



**Framing the Conservation Conversation:**

**An investigation into framing techniques for communicating biodiversity conservation**

A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

Alexander Michael Kusmanoff

BEnvSc(Hons) *Flin*, LLB(with Hons) *Adel*

School of Global Urban and Social Studies

College of Design and Social Context

RMIT University

February 2017



## DECLARATION

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Alexander Michael Kusmanoff

3 February 2017



## PREFACE

This is a thesis ‘with publications’ and is substantially composed of papers either published, in review or in preparation that report the original research undertaken throughout the research program. These papers are compiled for this thesis with only minor amendments and are collectively preceded by an introduction to the research program and followed by a conclusion that draws together the key outcomes and findings of the collective research. Each paper is a self-contained account of the research that it reports, with its own abstract, introduction, methods, results and discussion. This inevitably results in some degree of overlap and repetition, for which I ask the reader’s patience. To afford the reader some respite from this format, references from each chapter have been consolidated and provided at the end of the thesis, immediately before the appendices.

The work presented here is predominantly my own. Publications and contributions from others are detailed below.

The work presented in Chapter 2 is an edited version of the paper in preparation:

Kusmanoff AM, Fidler F, Gordon A, Bekessy SA. (In Prep). How should private property rights be framed in the promotion of private land conservation?

Co-author Fiona Fidler provided advice on the research design and the data analysis. All co-authors provided feedback on study design, interpretation of results and editorial assistance.

The work presented in Chapter 3 is an edited version of the paper in preparation:

Kusmanoff AM, Fidler F, Gordon A, Bekessy SA. (In Prep). Economically framed information about ecosystem services can crowd-out intrinsic motivations for protecting nature.

In addition, Dr Adrian Camilleri provided help and advice in using Mechanical Turk, and Michelle Sier undertook the second coding of the qualitative data. All co-authors provided feedback on study design, interpretation of results and editorial assistance.

The work presented in Chapter 4 is an edited version of the published paper:

Kusmanoff AM, Hardy MJ, Fidler F, Maffey G, Raymond C, Reed MS, Bekessy SA. (2016). Framing the private land conservation conversation: Strategic framing of the benefits of conservation participation could increase landholder engagement. *Environmental Science & Policy* 61, 124-128.

Co-authors Christopher Raymond and Mathew Hardy provided advice in developing the research method, and undertook the second coding. All co-authors provided feedback on study design, interpretation of results and editorial assistance.

The work presented in Chapter 5 is an edited version of the submitted paper:

Kusmanoff AM, Fidler F, Gordon A, Bekessy SA. (In Review). Decline of 'biodiversity' in conservation policy discourse in Australia (submitted to *Environmental Science & Policy*).

Co-author Ascelin Gordon generated R code to plot figures 5.2, 5.3 and 5.4 and All co-authors provided feedback on study design, interpretation of results and editorial assistance. Dr Cathy Oake and Dr Joab Wilson helped source the media releases and Mathew Hardy undertook the second coding.

The work presented in Chapter 6 is an edited version of the paper in preparation:

Kusmanoff AM, Fidler F, Gordon A, Bekessy SA. (In Prep). Strategic framing for more effective biodiversity conservation messages.

All co-authors provided editorial assistance.

Notwithstanding these contributions, all errors, omissions, inaccuracies, hyperbole, misplaced assumptions, lazy thinking and poor writing are my own. This thesis was compiled using a template developed by Kayla Friedman and Malcolm Morgan.

## ACKNOWLEDGEMENTS

There are many people whose support has made this thesis possible, and I thank you all. Foremost of these are my supervisors, Sarah Bekessy, Fiona Fidler and Ascelin Gordon. Your advice support and encouragement has been essential, and is greatly appreciated. This includes a special thanks to Sarah and Ascelin for giving me this opportunity in the first place.

I am of course grateful to the many people who have provided direct contributions to this work, as outlined in the preface. Thanks also to others who have offered advice or support along the way, including Adrian Camilleri, and Karyn Bosomworth, both of whom served as independent advisers at my milestone conferences. Thanks also to Mathew Hardy for helping undertake the secondary coding in chapters four and five.

This research would not have been possible without the support of an Australian Government Research Training Scholarship and a scholarship funded by the Australian Government's National Environmental Research Program and the Australian Research Council Centre of Excellence for Environmental Decisions.

Essential also, were my anonymous research participants, whom I thank for giving their time to take my surveys.

I have also had the privilege of being a member of the Interdisciplinary Conservation Science Research Group throughout my PhD journey; this group of researchers have provided support, friendship and essential camaraderie, for which I thank you all. This includes a special thanks to my cohort compatriots, Laura and Mat, with whom I have shared the meandering and sometimes maddening course that maps the PhD journey.

I also offer heartfelt thanks to my friends and family whose love and support has always been forthcoming and greatly appreciated. Special mentions here for my Mum and to my eternal Best Man, Simon.

Most of all, I would like to express appreciation for the love and support of my wonderful wife Michelle, you have been a truly invaluable source of encouragement and essential to my completing this thesis.





# CONTENTS

<b>1 INTRODUCTION.....</b>	<b>3</b>
1.1 AN OVERVIEW OF FRAMING .....	5
1.2 NON-EQUIVALENCE FRAMES.....	6
1.3 EQUIVALENCE FRAMES .....	7
<i>Risky choice framing</i> .....	8
<i>Attribute framing</i> .....	10
<i>Goal framing</i> .....	11
1.4 FRAMES ARE MIXED .....	12
1.5 PROSPECT FOR STRATEGIC USE OF FRAMING .....	13
1.6 PREVIOUS FRAMING STUDIES IN BIODIVERSITY CONSERVATION.....	14
1.7 THESIS OUTLINE.....	19
<b>2 HOW SHOULD PRIVATE PROPERTY RIGHTS BE FRAMED IN THE PROMOTION OF PRIVATE LAND CONSERVATION?.....</b>	<b>23</b>
ABSTRACT .....	23
2.1 INTRODUCTION .....	24
<i>Property rights and framing</i> .....	25
2.2 METHODS .....	28
<i>Participant recruitment</i> .....	29
<i>Measuring property rights and utilitarianism</i> .....	30
<i>Acceptance measure</i> .....	32
<i>Construction of the frames</i> .....	33
<i>Correlations</i> .....	33
2.3 RESULTS .....	33
<i>Study 1</i> .....	33
<i>Study 2a and 2b</i> .....	34
2.4 DISCUSSION .....	38
<i>The impact of response scales</i> .....	39
<i>Valence framing not property paradigms framing</i> .....	39
<i>Unintended framing effect</i> .....	41
<i>Correlations between property rights strength, utilitarianism and acceptance</i> .....	41
<i>Implications for private land conservation</i> .....	42
2.5 CONCLUSIONS.....	42

<b>3 ECONOMICALLY FRAMED INFORMATION ABOUT ECOSYSTEM SERVICES CAN CROWD-OUT INTRINSIC MOTIVATIONS FOR PROTECTING NATURE.....</b>	<b>45</b>
ABSTRACT.....	45
3.1 INTRODUCTION.....	46
<i>Motivational crowding and conservation incentives</i> .....	46
<i>The ‘ecosystem services’ framing of nature.....</i>	47
<i>How ecosystem service frames may cause motivational crowding</i> .....	47
3.2 METHODS.....	49
<i>Participants.....</i>	49
<i>Survey design and procedure.....</i>	50
<i>Response Coding.....</i>	51
3.3 RESULTS.....	51
<i>How does ecosystem services information affect motivations to conserve whales or bees?</i> .....	51
<i>How does ecosystem services information affect the ranking of intrinsic/instrumental motivations?</i> .....	53
3.4 DISCUSSION.....	56
<i>Implications for conservation communication.....</i>	58
<b>4 FRAMING THE PRIVATE LAND CONSERVATION CONVERSATION: STRATEGIC FRAMING OF THE BENEFITS OF CONSERVATION PARTICIPATION COULD INCREASE LANDHOLDER ENGAGEMENT .....</b>	<b>61</b>
ABSTRACT.....	62
4.1 INTRODUCTION.....	62
<i>Background to value orientations: egoistic, social-altruistic and biospheric.....</i>	63
4.2 METHODS.....	65
4.3 RESULTS.....	66
4.4 DISCUSSION.....	68
<i>Market-based schemes.....</i>	69
<i>Framing failure.....</i>	69
<i>Future directions for PLC communications</i> .....	70
4.5 CONCLUSIONS.....	71
<b>5 DECLINE OF ‘BIODIVERSITY’ IN CONSERVATION POLICY DISCOURSE IN AUSTRALIA.....</b>	<b>73</b>
ABSTRACT.....	73

5.1 INTRODUCTION .....	74
5.2 METHODS .....	76
5.3 RESULTS .....	79
5.4 DISCUSSION .....	82
5.5 CONCLUSIONS.....	84
<b>6 STRATEGIC FRAMING FOR MORE EFFECTIVE BIODIVERSITY CONSERVATION MESSAGING.....</b>	<b>85</b>
ABSTRACT .....	85
6.1 INTRODUCTION .....	86
6.2 FRAMING .....	87
6.3 STRATEGIC USE OF FRAMING .....	89
<i>Audience</i> .....	92
<i>Biases</i> .....	93
<i>Emotional appeals</i> .....	94
<i>Psychological distance</i> .....	96
<i>Norms and agency</i> .....	97
6.4 TEST (FOR ADVERSE EFFECTS) .....	99
<i>Boomerang effects</i> .....	100
<i>Misguided norms</i> .....	100
<i>Crowding-out</i> .....	100
6.5 REPORT RESULTS .....	101
6.6 CONCLUSION .....	102
<b>7 CONCLUSIONS .....</b>	<b>103</b>
7.1 FURTHER RESEARCH .....	108
7.2 CLOSING REMARKS .....	108
<b>8 REFERENCES.....</b>	<b>111</b>
<b>9 APPENDICES .....</b>	<b>129</b>
APPENDIX A .....	131
APPENDIX B .....	133
APPENDIX C .....	135
APPENDIX D .....	141
APPENDIX E.....	143
APPENDIX F.....	145
APPENDIX G .....	149
APPENDIX H .....	151

APPENDIX I.....	153
APPENDIX J .....	155
APPENDIX K .....	157

## LIST OF TABLES

TABLE 2.1. SUMMARY OF DESCRIPTIVE STATISTICS FOR STUDY 2A AND 2B .....	35
TABLE 2.2. SPEARMAN’S RANK ORDER CORRELATIONS BETWEEN VARIABLES OF INTEREST ACROSS THREE DATASETS AND SUMMARY EFFECT SIZE OF THE COMBINED DATASETS. SHADED CORRELATIONS ARE THOSE WHICH WERE MEANINGFUL ACROSS ALL DATASETS .....	38
TABLE 3.1. EXAMPLES OF REASONS PROVIDED BY PARTICIPANTS THAT WERE CODED AS RELATING TO EITHER INTRINSIC OR INSTRUMENTAL VALUES.....	52
TABLE 3.2. SUMMARY OF THE KEY RESULTS FROM EACH SURVEY, INCLUDING 95% CIs WHERE APPLICABLE.....	54



# LIST OF FIGURES

FIGURE 1.1. SCHEMATIC REPRESENTATION OF THE DIFFERENT TYPES OF STRATEGIC FRAMING, AND WHERE THEY SIT IN RELATION TO ONE ANOTHER ON A SPECTRUM BETWEEN SEMANTIC FRAMING AND STORY FRAMING. SEMANTIC FRAMING REFERS TO THE USE OF ALTERNATIVE WORDS AND PHRASES TO DESCRIBE AN ASPECT OF REALITY, WHEREAS STORY FRAMING USES A MORE SOPHISTICATED NARRATIVE TO DO SO, AND MAY INCLUDE SEMANTIC AND OTHER FRAMING. THE DIFFERENT TYPES OF EQUIVALENCE FRAMES ARE SIMILAR TO SEMANTIC FRAMES AND LOCATED AT THAT END OF THE SPECTRUM. EMPHASIS/ISSUE FRAMING CAN BE USED IN CONJUNCTION WITH FRAMING AT ANY SCALE FROM SEMATIC TO STORY FRAMING AND IS GENERALLY USED TO CREATE A PARTICULAR CONTEXT OR THEME (E.G. THE CLAIM “90% FAT FREE” USES ATTRIBUTE FRAMING (I.E. A TYPE OF EQUIVALENCE FRAME) IN CONJUNCTION WITH A HEALTH-ORIENTED EMPHASIS/ISSUE FRAME).. ... 6

FIGURE 2.1. PERCENTAGE OF RESPONDENTS WHO PREFERRED THE DISCRETE ASSET FRAMED DESCRIPTION OF THE POLICY (OPTION A) AND THE BUNDLE-OF-RIGHTS FRAMED DESCRIPTION (OPTION B) (N=76). ERROR BARS REPRESENT 95% CONFIDENCE INTERVALS. .... 34

FIGURE 2.2. RESULTS OF STUDY 2A. PERCENTAGE OF RESPONDENTS WHO ACCEPTED, REJECTED, AND NEITHER ACCEPTED NOR REJECTED THE REGULATIONS, FOR BOTH FRAMING CONDITIONS (N=203). ERROR BARS REPRESENT 95% CONFIDENCE INTERVALS. .... 36

FIGURE 2.3. RESULTS OF STUDY 2B. PERCENTAGE OF RESPONDENTS WHO ACCEPTED, REJECTED, AND NEITHER ACCEPTED NOR REJECTED THE REGULATIONS, FOR BOTH FRAMING CONDITIONS (N=218). ERROR BARS REPRESENT 95% CONFIDENCE INTERVALS. .... 37

FIGURE 3.1. DIFFERENCE BETWEEN FRAMING CONDITIONS OF THE AVERAGE PROPORTION OF TOP 2 REASONS THAT ARE INTRINSICALLY MOTIVATED, WITH 95% CONFIDENCE INTERVALS. ‘ELICITED’ REFERS TO THE ORDER IN WHICH RESPONDENTS LISTED REASONS AND ‘RANKED’ REFERS TO THE ORDER OF IMPORTANCE THAT RESPONDENTS SUBSEQUENTLY RANKED THOSE REASONS. THE DIFFERENCES PLOTTED ARE ANALOGOUS TO EFFECT SIZE. .... 56

FIGURE 4.1. AVERAGE PROPORTIONS OF BENEFITS THAT ARE FRAMED AS EGOISTIC, SOCIAL-ALTRUISTIC AND BIOSPHERIC BENEFITS. SOLID BARS SHOW THE PROPORTION ACROSS 20 AUSTRALIAN PLC SCHEMES. ERROR BARS ARE 95%

CONFIDENCE INTERVALS. TRANSPARENT BARS SHOW THE PROPORTION FOR 5 AUSTRALIAN MARKET-BASED PLC SCHEMES (N INSUFFICIENT FOR ERROR BAR CALCULATION)..... 67

FIGURE 5.1. METHODOLOGICAL FLOW CHART FOR ANALYSING MEDIA RELEASES FROM THE AUSTRALIAN GOVERNMENT ENVIRONMENT PORTFOLIO AND THE AUSTRALIAN CONSERVATION FOUNDATION (ACF). ALL RELEASES WERE SUBJECTED TO A TEXT SEARCH FOR ‘BIODIVERSITY’ AND ‘ECONO’ AND A SUBSAMPLE OF THE RELEASES WERE SUBJECTED TO CONTENT ANALYSIS TO IDENTIFY USE OF ECOSYSTEM SERVICES LOGIC. TO ENSURE THAT THE SUB-SAMPLE OF AUSTRALIAN GOVERNMENT ENVIRONMENT PORTFOLIO RELEASES WERE RELEVANT, ONLY THOSE WITH AT LEAST ONE INSTANCE OF THE TERMS ‘ECOSYSTEM’, ‘ECOLOG’, OR ‘CONSERVATION’ WERE SELECTED. THE ACF SUB-SAMPLE WAS A RANDOM SELECTION..... 78

FIGURE 5.2. PERCENTAGE OF SCIENTIFIC PUBLICATIONS CONTAINING ‘BIODIVERSITY’ AND ‘ECOSYSTEM SERVICES’. DATA DERIVED FROM WEB OF SCIENCE ([HTTP://APPS.WEBOFKNOWLEDGE.COM](http://apps.webofknowledge.com))..... 80

FIGURE 5.3. PERCENTAGE OF 3553 AUSTRALIAN GOVERNMENT ENVIRONMENT PORTFOLIO MEDIA RELEASES THAT CONTAIN ‘BIODIVERSITY’, ‘ECONO’ AND ECOSYSTEM SERVICES FRAMING OVER TIME. ERROR BARS ARE 95% CONFIDENCE INTERVALS FOR THE ECOSYSTEM SERVICES FRAMING SUB-SAMPLE (N=516)..... 81

FIGURE 5.4. PERCENTAGE OF THE 745 AUSTRALIAN CONSERVATION FOUNDATION MEDIA RELEASES THAT CONTAIN ‘BIODIVERSITY’, ‘ECONO’ AND ECOSYSTEM SERVICES FRAMING OVER TIME. ERROR BARS ARE 95% CONFIDENCE INTERVALS FOR ECOSYSTEM SERVICES FRAMING (N=229)..... 81

FIGURE 6.1. STRATEGIC FRAMING IS A PROCESS THAT CAN BE APPLIED TO THE SHAPING OF ANY COMMUNICATION THAT CONSIDERS HOW KEY ASPECTS OF FRAMING MAY BE LEVERAGED OR AVOIDED IN ORDER THAT A MESSAGE IS AS EFFECTIVE AS POSSIBLE FOR ITS PURPOSE. THIS PURPOSE NEED NOT BE LIMITED TO ADVOCACY, AND THE FRAMING ASPECTS CONSIDERED NEED NOT BE LIMITED TO THOSE INCLUDED IN THE FIGURE. UNDERSTANDING THE INTENDED AUDIENCE SHOULD ALWAYS BE THE FIRST STEP AND TESTING AND REPORTING THE MESSAGE WILL OCCUR LAST, HOWEVER THE REMAINING STEPS MAY BE UNDERTAKEN IN ANY ORDER. .... 91



## ABSTRACT

Biodiversity loss is one of the most serious of contemporary environmental problems. As human activities are the primary driver of biodiversity loss, changes to human behaviour will be an essential component of species conservation strategies. Research in communication, sociology, psychology, and political science has shown that the way in which an issue is ‘framed’ can influence judgements, attitudes and behaviours. As such, communications intended to promote behaviour change in favour of biodiversity conservation may be made more effective by the strategic use of framing. Although a sizable framing literature exists across many research areas, there is little research on the use of framing to promote biodiversity conservation, and practically no guidance for those involved in communicating conservation messages. This thesis builds an understanding of the use of framing to promote biodiversity conservation by: empirically testing several alternatively framed conservation communications; investigating the degree to which framing is strategically used in the Australian private land conservation sector to promote conservation programs; considering how the framing of biodiversity has changed over the last decade within public policy discourse; and providing guidance to communicators on how to strategically frame their messages for greater effect.

This thesis begins by empirically testing several alternatively framed conservation messages. I test how framing ‘property’ as either a ‘discrete asset’ or as a ‘bundle-of-rights’ can influence attitudes to regulations that would interfere with property rights in order to achieve conservation outcomes. I find that the alternative property ‘frames’ can influence attitudes, but only when used to activate cognitive biases (in this case the endowment effect). I also test how framing nature in terms of ‘ecosystem services’ influences the way in which people think about and value nature, and find that information framed to emphasise economic aspects of ecosystem services can crowd-out (i.e. displace) intrinsic motivations for conservation. Such ‘ecosystem service’ framed messages thereby have the potential to promote a mindset that the only nature worth preserving is that with a demonstrable and quantifiable value.

The thesis then examines the degree to which framing is strategically used in the Australian private land conservation sector to promote participation. By examining the websites of a range of Australian schemes and categorising stated participation benefits as either benefits to landholders, to society or to the environment, I gain insight into the

types of landholders mostly likely to be engaged by these messages. The results indicate a predominance of environmentally-framed benefits, which arguably indicates a lack of strategic framing, whereby appeals are aimed chiefly at those landholders who are already most likely to participate in conservation.

The thesis then considers how the framing of biodiversity has changed over the last decade within public policy discourse by examining media releases from the Australian Government environment portfolio and the Australian Conservation Foundation. I find that the term 'biodiversity' has become less prevalent while the use of economic language has increased. This may reflect a strategic response by these agencies to better engage with both the general public and decision makers within what is an increasingly dominant neoliberal paradigm. However, this change in discourse is likely also to generate its own influence on the way people think about biodiversity conservation, including the potential for 'crowding-out' of intrinsic values.

Finally, the thesis presents a synthesis of these research findings including key concepts from the framing and related literature to provide some guidance to conservation communicators on how to strategically frame their messages for greater impact and effect.

# 1 INTRODUCTION

Biodiversity loss is recognised as one of the most critical environmental problems (Gordon 2006; Gustafsson 2013), not least because human wellbeing depends upon it (Millennium Ecosystem Assessment 2005). This loss continues in spite of substantial efforts to tackle it (Butchart et al. 2010). Human activities are the primary agent of biodiversity loss, driving key threatening processes such as habitat loss due to overexploitation of natural resources, agriculture, urban development, damage from introduction of invasive species and pollution, etc. (Millennium Ecosystem Assessment 2005; Maxwell et al. 2016). While many people perceive ‘nature’ as being something separate from the controlled urban environment that most of the world’s population inhabit (particularly in Western societies) (Vining, Merrick and Price 2008), there is a growing awareness amongst researchers and policy makers that humans interact with nature via complex social ecological systems (e.g. Folke et al. 2005; Walker et al. 2006). While such understanding can help guide policy to address biodiversity loss, the protection of biodiversity is a social and political process, which must include changes in human behaviour (Brechin et al. 2002; Schultz 2011). As such, communication and advocacy that more effectively influence attitudes and behaviour are an important component of efforts toward addressing conservation problems (e.g. Dayer et al. 2015).

Research in communication, sociology, psychology, and political science has shown that the way in which an issue is ‘framed’ can influence judgements, attitudes and behaviours (e.g. Kahneman and Tversky 1984; Meyerowitz and Chaiken 1987). As such, communications intended to promote environmental advocacy both generally and in relation to specific issues such as biodiversity conservation may be made more

effective by the strategic use of framing. This has the potential to benefit governments, non-governmental organisations, and environmental advocates in presenting their message in a more persuasive and ultimately more effective manner.

Framing is relevant to communication at various scales; from the semantic e.g. referencing immigrants as ‘illegal’ versus ‘undocumented’ (see Merolla et al. 2013) or the use of different descriptions for fees e.g. ‘levy’ versus ‘tax’ or ‘surcharge’ versus ‘convenience fee’; to the framing of entire issues e.g. climate change may be framed as either an environmental issue, a public health issue or a national security issue (see Myers et al. 2012). Although framing has been used in health promotion campaigns and increasingly so in energy and water conservation initiatives (e.g. Berk et al. 1980), it has not been well studied in biodiversity conservation communications, and is largely absent from the literature.

Much advocacy, including within conservation biology, has traditionally used the knowledge-deficit model, which essentially assumes that people will adopt the targeted behaviour if they can be informed about that behaviour and why it is ‘better’. This can be problematic, as behaviour results from the interaction of numerous factors, notably a person’s values, attitudes and relevant social and personal norms, rather than resulting simply from rational thought (Ajzen 1991). There is a growing awareness that various factors that influence behaviour can be leveraged by social ‘nudges’ in order to promote public policy (e.g. Thaler and Sunstein 2008), including biodiversity conservation (Akerlof and Kennedy 2013). Many of these factors may also be leveraged by the strategic use of framing. By understanding framing effects in the context of biodiversity conservation, communicators and advocates may be able to strategically shape their messages for greater effect.

This thesis explores a number of aspects of framing, in the context of biodiversity conservation communication. Through this research, I seek to provide some insight into how framing techniques may be used to promote conservation attitudes, as well as investigating some contemporary trends in the framing of conservation policy. I begin here by introducing the concept of framing, categorising the different framing approaches and including an overview of its use in biological conservation. I will then outline the particular objectives of my research and provide an outline of the thesis structure.

## 1.1 An overview of framing

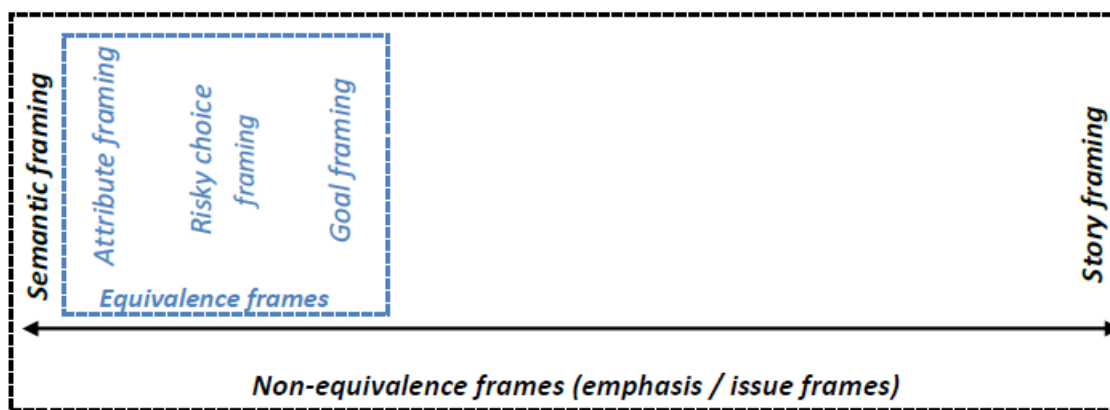
‘Framing’ is not a universal term and is used differently across disciplines (Cappella and Jamieson 1997; Druckman 2001). Generally speaking, to practise framing is to “select some aspects of a perceived reality and make them more salient in a communicating text” (Entman 1993, pp 52). However, framing is also used to refer to the way issues are conceptualised and has been used synonymously with the similar concepts of a ‘schema’, ‘script’, ‘package’, or ‘theme’ (Zhou and Moy 2007). That is, framing can also be the framework with which people understand the world and how they “locate, perceive, identify, and label” information and events (Goffman 1974, pp 21). Similarly, Gamson and Modigliani (1989), in relation to media discourse, consider a frame to be the central organising idea which makes sense of relevant events, and highlights what is at issue. According to Hallahan: “[f]raming puts information into a context and establishes frames of reference so people can evaluate information, comprehend meanings and take action” (Hallahan 1999, pp 224).

In some fields, the term ‘frame’ is used more broadly and intended to capture the process by which actors such as politicians, interest groups, community leaders and other ‘elites’ interact with news media to frame issues, and how this subsequently shapes opinion (Entman 1993). Much of the difficulty in defining framing comes from the conflation of distinct phenomena, to which the holistic use of the label ‘framing’ may be misleading (Druckman 2004; Levin, Schneider and Gaeth 1998; Fagley and Miller 1997). Notwithstanding this diversity of use, Fisher summarised things well when she stated that “a study of framing informs the study of how societies process information to generate meaning” (Fisher 1997 para 1.5).

It is possible to categorise various uses of the term ‘frame’. An initial distinction may be made between those frames that are “embedded in discourse” (or other communication) or frames that are “internal structures of the mind” (Kinder and Sanders 1990 pp74). Druckman (2001) re-casts these as ‘frames in communication’ and ‘frames in thought’. Frames in communication (herein ‘communication frames’) refer to those words, phrases or other elements of communication that a communicator uses when relaying information. That is, the frame relates to what the communicator is saying. For example, a politician who emphasises environmental issues when campaigning might be said to be using an ‘environmental frame’. In this vein, framing has been widely used in discourse analysis. In contrast to communication frames, frames in thought (herein ‘thought frames’) relate to what an individual is thinking. For example, a voter

concerned with environmental issues might respond positively to the communications made by the politician who uses the environmental frame. Communication frames and thought frames are inevitably intertwined, but where a communication frame influences a thought frame, this gives rise to a framing effect (Druckman 2001).

The alternative types of framing can be divided broadly into equivalence frames, and non-equivalence, with semantic and story frames at either end of a spectrum of frame complexity (see figure 1.1). In reality, messages will rarely consist of any single type of frame, but will almost inevitably be composed of a variety of different types of frame.



**Figure 1.1.** Schematic representation of the different types of strategic framing, and where they sit in relation to one another on a spectrum between semantic framing and story framing. Semantic framing refers to the use of alternative words and phrases to describe an aspect of reality, whereas story framing uses a more sophisticated narrative to do so, and may include semantic and other framing. The different types of equivalence frames are similar to semantic frames and located at that end of the spectrum. Emphasis/issue framing can be used in conjunction with framing at any scale from semantic to story framing and is generally used to create a particular context or theme (e.g. the claim “90% fat free” uses attribute framing (i.e. a type of equivalence frame) in conjunction with a health-oriented emphasis/issue frame).

## 1.2 Non-equivalence frames

The key non-equivalence frame identified by Druckman (2001) is emphasis framing, in which potentially relevant considerations may be emphasised such that a person will focus on these considerations when constructing their opinions. This is also often referred to as ‘issue framing’ which is the term that I will use here. This kind of framing can emerge in an ad hoc fashion or by the careful and strategic actions of high profile and influential communicators (generally referred to as ‘elites’) and/or the media (Entman 1993; Entman and Page 1994; Hallahan 1999). This is often undertaken in

order to serve certain interests; for example the proposed Australian Carbon Pollution Reduction Scheme of 2010 was championed by its proponents as an important environmental policy, but framed by its detractors as bad economic policy. Such issue frames may be present in a single communication or emerge as a recurring or dominant theme within a particular discourse.

Other non-equivalence frames include semantic frames and story frames (Hallahan 1999; Fig 1.1). Story framing is simply a more complicated way of seeking to influence an audience's attitudes and behaviours. In the context of promoting action on social and political issues, Entman (1993) suggests that the key functions of effective story frames are to define a problem, attribute blame for the problem, make a moral appeal to fix the problem, and to propose a solution. In contrast to story frames, semantic framing simply involves the replacement of one form of words for another form that is substantially similar or which achieves a similar purpose in the particular context, for example, in describing immigrants as 'illegal' versus 'undocumented' (Merolla et al. 2013). In this sense, semantic frames can appear to be similar to equivalent frames. However, owing to the imprecise nature of language, words and phrases often are not truly equivalent and can add subtle inferences, depending on the context. A contemporary example is the semantic considerations involved in the naming of driver assist modes in some cars; the label of 'autopilot' used by one manufacturer has been blamed for the death of a motorist who made the inference that the car was capable of driving itself. In contrast another manufacturer has chosen the label 'pro-pilot' (Hern 2016). Druckman (2001, pp 235) argues that emphasis (issue) frames influence people's preferences "because a substantively different consideration is brought to bear on the issue at hand". This seems equally applicable to all non-equivalent frames (i.e. emphasis/issue frames, semantic frames and story frames).

### 1.3 Equivalence frames

Equivalence frames can result in dramatically different reactions to objectively equivalent statements (Levin, Schneider and Gaeth 1998; Fig 1.1). These involve the use of different but logically equivalent words or phrases to alter a person's preference. A simple and common example is the presentation on food products of information about the fat content. For example, labelling minced beef as '75% lean' is objectively the same as labelling it '25% fat', but the former approach elicits more favourable perceptions than the latter (Levin 1987). The effects of this type of framing can be

strong and can influence not only purchasing decisions but even the taste experience of consumers (Levin and Gaeth 1988; Braun, Gaeth and Levin 1997). Equivalence frames are often also referred to as valence frames. The term ‘valence’ refers to the intrinsic attractiveness or aversiveness of an event, object or situation (Frijda 1986), and so a valence frame attempts to cast the same information in either a *positive* or *negative* light (Levin, Schneider and Gaeth 1998 pp 150). However, semantic framing can also be used to paint information in a positive or negative light, and thus, even though it is not necessarily logically equivalent, can be used to perform the same function and it would seem reasonable to include this within the realm of ‘valence framing’. As such, it might be better to think of ‘valence framing’ as a result rather than a method or typology of framing, in that many (perhaps all) types of frame can be used to generate a positive or negative valence with respect to a particular issue or object.

There are three distinct types of equivalence frames, for which the key property is that the alternative frames are ‘logically equivalent’ (Druckman 2004): risky-choice framing, attribute framing, and goal framing (Levin, Schneider and Gaeth 1998).

### Risky choice framing

The genesis of equivalence framing as a whole lies in the work of Kahneman and Tversky (1979), although it is now better recognised as one particular kind of equivalence frame. Their work demonstrated that people will make different decisions depending upon whether potential gains or potential losses of a situation are made more salient (Myers 2010). This understanding from Tversky and Kahneman’s empirically derived ‘prospect theory’, explains how people violate expected utility theory (Kahneman and Tversky 1979) and also change their decision preferences when possible outcomes are framed as either relative gains or relative losses. The key insight of prospect theory is that, while according to expected utility theory, the decision maker considers the final (objective) states of nature, prospect theory recognises that the decision maker considers the subjective values and subjective probabilities (Myers 2010). This has the outcome that when potential losses of a situation are made salient and a choice involves uncertainty, people will tend to be risk-seeking. On the other hand, where potential gains are made salient and the choice offers minimal uncertainty, people are generally risk averse (Myers 2010). Risk-seeking and risk-averse in this context refers to the willingness of the person to accept or to avoid risk, respectively. These kinds of framing effects have been observed in medical and clinical decisions, perceptual judgements, consumer choices, social dilemma responses, bargaining



behaviours, auditing evaluations and other situations (Levin, Schneider and Gaeth 1998). Despite the value of prospect theory in understanding these frame effects, it does not explain all framing effects (Myers 2010). It is worth noting that prospect theory is just one of many known cognitive biases.

Risky choice framing effects are categorised as those analogous to Kahneman and Tversky's (1984) well-known 'Asian disease problem' (Levin, Schneider and Gaeth 1998). In this famous experiment the researchers asked participants the following question:

*Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:*

*If Program A is adopted, 200 people will be saved. If Program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved. Which of the two programs would you favor? (Kahneman and Tversky 1984 pp 343).*

Despite the outcomes being identical (i.e. 200 people being saved), 72 percent of people chose option A. An equivalent follow up question reversed the 'framing' by focussing on deaths rather than lives saved. Despite equivalent outcomes between alternatives, the frame that presented the smaller number of deaths was preferred by 78 percent.

Studies that make use of this form typically involve the posing of a hypothetical decision scenario for which there are two choices: 1) a prospect without risk, and 2) a two-outcome all or nothing risky prospect with numerically specified probabilities (Levin, Schneider and Gaeth 1998). A positive message frame describes both prospects in terms of gains, and a negative message frame describes both prospects in terms of losses. The theory (backed by evidence) predicts that people are more likely to take risks when options focus attention on the chance to avoid losses than when options focus on the chance to realise gains (Levin, Schneider and Gaeth 1998).

Tversky and Kahneman (1981) use an insurance example to illustrate how the theory may be applied to promote a particular behaviour; an insurance policy that covers fire but not flood may be framed as 'a full protection against the specific risk of fire' or as 'a reduction in the overall probability of property loss' (Tversky and Kahneman 1981, pp 456). Prospect theory suggests that the insurance policy should appear more attractive

when described as an elimination of risk, than as a reduction of risk (though I note that insurance is actually about financial protection in the case of property loss and can do nothing to influence the actual likelihood of property loss itself). In turning its application to the promotion of pro-environmental or conservation attitudinal behaviour, risky-choice framing will be limited to those applications in which the framing of risk will induce the desired behaviour (either risk seeking or risk averse). A meta-analysis of risky-choice framing studies by Kuhberger (1998) found that this kind of framing is a reliable phenomenon with a small to moderate effect size.

### Attribute framing

Attribute framing involves only a single attribute within the context that is the subject of the framing manipulation (Levin, Schneider and Gaeth 1998). Rather than the decision maker being posed with a risky choice, they are simply presented with alternative descriptions of an attribute which is what results in the framing effect. The “75% lean” versus “25% fat” example discussed earlier is a typical and common example. Presuming that low fat is something that the target audience cares about, the decision maker (i.e. consumer) is more likely to have a positive view of the ‘lean’ emphasis framing of the same information. Many examples of attribute framing occur in the marketing of pre-packed foods. While this example may be appropriately described as an ‘attribute frame’ (i.e. one kind of equivalence frame), to alternatively represent the same product as being either “lean” or containing “fat”, is to create a corresponding set of semantic frames. It is easy to see here how semantic framing in conjunction with other frames is both inevitable and also non-trivial. For example, which of the following claims would best motivate people to buy the product? That it: (i) is lean; (ii) is low in fat; (iii) has little fat; or (iv) is not high in fat?

This demonstrates how different types of frames may co-occur. The alternative attribute frames provide equivalent factual information about a food product, but do so in a way that frames the product as a healthy choice. That is, the alternative attribute frames are both presented within a healthy choice ‘issue frame’ (this is also the case for the corresponding semantic frames). From an advertising perspective, the most carefully crafted attribute or semantic frame may be unhelpful if these are themselves presented within an issue frame that does not engage the intended audience. In the case of this hypothetical food product, it may be that consumers are more interested in taste than health. As such, an alternative issue frame that presents the product within a ‘tasty choice’ frame may be more effective. Such advertising may use a story frame to weave

this information together, e.g. “Twice as much taste than our competitor, with less than 10% fat”.

## Goal framing

Goal framing is directed toward “enhancing the evaluation of some situation or behaviour” such that a positive frame focuses attention on the potential benefit or gain and the negative frame focuses attention on the potential to prevent or avoid loss (Levin, Schneider and Gaeth 1998 pp 167). Although they did not recognise it as goal framing at the time, Meyerowitz and Chaiken’s (1987) well-known framing study concerning breast self-examination (BSE) provides a good example of goal framing. In that case, the positive frame states:

*“Research shows that women who do BSE have an increased chance of finding a tumor in the early, more treatable stages of the disease.”*

While the complementary negative frame states:

*“Research shows that women who do not BSE have a decreased chance of finding a tumor in the early, more treatable stages of the disease.”*

The study found that the negative frame stressing the negative consequences of not engaging in BSE was more effective at eliciting BSE behaviour. The question in goal framing is which frame will have the greater persuasive impact on achieving the same end result (Levin, Schneider and Gaeth 1998). This question may depend on the types of benefits/harms contemplated, the emotive strength of the language used and the personal relevance to each message receiver (Spence and Pidgeon 2010) as well as an appreciation for which attribute relevant to the behaviour is most likely to be of influence.

Meyerowitz and Chaiken’s study was originally conceived of and interpreted from the perspective of risky-choice framing and prospect theory. This was predicated on the basis that the advocated behaviour (breast self-examination) was the risky-choice because it carried the risk of finding a lump and that it was not preventative in nature, but was only to do with disease detection (Meyerowitz and Chaiken 1987). Because prospect theory predicts that people are risk averse when dealing with gains as in a positive frame and risk seeking with negative or ‘loss’ frames, then the negatively framed statement ought to be more persuasive, as it was found to be. On this basis, a negative frame ought to generally be more persuasive where the decision maker

perceives the advocated behaviour to carry some risk. However, this is not always the case and it is likely that there are cognitive influences other than prospect theory that influence decision making in these circumstances (Myers 2010; Levin, Schneider and Gaeth 1998). For example, goal-framing research by Morton et al. (2011) concerning pro-environmental behaviour related to climate change found that positive frames were more effective owing to their ability to enhance participants' sense of efficacy. Frames can also be effective at reaching some demographics and not others (see Van de Velde et al. 2010 and Grankvist, Dahlstrand and Biel 2004 for examples concerning pro-environmental behaviours related to goal and attribute framing, respectively).

Levin, Schneider and Gaeth (1998) identified that the kind of application of prospect theory to framing as used by the BSE example above was different to the risky-choice framing of Tversky and Kahneman and which gave rise to prospect theory. Many health related studies have used prospect theory to test and understand framing effects aimed at promoting health related behaviours, but this does not sufficiently explain the observed effects (Levin, Schneider and Gaeth 1998; Myers 2010). These kinds of applications should prove instructive to the design of pro-environmental behaviour related framing campaigns. It is also worth noting that in goal-framing both the positively and negatively framed messages promote the behaviour. In the BSE example above, both messages use attribute framing to 'sell' the benefit of undertaking the behaviour. In this sense there is a convergence between attribute and goal framing, as well as an interaction with prospect theory, although this may not always be significant or the dominant effect.

## 1.4 Frames are mixed

I've described above how attribute frames can at times be indistinguishable from semantic frames. If you consider that non-equivalence frames occur on a continuum between semantic frames and story frames, then it is possible to conceive of equivalence frames (with include attribute frames) as a particular category of frames that sit towards the semantic end of the continuum (figure 1.1). Although it is possible to distinguish between discrete types of framing, as I have sought to do, owing to the imprecise nature of language it is difficult in the real world to create such 'thoroughbred' examples of specific frame types. Certainly, in most real world cases, communications are going to contain multiple different frames. Even the examples given above inevitably incorporate degrees of semantic and story framing. Although not as elaborate as Entman's (1993) 'framing functions', these examples use a narrative to emphasize a particular view of

reality, with the differences between the alternative frames comprising semantic differences that also effect the narrative.

For a ubiquitous example, consider the food product claim “90% fat free” which seeks to paint the product in better light than “contains 10% fat”. This simple example provides an illustration of both logically equivalent framing and semantic framing (i.e. ‘fat’ versus ‘fat free’), as well as of issue framing (i.e. food as health). The issue frame arises from the receiver’s connection of the fat-related claim to the discourse on public health wherein high-fat foods have been labelled as problematic. This discourse has been framed by various actors, including news and other media, with actors often presenting information within frames that support vested interests. Hence a range of actors, influences, and types of framing will be at play in most situations.

Note that even in the carefully contrived example of Tversky and Kahneman’s Asian Disease problem outlined above, that although objectively equivalent, the alternative descriptions of either ‘200 people saved’ or ‘one-third probability that 600 people will be saved’ unavoidably introduces semantic differences that cannot easily be excluded as contributing to the observed framing effect.

## 1.5 Prospect for strategic use of framing

Irrespective of the category to which they belong, frames influence people’s preferences “because a substantively different consideration is brought to bear on the issue at hand” (Druckman 2001, pp 235). Because “framing puts information into a context and establishes frames of reference so people can evaluate information, comprehend meanings and take action” (Hallahan 1999, pp 224), the way an author frames information can influence the way that it is understood and acted upon by the audience. It stands to reason therefore that a strategic approach to the use of framing can help enhance the salience of a particular message. Such framing can be undertaken by shaping different aspects of a communication, for example situations, attributes, choices, actions, issues, responsibility and news can all be the subject of framing (Hallahan 1999). In order to begin to bring collective understanding of various framing research together, it is important to understand how the different uses and applications of previous framing research sit alongside each other, how they are similar, and where they differ. Despite the widespread reporting of framing effects, they often depend heavily on context, are complex and can be unreliable. Yet even semantic differences can never be assumed to be of no consequence. As such, it is not possible to choose to

communicate *without* a frame, and it is both naïve and futile to strive for some kind of objectively neutral frame in which to communicate information. Communicators cannot escape framing effects, but they can choose whether or not to use framing *strategically* to enhance their message.

Despite the varied and extensive study of framing across many research areas, there is no existing list of principles or rules of thumb to guide communicators who are interested in using strategic framing. This is a consequence of the varied use of ‘framing’ and related concepts across disciplines, as well as the context-specific nature within which frames tend to exert their influence. Notwithstanding this, the overarching goal of my research is to investigate how aspects of framing may be applied strategically to the communication of biodiversity conservation in order to more effectively connect with an audience.

## 1.6 Previous framing studies in biodiversity conservation

Although a variety of framing approaches have been used to investigate the efficacy of differently framed messages in a variety of environmental behaviour change contexts, very few exist in the context of biodiversity conservation. For example, the strategic framing of messages to drive behaviour change has been investigated in the context of energy consumption (e.g. van de Velde et al. 2010; Steinhorst, Klöckner and Matthies. 2015), recycling (e.g. Davis 1995; White, MacDonnell and Dahl 2011), climate change mitigation (e.g. Myers et al. 2012; Gifford and Comeau 2011; Morton et al. 2011; Spence and Pidgeon 2010) and the purchase of environmentally friendly products (e.g. Grankvist, Dahlstrand and Biel 2004; Tu, Kao and Tu 2013). This may be because most of this research is focussed on behaviour change, and thus requires a rather specific problem that is caused by identifiable behaviour that can be a target of the message. Biodiversity loss is caused by multitude human activities, only some of which are specifically attributable to individual behaviour and suitable for specific behavioural campaigns that promote people to, for example, buy product x instead of product y, or donate to this conservation charity, or to not take a certain fish species, etc. Other potential targets for biodiversity conservation communication and advocacy include providing information and influencing attitudes over time or generating public support for government (or other) conservation action. Such communications are likely to be enhanced by a strategic approach to their framing.

Very few studies have directly tested the efficacy of differently framed messages in the context of biodiversity conservation. Gregory, Lichtenstein and MacGregor (1993) demonstrated that loss/gain framing operated according to prospect theory in the context of environmental policy (although not specifically biodiversity conservation). By framing policy alternatives as either a restored environmental health gain (relative to a previously experienced loss) or alternatively as an environmental health gain compared to the status quo, they showed that changes in reference points can alter how people evaluate policy options. This demonstrates that prospect theory is applicable in these contexts which are arguably more complex than many previous applications. This not only has applications for strategic message framing, but is also relevant to the communication of policy options more broadly. In a somewhat similar vein, Wilson and Bruskotter (2009) examined how emphasising the past success or failure of previous wolf restoration efforts influenced future attitudes toward wolf restoration. Although provision of information about failed restoration resulted in more negative attitudes to wolf restoration, this did not influence voting or donation behaviour.

It is interesting to note that the restored loss versus new gain investigation of Gregory, Lichtenstein and MacGregor (1993) involves what are substantially ‘equivalence frames’, although their reliance on written language introduces numerous semantic elements. It is also tempting to consider the wolf restoration example of Wilson and Bruskotter (2009) as a positive versus negative framing, however this application involves semantic elements as well as the idea of success and failure as issues. This illustrates that ‘real world’ examples of framing, or at least those that are likely to be relevant to biodiversity conservation and policy contexts, are unlikely ever to be able to be described solely in terms of semantic, equivalence or issue frames, but are likely to be composed of elements of multiple types of frame.

A further example of empirical testing of alternative frames in a biodiversity context is provided by McComas et al. (2015). The authors tested alternatively framed messages about a fictitious oyster bacteria framed either as a public health issue or as an oyster health issue, caused by either ‘climate change’ or ‘global warming’. They found that the public health frame was more effective at eliciting support for marine policy and that participants with lower environmental values were more supportive of marine policy when exposed to the climate change/oyster health frame combination. This is consistent with previous research that has shown public health issue frames to be effective at increasing support for mitigating climate change (e.g. Myers et al. 2012). This study

also highlights how alternative words and terms can influence the way people respond to information, even in the case of apparent synonyms such as ‘climate change’ versus ‘global warming’ (McComas et al. 2015).

These were all the examples I could find in the literature of empirical tests of alternative biodiversity conservation frames given a thorough search. However, such research can be difficult to find, given that the term ‘framing’ is not universal. However, it is clear that there are comparatively few such studies.

The most common kind of framing research reported within biodiversity conservation is that which uses framing as a tool for understanding relevant discourse or concepts. Like empirically tested alternatively framed messages, this information can also help guide the strategic framing of communications for greater effect; it is important to be aware of the role that discourse can have in shaping a community’s perception and attitudes (e.g. Fairclough 1992). A particularly strategically attuned example is that of Apostolopoulou and Adams (2015) who considered the influence of biodiversity offsetting policies on the politics of biodiversity loss. Because offsetting policy re-frames nature as units of biodiversity that are easily measured and exchanged, by presenting this as a technical issue, the problem of biodiversity loss is de-politicised. They argue that this inhibits the possibility of opposing and challenging the ongoing biodiversity loss that is inherent in the policy. Analysis such as this is useful in contemplating how particular frames may arise unintentionally from policy and discourse, and for conservation advocates to foresee the potential for such frames to ultimately be counter-productive, or to provide guidance on effective ways to engage with such frames once they have become established.

There are also a number of studies in the literature that examine the frames with which key conservation stakeholders and actors view the world. Although they do not directly test the efficacy of alternative frames, these kinds of analyses are important for understanding how messages might best be framed to engage or influence key actors or a target audience. For example Wilhelm-Rechmann and Cowling (2011) investigated how biodiversity and similar issues were understood by government decision makers in South Africa. In that context they discovered that ‘conservation’ was typically regarded as a socially unjust endeavour because it was seen to oppose socio-economic development. This meant that conservation messages tended to generate opposition or be ignored. Analysis such as this provides valuable information to inform the strategic re-framing of not only individual messages within a particular context, but also of an



entire policy approach. For example, Tacaks (1996) analyses how conservation elites have influenced conservation discourse and policy, in part by contesting established frames. Similar examples have examined the different frames held by stakeholders about conservation or natural resource management problems influences attitudes and behaviours and which can lead to conflicting goals or policy preferences (e.g. Dewulf, Craps and Dercon 2004; Fischer and Bliss 2009). Such research is complemented by analyses that examine how conservation issues are framed in the media (e.g. Arvai and Mascarenhas 2001), including specifically how this relates to matters of trust (e.g. Dikou and Dionysopoulou 2011) and human-wildlife conflict (e.g. Jacobson et al. 2012; Bhatia et al. 2013; Muter et al. 2013). Although these examples provide a good basis to inform strategically framed communication strategies, it is unclear how often this happens, and how effective any attempts to do this are. Park and Kleinschmit (2016) investigated the roles that forest conservation stakeholders play in framing forest conservation issues within media reports and found that conservation actors do not seek to strategically re-frame forest conservation issues once they are established by journalists. This suggests that there is an opportunity here for conservation advocates to engage more strategically in influencing the framing process.

For communicators to best make use of strategic framing within their messages, they need to understand how their intended audience will likely respond to differently framed information. This includes all types of framing, whether it be semantic framing, equivalence framing or issue framing. However, there is no comprehensive treatment of this in the literature. Rather, previous framing research tends to approach particular issues or cases with specific frames in mind, regardless of whether or not it uses the term 'framing', and irrespective of the subject matter to which it relates. This may be in terms of whether messages framed in terms of 'hope' versus 'fear' are more effective, or losses versus gains, or framed as a health versus security issue (or some other issue). Certainly there is no cohesive framework or guidance that considers how the different types of framing interact or may best be used to create effective messages. Some useful efforts towards this have been attempted. For example Lakoff (2010) provides a useful introduction to the way in which frames are inherent in all communication, and provides a few rules of thumb to aid environmental communication. However, these are largely indistinguishable from oft-given advice for good communication, such as to talk about values, tell stories rather than listing facts, and to relate the message to the concerns of your audience, providing little guidance on the strategic framing of conservation issues.

The most comprehensive strategic analysis of frames in biodiversity conservation sits within the grey literature. Blackmore et al. (2013) analyse the communication and advocacy material of thirteen conservation organisations across the United Kingdom, principally on the basis of whether the appeals are framed as extrinsic (i.e. appealing to self-interest) or intrinsic (i.e. highlighting the intrinsic values of nature). The authors found that the organisations used extrinsic appeals more often than intrinsic appeals. Blackmore et al. (2013) also provide a range of communication recommendations, including avoiding making appeals that are rooted in self-interest. This echoes the work of Maio et al. (2009) which demonstrates that the engagement of one type of value can suppress opposing values. This is the basis of the mission of the Common Cause Foundation (<http://valuesandframes.org>) which works across public and private sectors to promote values that they consider will best support community, environment and equality across cultural, political and civic institutions. However their vision is one of generally transforming society, rather than of strategic framing for greatest contemporary effects. Perhaps the best ‘practical guide’ to message framing for communicators is that of Hine et al. (2014) which also draws on relevant literature to provide easy to follow guidance for the framing of messages designed to influence behaviours as they relate to invasive pest management. Hine et al. (2014) echo Blackmore et al. (2013) and recommend that appeals be limited to intrinsic values only, and specifically recommend that the mention of extrinsic values be avoided. On the other hand, Metz and Weigel (2013) specifically encourage the linking of conservation to extrinsic benefits in their recommendations on “how to communicate effectively to build support for conservation” (pp 1) for The Nature Conservancy. Based on polling of US voters Metz and Weigel (2013) provide a list of issue frames anticipated to be effective at promoting conservation to the public, as well as a list of issue frames to be avoided. The marketing group Futerra (2015) also provide some guidance on how to apply a marketing approach to promote the concept of biodiversity conservation. Said to be drawn from the psychology literature, Futerra’s advice provides a simple guide for conservation communicators, although this seems to be chiefly aimed at encouraging charitable donations. Like Metz and Weigel, Futerra suggests using extrinsic appeals that relate to the economic value of biodiversity, but caution how it is used, noting its capacity to undermine the argument in some cases.

Thus, between these few documents aimed at would-be strategic framing communicators, there is a spectrum of recommendations on the use of extrinsic motivations, ranging from ‘deliberately use these’ to ‘use these wisely’ to ‘don’t even

mention these'. This typifies the lack of clear guidance within the literature on how the framing of conservation messages ought to be undertaken for greatest effect. Hine et al. (2014) direct communicators to the use of other social phenomena such as social norms that may be a useful mechanism for strategic framing that, while considered in the more recent (and related) arena of 'social nudges' (e.g. Thaler and Sunstein 2008), has generally not been considered within the framing literature.

## 1.7 Thesis outline

The aim of this research is to begin to develop an understanding of how framing concepts may be used strategically to improve the effectiveness of biodiversity conservation messages. Although framing has received a lot of attention across a range of disciplines, as outlined above, there is very little application of it to biodiversity conservation and little guidance as to how the variety of framing approaches could be used strategically to enhance communication effectiveness. To begin building an understanding of the use of framing in the context of biodiversity conservation, my first research goal is to undertake empirical testing of alternatively framed conservation-related messages. It is perhaps unsurprising that equivalence frames have not been applied to conservation contexts, particularly given that these tend to require highly specific settings that involve a choice between alternatives or are intended to promote a specific behaviour. To apply and examine such equivalence frames in the context of conservation would add little in this area, given that that prospect theory upon which these types of frames chiefly rely is well understood. Instead I seek to test novel issue frames (i.e. non-equivalence frames) that are highly applicable to biodiversity conservation communication. The first such investigation involves testing the effect of the alternative frames on attitudes to a government policy in a conservation context, via a series of online surveys, and is reported in Chapter 2. This research also considers the effect of semantic framing in the operationalisation of the alternative concepts.

Thinking strategically about the influence of framing on a message not only concerns techniques for enhancing messages, but also avoiding framing effects that may be unhelpful. As such, and noting the increasing prominence of framing the rationale for conservation in terms of 'ecosystem services' (i.e. an issue frame in which nature provides the goods and services necessary to human survival), I next investigate how this influences the way in which people think about and value nature, also using a series of online surveys. This research, reported in Chapter 3, links ecosystem service framing

with the motivational crowding literature and engages with discussion of the relative merits and perils of extrinsic appeals identified in the existing conservation communication guidance identified above.

I am also interested in understanding the degree to which framing is strategically considered by conservation communicators. Using content analysis, I examine the degree to which the websites of key Australian private land conservation organisations strategically frame the benefits of participation in their conservation schemes when trying to engage prospective landholder participants. I do this using a value-orientation framework to analyse how the benefits of program participation are framed, categorising these as either benefits to landholders, to society or to the environment. Each way of framing the participation benefits can be considered as alternative issue frames, each corresponding to one of three value orientations that people are known to hold, and which can influence pro-environmental behaviours. In order to be relevant and engaging to as broad a range of landholders as possible, all three kinds of benefits should be well represented. However, a large predominance or minority of any of the three benefits types may indicate a lack of strategy in the way benefits are framed within these communications, and certainly will provide valuable insight. This research is reported in Chapter 4.

Understanding how the framing of public conservation policy discourse has changed over time can provide insight into how policy makers think about these issues and how it may influence the thinking of the public. In Chapter 5 I examine the degree to which an ecosystem services frame is used (explicitly or implicitly) to explain or justify environmental policy, and how this has changed over the past ten years. I also examine how use of the term ‘biodiversity’ and presence of economic language has changed over the same period. This is investigated by way of key-word search and discourse analysis of media releases from the Australian Government environment portfolio and the Australian Conservation Foundation.

In order to provide useful guidance on how framing concepts could be strategically used to enhance conservation communications, I draw together the key lessons from the research reported herein with key understandings from the existing literature in Chapter 6. This chapter serves as a general discussion for the thesis, and is presented in the form of an overview research article aimed at empowering communicators to engage with and begin to make strategic use of key framing concepts to enhance their conservation communications.

Lastly, Chapter 7 reiterates the key findings of this research, including implications for conservation messaging, and important areas for future research.



# 2 HOW SHOULD PRIVATE PROPERTY RIGHTS BE FRAMED IN THE PROMOTION OF PRIVATE LAND CONSERVATION?

This chapter is an edited version of the submitted paper:

Kusmanoff AM, Fidler F, Gordon A, Bekessy SA. (In Prep). How should private property rights be framed in the promotion of private land conservation?

## Abstract

It is well established that the way in which information is presented and framed can significantly affect how people understand and respond to this information. This means the strategic framing of messages can improve the effectiveness of information campaigns; a fact well utilised in health promotion. However, there has been little research on effective ways of framing information to promote biodiversity conservation. Here, I present the results of three online surveys that explore how alternative conceptualisations of property ownership can influence attitudes towards an urban conservation program. I find that the alternative conceptualisations of property rights offered no framing advantage, but that a beneficial framing effect can arise from use of

these concepts in conjunction with semantic framing and cognitive biases. The results suggest that communications that strategically use property concepts to minimise landholders' sense of interference with their property rights, could offer an advantage compared to communications that are not strategically framed. Given that conservation on private land is both very important for achieving conservation outcomes, and requires the prioritising of conservation actions by landholders over their own property, this research may inform more effective approaches for communications that promote private land conservation.

## 2.1 Introduction

It is widely recognised that the traditional protected area system is insufficient for the conservation of biological diversity at a global scale (Rodrigues et al. 2004; Gallo et al. 2009). In part this is due to the large proportion of threatened species and ecosystems that occur only on private property (Cooke et al. 2012), and various schemes for private land conservation (PLC) have been increasingly utilised over recent decades as a means of implementing conservation beyond the public protected area network (Cooke et al. 2012). Internationally, PLC is implemented through a range of instruments, including direct payments, tax incentives, cap and trade markets, voluntary markets, auctions and certification programs (Pascual and Perrings 2007; Yang et al. 2010; Pirard 2012). Conservation on private land is essential if real gains in protecting threatened vegetation and wildlife communities are to be made (Gallo et al. 2009), including within urban and peri-urban landscapes (Goddard, Dougill and Benton 2010).

Although much research seeks to understand what drives participation in PLC programs (e.g. Ervin and Ervin 1982; Lynne, Shonkwiler and Rola 1988; Adesina and Zinnah 1993; Negatu and Parikh 1999; Greiner, Patterson and Miller 2009; Moon and Cocklin 2011), questions remain regarding best approaches to maximising both participation and conservation gains that result from participation. Ultimately this is a question of human behaviour (Brechtin et al. 2002; Bennet and Roth 2015) as all PLC programs deal with private landholders and seek to change the way they use their land. Different schemes will appeal differently to landholders depending on the landholder's interests, values and circumstances.

Some PLC programs offer landholders no direct rewards or incentives, but through outreach support interested landholders to engage in conservation practices, and to also promote the community and landholder co-benefits of undertaking conservation



practices on their own land, largely in conjunction with their regular income generating activities (e.g. Landcare Australia International, [www.alci.com.au](http://www.alci.com.au)). In contrast, incentive schemes often involve payments or other financial inducements (including various market-based approaches) to incentivize landholders to manage parts of their land for conservation, often in place of traditional income generation (i.e. grazing, cropping, etc.) (e.g. BushTender, [www.depi.vic.gov.au](http://www.depi.vic.gov.au); Ferraro and Kiss 2002). Another approach involves creating enforceable restrictions on land use (i.e. easements or covenants) which prohibit vegetation clearing, stocking, cropping and other uses (e.g. Kabii and Horwitz 2006). Although entered into voluntarily by a landholder, these are enforceable against later title holders. Alongside these opt-in schemes, most Western countries have top-down regulations that impose some restrictions on the permitted uses of private land, centred on preserving habitat for threatened species or regulating vegetation clearing (Cooke et al. 2012).

### Property rights and framing

It is well established that the way information is presented and framed can significantly affect the way people understand and respond to that information (e.g. Harris 1973; Tversky and Kahneman 1981; Gamson and Modiglian 1989; Entman 1993). The term ‘framing’ is used to refer to the way an issue is described, or the way in which a problem is conceived, articulated or packaged with other contextual information. Framing theory has been used to understand communication and related behaviour in a wide range of disciplines including psychology, speech communication, organisational decision making, economics, health communication, media studies and political science (Hallahan 1999). Because the way something is framed can emphasise certain aspects, while minimising others (Entman 1993; Myers et al. 2012), much research has focussed on the effects on attitudes and behaviours from describing the same objective information in either a positive or negative light (often referred to as ‘valence framing’). Much of this research has assumed that Kahneman and Tversky’s (1979) ‘prospect theory’, one particular cognitive bias which in part suggests that losses may be more salient than equivalent gains, drives a choice preference despite the objective equivalence of two ways of framing the same information (Levin, Schneider and Gaeth 1998). However it is reasonable to expect that other cognitive biases may also generate choice preferences when activated by alternatively framed yet objectively equivalent information. Semantic framing has been shown to influence attitudes that result from describing, for example, immigrants as ‘illegal’ versus ‘undocumented’ (Merolla et al.

2013) or people as “tall” versus “short” (Rugg 1941) or as something that occurs “frequently” versus “occasionally” (Harris 1973). However, framing can also be used to articulate whole issues, for example describing climate change as a public health issue or alternatively as a national security problem (Myers et al. 2012), amongst many others; these are often referred to as ‘issue frames’ or ‘emphasis frames’ (Hallahan 1999; Druckman 2001).

Property rights can be conceived of in two different ways: the ‘bundle-of-rights’ paradigm and ‘discrete asset’ paradigm. The ‘discrete asset’ paradigm is generally what is understood by the layperson (Nash 2009) and which emphasises the ‘thing’ aspect of property over which the owner has dominion (Nash and Stern 2009). For example, the thought-logic may be thus: ‘I own this car, and it is mine to use as I like’. In contrast, the ‘bundle-of-rights’ paradigm represents the legal theoretical approach in which property rights are simply a bundle of separate rights, for example a right to occupy, use, sell, or exclude others from property in some way (Alchian and Demsetz 1973; Nash and Stern 2009). In the example of the car, the typical owner enjoys dominion because they usually hold these separate rights in their ‘bundle’. However the bundle may be separated; it is possible for one person to hold the rights of disposal for the car (i.e. they can sell it to another party) whilst another holds the right to use and operate the car. This applies also to land and realty; for example when an owner rents their house or office etc. to a tenant, the owner assigns the right to occupy the house or office to that tenant. The landlord retains ownership, but does not have the right to occupy the house or office while the lease remains in place.

In this conceptualisation, having a legal interest in a property is simply possessing one or more ‘rights’. A conservation covenant thereby involves a landholder giving up certain land use rights to that part of their land over which the covenant is placed and this right is thereafter held by the state (or other authority), which exercises this use right for the purpose of conservation (e.g. The Nature Conservancy, [www.nature.org](http://www.nature.org)). This does not involve the giving up of all of the landholders use rights, and neither does it change the ownership of the land that is subject to the covenant; it simply modifies how the landholder’s use rights may be exercised over the land that is subject to the covenant.

The alternative property paradigms can be considered as alternative emphasis frames, though the effects of such property frames on attitudes have not been widely studied. Nash (2009) and Nash and Stern (2009) demonstrated that by describing the prospective

purchase of laptop computers to students in either of the alternative property frames, they could alter the perceptions, attitudes and reactions of participants. In that case the bundle-of-rights framing was found to induce a more favourable response to the prospect of a later restriction of use rights over the laptop (i.e. a top-down curtailing of the rights inherent in the laptop ‘ownership’), compared to the discrete asset frame.

This capacity for the bundle-of-rights frames to influence attitudes about one’s own property and reactions to limitations in use of that property may have value to the private land conservation sector. PLC schemes are essentially appealing to landholders to sacrifice some of their property rights (e.g. conservation covenants and easements), their potential income (e.g. opportunity cost), or labour and other resources in favour of what is essentially a public good (biodiversity; Ferraro and Kiss 2002). In addition, top-down regulatory measures often effectively extinguish certain private property rights, for example by prohibiting the clearing of certain vegetation, and landholders are typically not compensated for this loss (e.g. in Australia government buy-backs of water licences and fishing rights involve compensation, but loss of rights to clear remnant vegetation typically do not). Conservation covenants (or easements) are voluntary agreements between a landholder and a conservation organisation in which the landholder permanently revokes aspects of their property rights over their land (or part thereof), in order to protect the biodiversity or other conservation values. Although a conservation covenant (or easement) is one of the few PLC mechanisms in which the property rights of a landholder are permanently restricted for the benefit of conservation, arguably all PLC programs implicitly conceive of a ‘bundle-of-rights’ approach to property rights by their assertion of public interest (i.e. in conservation) over the privately owned land (i.e. that the public interest of conservation should curtail aspects of the individual rights held in the bundle, but not in a way that interferes with the landholder’s ownership *per se*). However, the layperson generally understands property in the discrete asset terms (Nash 2009).

I was therefore interested in exploring whether the bundle-of-rights framing of property rights could be advantageous to promoting PLC. Here I build on work by Nash and Stern (2009) and test the effect on attitudes of residents concerning a proposal to limit the rights of property owners. Similar to Nash and Stern’s ‘forewarning’ example, I investigate whether alternative property frames could influence the attitudes of home owners and residents toward a nature conservation-related property restriction. If the

property frames can influence this attitude, then they may offer a useful approach to enhancing the effectiveness of some PLC communications.

To investigate this I undertook three separate studies, all via an online web survey. Given that urban areas are important for conservation (Goddard, Dougill and Benton 2010) but often overlooked as a target for private land conservation programs, I used an urban context for this research. Urban residents are also more easily accessible through online recruitment. Although this research looks specifically at the framing of property concepts, it is worth noting that framing in general has not been well studied in biodiversity conservation communications, and there appears to be little strategy employed in the framing of private land conservation messaging (Kusmanoff et al. 2016). I conclude by discussing the potential for message framing to be used strategically to improve conservation advocacy.

## 2.2 Methods

I conducted three studies to investigate the role of property framing in influencing attitudes of home-owners and residents in Australia concerning the degree to which they would accept a conservation-related property restriction. This consisted of two different studies (study 1 and 2a), and a repetition of the second study with an alternative recruitment method (study 2b). This research was conducted according to the National Statement on Ethical Conduct in Human Research and approved by the RMIT University College of Design and Social Context Human Ethics Advisory Network (17091-01/14 and 19479-06/15, Appendix A). The preliminary information provided to participants is available at Appendix B. All studies involved participants providing demographic information and information about attitudes concerning their preference for collective versus individual rights (herein referred to as ‘utilitarianism’) and their attitudes to the strength of property rights (herein referred to as ‘property rights strength’).

Study 1 asked participants to choose between two policy options for the regulation of trees on private land. The policy options were framed alternatively in the discrete asset and bundle-of-rights paradigms, but each described the same objective policy, and thereby investigated the extent to which either paradigm resulted in a choice preference. Here, the alternative options used a combination of semantic framing (i.e. different language) to describe the same objective policy in a way that emphasised a) the discrete

asset frame, and b) the bundle-of-rights frame. The wordings of the alternative options are provided below, and the complete surveys are provided in Appendix C.

In study 2a and 2b participants were randomly assigned to one of two framing conditions. All study 2 participants read a legalese statement of a hypothetical regulation to limit how trees may be dealt with on private land. Participants were provided with explanatory information framed in either the discrete asset paradigm or the bundle-of-rights paradigm. Participants then indicated their degree of acceptance of the hypothetical regulation (see ‘acceptance measure’ below). Although the alternative policy descriptions necessarily used different language, the language was carefully chosen not to create any obviously discernible valence between the alternatives (see ‘Construction of the frames’ below). This allowed me to test the influence of the alternative property paradigms in their own right, without any combined effect due to semantic framing. In addition, this scenario in which a regulation (or other conservation action) is described in terms of either property frame is a more realistic example for ‘real world’ use than as a choice between alternatively framed options, as tested in study 1 (refer to Appendix C for the exact wording).

### Participant recruitment

In the interest of enlisting as many participants as possible, both studies were undertaken via a web-based survey instrument, hosted by Qualtrics ([www.qualtrics.com](http://www.qualtrics.com)), and using a hypothetical regulation applicable across Australian (and other Western nations) urban regions. For both studies, participants were first asked to provide basic demographic information, such as age, education and occupation, as well as whether they had ever owned property and if their current home had a yard. A composite method for recruiting participants that combined both convenience and snowball sampling was used. This involved using email and social media to send invitations to undertake the survey to my own network, both personal and professional, as well as requesting those recipients to forward the request to their own networks. Because the results of study 2a suggested a ceiling effect (indicated by high ‘acceptance’ of the proposed regulation across the sample), this study was repeated using an alternative recruitment method (see study 2b). For the repeated study (2b), I engaged a professional social research company to provide a broad sample of participants drawn from across Australia that were incentivized for their participation. This ensured that the participants were not self-selected on the basis of topic interest or

altruism, and that they represented a range of ages and locations. This enabled me to verify that the results obtained in study 2a were reliable and not an artefact of the recruitment method.

### Measuring property rights and utilitarianism

I hypothesised that attitudes towards utilitarianism and property rights would influence the choice preference in each of the studies. To measure these attitudes, respondents were asked to indicate on a 7 point Likert-scale the degree to which they agreed or disagreed with the following statements:

- It is sometimes necessary to limit personal freedoms for the benefit of society as a whole; and
- I should be able to do whatever I like with my own property, so long as I don't harm anyone.

Responses to these questions were used to investigate a number of correlations within the data (see 'correlations' section of the results) and are herein referred to 'utilitarianism' and 'property rights strength', respectively. The order in which the two questions were presented to respondents was counterbalanced (i.e. alternated) in order to minimise order effects (Schuman and Presser 1981).

### Study 1

Participants were asked to select their preference between two alternative hypothetical approaches to regulating removal of native trees, based on the brief descriptions recreated below:

*Please imagine that you are a property owner and that your local government plans to regulate the removal of trees. Imagine that the two following options are being considered:*

*Option A would modify private property rights by taking away the right of property owners to freely manage their own land through prohibiting the removal of native trees greater than 2 metres in height, other than with a permit.*

How should private property rights be framed in the promotion of private land conservation?

*Option B would not change private property rights other than to require a permit before property owners may remove native trees greater than 2 metres in height.*

*Based only on this information, which option would you prefer?*

Both options describe the same regulation, but in different frames. Option A is framed in the discrete asset concept, wherein ownership is all-encompassing and interference with the associated rights implicitly threatens that ownership. Option B is framed in the bundle-of-rights paradigm in which ‘ownership’ is bestowed by a number of separate and severable rights, and that should one of these be interfered with, it need not threaten the ownership as a whole. Participants were then asked to indicate on a 5-point Likert scale the degree to which they were confident that their choice was the better alternative, in which a value of 1 indicated ‘not at all confident’ and a value of 5 indicated ‘very highly confident’ (herein referred to as ‘sureness’). The full survey is provided in Appendix C.

#### Study 2a and 2b

This investigation was undertaken using an ‘independent groups design’ wherein respondents were randomly assigned to one of two groups: the ‘discrete asset frame’ group, or the ‘bundle-of-rights frame’ group. Respondents were first asked to imagine that the local council proposed to introduce the following regulation:

*Unless in accordance with a permit, a person must not remove, damage, kill or destroy a Valuable Tree. A Valuable Tree is a native tree greater than 2 metres in height.*

This is similar to ‘significant tree’ regulations already been introduced by many local government areas across Australia, but modified here to provide added and specific protection to ‘native trees’ for the purposes of biodiversity conservation. The hypothetical regulation would apply to many trees, owing to the 2 metre height threshold; this was intentional to ensure significant likelihood that the homes of many respondents would be affected by the regulation. After reading this ‘legalese’ version of the hypothetical regulation, respondents were told that in order to help explain the proposed regulation, the local government had provided further information. At this point, the ‘discrete asset frame’ group received information that explained the regulation framed in that frame, and the ‘bundle-of-rights frame’ group received information framed in that frame (see Appendix C for the text used).

Respondents were then asked a number of questions about their attitudes to the policy, in order to measure their degree of ‘acceptance’ of the policy (this scale is described in further detail below). I hypothesised that respondents who were given the explanatory information framed in the bundle-of-rights paradigm would report greater ‘acceptance’ of the hypothetical regulation.

### Acceptance measure

The acceptance measure comprised three questions designed to measure attitudes related to separate aspects of acceptance of the hypothetical regulation. Respondents were asked to indicate on a 7 point Likert scale (with the same labels as that used to measure utilitarian and property strength rights attitudes) the degree to which they agreed with the statements: “I think this policy is fair”; “I would comply with this policy”; and “I would protest this policy”. Each response option on the Likert scale was given a numerical value which allowed scores to be added (with the protest question reverse-scored) to generate a scale of acceptance that ranged from 3 to 21. Although the statements about compliance and protest may seem to be alternative ways of answering the same question, there is a distinction between mere non-compliance and active protest, and this allows stronger negative feelings to be registered. This also allows evaluation of the internal consistency of the acceptance scale, by calculating Cronbach’s alpha (Cronbach 1951), which is the most widely used objective measure of reliability for social surveys (Tavakol and Dennick 2011). This measure relates to particular responses to the scale used, and should thus be measured each time data is collected via any scale, even where the scale is widely used and accepted as reliable. Cronbach’s alpha is obtained by correlating the score for each question on the scale with the total score for each participant and comparing that to the variance for all individual item scores (University of Virginia Library 2016). This gives an indication of the degree to which the items measure the same concept, and the higher the score (between 0 and 1), the greater the consistency and thus the reliability (Tavakol and Dennick 2011). Although these attitudes are measured as a predictor of behaviour, they cannot be considered determinative of behaviour, as behaviour is also heavily influenced by a range of other factors (Heberlein 2012). Nonetheless, attitudes are important influencers of behaviour (Ajzen and Madden 1986; Ajzen 1991) and the correlation between attitudes and behaviour is stronger where attitudes relate to a specific behaviour and where participants are asked if they plan to carry-out the specific behaviour (St John, Edwards-Jones and Jones 2011).



## Construction of the frames

In order to operationalize the alternative property paradigms in study 2, the frames for each were written so as to emphasise those aspects of each paradigm that are key to that paradigm's world view. As such, the discrete asset frame sought to focus on the property itself as a whole, and with an emphasis upon the owner's dominion over the asset, such that there is the implication that any trespass upon the dominion (even a relatively minor one) is a threat to that ownership. In contrast, the bundle-of-rights frame sought to emphasise that property rights are actually about relationships between people, about property, and which gives rise to numerous discrete and severable rights. The implication is that a minor trespass need not be a threat to the broader ownership or the rights that this entails. The frames intentionally did not provide any contextual or advocacy material to promote the merits of the regulation. The full surveys are provided in Appendix C.

## Correlations

Correlation between several parameters of interest across both studies were investigated. Because data was collected via Likert scales, non-parametric statistical methods were required, and Spearman's Rank Order Correlation ( $\rho$ ) was used in both studies to measure correlation. The summary effect size (including 95% confidence intervals) of the correlations for all three datasets was also calculated. This involved converting the correlation between each pair of variables tested ( $\rho$ ) to Fisher's  $z$ , for each data set, and then calculating the summary Fisher's  $z$  for each pair of variables (Borenstein et al. 2009). The summary Fisher's  $z$  for each pair of variables is the average of the Fisher  $z$  for that pair of variables across the three data sets, weighted by the number of participants (Field 2001). These values were then transformed back into Spearman's Rank Order Correlation for comparison with the other correlation data, presented in Table 2.2.

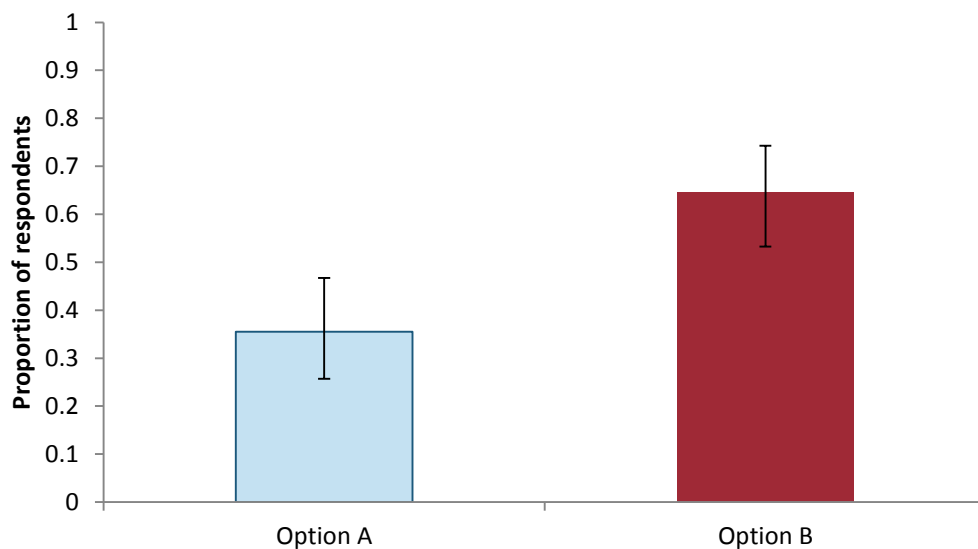
## 2.3 Results

### Study 1

The resulting participants from the snowball sampling comprised a non-random sample of 76 women and men aged between 29 to 70 years ( $M = 41.2$  years,  $SD = 13.9$ ). Of the participants, 41 (55.4%) were female and 33 (44.6%) were male, and two participants declined to indicate their gender. Of the participants, 40 (53.3%) either currently owned,

or had previously owned property, and 53 (77.9%) currently lived in a home with a yard.

The choice of approaches showed a strong framing effect in favour of the ‘bundle-of-rights’ description of the hypothetical regulation, with 49 respondents (64%) choosing option B (bundle-of-rights frame), and 27 (36%) choosing option A (discrete asset frame) (figure 2.1). When asked how confident they were that their choice was the better alternative, irrespective of their choice, respondents reported a mean sureness value of 2.5 ( $SD = 1.19$ ); a value close to ‘reasonably confident’. For those who chose option A, the mean sureness was greater at 2.78 ( $SD = 1.19$ ) than those who chose option B at 2.39 ( $SD = 1.19$ ), although this difference is not statistically significant.



**Figure 2.1.** Proportion of respondents who preferred the discrete asset framed description of the policy (Option A) and the bundle-of-rights framed description (Option B) ( $n=76$ ). Error bars represent 95% confidence intervals.

### Study 2a and 2b

Respondents were non-random convenience samples of 203 women and men aged between 22 and 70 years ( $M = 38.4$  years,  $SD = 11.0$ ) (study 2a) and 218 women and men aged between 19 and 90 years ( $M = 48.5$ ,  $SD = 18.0$ ) (study 2b). A summary of the demographic information for the participants of both study 2a and study 2b are provided in Table 2.1.

**Table 2.1.** Summary of descriptive statistics for study 2a and 2b.

	<b>Study 2a</b>	<b>Study 2b</b>
Total respondents	203	218
Age range	22 to 70 years	19 to 90 years
Mean age	38.4 years (SD = 11)	48.5 years (SD = 18)
Female	126 (62%)	122 (56%)
Male	77 (38%)	96 (44%)
Owned current home	100 (49%)	136 (62%)
Owned or previously owned property	122 (60%)	169 (78%)
Never owned property	81 (40%)	49 (23%)
Current home had a yard	161 (79%)	183 (84%)
Received discrete asset framed info	100 (49%)	101 (46%)
Received bundle-of-rights framed info	103 (51%)	117 (54%)

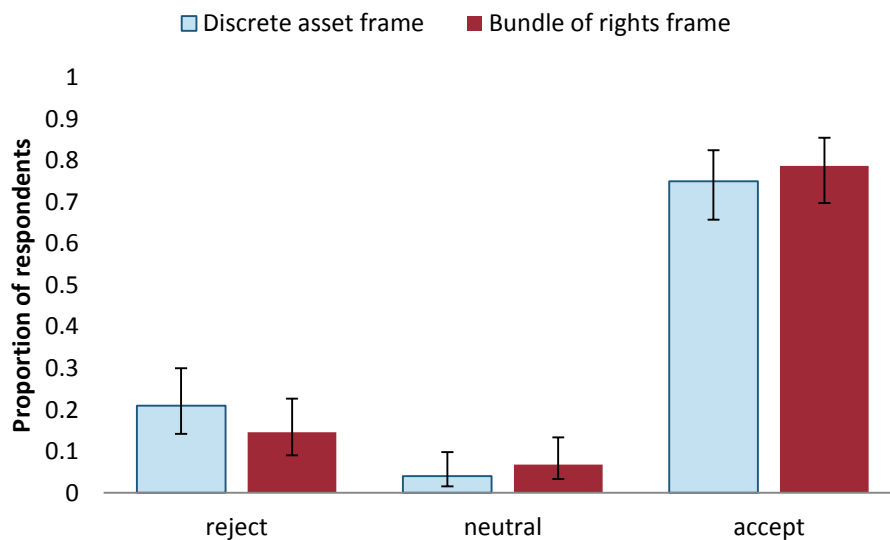
#### Acceptance measure

The acceptance measure is designed to measure the degree to which respondents accept the hypothetical policy by measuring three separate aspects of ‘acceptance’. The typical measure of internal consistency and thus the reliability of such measures is Cronbach’s alpha. For these studies, Cronbach’s alpha was 0.89 (study 2a) and 0.85 (study 2b). Values greater than 0.7 are generally regarded as acceptable, although there is no absolute rule (e.g. Cortina 1993); as such, it is both convenient and appropriate to use the calculated acceptance values as a single metric of participants’ acceptance of the hypothetical regulation.

#### Framing effects for study 2a

Responses were categorised into three categories using their acceptance scores (see Methods): those who accepted the regulation (acceptance scores of 13 to 21); those who rejected the regulation (acceptance scores of 3 to 11) and those who neither accepted nor rejected the regulation (acceptance scores of 12). The results are summarized in Figure 2.2. Overall, 77% of respondents accepted the regulations, 18% rejected the regulations, and 5% neither accepted nor rejected the regulations. For those respondents who received the information in the discrete asset frame, 75% accepted the regulation compared to 79% of those who received the bundle-of-rights frame. Consistent with

this, 21% of respondents who received the discrete asset frame rejected the regulation whilst only 15% who received the bundle-of-rights frame rejected the regulation. Four per cent of respondents who received the discrete asset frame neither accepted nor rejected the regulations, whilst 7% who received the bundle-of-rights frame neither accepted nor rejected the regulations (figure 2.2).

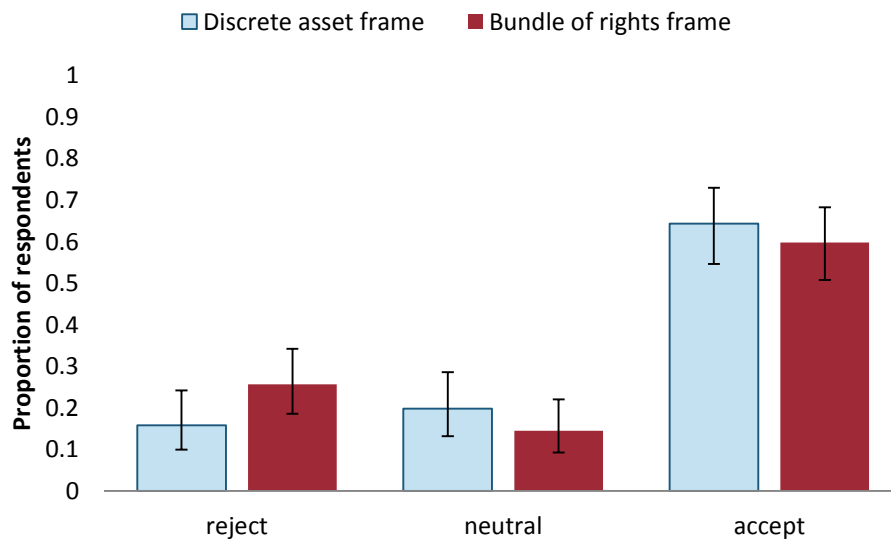


**Figure 2.2.** Results of study 2a. Percentage of respondents who accepted, rejected, and neither accepted nor rejected the regulations, for both framing conditions (n=203). Error bars represent 95% confidence intervals.

Here, there is no clear framing effect, although the results could be interpreted as being consistent with a very small framing effect such that the bundle-of-rights frame is facilitating greater acceptance of the regulations. Given that participants are already generally favourable to the proposed regulations (mean acceptance of 15.4 out of a minimum score of 3 and a maximum score of 21, with ‘acceptance’ being scores greater than 12), there is only a limited scope for the alternative framing to influence the respondents’ acceptance of the regulation. On this basis, I speculated that a ceiling effect might be limiting the apparent framing effect of this sample (Lewis-Beck 2003). This is likely due to self-selection bias arising from the convenience/snowball sampling method. To test this, I repeated the survey using a commercial research panel provider to avoid self-selection bias (study 2b).

### Framing effects for study 2b

Use of a commercial research panel provider for study 2b was successful at recruiting a respondent sample with a lower mean acceptance (13.9 compared to 15.4 for replicate 1), although ‘acceptance’ of the regulation is still the most common response. Once again there is no clear framing effect; there is an apparent effect of similar magnitude but opposite direction to that of Study 2a (figure 2.3). In light of this, rather than a small but real framing effect present in survey 2a, both results are likely to be peculiar to their particular data sets with neither representing an effect. Overall for the repeated study, 63% of respondents accepted the regulations, 21% rejected the regulations and 17% neither accepted nor rejected the regulations. For those respondents who received the information in the discrete asset frame, 64% accepted the regulation, compared to 60% of respondents who received the bundle-of-rights frame. Of respondents who received the discrete asset frame, 16% rejected the regulation whilst 26% of those who received the bundle-of-rights frame rejected the regulation. Thirty-six per cent of respondents who received the discrete asset frame neither accepted nor rejected the regulations, whilst 15% who received the bundle-of-rights frame neither accepted nor rejected the regulations (figure 2.3).



**Figure 2.3.** Results of Study 2b. Percentage of respondents who accepted, rejected, and neither accepted nor rejected the regulations, for both framing conditions (n=218). Error bars represent 95% confidence intervals.

**Table 2.2.** Spearman’s Rank Order Correlations between variables of interest across three datasets and summary effect size of the combined datasets. Correlations that were meaningful across all datasets are shaded.

<b>Correlations (Spearman’s Rho)</b>	<b>Survey 1 (n=76)</b>	<b>Survey 2a (n=203)</b>	<b>Survey 2b (n=218)</b>	<b>Summary effect size</b>
Age and property rights strength (95% CI)	-0.53 (-0.675, -0.346)	-0.16 (-0.291, -0.023)	0.03 (-0.103, 0.162)	-0.223 (-0.484, 0.075)
Age and utilitarianism	0.21 (-0.016, 0.415)	0.15 (0.013, 0.281)	0.09 (-0.043, 0.22)	0.133 (0.045, 0.219)
Age and acceptance of the regulation	N/A	-0.08 (-0.215, 0.058)	0.13 (-0.002, 0.258)	0.026 (-0.0179, 0.229)
Property rights strength and utilitarianism	-0.24 (-0.441, -0.016)	-0.23 (-0.356, -0.096)	-0.05 (-0.181, 0.083)	-0.163 (-0.29, -0.029)
Having owned property and utilitarianism	0.29 (0.07, 0.483)	-0.06 (-0.96, 0.078)	0.11 (-0.023, 0.239)	0.098 (-0.083, 0.273)
Having owned property and property rights strength	-0.42 (-0.589, -0.215)	0.11 (-0.028, 0.244)	0.05 (-0.083, 0.181)	-0.079 (-0.341, 0.194)
Having a yard and property rights strength	-0.26 (-0.458, -0.037)	-0.07 (-0.205, 0.068)	0.15 (0.018, 0.277)	-0.046 (-0.26, 0.171)
Having a yard and utilitarianism	0.24 (0.016, 0.441)	-0.01 (-0.147, 0.127)	0.091 (-0.042, 0.221)	0.084 (-0.04, 0.205)
Property rights strength and acceptance of the regulation	N/A	-0.20 (-0.328, -0.065)	-0.08 (-0.21, 0.053)	-0.139 (-0.254, -0.020)
Utilitarianism and acceptance of the regulation	N/A	0.30 (0.17, 0.42)	0.24 (0.111, 0.361)	0.269 (0.178, 0.356)

### Correlations

The correlations investigated are shown in Table 2.2. There are only four that were meaningful across all three datasets. These comprised: (i) a small negative correlation between property rights strength and acceptance of the regulation; (ii) a small negative correlation between property rights strength and utilitarianism; (iii) a small to medium positive correlation between utilitarianism and acceptance of the regulation; and (iv) a small positive correlation between age and utilitarianism (highlighted rows in Table 2.2).

## 2.4 Discussion

Study 1 suggests that alternative property paradigms can create a strong framing effect. However, studies 2a and 2b showed no such effect. Although these results appear to contradict each other, they may in fact highlight the subtlety and frailty of framing effects. The key to understanding the differences between the studies lies not in the property paradigm frames themselves, but in the operationalization of these frames in each study. Here I propose two alternative explanations for the phenomenon. These

explanations are not in competition, or mutually exclusive. Rather, I suggest that they each contribute to the difference in outcomes between study 1 and studies 2a and 2b.

### The impact of response scales

An obvious structural difference between the two studies is that study 1 involved a single forced choice by respondents, whereas study 2 measured the acceptance of the regulation using a three-question measure of a number of attitudes concerning the regulation and which allowed for neutral responses. This data was collected via Likert scales for which people have a tendency to avoid extreme responses (Schwarz et al. 1985) and therefore this data when aggregated into ‘accept’/‘reject’/‘neutral’ categories may not capture a framing effect if it is subtle. However, there is also little difference between the mean values of acceptance, and thus no evidence for even a subtle framing effect.

Study 1 also differed in that it was a choice between two alternative versions of the regulation, and thus it did not seek to influence or measure the degree to which respondents favoured the policy, but rather, how they viewed the alternatively framed regulations in comparison to each other. This is quite a different question. Property is something that people often feel strongly about, particularly if they have strong views in favour of property rights, and although the respondents in study 2 were generally in favour of the regulation, it is likely that this is the sort of issue that people are likely to already have an opinion about, and thus likely to be more resistant to the influence of framing (Chong & Druckman 2007). Thus, strategic uses of framing in communications would be most effective when aimed at people without strong opinions about the relevant issue. These considerations also highlight the importance of context in the effectiveness (or otherwise) of framing, and that a successful frame in one context cannot be assumed to be effective in another.

### Valence framing not property paradigms framing

Related to context is the mechanism by which the alternative frames may be anticipated to affect perceptions and attitudes. While much of the previous research on framing has relied on prospect theory to drive a choice preference (Levin, Schneider and Gaeth 1998), there is no reason that this effect should be limited to this cognitive bias alone. In the case of alternative property paradigms, it is likely that these interact with a related bias; the ‘endowment effect’. This bias results in a tendency for people to place greater

value on something when they own it, than if they do not own it, even if they have only owned it for a brief period (Kahneman, Knetsch and Thaler 1990). I suggest that it is the endowment effect that is operationalized by Nash and Stern (2009) with their bundle-of-rights frame, forewarning prospective laptop purchasers of the limited nature of the ownership that they would enjoy. In contrast, the discrete asset frame permitted an expectation of dominion by the purchaser, thus leading to more negative attitudes when the use restrictions were later contemplated. Similarly, in study 1, option A creates an impression that there is something of importance or value that is being lost as a result of the regulation, whereas option B, whilst describing the same objective outcome, seeks to minimise any apprehension of loss and describes the regulatory impost in a minimalist fashion. Option A specifically states that owners' rights will be 'modified' and that an aspect of those rights will be taken away. In contrast, option B explicitly states that it "would not change private property rights". As such, even though they are describing the same policy, option A emphasises that the regulation would trespass upon property rights and that it would result in some kind of loss, whereas option B minimised the perception of trespass and any resulting loss. This essentially evokes the endowment effect to create a valence effect in which one option is represented in a more positive light. This is reinforced by the semantic framing that uses negative language in option A such as "taking away" and "prohibiting"; in contrast option B employs neutral language such as "not change" and "other than...".

Compared to study 1, the operationalisation of the alternative property frames in study 2 is rather different. Being cognisant of the valence between the frames in study 1, I deliberately designed the frames in study 2 to reflect the different concepts in each property paradigm, but without creating a valence between the alternative frames. In this way, I intended to test only the influence of the alternative property concepts on the relative agreement of respondents to the hypothetical regulation. Given this, it makes sense that there were no framing effects in study 2; by not establishing a valence between the frames, I have effectively removed any framing potency. As such, I conclude that there is no evidence that the alternative property concepts have an inherent influence on attitudes. It is only when the bundle-of-rights frame is used to generate a valence by evoking the endowment effect and through semantic framing that a preference was induced.



### Unintended framing effect

Although it was anticipated that study 1 would generate a framing effect in favour of option B, it is interesting that respondents indicated such a degree of confidence in their choice, irrespective of which option they chose, despite both options describing the same objective policy. Had participants been cognisant that the alternatives were equivalent, even though the format of the survey required that they make a choice, it is reasonable to expect that they would have indicated a low-sureness that their choice was the better choice. This suggests that participants tended to have some degree of conviction in their choice, and indicates that the framing effect is genuine and not simply an artefact of the survey structure. This also suggests that for those who chose the minority option (A), that this choice was, for them, their genuine preference. This raises the intriguing possibility that the framing of option A may have acted to generate a choice preference for a minority of participants.

### Correlations between property rights strength, utilitarianism and acceptance

Only four meaningful correlations were observed across the three datasets. As hypothesised, there was a (small) negative association of property rights strength with acceptance of the regulation, and a (small to medium) positive association with utilitarianism and acceptance of the regulation (and therefore also a small negative association between property rights strength and utilitarianism). Although these correlations were anticipated and make intuitive sense, their empirical confirmation verifies their potential value as a subject of strategic message framing. They provide a foundation for future work in this area to build upon. In addition, a (small) positive association was identified between age and utilitarianism, such that older respondents reported greater agreement with the notion that limiting personal freedoms may sometimes be beneficial to society as a whole.

Interestingly there are a number of significant correlations that occur across both studies with self-selected participants (for both study 1 and study 2) that do not exist in the data for the panel supplied (i.e. rewarded) respondents (study 2b). It is unclear exactly why this is the case, although is likely related to self-selection bias. Because study 2a used a convenience/snowball recruitment method, it likely recruited more altruistically minded participants, as well as those with awareness or strong opinions on private property or biodiversity conservation (Eysenbach and Wyatt 2002).

## Implications for private land conservation

Framing can influence how people react to information, including in the context of private land conservation. Indeed, the framing effects associated with the alternative conceptualisations of property, demonstrated by Nash and Stern (Nash 2009; Nash and Stern 2009) can be used as a means of doing this. However, the alternative property frames do not influence attitudes on their own, but can be used in conjunction with other framing effect(s) to do so; in this case the endowment effect and semantic framing. Semantic framing may be applied to either property paradigm (indeed to any communication) but it is the discrete asset paradigm that is likely to evoke the endowment effect. This is because it lacks nuance and views ownership as a single binary concept; one either owns an object, or they do not own that object. Thus, when the government or other party interferes with their enjoyment of the object, something has been taken away. In contrast, the bundle-of-rights concept of property is better placed to avoid evoking the endowment effect because of its nuanced perception of property i.e. even if one's enjoyment of an object has been curtailed by government, it only relates to one aspect of that enjoyment. The perception of loss is more easily minimised in the context of the bundle-of-rights view of property than in the discrete asset view. However, the results of this research stress the need to deliberately minimise (or maximise) the perception of loss; the alternative property paradigms cannot do this of themselves. As such, the bundle-of-rights property frame may be useful, but only where minimisation of the endowment effect is advantageous.

Use of property concepts may be also informed by the observed (and largely intuitive) tendency of strong property rights to coincide with lower support for regulatory measures that interfere with those rights, and for utilitarian attitudes to be associated with acceptance of such regulatory measures. Communications that jointly use property concepts to minimise perceptions of interference by an advocated regulation, coupled with conservation arguments that emphasise the value to society of biodiversity may offer an advantage compared to those generated ad hoc and without strategic framing.

## 2.5 Conclusions

Participants were more likely to respond favourably to the idea of a tree clearing regulation when framed as an impact to one of a bundle-of-rights, rather than to a discrete asset. However, this reflects different responses to the options as presented, and may not be attributed specifically to the use of either property frame within each option. Rather, the collective results suggest that the property paradigm framing effect

occurs by the alternative property conceptualisations interacting differently with the endowment effect and subsequently generating a preference for one option over another (study 1) or tempering expectations of what ownership comprises (Nash 2009; Nash and Stern 2009). This suggests that the alternative property concepts alone are of little use from a framing perspective, but must be used with other framing techniques (i.e. semantic framing, promoting biases etc.) to promote the goal at hand. The results also stress the importance of context, and that it should not be assumed that a framing effect will occur simply because it has done so previously in a similar setting. Therefore, any strategic use of framing should also be tested both for effectiveness and for unintended effects, prior to being implemented. Ultimately, strategic framing of communications (including how property concepts are articulated) are likely to make them more effective. However, whilst a theoretical underpinning is important to guide this framing, this is not sufficient to be sure that the message is optimised or even effective; testing messages (e.g. focus groups) is important before they are released into the wild.



# 3 ECONOMICALLY FRAMED INFORMATION ABOUT ECOSYSTEM SERVICES CAN CROWD-OUT INTRINSIC MOTIVATIONS FOR PROTECTING NATURE

This chapter is an edited version of the submitted paper:

Kusmanoff AM, Fidler F, Gordon A, Bekessy SA. (In Prep). Economically framed information about ecosystem services can crowd-out intrinsic motivations for protecting nature.

## Abstract

The ecosystem services concept is increasingly prominent in conservation policy, particularly in determining the value of biodiversity in monetary terms. It is well established that monetary incentives can result in the crowding-out of intrinsic motivations for conservation behaviour. Here, I explore whether including economically framed ecosystem service information about nature could result in the crowding-out of

intrinsic motivations to protect it, even without an actual monetary incentive. Using an independent groups design, I undertook separate surveys concerning whales and bees. Both surveys were divided into two participant groups, both groups receiving a collection of facts about whales (or bees), and one group receiving additional economically framed information about the value of ecosystem services they provided. I found that the economically framed ecosystem services information resulted in the crowding-out of intrinsic motivations for whale and bee conservation. These results raise questions about the long-term impacts of economically framed ecosystem-service based conservation messages on people's motivations for protecting nature.

### 3.1 Introduction

Standard economic theory posits that increasing monetary incentives for a product or service will lead to an increase in supply of that product or service (i.e. the more you offer to pay people to do something, the more people are likely to do it). However, because standard economic theory does not distinguish between internal and external sources of motivation, anomalies to this assumption are often seen. Extrinsic motivations are those that come from outside a person, such as monetary rewards or praise, whereas intrinsic motivations are internal to a person, such as moral or ethical beliefs, which often have no apparent external reward associated with them (Frey and Regen 2001 following Deci 1971). The 'motivational crowding effect' is seen when intrinsic (arguably altruistic) motives are replaced or 'crowded out' by extrinsic motivations (Frey and Jegen 2001; Bekessy and Cooke 2011).

#### Motivational crowding and conservation incentives

A simple example of motivational crowding-out is the child who is paid by her parents to mow the lawn; once the child expects to receive money for the task, they are willing to do it again only if they receive a similar monetary reward (Frey and Jegen 2001). Such crowding-out has been shown to occur in many settings, including conservation, particularly where landholders receive financial incentives to engage in conservation activities (Bekessy and Cooke 2012; García-Amado et al. 2013; Rode, Gómez-Baggethun and Krause 2015). For the crowding-out of intrinsic motivation to occur, there must be an intrinsic motivation to crowd-out; it cannot occur with respect to tasks for which a participant sees no intrinsic value (Deci, Koester and Ryan 1999; Frey and Jegen 2001). Tangible rewards also do not crowd-out intrinsic motivation when the reward is unexpected or is not contingent upon the behaviour, but only when the reward

is perceived as controlling (Frey and Jegen 2001; Stern 2008). That is, crowding-out occurs only where the actor undertakes the activity because of a reward that is expected and contingent upon the behaviour. Whilst money is the most common example of an external tangible reward, it's likely that any kind of external 'payoff' is capable of having a similar effect, so long as the payoff is a controlling factor (consideration) in the decision to undertake the behaviour.

### The 'ecosystem services' framing of nature

The 'ecosystem services' concept has become an increasingly prominent way of framing the environmental and conservation discourse. Originally developed in the 1970s as a communication tool to attract public interest in biodiversity conservation (Westman 1977), it has now become a prominent guiding concept for policy makers, facilitating the valuation of biodiversity in monetary terms (Costanza et al. 1997; Silvertown 2015). Ecosystem services are the useful and essential services that nature provide to humans, for example, a supply of clean air, drinking water, food, building materials, pollination, etc. (Costanza et al. 1997), and form the basis of the Millennium Ecosystem Assessment (2005). The term has since achieved global prominence and has evolved to focus on economic dimensions, facilitating the valuation of biodiversity in monetary terms (Costanza et al. 1997) and coincides with the broader rise (and dominance) of neoliberal ideology in public policy (Silvertown 1991) including within environmental policy (Coffey 2015). As such, the ecosystem services concept is an increasingly dominant frame within conservation policy for both informing conservation priorities, as well as for communicating the rationale for biodiversity conservation to stakeholders, including the general public (Goldman and Tallis 2009).

### How ecosystem service frames may cause motivational crowding

The ecosystem services approach to communicating the value of nature is based upon an anthropocentric perspective that reinforces the view that nature is important only to the extent that it provides goods and services of value to humans (McCauley 2006; Coffey 2015). This ignores any intrinsic values people may have for nature (e.g. Schultz 2001), with its persuasive value relying on an assumption of human rationality informed by the 'value' that is attributed to the services provided by nature. Given that humans are not strictly rational and their behaviour is influenced by the interaction of numerous factors (e.g. Ajzen 1991) and seldom change views owing only to being presented with

new information (consider climate change for example – see Kahan et al. (2012)), the effectiveness of the ecosystem services approach as a communication tool should be evaluated.

An emphasis on anthropocentric benefits may have the capacity to act as extrinsic motivations to society at large for practicing biodiversity conservation. Here the ecosystem services are analogous to an external payment that nature provides to society for undertaking conservation behaviours. As such, describing nature in terms of ecosystem services ('ecosystem service frames' - herein 'ES frames') may, in certain contexts, have the effect of crowding-out intrinsic motivations to care for the environment. According to motivation crowding theory, ES frames could result in crowding-out of intrinsic motivations where a person's appreciation of the ecosystem services provided are the dominant factor in their motivation for conservation. Thus, the people most likely to experience motivational crowding-out are those people that have some level of intrinsic care for nature, but who are not necessarily supportive of conservation generally. This is the very audience that messages containing ES frames are likely to be targeted towards. The risk of crowding-out intrinsic motivations is that it may create an expectation that the only nature worth preserving is that with a demonstrable and quantifiable anthropocentric value, with ES framed messages leading to the reduced care and concern of organisms and ecosystems that cannot demonstrate such value.

Here I aim to directly test how economically framed ecosystem service information about nature affects motivations for protecting nature, and whether the emphasis of ecosystem services in conservation messages may have a crowding-out effect. García-Amado et al. (2013) demonstrated that conservation schemes which paid money to people for the ecosystem services generated from their land had a crowding-out effect in that it changed their perceived reasons for engaging in conservation, from intrinsic motivations towards utilitarian and monetary motivations. However, such an effect has not previously been demonstrated in the absence of a tangible external payoff, and so it is not clear whether this dynamic can be induced by ES frames alone. In addition, conservation advocacy is often concerned with influencing attitudes rather than promoting a specific behaviour, and as such, information framing is not a typical example of where crowding-out has previously been studied or encountered.

ES frames can be expressed in a variety of ways; an ES frame could simply involve highlighting the anthropocentric benefits provided by nature, or alternatively could reduce such benefits to a monetary value (e.g. perhaps the economic contribution of a



fishery or the cost of building a water treatment facility to provide equivalent water filtration to natural processes). While all ES frames may have the potential to crowd-out intrinsic motivations in certain contexts, those ES frames that include monetary values of nature are more strongly emphasising the financial incentive inherent in such framing of the rationale for conservation.

Here I present empirical research into the effect of ES frames on intrinsic motivations, starting with ES frames that emphasise monetary values of nature. Using an independent groups design, I undertook two surveys to test whether economically framed ES information can crowd-out intrinsic motivations for protecting aspects of nature, specifically focussing on whales and bees. I chose whales and bees as I expected that people would generally have a high degree of care for whales, and a lower degree of care for bees, this would allow me to examine any crowding-out effects for different degrees of 'care'.

### 3.2 Methods

This research employed two online surveys that each used an independent groups design to test participant responses to the presence (and absence) of economic-based ecosystem services information about an aspect of nature. One survey concerned whales, and the other bees. This research was conducted according to the *National Statement on Ethical Conduct in Human Research* and approved by the RMIT University College of Design and Social Context Human Ethics Advisory Network (19480-06/15, Appendix D).

#### Participants

Participants were recruited via Mechanical Turk ([www.mturk.com](http://www.mturk.com)) and paid a small incentive for completing one of two online survey instruments hosted by Qualtrics ([www.qualtric.com](http://www.qualtric.com)) (refer to Appendix E for the participant information sheet). Mechanical Turk is a web-based tool that links registered 'workers' with small paid tasks. Recruiting participants in this way allowed me to avoid problems of self-selection bias that would likely occur if otherwise completed exclusively by non-recompensed volunteers.

Different participants were recruited for each survey and in each survey participants were randomly assigned to one of two independent groups. Participants were asked to

complete basic demographic information, such as age and gender, and asked to indicate on a 10-point scale the degree to which they cared for whales or bees. Four surveys were conducted with 110 respondents for the whales survey without the economically framed ecosystem services information (ES absent); 88 respondents for the whales with the economically framed ecosystem services information (ES present); 106 respondents for the bees with ES absent and 101 respondents for the bees with ES present.

### Survey design and procedure

Both the whale and bee surveys provided participants with information about these respective organisms. This information included facts about their intelligence, communication methods, experience of emotions, their long history on Earth and several other qualities. This information did not include any promotion of conservation. Participants in non-ES frame groups saw only the information and questions described thus far. Participants in the ES frame groups saw the information described above immediately preceded by economically framed ecosystem service information about the economic value of bees or whales (see Appendix F for the information provided to participants).

Participants were then asked to list as many reasons that they could think of for protecting whales (participants could list up to 10 reasons and were encouraged to list at least three). They were subsequently asked to rank their own elicited reasons in order of most to least important. This allowed examination of fluency effects (number of reasons provided) and order effects (the order of reasons provided). These orderings of the reasons are referred to herein as *elicited* and as *ranked*, respectively.

Analysing the responses of the participants from each group in each survey allowed me to investigate whether the inclusion of economically framed ecosystem service information influenced the reasons participants later give for why protection of whales or bees is important, or the relative importance that these reasons were assigned by participants. Given the affection for whales often shown by humans, I expected that whales would generate greater intrinsic motivations for protection than bees; by undertaking this experiment for both whales and bees, I could also examine how the degree of intrinsic care for an aspect of nature influences any crowding-out effects.

A final question asked participants to rank the following reasons for protecting whales or bees in order of most important to least important: (i) because they have the right to exist; (ii) because they help the economy; (iii) because they provide humans with

natural goods and services; or (iv) because they are important to the health of the ecosystem. The order in which these options were listed was counter-balanced to avoid order effects, whereby the order that response options are presented in can influence participant choice (Schuman and Presser 1981). Refer to Appendix G for the complete questionnaire completed by participants.

### Response Coding

To undertake the analysis, each elicited reason was coded for whether it reflected an intrinsic motivation or an instrumental motivation. In this case intrinsic values are those in which either the whales or bees are seen to have value for their own sake. In contrast, instrumental values are those in which the whales or bees are seen to have value by virtue of their use in achieving something else, for example in providing food or pollination. Examples of the kinds of reasons given by participants that were coded as intrinsic and instrumental are provided below (Table 3.1). A handful of responses were unable to be coded as either intrinsic or instrumental and were not included in the analysis. A typical example of a statement that couldn't be coded was: "we should not throw trash in the waters". To ensure reliability in the coding, 20% of all reasons elicited across both versions of each survey were double-coded (358 out of 1751 reasons), for which the secondary coder agreed with the primary coder in 91% of instances (i.e. for 324 of 358 reasons).

## 3.3 Results

### How does ecosystem services information affect motivations to conserve whales or bees?

Fewer intrinsic responses were elicited from participants who received the economically framed ecosystem services information (ES information) (14% fewer for whales and 5% fewer for bees). This corresponds to an identical increased elicitation of instrumental reasons, and because approximately the same numbers of responses were given per participant across all conditions, this means that when ES information is present, instrumental reasons displace intrinsic reasons. Approximately the same number of reasons were given on average per participant across all groups. Although participants were able to list up to 10 reasons, the average number of reasons given was 4.3 for all conditions, except for bees (ES present) which was 4.4.

Because I am interested in how the number and ranking of *intrinsically* motivated reasons for protecting whales/bees is influenced by the economically framed ES information, the results are expressed in terms of *percentage of intrinsic reasons*, with the figures for instrumental reasons omitted. However, by virtue of the binary coding system, the corresponding instrumental reasons are the remainder of the proportion (i.e. 20% intrinsic reasons correspond to 80% instrumental reasons).

**Table 3.1.** Examples of reasons provided by participants that were coded as relating to either intrinsic or instrumental values.

<b>Intrinsic values</b>	
<b>Whales</b>	<b>Bees</b>
They're intelligent	Communicate with pheromones
They are sentient	They feel anxiety
They are an animal	Have been around a long time
It is hard to imagine our world without whales.	Intelligence
I love them	Moral reasons
To prevent extinction	Are a special part of nature
Have been around for 55 million years	Because they're dying
kindness, animal rights	Conservation of species
<b>Instrumental values</b>	
<b>Whales</b>	<b>Bees</b>
Valuable to local economies	They help the economy
Whale watching creates jobs	Bees are critical for the food chain
For future generations	Pollination
Historically significant.	Help flowers
Interesting to study	For the ecosystem
Genetic diversity	Produce honey
Important to the ecosystem	Bees are vital to human existence
Help people forge a connection to nature	Are hardworking

The mean reported degree of care (i.e. reported on a scale between 1 and 10) for whales was 7.2 (ES absent, with SD=1.9) and 7.3 (ES present, with SD=2.1), and the proportion of intrinsically motivated reasons for their protection was 72% (ES absent) and 58% (ES present) (table 3.2). For bees the average reported care was 6.9 for both conditions (with SD=2.3 for ES absent and SD=2.5 for ES present) and the proportion of intrinsically motivated reasons for their protection was 25% (ES absent) and 20% (ES present) (table 3.2). The effect size of the crowding-out of intrinsic reasons was determined using Cohen's  $d$ , which gives a standardised difference between two means. For the whales Cohen's  $d=0.58$  (elicited) and  $d=0.47$  (ranked); for the bees this was  $d=0.41$  (elicited) and  $d=0.23$  (ranked) (table 3.2). There was no meaningful difference between the framing conditions for the final question that asked participants to rank the reasons listed by me for protecting whales/bees.

### How does ecosystem services information affect the ranking of intrinsic/instrumental motivations?

Although this result confirms the hypothesized crowding-out effect of the economically framed ecosystem services information, I am also interested in how this information affects both the elicitation order and subsequent rankings of conservation reasons. Essentially, I am interested in whether those reasons elicited most readily (i.e. elicited earlier and thus appearing higher in the elicited order of reasons) and those ranked as most highly important, also demonstrate a bias induced by the economically framed ecosystem services information. This is important because while the framing effect promotes elicitation of instrumentally motivated reasons for conservation, it may be that participants consider these as less important and subsequently tend to rank them lower than intrinsically motivated reasons.

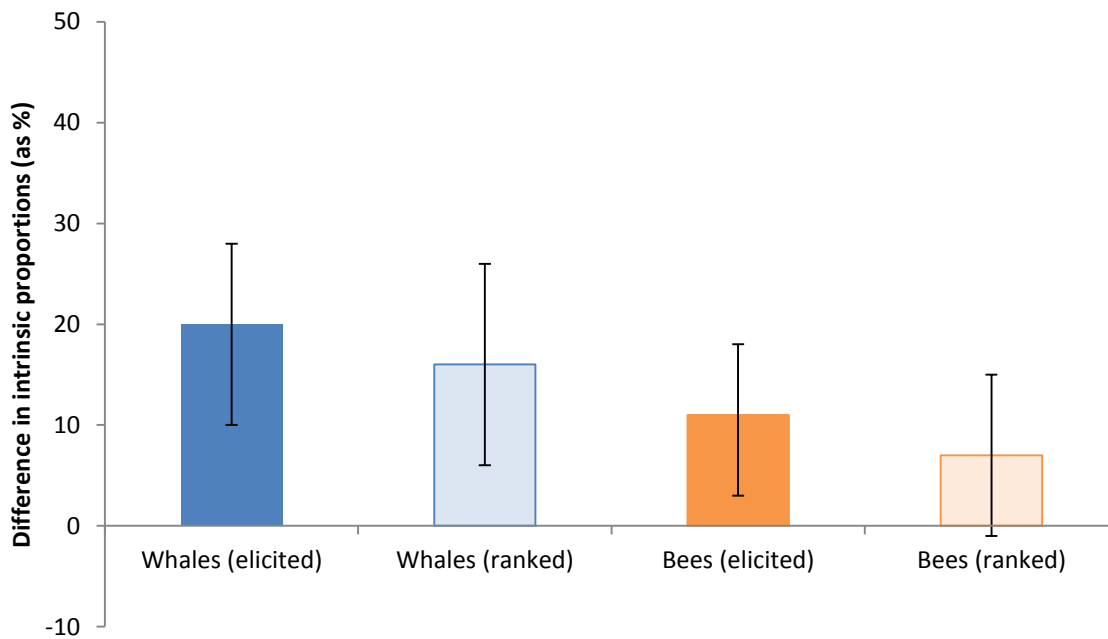
I examined this by comparing the number of participants in each frame that listed an intrinsic reason as their top reason. In the case of the whales, 70% of participants ranked an intrinsic reason for protecting whales as their most important reason in the absence of the economic ecosystem services information; this drops to 61% when the economic ecosystem services information is present. Similarly in the case of the bees, 20% ranked an intrinsic reason as their most important motivation in the absence of the economic ecosystem services information, dropping to 15% in its presence.

**Table 3.2.** Summary of the key results from each survey, including 95% CIs where applicable.

Ecosystem services info	Whales		Bees	
	absent	present	absent	present
Participants	110	88	106	101
Average reported 'care'	7.2 (SD=1.9)	7.3 (SD=2.1)	6.9 (SD=2.3)	6.9 (SD=2.5)
Total reasons	473	380	451	446
Total intrinsic reasons	341	223	113	89
Total instrumental reasons	132	157	338	357
Ave number of reasons per participant	4.3	4.3	4.3	4.4
Proportion of all reasons that are intrinsic (95% CI)	72% (68, 76)	59% (54, 64)	25% (21, 29)	20% (17, 24)
Proportion of first <i>elicited</i> reasons that are intrinsic (95% CI)	76% (67, 83)	55% (44, 65)	19% (13, 28)	5% (2, 11)
Proportion of top <i>ranked</i> reasons that are intrinsic (95% CI)	70% (61, 78)	61% (50, 71)	20% (14, 29)	15% (9, 23)
Mean intrinsic proportion of first 2 <i>elicited</i> reasons that are intrinsic (95% CI)	77% (71, 83)	58% (50, 65)	19% (13, 25)	8% (5, 12)
	Effect size: Cohen's d = 0.58 (0.29, 0.87)		Effect size: Cohen's d = 0.41 (0.14, 0.69)	
Mean intrinsic proportion of first two <i>ranked</i> reasons that are intrinsic	75% (69, 81)	59% (51, 66)	20% (13, 27)	13% (8, 24)
	Effect size: Cohen's d = 0.47 (0.19, 0.76)		Effect size: Cohen's d = 0.23 (0.04, 0.51)	

I also compared the relative proportion of intrinsic motivations of the top two reasons given, for each condition. This is likely a more robust indicator, as it accounts for those people who might have had difficulty choosing between rankings of their top two alternative reasons. In addition, given that the average number of reasons per participant is (approximately) four, this method accounts for the possibility that some participants may have ranked the (greater number of) instrumental reasons elicited when the economic ecosystem services information was present, to be of lower importance. Rather than simply comparing the overall percentage of the top two ranked responses that are intrinsic (for each group), a more robust approach is to consider the mean intrinsic proportion of the top two ranked responses of each participant. Taking this approach, the difference between frames is apparent (figure 3.1). For whales, the average percentage of intrinsic reasons in the top two ranked responses was 75% when no ecosystems services information was provided, compared to 59% when it was. For bees, the corresponding figures were 20% and 13% (figure 3.1).

The difference between the two conditions for both whales and bees, including for both elicited and ranked orders, are shown in figure 3.1 with 95% confidence intervals. These values are greater than zero, indicating a meaningful difference between each condition (notwithstanding a slight overlap with zero for the 95% CI for the ranked bee responses, owing to the reduced effect size here). This shows that in the presence of economic ecosystem services information, intrinsic reasons for protecting whales/bees are indeed crowded-out by instrumental reasons.



**Figure 3.1.** Difference between framing conditions of the average proportion of top 2 reasons that are intrinsically motivated, with 95% confidence intervals. ‘Elicited’ refers to the order in which respondents listed reasons and ‘ranked’ refers to the order of importance that respondents subsequently ranked those reasons. The differences plotted are analogous to effect size.

### 3.4 Discussion

Here I demonstrate that economically framed ecosystem services information can influence the way that people think about an aspect of nature, including underlying motivations for conservation. The greater emphasis on instrumentally motivated reasons elicited when economically framed ecosystem services information is present, demonstrates a clear framing effect. This makes sense, as the economic ecosystem service concept was explicitly mentioned to participants who received the version of survey that included this information. This is similar to the way in which leading questions can influence responses (e.g. Harris 1973) which here may be explained as an availability bias (e.g. Tversky and Kahneman 1973; Schwarz et al. 1991) whereby people use examples readily available in their mind to help them evaluate a specific issue. However, that motivational crowding is also at play is confirmed in the analysis of the relative intrinsic proportion of the top two reasons given by each participant. This demonstrates that as well as resulting in elicitation of more instrumentally motivated reasons to conserve nature, participants were more likely to rank instrumentally motivated reasons as being of greater importance when economically framed ecosystem services information was present.



Having established that there is a crowding-out effect, it would also be useful to understand how permanent or transient this effect is. While further research is needed to test this definitively, I can gain some understanding by considering the change of the effect size of the crowding-out for the mean intrinsic proportion of top two reasons in the order elicited, compared to as subsequently ranked by the participants. For both the whales and the bees, the initial crowding effect on the elicited order of reasons is greater than when those reasons are subsequently ranked (table 3.2). A large decrease in the effect size could indicate that the framing effect is short-lived and potentially mitigated by the ranking processes (i.e. that perhaps after reflection, participants were of the view that the intrinsic reasons were more important to them). However the persisting effect size is significant and meaningful (figure 3.1). Nonetheless, there was no apparent framing effect on the subsequent ranking of the reasons for protecting whales/bees that I provided to participants (Appendix H). This may be because the method used did not capture any framing effects, or because the effects had entirely diminished at this point in the survey.

There are some differences between the results for whales and bees. Although the average reported degree of care for both whales and bees was similar, whales elicited a much greater proportion of intrinsically motivated reasons for their protection compared to bees (table 3.2). This indicates that people think about bees in a more instrumental way than they do for whales. The crowding-out of intrinsic reasons is also less pronounced in the case of the bees than the whales (figure 3.1). This is consistent with crowding theory, in that because bees are regarded with a lower intrinsic value (relative to whales) (table 3.2), there is less intrinsic value to be crowded out. There is also an indication that the crowding effect may be shorter lived in the case of the bees, as the decrease in effect size between the elicited values and the ranked values is greater in the case of the bees (table 3.2). This may suggest that the dynamics of crowding-out are different between the examples of the whales and the bees.

The similar reported 'care' for both whales and bees, despite the clearly greater degree of intrinsic care for whales indicates that self-reported care is not a good indicator of the intrinsic care that people may have for an aspect of nature. This makes sense, as there are many different reasons and ways for which people may care for nature. Any future research that relies on self-reported 'care of nature' (or similar construct) should bear

this in mind and critically examine what exactly is intended for measure, and how this may best be done.

## Implications for conservation communication

This research shows that the inclusion of economically framed ecosystem services information, amongst other facts about an aspect of nature, can result in a different set of values being recalled and articulated by participants. Though further research may be needed to confirm the mechanism, we speculate a mild form of motivational crowding out is responsible. This goes beyond a simple framing effect and actually influences the importance that people place on intrinsic and instrumental reasons for protecting nature. Although it has previously been demonstrated that activating a particular set of values can suppress opposing values (Maio et al. 2009), to my knowledge, this is the first study to indicate that crowding-out may occur in the absence of a tangible external reward.

Importantly, this study showed that when the additional economically framed ecosystem services information is provided, it did not result in elicitation of a greater number of reasons for protecting whales or bees (table 3.2).

There is empirical evidence for motivational-crowding effects occurring across a range of settings including labour supply, service provision, and common pool resources (see Frey and Jegen (2001) for a summary), including conservation (García-Amado et al. 2013; Rode, Gómez-Baggethun and Krause 2015). This is a phenomenon that policy makers should have awareness of in order to avoid unintended adverse effects of policy that involves financial incentives. Here I have demonstrated that a single instance of receiving economically framed ecosystem services information can result in a crowding-out effect. Although untested, it seems likely that this may be exacerbated when such information is a dominant part of the discourse (e.g. Dryzek 2013; Gustafsson 2013) or is implicit in all apparently available policy solutions (see Entman 1993). As such, this research has implications for conservation communicators who seek to use ecosystem services to gain support for conservation.

The emphasis in conservation communications of a variety of benefits of nature will likely help engage a range of people, and not simply those with an intrinsic care for nature (Kusmanoff et al. 2016). However, doing so in a manner that results in the crowding-out of intrinsic motivations in others could be counter-productive. There may be a risk that in focussing on the value of nature to humans, an expectation is

established that the only nature worth preserving is that with a demonstrable, and perhaps economically quantifiable, value. Further research is needed to understand how best to use such messages in a manner that does not also risk potential crowding-out of intrinsic motivations. Further development of this research would be to investigate the crowding effect for a wider range of aspects of nature, as well as to test the effects of different types of ecosystem services (for example ‘provisioning services’ versus ‘regulating services’). It would also be interesting to understand how the order in which the information is presented affects crowding-out (in this study the economically framed ecosystem services information was listed first, when present). It may be possible to develop methodology for articulating the many benefits of nature in a way that is less likely to result in the crowding-out of intrinsic motivations (perhaps by using a particular ratio of extrinsic to intrinsic reasons, or by using extrinsic reasons that are abstract in combination with intrinsic reasons that are personally relevant). In the meantime, conservation communicators ought to be mindful of how they are framing their messages, lest the use of extrinsically motivated appeals inadvertently undermines future intrinsic motivations to care for nature. While such extrinsic appeals might be effective in the short term, particularly for engaging people who do not hold strong intrinsic value for nature, over time they risk undermining the intrinsic motivations of the wider audience.



# 4 FRAMING THE PRIVATE LAND CONSERVATION CONVERSATION: STRATEGIC FRAMING OF THE BENEFITS OF CONSERVATION PARTICIPATION COULD INCREASE LANDHOLDER ENGAGEMENT

This chapter is an edited version of the published paper:

Kusmanoff AM, Hardy MJ, Fidler F, Maffey G, Raymond C, Reed MS, Bekessy SA. (2016). Framing the private land conservation conversation: Strategic framing of the benefits of conservation participation could increase landholder engagement. *Environmental Science & Policy* 61, 124-128.

## Abstract

How conservation messages are framed will impact the success of our efforts to engage people in conservation action. This is highly relevant in the private land conservation (PLC) sector given the low participation rates of landholders. Using a case study of PLC schemes targeted at Australian landholders, I present the first systematic analysis of communication strategies used by organisations and government departments delivering those schemes to engage the public. I develop a novel approach for analysing the framing of conservation messages that codes the stated benefits of schemes according to value orientation. I categorised the benefits as flowing to either the landholder, to society, or to the environment, corresponding to the egoistic, altruistic and biospheric value orientations that have been shown to influence human behaviour. I find that messages are biased towards environmental benefits. Surprisingly, this is the case even for market-based schemes that have the explicit objective of appealing to production-focussed landholders and those who are not already involved in conservation. The risk is that PLC schemes framed in this way will fail to engage more egoistically oriented landholders and are only likely to appeal to those who are already conservation-minded. By understanding the frame in which PLC benefits are communicated, we can begin to understand the types of people who may be engaged by these messages, and who may not be. Results suggest that the framing of the communications for many schemes could be broadened to appeal to a more diverse group (and thus ultimately to a larger group) of landholders.

## 4.1 Introduction

Private land conservation has become increasingly common over the last twenty years as a means of implementing conservation action beyond the protected area network. Internationally, PLC is implemented through a range of instruments including direct payments, tax incentives, cap and trade markets, voluntary markets and auctions and certification programs (Pascual and Perrings, 2007; Pirard 2012; Yang et al. 2010). Despite widespread implementation, there has been mixed success in engaging rural landholders in conservation initiatives (e.g. Posthumus, Gardebroek and Ruben 2010; Prager and Posthumus 2010). Thinking strategically about how PLC messages to rural landholders are framed could help increase engagement. To understand how messages are currently framed, I use an Australian case study to examine how PLC organisations currently promote the benefits of landholder participation. My purpose here is to critically analyse the current information provided to this target group, and discuss

alternative framings that may improve participation rates. Communications strategies are important for informing landholders about the purpose of a PLC program, how they can become involved, and the benefits of participation. Within this, there is much scope for promoting the benefits of any PLC scheme in a variety of frames. Previous studies indicate that a range of factors influence a landholder's decision to participate in PLC, for example, economic considerations, the adoptability of new practices, and the characteristics of landholders themselves have all been shown to be relevant (e.g. Ervin and Ervin 1982; Lynne, Shonkwiler and Rola 1988; Adesina and Zinnah 1993; Negatu and Parikh 1999; Greiner, Patterson and Miller 2009; Kuehne et al. 2013). I propose that social value orientation also plays an important role. Below I discuss what I mean by social value orientation, and explain why I have used this concept to critically analyse existing PLC messages.

### Background to value orientations: egoistic, social-altruistic and biospheric

The value orientation concept builds on the *homo economicus* (with apologies for the dated, sexist language) model of human behaviour that underpins traditional economics (see Persky 1995 for an overview), recognising that narrow self-interest alone does not always guide human decision-making. The value orientation concept identifies two general approaches that people take when allocating resources in a social dilemma scenario, reflecting the differing degrees of self-interest that individuals show for others. People tend to either maximise their own payoff (i.e. exhibit narrow self-interest) or maximise the joint payoff (i.e. display altruism) (Gärting 1999). People who display these alternative behaviours (i.e. 'value orientations') are referred to as non-co-operators (or pro-selves) and co-operators (or pro-socials), respectively. In the context of undertaking pro-environmental behaviours, a third value orientation, the 'biospheric' orientation in which an individual places primacy on the intrinsic value of the biosphere, is also relevant (De Groot and Steg 2007, 2008).

In this three value orientation framework, the pro-self value orientation is akin to the egoistic value orientation, while the pro-social value orientation is supplanted by both the social-altruistic and biospheric value orientations (De Groot and Steg 2007). This framework describes how values inform individual choices; with egoistically oriented people tending to weigh the cost and benefits for them personally; social-altruistically oriented people tending to weigh the costs and benefits to other people; and biospherically oriented people tending to weigh the costs and benefits to the biosphere

as a whole (De Groot and Steg 2007). Egoistically oriented people are more likely to value such things as social power, wealth, authority, influence and ambition; social-altruistically oriented individuals are more likely to value such things as equality, peace, social justice and helping others; and biospherically oriented people are likely to value such things as unity with nature, respecting the Earth and pollution prevention (De Groot and Steg 2007 following Schwartz1992). In describing these value orientations it is convenient to talk in an idealised manner, implying that individuals act as if they were of either one orientation or another. In reality, value orientation is a continuous concept (Murphy et al. 2011) and is better conceived of as a spectrum upon which individuals exist, and exhibit a combination of orientations that can vary across time.

The way information is framed can influence environmentally significant behaviour (Opdam et al. 2015), and when information is framed to align with a person's values and beliefs, it has the greatest influence on behaviour (e.g. Hong and Zinkhan 1995; Chernev 2004; Florack and Scarabis 2006; Ku et al. 2012). While individuals of a pro-social orientation (social-altruistic or biospheric) are more willing to engage in pro-environmental behaviour, this is not the only pathway by which an interest in and value for conservation may be evoked (Ives and Kendal 2013). Communications about PLC provides an opportunity to present the case for participation not only to the biospheric and the socialaltruistic, but also to the egoistic by emphasising those benefits that flow to the landholder or to society (or both) as a result of participation. As such, we could expect congruence between the benefits emphasised in PLC communications and engagement by landholders with corresponding value orientations. For example, an egoistically oriented landholder may not be strongly engaged by the promise of conservation benefits, but may be motivated by wider benefits such as increased land productivity, a sense of achievement, the respect of peers, or greater opportunity for social interaction. By analysing the way PLC organisations frame the benefits of participation to landholders, we can gain insight into the breadth of the audience that are likely to be engaged. To ensure that communications are relevant and engaging to as broad a range of landholders as possible, the PLC sector ought to ensure that these three different kinds of benefits are included in their messaging.

In this study, I examine the extent to which contemporary communications about PLC actively seek to engage individuals across the three value orientations. I make no assumptions about the dominant value orientation, if any, of rural landholders. In any case, a persons' orientation may change over time. My motivation is to understand how



messages are currently framed to inform approaches that may improve rates of participation in PLC schemes.

## 4.2 Methods

Communications pertaining to PLC schemes were analysed to identify the apparent benefits of each scheme. These were subsequently categorised as ‘benefits to landholders’, ‘benefits to society’ or ‘benefits to conservation’, corresponding to the value orientations outlined above. A sample of 20 Australian PLC schemes representing a variety of scheme types were chosen for content analysis (Appendix I). This analysis involved identifying sentences on the PLC scheme’s websites (accessed between December 2013 and March 2014) that described a benefit of participation, and coding these as either a benefit to landholders, a benefit to society, a benefit to conservation or as any combination of these. The proportion of each type of benefit as a fraction of the total benefits described by each scheme was calculated and then averaged across all schemes to determine the relative proportion of each type of benefit described by the websites, across the Australian PLC sector. Websites were used as a convenient proxy for the wider communications by PLC schemes, noting that the Web is a useful source of information for farmers (Morrison et al. 2008), and that websites are increasingly the ‘first point of contact’ for many businesses and organisations (Flannagan, 2014; Musante, Bojanic and Zhang. 2009).

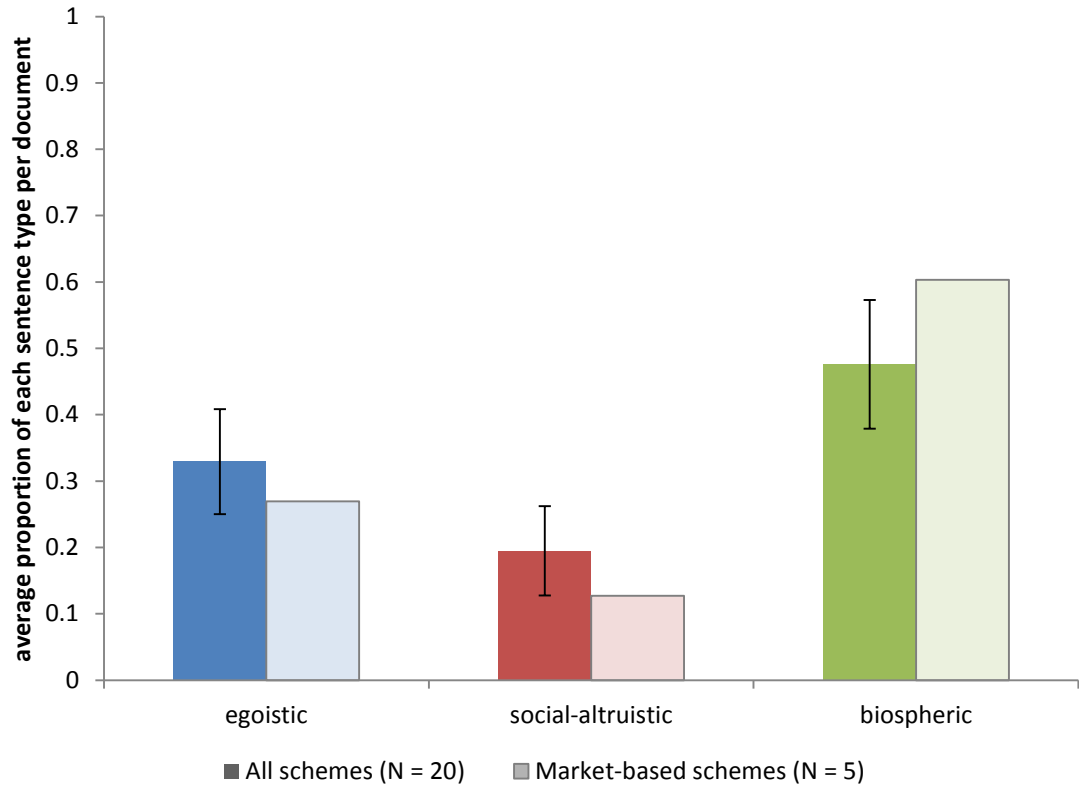
I employed a directed content analysis approach (Hsieh and Shannon 2005) whereby the coding was based on the a priori identified benefit types derived from value orientation theory (see Appendix J for the coding guide). All schemes were coded by a single coder, with double coding by a secondary coder to measure reliability. Double-coding was conducted on 27% of sentences (324 out of 1209 total sentences coded). The secondary coder agreed with the primary coder for 83% (140 of 168 sentences) of ‘non-benefit’ categorisations; 82.9% (63 of 76 sentences) of ‘pro-self’ (i.e. egocentric) categorisations; and 85.9% (85 of 99 sentences) of ‘pro-social’ (i.e. social-altruistic plus biospheric) categorisations. The ‘pro-social’ sentences were then coded to discriminate between explicit conservation related benefits and other social benefits more broadly (or as both). The double-coding by the second coder here consisted of 20% (53 of 266 sentences) for which there was agreement with the primary coder of 81% (43 of 53 sentences).

The initial count of landholder benefits included all apparent benefits, not all of which may rightly be considered as a ‘true’ benefit from the perspective of the egoistic value orientation. Many of these *prima facie* benefits are actually aimed at facilitating participation or removing barriers to participation, and do not offer a ‘true’ (egoistic) benefit in which a landholder would gain something from participation. For example, notional benefits such as minimal administration involved in participation, nil ongoing obligations, and free provision of additional fencing that may be required for participation may all be helpful in lowering the barriers to participation for landholders that already have an interest, yet offer no actual ‘reward’ for participation. Accordingly these types of benefits were identified and excluded, with 20% (59 out of 295) double coded, and both coders in agreement for 97% of instances (57 of 59 sentences).

Rather than looking solely at the total count of the benefit sentences for each value orientation, it is more instructive to consider the relative proportions of all benefits for each scheme that are framed in each orientation. To calculate this, I first took the total number of benefit sentences of each value orientation, for each scheme separately, and calculated the relative proportions that these comprised of the total benefits described by each scheme. For example, if Scheme A had three benefit sentences coded ‘egoistic’, two coded ‘social-altruistic’ and four coded ‘biospheric’, then the relative proportion of each orientation for that scheme would be given by 3/9 (i.e. 0.33), 2/9 (i.e. 0.22) and 4/9 (i.e. 0.44), respectively. By averaging these proportions across all schemes, the average relative proportion of each benefit type (i.e. value orientation) was calculated.

### 4.3 Results

The total number of sentences that describe a benefit of PLC, when categorised simply as pro-self, pro-social, or both, are strongly dominated by pro-social benefits (64% of all benefits). If we consider the benefit sentences framed in terms of the three value orientations, and account for the relative proportion of each category as a component of the total benefits described by the website for each scheme, and averaged across all schemes, we see that biospheric (conservation) benefits make up the greatest proportion. On average (across all schemes) biospherically framed benefits accounted for 48% of communications related to the benefits of participation, while egoistically framed (landholder) benefits made up 33% and social-altruistically framed benefits (to society) made up 19% (figure 4.1).



**Figure 4.1.** Average proportions of benefits that are framed as egoistic, social-altruistic and biospheric benefits. Solid bars show the proportion across 20 Australian PLC schemes. Error bars are 95% confidence intervals. Transparent bars show the proportion for 5 Australian market-based PLC schemes (n insufficient for error bar calculation).

Five of the 20 schemes analysed were market-based schemes in which landholders competitively bid for funds to undertake specified conservation activities. These schemes are distinct from other PLC schemes in their reliance upon markets to find prospective participants, and are inherently designed to appeal to the more egoistic oriented landholder. Hence, I thought it would be interesting to see what the relative frequency of each benefit type was for these schemes, compared to the average for the sector. I note that this data should be used cautiously when drawing inferences about market-based schemes generally, as it is derived from a small sample of only five schemes. For the market-based schemes, biospherically framed (conservation) benefits made up 60% of communications that related to the benefits of participation, while egoistically framed (landholder) benefits made up 27% and social-altruistically framed benefits (to society) made up 13% (figure 4.1).

## 4.4 Discussion

Of the three benefit types examined in this study, biospheric (conservation) related benefits are the most common type emphasised by PLC websites in Australia. The potential consequence of this bias is that landholders with a strong egoistic value orientation are less likely to be engaged by content on PLC program websites because the benefits have not been communicated in a way that aligns with their primary production interests (this would also include corporate farming entities). To ensure that egoistic landholders (and not only biospheric oriented landholders) are engaged by PLC program websites, new communication strategies need to be devised which link conservation interests to primary production and/or personal interests.

The under-representation of egoistic (landholder) benefits in PLC communications may stem from a cautious approach to the use of financial incentives in conservation. In certain circumstances, financial incentives have the ability to crowd-out intrinsic motivations for conservation practices, and can be counter-productive to promoting conservation land management practices over the longer term (e.g. Frey and Jegen 2001; Reeson 2008; Rode, Gómez-Baggethun and Krause 2015). However, 'joining the dots' from conservation outcomes to public benefits can extend also to egoistic (landholder) benefits without the need for direct financial incentives. By explaining how certain conservation practices may aid or maintain productivity (Carvalho et al. 2011; Scherr and McNeely 2008) and allow increased diversification of income streams (e.g. from market-based schemes) that in turn provide some insurance against the threat of bushfire and drought, etc., conservation outcomes may be framed in a manner more receptive to the egoistic oriented landholder. In any case, there is evidence that financial incentives are important in recruiting production-based landholders to PLC schemes (Moon and Cocklin 2011). The risk of such incentives crowding-out intrinsic conservation motivations only exists where there is already an existing intrinsic conservation motivation (Stern 2006), which may not necessarily be the case for egoistic landholders. If the underlying motivation for production-based landholders is to generate profit from the land there may be little competing conservation motivation to be crowded-out. Rather, a financial incentive alone or in conjunction with other non-financial landholder benefits, may provide the motivation required to retire marginally profitable land from cropping or grazing in preference for conservation. Whilst the communications of some schemes did make some of these connections, they were used infrequently.

Social-altruistic benefits (to society) were the least emphasised type of benefit, with more than twice as many biospheric (conservation) benefits emphasised. The social-altruistic benefits (to society) portrayed on the websites of PLC schemes tended to be less explicit and generally harder to define than either the biospheric (conservation) or egoistic (landholder) benefits. Given the relative subtlety with which the biospheric value orientation distinguishes itself from the social-altruistic value orientation, and generally only in instances of conflict between a pro-social outcome and a pro-environment outcome (De Groot and Steg 2007), this may be a missed opportunity to engage potentially receptive landholders. By explaining how conservation benefits will lead to, or could themselves be considered as public benefits, it may be possible to increase the emphasis of the social-altruistic benefits (to society).

### Market-based schemes

The proportions of benefit types for the market-based schemes shows a similar distribution to that of the sector as a whole, although rather surprisingly, it is even more biospherically (conservation) framed, with such benefits making up a greater proportion of the communicated benefits (60% compared to 48%). This comes at the expense of social-altruistic benefits (to society) (13% compared to 20%), and egoistic (landholder) benefits (27% compared to 33%). While I note the low sample size for this data, it arguably represents a lack of strategic framing, given that by providing monetary incentives to undertake conservation, market-based schemes seek in part to appeal to those landholders who would not otherwise be likely to engage in conservation behaviour without such financial incentives. As such, the significant focus on biospheric (conservation) benefits is arguably misaligned to the interests of this target landholder audience. Blackmore and Doole (2013) found that landholders who participate in market-based PLC are typically of a conservation mindset and are likely to engage in pro-conservation practices anyway. These findings suggest that market-based schemes do not appear to strategically frame the benefits of participation in a way that would engage a broad range of landholders, particularly egoistic oriented landholders who are a key target audience.

### Framing failure

This apparent failure of PLC scheme websites to make the case for conservation to those less biospherically oriented is consistent with criticisms that much of the

environmental movement continues to preach only to the converted (e.g. Hope 2014; Murray 2012) and is not engaging the ‘silent majority’. In discussing the importance of values in conservation messages, Ives and Kendal (2013, pp 71) point out that “many conservation messages fail to be as effective as they could be because the message is framed in a way that only a subset of people will find important” and thus communication strategies must be designed for the greatest effect.

There is also a possibility that an emphasis on biospheric oriented (conservation) benefits may not be necessary in engaging landholders, given that consumers with positive attitudes toward the environment are equally receptive to weak as well as strong ‘green’ product claims (Tucker et al. 2012). It may be that biospheric oriented landholders are easily engaged by the conservation aspect of a PLC communication, even where the emphasis may not actually be on the biospheric (conservation) benefits. Meanwhile the over-emphasis of these benefits may fail to engage egoistic and social-altruistic oriented landholders, However, Dayer et al. (2015) in a US case study found that in a setting in which financial incentives were emphasised, that inadequate participation resulted from landowners lack of appreciation of the conservation value of the targeted activity. This suggests value in using a range of complementary messages, rather than emphasis on any single benefit type.

### Future directions for PLC communications

This is the first study that I am aware of which has attempted to analyse PLC message content, and further studies are required to show how pervasive this pattern is across the international PLC sector. Future research could adapt the novel approach used here to investigate the communications of specific categories of PLC schemes. Future investigations could examine the messages used by schemes within each type of PLC mechanism to understand the degree to which the framing of these benefits matches the value orientation of the landholders that the policy is designed to appeal to. This could provide further guidance for the strategic framing of PLC benefits and insight into the imbalance in the use of benefit types observed in this study. Future research could also consider the range of communications provided to landholders (website, printed, verbal, social media) and compare the similarities or differences between these framings. Finally, understanding how messages are currently framed is a good first step, but we also need research that tests the impact of alternatively framed PLC communications on landholders with different value orientations.

## 4.5 Conclusions

Here I have shown that there is a bias across the Australian PLC sector toward the framing of PLC participation benefits as conservation benefits. Increased use of egoistic and social-altruistic frames in emphasising both landholder and social benefits of PLC may be advantageous in engaging a wider range (and greater number) of landholders. Appealing to a wider range of landholders is potentially key to improving participation rates.

However, I caution that any promised benefits must be reasonably achievable by the landholder through their participation; over-promising and under-delivering could be a sure-fire means of permanently deterring the participation of many landholders. Furthermore, we need to investigate the potential for unintended feedback effects of messages matched to other value orientations, for example, the potential for motivation crowding-out in egoistic (pro-self) messages. As a first step, I recommend PLC programs be aware of the value orientation frame implicit in their messages, and to consider whether this is a good match for their audience and their program's goal.





# 5 DECLINE OF 'BIODIVERSITY' IN CONSERVATION POLICY DISCOURSE IN AUSTRALIA

This chapter is an edited version of the submitted paper:

Kusmanoff AM, Fidler F, Gordon A, Bekessy SA. (In Review). Decline of 'biodiversity' in conservation policy discourse in Australia (submitted to *Environmental Science & Policy*).

## Abstract

Market-based instruments, along with conceptualising the environment as a collection of 'ecosystem services', have become increasingly common within environmental and conservation policy. This kind of thinking is also increasingly prominent in the public discourse surrounding environment and conservation policy, particularly in the context of communicating the importance of policy measures. Language used in public discourse can have a powerful influence on how people engage with policy issues, and changes within the biodiversity and conservation discourse may have consequences for public engagement in conservation. I explored how these factors are changing with time by documenting the use of the terms 'biodiversity' and the prevalence of economic language in the text of 3553 media releases between 2003 and 2014 from the Australian Government environment portfolio, and 1064 media releases from the Australian Conservation Foundation (ACF). Results show that in the last decade, the term

'biodiversity' has become less prevalent whilst economic language has increased in both Australian Government and ACF communication. A further content analysis in a subsample of 745 media releases explored the prevalence of ecosystem services framing, results indicating that it has become a mainstream concept. While this may reflect a strategic response by these agencies to better engage with both the general public and decision makers within what is an increasingly dominant neoliberal paradigm, I argue it may also have unintended (possibly adverse) impacts on how people think about and engage with biodiversity conservation.

## 5.1 Introduction

How people think about an issue is significantly influenced by the way it is represented in the discourse within which it sits. Consequently, environmental discourse influences how 'the environment' is understood and addressed by society (Dryzeck 2013; Gustafsson 2013), including how it is governed (Fairclough 1992; Coffey 2015). Given that we are in the midst of a 'biodiversity crisis', this raises questions about how biodiversity is represented within the discourse concerning public environmental policy. Biodiversity loss is recognized as one of the most critical environmental problems (Gordon 2006; Gustafsson 2013) and remains so, despite global efforts to tackle it (Butchart et al. 2010).

Public environmental policy sits within the (non-exclusive) remit of national governments via a range of policy tools. Many national governments have specific responsibilities for biodiversity conservation as signatories to the *Convention on Biological Diversity* (1992). This makes environmental policy inherently political in its nature. It is also of central importance to conservation non-governmental organisations (NGO), some of which have direct roles in conservation programs, but most of which seek to play some role in conservation advocacy. It has been argued that environmental NGOs are uniquely suited to build the links and advocate for the actions needed to curb biodiversity loss (Gunter 2004). As a result, both governments and conservation NGOs provide a significant contribution to the public political discourse on environmental and conservation issues. Much of this discourse is in the form of media releases about prominent environmental policy issues of the day.

One approach to analyzing discourse is to identify different 'frames'. While there is no precise universal definition of what a 'frame' is (Cappella and Jamieson 1997; Druckman 2001), frames generally "select some aspects of a perceived reality and make

them more salient in a communicating text" (Entman 1993, pp 52). In this way frames can provide both a framework by which people "locate, perceive, identify, and label" information and events (Goffman 1974, pp 21) and thereby understand the world, and also provide a central organising idea which makes sense of relevant events, and highlights what is at issue (Gamson and Modigliani 1989). All information exists within a frame of some kind, and it is well established that the way information is presented and framed can significantly affect the way people understand and respond to it (e.g. Harris 1973; Tversky & Kahneman 1981; Gamson & Modigliani 1989; Entman 1993; Druckman 2001). As such, understanding how issues within a discourse are framed can provide insight into the way issues are thought about by a society.

Of interest to me is how the public environmental policy discourse has changed over the last decade, including the concept of 'biodiversity' and the use of economic rationales within the discourse. 'Biodiversity' is the contracted form of 'biological diversity' and lacks precise definition, but is generally used to conceptualise heterogeneity at multiple levels of biology, such as within organisms, within populations, within communities and within biomes (Haila & Kouki 1994). As such, the same term can be used with different meanings within different contexts (Haila & Kouki 1994; Kaennel 1998), including as shorthand for 'life on Earth', or as a natural resource to be exploited (Haila & Kouki 1994). Biodiversity loss has become one of the key issues of the environmental movement (Takacs 1996) and is central to the discipline of conservation science. Arguably this connection has (at least previously) enabled biodiversity loss to remain a relevant public policy issue where concern for other environmental issues has been subject to the 'issue-attention cycle' (Hannigan 1995). However, concern about biodiversity loss has seen the term 'biodiversity' used across many disciplines (Väliaverronen 1998) and in myriad ways, ensuring that it has become a more complex concept than its original 'biological diversity' (Takacs 1996).

Concurrent with the evolution of biodiversity, is the genesis and increasingly prominent concept of 'ecosystem services'. Ecosystem services are the useful and essential services that nature provides humans, for example, a supply of clean air, drinking water, food, building materials, pollination, etc. Originally developed in the 1970s as a communication tool to attract public interest in biodiversity conservation (Westman 1977), it is arguably now "the dominant paradigm framing research and policy making in biodiversity, ecology and conservation biology" (Silvertown 2015, pp 641) and facilitates the valuation of biodiversity in monetary terms (Costanza 1997; Spash 2008;

Silvertown 2015). This is consistent with the broader rise of neoliberal ideology in public policy since the late 1970s (Purcell 2009), including within environmental policy (Coffey 2015).

Here I ask whether there has been an increase in the use of ‘ecosystem services’ within environmental policy communication, similar to that which has occurred within policy making, and if so, whether this corresponds to an increase in economic arguments appearing alongside environmental arguments in the policy communication discourse. I was also interested in how the frequency of use of the term ‘biodiversity’ within environmental policy discourse compares with its use within the scientific discourse. As a starting point in tackling these complex issues, I used Australia as a case study and analysed the text of media releases from the Australian Government environment portfolio and the Australian Conservation Foundation (ACF), a large conservation advocacy NGO. I tracked use of the term ‘biodiversity’ and the prevalence of economic language over the period 2003 to 2014. I also investigated the prevalence of ecosystem services framed rationales within a subsample from each organization. Because a discourse enables people to interpret information and create meaning and narratives about issues, changes in the frequency of terms and concepts may be indicative of a change in how they are understood.

## 5.2 Methods

In order to be able to understand how the data from the policy discourse compares with the scientific discourse, I first interrogated the Web of Science database (Web of Science 2016) and recorded the proportion of publications for each year that included the terms ‘biodiversity’ and ‘ecosystem services’ within title, abstract or keywords between 2003 and 2015.

I then analyzed the policy discourse by first conducting a text search to document the prevalence of key terms in 4617 media releases. These comprised of 1064 media releases published by the Australian Conservation Foundation between 2004 and 2014 and 3553 media releases published by Ministers within the Australian Government environment portfolio (‘Australian Government’) between 2003 and 2014. The ACF releases were downloaded from the ACF website ([www.acfonline.org.au](http://www.acfonline.org.au)) and the Australian Government releases from 2003 to 2012 were provided by Department of the Environment staff and those from 2013 to 2014 were downloaded from the Department of the Environment website ([www.environment.gov.au](http://www.environment.gov.au)). The ACF provides an

appropriate NGO comparator to the Australian Government, as it campaigns on a national level and is one of the most prominent national environmental advocates in Australia, although it may not necessarily be considered a proxy for all Australian NGOs.

All Individual media releases were subjected to key word searches. I searched for the term 'biodiversity' and for the term 'econo' as the root of 'economic', 'economy', and 'economist', allowing the inference that the presence of these terms indicate that economic considerations are present in a media release (Fig 5.1). In order to compare use of these terms over time, I calculated the percentage of the total media releases that contained at least one instance of a term for each year, for both the ACF and the Australian Government media releases. Although the presence (or absence) of the term 'biodiversity' or of economic language doesn't give any information about the broader frame within which these concepts are used, changes in the frequency with which these concepts are used can provide an indication that the way in which these concepts are thought of or are communicated, have changed.

I also conducted a more detailed content analysis on a subsample of 745 media releases. This comprised of 229 ACF (approximately 20% of all 1064 ACF releases) and 516 Australian Government (approximately 15% of all 3553 Australian Government releases) media releases to identify those that framed the environment in terms of 'ecosystem services' within any part of the document (Fig. 5.1). The specific term 'ecosystem services' itself was unsurprisingly not present in the media releases, as this is a technocratic term with little meaning for the public with whom the media releases seek to communicate. However, I was interested in the presence of statements that used this conceptual logic (present in many releases), which necessitated a content analysis, rather than a simple text search. Content analysis was necessary as there is no keyword or phrase that could be considered diagnostic for the presence of ecosystem services logic or rationale.

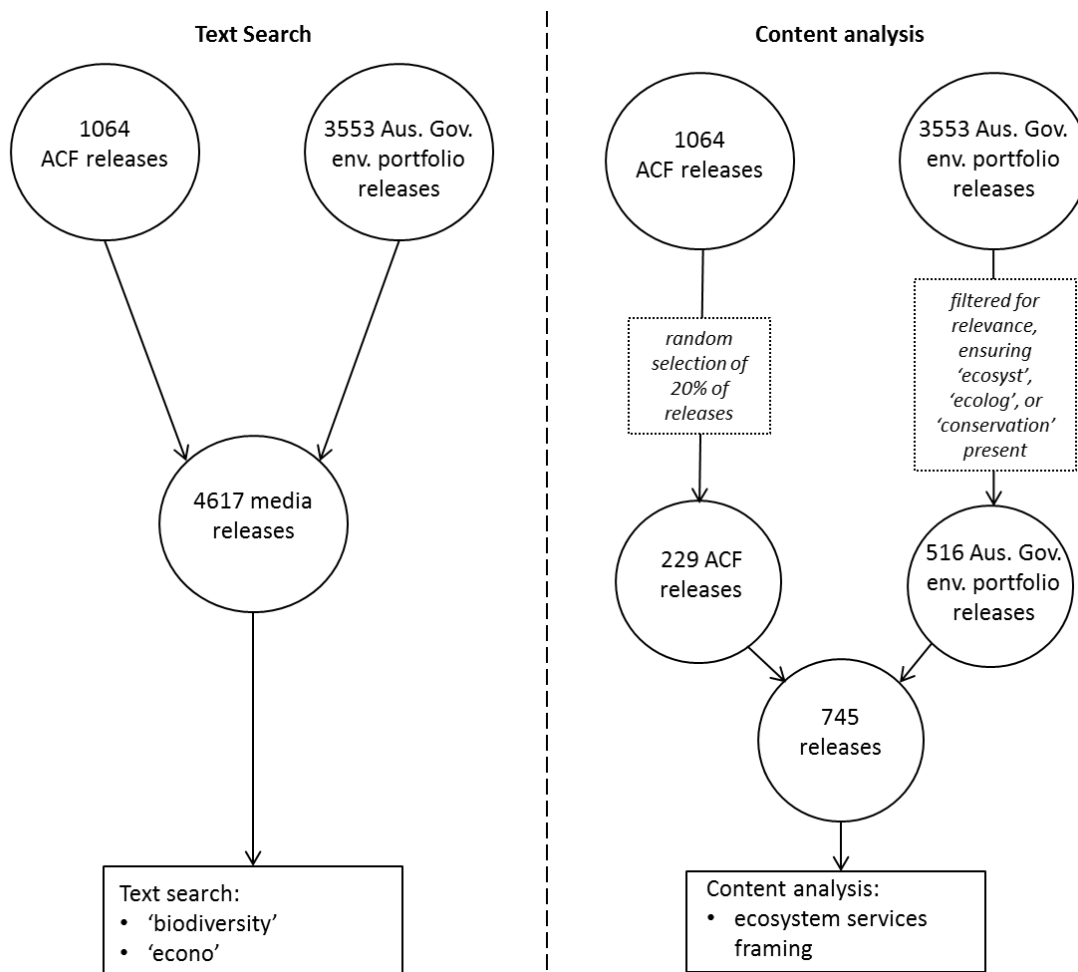
To be counted as including an ecosystem services concept, media releases had to refer to a human benefit being derived from nature. The mere mention of a primary industry (e.g. fishing, forestry, etc.) was not itself sufficient, but where a media release taken as a whole created a connection between the environment and a resulting provision of a human benefit, this was sufficient to be counted as containing an ecosystem services 'frame'. For example, the following would be counted:

*“Australia’s marine environment generates \$52 billion annually for the national economy in tourism, fisheries and other areas...” (ACF, Sept 13 2004).*

In contrast, the following would not be counted as an ecosystem service frame:

*“The Great Barrier Reef is one of our most significant environmental assets.”*  
(Minister Garrett, June 18 2008).

Although both examples attribute ‘value’ to the environment, the latter does not link the environment with the provision of any particular service or human benefit. The coding guide is presented in Appendix K.

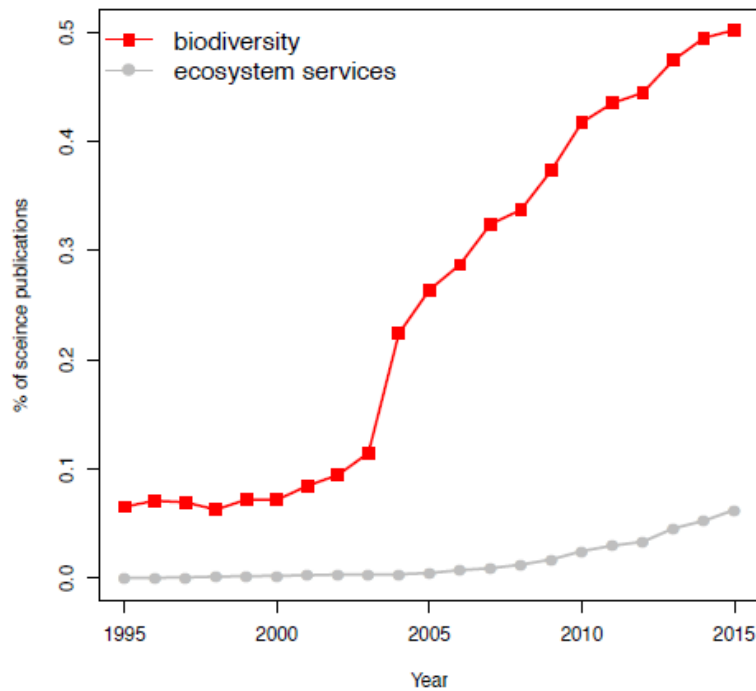


**Figure 5.1.** Methodological flow chart for analysing media releases from the Australian Government environment portfolio and the Australian Conservation foundation (ACF). All releases were subjected to a text search for ‘biodiversity’ and ‘econo’ and a subsample of the releases were subjected to content analysis to identify use of ecosystem services logic. To ensure that the sub-sample of Australian Government environment portfolio releases were relevant, only those with at least one instance of the terms ‘ecosystem’, ‘ecolog’, or ‘conservation’ were selected. The ACF sub-sample was a random selection.

From time to time, there has been an inclusion of non-environmentally relevant areas of ministerial responsibility within the broader environment portfolio (e.g. this included heritage and the arts between 2010 and 2013). To ensure that the Australian Government releases included in the content analysis sub-sample were of a subject matter for which an ecosystem services frame could have relevance, these releases were screened such that only those that included at least one instance of the key words 'ecosystem', 'ecolog', or 'conservation' were used. In contrast, all ACF releases were taken to have potential relevance for ecosystem services framing, and the sub-sample used for the content analysis was randomly generated. To ensure reliability of the coding, approximately 10% (77 out of 745) of the coded documents were reviewed by an independent coder who agreed with the primary coder in 92% (71 of 77) of cases. The method for calculating confidence intervals for proportions recommended by Newcombe and Altman (2000) was used to calculate 95% confidence intervals for the proportions of media releases that contained ecosystem services frames.

### 5.3 Results

References to 'biodiversity' over the last decade or so in the world wide scientific literature (available on Web of Science) have increased significantly from 671 out of 1,024,674 publications in 1995 (0.07% of total publications) to 19,107 out of 3,806,894 publications (0.5%) in 2015. References to 'ecosystem services' have also increased markedly over the same period, from just 5 instances of its use out of 1,024,674 publications in 1995, to 2384 out of 3,806,894 publications in 2015. As a percentage of the total publications, this represents an increase from effectively zero to 0.06% (Fig. 5.2).

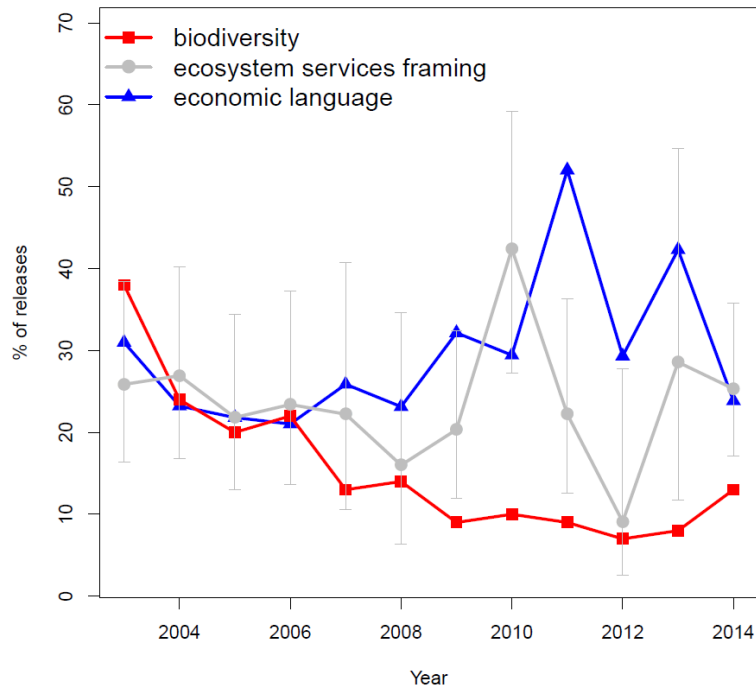


**Figure 5.2.** Percentage of scientific publications containing ‘biodiversity’ and ‘ecosystem services’ within the title, abstract or keywords. Data derived from Web of Science (<http://apps.webofknowledge.com>).

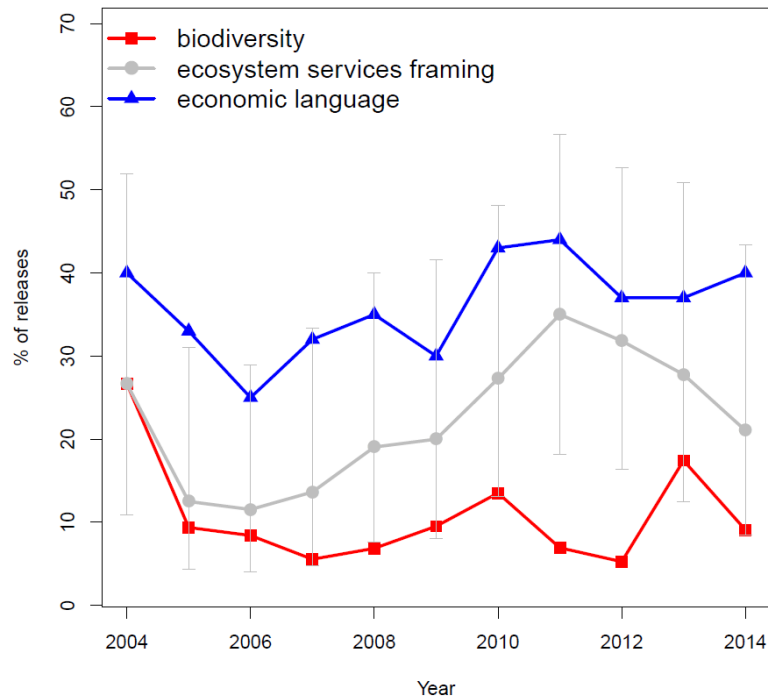
In contrast, there was an overall decline in the use of the term ‘biodiversity’ in media releases from both the Australian Government environment portfolio (Fig. 5.3) and the ACF (Fig. 5.4). This decline is steeper for the Australian Government, although there is a small but noticeable increase in use of the term in government media releases from 2014. This spike may be directly traced to a focus of the incoming Government at this time on threatened species, with 53% (17 of 32) of the 2014 releases that referred to ‘biodiversity’ also including references to ‘threatened species’ which included 16% (5 of 32) with specific reference to a newly appointed Threatened Species Commissioner. Interestingly, this coincides with a steeper decline in ‘biodiversity’ for the ACF releases between 2013 and 2014.

In general, both ACF and the Australian Government tend to use economic language in their media releases more often than they use the term ‘biodiversity’ (Fig. 5.3 and 5.4). For the Australian Government this occurs after 2006, while for the ACF economic language was dominant for all years. Averaged across the 2004-2014 period, the ACF uses ‘biodiversity’ in only 9% of its media releases, yet it uses economic language in 36%. Over a similar period (2003-2014), the Australian Government uses ‘biodiversity’ in 16% of media releases and economic language in 29%.





**Figure 5.3.** Percentage of 3553 Australian Government environment portfolio media releases that contain 'biodiversity', 'econo' and ecosystem services framing over time. Error bars are 95% confidence intervals for the ecosystem services framing sub-sample (n=516).



**Figure 5.4.** Percentage of the 745 Australian Conservation Foundation media releases that contain 'biodiversity', 'econo' and ecosystem services framing over time. Error bars are 95% confidence intervals for ecosystem services framing (n=229).

Despite the increase in use of economic language, there is no clear trend in the use of ‘ecosystem services’ framing which varies between 9% and 42% of the sampled releases for the Australian Government (Fig. 5.3) and 12% and 35% for the ACF (Fig. 5.4) across the period, though there is a suggestion of a peak in ecosystem services framing around 2010 to 2011. The presence of economic language and of ecosystem services framing trace similar curves within each agency, although this is different for each agency and more similar for the ACF than the Australian Government. The ecosystem services and ‘biodiversity’ lines noticeably separate around 2009 (Australian Government) to 2010 (ACF), with ecosystem services framing subsequently more prevalent than ‘biodiversity’ through till 2014 where the dataset ends. The data for the ACF shows a consistent increase of ecosystem services framing across five years from 2006 to 2011. This represents the most consistent trend across the data.

## 5.4 Discussion

The presence of ecosystem services framing in Australian Government media releases will partly be influenced by the public service practice of developing ‘standard words’ in relation to an issue. In such cases once approved language has been developed for a given issue, this same language tends to be re-used whenever the same issue is addressed, until it is eventually superseded by new language. As a result, if ecosystem services language is used in an initial release about an issue that remains topical, subsequent releases will likely also use this same language, reflecting a local peak in the data. For example, the 2010 peak in the Australian Government data is influenced by five separate releases concerning the ‘East Marine Region Assessment’ that each use the same ecosystem services language. A corresponding peak in the ACF data is dominated by releases concerning the Murray-Darling Basin, an important region for Australian Agriculture.

While the temptation to over-interpret the data should be resisted, particularly owing to the large confidence intervals, it raises some important questions. Foremost, what is driving the observed decline in use of the term ‘biodiversity’ in the media releases? It is interesting that although use of ‘biodiversity’ is increasing in the scientific discourse, our results show its use declining in the policy discourse. This raises a question of whether this reflects a deliberate strategy by communication practitioners to replace ‘biodiversity’ with alternative terms considered to be more effective for communicating policy. Perhaps owing to its lack of fixed definition and broad usage across disciplines, ‘biodiversity’ is a concept that political communicators find unhelpful for engaging

people; it has even been suggested that the term be deliberately avoided (Shanahan 2008). However, our results (particularly in relation to the Australian Government releases) indicate not that 'biodiversity' is little used in such communications, but rather, that its usage has *declined*. This may reflect a change in the way 'biodiversity' is understood, or a change in the level of public or government support for biodiversity conservation, and likely also corresponds to changes in the way biodiversity and similar concepts such as nature are framed. The rise of the biodiversity concept itself displaced similar (previously abundant) concepts such as 'wilderness' and 'nature' in conservation discourse (Takacs 1996), and perhaps it too is now falling from favour and currently in the process of being supplanted by an alternative concept. Alternatively, other environmental issues (climate change for example) may have come to occupy the limited discourse space available (Verissimo et al. 2014), and that the resilience to the issue-attention cycle of biodiversity loss (e.g. Hannigan 1995) has somehow been lost. Here I have only analysed for the presence and absence of the term 'biodiversity', but these results raise interesting questions that could be explored by future research specifically designed to interrogate these questions.

Results also show that economic language is often (and increasingly) present in the policy discourse, and is more commonly used than the term 'biodiversity' (Fig. 5.3, 5.4). This may be counter-productive to promoting conservation goals; a growing body of literature raises concerns about the way utilitarian framing of ecological concerns may influence human perceptions of and relations to nature in a manner counterproductive to conservation (Rees 1998; McCauley 2006; Spash 2008; Gomez-Baggethun et al. 2010; Kosoy & Corbera 2010). It is well established that extrinsic rewards (typically monetary incentives) can 'crowd-out' intrinsic motivations for conservation behaviours and result in a reduction in targeted behaviors over the longer term (e.g. Frey & Jegen 2001; Stern 2006). Thus there is reason to expect that communications that simply mention an economic value for components of biodiversity may have similar effect (also see Chapter 3). Through emphasizing the financial benefits of nature, the intrinsic motivations for biodiversity that drive public interest in nature may become crowded-out and gradually eroded. The observed trend for conflating economics and conservation occurs in the context of the growing dominance of 'ecosystem services' (Silvertown 2015).

Various authors have explained the lack of community support for biodiversity conservation as a result of the public's lack of knowledge about the benefits of

biodiversity (Hunter & Brehm 2003; Buijs et al. 2008). The increase in economic considerations within the policy discourse may thus reflect a strategic approach to communication, based on this view. However, the inclusion of economic considerations within environmental policy communications implicitly supports the assumption that it is a lack of economic quantification of the environment that results in its destruction. This serves to reinforce the (neoliberal) view that nature is important only to the extent that it provides goods and services of economic value to humans (McCauley 2006). The unintended consequence of this view may be that through emphasising the value of biodiversity, an expectation is created whereby nature must be seen to have a demonstrable and quantifiable value in order for it to warrant protection. Such a worldview would make it even more difficult to motivate people to support the protection of 'ugly' and 'useless' biodiversity.

## 5.5 Conclusions

Although this study is centred on this limited Australian case study, the trends identified are worthy of note. Irrespective of the reasons behind these trends, because discourse is constructive as well as reflective (Fairclough 1992), such changes may both exert and reflect change. In reinforcing the view that nature is of economic value, such policy communicates unavoidably place biodiversity conservation within an economic frame. This arguably promotes an understanding of 'biodiversity' as a resource to be exploited and undermines its alternative understanding as the 'life on Earth' (e.g. Spash 2008). As it is well established that the way information is framed can significantly affect the way people understand and respond to it, it is likely that this will influence the public understanding and enthusiasm for biodiversity conservation. In my view, conservation communicators should strategically consider how to phrase and frame messages for greatest immediate impact, as well as also giving consideration to how this may shape the discourse over time.

# 6 STRATEGIC FRAMING FOR MORE EFFECTIVE BIODIVERSITY CONSERVATION MESSAGING

This chapter is an edited version of the paper in preparation:

Kusmanoff AM, Fidler F, Gordon A, Bekessy SA. (In Prep). Strategic framing for more effective biodiversity conservation messages.

## Abstract

Because the conservation of biodiversity is a social and political process, conservation policies are more effective if they can create shifts in attitudes and/or behaviours. As such, communication and advocacy approaches that influence attitudes and behaviours will be key to addressing conservation problems. Research in communication, sociology, psychology, and political science has shown that the way an issue is ‘framed’ can influence how people view, judge, and respond to an issue. I contend that by strategically considering how conservation communications are framed, messages can be made more effective with little or no additional cost. Here I provide a practical guide and outline key considerations to aid communicators in framing their messages for greater effect.

## 6.1 Introduction

Biodiversity loss is recognized as one of the most critical environmental problems (Gordon 2006; Gustafsson 2013). While it is common for 'nature' to be perceived as being separate from the controlled urban environment that most of the world's population inhabit (particularly in Western societies) (Vining and Price 2008), human activities are the primary agent of biodiversity loss, driving key threatening processes such as habitat loss due to overexploitation of natural resources, agriculture, urban development, damage from introduction of invasive species and pollution, etc. (Millennium Ecosystem Assessment 2005; Maxwell et al. 2016). As such, the protection of biodiversity is a social and political process, which must include changes in human behaviour (Brechin et al. 2002; Schultz 2011). This means that communication and advocacy approaches that better influence attitudes and behaviour will be key to addressing conservation problems.

It is well established that the way information is presented and framed can significantly affect the way people understand and respond to that information (e.g. Harris 1973; Tversky and Kahneman 1981; Gamson and Modiglian 1989; Entman 1993). 'Framing' is a broadly used term that refers to the way an issue is described or how a problem is conceived, articulated and approached. It is relevant at a variety of communication scales, such as the semantic e.g. referring to immigrants as 'illegal' versus 'undocumented'; see Merolla et al. (2013), to the framing of entire issues, such as climate change being framed as either an environmental issue, a public health issue or a national security issue (see Myers et al. 2012). While conceptually separate there is no clear delineation between framing at the semantic level and the issue level. And although framing has been used in health promotion campaigns and increasingly in energy and water conservation initiatives (e.g. Berk et al. 1980), it has not been well studied in biodiversity conservation communications, and is largely absent from the literature. There is also little or no guidance on how communicators can strategically think about and use various framing effects to enhance their communications, particularly in the context of biodiversity conservation.

Much advocacy, including within conservation biology, has traditionally used the knowledge-deficit model, which essentially assumes that people will adopt the targeted behaviour if they can be educated and informed about that behaviour and why it is 'better'. This approach can be problematic, as human behaviour results from the interaction of numerous factors, notably a person's values, attitudes and relevant social

and personal norms, rather than resulting simply from rational thought (Ajzen 1991). There is a growing awareness that various factors that influence behaviour can be leveraged by social ‘nudges’ in order to promote public policy (e.g. Thaler and Sunstein 2008), including biodiversity conservation (Akerlof and Kennedy 2013). Many of these factors also have potential to be leveraged by communications that are ‘strategically’ framed to emphasise (or minimise) relevant aspects of a given ‘reality’.

In the context of biodiversity conservation, communication and advocacy is sometimes about providing information and seeking to influence attitudes over time, and is not always about motivating a particular behaviour or choice; often it is about generating popular support or acceptance of government policies or interventions, or even helping to make people more receptive to future messages to be targeted at a particular behaviour. By understanding how framing effects occur, messages can be strategically shaped to be more effective, either when messages are aimed generally, or at particular behaviours. This need not be limited to advocacy or to written media, but can be used to guide the framing of any kind of communication. Here I refer to this as ‘strategic framing’, and although I particularly focus on written media, which is of most use in reports, public advocacy, blogs and social media, much of this will also be relevant to audio-visual media including podcasts and videos. For example, Krantz and Monroe (2016) discuss an application involving strategically framed videos designed to appeal to forest landowners.

Here I outline key elements that can help conservation communicators consider how best to strategically frame their messages. I do not seek to prescribe how strategic framing ought to be undertaken, but I provide a practical starting point for those wishing to improve the way they deliver their messages.

## 6.2 Framing

‘Framing’ is not a universal term and is used differently across disciplines (Cappella and Jamieson 1997; Druckman 2001). However, at its heart, framing is about emphasising (or obfuscating) certain aspects of an issue (Entman 1993; Myers et al. 2012), whether intentionally or otherwise. Social surveys have demonstrated that minor differences in phrasing can result in significantly different answers. For example, in a study by Harris (1973), when respondents were asked, “How long was the movie?” the average answer of respondents was 130 minutes, but when asked, “How short was the movie?” the average answer was 100 minutes. Similar effects have been demonstrated

in other contexts, including with respect to ‘tall/short’, ‘frequently/occasionally’ and ‘allow/forbid’ (Rugg 1941; Harris 1973; Loftus 1975; Schuman and Presser 1981). These examples demonstrate the power of words and demonstrate that differently phrased, yet objectively equivalent language can influence how people respond to information. Thus the language chosen to deliver information is important, and is much more than just a stylistic consideration.

The classic example of framing comes from the work of Kahneman and Tversky (1981, 1984) and their well-known ‘Asian disease’ problem, as outlined in Chapter 1. This and similar work by Tversky and Kahneman led to their development of ‘prospect theory’, which proposes (amongst other things) that rather than being strictly rational, people tend to weigh losses more heavily than equivalent gains. Subsequently, much framing research has centred on how to apply prospect theory to make messages more effective, asking when is it most effective to highlight risks versus benefits? (Levin, Schneider and Gaeth 1998; Myers 2010). Another well-known example is Meyerowitz and Chaiken’s (1987) study concerning breast self-examination (BSE). In this case the frame that highlighted the potential for loss (i.e. that not performing self-examination decreases the chance of finding a tumour in the early, more treatable stages of the disease) was more effective at influencing attitudes and behaviour than the frame that highlighted the gains. This results from prospect theory’s interaction with attitude to risk; positive frames that highlight gains tend to create a preference for definite outcomes (i.e. risk aversion), whereas negative frames that highlight loss will result in an increased preference for risky choices (i.e. encourage risk-taking) (Ku et al. 2012). (Note that in the BSE example the risky-choice is taken to be engaging in BSE, because this brings with it the potential distress (i.e. ‘risk’) of finding a tumour).

However, framing is not limited to generating preferences for objectively equivalent but differently framed choices. For example, Gifford and Comeau (2011) demonstrated how appeals that emphasised the personal benefits of taking climate action (i.e. lifestyle and quality of life improvements) rather than emphasising the need for making sacrifices (i.e. drive less, use less power) were associated with greater climate change engagement, and behavioural intentions. Framing is also a broader concept than just placing an emphasis on losses versus gains; framing can also refer to the way issues are conceptualised, and how people “locate, perceive, identify, and label” information and events (Goffman 1974, pp 21). According to Hallahan (1999, pp 224) “[f]raming puts information into a context and establishes frames of reference so people can evaluate



information, comprehend meanings and take action”. This means that how an author frames information can influence the way that information is understood by the audience. This can be seen in the way that politicians seek to frame issues to serve their own interests; for example, the proposed Australian Carbon Pollution Reduction Scheme of 2008 was championed by its proponents as an important *environmental* policy, but framed by its detractors as bad *economic* policy. This kind of framing is often referred to as ‘issue framing’ and can emerge in an ad hoc fashion, as well by the careful and strategic actions of high profile communicators (often referred to as ‘elites’) and the media (Entman 1993; Entman and Page 1994; Hallahan 1999). Framing can be undertaken by shaping different aspects of a communication, for example situations, attributes, choices, actions, issues, responsibility and news can all be the subject of framing (Hallahan 1999). Frames influence people’s preferences “because a substantively different consideration is brought to bear on the issue at hand” (Druckman 2001, pp 235).

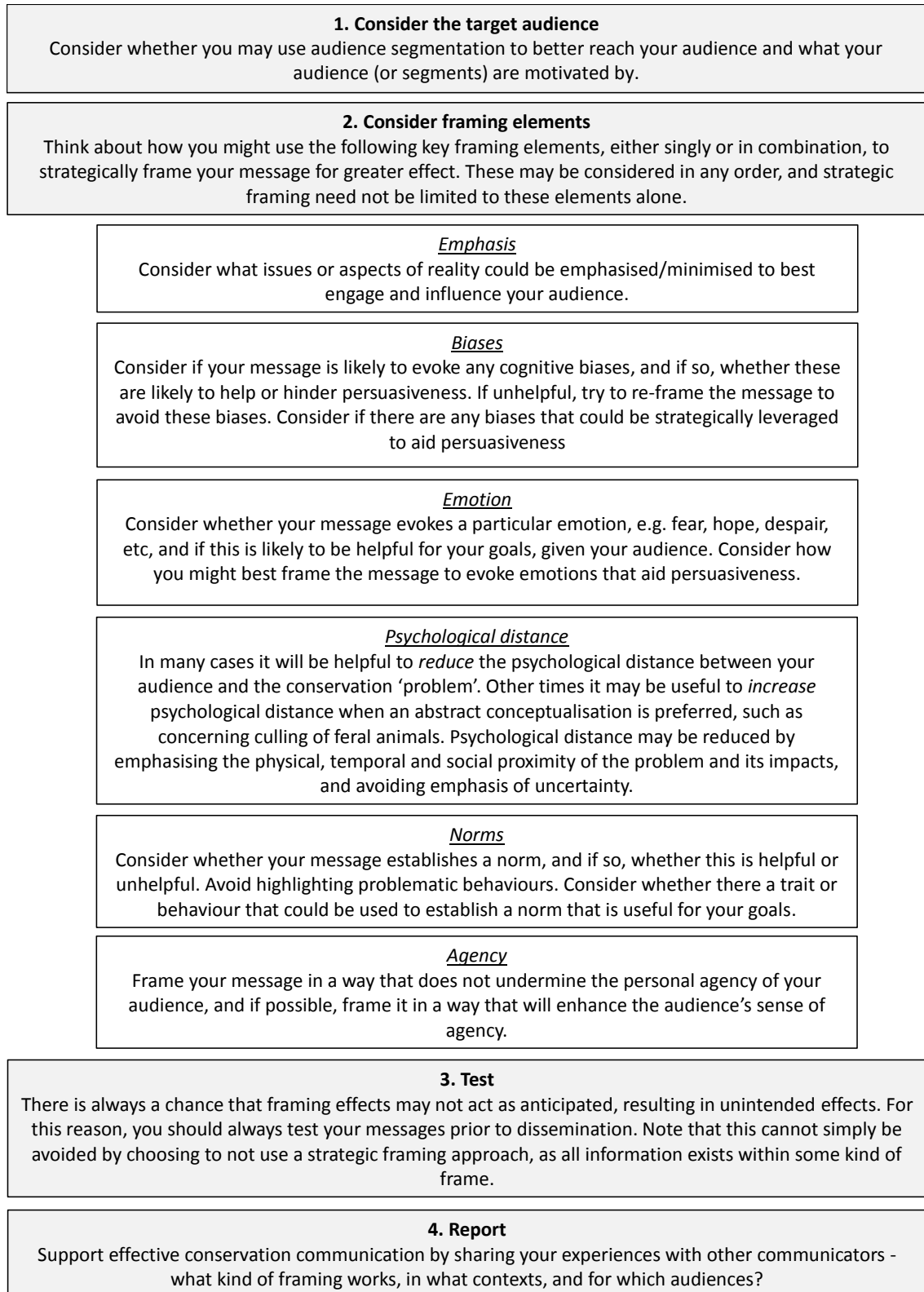
In most ‘real world’ situations, the way information is communicated will rarely be applicable to a single discrete type of framing, in most cases several of the categories discussed above will apply (as discussed in Chapter 1). In addition, frames emphasised in one setting, for example the low-fat nature of a food product, interacts with other frames of reference. In this case the low-fat claim interacts with discourse on public health in which fatty foods have been labelled as problematic. This discourse on the fat content of food has been framed by various actors, including media and industry groups, with actors often presenting information within frames that support vested interests. Hence a range of actors, influences, and types of framing will be at play in most situations.

### 6.3 Strategic use of framing

All information exists within a frame of some kind, and there is no way to present information that is devoid of a frame; communicators can choose to be aware of the influence of framing and utilize it, or they can remain ignorant to it. The degree to which framing considerations influence the persuasive impact of a strategically framed message will depend on the types of benefits or harms contemplated, the emotive strength of the language used and the personal relevance to each message receiver (Spence and Pidgeon 2010). Framing effects often depend heavily on context, are complex and can be unreliable. But, given the influence that framing can have,

communicators should consider how to most strategically frame their message in order to enhance its effectiveness.

For biodiversity conservation advocates, messages are going to interact with the contemporary framing of issues within the zeitgeist of the target audience; this includes the audience's existing schema (i.e. mental framework), mental models and values (Myers et al. 2012). As such there is no ideal frame for all conservation issues, but there are some key considerations that can guide the framing of messages to be more engaging and effective for a given audience. Below I briefly outline key aspects that have been shown to influence attitudes and behaviour in the literature, and identify where strategic framing has the potential to enhance conservation messages. The process by which strategic framing can be practised is outlined in figure 6.1. These aspects are described in further detail below.



**Fig. 6.1.** Strategic framing is a process that can be applied to the shaping of any communication that considers how key aspects of framing may be leveraged or avoided in order that a message is as effective as possible for its purpose. This purpose need not be limited to advocacy, and the framing aspects considered need not be limited to those included in the figure. Understanding the intended audience should always be the first step and testing and reporting the message will occur last, however the remaining steps may be undertaken in any order.

## Audience

A central principle of effective communications is the clear identification of the context and audience (e.g. Maibach and Parrott 1995). Particularly relevant to framing is a consideration of what is likely to engage or motivate the intended audience and how that audience will be reached.

While it is tempting to think that one might craft a single perfect message and broadcast it (or put it on a webpage) and influence everyone in the same way, this is naïve. It is likely that the target audience comprises a variety of people, and thus messages should be tailored to the different interests and needs of the audience segments. There is already much in the marketing literature on this approach (e.g. see Maibach, Roser-Renouf and Leiserowitz (2009) for an example of market segmentation for climate change) which typically uses demographic information to divide the general public into discrete and uniform groupings to facilitate marketing communication that best matches each subgroup. This is more efficient than a generic marketing approach that tries to speak to all subgroups simultaneously (Hine et al. 2014). Personalised messages (whether for individuals or specific groups) can be more effective and avoid possible adverse effects from a one-size fits all approach (e.g. La Rose et al. 2008). While resources may dictate that the available means of communication are limited, even a well-designed web-page is capable of providing differently framed messages on different pages with the aim of engaging a variety of audiences. However, if a communication is constrained to a single mode of broadcast or dissemination, communicators should think carefully about the audience with whom they most wish to reach and influence, and frame it with that group in mind.

A part of knowing the audience is understanding what motivates them. While economic theory assumes rationality, wherein people choose the action that presents the greatest payoff, in reality individuals weigh different costs and payoffs differently. Broadly speaking, people may tend to act in ways that either maximise their own payoff (i.e. they are motivated by self-interest), or maximise the payoff to society (i.e. are motivated by altruism) (Garling 1999), or in the context of pro-environmental behaviour, to maximise payoff to the biosphere (i.e. an environmental motivation) (De Groot and Steg 2007, 2008). While people do not necessarily act according to only one of these ‘value-orientations’ in all situations, an individual’s orientation will likely influence the sorts of things they value more. For example, an individual motivated by self-interest is likely to value elements such as social power, wealth, authority, influence and ambition; while

those motivated by altruism are more likely to value equality, peace, social justice and helping others; and individuals motivated by environmental wellbeing are likely to value unity with nature, respecting the Earth and pollution prevention (Schwartz 1992; de Groot and Steg 2007).

Thus, by knowing an audience's motivations, a message can be framed to capitalise on this. This not only ensures that the message is relevant to the audience, but motivational appeals used in conjunction with information has (in the public health arena) been shown to be effective at inducing behaviour change (Fisher et al. 1996). Because much of the behaviour changes advocated in conservation are about sacrifice (i.e. to consume less), motivational messages are important (Schultz 2011), but likely to be less effective for a self-interested audience. Strategically framing a message to highlight personal benefits as opposed to social or environmental benefits may help engage such an audience more effectively than simply continuing to 'preach to the converted' (Chapter 3; Kusmanoff et al. 2016). However, it has been shown that the engagement of one type of value can suppress opposing values (Maio et al. 2009), for example in appealing to self-interest, altruistic values may be suppressed. As such some environmental advocacy experts argue that communicators should generally avoid making self-interested appeals at all (e.g. Blackmore et al. 2013).

There is also evidence that framing information in a way that is familiar to a particular audience can be advantageous. For example, recent work by Connor et al. (2016) examined the influence of differently framed messages about climate change in a social-network environment. They found that statements centred on 'conventional' issues (e.g. environmental impacts and human health) 'survived' longer (i.e. were passed between more users) than less conventional topics such as societal competence or development. This demonstrates a benefit in situating a message within already established frames that are both familiar and accepted by the audience.

## Biases

Utilising the cognitive bias that gives rise to prospect theory is probably the most well-known approach used to guide message framing, as described in the Asian disease problem (see Chapter 1). However, there are many other cognitive biases that can also inform strategic framing. Take the 'endowment effect', for example, which is the tendency for people to value something more highly when they own it than if they do not, even if they have only owned it for a brief period (Kahneman et al. 1990). This bias

was leveraged in the framing study by Nash and Stern (2009) who found that, in the context of selling laptop computers, by framing the concept of ownership in different ways, they could influence how agreeable purchasers were to a subsequent restriction of the laptop use rights the owners could enjoy (Chapter 2). Importantly, strategic framing is not simply about choosing a frame that makes the message more effective, but can also be about avoiding unhelpful framing effects. For example, if a message designed to promote a conservation policy that includes vegetation clearing restrictions was to (intentionally or inadvertently) highlight the corresponding restrictions in property use rights, it would likely evoke the endowment effect and adversely affect the audience's attitudes to the policy (Chapter 2).

Another well-known bias potentially useful for strategic framing is the 'status quo bias'. This is the preference to avoid change, such that among alternatives, people display a bias for the status quo (Samuelson and Zeckhauser 1988). As such, it may be advantageous to frame an advocated policy option as a continuation of some existing policy or principle. The 'scarcity heuristic' is also potentially useful, whereby things perceived to be in short supply are considered more desirable and therefore more valuable, particularly where the short supply is a result of high demand (Worchel, Lee and Adewole 1975). This is often used to sell products on infomercials with claims that "stocks are limited" and that consumers should "act now to avoid disappointment". Although this is most obviously aligned with a marketing approach, creative communicators could strategically frame parts of messages to interact with this bias, where appropriate for a particular context and audience.

Here I have provided a small number of examples, but there is ample room for creativity and imagination in how cognitive biases may be leveraged by strategic framing to give better effect to conservation messages. Whether or not biases can be leveraged for effect in a given communication, understanding these biases will allow strategic framers to avoid inadvertently activating them in a way that is counter-productive to their message.

A comprehensive list of potential biases is available at:

[http://rationalwiki.org/wiki/List\\_of\\_cognitive\\_biases](http://rationalwiki.org/wiki/List_of_cognitive_biases).

## Emotional appeals

Cognitive biases arise as mental short-cuts that allow humans to rapidly assess a situation and choose a course of action, rather than to pause while undertaking a thorough situation analysis before the appropriate course of action has been determined

(only to be eaten by a tiger) (Slovic et al. 2004). These ‘gut-reactions’ are inherently tied to emotion, making emotion (‘affect’) another prime target for the strategic framing of conservation messages. One simple example is the evocation of positive feelings through use of charismatic flagship species (Akerlof and Kennedy 2013), such as the World Wildlife Fund’s panda. The positive emotions brought forth by the panda and other ‘cute’ animals are driven by the ‘baby schema’ that tap into human instinct to care for infants (Lorenz 1943) and which influences the species that we prioritise for conservation (Smith et al. 2012). Thus, the emphasis of human-infant-esque attributes of less-charismatic species may be one mechanism to re-frame these species for greater likability, and thus for greater conservation support. Both positive and negative appeals can be effective at influencing attitudes, although negative attitudes (e.g. fear) have tended to be used more often in environmental campaigns (i.e. the impending doom of CFCs, climate change, etc.) and have potential to induce adverse effects (see *Test (for adverse effects)*, below). It should also not be assumed that emotive appeals (or any specific frame) act in isolation. As Keller, Lipkus and Rimer (2003) showed, inducing a positive mood can increase the influence of loss-framed messages, whereas inducing a negative mood can enhance a gain-framed message. This has relevance for conservation messages; for example, a message that induces a bad mood, perhaps as a result of emphasising the adverse consequences of biodiversity loss, may be best paired with gain-framed benefits (i.e. ‘these are the benefits if we change’) rather than loss-framed (i.e. ‘if things don’t change, these losses will occur’).

Where cognitive and affective assessments are different, affect (i.e. the felt emotions) will often have a greater influence on resultant behaviour, unless the individual has the resources and desire to make a deliberative evaluation (Shiv and Fedorikhin 1999). Because deliberative thinking requires conscious effort, a message framed to tug the heartstrings may be more effective than one that nudges cognition via biases, although this will depend on the audience. Increasing the vividness of an issue or outcome in the mind of the audience is one way to evoke stronger emotions and have greater influence (Loewenstein et al. 2001). Vividness can be increased by presenting information in an anecdotal form that relates to people and experiences, rather than as numbers and statistics (Loewenstein et al. 2001). It can also be enhanced by the way an issue is described. For example a statement that says “the palm oil industry fuels biodiversity loss” will not induce as strong an emotional reaction as compared to it being re-framed to say “palm oil producers are responsible for the widespread deforestation that kills,

injures and causes suffering to thousands of animals”. Note that this re-framing has also reduced the level of abstraction concerning the impact of palm oil (see *Psychological distance*, below).

Frames that induce hope can be advantageous in promoting favourable attitudes and behaviours (Myers et al. 2012), as can frames that induce fear. However, fear may be ultimately counterproductive as it can lead individuals to avoid the fear-inducing information (Loewenstein et al. 2001). Commercial advertising is replete with examples of emotionally framed appeals, with both positive and negative emotions used to strategically target different audiences, e.g. ‘fear’ in the case of promoting the virtues of a life insurance policy to parents, and ‘fun’ in promoting soft drinks to young people. The question for conservation communicators to consider is what emotion their message will likely evoke, and whether this may be helpful or counter-productive. If the emotion in response to the message is likely to be counter-productive, can the communication be re-framed to ameliorate this, or even to induce an advantageous emotional response.

### Psychological distance

‘Psychological distance’ concerns the distance from themselves in which they think about an object (i.e. a person, event, issue, outcome, etc.). When psychological distance is greater, people tend to think about the object in a more abstract fashion (Bar-Anan, Liberman and Trope 2006), and can be less motivated to take individual action (Spence, Poortinga and Pidgeon 2012; Jones, Hines and Marks 2016). In the context of messaging, reducing psychological distance can help a message better engage an audience about an issue (Jones, Hines and Marks 2016). The psychological distance between an audience and the problem being articulated includes geographic, temporal and social distance, and is also influenced by the relative certainty of an event occurring, with greater certainty reducing psychological distance (Bar-Anan, Liberman and Trope 2006). Thus, a message will tend to create a smaller psychological distance between the audience and the problem if it emphasises that a problem or event will affect the audience or people who are just like them, occur nearby, occur sometime soon, and is very likely to happen. This results in a more concrete and less abstract understanding of the issue. As in all aspects of strategic framing, this is something that could be purposely increased or decreased, depending upon the need. For example it could be advantageous to *reduce* the psychological distance between an audience and the effects of vegetation clearing (i.e. to make the consequences of habitat loss more tangible), but advantageous to *increase* the psychological distance between an audience



and feral cats (i.e. to promote the more abstract notion that cats are pests, not pets). Though not applicable to every message, these aspects can be emphasised (or minimised) to the extent that they apply, so as to increase (or decrease) the psychological distance as appropriate to the issue.

As another example, if communicating the plight of southern right whales, one might say “the population of southern right whales continues to be threatened as a result of whaling in the Southern Ocean”. However, to reduce the psychological distance one might instead say (particularly to an Australian audience) “the southern right whales, that visit Australian coastlines each year and bring joy to whale watchers, are under threat from whalers who stalk and kill them in the Southern Ocean”. In this re-framing the physical distance is geographically reduced, as well as socially reduced by relating the whales to people (i.e. the whale watchers), as well as reducing the level of abstraction – the whales are ‘stalked and killed’, not merely ‘threatened’. There is plenty of room for additional framing elements, particularly semantic and emotive elements, and also promotion of the audience’s personal agency. Increasing emotional intensity reduces psychological distance (Van Boven et al. 2010), as can the construction of more concrete mental images of the object (e.g. a conservation problem) (Lieberman et al. 2007). As such, the use of richer more emotive, vivid or descriptive language will likely help reduce psychological distance. However, where psychological distance is too small, it can become counter-productive at promoting behaviour (McDonald, Chai and Newell 2015) where, for example, ‘doom and gloom’ messages about impending extinctions could potentially undermine a person’s sense of agency (see ‘Norms and agency’ below).

### Norms and agency

The Theory of Planned Behaviour (Ajzen 1991) is one of the most tested and successful theories for understanding human behaviour. The theory posits that attitudes, norms and personal agency (a person’s belief about their ability to undertake an action and achieve a favourable result) all influence a person’s intention to undertake a behaviour. The examples outlined above operate principally by influencing attitudes. While biodiversity conservation is not always concerned with advocating a specific behaviour, strategic framing can include these elements to the extent that they are relevant in any given context. Norms and personal agency interact with and influence attitudes, and the

influence of a message on attitudes will depend on the degree to which a person engages in the message and how the message fits with a person's norms.

Social norms are the codes of appropriate behaviour within a particular social group, and can have a strong influence on behaviour. For example, people are more likely to litter in an environment that is already littered because this indicates that littering is a normal behaviour in that context (Cialdini, Reno and Kallgren 1990). Although stemming from our needs as social beings, social norms can be invoked by printed words alone (Schultz, Kahzian and Zaleski 2008). However, care must be taken when doing so, because whilst normative information can direct behaviour in a target direction, it can also have unintended effects. This is demonstrated by Cialdini (2003) in the context of 'wood' theft from the Arizona Petrified Forest National Park. To combat the theft, managers had placed a sign that read: "Your heritage is being vandalized every day by theft losses of petrified wood of 14 tons a year, mostly a small piece at a time." Unfortunately, by highlighting the problem, the sign established the theft as a social norm, making it less effective than it might have been, and possibly contributing to further theft. A subsequently installed sign that read: "Please don't remove the petrified wood from the Park, in order to preserve the natural state of the Petrified Forest" and thus which did not 'normalise' the theft, was more effective (Cialdini 2003). This is another example of where strategic framing can be about avoiding an unhelpful effect; the key lesson here is that simply highlighting the prevalence of an undesirable behaviour is likely to be counterproductive.

Where a desirable behaviour is common, it can be highlighted to promote it as a norm. It is useful to distinguish between norms that describe a typical behaviour (known as descriptive norms) and also what is the approved behaviour (injunctive norms) (Cialdini 2003). For example:

*"Australians eat 25 kg of seafood per person each year... [i.e. descriptive] ...but they also care that it is caught from sustainable fisheries [i.e. an injunctive norm]."*

Note that this is a hypothetical example for illustration only, and there are likely many ways in which this message could be optimised. Importantly from an ethical perspective, I have not simply made up these claims for the convenience of framing the message (see Australian Marine Conservation Society 2016); I do not advocate lying for the sake of increasing a strategic framing effect.

While it may not always be possible to strategically frame messages to take advantage of a social norm, it is worth considering, even if it is simply to ensure that the message does not inadvertently establish an undesirable behaviour as a social norm. This does not mean that communicators should necessarily refrain from reporting the prevalence of adverse behaviour, but that the context in which it is done is important.

This brings us to personal agency (sometimes referred to as self-efficacy), which is mostly of relevance to communicators interested in influencing a specific behaviour. A related concept is ‘response efficacy’ which is a person’s sense that their actions will achieve the intended outcomes (LaRose, Rifon and Enbody 2008; Morton et al. 2011). Building on the hypothetical seafood example above, to leverage self-efficacy and response efficacy, we could add the following sentence:

*“By ensuring that the seafood you buy is marked with the Sustainable Seafood logo... [i.e. enhancing self-efficacy by instructing the reader in an easily achieved behaviour] ...you can be sure that you are helping support sustainable fisheries [i.e. enhancing response efficacy by suggesting that the behaviour will promote sustainability].”*

In this example the response efficacy is largely dependent on how believable the person finds the claim that the ‘Sustainable Seafood’ marked products will promote sustainable fisheries. As with social norms, strategic framing of a conservation communication may not necessarily include highlighting efficacy related aspects, however the message’s capacity to influence the audience’s sense of efficacy should be borne in mind. For example, many affective appeals such as those that induce hope or fear are likely to also influence efficacy. Hope appeals are well suited to promoting efficacy (Myers et al. 2012) i.e. ‘this species can be saved if you do take this action’. However, this does not work in all cases, for example an optimistic message about recent progress in curbing carbon emissions was less effective than a pessimistic message because the emphasis on the ‘good news’ increased complacency (Hornsey and Fielding 2016).

## 6.4 Test (for adverse effects)

Even for carefully considered messages, there is a chance that it will result in unintended and possibly counter-productive effects. For this reason, wherever possible it’s important to test a message before dissemination. A common method for this is the use of focus groups (for which there is much guidance in the literature, e.g. Morgan (1996)), however the advent of highly capable web based survey platforms (e.g.

[www.qualtrics.com](http://www.qualtrics.com); [www.surveymonkey.com](http://www.surveymonkey.com)) provide convenient alternatives. Whilst far from a comprehensive list, below I outline several of the important adverse effects that should be considered when undertaking strategic framing.

### Boomerang effects

Sometimes framing can have unforeseen ‘boomerang’ effects. For example, Myers et al. (2012) found that framing climate change as a national security issue was counter-productive for engaging an audience that was usually dismissive of climate change, resulting in an angry backlash. In contrast, presenting climate change as a public health issue and emphasising the benefits of action was effective across a variety of audience segments. These interactions are also closely tied with emotions (and thus relevant to affect based framing). For example, messages that emphasise calamitous threats, though engaging, can ultimately be counter-effective (O’Neill and Nicholson-Cole 2009). This may be particularly the case where the one message is received by multiple audience segments who react differently to the content (Myers et al. 2012).

### Misguided norms

In discussing use of social norms above, the Arizona Petrified Forest National Park example (Cialdini 2003) demonstrates how highlighting a problematic descriptive norm can be counter-effective. I also pointed to the value of using aligned descriptive and injunctive norms for best effect. This point is further demonstrated in cases where a descriptive norm applied on its own can act as an anchor, with unhelpful results. For example, Schultz et al. (2007) demonstrate how an electricity consumption bill that includes information about neighbours’ average usage (i.e. a descriptive norm) can be effective at reducing consumption of higher consumption customers but also simultaneously influence lower than average usage customers to consume more. However, this was remedied by adding an injunctive norm to indicate social approval (where usage was less than average) and disapproval (where usage was greater than average) (Schultz et al. 2007).

### Crowding-out

Motivational crowding-out is the process whereby intrinsic altruistic motivations for behaviour are replaced by extrinsic self-interested motivations when an external (generally monetary) reward is offered for the behaviour. The classic example is the child who is paid by her parents to complete a household chore; once the child expects

to receive money for the task, they are only willing to do it again if they receive a similar monetary reward (Frey and Jegen 2001). There is empirical evidence for motivational-crowding effects occurring across a range of settings including labour supply, service provision, common pool resources, and the law (see Frey and Jegen (2001) for a summary). This has led to concern about the use of monetary incentives in conservation (Bekessy and Cooke 2012; García-Amado et al., 2013 Rode, Gómez-Baggethun and Krause 2015) such that, in the longer term, these may actually reduce the occurrence of the incentivised behaviour. Chapter 3 demonstrated that even economically framed information about the benefits of nature, without any external monetary reward, can itself result in the crowding-out intrinsic motivations to care for nature. Behaviours induced by external motivations (e.g. regulation, financial incentives, etc.) generally cease when they are removed, but this is not the case with intrinsic motivations (Akerlof and Kennedy 2013). Thus, emphasising the economic value of nature is an exercise in strategic framing and may enhance the effectiveness of the specific message for people with low intrinsic values for nature, but it may simultaneously undermine intrinsic value for nature in other audience segments, with adverse effects overall.

It has also been suggested that promoting the economic benefits of nature whilst simultaneously appealing to nature's emotional qualities, feels incongruent and possibly offensive (Futerra 2015). This likely interacts with cognitive dissonance (a cognitive bias) where discomfort arises within an individual when their beliefs or values are contrary to new information that conflicts with these beliefs/values, or when they perform an action contrary to the belief/values. In order to achieve consistency (and thus to reduce the dissonance), people may change their beliefs or their behaviour, or avoid situations that give rise to the inconsistency (see Festinger 1962). Refusal of climate change sceptics to accept the scientific consensus is a contemporary example (e.g. Stoll-Kleemann, O'Riordan and Jaeger 2001).

## 6.5 Report results

Reporting the results of any testing undertaken prior to a communication campaign, or the effectiveness and outcomes of any campaign undertaken, will add to the body of knowledge that can inform future strategic communication of biodiversity conservation. This need not be limited to peer-reviewed journals, but may also include simple reports or datasets being made accessible online such as on conservation group site, blogs, etc.

By simply reporting the kind of framing that tends to be more effective, including for which contexts and audiences, all communicators can work together to support more effective conservation communication.

## 6.6 Conclusion

Influencing attitudes and behaviour is a key component of effective conservation. Therefore, the effectiveness of conservation messages can be critical to the successful implementation of policy interventions and campaigns. With this in mind, there are easy and low cost gains (and avoided losses) to be had by putting more effort into strategically framing messages. Here I have provided a guide to some key elements of strategic framing. However, not all elements will be always relevant, as strategic framing depends heavily on context, and neither are the elements of strategic framing limited to those outlined here. Although I have discussed these concepts as discrete elements, most conservation messages will include many elements of framing that use a variety of approaches targeted to different aspects of the message. Part of the process of strategic framing is to consider how a communication sits together as a whole. I do not suggest that strategic framing should seek to manipulate people, but rather, that information can be framed in multiple ways, and because it cannot be communicated without a frame of some, communicators should consider these effects when crafting their message. If the characteristics of the audience are known (or even estimated), and there is a clear understanding of what a message is trying to achieve, it's likely that a strategically framed message will have greater influence. The guide I provide here gives communicators a solid foundation to begin to understand how strategically framing their communications can be advantageous, and provides an overview of important components of strategic framing.

# 7 CONCLUSIONS

The aim of this research was to develop an understanding of how framing concepts may be used strategically to improve the effectiveness of biodiversity conservation messages. Biodiversity loss is one of the most serious of contemporary environmental problems and occurs as a direct result of human activities (Gordon 2006; Butchart et al. 2010; Maxwell et al. 2016). This means that changes to human behaviour must be an essential component of strategies that seek to achieve biodiversity conservation outcomes. It is well established that how information is ‘framed’ can influence the resulting judgements, attitudes and behaviours of those receiving the information (e.g. Harris 1973; Tversky and Kahneman 1981; Gamson and Modiglian 1989; Entman 1993). This means that communications intended to promote behaviour change in favour of biodiversity conservation may be made more effective through strategic consideration of how that information is framed. While a sizable framing literature exists across many research areas, there is little research on the use of framing to promote biodiversity conservation, and practically no guidance for conservation communicators.

Framing and related concepts have long been used in advertising and marketing, which, by promoting the purchase of many products, have promoted the consumption of materials more generally, which is a key contributor to biodiversity loss (Maxwell et al. 2016). While marketing, including framing, has begun to be applied to environmental issues, this tends to simply be an application of marketing concepts to environment related campaigns that target a single specific behaviour, for example promoting environmentally friendly products (e.g. Grankvist, Dahlstrand and Biel 2004; Tu, Kao

and Tu 2013), appeals to reduce water or energy use (e.g. van de Velde et al. 2010; Steinhorst, Klöckner and Matthies. 2015) or collecting donations (e.g. Futerra 2015). Few of these have been specifically related to biodiversity conservation, and have been limited in scope (biodiversity conservation specific examples that have directly tested alternative frames include: Gregory, Lichtenstein and MacGregor 1993; Wilson and Bruskotter 2009; McComas et al. 2015). By failing to strategically consider framing issues when communicating about biodiversity conservation, advocates do not avail themselves of potentially powerful tools. However, the task of ‘selling’ biodiversity conservation is much more difficult than selling products because there is rarely a single conservation behaviour that can be targeted, and thus it is more complex than simply applying marketing and framing concepts. The research presented in this thesis has tackled this challenge, exploring the concept of framing in the context of the promotion of biodiversity conservation.

This research has begun to build an understanding of the use of framing in the context of biodiversity conservation by:

- empirically testing several alternatively framed conservation communications;
- investigating the degree to which framing is strategically used in the Australian private land conservation sector to promote conservation programs;
- considering how the framing of biodiversity has changed over the last decade within public policy discourse; and
- providing guidance to communicators on how to strategically frame messages for greater effect.

Chapter 2 empirically tested how alternatively framed conservation messages influenced people’s attitudes toward regulations that would interfere with property rights in order to achieve conservation outcomes. The messages framed the concept of ‘property’ in terms of a ‘discrete asset’ or alternatively as a ‘bundle-of-rights’. The results demonstrate that these alternative ‘property frames’ can influence attitudes, but only when used to activate cognitive biases (in this case the ‘endowment effect’, whereby people place greater value on something when they own it). This suggests that alternative property concepts alone are of little use from a strategic framing perspective, but may be used to activate cognitive biases in order to generate a framing effect in some circumstances. The overarching lesson for the strategic use of framing that arises here is: a) that cognitive biases other than prospect theory may be activated by issue



frames (in this case the endowment effect); and b) that where conservation participation interacts with property ownership rights (i.e. most likely in private land conservation scenarios), that the ‘strategic’ approach is to avoid evoking the endowment effect by the way in which property ownership is contemplated in any related communication. These findings demonstrate the value for communicators in understanding framing effects in communications; not only can framing be used to enhance the effectiveness of a message, but it can help avoid adverse framing effects.

Chapter 3 showed that the inclusion of information about the economic contributions of whales and bees within a list of broader general information about these species, can influence the kinds of reasons that people give and consider most important for protecting them. When information about economic contributions are included in a list of general information, people gave more extrinsically motivated reasons, and ranked the extrinsically motivated reasons as more important, compared to when economic information was not included. These results show that, in the same way monetary incentives can crowd-out (i.e. displace) intrinsic motivations for performing hitherto intrinsic tasks, the use of economically framed ecosystem services information can also crowd-out intrinsic motivations for whale and bee conservation. This is perhaps the first demonstration that crowding-out effects can occur even in the absence of an actual external reward, and has implications for communication and advocacy generally. In the context of biodiversity conservation, the risk is that framing nature in terms of ecosystem services may create an expectation that the only nature worth preserving is that with a demonstrable and quantifiable anthropocentric value, with messages framed in terms of ecosystem services leading to the reduced care and concern of organisms and ecosystems that cannot demonstrate such value. This raises questions about the long-term effects of economically framed ecosystem-service based conservation messages on people’s motivations for protecting nature.

Chapter 4 examines the content of the websites of a range of Australian private land conservation (PLC) schemes, categorising the stated participation benefits as either benefits to landholders, to society or to the environment. The results indicate a predominance of environmentally-framed benefits, which arguably indicates a lack of strategic framing by the Australian PLC sector in the promotion of their programs. The heavy reliance on environmentally-framed messages is less likely to engage landholders who are more egoistically oriented. This is particularly the case with market-based schemes, which arguably should be even more strongly marketed toward

production-focussed landholders and others not already involved in conservation. This suggests that the way in which PLC benefits are currently articulated to landholders in Australia may not be particularly strategic, and that there may be some advantage in more carefully considering the way benefits of participation in PLC schemes are framed. In particular, this research suggests that framing the benefits of PLC more broadly (and appealing to people within all value orientations) could engage a greater diversity of landholders, aiding PLC recruitment. This research is not intended as a definitive statement on how PLC benefits are framed, or even how they ought to be framed, but as an initial step in understanding how they might be strategically re-framed for better effect. As a first step, I encourage PLC programs to be aware of the value orientation frame implicit in their messages, and to consider whether this is a good match for their audience and the goals of their program.

Although I have argued in Chapter 4 that there ought to be a greater focus on landholder benefits in order to appeal to egoistic oriented landholders, Chapter 3 demonstrates that extrinsically motivated messages can crowd-out intrinsic motivations for conservation. As such there is a risk that the same could occur in the PLC context. However, in this case the message is not the end in itself, but is merely an initial invitation to a landholder to consider participation in the program. Those landholders whose interest is not piqued will not have been swayed (and thus there is no ‘controlling behaviour’ to lead to motivational crowding), while those who investigate further and potentially participate will embark upon a journey that goes beyond the messages on a scheme’s website, and thus beyond what can be speculated here. While this understanding may be reasonably surmised from current research, the prospect of deleterious effects arising from motivational crowding induced by egoistic framing of benefits is worthy of further research.

Chapter 5 considers how the framing of biodiversity has changed over the last decade within public policy discourse by examining media releases from the Australian Government environment portfolio and the Australian Conservation Foundation (ACF), specifically tracking the use of ‘ecosystem services’ logic, the term ‘biodiversity’, and the use of economic language. Although there was no obvious trend in the use of ‘ecosystem services’ logic over the previous ten years of media releases from the Australian Government or from the Australian Conservation Foundation (ACF), it was by no means uncommon, indicating that it is a mainstream concept and not confined to researchers or policy makers. In addition, over the same period, use of the term

‘biodiversity’ has become less prevalent whilst use of economic language has increased, in both Australian Government and ACF media releases. This indicates a change in this public discourse over this time, which may be reflective of the way the environment and biodiversity are thought of (or may contribute to this change, or both). This may be a strategic response by these agencies to better engage with both the general public and decision makers within what is an increasingly dominant neoliberal paradigm, representing an example of the strategic use of framing as I have advocated throughout this thesis. However, being aware of the influence of framing generally, and of the power of discourse to reflect *and* influence how people think about and interact with issues, I contend that the trends identified risk adversely affecting how people think about and engage with biodiversity conservation. By engaging with economic considerations within the environmental policy space, these messages may be inducing a crowding-out effect similar to that observed in Chapter 3. While this is only speculative at this stage, further research exploring related trends across other sources and regions would help clarify the effect. In the meantime, I reiterate the value for communicators in the strategic consideration of how to phrase and frame messages for greatest immediate impact, but also caution that this be tempered by consideration of how this may in turn shape the discourse over time, and what the effect of this may be.

Chapter 6 provides a synthesis of key elements of framing that may be used strategically to enhance the effectiveness of biodiversity conservation messages. This chapter provides an overview of the key aspects of framing identified throughout this research, both from the relevant literature and from the research described in this thesis. The intention is to provide useful, accessible and concise guidance for communicators to begin to strategically consider how to frame their communications. Although much of this guidance comes from the published literature, this research is drawn from a range of research areas not necessarily identified as relating to ‘framing’ or ‘conservation’, or even with ‘messaging’ and ‘communication’. As such, much information that could provide guidance to communicators about framing messages is not easily identifiable or accessible to them. The synthesis provided in Chapter 6 draws key concepts identified in the literature and underpinned by research described in the thesis, and describes their application to a message framing context in a useful and practical way, including with examples relevant to biodiversity conservation.

## 7.1 Further research

Additional to the insights and conclusions outlined above, this research also gives rise to further questions. In particular, further research about the potential for unintended feedback effects of extrinsically framed appeals would be valuable to conservation communicators. The key question that arises from the research is:

How can communicators leverage the power of extrinsically motivated appeals, without risk of crowding-out intrinsic motivations?

Addressing this question has the potential to provide communicators with a valuable tool to guide future strategically framed conservation communications.

In addition, the following specific questions arise directly from the present research:

- Does the crowding-out of intrinsic motivations occur only when economic ecosystem services frames are used, or whenever anthropocentric ecosystem service frames are used?
- How long does the crowding-out effect last, and is it cumulative?
- How does ‘ecosystem services’ framing within the broader conservation discourse influence these crowding-out effects?
- Can the emphasis of extrinsic motivations in the context of private land conservation result in the crowding-out of intrinsic conservation motivations for landholders to participate in conservation schemes?
- What is the efficacy of appeals to multiple value-orientations, particularly in a PLC context?

## 7.2 Closing remarks

This research has provided some valuable insights about the importance of framing in communications. Although focussed on promotion of biodiversity conservation, many of these insights may also be valuable more generally.

I also hope that this research will empower conservation advocates to embrace strategic framing and to consider it in all communications. Whilst I do not have all the answers, I hope that my work provides an approach that will encourage and enable strategic thinking about how best to frame conservation issues for a given audience in a given context.

## Conclusions

In addition, I hope that this work will encourage a new research direction focussed on unpacking the many nuanced ways that framing influences the messages that they communicate. The outlook for this is promising, as already a number of research colleagues within the Environmental Decisions Group ([www.edg.org.au](http://www.edg.org.au)) and more broadly within the Society for Conservation Biology (<https://conbio.org/groups/working-groups/conservation-marketing-working-group>) have begun to explore further aspects of conservation framing research.



## 8 REFERENCES

- Adesina AA, Zinah MM. (1993). Technology characteristics, farmers' perceptions and adoption decisions: a Tobit model application in Sierra Leone. *Agricultural Economics* 9(4), 297-311.
- Ajzen I, Madden TJ. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology* 22(5), 453-474.
- Ajzen I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50(2), 179-211.
- Akerlof K, Kennedy C. (2013). Nudging toward a Healthy Natural Environment: How Behavior Change Research Can Inform Conservation. Gordon and Betty Moore Foundation, California.
- Alchian, AA, Demsetz H. (1973). The property right paradigm. *The Journal of Economic History* 33(01), 16-27.
- Apostolopoulou E, Adams WM. (2015). Biodiversity offsetting and conservation: reframing nature to save it. *Oryx* 49, 1-9.
- Arvai JL, Mascarenhas MJ. (2001). Print media framing of the environmental movement in a Canadian forestry debate. *Environmental Management*, 27(5), 705-714.
- Australian Marine Conservation Society. (2016). Australia's Sustainable Seafood Online Guide. Available from: [www.sustainableseafood.org.au](http://www.sustainableseafood.org.au) (accessed June 2016).

- Bar-Anan Y, Liberman N, Trope Y. (2006). The association between psychological distance and construal level: evidence from an implicit association test. *Journal of Experimental Psychology: General* 135(4), 609-622.
- Bekessy SA, Cooke B. (2011). Social and cultural drivers behind the success of Payment for Ecosystem Services (PES). Pages 141-155 in Ottaviani D, El-Hage Scialabba N, (eds). *Payment for Ecosystem Services and Food Security*. Food and Agriculture Organization, Rome.
- Bennett NJ, Roth R. (eds.) (2015). *The Conservation Social Sciences: What?, How? and Why?*. Canadian Wildlife Federation and Institute for Resources, Environment and Sustainability, University of British Columbia, Vancouver.
- Berk RA, Cooley TF, LaCivita CJ, Parker S, Sredl K, Brewer M. (1980). Reducing consumption in periods of acute scarcity: the case of water. *Social Science Research* 9(2): 99-120.
- Bhatia S, Athreya V, Grenyer R, Macdonald DW. (2013). Understanding the Role of Representations of Human–Leopard Conflict in Mumbai through Media-Content Analysis. *Conservation Biology*, 27(3), 588-594.
- Blackmore E, Underhill R, McQuilkin J, Leach R. (2013). Common cause for nature: finding values and frames in the conservation sector. Public Interest Research Centre, Machynlleth, Wales.
- Blackmore L, Doole GJ. (2013). Drivers of landholder participation in tender programs for Australian biodiversity conservation. *Environmental Science and Policy* 33, 143–153.
- Borenstein M, Hedges LV, Higgins JPT, Rothstein HR. (2009) *Introduction to Meta-Analysis*. John Wiley & Sons, Ltd.
- Braun KA, Gaeth GJ, Levin IP. (1997). Framing effects with differential impact: The role of attribute salience. *Advances in Consumer Research*. Pages: 405-411 in Merrie Brucks and Deborah J. MacInnis (eds). Association for Consumer Research, Provo, Utah.
- Brechin SR, Wilshusen PR, Fortwangler CL, West PC. (2002). Beyond the square wheel: toward a more comprehensive understanding of biodiversity conservation as social and political process. *Society & Natural Resources* 15(1), 41-64.



- Buijs AE, Fischer A, Rink D, Young JC. (2008). Looking beyond superficial knowledge gaps: understanding public representations of biodiversity. *The International Journal of Biodiversity Science and Management* 4(2), 65-80.
- Butchart SH, Walpole M, Collen B, Van Strien A, Scharlemann JP, Almond RE, Baillie JE, Bomhard B, Brown C, Bruno J, Carpenter KE. (2010). Global biodiversity: indicators of recent declines. *Science* 328(5982), 1164-1168.
- Capella J and Jamieson KH. (1997). *Spiral of Cynicism: The press and the public good*, Oxford University Press, New York.
- Carvalho LG, Veldtman R, Shenkute AG, Tesfay GB, Pirk CWW, Donaldson JS, Nicolson SW. (2011). Natural and within-farmland biodiversity enhances crop productivity. *Ecology Letters* 14(3), 251–259.
- Chernev A. (2004). Goal-attribute compatibility in consumer choice. *Journal of Consumer Psychology* 14(1), 141–150.
- Chong D, Druckman JN. (2007). A theory of framing and opinion formation in competitive elite environments. *Journal of Communication*, 57(1), 99-118.
- Cialdini RB, Reno RR, Kallgren CA. (1990). A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology* 58(6), 1015-1026.
- Cialdini RB. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science* 12(4), 105-109.
- Coffey B. (2015). Unpacking the politics of natural capital and economic metaphors in environmental policy discourse. *Environmental Politics* 25(2), 203-222.
- Connor P, Harris E, Guy S, Fernando J, Shank DB, Kurz T, Bain PG, Kashima Y. (2016). Interpersonal communication about climate change: how messages change when communicated through simulated online social networks. *Climatic Change* 136(3), 463-476.
- Convention on Biological Diversity, 5 June 1992, 1760 UNTS.
- Cooke B, Langford WT, Gordon A, Bekessy S. (2012). Social context and the role of collaborative policy making for private land conservation. *Journal of Environmental Planning and Management* 55(4), 469-485.

- Cortina JM. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology* 78(1), 98.
- Costanza R, d'Arge R, de Groot R, Farber S, Grasso M, Hannon B, Limburg K, Naeem S, O'Neill RV, Paruelo J, Raskin RG, Sutton P, van den Belt M. (1997). The value of the world's ecosystem services and natural capital. *Nature* 387, 253–260.
- Cronbach LJ. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika* 16(3), 297-334.
- Davis JJ. (1995). The effects of message framing on response to environmental communications. *Journalism & Mass Communication Quarterly* 72(2), 285-299.
- Dayer, AA, Stedman RC, Allred SB, Rosenberg KV, Fuller AK. (2015). Understanding landowner intentions to create early successional forest habitat in the northeastern United States. *Wildlife Society Bulletin* 40(1), 59-68.
- De Groot JI, Steg L. (2007). Value Orientations and Environmental Beliefs in Five Countries Validity of an Instrument to Measure Egoistic, Altruistic and Biospheric Value Orientations. *Journal of Cross-Cultural Psychology* 38(3), 318-332.
- De Groot JI, Steg L. (2008). Value Orientations to Explain Beliefs Related to Environmental Significant Behavior How to Measure Egoistic, Altruistic, and Biospheric Value Orientations. *Environment and Behavior* 40(3), 330-354.
- Deci EL, Koestner, R, Ryan RM. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin* 125(6), 627-668.
- Deci EL. (1971). Effects of Externally Mediated Rewards on Intrinsic Motivation. *Journal of Personality and Social Psychology* 18(1), 105-115.
- Dewulf A, Craps M, Dercon G. (2004). How issues get framed and reframed when different communities meet: a multi-level analysis of a collaborative soil conservation initiative in the Ecuadorian Andes. *Journal of Community & Applied Social Psychology*, 14(3), 177-192.
- Dikou A, Dionysopoulou N. (2011). Communicating a marine protected area through the local press: the case of the national marine park of Alonissos, Northern Sporades, Greece. *Environmental Management* 47(5), 777-788.

- Druckman JN. (2001). The implications of framing effects for citizen competence. *Political Behavior* 23(3), 225-256.
- Druckman, JN. (2004) 'Political preference formation: Competition, deliberation, and the (ir) relevance of framing effects', *American Political Science Review*, 98(4), 671-686.
- Dryzek JS. (2013). The politics of the earth: Environmental discourses. Oxford University Press.
- Entman R. (1993). Framing: towards a clarification of a fractured paradigm. *Journal of Communication* 43(4), 51-58.
- Entman RM, Page B. (1994). The news before the storm. Pages 82-101 in Bennet WL, and Paletz DL, (eds). Taken by storm: The media, public opinion, and US foreign policy in the Gulf War, University of Chicago Press.
- Ervin CA, Ervin DE. (1982). Factors affecting the use of soil conservation practices: hypotheses, evidence, and policy implications. *Land Economics* 58(3), 277-291.
- Eysenbach G, Wyatt J. (2002). Using the Internet for surveys and health research. *Journal of Medical Internet Research* 4(2), e13.
- Fagley NS, Miller PM. (1997). Framing effects and arenas of choice: Your money or your life? *Organizational Behavior and Human Decision Processes* 71(3), 355-373.
- Fairclough N. (1992). Discourse and social change. Blackwell Publishing, Malden USA.
- Field AP. (2001). Meta-analysis of correlation coefficients: a Monte Carlo comparison of fixed-and random-effects methods. *Psychological Methods*, 6(2), 161.
- Ferraro PJ, Kiss A. (2002). Direct payments to conserve biodiversity. *Science* 298(5599), 1718.
- Festinger L. (1962). Cognitive dissonance. *Scientific American* 207(4), 93-107.
- Fischer AP, Bliss JC. (2009). Framing conservation on private lands: Conserving oak in Oregon's Willamette Valley. *Society and Natural Resources* 22(10), 884-900.
- Fisher JD, Fisher WA, Misovich SJ, Kimble DL, Malloy TE. (1996). Changing AIDS risk behavior: effects of an intervention emphasizing AIDS risk reduction

- information, motivation, and behavioral skills in a college student population. *Health Psychology* 15(2), 114-123.
- Fisher K. (1997). Locating frames in the discursive universe. *Sociological Research Online* 2(3).
- Flannagan R. (2014). How important is your business website? at: <http://nuancedmedia.com/how-important-is-a-business-website/>, October 2014.
- Florack A, Scarabis M. (2006). How advertising claims affect brand preferences and category–brand associations: the role of regulatory fit. *Psychology & Marketing* 23(9), 741–755.
- Folke C, Hahn T, Olsson P, Norberg J. (2005). Adaptive governance of social-ecological systems. *Annual Review of Environmental Resources* 30, 441-473.
- Frey BS, Jegen R. (2001). Motivation crowding theory. *Journal of Economic Surveys* 15(5), 589-611.
- Frijda N. (1986). *The Emotions*. New York: Cambridge University Press.
- Futerra (2015). Branding biodiversity, the new nature message. Futerra Sustainability Communications, London. Available from [www.wearefuterra.com/wp-content/uploads/2015/10/Branding\\_Biodiversity.pdf](http://www.wearefuterra.com/wp-content/uploads/2015/10/Branding_Biodiversity.pdf) (accessed May 2016).
- Gallo JA, Pasquini L, Reyers B, Cowling RM. (2009). The role of private conservation areas in biodiversity representation and target achievement within the Little Karoo region, South Africa. *Biological Conservation* 142(2), 446-454.
- Gamson WA, Modigliani A. (1989). Media discourse and public opinion on nuclear power: A constructionist approach. *American Journal of Sociology* 95(1), 1-37.
- Gärling T. (1999). Value priorities, social value orientations and cooperation in social dilemmas. *British Journal of Social Psychology* 38(4), 397-408.
- García-Amado LR, Pérez MR. and García SB. (2013). Motivation for conservation: assessing integrated conservation and development projects and payments for environmental services in La Sepultura Biosphere Reserve, Chiapas, Mexico. *Ecological Economics* 89, 92-100.
- Gifford R, Comeau LA. (2011). Message framing influences perceived climate change competence, engagement, and behavioral intentions. *Global Environmental Change* 21(4), 1301-1307.

- Goddard MA, Dougill AJ, Benton TG. (2010). Scaling up from gardens: biodiversity conservation in urban environments. *Trends in Ecology & Evolution* 25(2), 90-98.
- Goffman E. (1974). *Frame Analysis: An essay on the organisation of experience*. Harvard University Press, Massachusetts.
- Goldman RL, Tallis H. (2009). A critical analysis of ecosystem services as a tool in conservation projects: the possible perils, the promises, and the partnerships. *Annals of the New York Academy of Sciences* 1162(1), 63-78.
- Gómez-Baggethun E, De Groot R, Lomas P, Montes C. (2010). The history of ecosystem services in economic theory and practice: from early notions to markets and payment schemes. *Ecological Economics* 69(6) 1209-1218.
- Gordon JE. (2006). The role of science in NGO mediated conservation: insights from a biodiversity hotspot in Mexico. *Environmental Science & Policy* 9(6), 547–554.
- Grankvist G, Dahlstrand U, Biel A. (2004). The impact of environmental labelling on consumer preference: Negative vs. positive labels. *Journal of Consumer Policy*, 27(2), 213-230.
- Gregory R, Lichtenstein S, MacGregor D. (1993). The role of past states in determining reference points for policy decisions. *Organizational behavior and human decision processes* 55(2), 195-206.
- Greiner R, Patterson L, Miller O. (2009). Motivations, risk perceptions and adoption of conservation practices by farmers. *Agricultural Systems* 99(2), 86-104.
- Gunter MM. (2004). *Building the next ark: How NGOs work to protect biodiversity*. University Press of New England.
- Gustafsson KM. (2013). Environmental discourses and biodiversity: the construction of a storyline in understanding and managing an environmental issue. *Journal of Integrative Environmental Sciences* 10(1), 39-54.
- Haila Y, Kouki J. (1994). The phenomenon of biodiversity in conservation biology. *Annales Zoologici Fennici* 31(1), 5-18.
- Hallahan K. (1999). Seven models of framing: Implications for public relations. *Journal of Public Relations Research* 11(3), 205-242.
- Hannigan J. (1995). *Environmental Sociology*. Routledge, London

- Harris RJ. (1973). Answering questions containing marked and unmarked adjectives and adverbs. *Journal of Experimental Psychology* 97(3), 399-401.
- Heberlein T. (2012). Navigating Environmental Attitudes. *Conservation Biology* 26(4), 583-585.
- Hern A. (2016). If the age of self-driving cars is upon us, what's keeping them off the roads? *The Guardian*, 22 August 2016 at: [www.theguardian.com/technology/2016/aug/22/google-x-self-driving-cars](http://www.theguardian.com/technology/2016/aug/22/google-x-self-driving-cars).
- Hine DW, Please PM, McLeod LJ, and Driver AB (2014). Behaviourally Effective Communications for Invasive Animals Management: A Practical Guide. Canberra, Australia: Invasive Animals Cooperative Research Centre.
- Hong JW, Zinkhan GM. (1995). Self-concept and advertising effectiveness: the influence of congruency, conspicuousness, and response mode. *Psychology & Marketing* 12(1), 53–77.
- Hope M. (2014). Could rebranding environmentalism help tackle climate change? [www.carbonbrief.org/blog/2014/06/could-rebranding-environmentalism-help-tackle-climate-change/](http://www.carbonbrief.org/blog/2014/06/could-rebranding-environmentalism-help-tackle-climate-change/), accessed October 2014.
- Hornsey MJ, Fielding KS. (2016). A cautionary note about messages of hope: Focusing on progress in reducing carbon emissions weakens mitigation motivation. *Global Environmental Change* 39, 26-34.
- Hsieh HF, Shannon SE. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research* 15(9), 1277–1288.
- Hunter LM, Brehm J. (2003). Brief comment: Qualitative insight into public knowledge of, and concern with, biodiversity. *Human Ecology* 31(2), 309-320.
- Ives CD, Kendal D. (2013). Values and attitudes of the urban public towards peri-urban agricultural land. *Land Use Policy* 34, 80–90.
- Jacobson SK, Langin C, Carlton JS, Kaid LL. (2012). Content analysis of newspaper coverage of the Florida panther. *Conservation Biology*, 26(1), 171-179.
- Jones C, Hine DW, Marks AD. (2016). The Future is Now: Reducing Psychological Distance to Increase Public Engagement with Climate Change. *Risk Analysis*.

- Kabii TI, Horwitz P. (2006). A review of landholder motivations and determinants for participation in conservation covenanting programmes. *Environmental Conservation* 33(1), 11-20.
- Kaennel M. 1998. Biodiversity: a diversity in definition. Pages 71-81 in Bachmann P, Kohl M, Paivinen R, (eds). Assessment of biodiversity for improved forest planning. Springer, Netherlands.
- Kahan DM, Peters E, Wittlin M, Slovic P, Ouellette LL, Braman D, Mandel G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nature Climate Change* 2(1), 732-735.
- Kahneman D, Knetsch JL, Thaler RH. (1990). Experimental tests of the endowment effect and the Coase theorem. *Journal of Political Economy* 98(6), 1325-1348.
- Kahneman D, Tversky A. (1984). Choices, values, and frames. *American Psychologist* 39(4), 341-350.
- Kahneman D, Tversky A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society* 47(2), 263-291.
- Keller PA, Lipkus IM, Rimer BK. (2003). Affect, framing, and persuasion. *Journal of Marketing Research* 40(1), 54-64.
- Kinder DR, Sanders LM. (1990). Mimicking political debate with survey questions: The case of white opinion on affirmative action for blacks. *Social Cognition* 8(1), 73-103.
- Kosoy N, Corbera E. (2010). Payments for ecosystem services as commodity fetishism. *Ecological Economics* 69(6), 1228-1236.
- Krantz SA, Monroe MC. (2016). Message Framing Matters: Communicating Climate Change with Forest Landowners. *Journal of Forestry* 114(2), 108-115.
- Ku, H.H., Kuo, C.C., Wu, C.L., Wu, C.Y., 2012. Communicating green marketing appeals effectively: the role of consumers' motivational orientation to promotion versus prevention. *Journal of Advertising* 41(4), 41-50.
- Kuehne G, Llewellyn R, Pannell D, Wilkinson R, Dolling P, Ouzman J. (2013). ADOPT: the Adoption and Diffusion Outcome Prediction Tool (Public Release Version 1.0, June 2013) [Computer software] Adelaide SA; CSIRO. Available from: [www.csiro.au/ADOPT](http://www.csiro.au/ADOPT).

- Kühberger A. (1998). The influence of framing on risky decisions: A meta-analysis. *Organizational Behavior and Human Decision Processes* 75(1), 23-55.
- Kusmanoff AM, Hardy MJ, Fidler F, Maffey G, Raymond C, Reed MS, Bekessy SA. (2016). Framing the private land conservation conversation: Strategic framing of the benefits of conservation participation could increase landholder engagement. *Environmental Science & Policy* 61, 124-128.
- Lakoff G. (2010). Why it matters how I frame the environment. *Environmental Communication* 4(1), 70-81.
- LaRose R, Rifon NJ, Enbody R. (2008). Promoting Personal Responsibility for Internet Safety. *Communications of the Association for Computing Machinery* 51(3), 71-76.
- Levin IP. (1987). Associative effects of information framing. *Bulletin of the Psychonomic Society* 25(2), 85-86.
- Levin IP, Schneider SL, Gaeth GJ. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes* 76(2), 149-188.
- Levin, Irwin P. and Gary J. Gaeth (1988). How consumers are affected by the framing of attribute information before and after consuming the product. *Journal of Consumer Research* 15(3) 374-378.
- Lewis-Beck M, Bryman AE, Liao TF. (2003). The Sage encyclopedia of social science research methods. Sage Publications.
- Liberman N, Trope Y, McCrea SM, Sherman SJ. (2007). The effect of level of construal on the temporal distance of activity enactment. *Journal of Experimental Social Psychology* 43(1), 143-149.
- Loewenstein GF, Weber EU, Hsee CK, Welch N. (2001). Risk as feelings. *Psychological Bulletin* 127(2), 267-286.
- Loftus EF. (1975). Leading questions and the eyewitness report. *Cognitive Psychology* 7(4), 560-572.
- Lorenz K. (1943). Die angeborenen Formen moeglicher Erfahrung. *Zeitschrift für Tierpsychologie* 5(2), 235-409.



- Lynne GD, Shonkwiler JS, Rola LR. (1988). Attitudes and farmer conservation behavior. *American Journal of Agricultural Economics* 70(1), 12-19.
- Maibach E, Roser-Renouf C, Leiserowitz A. (2009). Global warming's Six Americas 2009: an audience segmentation analysis. George Mason University Center for Climate Change Communication, Fairfax, VA 22030 USA.
- Maibach EW, Parrott RL. (Eds). (1995). Designing health messages: Approaches from communication theory and public health practice. Sage Publications.
- Maio GR, Pakizeh A, Cheung WY, Rees KJ. (2009). Changing, priming, and acting on values: effects via motivational relations in a circular model. *Journal of Personality and Social Psychology* 97(4), 699-715.
- Maxwell SL, Fuller RA, Brooks TM, & Watson JE. (2016). Biodiversity: The ravages of guns, nets and bulldozers. *Nature* 536(7615), 143-145.
- McCauley D J. (2006). Selling out on nature. *Nature* 443(7107), 27-28.
- McComas KA, Schuldt JP, Burge CA, Roh S. (2015). Communicating about marine disease: The effects of message frames on policy support. *Marine Policy* 57, 45-52.
- McDonald RI, Chai HY, Newell BR. (2015). Personal experience and the ‘psychological distance of climate change: An integrative review. *Journal of Environmental Psychology* 44, 109-118.
- Merolla J, Ramakrishnan SK, Haynes C. (2013). "Illegal," "Undocumented," or "Unauthorized": Equivalency Frames, Issue Frames, and Public Opinion on Immigration. *Perspectives on Politics* 11(3): 789-807.
- Metz D, Weigel L. (2013). The language of conservation. Conservation Gateway [www.conservationgateway.org](http://www.conservationgateway.org) accessed June 2016.
- Meyerowitz BE, Chaiken S. (1987). The effect of message framing on breast self-examination attitudes, intentions, and behavior. *Journal of Personality and Social Psychology* 52(3), 500-510.
- Millennium Ecosystem Assessment. (2005). Ecosystems and Human Well-being: Biodiversity Synthesis. World Resources Institute, Washington DC.
- Moon K, Cocklin, C. (2011). A landholder-based approach to the design of private-land conservation programs. *Conservation Biology* 25(3), 493–503.

- Morgan DL. (1996). Focus groups. *Annual Review of Sociology* 22, 129-152.
- Morrison M, Durante J, Greig J, Ward J. (2008). Encouraging Participation in Market Based Instruments and Incentive Programs. Final Report prepared for Land and Water Australia.
- Morton TA, Rabinovich A, Marshall D, Bretschneider P. (2011). The future that may (or may not) come: How framing changes responses to uncertainty in climate change communications. *Global Environmental Change* 21(1), 103-109.
- Murphy RO, Ackermann KA, Handgraaf M.J. (2011). Measuring social value orientation. *Judgment and Decision Making* 6(8), 771–781.
- Murray J. (2012). Building a new environmentalism. BusinessGreen [www.businessgreen.com/bg/james-blog/2220056/building-a-new-environmentalism](http://www.businessgreen.com/bg/james-blog/2220056/building-a-new-environmentalism) accessed October 2014.
- Musante MD, Bojanic DC, Zhang J. (2009). An evaluation of hotel website attribute utilization and effectiveness by hotel class. *Journal of Vacation Marketing* 15(3), 203–215.
- Muter BA, Meredith L, Gore KS, Gledhill CL, Huveneers C. (2013). Australian and US news media portrayal of sharks and their conservation. *Conservation Biology* 27(1), 187-196.
- Myers RE. (2010). Promoting healthy behaviors: how do we get the message across? *International Journal of Nursing Studies* 47(4), 500-512.
- Myers TA, Nisbet MC, Maibach EW, Leiserowitz AA. (2012). A public health frame arouses hopeful emotions about climate change. *Climatic Change* 113(3), 1105-1112.
- Nash JR, Stern SM. (2009). Property frames. *Washington University Law Review* 87(3), 449-504.
- Nash JR. (2009). Packaging property: The effect of paradigmatic framing of property rights. *Tulane Law Review* 83(3), 691-734.
- Negatu W, Parikh A. (1999). The impact of perception and other factors on the adoption of agricultural technology in the Moret and Jiru Woreda (district) of Ethiopia. *Agricultural Economics* 21(2), 201-216.

- Newcombe RG, Altman DG. (2000). Proportions and their differences. Pages 45-56 in Altman DG, Machin D, Bryant TN, and Gardner MJ (Eds.), *Statistics with confidence: Confidence intervals and statistical guidelines*. British Medical Journal Books, London.
- O'Neill S, Nicholson-Cole S. (2009). "Fear Won't Do It" Promoting Positive Engagement With Climate Change Through Visual and Iconic Representations. *Science Communication* 30(3), 355-379.
- Opdam P, Coninx I, Dewulf A, Steingröver E, Vos C, van der Wal M. (2015). Framing ecosystem services: affecting behaviour of actors in collaborative landscape planning? *Land Use Policy* 46, 223–231.
- Park MS, Kleinschmit D. (2016). Framing forest conservation in the global media: An interest-based approach. *Forest Policy and Economics* 68, 7-15.
- Pascual U, Perrings C. (2007). Developing incentives and economic mechanisms for in situ biodiversity conservation in agricultural landscapes. *Agriculture, Ecosystems & Environment* 121(2), 256-268.
- Persky J. (1995). Retrospectives: the ethology of homo economicus. *The Journal of Economic Perspectives* 9(2), 221–231.
- Pirard R. (2012). Market-based instruments for biodiversity and ecosystem services: a lexicon. *Environmental Science & Policy* 19, 59-68.
- Posthumus H, Gardebroek C, Ruben R. (2010). From participation to adoption: comparing the effectiveness of soil conservation programs in the Peruvian Andes. *Land Economics* 86(4), 645–667.
- Prager K, Posthumus H. (2010). Socio-economic factors influencing farmers' adoption of soil conservation practices in Europe. In: Napier, T. (eds.), *Human Dimensions of Soil and Water Conservation: A Global Perspective*. Nova Science Publishers, USA, pp 203–223.
- Purcell M. (2009). Resisting neoliberalization: communicative planning or counter-hegemonic movements? *Planning Theory* 8(2), 140-165.
- Rees W E. (1998). How should a parasite value its host? *Ecological Economics* 25(1), 49-52.

- Reeson A. (2008). Institutions, motivations and public goods: theory, evidence and implications for environmental policy. *Socio-economics and the Environment in Discussion*. CSIRO working paper series, Canberra.
- Rode J, Gómez-Baggethun E. Krause T. (2015). Motivation crowding by economic incentives in conservation policy: A review of the empirical evidence. *Ecological Economics* 117, 270-282.
- Rodrigues AS, Andelman SJ, Bakarr MI, Boitani L, Brooks TM, Cowling RM, Fishpool LDC, da Fonseca GAB, Gaston KJ, Hoffmann M, Long JS, Marquet, PA, Pilgrim JD, Pressey RL, Schipper J, Sechrest W, Stuart SN, Underhill LG, Waller RW, Watts MEJ, Yan X. (2004). Effectiveness of the global protected area network in representing species diversity. *Nature* 428(6983), 640-643.
- Rugg D. (1941). Experiments in wording questions: II. *Public Opinion Quarterly* 5(1), 91-92.
- Samuelson W, Zeckhauser R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty* 1(1) 7-59.
- Scherr SJ, McNeely JA. (2008). Biodiversity conservation and agricultural sustainability: towards a new paradigm of 'ecoagriculture' landscapes. *Philosophical Transactions of the Royal Society B: Biological Sciences* 363(1491), 477-494.
- Schultz P. (2011). Conservation means behavior. *Conservation Biology* 25(6): 1080-1083.
- Schultz PW, Nolan JM, Cialdini RB, Goldstein NJ, Griskevicius V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science* 18(5), 429-434.
- Schultz PW. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology* 21(4), 327-339.
- Schultz PW, Khazian AM, Zaleski AC. (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence* 3(1), 4-23.
- Schuman H, Presser S. (1981). Questions and answers in attitude surveys: Experiments on question form, wording, and context. Sage.

- Schwartz SH, (1992). Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. In: Zanna, M. (ed.), *Advances in Experimental Social Psychology*. Academic Press, Orlando Florida.
- Schwarz N, Bless H, Strack F, Klumpp G, Rittenauer-Schatka H, Simons A. (1991). Ease of retrieval as information: Another look at the availability heuristic. *Journal of Personality and Social Psychology* 61(2), 195–202.
- Schwarz N, Hippler HJ, Deutsch B, Strack F. (1985). Response scales: Effects of category range on reported behavior and comparative judgments. *Public Opinion Quarterly* 49(3): 388-395.
- Shanahan M. (1998). *Entangled in the web of life: biodiversity and the media*. International Institute for Environment and Development, London.
- Shiv B, Fedorikhin A. (1999). Heart and mind in conflict: The interplay of affect and cognition in consumer decision making. *Journal of Consumer Research* 26(3), 278-292.
- Silvertown J. (2015). Have Ecosystem Services Been Oversold? *Trends in Ecology & Evolution* 30(11), 641-648
- Slovic P, Finucane ML, Peters E, MacGregor DG. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis* 24(2), 311-322.
- Smith RJ, Verissimo D, Isaac NJB, Jones KE. (2012). Identifying Cinderella species: Uncovering mammals with conservation flagship appeal. *Conservation Letters* 5(3), 205-212.
- Spash CL. (2008). How much is that ecosystem in the window? The one with the bio-diverse trail. *Environmental Values* 17(2), 259-284.
- Spence A, Pidgeon N. (2010). Framing and communicating climate change: The effects of distance and outcome frame manipulations. *Global Environmental Change* 20(4), 656-667.
- Spence A, Poortinga W, Pidgeon N. (2012). The psychological distance of climate change. *Risk Analysis* 32(6), 957-972.
- St John FA, Edwards-Jones G, Jones JP. (2011). Conservation and human behaviour: lessons from social psychology. *Wildlife Research* 37(8), 658-667.

- Steinhorst J, Klöckner CA, Matthies E. (2015). Saving electricity—For the money or the environment? Risks of limiting pro-environmental spillover when using monetary framing. *Journal of Environmental Psychology* 43, 125-135.
- Stern SM. (2008). Reconsidering Crowding Out of Intrinsic Motivation from Financial Incentives: The Case of Conservation on Private Lands. In Chalifour N, (ed). 5 Critical Issues in Environmental Taxation: International and Comparative Perspectives, Oxford University Press.
- Stern S. (2006). Encouraging conservation on private lands: a behavioral analysis of financial incentives. *Arizona Law Review* 48, 541-583.
- Stoll-Kleemann S, O’Riordan T, Jaeger CC. (2001). The psychology of denial concerning climate mitigation measures: evidence from Swiss focus groups. *Global Environmental Change* 11(2), 107-117.
- Takacs D. (1996). The Idea of Biodiversity Philosophies of Paradise. The John Hopkins University Press, Baltimore.
- Tavakol M, Dennick R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education* 2, 53.
- Thaler RH, Sunstein CR. (2008). Nudge: Improving decisions about health, wealth, and happiness. Yale University Press, New Haven.
- Tu JC, Kao TF, Tu YC. (2013). Influences of framing effect and green message on advertising effect. *Social Behavior and Personality: an International Journal* 41(7), 1083-1098.
- Tucker EM, Rifon NJ, Lee EM, Reece BB. 2012. Consumer receptivity to green ads: a test of green claim types and the role of individual consumer characteristics for green ad response. *Journal of Advertising* 41(4), 9–23.
- Tversky A, Kahneman D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology* 5(2), 207–232.
- Tversky A, Kahneman D. (1981). The framing of decisions and the psychology of choice. *Science* 211, 453-458.
- University of Virginia Library. (2016). Using and Interpreting Cronbach’s Alpha. Research Data Services and Sciences <http://data.library.virginia.edu/using-and-interpreting-cronbachs-alpha/> accessed December 2016.

- Väliverronen, E. (1998). Biodiversity and the power of metaphor in environmental discourse. *Science Studies* 11(1), 19-34.
- Van Boven L, Kane J, McGraw AP, Dale J. (2010). Feeling close: emotional intensity reduces perceived psychological distance. *Journal of Personality and Social Psychology* 98(6), 872.
- Van de Velde L, Verbeke W, Popp M, Van Huylenbroeck G. (2010). The importance of message framing for providing information about sustainability and environmental aspects of energy. *Energy Policy* 38(10), 5541-5549.
- Veríssimo D, MacMillan DC, Smith RJ, Crees J, Davies ZG. (2014). Has climate change taken prominence over biodiversity conservation? *BioScience* 64(7), 625-629.
- Vining J, Merrick MS, Price EA. (2008). The distinction between humans and nature: Human perceptions of connectedness to nature and elements of the natural and unnatural. *Human Ecology Review* 15(1), 1-11.
- Walker B, Gunderson L, Kinzig A, Folke C, Carpenter S, Schultz L. (2006). A handful of heuristics and some propositions for understanding resilience in social-ecological systems. *Ecology and Society* 11(1), 13-27.
- Web of Science. Thomson Reuters. Available from <http://apps.webofknowledge.com> (accessed February 2016).
- Westman I. (1977). How much are nature's services worth. *Science* 197(4307), 960-964.
- White K, MacDonnell R, Dahl DW. (2011). It's the mind-set that matters: The role of construal level and message framing in influencing consumer efficacy and conservation behaviors. *Journal of Marketing Research* 48(3), 472-485.
- Wilhelm-Rechmann A, Cowling RM. (2011). Framing biodiversity conservation for decision makers: insights from four South African municipalities. *Conservation Letters* 4(1), 73-80.
- Wilson RS, Bruskotter JT. (2009). Assessing the impact of decision frame and existing attitudes on support for wolf restoration in the United States. *Human Dimensions of Wildlife* 14(5), 353-365.

- Worchel S, Lee J, Adewole A. (1975). Effects of supply and demand on ratings of object value. *Journal of Personality and Social Psychology* 32(5), 906-914.
- Yang WH, Bryan BA, MacDonald DH, Ward JR, Wells G, Crossman ND, Connor JD. (2010). A conservation industry for sustaining natural capital and ecosystem services in agricultural landscapes. *Ecological Economics* 69(4), 680-68.
- Zhou Y, Moy P. (2007). Parsing framing processes: The interplay between online public opinion and media coverage. *Journal of Communication* 57(1), 79-98.



# 9 APPENDICES



## Appendix A

College Human Ethics Advisory Network letters of approval for the studies reported in Chapter 2.



Design and Social Context College Human Ethics Advisory Network (CHEAN)  
Sub-committee of the RMIT Human Research Ethics Committee (HREC)

### Notice of Approval

Date: 04 July 2014

Project number: CHEAN A 0000017091-01/14

Project title: Information framing and attitudes toward biodiversity conservation

Risk classification: Low Risk

Investigator: A/Professor Sarah Bekessy and Alex Kusmanoff

Approved: From: 04 July 2014 To: 01 January 2015

I am pleased to advise that your application has been granted ethics approval by the Design and Social Context College Human Ethics Advisory Network as a sub-committee of the RMIT Human Research Ethics Committee (HREC).

#### Terms of approval:

- 1. Responsibilities of investigator**  
It is the responsibility of the above investigator/s to ensure that all other investigators and staff on a project are aware of the terms of approval and to ensure that the project is conducted as approved by the CHEAN. Approval is only valid whilst the investigator/s holds a position at RMIT University.
- 2. Amendments**  
Approval must be sought from the CHEAN to amend any aspect of a project including approved documents. To apply for an amendment please use the 'Request for Amendment Form' that is available on the RMIT website. Amendments must not be implemented without first gaining approval from CHEAN.
- 3. Adverse events**  
You should notify HREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
- 4. Participant Information and Consent Form (PICF)**  
The PICF and any other material used to recruit and inform participants of the project must include the RMIT university logo. The PICF must contain a complaints clause including the project number.
- 5. Annual reports**  
Continued approval of this project is dependent on the submission of an annual report. This form can be located online on the human research ethics web page on the RMIT website.
- 6. Final report**  
A final report must be provided at the conclusion of the project. CHEAN must be notified if the project is discontinued before the expected date of completion.
- 7. Monitoring**  
Projects may be subject to an audit or any other form of monitoring by HREC at any time.
- 8. Retention and storage of data**  
The investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

In any future correspondence please quote the project number and project title.

On behalf of the DSC College Human Ethics Advisory Network I wish you well in your research.

Suzana Kovacevic  
Research and Ethics Officer  
College of Design and Social Context  
RMIT University  
Ph: 03 9925 2974  
Email: [suzana.kovacevic@rmit.edu.au](mailto:suzana.kovacevic@rmit.edu.au)  
Website: [www.rmit.edu.au/dsc](http://www.rmit.edu.au/dsc)

**Notice of Approval**

**Date:** 24 July 2015

**Project number:** CHEAN A 0000019479-06/15

**Project title:** Information framing and attitudes toward biodiversity conservation

**Risk classification:** Low Risk

**Investigator:** A/Prof. Sarah Bekessy and Mr Alexander Kushmanoff

**Approved:** From: 24 July 2015 To: 1 January 2016

I am pleased to advise that your application has been granted ethics approval by the Design and Social Context College Human Ethics Advisory Network as a sub-committee of the RMIT Human Research Ethics Committee (HREC).

Terms of approval:

- 1. Responsibilities of investigator**  
It is the responsibility of the above investigator/s to ensure that all other investigators and staff on a project are aware of the terms of approval and to ensure that the project is conducted as approved by the CHEAN. Approval is only valid whilst the investigator/s holds a position at RMIT University.
- 2. Amendments**  
Approval must be sought from the CHEAN to amend any aspect of a project including approved documents. To apply for an amendment please use the 'Request for Amendment Form' that is available on the RMIT website. Amendments must not be implemented without first gaining approval from CHEAN.
- 3. Adverse events**  
You should notify HREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
- 4. Participant Information and Consent Form (PICF)**  
The PICF and any other material used to recruit and inform participants of the project must include the RMIT university logo. The PICF must contain a complaints clause including the project number.
- 5. Annual reports**  
Continued approval of this project is dependent on the submission of an annual report. This form can be located online on the human research ethics web page on the RMIT website.
- 6. Final report**  
A final report must be provided at the conclusion of the project. CHEAN must be notified if the project is discontinued before the expected date of completion.
- 7. Monitoring**  
Projects may be subject to an audit or any other form of monitoring by HREC at any time.
- 8. Retention and storage of data**  
The investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

In any future correspondence please quote the project number and project title.

On behalf of the DSC College Human Ethics Advisory Network I wish you well in your research.

**Daniel Martini**  
**Research and Ethics Officer (acting)**  
College of Design and Social Context  
RMIT University  
Ph: 03 9925 2974  
Email: [daniel.martini@rmit.edu.au](mailto:daniel.martini@rmit.edu.au)  
Website: [www.rmit.edu.au/dsc](http://www.rmit.edu.au/dsc)

## Appendix B

Participant information form for the research reported in Chapter 2.



### **INVITATION TO PARTICIPATE IN A RESEARCH PROJECT**

*You are invited to participate in a research project being conducted by RMIT University. Please read this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please ask one of the investigators.*

#### **PARTICIPANT INFORMATION**

##### **Project Title: *Property frames and public policy attitudes***

You are invited to participate in a survey about how the way information is framed affects people's attitudes towards public policy. Your time is greatly appreciated!

This study is being conducted by Alex Kusmanoff (PhD student), supervised by Associate Professor Sarah Bekessy at RMIT University, contact details are provided below. The RMIT Human Research Ethics Committee has approved this project, also see details below.

##### ***Why have you been approached?***

You have been invited to take part in this research because you are registered as a worker on Mechanical Turk. You must be aged 18 years or older and reside in Australia to participate in the survey.

##### ***If I agree to participate, what will I be required to do?***

The survey should take around 5 minutes. We do not ask for any identifying information (you do not need to give us your name and email address!). We will ask for basic, non-identifying demographic information (e.g., age, gender and postcode). The survey itself asks for your reaction to a hypothetical local government policy. There are no right or wrong answers and we are interested only in your intuitive feelings toward the policy.

The survey may be also be completed online at [weblink removed].

##### ***What will happen to the information I provide?***

Responses will be collated and stored in a spreadsheet as group data, then subjected to statistical analyses. Results from these analyses will be used in Alex Kusmanoff's PhD thesis and may also be published in academic journals and presented at academic conferences. Only summary information will be disseminated. Again, no identifying information will be collected as part of the survey. Once we have completed our data collection and analysis, we will import the data we collect to the RMIT server where it will be stored securely for five (5) years.

Following your participation, you may contact Alex ([alex.kusmanoff@rmit.edu.au](mailto:alex.kusmanoff@rmit.edu.au)) to obtain a summary of the results (expected to be available towards the end of 2014).

##### ***Whom should I contact if I have any questions?***

If you have any questions about your participation, please contact Alex Kusmanoff on (03) 9925 9944 or [alex.kusmanoff@rmit.edu.au](mailto:alex.kusmanoff@rmit.edu.au).

**Investigators:**

Associate Professor Dr Sarah Bekessy (Supervisor)  
School of Global, Urban and Social Studies,  
RMIT University  
(03) 99251858  
[sarah.bekessy@rmit.edu.au](mailto:sarah.bekessy@rmit.edu.au)

Alex Kusmanoff (PhD Candidate)  
School of Global, Urban and Social Studies,  
RMIT University  
(03) 9925 9944  
[alex.kusmanoff@rmit.edu.au](mailto:alex.kusmanoff@rmit.edu.au)

This study is jointly funded by the Australian Research Council's Centre of Excellence for Environmental Decisions and by the National Environmental Research Program.

*If you have any concerns about your participation in this project, which you do not wish to discuss with the researchers, then you can contact the Ethics Officer, Research Integrity, Governance and Systems, RMIT University, GPO Box 2476V VIC 3001. Tel: (03) 9925 2251 or email [human.ethics@rmit.edu.au](mailto:human.ethics@rmit.edu.au)*

Your consent to participate in this research is indicated by the completion and submission of the attached survey.

## Appendix C

Questionnaires used for the research reported in Chapter 2.

### Study 1 questionnaire

Thank you to agreeing to participate in our research.

- Please write your age in years
- What is your gender? (circle)
  - Male
  - Female
- What is your highest level of completed education? (circle)
  - No formal education
  - Primary (Grade 6)
  - Secondary (Year 12)
  - TAFE
  - Undergraduate
  - Postgraduate
- Please write you occupation
- Please indicate the option that best describes your home (circle)
  - I pay rent
  - I own my home (with or without mortgage)
  - Other (please specify)
- Have you ever owned property? (circle)

Yes	No
-----	----
- Please write your current postcode
- Which description below best describes your current home? (circle)
  - House with a yard
  - House without a yard
  - Apartment or townhouse with a yard
  - Apartment or townhouse without a yard
  - Rural property
  - Other (please specify)

- On the scale below, please indicate the extent to which you agree with the following statements:

*It is sometimes necessary to limit personal freedoms in order to ensure the well-being of society as a whole.*

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

*I should be able to do whatever I want with my own property, so long as I don't harm others.*

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

- Please imagine that you are a property owner and that your local government plans to regulate the removal of trees. Imagine that the two following options are being considered:

Option A modifies private property rights by taking away the right of owners to manage their land through prohibiting the removal of native trees greater than 2 metres in height, other than with a permit.

Option B does not interfere with private property rights other than to require a permit before owners may remove native trees greater than 2 metres in height.

- Based only on this information, which option would you prefer?
  - Option A
  - Option B
- How confident are you that your preferred option is better than the alternative?

1	2	3	4
Not at all confident	Somewhat confident	Confident	Very confident



### Study 2a, 2b questionnaire

Thank you to agreeing to participate in our research.

- Please write your age in years
  
- What is your gender? (circle)
  - Male
  - Female
  
- What is your highest level of completed education? (circle)
  - No formal education
  - Primary (Grade 6)
  - Secondary (Year 12)
  - TAFE
  - Undergraduate
  - Postgraduate
  
- Please write you occupation
  
- Please indicate the option that best describes your home (circle)
  - I pay rent
  - I own my home (with or without mortgage)
  - Other (please specify)
  
- Have you ever owned property? (circle)
  - Yes
  - No
  
- Please write your current postcode
  
- Which description below best describes your current home? (circle)
  - House with a yard
  - House without a yard
  - Apartment or townhouse with a yard
  - Apartment or townhouse without a yard
  - Rural property
  - Other (please specify)

- On the scale below, please indicate the extent to which you agree with the following statements:

*It is sometimes necessary to limit personal freedoms in order to ensure the well-being of society as a whole.*

1	2	3	4	5	6	7
Strongly dis agree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

*I should be able to do whatever I want with my own property, so long as I don't harm others.*

1	2	3	4	5	6	7
Strongly dis agree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

- Please imagine that the local government plan to implement the following regulation:

*Unless in accordance with a permit, a person must not remove, damage, kill or destroy a Valuable Tree. A Valuable Tree is a native tree greater than 2 metres in height.*

To help explain the proposed regulation, the local government has provided the information below:

[participants received only one of the following pieces of information]

[bundle-of-rights framed information]

#### **How the regulation will work**

Although it is usual to talk about 'owning' a house, land or some other asset, the 'thing' that is actually owned are a *bundle of rights concerning* the house, land or asset.

For land, these rights typically include (but are not limited to) the right to occupy, to use and enjoy, and to sell the property. When the house (or asset) is sold, these property rights pass to the new owner.

These rights can also be separated, so that one person may own the right to *use* an asset, even though the remaining 'ownership' rights remain with another person. This happens when an owner leases their house to a tenant, for example.

In this sense, 'ownership' can be thought of as holding a bundle of different rights. Individual rights may be traded or sold to other people, but the remaining 'bundle' is retained, preserving these other rights and the status of ownership.

## Appendices

The proposed regulation will protect 'Valuable Trees' without interfering with the various private property rights, other than to require a permit for owners to remove native trees greater than 2 metres in height.

[discrete asset framed information]

### How the regulation will work

Ownership of a house, land, or some other asset, allows the owner to largely control how they use their asset.

In the case of land, owners typically enjoy exclusive access to their property, the freedom to use and enjoy their property, and ultimately the right to sell their property.

In this way, an owner can be said to exercise dominion over their property, though this is subject to some constraints. For example, an owner may only use and enjoy their property in a manner that respects the rights of others, and which otherwise complies with the law.

The proposed regulation will protect 'Valuable Trees' by limiting the right to use and enjoy private property through prohibiting owners from removing native trees greater than 2 metres in height, other than with a permit.

- On the scale below, please indicate the extent to which you agree with each of the following statements:

*This regulation is fair*

1	2	3	4	5	6	7
Strongly dis agree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

*I would comply with this regulation*

1	2	3	4	5	6	7
Strongly dis agree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

*I would protest this regulation*

1	2	3	4	5	6	7
Strongly dis agree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree



## Appendix D

College Human Ethics Advisory Network letter of approval for the studies reported in Chapter 3.



Design and Social Context College Human Ethics Advisory Network (CHEAN)  
Sub-committee of the RMIT Human Research Ethics Committee (HREC)

### Notice of Approval

**Date:** 24 July 2015

**Project number:** CHEAN A 0000019480-06/15

**Project title:** How does ecosystem services framing influence conservation motivation

**Risk classification:** Low Risk

**Investigator:** A/Prof. Sarah Bekessy and Mr Alexander Kushmanoff

**Approved:** From: 24 July 2015 To: 1 January 2016

I am pleased to advise that your application has been granted ethics approval by the Design and Social Context College Human Ethics Advisory Network as a sub-committee of the RMIT Human Research Ethics Committee (HREC).

Terms of approval:

**1. Responsibilities of investigator**

It is the responsibility of the above investigator/s to ensure that all other investigators and staff on a project are aware of the terms of approval and to ensure that the project is conducted as approved by the CHEAN. Approval is only valid whilst the investigator/s holds a position at RMIT University.

**2. Amendments**

Approval must be sought from the CHEAN to amend any aspect of a project including approved documents. To apply for an amendment please use the 'Request for Amendment Form' that is available on the RMIT website. Amendments must not be implemented without first gaining approval from CHEAN.

**3. Adverse events**

You should notify HREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.

**4. Participant Information and Consent Form (PICF)**

The PICF and any other material used to recruit and inform participants of the project must include the RMIT university logo. The PICF must contain a complaints clause including the project number.

**5. Annual reports**

Continued approval of this project is dependent on the submission of an annual report. This form can be located online on the human research ethics web page on the RMIT website.

**6. Final report**

A final report must be provided at the conclusion of the project. CHEAN must be notified if the project is discontinued before the expected date of completion.

**7. Monitoring**

Projects may be subject to an audit or any other form of monitoring by HREC at any time.

**8. Retention and storage of data**

The investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

In any future correspondence please quote the project number and project title.

On behalf of the DSC College Human Ethics Advisory Network I wish you well in your research.

**Daniel Martini**

**Research and Ethics Officer (acting)**

College of Design and Social Context

RMIT University

Ph: 03 9925 2974

Email: [daniel.martini@rmit.edu.au](mailto:daniel.martini@rmit.edu.au)

Website: [www.rmit.edu.au/dsc](http://www.rmit.edu.au/dsc)



## Appendix E

Participant information form for the research reported in Chapter 3.



### **INVITATION TO PARTICIPATE IN A RESEARCH PROJECT**

*You are invited to participate in a research project being conducted by RMIT University. Please read this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please ask one of the investigators.*

#### **PARTICIPANT INFORMATION**

##### **Project Title: *Why do people want to conserve bees?***

You are invited to participate in a survey about the reasons that people have for wanting to conserve bees in the ocean environment. Your time is greatly appreciated! *[Note that this heading and line was substituted for an equivalent line about whales for participants in that version of the survey].*

This study is being conducted by Alex Kusmanoff (PhD student), supervised by Associate Professor Sarah Bekessy at RMIT University, contact details are provided below. The RMIT Human Research Ethics Committee has approved this project, also see details below.

##### ***Why have you been approached?***

You have been invited to take part in this research because you are registered as a worker on Mechanical Turk. You must be aged 18 years or older may participate in the survey.

##### ***If I agree to participate, what will I be required to do?***

The survey should take around 5 minutes. We do not ask for any identifying information (you do not need to give us your name and email address!). We will ask for basic, non-identifying demographic information (e.g., age, gender and postcode). The survey itself asks you to read some information about bees, and then to list some reasons for preserving them. There are no right or wrong answers.

##### ***What will happen to the information I provide?***

Responses will be collated and stored in a spreadsheet as group data, then subjected to analyses. Results will be used in Alex Kusmanoff's PhD thesis and may also be published in academic journals and presented at academic conferences. Only summary information will be disseminated. Again, no identifying information will be collected as part of the survey. Once we have completed our data collection and analysis, we will import the data we collect to the RMIT server where it will be stored securely for five (5) years.

Following your participation, you may contact Alex ([alex.kusmanoff@rmit.edu.au](mailto:alex.kusmanoff@rmit.edu.au)) to obtain a summary of the results (expected to be available towards the middle of 2016).

##### ***Whom should I contact if I have any questions?***

If you have any questions about your participation, please contact Alex Kusmanoff on (03) 9925 9944 or [alex.kusmanoff@rmit.edu.au](mailto:alex.kusmanoff@rmit.edu.au).

**Investigators:**

Associate Professor Dr Sarah Bekessy (Supervisor)  
School of Global, Urban and Social Studies,  
RMIT University  
(03) 99251858  
[sarah.bekessy@rmit.edu.au](mailto:sarah.bekessy@rmit.edu.au)

Alex Kusmanoff (PhD Candidate)  
School of Global, Urban and Social Studies,  
RMIT University  
(03) 9925 9944  
[alex.kusmanoff@rmit.edu.au](mailto:alex.kusmanoff@rmit.edu.au)

This study is jointly funded by the Australian Research Council's Centre of Excellence for Environmental Decisions and by the National Environmental Research Program.

*If you have any concerns about your participation in this project, which you do not wish to discuss with the researchers, then you can contact the Ethics Officer, Research Integrity, Governance and Systems, RMIT University, GPO Box 2476V VIC 3001. Tel: (03) 9925 2251 or email [human.ethics@rmit.edu.au](mailto:human.ethics@rmit.edu.au)*

Your consent to participate in this research is indicated by the completion and submission of the attached survey.



## Appendix F

Economically framed ecosystem service information was provided to one group only in each survey. The sources used to compile this information are shown below, but were not provided to participants.

Information provided to participants		
	Whales	Bees
Economically framed ecosystem service information (ES present conditions only)	<p>Whale-watching is a growing industry and, is estimated to have generated nearly three billion dollars worldwide in 2008. These profits are far in excess of those obtained from hunting whales.<sup>1</sup></p> <p>A report for the International Fund for Animal Welfare shows that the value of a single whale to local Australian coastal economies can be as high as \$1.25 million.<sup>2</sup></p>	<p>It is estimated that bees and other pollinating insects contributed \$29 billion to farm income in the USA in 2010.<sup>5</sup></p> <p>A third of all the plants we eat have been pollinated by bees,<sup>6</sup> and more than half of the world's diet of fat and oil comes from oilseeds such as cotton, rape, sunflower, coconut, groundnut and oil palm, which rely on or benefit from pollination by bees.<sup>7</sup></p>
Non-conservation oriented interesting information (all groups)	<p>Whales are complex, often highly social and intelligent creatures.<sup>3</sup></p> <p>Some whale species live, at times, in very complex social structures and have been shown to socialise, forage, care for their young and travel together in groups just as humans do.<sup>3</sup></p> <p>Whales have existed on Earth for a long time, having evolved from land mammals that lived in warm salty waters about 55 million years ago.<sup>3</sup></p> <p>The Blue Whale is the largest creature ever to have lived on earth with their tongues alone weighing as much as an elephant, and their hearts, as much as a car.<sup>4</sup></p>	<p>Bees have a surprising capacity to learn and remember things and to make complex calculations on distance travelled and foraging efficiency.<sup>8</sup></p> <p>Honey bees have 170 smell receptors, compared with only 62 in fruit flies and 79 in mosquitoes. Because of this, their sense of smell is so precise they can distinguish between hundreds of flower varieties and tell whether a flower carries pollen or nectar from metres away.<sup>8</sup></p> <p>Bees have existed on Earth for more than 30 million years.<sup>6</sup></p> <p>A bee's wings stroke very fast, about 200 beats per second, which is what generates their</p>

	<p>Like humans, whales are mammals, which mean whale calves feed on their mother's milk. A Blue Whale calf drinks more than 600 litres of milk each day and gains about 90kg every day for its first year.<sup>4</sup></p> <p>It is thought that whales feel emotions.<sup>4</sup></p> <p>Blue whales are one of the loudest animals on the planet, communicating with each other using a series of low frequency pulses, groans, and moans. It is thought that in good conditions blue whales can hear each other over distances of up to 1,600km.<sup>4</sup></p>	<p>distinctive buzz. A honey bee can fly for around 10 kilometres, and as fast as 24 kilometres an hour.<sup>6</sup></p> <p>During winter, honey bees feed on the honey they collected during the warmer months. They form a tight cluster in their hive to keep the queen and themselves warm.<sup>8</sup></p> <p>Honey is the only food that includes all the substances necessary to sustain life, including enzymes, vitamins, minerals, and water.<sup>8</sup></p> <p>There is some evidence that bees experience anxiety and other emotions.<sup>9</sup></p> <p>Bees communicate by smells called 'pheromones' and by performing special 'dances'.<sup>6</sup></p>
--	---	--

### Sources

1. New South Wales Department of the Environment, Water, Heritage and the Arts. 2013. Why People Love Whales. Wild About Whales. Online [www.wildaboutwhales.com.au/news-and-events/news/why-people-love-whales](http://www.wildaboutwhales.com.au/news-and-events/news/why-people-love-whales) accessed March 2015.
2. Knowles T, Campbell R. 2011. What's a whale worth? Valuing whales for National Whale Day, a report for the International Fund for Animal Welfare (IFAW). Economists at Large, Melbourne, Australia.
3. Australian Government Department of the Environment, Water, Heritage and the Arts. 2010. Whale Protection (brochure). Online [www.environment.gov.au/system/files/resources/0bc1c82b-0a06-4113-9704-2cce2b13af83/files/fs-whale-protection.pdf](http://www.environment.gov.au/system/files/resources/0bc1c82b-0a06-4113-9704-2cce2b13af83/files/fs-whale-protection.pdf) accessed March 2015.
4. OneKind. 2010. Whale (Blue). Online [www.onekind.org/be-inspired/animals\\_a\\_z/whale\\_blue/](http://www.onekind.org/be-inspired/animals_a_z/whale_blue/) accessed March 2015.
5. Ramanujan K. 2012. Insect pollinators contribute \$29 billion to U.S. farm income. Cornell Chronicle. Online at [www.news.cornell.edu/stories/2012/05/insect-pollinators-contribute-29b-us-farm-income](http://www.news.cornell.edu/stories/2012/05/insect-pollinators-contribute-29b-us-farm-income) January 2016.
6. Bee Healthy. 2010. Fun facts about honey bees online at [www.bees4kids.org.uk/fun-facts-about-honey-bees/](http://www.bees4kids.org.uk/fun-facts-about-honey-bees/) accessed January 2016.
7. Bradbear N. 2009. Bees and their role in forest livelihoods: a guide to the services provided by bees and the sustainable harvesting, processing and marketing of their products. Food and Agriculture Organization of the United Nations, Rome.

8. Benefits-of-Honey. 2011. 20 amazing honey bee facts! Online [www.benefits-of-honey.com/honey-bee-facts.html](http://www.benefits-of-honey.com/honey-bee-facts.html) accessed January 2016.
9. Castro J. 2011. Do bees have feelings? Scientific American. Online [www.scientificamerican.com/article/do-bees-have-feelings/](http://www.scientificamerican.com/article/do-bees-have-feelings/) accessed January 2016.



## Appendix G

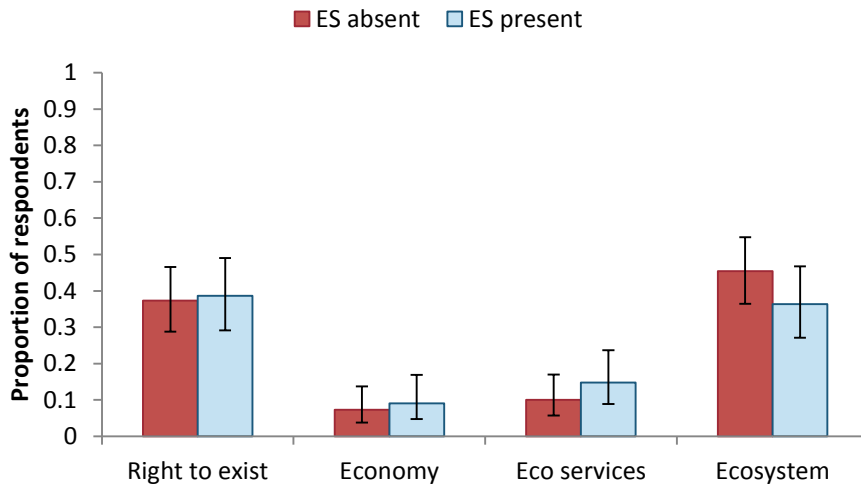
Questionnaire used for the research reported in Chapter 3.

1. Please indicate your age
2. What is your gender?
3. On the scale below, please indicate how much do you care about whales/bees?  
(where 1 is very little, and 10 is a great deal)  
  
1      2      3      4      5      6      7      8      9      10
4. On the scale of 1 to 10 below, please indicate how much you know about  
whales/bees? (where 1 is very little, and 10 is a great deal)  
  
1      2      3      4      5      6      7      8      9      10
5. Please read the following collection of facts about whales/bees:  
  
[refer to Appendix F]
6. Please take a couple of minutes to list all of the reasons that you can think of  
for protecting whales/bees. You may list as many as you like, but please try and  
list at least 3.
7. Now, please list the reasons you gave above, in the order of most important to  
least important.
8. Please rank the following reasons for protecting whales/bees in order of most  
important to least important: [note this order was counter-balanced]
  - Because they have the right to exist
  - Because they help the economy
  - Because they provide humans with natural goods and services
  - Because they are important to the health of the ecosystem
9. Please indicate the topic of this survey: [this is an attention-check question.  
Note the order of response options was counterbalanced]
  - Bees
  - Politics
  - Whales
  - Corporations

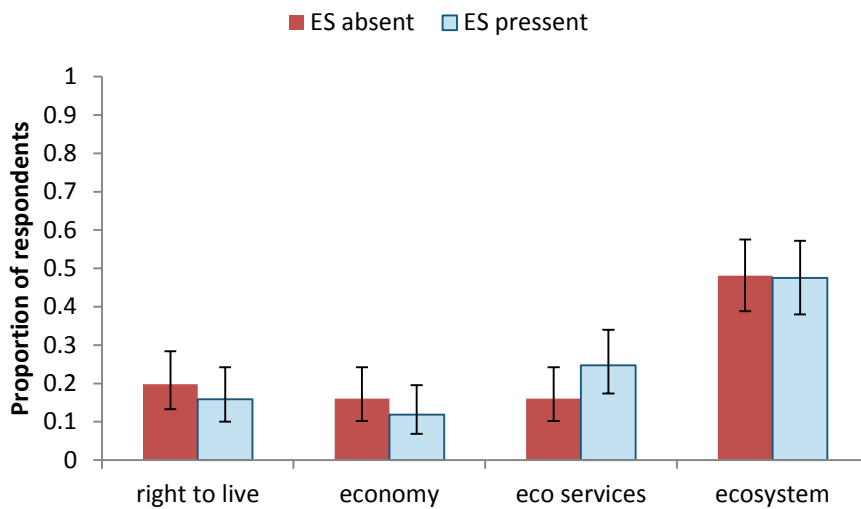


## Appendix H

A final question (question 8 in Appendix G above) asked participants to rank the following reasons for protecting whales or bees in order of most important to least important: (i) because they have the right to exist; (ii) because they help the economy; (iii) because they provide humans with natural goods and services; or (iv) because they are important to the health of the ecosystem. There was no apparent framing effect on these rankings arising from whether respondents received information that contained economically framed ecosystem services information (ES present) or not (ES absent).



**Figure H.1** Proportion of respondents that selected each reason for caring for whales as the most important reason for doing so, with 95% confidence intervals.



**Fig H.2** Proportion of respondents that selected each reason for caring for bees as the most important reason for doing so, with 95% confidence intervals.





## Appendix I

List of schemes analysed in the research reported in Chapter 4.

Jurisdiction	Organisation	Program name	Website
National	Australian Government	Environmental Stewardship Program	<a href="http://www.nrm.gov.au/funding/previous/stewardship/index.html">http://www.nrm.gov.au/funding/previous/stewardship/index.html</a>
	Landcare Australia	Landcare	<a href="http://www.landcareonline.com.au/?page_id=26">http://www.landcareonline.com.au/?page_id=26</a>
	Humane Society International Wildlife Land Trust	Wildlife Land Trust Sanctuary	<a href="http://www.wildlifelandtrust.org.au/index.php/about">http://www.wildlifelandtrust.org.au/index.php/about</a>
New South Wales	Nature Conservation Trust NSW	Conservation Agreements	<a href="http://nct.org.au/supporting-land-owners/legal-protection-for-land/">http://nct.org.au/supporting-land-owners/legal-protection-for-land/</a>
	Office of Environment and Heritage	Conservation Agreements	<a href="http://www.environment.nsw.gov.au/cpp/ConservationAgreements.htm">http://www.environment.nsw.gov.au/cpp/ConservationAgreements.htm</a>
	Office of Environment and Heritage	Biobanking	<a href="http://www.environment.nsw.gov.au/biobanking/index.htm">http://www.environment.nsw.gov.au/biobanking/index.htm</a>
	Office of Environment and Heritage	Wildlife refuges	<a href="http://www.environment.nsw.gov.au/cpp/WildlifeRefuges.htm">http://www.environment.nsw.gov.au/cpp/WildlifeRefuges.htm</a>
Northern Territory	Territory Natural Resource Management	Territory Conservation Agreements	<a href="http://www.territorynrm.org.au/funding/tcas">http://www.territorynrm.org.au/funding/tcas</a>
Queensland	Dept. Environment and Heritage Protection	Nature refuges	<a href="http://www.ehp.qld.gov.au/ecosystems/nature-refuges/the_nature_refuges_program.html">http://www.ehp.qld.gov.au/ecosystems/nature-refuges/the_nature_refuges_program.html</a>
	Dept. Environment and Heritage Protection	Nature Assist	<a href="http://www.ehp.qld.gov.au/ecosystems/nature-refuges/natureassist/">http://www.ehp.qld.gov.au/ecosystems/nature-refuges/natureassist/</a>

<b>South Australia</b>	Dept. Environment, Water and Natural Resources	Heritage agreements	<a href="http://www.environment.sa.gov.au/managing-natural-resources/Native_vegetation/Managing_native_vegetation/Heritage_Agreement_Scheme">http://www.environment.sa.gov.au/managing-natural-resources/Native_vegetation/Managing_native_vegetation/Heritage_Agreement_Scheme</a>
<b>Tasmania</b>	Dept. Primary Industries, Parks, Water and Environment	Land for Wildlife	<a href="http://www.dpipwe.tas.gov.au/inter.nsf/WebPages/DRAR-7T8VRQ?open">http://www.dpipwe.tas.gov.au/inter.nsf/WebPages/DRAR-7T8VRQ?open</a>
	Tasmanian Land Conservancy	Midlands Landscape Project	<a href="http://www.tasland.org.au/majorprogrammes/midlands/">http://www.tasland.org.au/majorprogrammes/midlands/</a>
<b>Victoria</b>	Dept. Environment and Primary Industries	BushTender	<a href="http://www.depi.vic.gov.au/environment-and-wildlife/environmental-action/innovative-market-approaches/bushtender">http://www.depi.vic.gov.au/environment-and-wildlife/environmental-action/innovative-market-approaches/bushtender</a>
	Trust for Nature	Conservation covenants	<a href="http://www.trustfornature.org.au/conservation-planning/conservation-covenants/">http://www.trustfornature.org.au/conservation-planning/conservation-covenants/</a>
	Dept. Environment and Primary Industries	Land for Wildlife	<a href="http://www.depi.vic.gov.au/environment-and-wildlife/community-programs/land-for-wildlife">http://www.depi.vic.gov.au/environment-and-wildlife/community-programs/land-for-wildlife</a>
	Dept. Environment and Primary Industries	Landcare	<a href="http://www.depi.vic.gov.au/environment-and-wildlife/community-programs/landcare/about-the-victorian-landcare-program">http://www.depi.vic.gov.au/environment-and-wildlife/community-programs/landcare/about-the-victorian-landcare-program</a>
<b>Western Australia</b>	The National Trust of Australia (WA)	Conservation covenants	<a href="http://www.nationaltrust.org.au/wa/natural-heritage">http://www.nationaltrust.org.au/wa/natural-heritage</a>
	Dept Parks and Wildlife	Conservation covenants	<a href="http://www.dpaw.wa.gov.au/management/off-reserve-conservation/nature-conservation-covenant-program">http://www.dpaw.wa.gov.au/management/off-reserve-conservation/nature-conservation-covenant-program</a>
	Dept Parks and Wildlife	Healthy Wetland Habitats	<a href="http://www.dec.wa.gov.au/management-and-protection/conservation-on-other-lands/healthy-wetland-habitats.html">http://www.dec.wa.gov.au/management-and-protection/conservation-on-other-lands/healthy-wetland-habitats.html</a>

## Appendix J

This is the guide developed for coding the conservation participation benefits analysed in the research reported in Chapter 4.

Benefit category	Specific benefit theme or outcomes
<p><b>Benefits to the landholder (i.e. egoistic value orientation)</b></p>	<p><u>Improvements in amenity</u></p>
	<p><u>Participation in good land management</u></p> <ul style="list-style-type: none"> <li>• Native vegetation management</li> <li>• Practicing environmental citizenship</li> <li>• Land stewardship (production focussed)</li> </ul>
	<p><u>Social interaction and inclusion</u></p>
	<p><u>Achievement</u></p>
	<p><u>Education/empowerment</u></p>
	<p><u>Recognition and respect</u></p>
	<p><u>Measures to encourage/facilitate participation</u></p> <ul style="list-style-type: none"> <li>• Low administrative burden</li> <li>• Flexibility to shape initial commitment</li> <li>• Flexibility to alter ongoing commitment</li> <li>• Contracts and other means of ensuring certainty</li> <li>• Participation cost reimbursement</li> <li>• In-kind support (i.e. help with fencing, developing management plans, etc)</li> </ul>
	<p><u>Measures to compensate for participation</u></p> <ul style="list-style-type: none"> <li>• Tax incentives</li> <li>• Council rate reductions</li> </ul>
	<p><u>Financial security</u></p> <ul style="list-style-type: none"> <li>• Income stream (i.e. stewardship payments)                             <ul style="list-style-type: none"> <li>◦ Income diversification</li> </ul> </li> <li>• Increase in property value</li> <li>• Land productivity</li> <li>• Threat mitigation (i.e. bushfire, drought ‘proofing’)</li> </ul>
	<p><u>Property security</u></p> <ul style="list-style-type: none"> <li>• Sustainable land management</li> <li>• Increased productivity</li> <li>• Protection from competing land use (i.e. mining) or advocacy on behalf of landholder</li> </ul>
<p><b>Benefits to the public good (i.e. altruistic value orientation)</b></p>	<p><u>Value for public money</u></p>
	<p><u>Community benefits</u></p> <ul style="list-style-type: none"> <li>• Community Inclusiveness</li> <li>• Community awareness/education</li> <li>• Community empowerment</li> <li>• Community amenity</li> <li>• Other community benefits</li> </ul>
	<p><u>Natural resource management</u></p> <ul style="list-style-type: none"> <li>• Improvement in farmland quality</li> <li>• Balance between productive land use and conservation</li> </ul>
	<p><u>Greenhouse abatement (including adaptation)</u></p>
	<p><u>Cultural and heritage protection/benefits</u></p>

<b>Benefits to conservation (i.e. biospheric value orientation)</b>	<u>Biodiversity conservation outcomes</u> <ul style="list-style-type: none"> <li>• Protect ecosystems</li> <li>• Protect endangered species</li> <li>• Protect habitat</li> <li>• Protect native vegetation</li> <li>• Removal of introduced species (including stock)</li> <li>• Build/enhance resilience</li> <li>• Revegetation</li> </ul>
	<u>Landscape conservation</u> <ul style="list-style-type: none"> <li>• Waterways</li> <li>• Erosion control</li> <li>• Fire management</li> <li>• Salinity</li> <li>• Connectivity</li> <li>• general</li> </ul>
	<u>Long term security of conservation (e.g. from covenants)</u>
	<u>Environmental appreciation</u>

## Appendix K

These guidelines were used to code media releases as having ecosystem services logic present or absent, for the research reported in Chapter 5.

### Coding Guide

This content analysis is designed to identify those media releases that invoke an 'ecosystem services' logic within any aspect of the release.

The concept of 'ecosystem services' (ES) relates to the useful (and essential) services that nature provides humans, for example, supply of clean air, drinking water, food, building materials, pollination, etc. (Costanza et al. 1997), and has been described in the Millennium Ecosystem Assessment (2005) as "the functions and products of ecosystems that benefit humans, or yield welfare to society".

Given that in most cases the term 'ecosystem services' is not used, it is necessary to review individual releases in order to determine whether an ecosystem services concept is present within the release.

### *Coding*

For a press release to be considered as having an ecosystem services concept (i.e. to be coded 'ES present'), the following general criteria is to be applied:

- A benefit to humans is mentioned; and
- This benefit is derived from nature/the environment.

This may be taken from a specific statement within the press release, or constructed from reading the press release as a whole.

If these elements are present and satisfy the 'ES present' code, it does not matter whether the ES concept dominates or forms a substantial part of the media release, it is sufficient that this concept be present for the document to be coded as being 'ES present'.

### *In practice*

Coding in practice is rarely as easy as applying an arbitrary script. Following are notes on how to apply the coding criteria.

Generally, inferences about the use of nature for human benefit satisfy the 'ES present' coding. However, to be coded as 'ES present', something more than the mere mention of a primary industry (fishing, forestry, etc) is required. That is, there must be within the context of the release taken as a whole, or within the specific words, some nexus between the environment and the human benefit.

For example, the following statement would satisfy the 'ES present' code:

"Australia's marine environment generates \$52 billion annually for the national economy in tourism, fisheries and other areas..." (ACF, Sept 13 2004)

For another example, the following statement in a media release about drought recovery measures would satisfy the 'ES present' code:

“These projects will not only help protect precious natural resources at a local level, they will help protect the long-term productivity of rural land.” (Minister Kemp, 28 March 2003)

However, a counter-example is provided by the following:

The Great Barrier Reef is one of our most significant environmental assets. (Minister Garrett June 18 2008)

This statement does not satisfy the 'ES present' code. Although it infers that the environment in question has value, it does not link it with the provision of specific 'services' or products.

A further counter-example is provided in the following:

“This vast Basin deserves the commitment of the relevant governments to protect its unique values – both as an important grazing and mining province and its great natural wonders which include Lake Eyre itself, the Coogie Lakes, and many of Australia’s unique plants and animals.” (Minister Kemp, June 10 2004)

This statement does not satisfy the 'ES present' code. Although it talks of the environment having a number of values and places these values and the environment adjacent to one another, it does not sufficiently link these values to the environment such that the values flow necessarily from the environment.

However, a similar example that does satisfy the 'ES present' code is given by the statement below from a media release below concerning management of the Great Barrier Reef:

Both Governments recognise the significant environmental and economic value of the reef... (Minister Garrett, Premier Bligh and Minister Jones Sept 2 2009).

Although not dramatically different to the preceding example, this statement (and the context of the media release as a whole) sufficiently links the 'economic service' with the environment of the Great Barrier Reef.

Similarly (and specifically), the mere mention of 'sustainability', 'water efficiency', 'soil' or 'weed management' are not sufficient to satisfy the 'ES present' code. A link between the 'service' and nature is required. That is, a mere mention of the existence of services (or industries derived from these services) is not sufficient.

Benefits such as tax rebates for entering into conservation covenants do not satisfy the 'ES present' code, as these are artificial benefits designed by government to modify human behaviour and are not directly an ecosystem service.

Cultural ES services may satisfy the 'ES present' code, but again there must be a sufficient link between the service and the environment, it is not sufficient that a document simply to refer to the 'natural beauty' of a place, or similar.

The table below shows some of the kinds of statements classified as ES frames, and others that were not.

## Appendices

Some specific concepts and statements that are to be included and excluded as an ES frame

Included	Excluded
<ul style="list-style-type: none"> <li>• Primary industry (e.g. eco-tourism, fisheries, etc so long as there is a connection made between these as a benefit of nature, not simply stating their existence.</li> <li>• Carbon capture from carbon farming, where there is a sufficient link made between, re-vegetation and carbon storage, for example.</li> <li>• Statements along the lines of:               <ul style="list-style-type: none"> <li>○ 'natural heritage drives the economy'</li> <li>○ 'greening to enhance liveability'</li> <li>○ 'economic value of the environment'</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• A mere mention of a relevant primary industry (e.g. fishing, forestry, eco-tourism, etc.) insufficient.</li> <li>• A mere mention of 'sustainability', 'water efficiency', or 'soil' or 'weed' management insufficient.</li> <li>• 'Saving the Great Barrier Reef for future generations' (or similar) insufficient.</li> <li>• Heritage conservation for the purposes of economic stimulus.</li> <li>• Tax rebates for conservation covenants and similar benefits that result from policy rather than directly from nature.</li> </ul>