://www.australian-societyforkangaroos.org/joey_home.html">http://www.australian-societyforkangaroos.org/joey_home.html</a>	5.15	9.23	3.92	9.33	2.80	12.80
2	43	Million reasons not to eat kangaroo meat	<a href="http://www.scribd.com/doc/24025152/Million-reasons-not-to-eat-kangaroo-meat">http://www.scribd.com/doc/24025152/Million-reasons-not-to-eat-kangaroo-meat</a>	5.93	9.46	4.06	11.13	2.79	12.29
2	44	Kangaroo Slaughter For Fur	<a href="https://www.youtube.com/watch?v=07MEfx48vuk">https://www.youtube.com/watch?v=07MEfx48vuk</a>	7.28	8.72	4.57	9.45	3.60	11.53
2	45	Kangaroo slaughter	<a href="http://www.wlpa.org/the-issues/kangaroo_slaughter/">http://www.wlpa.org/the-issues/kangaroo_slaughter/</a>	6.74	9.00	4.24	10.13	4.00	12.10

Notes. Message type 1= kangaroo management messages, 2=animal protection messages. Score range for *engagement* is 2 to 10. Score range for *rejection* is 4 to 20. Message no. 3 was duplicated so not included.

# Implications

The results suggest that, based on psychological profiles, there are three distinct kangaroo management mindsets in the Australian community and they respond to messages about kangaroo management in different ways. The pattern of results demonstrated that respondents who are already concerned about the management of kangaroos were the most engaged by messages about this issue. This group also showed less rejection of messages that reflected their concern. This is not surprising since people have a tendency to seek or favour information that confirms their existing beliefs or expectations (called confirmation bias; Nickerson, 1998).

The *Concerned* group found animal protection messages containing emotional appeals and graphic images to be highly engaging whilst more text-based messages without images were less engaging. The most engaging kangaroo management messages were those that discussed topical issues like the pet food trial in Victoria and culling for conservation in the ACT. Messages about eating kangaroo meat were not appealing to the *Concerned* group.

Overall, the *Neutral* group found the management messages less engaging than the animal protection messages, but there was more rejection of the animal protection messages (though the level of rejection was less than for the *Accepting* group). With regard to kangaroo management, they showed more interest in messages that included information about animal welfare (e.g. kangaroos in drought) and were less interested in articles about eating kangaroo meat and how the kangaroo industry works. However, they were still highly engaged by messages produced by animal rights groups that appeal to emotions and show graphic images. This suggests that this group is open to a range of communications from different sources and provides the greatest potential for increasing engagement and awareness.

The *Accepting* group were also less engaged with the management messages compared with the animal protection messages. And, similar to the *Neutral* group, had high levels of rejection for the animal protection messages. This group was interested in reading about the health benefits of eating kangaroo meat and the impact of kangaroos but were less engaged with specific articles on harvesting and culling.

Of note is that the animal protection message with the lowest score on rejection for all three groups was an RSPCA Australia text-based article on ‘What happens to joeys when female kangaroo are shot?’ This could suggest that credibility of message source may be an important message cue when making judgements about accepting or rejecting animal protection messages.

This study highlights the importance of considering different profiles or groups within the community when communicating about kangaroos and their management. Research that further assesses how particular message attributes are utilised across the different kangaroo management mindsets would aid with the design of tailored communications. This study provides formative research in this field and demonstrates the value of a quantitative psychological approach to understanding the decisions, judgements and behaviours of the Australian public with regard to controversial wildlife management issues.

# Appendix



## Characterising the Australian public and responses to messages about kangaroo management

### INFORMATION SHEET

**You are invited to take part in a research study to investigate Australians' views about the management of kangaroos.**

#### Investigators

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#### Background to the research

This research project involves researchers from the University of New England (UNE), Animal Welfare Science Consultants (AWSC) and the NSW Department of Primary Industries (NSW DPI). It aims to explore how Australians think and feel about the management of kangaroos and to determine if they support or oppose a range of management methods. Your responses to this survey will enable us to understand how Australians perceive the management of kangaroos and how we can best communicate information about how and why kangaroos are managed.

There are a number of parts to the survey. Part 1 asks for some general information about you, Part 2 focuses on your attitudes and perceptions about different aspects of kangaroos and their management. Part 3 asks about your attitudes towards the use of animals, Part 4 examines your views about environmental issues and Part 5 looks at your cultural worldviews. Finally, Part 6 presents a series of communications about the management and use of kangaroos.

Your participation in this project would be greatly appreciated.

#### What you will be asked to do

Should you agree to participate, you will be asked to complete an online survey that should take around 30 to 40 minutes. When responding to the questions, it is important that you express your honest thoughts, feelings, and opinions about kangaroo management.

### **Your selection for this research**

Your contact details have been obtained through your online panel membership.

### **Risks associated with this research**

Completing this survey should not present any risk to you. However, if you experience distress, please consider contacting Lifeline on 13 11 14.

### **Your confidentiality**

The survey will not request any personal or threatening information. Your responses will remain anonymous and confidential, and will be saved and stored electronically in a confidential database. Your computer IP address, which is automatically logged when you submit your survey online, will be deleted immediately upon receipt. To prevent unauthorised access, all survey responses will be stored electronically on secure UNE and AWSC computer systems. Survey responses will be deleted from the Qualtrics server once the project is completed and the UNE copy of the data will be deleted on 01/01/2020.

### **Voluntary participation**

Your participation is voluntary and you have the right to withdraw from the study prior to completion of the survey without penalty. Please note however, that once you have completed and submitted the survey you will be unable to withdraw data.

### **Your agreement to participate**

Completion and submission of the electronic survey will be deemed as your consent to participate in this research. If required, the current webpage can be printed and retained as your personal copy of the project's details.

### **Further information**

If you would like further information about the survey, research project, or your participation, please contact Trudy Sharp, the Project Coordinator, by email at [trudy@awscience.com](mailto:trudy@awscience.com).

### **Approval**

This project has been approved by the Human Research Ethics Committee of the University of New England (Approval No HE14-061 Valid to 09/04/2015).

### **Complaints**

Should you have any complaints concerning the manner in which this research is conducted, please contact the Research Ethics Officer at:

Research Services

University of New England

Armidale, NSW 2351

Tel: (02) 6773 3449 Fax: (02) 6773 3543

Email: [ethics@une.edu.au](mailto:ethics@une.edu.au)

**Research Project: Characterising the Australian public and responses to messages about kangaroo management**

I have read the information contained in the Information Sheet for Participants and any questions I have asked have been answered to my satisfaction.

I agree to participate in this activity, realising that I may withdraw at any time.

I agree that research data gathered for the study may be published, and my identity will be unidentifiable due to the strict confidentiality explained in the information sheet.

I am over 18 years of age.

In preservation of anonymity, I understand that no name or signature is required of me to give consent. By activating the proceed button below I am agreeing to participate in this study.

**PROCEED TO STUDY**

**To begin the questionnaire, please click on the "next" button below.**

## Part 1

To determine whether the statements in this survey are biased in favour of specific gender, age or demographic factors, please provide the following information about yourself.

1. What is your gender?

Male (1)

Female (2)

2. What year were you born?

3. What is your home postcode?

4. What is the highest level of education you have completed?

Did not complete high school (1)

School Certificate (2)

Higher School Certificate (3)

TAFE Certificate or Diploma (4)

Bachelors Degree (5)

Postgraduate Diploma (6)

Masters Degree (7)

Doctoral Degree (8)

5. Which of the following would best describe the residential situation that you have had for most of your life?

A rural area or village (under 1,000 people) (1)

A small country town (under 10,000 people) (2)

A larger country town (over 10,000 people) (3)

A large town (over 25,000 people) (4)

Outer metropolitan area of a major city (under 100,000 people) (5)

Inner metropolitan area of a major city (under 100,000 people) (6)

6. How would you describe your current residential situation?

A rural area or village (under 1,000 people) (1)

A small country town (under 10,000 people) (2)

A larger country town (over 10,000 people) (3)

A large town (over 25,000 people) (4)

Outer metropolitan area of a major city (under 100,000 people) (5)

Inner metropolitan area of a major city (under 100,000 people) (6)

## Part 2

Before presenting specific questions about your perceptions of kangaroo management, we would like to get an impression of your immediate response to the word KANGAROO.

Please list the first three (3) thoughts or images that come to your mind when you think about kangaroos. Indicate your thoughts or images in one or two words, and type them in the boxes below.

Thought/image 1

Thought/image 2

Thought/image 3

Now we'd like to assess your immediate emotional response to each of the thoughts and images you listed above. Please select an appropriate description of your response from the options below, which range from Very Negative to Very Positive.

Try not to think too much about your answers. Remember we want to assess your immediate emotional response.

	Very Negative (1)	Negative (2)	Neutral (3)	Positive (4)	Very Positive (5)
Thought/image #1 (1)	<input type="radio"/>				
Thought/image #2 (2)	<input type="radio"/>				
Thought/image #3 (3)	<input type="radio"/>				

Please indicate whether you think the following statements are TRUE or FALSE. If you do not know, just click on "DON'T KNOW", rather than asking someone else or looking up the answer.

1. Kangaroos are farmed just like sheep and cattle.

- True (1)
- False (2)
- Don't know (3)

2. If kangaroos continue to be harvested at the current levels, there is a high risk they will become extinct.

- True (1)
- False (2)
- Don't know (3)

3. A rifle shot to the brain is considered by animal welfare experts to be an inhumane (or cruel) method of killing kangaroos.

- True (1)
- False (2)
- Don't know (3)

4. During periods of severe drought many kangaroos still die of starvation even though they are well-adapted to live in the Australian environment.

- True (1)
- False (2)
- Don't know (3)

5. Scientific studies have demonstrated that when pasture is abundant kangaroos rarely compete with domestic stock for food.

- True (1)
- False (2)
- Don't know (3)

6. It is common for female kangaroos to have more than one young (or joey) at different stages of development (i.e. if they have a large joey at foot, they can also have a smaller joey in their pouch).

- True (1)
- False (2)
- Don't know (3)

7. In some areas, high densities of kangaroos can have a negative impact on biodiversity by competing with other native animals and grazing on native plants.

- True (1)
- False (2)
- Don't know (3)

8. Most scientists agree with the statement “there are more kangaroos now than at the time of European settlement”.

- True (1)
- False (2)
- Don't know (3)

Listed below are 9 different kangaroo management methods that are either currently used (or could potentially be used) in Australia along with a short description of how they are performed.

1. Shooting by professional shooters (commercial harvesting)  
Kangaroos are shot by an experienced shooter who has passed an accuracy test. A national code of practice requires that all kangaroos must be *head* shot (i.e. killed by a shot to the head that destroys the brain). Meat and skin from carcasses are used commercially. Animals that have been shot in the body are not accepted by buyers.
2. Shooting by professional shooters (animals shot and carcasses 'let lie')  
Shot by an experienced shooter. A national code of practice requires that in most circumstances kangaroos must be *head* shot (i.e. killed by a shot to the head that destroys the brain). Meat and skin of the carcass are NOT used commercially and the carcass is left where it was shot.
3. Shooting by non-professional shooters (animals shot and carcasses 'let lie')  
Shot by a shooter whose level of experience may range from inexperienced to highly experienced. A national code of practice requires that in most circumstances kangaroos must be *head* shot (i.e. killed by a shot to the head that destroys the brain). Meat and skin of the carcass are NOT used commercially and the carcass is left where it was shot.
4. Capture followed by euthanasia  
Kangaroos are approached (to a distance no more than 50 metres) and captured using a dart containing an anaesthetic. While kangaroos are unconscious they are killed by a lethal injection.
5. Capture followed by translocation  
Kangaroos are approached (to a distance no more than 50 metres) and captured using a dart containing an anaesthetic. While kangaroos are unconscious they are transported to another location and released.
6. Fertility control  
Kangaroos are approached (to a distance no more than 50 metres) and captured using a dart containing an anaesthetic. While kangaroos are unconscious they are injected with a drug that makes them infertile or are surgically sterilised and then released.
7. Exclusion from water points  
A fence or other barrier is placed around a water source (dam or trough). Kangaroos are prevented from drinking.
8. Exclusion fencing  
A fence or other barrier is placed around a resource (e.g. a crop or pasture). Kangaroos are prevented from accessing the resource.
9. Do nothing – no management  
No human intervention.

How do YOU rate the level of ACCEPTABILITY of each of these methods? (Select one answer for each method)

	Unacceptable (1)	Slightly unacceptable (2)	Neutral (3)	Slightly acceptable (4)	Acceptable (5)
1. Shooting by professional shooters (commercial harvesting)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Shooting by professional shooters (shoot and 'let lie')	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Shooting by non-professional shooters (animals shoot and 'let lie')	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Capture followed by euthanasia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Capture followed by translocation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Fertility control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Exclusion from water points	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Exclusion fencing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Do nothing – no management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate each of the kangaroo management methods in terms of how HUMANE you believe they are. (Select one answer for each method)

	Very inhumane (1)	Slightly inhumane (2)	Neutral (3)	Slightly humane (4)	Very humane (5)
1. Shooting by professional shooters (commercial harvesting)	<input type="radio"/>				
2. Shooting by professional shooters (shoot and 'let lie')	<input type="radio"/>				
3. Shooting by non-professional shooters (animals shoot and 'let lie')	<input type="radio"/>				
4. Capture followed by euthanasia	<input type="radio"/>				
5. Capture followed by translocation	<input type="radio"/>				
6. Fertility control	<input type="radio"/>				
7. Exclusion from water points	<input type="radio"/>				
8. Exclusion fencing	<input type="radio"/>				
9. Do nothing – no management	<input type="radio"/>				

The following questions are about the use of kangaroo products.

During the last 12 months how often have you purchased kangaroo meat products for consumption by you or your family/friends/colleagues?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very Often (5)

During the last 12 months how often have you purchased products that you know contains kangaroo meat for consumption by your pet/s?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very Often (5)

During the last 12 months how often have you eaten kangaroo meat at a restaurant, café etc.?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very Often (5)

During the last 12 months how often have you bought or used leather products (e.g. sports boots, belts, handbags, wallets etc.) made from kangaroo skin?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very Often (5)

How closely do you attend to news reports, discussions or other information about the management of kangaroos?

- Not at all (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- A great deal (5)

Within the next 12 months please indicate how likely or unlikely you are to....(Select one answer for each statement)

	Very unlikely (1)	Unlikely (2)	Undecided (3)	Likely (4)	Very likely (5)
Sign a petition against killing kangaroos	<input type="radio"/>				
Write to a politician to express your concern about the killing of kangaroos	<input type="radio"/>				
Convince a friend, colleague or family member that killing kangaroos is the best method in some situations	<input type="radio"/>				
Contribute to an organisation that opposes the killing of kangaroos	<input type="radio"/>				
Write a letter to the editor of your local newspaper to oppose the killing of kangaroos	<input type="radio"/>				

The following questions are about the methods that are used to kill kangaroos.

There are 4 methods listed that could potentially be used:

1. shooting (usually a shot to the head)
2. blunt trauma (or a blow) to the head
3. capture followed by lethal injection

Rate SHOOTING on each of the following dimensions:

	1	2	3	4	5	6	7	
bad	<input type="radio"/>	good						
cruel	<input type="radio"/>	kind						
inhumane	<input type="radio"/>	humane						
violent	<input type="radio"/>	gentle						
slow	<input type="radio"/>	quick						
dangerous	<input type="radio"/>	safe						
difficult	<input type="radio"/>	easy						
ineffective	<input type="radio"/>	effective						
painful	<input type="radio"/>	painless						
sickening	<input type="radio"/>	pleasing						
intolerable	<input type="radio"/>	tolerable						

Rate BLUNT TRAUMA TO THE HEAD on each of the following dimensions:

	1	2	3	4	5	6	7	
bad	<input type="radio"/>	good						
cruel	<input type="radio"/>	kind						
inhumane	<input type="radio"/>	humane						
violent	<input type="radio"/>	gentle						
slow	<input type="radio"/>	quick						
dangerous	<input type="radio"/>	safe						
difficult	<input type="radio"/>	easy						
ineffective	<input type="radio"/>	effective						
painful	<input type="radio"/>	painless						
sickening	<input type="radio"/>	pleasing						
intolerable	<input type="radio"/>	tolerable						

Rate CAPTURE FOLLOWED BY A LETHAL INJECTION on each of the following dimensions:

	1	2	3	4	5	6	7	
bad	<input type="radio"/>	good						
cruel	<input type="radio"/>	kind						
inhumane	<input type="radio"/>	humane						
violent	<input type="radio"/>	gentle						
slow	<input type="radio"/>	quick						
dangerous	<input type="radio"/>	safe						
difficult	<input type="radio"/>	easy						
ineffective	<input type="radio"/>	effective						
painful	<input type="radio"/>	painless						
sickening	<input type="radio"/>	pleasing						
intolerable	<input type="radio"/>	tolerable						

Part 2

Listed below are 20 statements regarding the use of animals.

Please click on the response that best indicates your level of agreement for each statement below.  
(Select one answer for each statement)

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
It is morally wrong to hunt wild animals just for sport.	<input type="radio"/>				
I do not think that there is anything wrong with using animals in medical research.	<input type="radio"/>				
There should be extremely stiff penalties including prison sentences for people who participate in cock-fighting.	<input type="radio"/>				
Wild animals, such as mink and raccoons, should not be trapped and their skins made into fur coats.	<input type="radio"/>				
There is nothing morally wrong with hunting wild animals for food.	<input type="radio"/>				
I think people who object to raising animals for meat are too sentimental.	<input type="radio"/>				
Much of the scientific research done with animals is unnecessary and cruel	<input type="radio"/>				
I think it is perfectly acceptable for cattle and pigs to be raised for human consumption.	<input type="radio"/>				
Basically, humans have the right to use animals as we see fit.	<input type="radio"/>				
The slaughter of whales and dolphins should be immediately stopped even if it means some people will be put out of work.	<input type="radio"/>				
I sometimes get upset when I see wild animals in cages at zoos.	<input type="radio"/>				
In general, I think that human economic gain is more important than setting aside more land for wildlife.	<input type="radio"/>				
Too much fuss is made over the welfare of animals these days when there are many human problems that need to be solved.	<input type="radio"/>				
Breeding animals for their skins is a legitimate use of animals.	<input type="radio"/>				
Some aspects of biology can only	<input type="radio"/>				

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
be learned through dissecting preserved animals such as cats.					
Continued research with animals will be necessary if we are to ever conquer diseases such as cancer, heart disease, and AIDS.	<input type="radio"/>				
It is unethical to breed purebred dogs for pets when millions of dogs are killed in animal shelters each year.	<input type="radio"/>				
The production of inexpensive meat, eggs, and dairy products justifies maintaining animals under crowded conditions.	<input type="radio"/>				
The use of animals such as rabbits for testing the safety of cosmetics and household products is unnecessary and should be stopped.	<input type="radio"/>				
The use of animals in rodeos and circuses is cruel.	<input type="radio"/>				

Part 3

The following statements relate to Government and society.

Please click on the response that best indicates your level of agreement for each statement below.  
(Select one answer for each statement)

The government interferes far too much in our everyday lives.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sometimes government needs to make laws that keep people from hurting themselves.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It's not the government's business to try to protect people from themselves.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The government should stop telling people how to live their lives.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The government should do more to advance society's goals, even if that means limiting the freedom and choices of individuals.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Government should put limits on the choices individuals can make so they don't get in the way of what's good for society.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

We have gone too far in pushing equal rights in this country.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Our society would be better off if the distribution of wealth was more equal.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

We need to dramatically reduce inequalities between the rich and the poor, whites and blacks, and men and women.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Discrimination against minorities is still a very serious problem in our society.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It seems like aboriginal people, women, homosexuals and other groups don't want equal rights, they want special rights just for them.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Society as a whole has become too soft and feminine.

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Slightly agree (4)	Moderately agree (5)	Strongly agree (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part 5

Listed below are statements regarding concern for the environment.

Please click on the response that indicates the extent to which you AGREE or DISAGREE with each statement. (Select one answer for each statement)

	Strongly Agree (1)	Agree (2)	Neither Agree nor Disagree (3)	Disagree (4)	Strongly Disagree (5)
1. We are approaching the limit of the number of people the Earth can support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Humans have the right to modify the natural environment to suit their needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. When humans interfere with nature it often produces disastrous consequences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Human ingenuity will insure that we do not make the Earth unliveable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Humans are seriously abusing the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. The Earth has plenty of natural resources if we just learn how to develop them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Plants and animals have as much right as humans to exist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Despite our special abilities, humans are still subject to the laws of nature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The so-called 'ecological crisis' facing humankind has been greatly exaggerated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The Earth is like a spaceship with very limited room and resources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Humans were meant to rule over the rest of nature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. The balance of nature is very delicate and easily upset.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Humans will eventually learn enough about how nature works to be able to control it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. If things continue on their present course, we will soon experience a major ecological catastrophe.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Part 6

In this section, we will present a series of brief messages relating to the management and/or use of kangaroos in Australia. The messages vary in format, and may include fact sheets, videos, brochures, news articles, radio broadcasts, or websites. Some messages are short (e.g. one or two page brochures or websites) but others are longer (e.g. 2-3 minute videos). Please limit the time you spend on each message to four minutes. After you have viewed each message, please respond to a series of questions about your responses to that message. There are no right or wrong responses. People often respond differently to the same message, and we are interested in your personal response.

### **WARNING**

***Some of the following messages are graphic in nature and might be disturbing to some viewers.***

Please click PLAY ► to view the message.

After you have viewed the message, please respond to each of the following questions about the message by clicking the appropriate button

a) To what extent did you find the message credible? (1)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

b) To what extent did you find the message easy to understand? (2)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

c) To what extent did the message make you feel sad? (3)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

d) To what extent did you find the message engaging? (4)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

e) To what extent did the message make you feel that urgent action is required? (5)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

f) To what extent did the message make you feel that kangaroos are vulnerable? (6)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

g) To what extent did the message motivate you to seek out more information on the topic? (7)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

h) To what extent did the message make you feel motivated to take immediate action? (8)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

i) To what extent did the message make you feel disgusted? (9)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

j) How important did you find the issue addressed by the message? (10)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

k) To what extent did the message make you NOT want to think about the issue it addressed? (11)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

l) To what extent did you find the information in the message was exaggerated? (12)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

m) To what extent did you feel that the message tried to manipulate your views or feelings? (13)

Extremely (5)	Very (4)	Moderately (3)	Slightly (2)	Not at all (1)
<input type="radio"/>				

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